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**Project Title**

An Analysis of Possible Risk to Threatened and Endangered Plant Species  
Associated with Glyphosate Use in Alfalfa: A County-Level Analysis –  
Supplement

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The work reported here does not meet the U.S. EPA Good Laboratory Practice requirements as specified in 40 CFR Part 160.

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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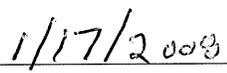
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**CERTIFICATION PAGE**

This report is an accurate and complete representation of the project activities.

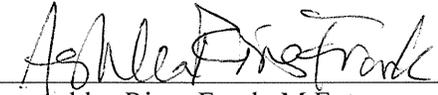
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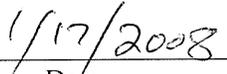
  
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## ABSTRACT

This report is a supplement to the county-level analysis report for glyphosate use in alfalfa and the possible risk to threatened and endangered plants (Priester et al., 2007). This report details a supplemental evaluation that included additional county-level locations for federally listed threatened and endangered (“listed”) plants based on location data available from another data provider.

The original county-level analysis (Priester et al., 2007) considered acreage and farm data for alfalfa hay and seed production based on the 2002 Census of Agriculture (USDA, 2002). County-level locations of listed plant species were obtained from the FIFRA Endangered Species Task Force (FESTF) Information Management System (IMS). The FESTF IMS locations were based on a dataset provided to the FESTF by the U.S. EPA in June 2003.

This supplemental county-level analysis considered the same alfalfa production counties as the original analysis. However, additional county-level species location data were obtained based on the FESTF MJD (Multi-Jurisdictional Database). The FESTF MJD consists of a “licensed dataset” drawn from NatureServe’s Multi-Jurisdictional Database (MJD) licensed to FESTF (NatureServe, 2006). The “licensed dataset” contains information on listed species, including sub-county location data. County-level locations of listed plant species were derived from this dataset, and compared to the locations evaluated in the original analysis. If additional listed plant species or county locations were noted, these were included in this supplemental analysis.

In this supplemental analysis, a total of 237 species/crop co-occurrences were identified for alfalfa hay-producing counties (22 for alfalfa seed-producing counties). These represent 69 different plant species, including one species, North Park phacelia (*Phacelia formosula*), that was not considered in the original analysis. These co-occurrences were in 202 counties; 184 of these counties were not included in the original analysis for any species (18 counties were included but for other plant species). The alfalfa hay co-occurrences encompass all of the alfalfa seed co-occurrences. Each of these co-occurrences was evaluated and conclusions for each were expressed using determination statements in the same manner as for the original analysis.

The conclusion of this supplement analysis was as follows, for alfalfa hay production: 80 co-occurrences (for 33 species) can be eliminated from concern based on the habitat characteristics of the species in question. Of the remaining co-occurrences, three co-occurrences (for three species) can be excluded on the basis of an examination of the interactions within the county, which show a lack of proximity of alfalfa culture or pesticide use to the species locations (at the section (square mile) level). An additional seven co-occurrences (for three species) may also be protected using existing species management practices. Finally, there are 147 co-occurrences for alfalfa hay, representing 32 species in 130 counties, for which it has not been possible to identify an exclusion or protection determination at the county level. These remaining co-occurrences merit further analysis to determine whether exclusions exist or protections are needed. These additional analyses will be reported separately.

## SECTION 1.0: INTRODUCTION AND OBJECTIVES

This report is a supplement to the county-level analysis report for glyphosate use in alfalfa and the possible risk to threatened and endangered plants (Priester et al., 2007). This report details a supplemental evaluation that included additional county-level locations for federally listed threatened and endangered (“listed”) plants based on location data available from another data provider.

The original county-level analysis (Priester et al., 2007) considered acreage and farm data for alfalfa hay and seed production based on the 2002 Census of Agriculture (USDA, 2002). County-level locations of listed plant species were obtained from the FIFRA Endangered Species Task Force (FESTF) Information Management System (IMS). The FESTF IMS locations were based on a dataset provided to the FESTF by the U.S. EPA in June 2003.

This supplemental county-level analysis considered the same alfalfa production counties as the original analysis. However, additional county-level species location data were obtained based on the FESTF MJD (Multi-Jurisdictional Database). The FESTF MJD consists of a “licensed dataset” drawn from NatureServe’s Multi-Jurisdictional Database (MJD) licensed to FESTF (NatureServe, 2006). The “licensed dataset” contains information on listed species, including sub-county location data. County-level locations of listed plant species were derived from this dataset, and compared to the locations evaluated in the original analysis. If additional listed plant species or county locations were noted, these were included in this supplemental analysis.

The methodology followed for the original analysis was used for this supplemental analysis. The original report (Priester et al., 2007) should be consulted for details not included in this supplemental report.

## SECTION 2.0: CHARACTERISTICS OF GLYPHOSATE

There were no additions to this section compared to the original report (Priester et al., 2007). Refer to the original report for a description of the herbicide glyphosate and Monsanto’s products registered for use in conventional and Roundup Ready® alfalfa<sup>1</sup>.

As in the original analysis, this supplemental analysis considers all listed plant taxa (dicots, monocots, ferns & allies, conifers & cycads, and lichens).

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<sup>1</sup> Roundup Ready® alfalfa contains in-plant tolerance to glyphosate. Roundup Ready® is a registered trademark of Monsanto Technology, LLC.

## SECTION 3.0: SCOPE OF THE ANALYSIS

### 3.1 Listed Plant Species

Threatened and endangered plants considered in this assessment are those that are included in the List of Endangered and Threatened Plants (50 CFR 17.12, USFWS 2005(n)). In this report, “listing status” refers to whether a plant species is on this list.

The original county-level analysis (Priester et al., 2007) used the FESTF IMS as a data source for species locations at the county level. The IMS location data were used to identify the co-occurrence of threatened and endangered plants (conifers and cycads, dicots, ferns and allies, lichens, and monocots) with counties having alfalfa production (hay and seed) in 2002.

In this supplemental analysis, county-level location data available in the FESTF MJD (see description in Section 1) was used to identify additional co-occurrences that were not evaluated in the original analysis. MJD species observation records with “last observed” dates prior to 1977 and records flagged as “historical” or “extirpated” were excluded from consideration for this analysis. In addition, species observation records for species that were candidate for federal listing were not considered.

During this analysis, discrepancies between the two data sources in naming conventions for several plant species were noted, and were generally related to recent classification changes and differences in common names. NatureServe’s public website ([www.natureserve.org/explorer](http://www.natureserve.org/explorer)) and the Integrated Taxonomic Information System ([www.itis.gov](http://www.itis.gov)) were used to resolve these discrepancies. Appendix 12 lists these discrepancies. The species names used in this report are based on the FESTF IMS.

In addition, all species’ lifeform classifications (aquatic, terrestrial, or both) were verified and updated in the FESTF IMS on September 24, 2007. Appendix 13 lists the species found in association with alfalfa production (from the original report and in this supplement) for which the lifeform in the FESTF IMS has been updated.

### 3.2 Initial Spatial Extent of the Analysis as Defined by Crop Growth Pattern and Listed Plant Species Presence

The degree to which listed plant species and alfalfa culture co-occur at the county level is expressed in Appendix 2. The acreage and farm data for alfalfa hay and seed production were obtained from the 2002 Census of Agriculture (USDA, 2002), while the listed plant species county-level locations were obtained from the FESTF IMS.

As mentioned in Section 1.0, the FIFRA Endangered Species Task Force (FESTF) Information Management System 2.0 (IMS) provides a mechanism through which EPA and pesticide product manufacturers track each overlap of an endangered or threatened species, crop and pesticide use, and record how that intersection was evaluated, or if necessary, mitigated to achieve an acceptable risk quotient.

Tables A-2a and A-2b contain the following information (for alfalfa hay and alfalfa seed production, respectively), for the combined results of the original and supplemental analyses:

- Number of counties with alfalfa farms or harvested acres and listed plant species (column 1)
- Number of alfalfa farms in those counties (column 2)
- Harvested alfalfa acres in counties with listed plant species (column 3)
- Harvested alfalfa acres in all counties (including those with no listed plant species)(State total) (column 4) (unchanged from original report)

Table A-2c contains the county-level information comprising the state-level data reported in Tables A-2a and A-2b. For each county with alfalfa hay or seed production (either farms or harvested acres) and listed plant species, the following information is provided:

- Number of farms (alfalfa hay)
- Number of farms (alfalfa seed)
- Harvested acres reported (alfalfa hay)
- Harvested acres reported (alfalfa seed)

The Census of Agriculture has separate reporting for alfalfa for hay and alfalfa for seed. This report considers both uses. By separating the tables according to hay and seed, it is easier to note what (if any) differences use site makes on determinations for occurrences that only differ by use site, and to see which use sites occur in which counties.

Figure 1 depicts the counties with alfalfa production and listed plant species, combined for original and supplemental analyses.

Figure 2 depicts the counties with alfalfa production and listed plant species that were assessed in this supplemental analysis.

### **3.3 Spatial Extent of the Analysis Revised According to Species Occurrences**

Alaska and Mississippi are the only states in which no harvested alfalfa acres or alfalfa farms were reported for either alfalfa hay or seed in counties where listed species of plants occur, and therefore can be excluded from this analysis. When these states of no possible co-occurrence are eliminated, the total number of co-occurrences considered in this analysis (original and supplement) is 2,024 for alfalfa hay production (284 of these apply to alfalfa seed production). These co-occurrences consist of a total of 550 species in 1,015 counties in 48 states for alfalfa hay and 129 species in 119 counties in 20 states for alfalfa seed. These co-occurrences are presented in Appendix 3, in two different presentations:

- Table A-3a: by Species, State, and County
- Table A-3b: by State, Taxa, and Species

The above listed tables present data for the supplemental analysis only; the corresponding table from the original report should also be consulted.

## SECTION 4.0: ANALYSIS OF SPECIES CO-OCCURRENCES

**This analysis process did not differ from the process described in the original report (Priester et al., 2007). The details of this process relevant to this supplemental analysis are included here to assist the reader.**

The analysis of species co-occurrences explained in this section follows the process described in the EPA Overview Document (USEPA, 2004(a)). Species were examined with respect to their current listing status, actual crop and species locations, species biology, and species habitat requirements, in order to determine whether or not exposure to glyphosate is of concern. The conclusion for each co-occurrence is expressed in the form of a simple general statement (a determination statement) supported by comments and reference sources. Each determination statement is drawn from a finite set and classified according to the following determination types and criteria of proof:

### *Exclusions*

- *Species co-occurrences not of concern*  
Physical or regulatory factors provide clear evidence that a species is not of concern in a particular county.
- *Species co-occurrences for which proximity exclusions are applicable*  
Species and use site (crop) are not in spatial proximity (at the section (square mile) level) within the county.
- *Species co-occurrences for which habitat exclusions are applicable*  
Species habitat requirements preclude exposure.
- *Species co-occurrences for which product-property exclusions are applicable*  
The properties of the product are such that presumed risk from the use of the product need not be assumed for a particular species.
- *Species co-occurrences for which other exclusions are applicable*  
In this assessment, this ‘user-defined’ statement applies when species and use site (crop) are not in spatial proximity (separation distance not specified) within the county.

### *Protections*

- *Species co-occurrences for which species management practices are applicable*  
A plan or measure may be in place that is designed to protect the species from harmful exposure (such as use limitations expressed in a county bulletin or local restrictions on use).
- *Species co-occurrences for which product management practice protections are applicable*  
Actions have been specified, with respect to product use, that are designed to protect a species from exposure (such as application restrictions specified on a product label).

### *General*

- *Species co-occurrences for which further analysis is required*  
Species co-occurrences for which none of the above exclusion or protection types have been found to be applicable at the present time.

Each co-occurrence is assigned only one determination type and the order above indicates the order of priority in which determinations are assigned.

#### 4.1 Introduction to Findings for Alfalfa

In this supplemental analysis, there are 237 co-occurrence records for alfalfa hay production (22 for alfalfa seed production). These co-occurrences were in 202 counties; 184 of these counties were not included in the original analysis for any species (18 counties were included but for other plant species). The respective counts for the taxa of concern in the analysis are provided in Table 1. All species considered for alfalfa seed production are included in the alfalfa hay assessment. There was one species, North Park phacelia (*Phacelia formosula*), that was not considered in the original analysis. All other species considered in this supplemental analysis had been considered in the original analysis, but for different county-level locations than are considered in this work. Therefore, the total number of species included in this supplemental analysis is 69 as noted in Table 1.

**Table 1. Supplement: Number of co-occurrences and species by taxa for alfalfa hay and seed production**

Taxa	Alfalfa Hay		Alfalfa Seed	
	Number of Co-Occurrences	Number of Species	Number of Co-Occurrences	Number of Species
Conifers and Cycads	0	0	0	0
Dicots	159	60	9	8
Ferns and Allies	1	1	0	0
Lichens	1	1	0	0
Monocots	76	7	13	4
<b>Total</b>	<b>237</b>	<b>69</b>	<b>22</b>	<b>12</b>

When the original and supplemental analyses are combined, there are 2,024 co-occurrence records for alfalfa hay production (284 for alfalfa seed production). The respective counts for the taxa of concern in the analysis are provided in Table 2. All species considered for alfalfa seed production are included in the alfalfa hay assessment. Therefore, the total number of species included in the combined analysis (original and supplement) is 550 as noted in Table 2.

**Table 2. Original plus Supplement: Number of co-occurrences and species by taxa for alfalfa hay and seed production**

Taxa	Alfalfa Hay		Alfalfa Seed	
	Number of Co-Occurrences	Number of Species	Number of Co-Occurrences	Number of Species
Conifers and Cycads	2	2	0	0
Dicots	1,464	474	191	111
Ferns and Allies	25	13	0	0
Lichens	13	2	0	0
Monocots	520	59	93	18
<b>Total</b>	<b>2,024</b>	<b>550</b>	<b>284</b>	<b>129</b>

By examining the determinations for alfalfa co-occurrences, described in the following subsections, ~ 70% of the co-occurrences and ~ 77 % of the species can be addressed and do not require further analysis.

#### 4.2 Species Co-Occurrences Not of Concern

This determination is relevant when physical or regulatory factors provide clear evidence that a species is not of concern in a particular county.

Of the species co-occurrences evaluated in this supplemental analysis, none were classified as “Not of Concern”.

#### 4.3 Species Co-Occurrences for which Habitat Exclusions are Applicable

This determination is relevant when characteristics of a species preclude their being adjacent to land used for alfalfa culture.

For this supplemental analysis, the co-occurrences eliminated from concern based on these circumstances are detailed in Appendix 5. These exclusions account for the removal of 80 co-occurrences for alfalfa hay (four for alfalfa seed) for 33 species.

Note that all of the forest dwelling species listed in Appendix 5 occupy habitat located deep within the forest. If crops are grown adjacent to these forests, the effects of spray drift and runoff would be negligible as the forest periphery would prevent damaging drift or runoff from penetrating to areas of the forest inhabited by the species.

#### **4.4 Species Co-Occurrences for which Proximity Exclusions are Applicable**

This determination is relevant when it can be demonstrated that there is a lack of proximity of alfalfa to each species location at the section level<sup>2</sup>. This exclusion was applied for species in California. A detailed explanation of this California Department of Pesticide Regulation (CDPR) information used for this determination is provided in the original report (Priester et al., 2007).

This refinement of location data allowed the elimination of three species co-occurrence records for alfalfa hay (one for alfalfa seed), for three species, from further concern due to the fact that there is a defined separation between alfalfa and the given species. The results of this refinement process are presented in Appendix 6 for this supplemental analysis.

#### **4.5 Species Co-Occurrences for which Product-Property Exclusions are Applicable**

This determination is relevant if the properties of the product are such that presumed risk from the use of the product need not be assumed for a particular species.

Of the species co-occurrences evaluated in this supplemental analysis, none were determined to have applicable product-property exclusions.

#### **4.6 Species Co-Occurrences for which Other Exclusions are Applicable**

This determination is relevant when the species and use site (crop) are not in spatial proximity (separation distance not specified) within the county.

Of the species co-occurrences evaluated in this supplemental analysis, none were determined to have applicable “other” exclusions.

#### **4.7 Species Co-Occurrences for which Species Management Practice Protections are Applicable**

This determination is relevant when a plan or measure may be in place that is designed to protect the species from harmful exposure (such as use limitations expressed in a county bulletin or local restrictions on use). A detailed explanation of these protections is provided in the original report (Priester et al., 2007).

Details of species co-occurrences addressed by species management practices are provided in Appendix 8. For this supplemental analysis, seven co-occurrences for alfalfa hay (zero for alfalfa seed), for three species, can be eliminated from further consideration on the basis of species management practices.

#### **4.8 Species Co-Occurrences for which Product Management Practice Protections are Applicable**

No co-occurrences were excluded from further investigation based on label statements in either the original or supplemental analyses. More information about label instructions for Monsanto’s glyphosate herbicides is included in the original report (Priester et al., 2007).

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<sup>2</sup> In California, sections depict the township, range and sections contained in the Public Land Survey System grid for the State of California. Each section is approximately one square mile.

#### 4.9 Species Co-Occurrences for which Further Analysis is Required

After having assigned as many species co-occurrences as possible to the six exclusion/protection types, as explained in sections 4.1 through 4.7, a total of 147 co-occurrences for alfalfa hay (17 for alfalfa seed), for 32 species remain to be addressed. These co-occurrences are presented in Appendix 10.

The tables listed below present data for the supplemental analysis only; the corresponding table from the original report should also be consulted.

- Table A-10a: by Taxa, Species, State, and County (alfalfa hay)
- Table A-10b: by Taxa, Species, State, and County (alfalfa seed)
- Table A-10g: by State, Taxa, and Species (alfalfa hay)
- Table A-10h: by State, Taxa, and Species (alfalfa seed)

The tables listed below present data for both the supplemental analysis and the combined analyses (original plus supplement).

- Table A-10c: by State (alfalfa hay)
- Table A-10d: by State (alfalfa seed)
- Table A-10e: by State and County (alfalfa hay)
- Table A-10f: by State and County (alfalfa seed)

Figure 3 depicts the counties with alfalfa production and listed plant species for which further analysis is required, combined for original and supplemental analyses.

The listed species identified in Appendix 10 merit further analysis to explore whether exclusions exist, or whether protections are needed. It is possible that further examination of these species, through contact with county agents or local FWS field personnel, or an analysis of the species location at the sub-county level, may reveal that they do not occur near alfalfa production or that their co-occurrences are otherwise not of concern.

Local information should be examined more closely before any mitigation or restrictions on glyphosate use are considered.

### SECTION 5.0: DESIGNATED CRITICAL HABITAT

Critical habitat is defined as “a specific geographic area(s) that contains features essential for the conservation of a threatened or endangered species and that may require special management and protection. Critical habitat may include an area that is not currently occupied by the species but will be needed for its recovery” (USFWS, 2005(m)).

The intersection of alfalfa hay and seed production with designated critical habitat has not been evaluated in this report. However, it is important to identify which listed plant species have critical habitat, for use in subsequent evaluations. Appendix 11 summarizes the availability of critical habitat information for the species considered in this supplemental analysis. Of the 69 species evaluated in this supplemental analysis, five have designated critical habitat. These five

species were listed in Appendix 11 in the original report (Priester et al., 2007). Of the 550 species evaluated (original plus supplement), 188 species have designated critical habitat.

## SECTION 6.0: CONCLUSIONS

This supplemental evaluation identified county-level locations for listed plants in addition to those identified in the original county-level analysis (Priester et al., 2007). These additional species locations were based on data available from the FESTF MJD and were analyzed with respect to the sub-county relationships of the species and crop. The results are summarized in Table 3.

**Table 3. Supplement: Summary of species determinations for alfalfa hay and seed production**

Determination Type	Alfalfa Hay		Alfalfa Seed	
	Number of Co-Occurrences	Number of Species	Number of Co-Occurrences	Number of Species
Not of concern	0	0	0	0
Habitat exclusions are applicable	80	33	4	4
Proximity exclusions are applicable	3	3	1	1
Other exclusions are applicable	0	0	0	0
Species management practices are applicable	7	3	0	0
Further analysis is required	147	32	17	7
<b>Total</b>	<b>237</b>	<b>71</b>	<b>22</b>	<b>12</b>
<b>Total distinct species<sup>a</sup></b>		<b>69</b>		<b>12</b>

<sup>a</sup> More than one determination type may be assigned to different county-level co-occurrences of the same species. Therefore, the total number of species for all determination types is more than the total number of distinct species.

When the results of this supplemental assessment are combined with the original county-level assessment, there are 606 co-occurrences for alfalfa hay and 63 co-occurrences for alfalfa seed, referring to 141 distinct species in 438 counties, for which it has not been possible to identify an exclusion or protection determination at the county level. The combined analysis results are summarized in Table 4.

**Table 4. Original plus Supplement: Summary of species determinations for alfalfa hay and seed production**

Determination Type	Alfalfa Hay		Alfalfa Seed	
	Number of Co-Occurrences	Number of Species <sup>a</sup>	Number of Co-Occurrences	Number of Species <sup>a</sup>
Not of concern	295	44	72	8
Habitat exclusions are applicable	702	268	41	33
Proximity exclusions are applicable	239	137	69	57
Other exclusions are applicable	30	10	4	3
Species management practices are applicable	152	52	35	18
Further analysis is required	606	141	63	25
<b>Total</b>	<b>2,024</b>	<b>617</b>	<b>284</b>	<b>144</b>
<b>Total distinct species<sup>b</sup></b>		<b>550</b>		<b>129</b>

<sup>a</sup>The number of species values are not additive for the original and supplemental analyses, since all but one of the species included in the supplemental analysis were also included in the original analysis (but in different counties).

<sup>b</sup> More than one determination type may be assigned to different county-level co-occurrences of the same species. Therefore, the total number of species for all determination types is more than the total number of distinct species.

Of the 141 distinct species for which further analysis is required, 25 species occur in both alfalfa hay and alfalfa seed production counties; all co-occurrences considered for alfalfa seed are included in the alfalfa hay co-occurrences. These co-occurrences merit further analysis to evaluate whether exclusions exist or protections are needed. This analysis will be reported separately.

## SECTION 7.0: REFERENCES

Note: When applicable, the references listed below use the same citation year as was used in the original report (Priester et al, 2007).

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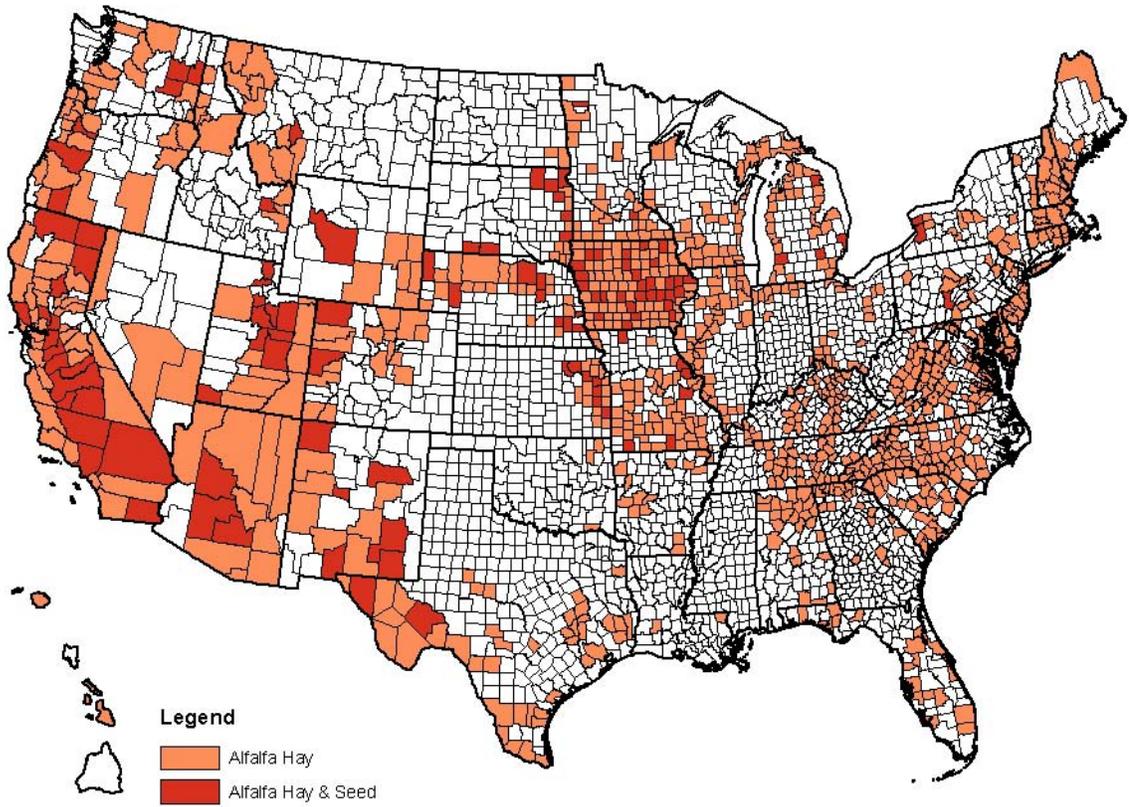
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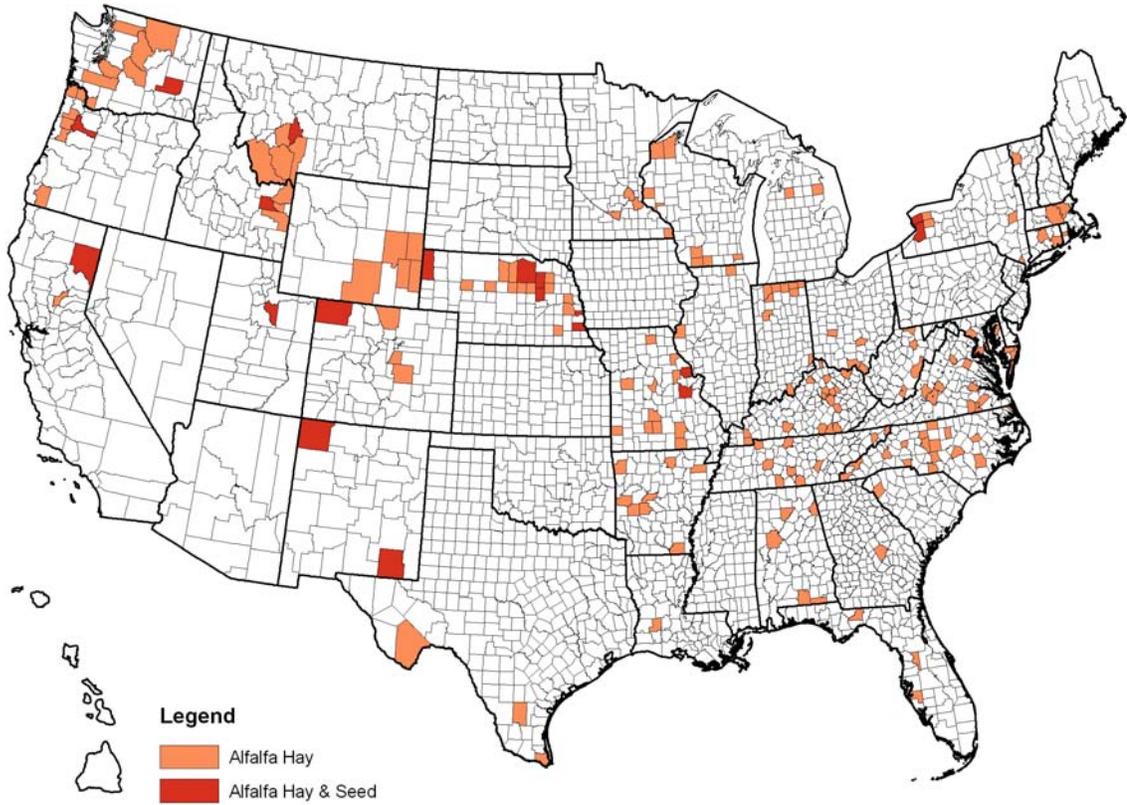
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**SECTION 8.0: FIGURES**

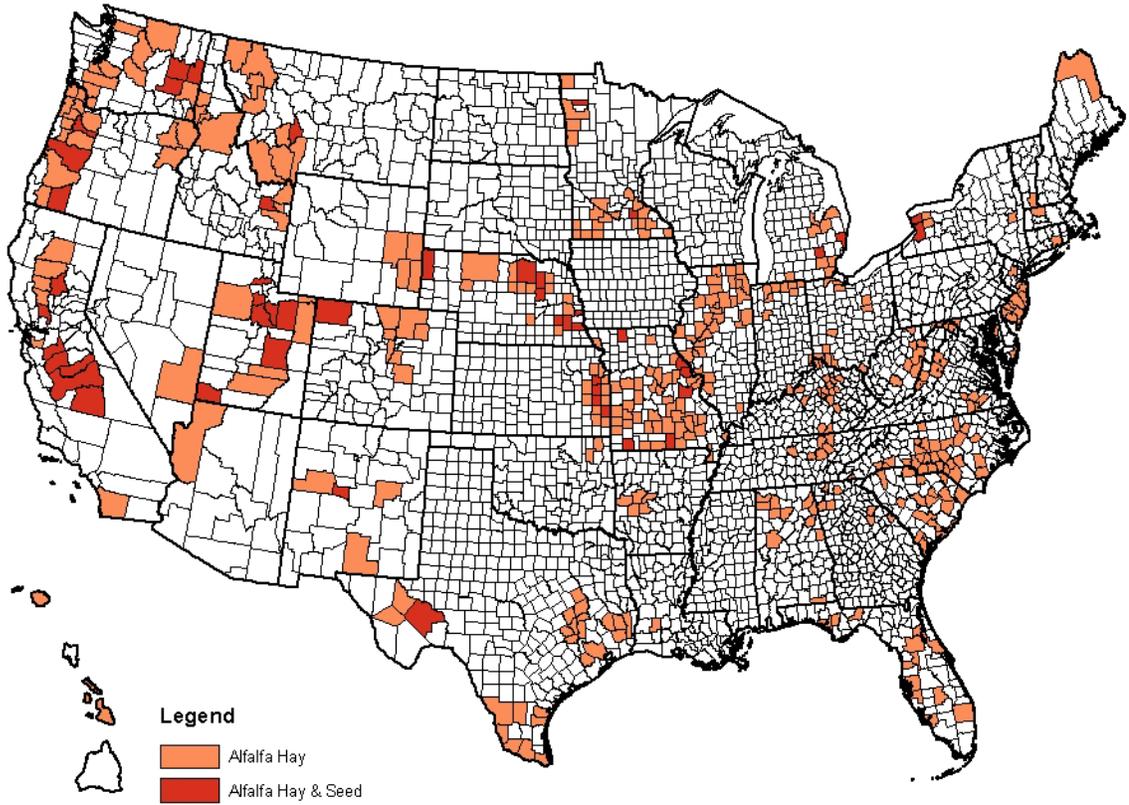
**Figure 1. U.S. counties with alfalfa production and listed plant species (original plus supplement)**



**Figure 2. U.S. counties with alfalfa production and listed plant species assessed in this supplemental analysis**



**Figure 3. U.S. counties with alfalfa production and listed plant species for which further analysis is required (original plus supplement)**



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**Appendix 1. Contributing Scientists**

Scientists contributing to this analysis and report include:

- Thomas Priester, Ph.D. – Senior Environmental Scientist, Compliance Services International. Over 22 years experience in pesticide regulatory science and registration, including work at DuPont Agricultural Products as a full time researcher in metabolism, environmental fate, and ecotoxicology.
- Rick Kemman, M.S. – Environmental Scientist, Compliance Services International. Over 12 years experience in crop protection product GLP ecotoxicological research projects, including assessing impacts of pesticides on free-ranging wildlife populations in agricultural and urban settings.
- Ashlea Rives Frank, M.Ent. – Project Coordinator, Compliance Services International. Background and experience in entomology with focus on applied and field research in insect behavior, vector ecology and control, and biopesticides.
- Bernalyn McGaughey – President, Compliance Services International. Thirty years experience in pesticide technical and regulatory support and assessment, including ten years supporting the resolution and fulfillment of data requirements for endangered species pesticide assessments.
- David Howes, Ph.D. – Geospatial Information Scientist, Compliance Services International. Fourteen years experience in Geographic Information Systems analysis, fluvial geomorphology, and environmental information systems development, including four years supporting the resolution and fulfillment of data requirements for endangered species pesticide assessments.
- Jeffrey Giddings, Ph.D. – Principal Consultant, Compliance Services International. Over 30 years experience in ecological risk assessment and endangered species assessments for pesticides and other chemicals.
- Stephanie Dressel – Scientific Support Technician, Compliance Services International. Background and experience in environmental science and regulatory policy.

**Appendix 2. Census of Agriculture (2002) data for alfalfa production**

Table A-2a. Alfalfa hay production and listed plant species: number of counties, farms, and harvested acres (original plus supplement)

State Code	In Counties with Listed Plant Species			Total Harvested Acres of Alfalfa Hay in all Counties (Reported State Total)**
	Number of Counties with Alfalfa Hay Farms	Number of Alfalfa Hay Farms	Total Harvested Acres of Alfalfa Hay*	
AK	0	0	0	80
AL	24	280	6,586	8,847
AR	13	81	2,551	16,639
AZ	12	649	145,989	232,579
CA	49	4,320	1,162,779	1,176,021
CO	17	4,780	338,491	770,432
CT	5	296	8,160	9,825
DE	3	278	4,431	(D)
FL	18	48	799	3,494
GA	23	50	214	1,151
HI	2	2	(D)	(D)
IA	99	29,114	1,168,668	1,168,668
ID	9	1,700	190,578	1,033,827
IL	42	6,422	175,127	416,997
IN	13	3,403	82,951	320,210
KS	20	1,720	67,495	938,209
KY	42	6,323	153,589	310,874
LA	2	12	457	6,040
MA	8	365	9,784	15,756
MD	14	790	20,584	57,104
ME	5	153	7,841	13,944
MI	38	7,165	318,727	806,713
MN	29	8,114	371,233	1,264,403
MO	54	4,620	171,656	399,647
MS	0	0	0	0
MT	10	2,364	291,430	1,529,867
NC	57	993	15,534	21,907
ND	2	353	25,679	1,388,395
NE	28	4,949	353,199	1,341,230
NH	9	224	7,093	7,938
NJ	12	711	18,038	26,854
NM	13	1,714	106,794	188,273
NV	3	145	42,087	304,033
NY	16	2,741	171,550	657,019
OH	19	4,793	136,544	614,615
OK	3	48	3,926	349,028
OR	20	1,993	208,562	487,661
PA	10	2,668	95,349	669,130
RI	4	62	1,383	1,731
SC	26	115	1,722	3,030
SD	16	4,898	623,842	2,393,123
TN	37	925	11,965	29,617

Table A-2a (continued). Alfalfa hay production and listed plant species: number of counties, farms, and harvested acres (original plus supplement)

State Code	In Counties with Listed Plant Species			Total Harvested Acres of Alfalfa Hay in all Counties (Reported State Total)**
	Number of Counties with Alfalfa Hay Farms	Number of Alfalfa Hay Farms	Total Harvested Acres of Alfalfa Hay*	
TX	43	566	37,020	164,069
UT	19	5,414	310,029	562,326
VA	54	2,954	78,494	140,045
VT	3	122	5,110	44,573
WA	16	1,947	128,297	535,694
WI	28	16,000	758,530	1,657,958
WV	19	840	23,236	52,567
WY	7	1,418	201,386	489,825
Total	1,015	139,642	8,065,489	22,631,968

Information based on alfalfa data from 2002 Census of Agriculture and listed plant species locations from the FESTF IMS (original analysis) and the FESTF MJD (supplemental analysis).

\*Census of Agriculture (2002) Note: "(D) Withheld to avoid disclosing data for individual farms." Numeric totals do not include harvested acres from counties for which Note (D) was reported.

\*\* Unchanged from original report (Priester et al., 2007). The reported state totals include all counties, including those that do not have listed plant species. State totals will include harvested acreage for counties where Note (D) was reported. A "zero" value indicates that no harvested acres were reported for any counties in the state.

Table A-2b. Alfalfa seed production and listed plant species: number of counties, farms, and harvested acres (original plus supplement)

State Code	In Counties with Listed Plant Species			Total Harvested Acres of Alfalfa Seed in all Counties (Reported State Total)**
	Number of Counties with Alfalfa Seed Farms	Number of Alfalfa Seed Farms	Total Harvested Acres of Alfalfa Seed*	
AK	0	0	0	0
AL	0	0	0	0
AR	0	0	0	0
AZ	3	12	(D)	2,511
CA	18	152	25,549	27,160
CO	2	2	(D)	406
CT	0	0	0	0
DE	0	0	0	0
FL	0	0	0	0
GA	0	0	0	0
HI	0	0	0	0
IA	30	52	108	471
ID	1	1	(D)	17,126
IL	0	0	0	0
IN	0	0	0	0
KS	7	7	(D)	8,272
KY	0	0	0	0
LA	0	0	0	0
MA	0	0	0	0
MD	0	0	0	0
ME	0	0	0	0
MI	4	6	(D)	114
MN	2	2	(D)	658
MO	6	9	(D)	362
MS	0	0	0	0
MT	1	1	(D)	6,824
NC	0	0	0	0
ND	0	0	0	695
NE	9	19	266	1,470
NH	0	0	0	0
NJ	0	0	0	0
NM	6	20	182	697
NV	0	0	0	(D)
NY	2	3	(D)	1,165
OH	0	0	0	(D)
OK	0	0	0	2,266
OR	3	5	(D)	5,605
PA	1	1	(D)	(D)
RI	0	0	0	0
SC	0	0	0	0
SD	8	17	1,337	5,456
TN	0	0	0	0
TX	2	4	(D)	606
UT	10	27	272	2,596

Table A-2b (continued). Alfalfa seed production and listed plant species: number of counties, farms, and harvested acres (original plus supplement)

State Code	In Counties with Listed Plant Species			Total Harvested Acres of Alfalfa Seed in all Counties (Reported State Total)**
	Number of Counties with Alfalfa Seed Farms	Number of Alfalfa Seed Farms	Total Harvested Acres of Alfalfa Seed*	
VA	0	0	0	0
VT	0	0	0	0
WA	3	6	379	14,161
WI	0	0	0	0
WV	0	0	0	0
WY	1	5	211	4,049
Total	119	351	28,304	102,670

Information based on alfalfa data from 2002 Census of Agriculture and listed plant species locations from the FESTF IMS (original analysis) and the FESTF MJD (supplemental analysis).

\* Census of Agriculture (2002) Note: "(D) Withheld to avoid disclosing data for individual farms."

Numeric totals do not include harvested acres from counties for which Note (D) was reported.

\*\* Unchanged from original report (Priester et al., 2007). The reported state totals include all counties, including those that do not have listed plant species. State totals may include harvested acreage for counties where Note (D) is reported. A "zero" value indicates that no harvested acres were reported for any counties in the state.

Table A-2c. County detail of Census of Agriculture (2002) data for counties with alfalfa production and listed plant species (original plus supplement)

State Code	County Name	Number of Farms Reported		Harvested Acres Reported*	
		Alfalfa Hay	Alfalfa Seed	Alfalfa Hay	Alfalfa Seed
AL	Autauga	1	0	(D)	0
	Blount	9	0	449	0
	Calhoun	10	0	318	0
	Cherokee	8	0	423	0
	Chilton	2	0	(D)	0
	Colbert	19	0	365	0
	Covington	2	0	(D)	0
	Cullman	27	0	497	0
	De Kalb	27	0	915	0
	Etowah	9	0	238	0
	Franklin	22	0	829	0
	Geneva	10	0	41	0
	Henry	1	0	(D)	0
	Jackson	20	0	469	0
	Lawrence	27	0	809	0
	Lee	2	0	(D)	0
	Madison	23	0	269	0
	Marshall	24	0	481	0
	Morgan	12	0	186	0
	Randolph	7	0	55	0
	St Clair	4	0	106	0
Tuscaloosa	1	0	(D)	0	
Walker	6	0	(D)	0	
Winston	7	0	136	0	
AR	Ashley	2	0	(D)	0
	Clay	4	0	71	0
	Craighead	1	0	(D)	0
	Drew	6	0	159	0
	Franklin	6	0	417	0
	Garland	1	0	(D)	0
	Izard	5	0	196	0
	Lawrence	6	0	(D)	0
	Montgomery	3	0	(D)	0
	Perry	5	0	54	0
	Scott	6	0	699	0
	Washington	32	0	787	0
	Yell	4	0	168	0
AZ	Apache	54	0	2,168	0
	Cochise	62	0	12,950	0
	Coconino	12	0	446	0
	Gila	5	0	(D)	0

Table A-2c (continued). County detail of Census of Agriculture (2002) data for counties with alfalfa production and listed plant species (original plus supplement)

State Code	County Name	Number of Farms Reported		Harvested Acres Reported*	
		Alfalfa Hay	Alfalfa Seed	Alfalfa Hay	Alfalfa Seed
AZ	Graham	57	0	2,304	0
	Maricopa	216	8	74,514	(D)
	Mohave	23	0	9,960	0
	Navajo	32	0	743	0
	Pima	23	0	1,147	0
	Pinal	145	3	40,877	(D)
	Santa Cruz	1	0	(D)	0
	Yavapai	19	1	880	(D)
CA	Alameda	4	0	(D)	0
	Amador	3	0	(D)	0
	Butte	21	1	1,465	(D)
	Calaveras	1	0	(D)	0
	Colusa	54	0	13,505	0
	Contra Costa	23	0	4,142	0
	Fresno	316	28	75,799	4,791
	Glenn	127	0	20,215	0
	Humboldt	21	0	939	0
	Imperial	273	88	202,568	20,282
	Inyo	11	0	2,579	0
	Kern	341	1	100,577	(D)
	Kings	238	1	67,872	(D)
	Lake	13	0	395	0
	Lassen	125	3	20,809	(D)
	Los Angeles	23	3	7,150	103
	Madera	117	2	40,783	(D)
	Marin	2	0	(D)	0
	Mariposa	4	0	(D)	0
	Mendocino	10	0	417	0
	Merced	393	1	89,862	(D)
	Modoc	177	4	44,504	366
	Mono	21	0	5,830	0
	Monterey	16	0	1,896	0
	Napa	4	0	(D)	0
	Nevada	1	0	(D)	0
	Orange	5	0	(D)	0
	Placer	1	0	(D)	0
	Plumas	15	0	5,110	0
	Riverside	103	0	50,744	0
	Sacramento	71	5	9,216	(D)
	San Benito	7	0	1,005	0
San Bernardino	70	2	13,156	(D)	
San Diego	8	0	(D)	0	

Table A-2c (continued). County detail of Census of Agriculture (2002) data for counties with alfalfa production and listed plant species (original plus supplement)

State Code	County Name	Number of Farms Reported		Harvested Acres Reported*	
		Alfalfa Hay	Alfalfa Seed	Alfalfa Hay	Alfalfa Seed
CA	San Joaquin	314	2	71,288	(D)
	San Luis Obispo	26	0	5,228	0
	Santa Barbara	19	0	1,576	0
	Santa Clara	10	0	(D)	0
	Shasta	50	0	6,108	0
	Siskiyou	268	2	65,308	(D)
	Solano	81	0	34,598	0
	Sonoma	5	1	429	(D)
	Stanislaus	348	2	36,463	(D)
	Tehama	44	0	6,163	0
	Tulare	401	3	94,519	7
	Tuolumne	1	0	(D)	0
	Ventura	4	0	430	0
	Yolo	124	3	59,729	(D)
Yuba	6	0	402	0	
CO	Boulder	241	0	12,768	0
	Delta	528	0	20,008	0
	Douglas	50	0	3,459	0
	El Paso	75	0	7,270	0
	Garfield	244	0	17,652	0
	Grand	9	0	(D)	0
	Jefferson	29	0	589	0
	La Plata	234	0	15,617	0
	Larimer	379	0	19,573	0
	Mesa	662	1	29,306	(D)
	Moffat	126	1	13,070	(D)
	Montezuma	305	0	33,595	0
	Montrose	470	0	25,746	0
	Morgan	257	0	32,132	0
	Park	6	0	264	0
	Rio Blanco	70	0	6,217	0
Weld	1095	0	101,225	0	
CT	Hartford	43	0	580	0
	Litchfield	84	0	3,760	0
	New London	94	0	1,991	0
	Tolland	29	0	510	0
	Windham	46	0	1,319	0
DE	Kent	164	0	3,032	0
	New Castle	47	0	1,399	0
	Sussex	67	0	(D)	0
FL	Bay	1	0	(D)	0
	Brevard	1	0	(D)	0

Table A-2c (continued). County detail of Census of Agriculture (2002) data for counties with alfalfa production and listed plant species (original plus supplement)

State Code	County Name	Number of Farms Reported		Harvested Acres Reported*	
		Alfalfa Hay	Alfalfa Seed	Alfalfa Hay	Alfalfa Seed
FL	Broward	4	0	74	0
	Calhoun	1	0	(D)	0
	Hardee	3	0	21	0
	Hernando	2	0	(D)	0
	Highlands	3	0	220	0
	Hillsborough	6	0	56	0
	Jackson	7	0	160	0
	Lee	3	0	18	0
	Leon	1	0	(D)	0
	Manatee	2	0	(D)	0
	Marion	1	0	(D)	0
	Okaloosa	1	0	(D)	0
	Palm Beach	1	0	(D)	0
	Putnam	3	0	(D)	0
	Sumter	6	0	250	0
	Volusia	2	0	(D)	0
GA	Bartow	1	0	(D)	0
	Burke	2	0	(D)	0
	Catoosa	3	0	(D)	0
	Columbia	2	0	(D)	0
	Dade	1	0	(D)	0
	Dawson	1	0	(D)	0
	Fannin	1	0	(D)	0
	Floyd	1	0	(D)	0
	Gilmer	1	0	(D)	0
	Greene	1	0	(D)	0
	Jackson	2	0	(D)	0
	Laurens	1	0	(D)	0
	Lumpkin	2	0	(D)	0
	Macon	3	0	69	0
	Murray	3	0	(D)	0
	Oglethorpe	1	0	(D)	0
	Stephens	2	0	(D)	0
	Towns	3	0	(D)	0
	Union	5	0	96	0
	Walker	3	0	5	0
Wheeler	4	0	(D)	0	
White	2	0	(D)	0	
Whitfield	5	0	44	0	
HI	Kauai	1	0	(D)	0
	Maui	1	0	(D)	0
IA	Adair	425	0	26,995	0

Table A-2c (continued). County detail of Census of Agriculture (2002) data for counties with alfalfa production and listed plant species (original plus supplement)

State Code	County Name	Number of Farms Reported		Harvested Acres Reported*	
		Alfalfa Hay	Alfalfa Seed	Alfalfa Hay	Alfalfa Seed
IA	Adams	230	0	12,639	0
	Allamakee	503	0	33,930	0
	Appanoose	350	0	22,424	0
	Audubon	203	1	8,364	(D)
	Benton	423	0	12,368	0
	Black Hawk	204	0	4,720	0
	Boone	241	0	6,093	0
	Bremer	285	1	7,814	(D)
	Buchanan	334	0	8,363	0
	Buena Vista	145	0	3,218	0
	Butler	279	0	6,517	0
	Calhoun	139	0	2,336	0
	Carroll	315	0	9,006	0
	Cass	326	0	15,303	0
	Cedar	308	1	9,776	(D)
	Cerro Gordo	163	0	3,212	0
	Cherokee	285	0	7,541	0
	Chickasaw	287	0	9,539	0
	Clarke	378	0	25,482	0
	Clay	144	2	4,200	(D)
	Clayton	726	0	37,680	0
	Clinton	400	0	12,590	0
	Crawford	403	0	15,100	0
	Dallas	277	2	7,271	(D)
	Davis	432	0	22,021	0
	Decatur	287	1	18,917	(D)
	Delaware	511	0	20,379	0
	Des Moines	159	0	3,735	0
	Dickinson	106	0	4,540	0
	Dubuque	774	0	38,618	0
	Emmet	105	0	2,685	0
	Fayette	457	0	20,892	0
	Floyd	206	0	6,015	0
	Franklin	164	0	3,692	0
	Fremont	151	0	3,697	0
	Greene	184	0	5,500	0
Grundy	134	0	3,151	0	
Guthrie	311	0	13,445	0	
Hamilton	129	0	2,307	0	
Hancock	130	1	3,021	(D)	
Hardin	178	1	4,274	(D)	
Harrison	253	0	8,843	0	

Table A-2c (continued). County detail of Census of Agriculture (2002) data for counties with alfalfa production and listed plant species (original plus supplement)

State Code	County Name	Number of Farms Reported		Harvested Acres Reported*	
		Alfalfa Hay	Alfalfa Seed	Alfalfa Hay	Alfalfa Seed
IA	Henry	259	2	9,456	(D)
	Howard	262	0	10,883	0
	Humboldt	87	0	1,583	0
	Ida	187	0	6,546	0
	Iowa	376	3	15,497	20
	Jackson	678	2	35,598	(D)
	Jasper	435	2	15,229	(D)
	Jefferson	268	0	11,272	0
	Johnson	500	1	18,007	(D)
	Jones	426	1	17,506	(D)
	Keokuk	308	0	12,114	0
	Kossuth	170	0	4,327	0
	Lee	322	0	10,837	0
	Linn	511	6	14,284	41
	Louisa	141	0	3,802	0
	Lucas	323	3	19,781	29
	Lyon	293	0	7,810	0
	Madison	524	0	25,025	0
	Mahaska	310	0	9,809	0
	Marion	413	0	15,709	0
	Marshall	219	1	5,983	(D)
	Mills	151	0	4,899	0
	Mitchell	207	2	6,236	(D)
	Monona	170	1	7,202	(D)
	Monroe	383	0	25,245	0
	Montgomery	212	1	8,602	(D)
	Muscatine	246	0	6,818	0
	Obrien	196	1	5,277	(D)
	Osceola	81	0	3,922	0
	Page	339	0	12,307	0
	Palo Alto	116	0	2,893	0
	Plymouth	392	1	12,457	(D)
	Pocahontas	104	0	2,359	0
	Polk	211	0	6,609	0
Pottawattami	431	0	13,763	0	
Poweshiek	395	2	19,969	(D)	
Ringgold	311	0	25,079	0	
Sac	212	0	5,896	0	
Scott	198	0	5,719	0	
Shelby	306	1	8,902	(D)	
Sioux	286	0	10,500	0	
Story	224	0	5,000	0	

Table A-2c (continued). County detail of Census of Agriculture (2002) data for counties with alfalfa production and listed plant species (original plus supplement)

State Code	County Name	Number of Farms Reported		Harvested Acres Reported*	
		Alfalfa Hay	Alfalfa Seed	Alfalfa Hay	Alfalfa Seed
IA	Tama	432	5	15,625	(D)
	Taylor	313	0	14,912	0
	Union	300	0	20,674	0
	Van Buren	335	0	16,224	0
	Wapello	315	0	12,491	0
	Warren	565	1	22,323	(D)
	Washington	335	1	10,355	(D)
	Wayne	343	0	25,628	0
	Webster	138	0	3,206	0
	Winnebago	88	0	1,719	0
	Winneshiek	765	3	40,047	18
	Woodbury	326	1	11,910	(D)
	Worth	139	0	2,990	0
	Wright	93	1	1,639	(D)
ID	Bonneville	351	0	33,637	0
	Fremont	186	0	16,538	0
	Idaho	197	0	17,081	0
	Jefferson	411	1	89,128	(D)
	Kootenai	113	0	4,137	0
	Latah	119	0	5,041	0
	Lewis	52	0	4,845	0
	Madison	192	0	16,131	0
	Nez Perce	79	0	4,040	0
IL	Alexander	9	0	91	0
	Brown	109	0	3,315	0
	Bureau	202	0	3,898	0
	Calhoun	112	0	3,975	0
	Cass	64	0	2,082	0
	Cook	26	0	(D)	0
	Du Page	7	0	(D)	0
	Ford	56	0	917	0
	Fulton	348	0	11,110	0
	Greene	174	0	3,364	0
	Grundy	68	0	1,446	0
	Hancock	293	0	8,179	0
	Henry	364	0	9,417	0
	Iroquois	182	0	5,292	0
	Jackson	144	0	4,011	0
	Jersey	134	0	3,558	0
	Kane	151	0	4,152	0
La Salle	240	0	4,612	0	
Lake	87	0	2,778	0	

Table A-2c (continued). County detail of Census of Agriculture (2002) data for counties with alfalfa production and listed plant species (original plus supplement)

State Code	County Name	Number of Farms Reported		Harvested Acres Reported*	
		Alfalfa Hay	Alfalfa Seed	Alfalfa Hay	Alfalfa Seed
IL	Lee	139	0	3,644	0
	Madison	253	0	5,389	0
	Marshall	105	0	3,140	0
	Mason	71	0	2,768	0
	Massac	25	0	705	0
	Mchenry	320	0	12,138	0
	Monroe	117	0	3,375	0
	Morgan	142	0	4,169	0
	Ogle	332	0	9,012	0
	Peoria	300	0	6,514	0
	Pike	246	0	10,427	0
	Putnam	30	0	754	0
	Randolph	200	0	5,488	0
	Saline	47	0	957	0
	Schuyler	141	0	4,392	0
	Scott	76	0	1,302	0
	St Clair	132	0	2,550	0
	Tazewell	168	0	4,074	0
	Union	89	0	2,951	0
	Will	204	0	5,393	0
Williamson	66	0	1,356	0	
Winnebago	287	0	8,962	0	
Woodford	162	0	3,470	0	
IN	Dearborn	103	0	2,549	0
	Elkhart	656	0	15,284	0
	Harrison	287	0	6,280	0
	La Porte	187	0	6,034	0
	Lagrange	927	0	21,341	0
	Lake	103	0	2,234	0
	Noble	328	0	8,958	0
	Ohio	35	0	574	0
	Porter	144	0	3,345	0
	St Joseph	243	0	5,357	0
	Starke	94	0	2,369	0
	Steuben	184	0	6,800	0
	White	112	0	1,826	0
KS	Allen	73	0	2,365	0
	Anderson	84	1	3,006	(D)
	Atchison	66	0	1,699	0
	Bourbon	70	1	3,444	(D)
	Coffey	64	0	4,992	0
	Crawford	45	0	1,753	0

Table A-2c (continued). County detail of Census of Agriculture (2002) data for counties with alfalfa production and listed plant species (original plus supplement)

State Code	County Name	Number of Farms Reported		Harvested Acres Reported*	
		Alfalfa Hay	Alfalfa Seed	Alfalfa Hay	Alfalfa Seed
KS	Douglas	64	1	1,480	(D)
	Franklin	79	1	2,642	(D)
	Jackson	96	0	3,220	0
	Jefferson	85	0	3,132	0
	Johnson	32	0	796	0
	Leavenworth	71	0	2,108	0
	Linn	49	0	1,147	0
	Lyon	161	0	7,703	0
	Miami	66	0	1,969	0
	Neosho	70	0	2,669	0
	Osage	51	0	3,945	0
	Pottawatomie	260	1	10,916	(D)
	Riley	155	1	6,249	(D)
	Shawnee	79	1	2,260	(D)
KY	Barren	345	0	10,199	0
	Boone	151	0	2,550	0
	Bourbon	218	0	7,885	0
	Calloway	35	0	866	0
	Clark	155	0	2,818	0
	Edmonson	45	0	979	0
	Estill	77	0	1,243	0
	Fayette	82	0	2,683	0
	Fleming	390	0	15,180	0
	Franklin	114	0	2,201	0
	Grayson	165	0	2,895	0
	Hardin	370	0	8,554	0
	Harrison	314	0	6,726	0
	Hart	431	0	11,664	0
	Henry	280	0	7,051	0
	Jackson	95	0	1,312	0
	Jefferson	55	0	1,046	0
	Jessamine	124	0	2,593	0
	Kenton	128	0	2,140	0
	Laurel	120	0	1,909	0
	Lewis	150	0	3,370	0
	Livingston	20	0	402	0
	Lyon	15	0	339	0
	Madison	250	0	3,230	0
	Marshall	19	0	422	0
	Mason	300	0	12,181	0
Mccreary	10	0	(D)	0	
Menifee	26	0	363	0	

Table A-2c (continued). County detail of Census of Agriculture (2002) data for counties with alfalfa production and listed plant species (original plus supplement)

State Code	County Name	Number of Farms Reported		Harvested Acres Reported*	
		Alfalfa Hay	Alfalfa Seed	Alfalfa Hay	Alfalfa Seed
KY	Montgomery	128	0	2,474	0
	Nelson	298	0	7,944	0
	Nicholas	204	0	5,173	0
	Owen	203	0	4,589	0
	Powell	14	0	210	0
	Pulaski	268	0	5,479	0
	Robertson	66	0	834	0
	Rockcastle	161	0	3,393	0
	Trigg	27	0	414	0
	Warren	214	0	4,613	0
	Wayne	72	0	1,227	0
	Whitley	18	0	272	0
	Wolfe	13	0	209	0
	Woodford	153	0	3,957	0
LA	Allen Parish	1	0	(D)	0
	Washington Parish	11	0	457	0
MA	Barnstable	3	0	65	0
	Dukes	6	0	(D)	0
	Essex	30	0	1,216	0
	Franklin	49	0	1,523	0
	Hampden	34	0	(D)	0
	Hampshire	53	0	1,256	0
	Middlesex	55	0	1,125	0
	Worcester	135	0	4,599	0
MD	Allegany	37	0	1,550	0
	Anne Arundel	33	0	911	0
	Baltimore	118	0	3,070	0
	Calvert	33	0	461	0
	Cecil	114	0	3,124	0
	Charles	34	0	610	0
	Dorchester	7	0	(D)	0
	Montgomery	44	0	1,241	0
	Prince Georges	30	0	480	0
	Queen Annes	49	0	948	0
	Somerset	16	0	534	0
	Washington	229	0	7,144	0
	Wicomico	29	0	511	0
	Worcester	17	0	(D)	0
ME	Aroostook	29	0	3,092	0
	Cumberland	22	0	(D)	0
	Kennebec	39	0	1,736	0
	Oxford	20	0	592	0

Table A-2c (continued). County detail of Census of Agriculture (2002) data for counties with alfalfa production and listed plant species (original plus supplement)

State Code	County Name	Number of Farms Reported		Harvested Acres Reported*	
		Alfalfa Hay	Alfalfa Seed	Alfalfa Hay	Alfalfa Seed
ME	York	43	0	2,421	0
MI	Alcona	123	0	10,389	0
	Alger	25	0	2,199	0
	Allegan	497	1	16,665	(D)
	Alpena	292	2	17,495	(D)
	Antrim	115	0	6,920	0
	Arenac	115	0	4,483	0
	Bay	131	0	4,384	0
	Benzie	55	0	2,152	0
	Berrien	200	0	4,913	0
	Charlevoix	156	0	8,405	0
	Cheboygan	140	0	9,798	0
	Chippewa	66	0	4,462	0
	Crawford	7	0	113	0
	Delta	136	0	11,657	0
	Emmet	146	0	11,543	0
	Grand Traverse	164	0	9,850	0
	Huron	317	0	16,513	0
	Iosco	133	0	8,311	0
	Kalkaska	63	0	3,185	0
	Leelanau	90	0	4,267	0
	Livingston	292	1	9,918	(D)
	Mackinac	26	0	1,908	0
	Manistee	157	0	7,357	0
	Mason	169	0	10,607	0
	Menominee	194	0	16,961	0
	Monroe	213	0	4,638	0
	Muskegon	166	0	6,660	0
	Oceana	266	0	11,123	0
	Ottawa	381	0	13,770	0
	Presque Isle	173	0	11,551	0
	Saginaw	256	0	5,477	0
	Schoolcraft	29	0	2,984	0
	St Clair	362	2	10,211	(D)
St Joseph	338	0	10,152	0	
Tuscola	401	0	13,653	0	
Van Buren	272	0	8,917	0	
Washtenaw	458	0	14,582	0	
Wayne	41	0	554	0	
MN	Brown	252	0	8,106	0
	Clay	217	0	19,240	0
	Cottonwood	140	0	5,099	0

Table A-2c (continued). County detail of Census of Agriculture (2002) data for counties with alfalfa production and listed plant species (original plus supplement)

State Code	County Name	Number of Farms Reported		Harvested Acres Reported*	
		Alfalfa Hay	Alfalfa Seed	Alfalfa Hay	Alfalfa Seed
MN	Crow Wing	172	0	10,094	0
	Dakota	287	0	9,090	0
	Dodge	211	0	6,444	0
	Douglas	395	0	19,536	0
	Faribault	91	0	2,379	0
	Fillmore	778	0	37,341	0
	Freeborn	266	0	7,061	0
	Goodhue	691	0	28,468	0
	Hennepin	238	0	6,785	0
	Houston	531	0	27,997	0
	Jackson	142	0	3,860	0
	Kandiyohi	355	0	16,472	0
	Kittson	122	0	18,659	0
	Mower	281	0	7,485	0
	Nicollet	160	0	3,655	0
	Nobles	193	0	8,159	0
	Norman	144	0	9,789	0
	Olmsted	545	0	21,346	0
	Pennington	159	1	20,518	(D)
	Pipestone	224	0	9,607	0
	Polk	249	0	24,523	0
	Redwood	204	0	6,693	0
	Renville	181	0	5,862	0
	Rice	441	1	12,064	(D)
Rock	216	0	7,281	0	
Steele	229	0	7,620	0	
MO	Adair	102	0	3,756	0
	Atchison	124	0	4,227	0
	Barry	89	1	3,567	(D)
	Barton	57	0	3,254	0
	Benton	24	0	1,249	0
	Boone	154	0	4,335	0
	Butler	14	0	260	0
	Callaway	130	0	3,541	0
	Carter	8	0	(D)	0
	Cass	153	0	4,288	0
	Cedar	36	0	1,858	0
	Christian	145	0	9,871	0
	Cole	102	0	2,021	0
	Crawford	49	0	1,499	0
	Dade	69	0	3,232	0
	Dent	28	0	1,224	0

Table A-2c (continued). County detail of Census of Agriculture (2002) data for counties with alfalfa production and listed plant species (original plus supplement)

State Code	County Name	Number of Farms Reported		Harvested Acres Reported*	
		Alfalfa Hay	Alfalfa Seed	Alfalfa Hay	Alfalfa Seed
MO	Dunklin	10	0	419	0
	Franklin	157	1	4,174	(D)
	Greene	202	0	11,676	0
	Harrison	236	2	12,750	(D)
	Henry	48	0	1,388	0
	Holt	105	0	2,722	0
	Howard	83	0	2,692	0
	Howell	167	2	6,441	(D)
	Iron	18	0	416	0
	Jasper	60	0	1,748	0
	Johnson	165	0	7,041	0
	Laclede	103	0	5,386	0
	Lawrence	178	0	7,244	0
	Lincoln	135	2	2,885	(D)
	Madison	14	0	597	0
	Maries	55	0	1,689	0
	Mississippi	9	0	239	0
	Moniteau	90	0	3,145	0
	Montgomery	73	0	1,993	0
	Oregon	67	0	1,798	0
	Ozark	56	0	1,492	0
	Pettis	111	0	3,011	0
	Phelps	32	0	(D)	0
	Pike	218	1	7,055	(D)
	Polk	178	0	7,403	0
	Ralls	120	0	4,107	0
	Reynolds	15	0	(D)	0
	Ripley	10	0	387	0
	Shannon	17	0	495	0
	St Charles	62	0	1,376	0
	St Clair	36	0	1,442	0
	St Louis	15	0	(D)	0
	Taney	7	0	(D)	0
Texas	101	0	4,588	0	
Vernon	45	0	3,371	0	
Wayne	15	0	397	0	
Webster	218	0	7,577	0	
Wright	105	0	4,330	0	
MT	Beaverhead	166	0	37,760	0
	Broadwater	138	1	26,952	(D)
	Flathead	414	0	27,854	0
	Gallatin	437	0	57,598	0

Table A-2c (continued). County detail of Census of Agriculture (2002) data for counties with alfalfa production and listed plant species (original plus supplement)

State Code	County Name	Number of Farms Reported		Harvested Acres Reported*	
		Alfalfa Hay	Alfalfa Seed	Alfalfa Hay	Alfalfa Seed
MT	Jefferson	104	0	13,787	0
	Lake	434	0	48,555	0
	Lincoln	97	0	3,436	0
	Madison	232	0	46,507	0
	Missoula	193	0	11,669	0
	Sanders	149	0	17,312	0
NC	Alexander	22	0	467	0
	Anson	1	0	(D)	0
	Ashe	55	0	767	0
	Avery	10	0	(D)	0
	Buncombe	88	0	1,046	0
	Burke	9	0	171	0
	Cabarrus	15	0	246	0
	Caldwell	10	0	168	0
	Catawba	28	0	415	0
	Chatham	12	0	323	0
	Cherokee	5	0	(D)	0
	Clay	9	0	304	0
	Cleveland	23	0	417	0
	Columbus	3	0	11	0
	Cumberland	1	0	(D)	0
	Currituck	3	0	79	0
	Davidson	60	0	1,051	0
	Davie	10	0	50	0
	Duplin	11	0	(D)	0
	Forsyth	44	0	414	0
	Franklin	2	0	(D)	0
	Gaston	23	0	461	0
	Graham	3	0	(D)	0
	Granville	2	0	(D)	0
	Harnett	3	0	31	0
	Haywood	43	0	846	0
	Henderson	12	0	119	0
	Hoke	4	0	231	0
	Jackson	3	0	(D)	0
	Lincoln	18	0	411	0
	Macon	7	0	(D)	0
	Mcdowell	17	0	341	0
	Mecklenburg	4	0	57	0
Mitchell	9	0	330	0	
Montgomery	6	0	190	0	
Moore	4	0	48	0	

Table A-2c (continued). County detail of Census of Agriculture (2002) data for counties with alfalfa production and listed plant species (original plus supplement)

State Code	County Name	Number of Farms Reported		Harvested Acres Reported*	
		Alfalfa Hay	Alfalfa Seed	Alfalfa Hay	Alfalfa Seed
NC	Orange	11	0	375	0
	Pender	3	0	21	0
	Polk	12	0	130	0
	Randolph	19	0	253	0
	Richmond	3	0	(D)	0
	Robeson	4	0	(D)	0
	Rockingham	48	0	488	0
	Rowan	47	0	987	0
	Rutherford	26	0	270	0
	Sampson	6	0	255	0
	Scotland	2	0	(D)	0
	Stanly	23	0	756	0
	Stokes	47	0	458	0
	Surry	52	0	726	0
	Swain	7	0	620	0
	Transylvania	6	0	109	0
	Union	9	0	119	0
	Wake	9	0	233	0
	Watauga	35	0	306	0
	Wilson	8	0	(D)	0
Yancey	37	0	434	0	
ND	Ransom	163	0	14,091	0
	Richland	190	0	11,588	0
NE	Antelope	305	3	20,681	(D)
	Boone	375	4	26,317	190
	Box Butte	92	0	13,514	0
	Brown	53	0	3,832	0
	Cherry	115	0	25,157	0
	Dodge	201	0	8,071	0
	Garden	77	1	13,926	(D)
	Garfield	85	0	7,480	0
	Grant	9	0	(D)	0
	Hall	178	0	7,363	0
	Holt	312	1	34,983	(D)
	Hooker	11	0	3,385	0
	Kimball	52	0	7,487	0
	Lancaster	482	3	13,849	(D)
	Loup	67	0	7,487	0
	Madison	299	0	17,118	0
	Morrill	190	0	24,642	0
	Otoe	279	1	8,757	(D)
Pierce	301	0	17,499	0	

Table A-2c (continued). County detail of Census of Agriculture (2002) data for counties with alfalfa production and listed plant species (original plus supplement)

State Code	County Name	Number of Farms Reported		Harvested Acres Reported*	
		Alfalfa Hay	Alfalfa Seed	Alfalfa Hay	Alfalfa Seed
NE	Rock	29	0	3,565	0
	Saline	302	0	7,924	0
	Sarpy	95	1	2,695	(D)
	Saunders	337	0	11,624	0
	Seward	263	2	7,281	(D)
	Sheridan	233	0	31,205	0
	Sioux	144	3	23,447	76
	Thomas	10	0	(D)	0
	Wheeler	53	0	3,910	0
NH	Belknap	14	0	229	0
	Carroll	12	0	450	0
	Coos	13	0	660	0
	Grafton	24	0	641	0
	Hillsborough	38	0	1,153	0
	Merrimack	47	0	1,469	0
	Rockingham	25	0	872	0
	Strafford	30	0	766	0
	Sullivan	21	0	853	0
NJ	Atlantic	14	0	211	0
	Burlington	70	0	1,758	0
	Camden	19	0	373	0
	Cape May	13	0	128	0
	Cumberland	88	0	1,430	0
	Gloucester	77	0	1,749	0
	Middlesex	11	0	296	0
	Monmouth	51	0	1,657	0
	Morris	30	0	882	0
	Ocean	7	0	147	0
	Salem	194	0	5,021	0
Sussex	137	0	4,386	0	
NM	Catron	20	0	1,677	0
	Chaves	133	2	24,784	(D)
	Cibola	13	0	900	0
	Dona Ana	429	2	16,997	(D)
	Eddy	202	4	29,378	119
	Guadalupe	46	0	932	0
	Lincoln	3	0	(D)	0
	Mckinley	13	0	(D)	0
	Otero	41	0	1,011	0
	San Juan	375	8	19,482	63
	San Miguel	84	1	2,955	(D)
	Sierra	65	0	2,327	0

Table A-2c (continued). County detail of Census of Agriculture (2002) data for counties with alfalfa production and listed plant species (original plus supplement)

State Code	County Name	Number of Farms Reported		Harvested Acres Reported*	
		Alfalfa Hay	Alfalfa Seed	Alfalfa Hay	Alfalfa Seed
NM	Valencia	290	3	6,351	(D)
NV	Lincoln	43	0	14,996	0
	Nye	53	0	13,863	0
	Washoe	49	0	13,228	0
NY	Albany	101	0	7,036	0
	Cayuga	382	0	30,826	0
	Delaware	200	0	13,222	0
	Erie	251	1	12,065	(D)
	Genesee	261	0	17,515	0
	Madison	345	0	27,186	0
	Nassau	4	0	(D)	0
	Niagara	207	2	14,169	(D)
	Onondaga	258	0	16,623	0
	Orleans	167	0	6,437	0
	Rockland	9	0	42	0
	Schuyler	116	0	6,217	0
	Suffolk	6	0	233	0
	Sullivan	30	0	1,911	0
	Ulster	50	0	3,472	0
Yates	354	0	14,596	0	
OH	Brown	168	0	3,152	0
	Butler	273	0	6,024	0
	Clark	215	0	5,434	0
	Clermont	99	0	1,911	0
	Coshocton	433	0	16,596	0
	Erie	77	0	1,968	0
	Hamilton	38	0	1,368	0
	Hocking	71	0	1,852	0
	Holmes	1152	0	33,434	0
	Lawrence	65	0	1,009	0
	Lucas	39	0	1,609	0
	Montgomery	210	0	3,981	0
	Ottawa	109	0	3,881	0
	Portage	287	0	7,703	0
	Sandusky	203	0	5,844	0
	Scioto	84	0	1,760	0
	Summit	51	0	1,501	0
Warren	201	0	4,117	0	
Wayne	1018	0	33,400	0	
OK	Choctaw	9	0	846	0
	Craig	15	0	2,480	0
	Rogers	24	0	600	0

Table A-2c (continued). County detail of Census of Agriculture (2002) data for counties with alfalfa production and listed plant species (original plus supplement)

State Code	County Name	Number of Farms Reported		Harvested Acres Reported*	
		Alfalfa Hay	Alfalfa Seed	Alfalfa Hay	Alfalfa Seed
OR	Baker	274	0	29,232	0
	Benton	11	0	329	0
	Clackamas	63	0	1,504	0
	Clatsop	4	0	150	0
	Columbia	17	0	418	0
	Coos	4	0	149	0
	Douglas	43	0	1,556	0
	Harney	178	0	37,693	0
	Jackson	108	2	5,895	(D)
	Josephine	39	0	810	0
	Klamath	377	0	72,491	0
	Lane	36	1	631	(D)
	Linn	45	0	1,121	0
	Marion	109	2	1,961	(D)
	Polk	24	0	1,085	0
	Tillamook	5	0	391	0
	Union	383	0	29,371	0
	Wallowa	152	0	19,783	0
	Washington	53	0	1,368	0
	Yamhill	68	0	2,624	0
PA	Centre	509	0	18,865	0
	Clinton	175	0	6,021	0
	Cumberland	392	0	12,893	0
	Dauphin	222	0	6,090	0
	Franklin	572	0	21,624	0
	Huntingdon	289	1	12,649	(D)
	Lackawanna	60	0	1,806	0
	Monroe	40	0	827	0
	Union	276	0	8,969	0
	Venango	133	0	5,605	0
RI	Kent	8	0	355	0
	Newport	12	0	408	0
	Providence	20	0	(D)	0
	Washington	22	0	620	0
SC	Anderson	8	0	44	0
	Charleston	2	0	(D)	0
	Cherokee	5	0	356	0
	Chesterfield	2	0	(D)	0
	Colleton	1	0	(D)	0
	Dorchester	1	0	(D)	0
	Florence	3	0	55	0
	Greenville	6	0	71	0

Table A-2c (continued). County detail of Census of Agriculture (2002) data for counties with alfalfa production and listed plant species (original plus supplement)

State Code	County Name	Number of Farms Reported		Harvested Acres Reported*	
		Alfalfa Hay	Alfalfa Seed	Alfalfa Hay	Alfalfa Seed
SC	Greenwood	3	0	22	0
	Hampton	1	0	(D)	0
	Horry	14	0	83	0
	Jasper	1	0	(D)	0
	Kershaw	5	0	58	0
	Lancaster	2	0	(D)	0
	Lee	3	0	22	0
	Lexington	4	0	39	0
	Marlboro	1	0	(D)	0
	Oconee	6	0	64	0
	Orangeburg	7	0	117	0
	Pickens	6	0	57	0
	Richland	1	0	(D)	0
	Saluda	7	0	89	0
	Spartanburg	11	0	611	0
	Sumter	2	0	(D)	0
	Williamsburg	3	0	34	0
York	10	0	(D)	0	
SD	Bennett	154	5	42,420	1,210
	Brookings	368	1	32,766	(D)
	Brown	438	1	65,508	(D)
	Clay	270	0	73,106	0
	Codington	318	3	37,525	127
	Day	303	2	32,786	(D)
	Deuel	277	0	26,925	0
	Grant	261	0	27,935	0
	Lincoln	272	0	11,449	0
	Minnehaha	547	2	38,293	(D)
	Moody	221	0	14,102	0
	Roberts	361	2	41,437	(D)
	Todd	172	1	87,530	(D)
	Turner	363	0	19,188	0
	Union	187	0	16,066	0
	Yankton	386	0	56,806	0
TN	Bedford	28	0	516	0
	Bledsoe	12	0	127	0
	Blount	21	0	219	0
	Bradley	10	0	209	0
	Carter	37	0	378	0
	Coffee	28	0	529	0
	Cumberland	9	0	101	0
	Davidson	10	0	74	0

Table A-2c (continued). County detail of Census of Agriculture (2002) data for counties with alfalfa production and listed plant species (original plus supplement)

State Code	County Name	Number of Farms Reported		Harvested Acres Reported*	
		Alfalfa Hay	Alfalfa Seed	Alfalfa Hay	Alfalfa Seed
TN	De Kalb	1	0	(D)	0
	Dickson	15	0	317	0
	Fentress	16	0	107	0
	Franklin	22	0	239	0
	Giles	20	0	390	0
	Hamilton	5	0	122	0
	Hickman	7	0	135	0
	Johnson	94	0	648	0
	Lawrence	43	0	689	0
	Marion	1	0	(D)	0
	Marshall	28	0	702	0
	Maury	59	0	1,014	0
	Montgomery	29	0	677	0
	Morgan	1	0	(D)	0
	Pickett	14	0	148	0
	Polk	1	0	(D)	0
	Roane	8	0	131	0
	Rutherford	33	0	562	0
	Scott	11	0	117	0
	Sequatchie	1	0	(D)	0
	Sevier	23	0	197	0
	Stewart	5	0	72	0
	Sumner	61	0	871	0
	Unicoi	8	0	61	0
	Van Buren	2	0	(D)	0
	Washington	176	0	1,484	0
	White	7	0	104	0
	Williamson	51	0	745	0
Wilson	28	0	280	0	
TX	Brazos	10	0	1,165	0
	Brewster	1	0	(D)	0
	Burleson	12	0	322	0
	Cameron	2	0	(D)	0
	Coke	1	0	(D)	0
	Culberson	4	0	(D)	0
	Duval	5	0	176	0
	El Paso	222	0	4,810	0
	Fort Bend	10	0	237	0
	Freestone	9	0	330	0
	Grimes	11	0	380	0
	Hardin	6	0	113	0
	Harris	14	0	759	0

Table A-2c (continued). County detail of Census of Agriculture (2002) data for counties with alfalfa production and listed plant species (original plus supplement)

State Code	County Name	Number of Farms Reported		Harvested Acres Reported*	
		Alfalfa Hay	Alfalfa Seed	Alfalfa Hay	Alfalfa Seed
TX	Harrison	6	0	344	0
	Hays	1	0	(D)	0
	Hidalgo	33	0	1,235	0
	Hudspeth	41	2	15,437	(D)
	Jasper	12	0	166	0
	Jeff Davis	1	0	(D)	0
	Jim Wells	8	0	82	0
	Kerr	1	0	(D)	0
	Kimble	2	0	(D)	0
	Kinney	4	0	772	0
	Kleberg	1	0	(D)	0
	Leon	22	0	838	0
	Madison	6	0	206	0
	Mitchell	11	0	222	0
	Nueces	1	0	(D)	0
	Pecos	18	2	4,341	(D)
	Polk	3	0	(D)	0
	Presidio	22	0	720	0
	Reeves	19	0	2,225	0
	Refugio	1	0	(D)	0
	Robertson	8	0	1,000	0
	Runnels	1	0	(D)	0
	Starr	2	0	(D)	0
	Terrell	1	0	(D)	0
	Tyler	8	0	457	0
	Uvalde	3	0	33	0
	Val Verde	1	0	(D)	0
	Washington	18	0	590	0
Webb	3	0	60	0	
Zapata	1	0	(D)	0	
UT	Cache	727	1	58,301	(D)
	Carbon	149	1	4,409	(D)
	Daggett	15	0	2,472	0
	Duchesne	423	2	35,439	(D)
	Emery	312	1	14,554	(D)
	Garfield	148	0	7,016	0
	Grand	40	0	2,124	0
	Kane	56	0	1,848	0
	Salt Lake	160	1	3,462	(D)
	San Juan	23	0	1,940	0
	Sanpete	388	1	33,015	(D)
	Sevier	365	0	32,252	0

Table A-2c (continued). County detail of Census of Agriculture (2002) data for counties with alfalfa production and listed plant species (original plus supplement)

State Code	County Name	Number of Farms Reported		Harvested Acres Reported*	
		Alfalfa Hay	Alfalfa Seed	Alfalfa Hay	Alfalfa Seed
UT	Tooele	177	0	12,204	0
	Uintah	461	0	27,022	0
	Utah	983	3	34,287	(D)
	Wasatch	223	1	5,768	(D)
	Washington	120	10	5,777	145
	Wayne	128	0	11,175	0
	Weber	516	6	16,964	127
VA	Accomack	5	0	138	0
	Alleghany	28	0	(D)	0
	Amherst	22	0	653	0
	Appomattox	20	0	873	0
	Augusta	446	0	15,292	0
	Bath	11	0	258	0
	Bedford	103	0	3,019	0
	Botetourt	86	0	2,640	0
	Brunswick	18	0	335	0
	Buckingham	10	0	462	0
	Campbell	35	0	1,021	0
	Caroline	16	0	539	0
	Carroll	137	0	2,497	0
	Charles City	6	0	(D)	0
	Chesterfield	4	0	36	0
	Dickenson	4	0	44	0
	Dinwiddie	14	0	363	0
	Essex	5	0	(D)	0
	Franklin	105	0	2,993	0
	Giles	42	0	813	0
	Gloucester	11	0	502	0
	Grayson	103	0	2,075	0
	Greensville	1	0	(D)	0
	Halifax	33	0	1,115	0
	Henrico	11	0	249	0
	Highland	20	0	588	0
	James City	2	0	(D)	0
	King And Queen	9	0	565	0
	King George	10	0	349	0
	King William	13	0	395	0
	Lee	157	0	1,679	0
Madison	46	0	1,276	0	
Montgomery	115	0	3,621	0	
Nelson	27	0	919	0	
New Kent	8	0	128	0	

Table A-2c (continued). County detail of Census of Agriculture (2002) data for counties with alfalfa production and listed plant species (original plus supplement)

State Code	County Name	Number of Farms Reported		Harvested Acres Reported*	
		Alfalfa Hay	Alfalfa Seed	Alfalfa Hay	Alfalfa Seed
VA	Northampton	4	0	38	0
	Nottoway	35	0	1,413	0
	Page	87	0	2,222	0
	Patrick	57	0	2,069	0
	Prince George	4	0	(D)	0
	Prince William	26	0	487	0
	Pulaski	75	0	2,870	0
	Richmond	13	0	267	0
	Roanoke	25	0	599	0
	Rockbridge	95	0	2,979	0
	Rockingham	436	0	11,629	0
	Shenandoah	155	0	3,772	0
	Smyth	176	0	3,175	0
	Spotsylvania	28	0	911	0
	Stafford	25	0	327	0
	Surry	13	0	(D)	0
	Sussex	1	0	(D)	0
	Westmoreland	7	0	169	0
Wise	9	0	130	0	
VT	Chittenden	54	0	3,212	0
	Windham	15	0	364	0
	Windsor	53	0	1,534	0
WA	Adams	120	4	20,618	379
	Asotin	30	0	2,469	0
	Chelan	53	0	1,355	0
	Clark	18	0	648	0
	Cowlitz	1	0	(D)	0
	Island	29	0	1,966	0
	Kittitas	202	0	9,201	0
	Lewis	38	0	1,576	0
	Lincoln	137	1	14,416	(D)
	Okanogan	423	0	22,895	0
	Pierce	9	0	76	0
	San Juan	12	0	415	0
	Skagit	10	0	438	0
	Spokane	725	1	46,015	(D)
	Thurston	17	0	607	0
Whitman	123	0	5,602	0	
WI	Bayfield	156	0	9,730	0
	Brown	535	0	29,988	0
	Dane	1002	0	38,419	0
	Door	364	0	16,731	0

Table A-2c (continued). County detail of Census of Agriculture (2002) data for counties with alfalfa production and listed plant species (original plus supplement)

State Code	County Name	Number of Farms Reported		Harvested Acres Reported*	
		Alfalfa Hay	Alfalfa Seed	Alfalfa Hay	Alfalfa Seed
WI	Douglas	87	0	6,758	0
	Grant	1272	0	76,080	0
	Green	821	0	50,654	0
	Iowa	685	0	39,508	0
	Jefferson	606	0	17,992	0
	Kenosha	167	0	5,128	0
	Lafayette	592	0	41,714	0
	Manitowoc	735	0	36,945	0
	Monroe	1030	0	43,314	0
	Ozaukee	188	0	8,543	0
	Pepin	275	0	13,662	0
	Pierce	717	0	28,559	0
	Portage	567	0	27,599	0
	Racine	220	0	6,651	0
	Richland	635	0	32,612	0
	Rock	605	0	20,446	0
	Sauk	866	0	41,060	0
	Sheboygan	548	0	24,885	0
	St Croix	718	0	37,161	0
	Vernon	1322	0	55,502	0
Walworth	357	0	12,683	0	
Waukesha	303	0	10,675	0	
Waushara	264	0	11,236	0	
Winnebago	363	0	14,295	0	
WV	Barbour	19	0	772	0
	Berkeley	131	0	3,675	0
	Brooke	28	0	(D)	0
	Fayette	16	0	266	0
	Greenbrier	121	0	3,836	0
	Hardy	45	0	1,228	0
	Jefferson	87	0	3,224	0
	Mercer	37	0	703	0
	Monongalia	35	0	769	0
	Morgan	15	0	370	0
	Nicholas	18	0	452	0
	Pendleton	81	0	3,208	0
	Pocahontas	67	0	2,052	0
	Raleigh	27	0	528	0
	Randolph	42	0	1,053	0
	Summers	29	0	767	0
Tucker	17	0	(D)	0	
Upshur	17	0	333	0	

Table A-2c (continued). County detail of Census of Agriculture (2002) data for counties with alfalfa production and listed plant species (original plus supplement)

State Code	County Name	Number of Farms Reported		Harvested Acres Reported*	
		Alfalfa Hay	Alfalfa Seed	Alfalfa Hay	Alfalfa Seed
WV	Webster	8	0	(D)	0
WY	Carbon	48	0	8,113	0
	Converse	125	0	22,313	0
	Fremont	550	5	68,977	211
	Goshen	325	0	37,727	0
	Laramie	114	0	20,791	0
	Niobrara	81	0	19,925	0
	Platte	175	0	23,540	0
Totals		139,642	351	8,065,489	28,304

Information based on alfalfa data from 2002 Census of Agriculture and listed plant species locations from the FESTF IMS (original analysis) and the FESTF MJD (supplemental analysis).

\* Census of Agriculture (2002) Note: “(D) Withheld to avoid disclosing data for individual farms.”

**Appendix 3: Listed plant species in counties with alfalfa production**

Table A-3a. Supplement: Listed plant species in counties with alfalfa production: By Species, State, and County

Note: This table is a supplement to Table A-3a as it appears in the original report (Priester et al., 2007).

Species*	State	Affected Counties
<i>Dicots</i>		
<b><i>Lifeform: Both</i></b>		
aster, decurrent false ( <i>Boltonia decurrens</i> )	MO	Franklin, Lincoln
bittercress, small-anthered ( <i>Cardamine micranthera</i> )	NC	Forsyth
Butterfly plant, Colorado ( <i>Gaura neomexicana</i> var. <i>coloradensis</i> )	CO WY	Douglas, Larimer Platte
button, Mohr's Barbara ( <i>Marshallia mohrii</i> )	AL	Cullman
cactus, black lace ( <i>Echinocereus reichenbachii</i> var. <i>albertii</i> )	TX	Duval
checkermallow, Wenatchee Mountains ( <i>Sidalcea oregana</i> var. <i>calva</i> )	WA	Kittitas
dropwort, Canby's ( <i>Oxypolis canbyi</i> )	MD	Queen Annes
Harperella ( <i>Ptilimnium nodosum</i> )	AL AR	Tuscaloosa Garland, Montgomery, Perry, Scott
howellia, water ( <i>Howellia aquatilis</i> )	OR WA	Benton, Columbia, Marion, Polk, Yamhill Pierce
joint-vetch, sensitive ( <i>Aeschynomene virginica</i> )	MD VA	Calvert, Charles, Wicomico Chesterfield
leather flower, Morefield's ( <i>Clematis morefieldii</i> )	TN	Franklin
loosestrife, rough-leaved ( <i>Lysimachia asperulaefolia</i> )	NC	Harnett
No common name ( <i>Geocarpon minimum</i> )	MO	Jasper
Pondberry ( <i>Lindera melissifolia</i> )	AL AR	Covington Ashley, Craighead
sandwort, Marsh ( <i>Arenaria paludicola</i> )	WA	Pierce
sneezeweed, Virginia ( <i>Helenium virginicum</i> )	MO	Oregon, Shannon, Texas, Webster, Wright
sunburst, Hartweg's golden ( <i>Pseudobahia bahiifolia</i> )	CA	Yuba

Table A-3a (continued). Supplement: Listed plant species in counties with alfalfa production:  
By Species, State, and County

Species*	State	Affected Counties
water-willow, Cooley's ( <i>Justicia cooleyi</i> )	FL	Sumter
<b>Lifeform: Terrestrial</b>		
amaranth, seabeach ( <i>Amaranthus pumilus</i> )	MD NC RI VA	Worcester Currituck Newport Accomack, Northampton
ambrosia, south Texas ( <i>Ambrosia cheiranthifolia</i> )	TX	Cameron
aster, Florida golden ( <i>Chrysopsis floridana</i> )	FL	Manatee
ayenia, Texas ( <i>Ayenia limitaris</i> )	TX	Cameron
bladderpod, Missouri ( <i>Lesquerella filiformis</i> )	AR	Izard, Washington
bonamia, Florida ( <i>Bonamia grandiflora</i> )	FL	Manatee
buckwheat, scrub ( <i>Eriogonum longifolium</i> var. <i>gnaphalifolium</i> )	FL	Sumter
bush-clover, prairie ( <i>Lespedeza leptostachya</i> )	IL MN WI	Mchenry Dakota, Dodge, Houston, Mower, Olmsted Green, Iowa, Lafayette, Pepin, St Croix
butterweed, Layne's ( <i>Senecio layneae</i> )	CA	Yuba
cactus, Kuenzler hedgehog ( <i>Echinocereus fendleri</i> var. <i>kuenzleri</i> )	NM	Eddy
cactus, Sneed pincushion ( <i>Coryphantha sneedii</i> var. <i>sneedii</i> )	NM	Eddy
Catchfly, Spalding's ( <i>Silene spaldingii</i> )	WA	Adams
chaffseed, American ( <i>Schwalbea americana</i> )	AL CT FL KY LA MD NC NY VA	Geneva New London Leon McCreary, Wayne Allen Parish Worcester Duplin Albany Greensville, Sussex
checker-mallow, Nelson's ( <i>Sidalcea nelsoniana</i> )	OR WA	Clatsop, Columbia Lewis
clover, running buffalo ( <i>Trifolium stoloniferum</i> )	IN KY	Dearborn Clark, Fayette, Harrison, Jackson, Jessamine, Kenton, Madison, Montgomery

Table A-3a (continued). Supplement: Listed plant species in counties with alfalfa production:  
By Species, State, and County

Species*	State	Affected Counties
	MO OH WV	Jasper, Laclede, Moniteau, Montgomery Lawrence Barbour, Brooke, Monongalia, Pocahontas
coneflower, smooth ( <i>Echinacea laevigata</i> )	NC SC VA	Montgomery, Orange, Rockingham Anderson Amherst, Botetourt
desert-parsley, Bradshaw's ( <i>Lomatium bradshawii</i> )	WA	Clark
fleabane, Zuni ( <i>Erigeron rhizomatus</i> )	NM	San Juan
gerardia, sandplain ( <i>Agalinis acuta</i> )	CT MA RI	Hartford Worcester Newport
goldenrod, Short's ( <i>Solidago shortii</i> )	IN	Harrison
heartleaf, dwarf-flowered ( <i>Hexastylis naniflora</i> )	NC	Alexander
heather, mountain golden ( <i>Hudsonia montana</i> )	MI NC NY	Kalkaska Mcdowell Genesee
locoweed, Fassett's ( <i>Oxytropis campestris</i> var. <i>chartacea</i> )	WI	Bayfield
manioc, Walker's ( <i>Manihot walkerae</i> )	TX	Duval
milkweed, Mead's ( <i>Asclepias meadii</i> )	IL MO	Hancock Adair, Franklin, Johnson
mint, longspurred ( <i>Dicerandra cornutissima</i> )	FL	Sumter
monkshood, northern wild ( <i>Aconitum noveboracense</i> )	OH	Hocking
oak, Hinckley ( <i>Quercus hinckleyi</i> )	TX	Brewster
paintbrush, golden ( <i>Castilleja levisecta</i> )	WA	Pierce, Skagit
penstemon, blowout ( <i>Penstemon haydenii</i> )	NE WY	Brown, Grant, Thomas Carbon
phacelia, clay ( <i>Phacelia argillacea</i> )	UT	Wasatch
phacelia, North Park ( <i>Phacelia formosula</i> )	CO	Larimer
potato-bean, Price's ( <i>Apios priceana</i> )	KY TN	Calloway, Marshall, Warren Giles, Hickman, Stewart
prairie-clover, leafy ( <i>Dalea foliosa</i> )	TN	Bedford, Sumner
rock-cress, Braun's ( <i>Arabis perstellata</i> )	KY	Henry
rock-cress, McDonald's ( <i>Arabis mcdonaldiana</i> )	OR	Josephine

Table A-3a (continued). Supplement: Listed plant species in counties with alfalfa production:  
By Species, State, and County

Species*	State	Affected Counties
rosemary, Cumberland ( <i>Conradina verticillata</i> )	KY	Mccreary
sandwort, Cumberland ( <i>Arenaria cumberlandensis</i> )	KY	Mccreary
spiraea, Virginia ( <i>Spiraea virginiana</i> )	KY NC OH TN WV	Lewis, Mccreary, Whitley Swain Scioto Bledsoe Summers
sumac, Michaux's ( <i>Rhus michauxii</i> )	NC VA	Wilson Brunswick
sunflower, Schweinitz's ( <i>Helianthus schweinitzii</i> )	NC	Anson, Davidson, Gaston, Montgomery, Randolph
thistle, Pitcher's ( <i>Cirsium pitcheri</i> )	MI WI	Alcona Douglas
<b><i>Ferns and Allies</i></b>		
<b><i>Lifeform: Terrestrial</i></b>		
fern, American hart's-tongue ( <i>Asplenium scolopendrium</i> var. <i>americanum</i> )	TN	Johnson
<b><i>Lichens</i></b>		
<b><i>Lifeform: Terrestrial</i></b>		
lichen, rock gnome ( <i>Gymnoderma lineare</i> )	NC	Swain
<b><i>Monocots</i></b>		
<b><i>Lifeform: Aquatic</i></b>		
water-plantain, Kral's ( <i>Sagittaria secundifolia</i> )	AL	Cherokee
<b><i>Lifeform: Both</i></b>		
ladies'-tresses, Ute ( <i>Spiranthes diluvialis</i> )	CO ID MT NE UT WA WY	El Paso, Larimer, Moffat Bonneville, Fremont, Jefferson, Madison Beaverhead, Broadwater, Gallatin, Jefferson, Madison Sioux Wasatch Chelan, Okanogan Converse, Goshen, Niobrara

Table A-3a (continued). Supplement: Listed plant species in counties with alfalfa production:  
By Species, State, and County

Species*	State	Affected Counties
orchid, eastern prairie fringed ( <i>Platanthera leucophaea</i> )	IL	Hancock, Mchenry, Will
	IN	Elkhart, La Porte, Lagrange, Noble, St Joseph, Starke, Steuben, White
	MO	Ralls
	NE	Dodge, Saunders
	NY	Erie, Genesee, Niagara, Orleans
	OH	Clark
	WI	Racine
orchid, western prairie fringed ( <i>Platanthera praeclara</i> )	MN	Hennepin, Houston, Nicollet
	MO	Jasper, Johnson, Webster
	NE	Antelope, Boone, Dodge, Garfield, Grant, Holt, Loup, Madison, Otoe, Pierce, Rock, Saline, Sarpy, Saunders, Wheeler
Orcutt grass, slender ( <i>Orcuttia tenuis</i> )	CA	Lassen
<b><i>Lifeform: Terrestrial</i></b>		
pogonia, small whorled ( <i>Isotria medeoloides</i> )	MA	Middlesex
	MD	Montgomery
	NC	Cherokee, McDowell
	NY	Rockland
	OH	Hocking, Scioto
	RI	Kent
	TN	Washington
	VA	Bedford, Madison, Spotsylvania
	VT	Chittenden
trillium, relict ( <i>Trillium reliquum</i> )	GA	Laurens

\* Lifeform classification from the FESTF IMS (updated September 24, 2007).

Table A-3b. Supplement: Listed plant species in counties with alfalfa production: By State, Taxa, and Species

Note: This table is a supplement to Table A-3b as it appears in the original report (Priester et al., 2007).

State	Taxa Name	Species Name	County Count
AL	Dicots	button, Mohr's Barbara ( <i>Marshallia mohrii</i> )	1
		chaffseed, American ( <i>Schwalbea americana</i> )	1
		Harperella ( <i>Ptilimnium nodosum</i> )	1
		Pondberry ( <i>Lindera melissifolia</i> )	1
	Monocots	water-plantain, Kral's ( <i>Sagittaria secundifolia</i> )	1
AR	Dicots	bladderpod, Missouri ( <i>Lesquerella filiformis</i> )	2
		Harperella ( <i>Ptilimnium nodosum</i> )	4
		Pondberry ( <i>Lindera melissifolia</i> )	2
CA	Dicots	butterweed, Layne's ( <i>Senecio layneae</i> )	1
		sunburst, Hartweg's golden ( <i>Pseudobahia bahiifolia</i> )	1
	Monocots	Orcutt grass, slender ( <i>Orcuttia tenuis</i> )	1
CO	Dicots	Butterfly plant, Colorado ( <i>Gaura neomexicana</i> var. <i>coloradensis</i> )	2
		phacelia, North Park ( <i>Phacelia formosula</i> )	1
	Monocots	ladies'-tresses, Ute ( <i>Spiranthes diluvialis</i> )	3
CT	Dicots	chaffseed, American ( <i>Schwalbea americana</i> )	1
		gerardia, sandplain ( <i>Agalinis acuta</i> )	1
FL	Dicots	aster, Florida golden ( <i>Chrysopsis floridana</i> )	1
		bonamia, Florida ( <i>Bonamia grandiflora</i> )	1
		buckwheat, scrub ( <i>Eriogonum longifolium</i> var. <i>gnaphalifolium</i> )	1
		chaffseed, American ( <i>Schwalbea americana</i> )	1
		mint, longspurred ( <i>Dicerandra cornutissima</i> )	1
		water-willow, Cooley's ( <i>Justicia cooleyi</i> )	1
GA	Monocots	trillium, relict ( <i>Trillium reliquum</i> )	1
ID	Monocots	ladies'-tresses, Ute ( <i>Spiranthes diluvialis</i> )	4
IL	Dicots	bush-clover, prairie ( <i>Lespedeza leptostachya</i> )	1
		milkweed, Mead's ( <i>Asclepias meadii</i> )	1
	Monocots	orchid, eastern prairie fringed ( <i>Platanthera leucophaea</i> )	3
IN	Dicots	clover, running buffalo ( <i>Trifolium stoloniferum</i> )	1
		goldenrod, Short's ( <i>Solidago shortii</i> )	1
	Monocots	orchid, eastern prairie fringed ( <i>Platanthera leucophaea</i> )	8
KY	Dicots	chaffseed, American ( <i>Schwalbea americana</i> )	2
		clover, running buffalo ( <i>Trifolium stoloniferum</i> )	8
		potato-bean, Price's ( <i>Apios priceana</i> )	3
		rock-cress, Braun's ( <i>Arabis perstellata</i> )	1
		rosemary, Cumberland ( <i>Conradina verticillata</i> )	1
		sandwort, Cumberland ( <i>Arenaria cumberlandensis</i> )	1
		spiraea, Virginia ( <i>Spiraea virginiana</i> )	3

Table A-3b (continued). Supplement: Listed plant species in counties with alfalfa production:  
By State, Taxa, and Species

State	Taxa Name	Species Name	County Count
LA	Dicots	chaffseed, American ( <i>Schwalbea americana</i> )	1
MA	Dicots	gerardia, sandplain ( <i>Agalinis acuta</i> )	1
	Monocots	pogonia, small whorled ( <i>Isotria medeoloides</i> )	1
MD	Dicots	amaranth, seabeach ( <i>Amaranthus pumilus</i> )	1
		chaffseed, American ( <i>Schwalbea americana</i> )	1
		dropwort, Canby's ( <i>Oxypolis canbyi</i> )	1
		joint-vetch, sensitive ( <i>Aeschynomene virginica</i> )	3
	Monocots	pogonia, small whorled ( <i>Isotria medeoloides</i> )	1
MI	Dicots	heather, mountain golden ( <i>Hudsonia montana</i> )	1
		thistle, Pitcher's ( <i>Cirsium pitcheri</i> )	1
MN	Dicots	bush-clover, prairie ( <i>Lespedeza leptostachya</i> )	5
	Monocots	orchid, western prairie fringed ( <i>Platanthera praeclara</i> )	3
MO	Dicots	aster, decurrent false ( <i>Boltonia decurrens</i> )	2
		clover, running buffalo ( <i>Trifolium stoloniferum</i> )	4
		milkweed, Mead's ( <i>Asclepias meadii</i> )	3
		No common name ( <i>Geocarpon minimum</i> )	1
		sneezeweed, Virginia ( <i>Helenium virginicum</i> )	5
	Monocots	orchid, eastern prairie fringed ( <i>Platanthera leucophaea</i> )	1
		orchid, western prairie fringed ( <i>Platanthera praeclara</i> )	3
MT	Monocots	ladies'-tresses, Ute ( <i>Spiranthes diluvialis</i> )	5
NC	Dicots	amaranth, seabeach ( <i>Amaranthus pumilus</i> )	1
		bittercress, small-anthered ( <i>Cardamine micranthera</i> )	1
		chaffseed, American ( <i>Schwalbea americana</i> )	1
		coneflower, smooth ( <i>Echinacea laevigata</i> )	3
		heartleaf, dwarf-flowered ( <i>Hexastylis naniflora</i> )	1
		heather, mountain golden ( <i>Hudsonia montana</i> )	1
		loosestrife, rough-leaved ( <i>Lysimachia asperulaefolia</i> )	1
		spiraea, Virginia ( <i>Spiraea virginiana</i> )	1
		sumac, Michaux's ( <i>Rhus michauxii</i> )	1
		sunflower, Schweinitz's ( <i>Helianthus schweinitzii</i> )	5
	Lichens	lichen, rock gnome ( <i>Gymnoderma lineare</i> )	1
	Monocots	pogonia, small whorled ( <i>Isotria medeoloides</i> )	2
NE	Dicots	penstemon, blowout ( <i>Penstemon haydenii</i> )	3
	Monocots	ladies'-tresses, Ute ( <i>Spiranthes diluvialis</i> )	1
		orchid, eastern prairie fringed ( <i>Platanthera leucophaea</i> )	2
		orchid, western prairie fringed ( <i>Platanthera praeclara</i> )	15
NM	Dicots	cactus, Kuenzler hedgehog ( <i>Echinocereus fendleri</i> var. <i>kuenzleri</i> )	1
		cactus, Sneed pincushion ( <i>Coryphantha sneedii</i> var. <i>sneedii</i> )	1
		fleabane, Zuni ( <i>Erigeron rhizomatus</i> )	1
NY	Dicots	chaffseed, American ( <i>Schwalbea americana</i> )	1

Table A-3b (continued). Supplement: Listed plant species in counties with alfalfa production:  
By State, Taxa, and Species

State	Taxa Name	Species Name	County Count
NY	Dicots	heather, mountain golden ( <i>Hudsonia montana</i> )	1
	Monocots	orchid, eastern prairie fringed ( <i>Platanthera leucophaea</i> )	4
		pogonia, small whorled ( <i>Isotria medeoloides</i> )	1
OH	Dicots	clover, running buffalo ( <i>Trifolium stoloniferum</i> )	1
		monkshood, northern wild ( <i>Aconitum noveboracense</i> )	1
		spiraea, Virginia ( <i>Spiraea virginiana</i> )	1
	Monocots	orchid, eastern prairie fringed ( <i>Platanthera leucophaea</i> )	1
		pogonia, small whorled ( <i>Isotria medeoloides</i> )	2
OR	Dicots	checker-mallow, Nelson's ( <i>Sidalcea nelsoniana</i> )	2
		howellia, water ( <i>Howellia aquatilis</i> )	5
		rock-cress, McDonald's ( <i>Arabis mcdonaldiana</i> )	1
RI	Dicots	amaranth, seabeach ( <i>Amaranthus pumilus</i> )	1
		gerardia, sandplain ( <i>Agalinis acuta</i> )	1
	Monocots	pogonia, small whorled ( <i>Isotria medeoloides</i> )	1
SC	Dicots	coneflower, smooth ( <i>Echinacea laevigata</i> )	1
TN	Dicots	leather flower, Morefield's ( <i>Clematis morefieldii</i> )	1
		potato-bean, Price's ( <i>Apios priceana</i> )	3
		prairie-clover, leafy ( <i>Dalea foliosa</i> )	2
		spiraea, Virginia ( <i>Spiraea virginiana</i> )	1
	Ferns and Allies	fern, American hart's-tongue ( <i>Asplenium scolopendrium</i> var. <i>americanum</i> )	1
	Monocots	pogonia, small whorled ( <i>Isotria medeoloides</i> )	1
TX	Dicots	ambrosia, south Texas ( <i>Ambrosia cheiranthifolia</i> )	1
		ayenia, Texas ( <i>Ayenia limitaris</i> )	1
		cactus, black lace ( <i>Echinocereus reichenbachii</i> var. <i>albertii</i> )	1
		manioc, Walker's ( <i>Manihot walkerae</i> )	1
		oak, Hinckley ( <i>Quercus hinckleyi</i> )	1
UT	Dicots	phacelia, clay ( <i>Phacelia argillacea</i> )	1
	Monocots	ladies'-tresses, Ute ( <i>Spiranthes diluvialis</i> )	1
VA	Dicots	amaranth, seabeach ( <i>Amaranthus pumilus</i> )	2
		chaffseed, American ( <i>Schwalbea americana</i> )	2
		coneflower, smooth ( <i>Echinacea laevigata</i> )	2
		joint-vetch, sensitive ( <i>Aeschynomene virginica</i> )	1
		sumac, Michaux's ( <i>Rhus michauxii</i> )	1
	Monocots	pogonia, small whorled ( <i>Isotria medeoloides</i> )	3
VT	Monocots	pogonia, small whorled ( <i>Isotria medeoloides</i> )	1
WA	Dicots	Catchfly, Spalding's ( <i>Silene spaldingii</i> )	1
		checker-mallow, Nelson's ( <i>Sidalcea nelsoniana</i> )	1
		checkermallow, Wenatchee Mountains ( <i>Sidalcea oregana</i> var. <i>calva</i> )	1
		desert-parsley, Bradshaw's ( <i>Lomatium bradshawii</i> )	1

Table A-3b (continued). Supplement: Listed plant species in counties with alfalfa production:  
By State, Taxa, and Species

State	Taxa Name	Species Name	County Count
WA	Dicots	howellia, water ( <i>Howellia aquatilis</i> )	1
		paintbrush, golden ( <i>Castilleja levisecta</i> )	2
		sandwort, Marsh ( <i>Arenaria paludicola</i> )	1
	Monocots	ladies'-tresses, Ute ( <i>Spiranthes diluvialis</i> )	2
WI	Dicots	bush-clover, prairie ( <i>Lespedeza leptostachya</i> )	5
		locoweed, Fassett's ( <i>Oxytropis campestris</i> var. <i>chartacea</i> )	1
		thistle, Pitcher's ( <i>Cirsium pitcheri</i> )	1
	Monocots	orchid, eastern prairie fringed ( <i>Platanthera leucophaea</i> )	1
WV	Dicots	clover, running buffalo ( <i>Trifolium stoloniferum</i> )	4
		spiraea, Virginia ( <i>Spiraea virginiana</i> )	1
WY	Dicots	Butterfly plant, Colorado ( <i>Gaura neomexicana</i> var. <i>coloradensis</i> )	1
		penstemon, blowout ( <i>Penstemon haydenii</i> )	1
	Monocots	ladies'-tresses, Ute ( <i>Spiranthes diluvialis</i> )	3

**Appendix 4. Species co-occurrences for alfalfa production that are Not of Concern**

There were no revisions to this appendix compared to the original report (Priester et al., 2007).

### Appendix 5. Species co-occurrences for alfalfa production for which habitat exclusions are applicable

Table A-5a. Supplement: Species co-occurrences for alfalfa hay production for which habitat exclusions are applicable

Note: This table is a supplement to Table A-5a as it appears in the original report (Priester et al., 2007).

Species*	State	Affected Counties
Synopsis of the Reason for Exclusion		
<i>Dicots</i>		
<b>Lifeform: Both</b>		
bittercress, small-anthered ( <i>Cardamine micranthera</i> )	NC	Forsyth
<i>Conclusion: Species habitat and use site spatial characteristics support the conclusion that sufficient physical separation exists such that exposure of the species is not likely to occur. Rationale: Forest dwelling species (NatureServe, 2005).</i>		
cactus, black lace ( <i>Echinocereus reichenbachii</i> var. <i>albertii</i> )	TX	Duval
<i>Conclusion: Species habitat and use site spatial characteristics support the conclusion that sufficient physical separation exists such that exposure of the species is not likely to occur. Rationale: Species occurs in grassy openings of south Texas rangeland invaded by mesquite and other shrubs (Texas Parks and Wildlife, 2005(a)). Alfalfa and other crop agriculture are not grown near these areas (Mike McMurry, with the Texas Department of Agriculture, pers. comm.). Drift and/or run-off would not be an issue for this species.</i>		
joint-vetch, sensitive ( <i>Aeschynomene virginica</i> )	MD VA	Calvert, Charles, Wicomico Chesterfield
<i>Conclusion: Species habitat and use site spatial characteristics support the conclusion that sufficient physical separation exists such that exposure of the species is not likely to occur. Rationale: This species is fully aquatic and stable populations of sensitive joint vetch are associated with shores of brackish estuaries and river shores, which are usually a good distance from agricultural fields (Turner 2005, pers. com.). This habitat is in the intertidal zone where plants are flooded twice daily (USFWS, 1995). Alfalfa is not likely to be adjacent to this habitat.</i>		
leather flower, Morefield's ( <i>Clematis morefieldii</i> )	TN	Franklin
<i>Conclusion: Species habitat and use site spatial characteristics support the conclusion that sufficient physical separation exists such that exposure of the species is not likely to occur. Rationale: Morefield's leather flower habitat is clay soils among massive limestone boulders on limestone bluffs in open juniper-hardwood forests (NatureServe, 2005). Such areas are not suitable for agriculture.</i>		
loosestrife, rough-leaved ( <i>Lysimachia asperulaefolia</i> )	NC	Harnett
<i>Conclusion: Species habitat and use site spatial characteristics support the conclusion that sufficient physical separation exists such that exposure of the species is not likely to occur. Rationale: This species occurs in poorly drained (wetland) soils in woodland situations (USFWS, 1992(c)); this habitat is not suitable for alfalfa culture.</i>		

Appendix 5. Species co-occurrences for alfalfa production for which habitat exclusions are applicable

Table A-5a (continued). Supplement: Species co-occurrences for alfalfa hay for which habitat exclusions are applicable

Species*	State	Affected Counties
	Synopsis of the Reason for Exclusion	
No common name ( <i>Geocarpon minimum</i> )	MO	Jasper
<p><i>Conclusion: Species habitat and use site spatial characteristics support the conclusion that sufficient physical separation exists such that exposure of the species is not likely to occur. Rationale: This species grows on sandstone outcrops in soils containing high amounts of sodium and magnesium (NatureServe, 2005). The composition of vegetation on sites containing Geocarpon minimum is largely controlled by edaphic factors, which make competing agriculture unlikely to adversely impact this species. In addition, the USFWS (1991(c)) notes that the habitat for this species is of "low agricultural quality" which indicates that it will not be found either near agriculture or in an area where agricultural spray drift and run-off are likely to be issues.</i></p>		
Pondberry ( <i>Lindera melissifolia</i> )	AL	Covington
	AR	Ashley, Craighead
<p><i>Conclusion: Species habitat and use site spatial characteristics support the conclusion that sufficient physical separation exists such that exposure of the species is not likely to occur. Rationale: Forest dwelling species (NatureServe, 2005).</i></p>		
<b>Lifeform: Terrestrial</b>		
amaranth, seabeach ( <i>Amaranthus pumilus</i> )	MD	Worcester
	NC	Currituck
	RI	Newport
	VA	Accomack, Northampton
	<p><i>Conclusion: Species habitat and use site spatial characteristics support the conclusion that sufficient physical separation exists such that exposure of the species is not likely to occur. Rationale: Seabeach amaranth occurs on accreting ends of barrier islands on lower foredunes and beaches above mean high tide (NatureServe, 2005). Plant is intolerant of competition and as such, does not grow in agricultural areas. Crop agriculture is not practiced at the accreting ends of barrier islands. These areas would be impacted solely by recreational housing development and occasional grazing.</i></p>	
ayenia, Texas ( <i>Ayenia limitaris</i> )	TX	Cameron
	<p><i>Conclusion: Species habitat and use site spatial characteristics support the conclusion that sufficient physical separation exists such that exposure of this species is not likely to occur. Rationale: According to Mike McMurry of the Texas Department of Agriculture (pers. comm.), Texas ayenia requires an unusual soil type typically found in the arid brushland areas of Texas for stable populations to occur. Such eco-regions have soil that is unsuitable for alfalfa culture. In addition, the USFWS (1994(a)) Final Rule for this species indicates that canopy cover is close to 95% in this plant community type. Therefore, even if drift were an issue, the plant canopy would protect this species.</i></p>	
bladderpod, Missouri ( <i>Lesquerella filiformis</i> )	AR	Izard, Washington
	<p><i>Conclusion: Species habitat and use site spatial characteristics support the conclusion that sufficient physical separation exists such that exposure of the species is not likely to occur. Rationale: Forest dwelling species found in open glades surrounded by trees (NatureServe, 2005). Agriculture other than grazing would not be practiced in these glades (Turner, 1997).</i></p>	

Table A-5a (continued). Supplement: Species co-occurrences for alfalfa hay for which habitat exclusions are applicable

Species*	State	Affected Counties
	Synopsis of the Reason for Exclusion	
bonamia, Florida ( <i>Bonamia grandiflora</i> )	FL	Manatee
	<i>Conclusion: Species habitat and use site spatial characteristics support to conclusion that sufficient physical separation exists such that exposure of the species is not likely to occur. Rationale: Florida bonamia is in found in deep sand (sand dunes), sandy ridges, or clearings (openings) of scrub habitats (NatureServe, 2005). Alfalfa is not grown near these areas.</i>	
cactus, Kuenzler hedgehog ( <i>Echinocereus fendleri</i> var. <i>kuenzleri</i> )	NM	Eddy
	<i>Conclusion: Species habitat and use site spatial characteristics support the conclusion that sufficient physical separation exists such that exposure of the species is not likely to occur. Rationale: Edaphic factors connected to habitat prevent co-occurrence of crop and endangered species. This species is site specific to open limestone outcrops in pinyon-juniper, which would not be suitable to alfalfa culture (NatureServe, 2005).</i>	
cactus, Sneed pincushion ( <i>Coryphantha sneedii</i> var. <i>sneedii</i> )	NM	Eddy
	<i>Conclusion: Species habitat and use site spatial characteristics support the conclusion that sufficient physical separation exists such that exposure of the species is not likely to occur. Rationale: Phil Tonne, Botany Coordinator for the New Mexico Natural Heritage Program (pers. comm.), indicated that this species is not likely to be exposed to pesticides due to its rocky habitat requirements.</i>	
coneflower, smooth ( <i>Echinacea laevigata</i> )	NC SC VA	Montgomery, Orange, Rockingham Anderson Amherst, Botetourt
	<i>Conclusion: Species habitat and use site spatial characteristics support the conclusion that sufficient physical separation exists such that exposure of the species is not likely to occur. Rationale: Typical habitat areas of this species have slopes that are very steep (limestone bluffs), in small forest openings and on cedar barrens (NatureServe, 2005). Such habitat does not support alfalfa and farm equipment could not be used on the jumped (extremely rocky) land where this species occurs without damaging it. Alfalfa fields would also be sufficiently removed from these areas so that spray drift and run-off would not be concerns.</i>	
fleabane, Zuni ( <i>Erigeron rhizomatus</i> )	NM	San Juan
	<i>Conclusion: Species habitat and use site spatial characteristics support the conclusion that sufficient physical separation exists such that exposure of the species is not likely to occur. Rationale: Forest dwelling species (NatureServe, 2005).</i>	
gerardia, sandplain ( <i>Agalinis acuta</i> )	CT MA RI	Hartford Worcester Newport
	<i>Conclusion: The physical separation between soil types underlying species habitat and use site is sufficient to support the conclusion that exposure of the species is not likely to occur. Rationale: Sandplain gerardia habitat consists of serpentine soils in grass plains (NatureServe, 2005). Although grass plain habitat is suitable for wheat culture, nutrient poor and/or minerally toxic soils (such as serpentine) are not suitable for agriculture.</i>	
heartleaf, dwarf-flowered ( <i>Hexastylis naniflora</i> )	NC	Alexander
	<i>Conclusion: Species habitat and use site spatial characteristics support the conclusion that sufficient physical separation exists such that exposure of the species is not likely to occur. Rationale: Forest dwelling species (NatureServe, 2005).</i>	

Table A-5a (continued). Supplement: Species co-occurrences for alfalfa hay for which habitat exclusions are applicable

Species*	State	Affected Counties
	Synopsis of the Reason for Exclusion	
heather, mountain golden ( <i>Hudsonia montana</i> )	MI	Kalkaska
	NY	Genesee
<p><i>Conclusion: Species habitat and use site spatial characteristics support the conclusion that sufficient physical separation exists such that exposure of the species is not likely to occur. Rationale: Houghton's goldenrod occupies two habitat types: sparsely vegetated, moist, sandy, interdunal depressions, rocky and cobbly shores, beach flats and calcareous beach sands; and seasonably wet alvar in and around sand flat and dunes around the Great Lakes (NatureServe, 2005). In either habitat, plants are typically situated to benefit from cool, moist lake winds. Crop agriculture is not practiced on marginal sand dune rangeland.</i></p>		
heather, mountain golden ( <i>Hudsonia montana</i> )	NC	Mcdowell
	<p><i>Conclusion: Species habitat and use site spatial characteristics support the conclusion that sufficient physical separation exists such that exposure of the species is not likely to occur. Rationale: Usually mountain golden heather is found in the sparsely vegetated ecotone between bare rock and heath bald where shallow soils form over quartzite or mica gneiss rock ledges (NatureServe, 2005). In addition, the USFWS (1991(b)) notes that "This plant is found only in Burke and McDowell Counties, North Carolina, at elevations of 2,800 to 4,000 feet". Edaphic factors necessary for mountain golden heather would generally not allow agriculture. Soil found in mountain golden heather habitat is too shallow for most agricultural practice and mountain habitat is not suitable for alfalfa production. In addition, crops are not grown at 2,800 to 4,000 ft altitudes in North Carolina.</i></p>	
monkshood, northern wild ( <i>Aconitum noveboracense</i> )	OH	Hocking
	<p><i>Conclusion: Species habitat and use site spatial characteristics support the conclusion that sufficient physical separation exists such that exposure of the species is not likely to occur. Rationale: Forest dwelling species (Ohio DNR, Undated). Species Management Practice also applies. Iowa has a State Program to protect all endangered plant species from herbicides (Iowa State University Extension Service, 2003). This program includes education for all pesticide applicators in the State and recommended buffer distances (50 ft buffer for hand sprayers, 100 ft buffer for boom sprayers, and 200 yds for aerial applications) for spraying in areas where threatened or endangered species occur.</i></p>	
oak, Hinckley ( <i>Quercus hinckleyi</i> )	TX	Brewster
	<p><i>Conclusion: Species habitat and use site spatial characteristics support the conclusion that sufficient physical separation exists such that exposure of the species is not likely to occur. Rationale: Species habitat was historically used for grazing (NatureServe, 2005); and is relatively unsuitable for other uses.</i></p>	
penstemon, blowout ( <i>Penstemon haydenii</i> )	NE	Brown, Grant, Thomas
	WY	Carbon
<p><i>Conclusion: Species habitat and use site spatial characteristics support the conclusion that sufficient physical separation exists such that exposure of the species is not likely to occur. Rationale: Habitat for blowout penstemon is sand dunes with less than 10% ground cover (NatureServe, 2005), which is not suitable for agriculture. No cultivated agriculture occurs around sand dunes (Turner, 1997).</i></p>		
phacelia, clay ( <i>Phacelia argillacea</i> )	UT	Wasatch
	<p><i>Conclusion: Species habitat and use site spatial characteristics support the conclusion that sufficient physical separation exists such that exposure of the species is not likely to occur. Rationale: This species requires shale derived soils in pinyon-juniper and mountain scrub habitats (NatureServe, 2005). Clay phacelia does not occur near cultivated crops (Turner, 1997).</i></p>	

Table A-5a (continued). Supplement: Species co-occurrences for alfalfa hay for which habitat exclusions are applicable

Species*	State	Affected Counties
	Synopsis of the Reason for Exclusion	
potato-bean, Price's ( <i>Apios priceana</i> )	KY	Calloway, Marshall, Warren
	TN	Giles, Hickman, Stewart
<i>Conclusion: Species habitat and use site spatial characteristics support the conclusion that sufficient physical separation exists such that exposure of the species is not likely to occur. Rationale: This species occurs in forest openings and edges of woods (NatureServe, 2005). Alfalfa would not be associated with such habitat (Turner, 1997).</i>		
prairie-clover, leafy ( <i>Dalea foliosa</i> )	TN	Bedford, Sumner
	<i>Conclusion: Species habitat and use site spatial characteristics support the conclusion that sufficient physical separation exists such that exposure of the species is not likely to occur. Rationale: Edaphic factors related to this species' habitat exclude it from exposure; leafy prairie clover grows on thin soils over limestone of cedar glades or barrens (NatureServe, 2005). Cedar glades generally occur in jumped soil (very rocky) and not suitable for mechanized farming; alfalfa is not grown in such areas.</i>	
rock-cress, Braun's ( <i>Arabis perstellata</i> )	KY	Henry
	<i>Conclusion: Species habitat and use site spatial characteristics support the conclusion that sufficient physical separation exists such that exposure of the species is not likely to occur. Rationale: Forest dwelling species (NatureServe, 2005).</i>	
rock-cress, McDonald's ( <i>Arabis mcdonaldiana</i> )	OR	Josephine
	<i>Conclusion: Species habitat and use site spatial characteristics support the conclusion that sufficient physical separation exists such that exposure of the species is not likely to occur. Rationale: Edaphic factors related to this species' habitat exclude it from exposure; Red mountain rockcress grows on rocky serpentine areas of reddish soils derived from serpentine (NatureServe, 2005). These areas are often on steep slopes that are not suitable for mechanized farming; alfalfa is not grown in such areas.</i>	
sandwort, Cumberland ( <i>Arenaria cumberlandensis</i> )	KY	Mccreary
	<i>Conclusion: Species habitat and use site spatial characteristics support the conclusion that sufficient physical separation exists such that exposure of the species is not likely to occur. Rationale: Cumberland sandworts' habitat is a very unusual sandstone formation consisting of "rock houses" and cave-like overhangs (NatureServe, 2005). Habitat is located well above areas used for agriculture.</i>	
spiraea, Virginia ( <i>Spiraea virginiana</i> )	KY	Lewis, Mccreary, Whitley
	NC	Swain
	OH	Scioto
	TN	Bledsoe
	WV	Summers
	<i>Conclusion: Species habitat and use site spatial characteristics support the conclusion that sufficient physical separation exists such that exposure of the species is not likely to occur. Rationale: Virginia spiraea requires permanent wetland environment, typically along the flood scoured banks of high gradient mountain streams or along lower streams with dynamic flooding regimes (NatureServe, 2005). Alfalfa would not be grown in such areas.</i>	

Table A-5a (continued). Supplement: Species co-occurrences for alfalfa hay for which habitat exclusions are applicable

Species*	State	Affected Counties
<b>Synopsis of the Reason for Exclusion</b>		
thistle, Pitcher's ( <i>Cirsium pitcheri</i> )	MI	Alcona
	WI	Douglas
<p><i>Conclusion: Species habitat and use site spatial characteristics support the conclusion that sufficient physical separation exists such that exposure of the species is not likely to occur. Rationale: Pitcher's thistle is restricted to sand dunes along the following Great Lakes: Michigan, Huron, and Superior (NatureServe, 2005). Alfalfa culture is not likely to occur near such areas (Turner, 1997). Grazing is the only likely form of agriculture that will be practiced in and around sand dunes.</i></p>		
<b>Ferns and Allies</b>		
<b>Lifeform: Terrestrial</b>		
fern, American hart's-tongue ( <i>Asplenium scolopendrium</i> var. <i>americanum</i> )	TN	Johnson
	<p><i>Conclusion: Species habitat and use site spatial characteristics support the conclusion that sufficient physical separation exists such that exposure of the species is not likely to occur. Rationale: Forest dwelling species found in well shaded microclimate woods (NatureServe, 2005).</i></p>	
<b>Lichens</b>		
<b>Lifeform: Terrestrial</b>		
lichen, rock gnome ( <i>Gymnoderma lineare</i> )	NC	Swain
	<p><i>Conclusion: Species habitat and use site spatial characteristics support the conclusion that sufficient physical separation exists such that exposure of the species is not likely to occur. Rationale: Wet forest dwelling species usually found on vertical canyon walls with constant moisture (USFWS, 1996(c)).</i></p>	
<b>Monocots</b>		
<b>Lifeform: Terrestrial</b>		
pogonia, small whorled ( <i>Isotria medeoloides</i> )	MA	Middlesex
	MD	Montgomery
	NC	Cherokee, McDowell
	NY	Rockland
	OH	Hocking, Scioto
	RI	Kent
	TN	Washington
	VA	Bedford, Madison, Spotsylvania
	VT	Chittenden
<p><i>Conclusion: Species habitat and use site spatial characteristics support the conclusion that sufficient physical separation exists such that exposure of the species is not likely to occur. Rationale: Forest dwelling species (USFWS, 1996(d)).</i></p>		

Table A-5a (continued). Supplement: Species co-occurrences for alfalfa hay for which habitat exclusions are applicable

Species*	State	Affected Counties
	Synopsis of the Reason for Exclusion	
trillium, relict ( <i>Trillium reliquum</i> )	GA	Laurens
	<i>Conclusion: Species habitat and use site spatial characteristics support the conclusion that sufficient physical separation exists such that exposure of the species is not likely to occur. Rationale: Forest dwelling species (NatureServe, 2005).</i>	

\* Lifeform classification from FESTF IMS (updated September 24, 2007).

\*\* The following exclusion statement holds true for all listed species: "Species habitat and use site conditions in the specified county(ies) preclude exposure". Forest dwelling species listed in this Appendix occupy habitat located deep within the forest, where exposure to pesticides from drift is unlikely.

Table A-5b. Supplement: Species co-occurrences for alfalfa seed production for which habitat exclusions are applicable

Note: This table is a supplement to Table A-5b as it appears in the original report (Priester et al., 2007).

Species*	State	Affected Counties
	Synopsis of the Reason for Exclusion**	
<i>Dicots</i>		
<i>Lifeform: Terrestrial</i>		
cactus, Kuenzler hedgehog ( <i>Echinocereus fendleri</i> var. <i>kuenzleri</i> )	NM	Eddy
	<i>Conclusion: Species habitat and use site spatial characteristics support the conclusion that sufficient physical separation exists such that exposure of the species is not likely to occur. Rationale: Edaphic factors connected to habitat prevent co-occurrence of crop and endangered species. This species is site specific to open limestone outcrops in pinyon-juniper, which would not be suitable to alfalfa culture (NatureServe, 2005).</i>	
cactus, Sneed pincushion ( <i>Coryphantha sneedii</i> var. <i>sneedii</i> )	NM	Eddy
	<i>Conclusion: Species habitat and use site spatial characteristics support the conclusion that sufficient physical separation exists such that exposure of the species is not likely to occur. Rationale: Phil Tonne, Botany Coordinator for the New Mexico Natural Heritage Program (pers. comm.), indicated that this species is not likely to be exposed to pesticides due to its rocky habitat requirements.</i>	
fleabane, Zuni ( <i>Erigeron rhizomatus</i> )	NM	San Juan
	<i>Conclusion: Species habitat and use site spatial characteristics support the conclusion that sufficient physical separation exists such that exposure of the species is not likely to occur. Rationale: Forest dwelling species (NatureServe, 2005).</i>	
phacelia, clay ( <i>Phacelia argillacea</i> )	UT	Wasatch
	<i>Conclusion: Species habitat and use site spatial characteristics support the conclusion that sufficient physical separation exists such that exposure of the species is not likely to occur. Rationale: This species requires shale derived soils in pinyon-juniper and mountain scrub habitats (NatureServe, 2005). Clay phacelia does not occur near cultivated crops (Turner, 1997).</i>	

\* Lifeform classification from FESTF IMS (updated September 24, 2007).

\*\* The following exclusion statement holds true for all listed species: "Species habitat and use site conditions in the specified county(ies) preclude exposure". Forest dwelling species listed in this Appendix occupy habitat located deep within the forest, where exposure to pesticides from drift is unlikely.

### Appendix 6. Species co-occurrences for alfalfa for which proximity exclusions are applicable

Table A-6a. Supplement: Species co-occurrences for alfalfa hay production for which proximity exclusions are applicable

Note: This table is a supplement to Table A-6a as it appears in the original report (Priester et al., 2007).

Species*	State	Affected Counties	Species Management Practice Applies <sup>1</sup>
<i>Dicots</i>			
<i>Lifeform: Terrestrial</i>			
butterweed, Layne's ( <i>Senecio layneae</i> )	CA	Yuba <sup>2</sup>	No
sunburst, Hartweg's golden ( <i>Pseudobahia bahiifolia</i> )	CA	Yuba <sup>2</sup>	No
<i>Monocots</i>			
<i>Lifeform: Aquatic</i>			
Orcutt grass, slender ( <i>Orcuttia tenuis</i> )	CA	Lassen <sup>2</sup>	Yes

\* Lifeform classification from FESTF IMS (updated September 24, 2007).

<sup>1</sup> Protection language from CA11 and CA17 exists according to California interim measures bulletins; available on-line at <http://www.cdpr.ca.gov/docs/es/colist.htm>.

<sup>2</sup>The following statement holds: Species habitat does not occur in proximity to alfalfa in the specified county.

Table A-6b. Supplement: Species co-occurrences for alfalfa seed production for which proximity exclusions are applicable

Note: This table is a supplement to Table A-6b as it appears in the original report (Priester et al., 2007).

Species*	State	Affected Counties	Species Management Practice Applies <sup>1</sup>
<i>Monocots</i>			
<i>Lifeform: Aquatic</i>			
Orcutt grass, slender ( <i>Orcuttia tenuis</i> )	CA	Lassen <sup>2</sup>	Yes

\* Lifeform classification from FESTF IMS (updated September 24, 2007).

<sup>1</sup> Protection language from CA11 and CA17 exists according to California interim measures bulletins; available on-line at <http://www.cdpr.ca.gov/docs/es/colist.htm>.

<sup>2</sup> The following statement holds: Species habitat does not occur in proximity to alfalfa in the specified county.

**Appendix 7. Species co-occurrences for alfalfa for which other exclusions are applicable**

There were no revisions to this appendix compared to the original report (Priester et al., 2007).

### Appendix 8. Species co-occurrences for alfalfa for which species management practice protections are applicable

There were no revisions to Table A-8b as it appears in the original report (Priester et al., 2007).

Table A-8a. Supplement: Species co-occurrences for alfalfa hay production for which species management practice protections are applicable

Note: This table is a supplement to Table A-8a as it appears in the original report (Priester et al., 2007).

Species*	State	Affected Counties
Synopsis of the Reason for Protection		
<i>Dicots</i>		
<b><i>Lifeform: Terrestrial</i></b>		
bush-clover, prairie ( <i>Lespedeza leptostachya</i> )	WI	Green, Iowa, Lafayette, Pepin, St Croix
<i>Wisconsin's protection plan for threatened and endangered plant species is likely to protect this species (L. Turner, pers. com., 2005).</i>		
locoweed, Fassett's ( <i>Oxytropis campestris</i> var. <i>chartacea</i> )	WI	Bayfield
<i>Fassett's locoweed is actively protected by the Wisconsin Department of Natural Resources (USFWS, 2003(e)) at sites owned by the DNR and through a landowner contact program whereby private landowners have volunteered to protect this species on their property. The largest threats to this species appear to be residential development of lakeshore areas and grazing. Crop agriculture is not noted as a threat to this species.</i>		
<i>Monocots</i>		
<b><i>Lifeform: Both</i></b>		
orchid, eastern prairie fringed ( <i>Platanthera leucophaea</i> )	WI	Racine
<i>Wisconsin's protection plan for threatened and endangered plant species is likely to protect this species (L. Turner, pers. com., 2005).</i>		

\* Lifeform classification from FESTF IMS (updated September 24, 2007).

**Appendix 9. Application Guidance from Roundup WeatherMAX® Labels**

There are no revisions to this appendix as it appears in the original report (Priester et al., 2007).

### Appendix 10. Species co-occurrences for alfalfa production for which further analysis is required

Table A-10a. Supplement: Species co-occurrences for alfalfa hay production for which further analysis is required: by Taxa, Species, State, and County

Note: This table is a supplement to Table A-10a as it appears in the original report (Priester et al., 2007).

Species*	State	Affected Counties
<i>Dicots</i>		
<b><i>Lifeform: Both</i></b>		
aster, decurrent false ( <i>Boltonia decurrens</i> )	MO	Franklin, Lincoln
Butterfly plant, Colorado ( <i>Gaura neomexicana</i> var. <i>coloradensis</i> )	CO WY	Douglas, Larimer Platte
button, Mohr's Barbara ( <i>Marshallia mohrii</i> )	AL	Cullman
checkermallow, Wenatchee Mountains ( <i>Sidalcea oregana</i> var. <i>calva</i> )	WA	Kittitas
dropwort, Canby's ( <i>Oxypolis canbyi</i> )	MD	Queen Annes
Harperella ( <i>Ptilimnium nodosum</i> )	AL AR	Tuscaloosa Garland, Montgomery, Perry, Scott
howellia, water ( <i>Howellia aquatilis</i> )	OR WA	Benton, Columbia, Marion, Polk, Yamhill Pierce
sandwort, Marsh ( <i>Arenaria paludicola</i> )	WA	Pierce
sneezeweed, Virginia ( <i>Helenium virginicum</i> )	MO	Oregon, Shannon, Texas, Webster, Wright
water-willow, Cooley's ( <i>Justicia cooleyi</i> )	FL	Sumter
<b><i>Lifeform: Terrestrial</i></b>		
ambrosia, south Texas ( <i>Ambrosia cheiranthifolia</i> )	TX	Cameron
aster, Florida golden ( <i>Chrysopsis floridana</i> )	FL	Manatee
buckwheat, scrub ( <i>Eriogonum longifolium</i> var. <i>gnaphalifolium</i> )	FL	Sumter
bush-clover, prairie ( <i>Lespedeza leptostachya</i> )	IL MN	Mchenry Dakota, Dodge, Houston, Mower, Olmsted
Catchfly, Spalding's ( <i>Silene spaldingii</i> )	WA	Adams

Table A-10a (continued). Supplement: Species co-occurrences for alfalfa hay production for which further analysis is required: by Taxa, Species, State, and County

Species*	State	Affected Counties
chaffseed, American ( <i>Schwalbea americana</i> )	AL CT FL KY LA MD NC NY VA	Geneva New London Leon McCreary, Wayne Allen Parish Worcester Duplin Albany Greensville, Sussex
checker-mallow, Nelson's ( <i>Sidalcea nelsoniana</i> )	OR WA	Clatsop, Columbia Lewis
clover, running buffalo ( <i>Trifolium stoloniferum</i> )	IN KY MO OH WV	Dearborn Clark, Fayette, Harrison, Jackson, Jessamine, Kenton, Madison, Montgomery Jasper, Laclede, Moniteau, Montgomery Lawrence Barbour, Brooke, Monongalia, Pocahontas
desert-parsley, Bradshaw's ( <i>Lomatium bradshawii</i> )	WA	Clark
goldenrod, Short's ( <i>Solidago shortii</i> )	IN	Harrison
manioc, Walker's ( <i>Manihot walkerae</i> )	TX	Duval
milkweed, Mead's ( <i>Asclepias meadii</i> )	IL MO	Hancock Adair, Franklin, Johnson
mint, longspurred ( <i>Dicerandra cornutissima</i> )	FL	Sumter
paintbrush, golden ( <i>Castilleja levisecta</i> )	WA	Pierce, Skagit
phacelia, North Park ( <i>Phacelia formosula</i> )	CO	Larimer
rosemary, Cumberland ( <i>Conradina verticillata</i> )	KY	McCreary
sumac, Michaux's ( <i>Rhus michauxii</i> )	NC VA	Wilson Brunswick
sunflower, Schweinitz's ( <i>Helianthus schweinitzii</i> )	NC	Anson, Davidson, Gaston, Montgomery, Randolph

Table A-10a (continued). Supplement: Species co-occurrences for alfalfa hay production for which further analysis is required: by Taxa, Species, State, and County

Species*	State	Affected Counties
<i>Monocots</i>		
<b><i>Lifeform: Aquatic</i></b>		
water-plantain, Kral's ( <i>Sagittaria secundifolia</i> )	AL	Cherokee
<b><i>Lifeform: Both</i></b>		
ladies'-tresses, Ute ( <i>Spiranthes diluvialis</i> )	CO	El Paso, Larimer, Moffat
	ID	Bonneville, Fremont, Jefferson, Madison
	MT	Beaverhead, Broadwater, Gallatin, Jefferson, Madison
	NE	Sioux
	UT	Wasatch
	WA	Chelan, Okanogan
	WY	Converse, Goshen, Niobrara
orchid, eastern prairie fringed ( <i>Platanthera leucophaea</i> )	IL	Hancock, Mchenry, Will
	IN	Elkhart, La Porte, Lagrange, Noble, St Joseph, Starke, Steuben, White
	MO	Ralls
	NE	Dodge, Saunders
	NY	Erie, Genesee, Niagara, Orleans
	OH	Clark
orchid, western prairie fringed ( <i>Platanthera praeclara</i> )	MN	Hennepin, Houston, Nicollet
	MO	Jasper, Johnson, Webster
	NE	Antelope, Boone, Dodge, Garfield, Grant, Holt, Loup, Madison, Otoe, Pierce, Rock, Saline, Sarpy, Saunders, Wheeler

\* Lifeform classification from FESTF IMS (updated September 24, 2007).

Table A-10b. Supplement: Species co-occurrences for alfalfa seed production for which further analysis is required: by Taxa, Species, State, and County

Note: This table is a supplement to Table A-10a as it appears in the original report (Priester et al., 2007).

Species*	State	Affected Counties
<b><i>Dicots</i></b>		
<b><i>Lifeform: Both</i></b>		
aster, decurrent false ( <i>Boltonia decurrens</i> )	MO	Franklin, Lincoln
howellia, water ( <i>Howellia aquatilis</i> )	OR	Marion
<b><i>Lifeform: Terrestrial</i></b>		
Catchfly, Spalding's ( <i>Silene spaldingii</i> )	WA	Adams
milkweed, Mead's ( <i>Asclepias meadii</i> )	MO	Franklin
<b><i>Monocots</i></b>		
<b><i>Lifeform: Both</i></b>		
ladies'-tresses, Ute ( <i>Spiranthes diluvialis</i> )	CO	Moffat
	ID	Jefferson
	MT	Broadwater
	NE	Sioux
	UT	Wasatch
orchid, eastern prairie fringed ( <i>Platanthera leucophaea</i> )	NY	Erie, Niagara
orchid, western prairie fringed ( <i>Platanthera praeclara</i> )	NE	Antelope, Boone, Holt, Otoe, Sarpy

\* Lifeform classification from FESTF IMS (updated September 24, 2007).

Table A-10c. Species co-occurrences for alfalfa hay production for which further analysis is required: by State

State Code	Supplement		Original plus Supplement	
	County Count	Species Count	County Count	Species Count
AL	4	4	11	7
AR	4	1	5	1
AZ	0	0	1	1
CA	0	0	13	7
CO	4	3	8	3
CT	1	1	1	1
FL	3	5	13	17
GA	0	0	7	6
HI	0	0	2	58
ID	4	1	8	3
IL	3	3	32	4
IN	10	3	11	3
KS	0	0	14	2
KY	10	3	18	4
LA	1	1	1	1
MA	0	0	1	1
MD	2	2	4	4
ME	0	0	1	1
MI	0	0	10	1
MN	7	2	23	3
MO	14	6	47	6
MT	5	1	9	3
NC	7	3	29	8
NE	16	3	20	3
NJ	0	0	11	3
NM	0	0	4	3
NV	0	0	1	1
NY	5	2	5	2
OH	2	2	11	2
OK	0	0	2	1
OR	6	2	17	10
SC	0	0	16	6
TN	0	0	6	2
TX	2	2	25	12
UT	1	1	12	3
VA	3	2	9	5
VT	0	0	1	1
WA	8	8	15	9
WV	4	1	10	3
WY	4	2	4	2
<b>Total</b>	<b>125<sup>1</sup></b>	<b>32<sup>2</sup></b>	<b>438<sup>1</sup></b>	<b>141<sup>2</sup></b>

<sup>1</sup> Number of counties.<sup>2</sup> Number of distinct species.

Table A-10d. Species co-occurrences for alfalfa seed production for which further analysis is required: by State

State Code	Supplement		Original plus Supplement	
	County Count	Species Count	County Count	Species Count
CA	0	0	7	6
CO	1	1	1	1
ID	1	1	1	1
KS	0	0	4	2
MI	0	0	2	1
MN	0	0	2	3
MO	2	2	6	4
MT	1	1	1	1
NE	6	2	8	2
NM	0	0	1	1
NY	2	1	2	1
OR	1	1	3	6
TX	0	0	1	1
UT	1	1	7	3
WA	1	1	3	1
<b>Total</b>	<b>16<sup>1</sup></b>	<b>7<sup>2</sup></b>	<b>49<sup>1</sup></b>	<b>25<sup>2</sup></b>

<sup>1</sup> Number of counties.<sup>2</sup> Number of distinct species.

Table A-10e. Species co-occurrences for alfalfa hay production for which further analysis is required: by State and County

State Code	County Name	Species Count	
		Supplement	Original plus Supplement
AL	Calhoun	0	2
	Cherokee	1	2
	Colbert	0	1
	Cullman	1	1
	De Kalb	0	2
	Franklin	0	2
	Geneva	1	1
	Lawrence	0	1
	Randolph	0	1
	Tuscaloosa	1	1
	Winston	0	1
AR	Garland	1	1
	Montgomery	1	1
	Perry	1	1
	Scott	1	1
	Yell	0	1
AZ	Mohave	0	1
CA	Alameda	0	1
	Butte	0	2
	Colusa	0	1
	Fresno	0	1
	Glenn	0	1
	Madera	0	2
	Merced	0	2
	San Diego	0	1
	Shasta	0	1
	Stanislaus	0	2
	Tehama	0	2
	Tulare	0	2
	Yolo	0	1
CO	Boulder	0	1
	Douglas	1	1
	El Paso	1	1
	Jefferson	0	1
	Larimer	3	3
	Moffat	1	1
	Morgan	0	1
	Weld	0	1
CT	New London	1	1
FL	Bay	0	1
	Calhoun	0	1
	Hernando	0	2

Table A-10e (continued). Species co-occurrences for alfalfa hay production for which further analysis is required: by State and County

State Code	County Name	Species Count	
		Supplement	Original plus Supplement
FL	Highlands	0	6
	Hillsborough	0	1
	Lee	0	1
	Leon	1	1
	Manatee	1	1
	Marion	0	3
	Palm Beach	0	1
	Putnam	0	1
	Sumter	3	3
	Volusia	0	1
	GA	Bartow	0
Columbia		0	2
Floyd		0	1
Gilmer		0	1
Greene		0	3
Oglethorpe		0	1
Whitfield		0	1
HI	Kauai	0	25
	Maui	0	43
ID	Bonneville	1	1
	Fremont	1	1
	Idaho	0	1
	Jefferson	1	1
	Latah	0	1
	Lewis	0	1
	Madison	1	1
	Nez Perce	0	1
IL	Bureau	0	1
	Cass	0	1
	Cook	0	2
	Du Page	0	2
	Ford	0	1
	Fulton	0	1
	Grundy	0	1
	Hancock	2	2
	Henry	0	1
	Iroquois	0	1
	Jersey	0	1
	Kane	0	1
	La Salle	0	1
	Lake	0	1
Lee	0	1	

Table A-10e (continued). Species co-occurrences for alfalfa hay production for which further analysis is required: by State and County

State Code	County Name	Species Count	
		Supplement	Original plus Supplement
IL	Madison	0	1
	Marshall	0	1
	Mason	0	1
	McHenry	2	2
	Morgan	0	1
	Ogle	0	1
	Peoria	0	1
	Pike	0	1
	Putnam	0	1
	Saline	0	1
	Schuyler	0	1
	Scott	0	1
	St Clair	0	1
	Tazewell	0	1
	Will	1	1
	Winnebago	0	1
Woodford	0	1	
IN	Dearborn	1	1
	Elkhart	1	1
	Harrison	1	1
	La Porte	1	1
	Lagrange	1	1
	Noble	1	1
	Ohio	0	1
	St Joseph	1	1
	Starke	1	1
	Steuben	1	1
	White	1	1
KS	Allen	0	1
	Anderson	0	1
	Bourbon	0	1
	Coffey	0	1
	Crawford	0	1
	Douglas	0	2
	Franklin	0	1
	Jefferson	0	2
	Johnson	0	1
	Leavenworth	0	2
	Linn	0	1
	Miami	0	1
	Neosho	0	1
Osage	0	1	

Table A-10e (continued). Species co-occurrences for alfalfa hay production for which further analysis is required: by State and County

State Code	County Name	Species Count	
		Supplement	Original plus Supplement
KY	Boone	0	1
	Bourbon	0	1
	Clark	1	1
	Fayette	1	1
	Fleming	0	1
	Harrison	1	1
	Jackson	1	1
	Jefferson	0	1
	Jessamine	1	1
	Kenton	1	1
	Madison	1	1
	McCreary	2	2
	Montgomery	1	1
	Nelson	0	1
	Nicholas	0	1
	Robertson	0	1
	Wayne	1	1
Woodford	0	1	
LA	Allen Parish	1	1
MA	Franklin	0	1
MD	Allegany	0	1
	Queen Annes	1	1
	Washington	0	2
	Worcester	1	1
ME	Aroostook	0	1
MI	Bay	0	1
	Huron	0	1
	Livingston	0	1
	Monroe	0	1
	Saginaw	0	1
	St Clair	0	1
	St Joseph	0	1
	Tuscola	0	1
	Washtenaw	0	1
Wayne	0	1	
MN	Brown	0	1
	Clay	0	1
	Cottonwood	0	1
	Dakota	1	1
	Dodge	1	2
	Goodhue	0	2
	Hennepin	1	1

Table A-10e (continued). Species co-occurrences for alfalfa hay production for which further analysis is required: by State and County

State Code	County Name	Species Count	
		Supplement	Original plus Supplement
MN	Houston	2	2
	Jackson	0	1
	Kittson	0	1
	Mower	1	2
	Nicollet	1	1
	Nobles	0	1
	Norman	0	1
	Olmsted	1	1
	Pennington	0	1
	Pipestone	0	1
	Polk	0	1
	Redwood	0	1
	Renville	0	1
	Rice	0	2
	Rock	0	1
	Steele	0	1
MO	Adair	1	1
	Barry	0	1
	Barton	0	1
	Benton	0	2
	Boone	0	1
	Callaway	0	1
	Carter	0	1
	Cass	0	1
	Cedar	0	2
	Cole	0	1
	Crawford	0	1
	Dade	0	2
	Dent	0	1
	Dunklin	0	2
	Franklin	2	2
	Harrison	0	1
	Holt	0	1
	Howard	0	1
	Howell	0	2
	Iron	0	1
	Jasper	2	2
	Johnson	2	2
	Laclede	1	1
	Lincoln	1	1
	Madison	0	1
	Maries	0	1

Table A-10e (continued). Species co-occurrences for alfalfa hay production for which further analysis is required: by State and County

State Code	County Name	Species Count	
		Supplement	Original plus Supplement
MO	Mississippi	0	1
	Moniteau	1	1
	Montgomery	1	1
	Oregon	1	1
	Ozark	0	1
	Pettis	0	1
	Phelps	0	1
	Pike	0	1
	Polk	0	1
	Ralls	1	1
	Reynolds	0	1
	Shannon	1	1
	St Charles	0	1
	St Clair	0	1
	St Louis	0	1
	Taney	0	1
	Texas	1	2
	Vernon	0	2
	Wayne	0	1
	Webster	2	2
Wright	1	1	
MT	Beaverhead	1	1
	Broadwater	1	1
	Flathead	0	1
	Gallatin	1	1
	Jefferson	1	1
	Lake	0	2
	Lincoln	0	1
	Madison	1	1
	Missoula	0	1
NC	Anson	1	1
	Cabarrus	0	1
	Chatham	0	1
	Clay	0	1
	Cumberland	0	1
	Davidson	1	1
	Davie	0	1
	Duplin	1	1
	Franklin	0	1
	Gaston	1	1
	Granville	0	1
	Henderson	0	1

Table A-10e (continued). Species co-occurrences for alfalfa hay production for which further analysis is required: by State and County

State Code	County Name	Species Count	
		Supplement	Original plus Supplement
NC	Hoke	0	2
	Mecklenburg	0	1
	Montgomery	1	1
	Moore	0	2
	Pender	0	1
	Polk	0	1
	Randolph	1	1
	Richmond	0	1
	Robeson	0	1
	Rowan	0	1
	Rutherford	0	1
	Scotland	0	2
	Stanly	0	1
	Stokes	0	1
	Union	0	1
	Wake	0	1
	Wilson	1	1
NE	Antelope	1	1
	Boone	1	1
	Cherry	0	1
	Dodge	2	2
	Garfield	1	1
	Grant	1	1
	Hall	0	1
	Holt	1	1
	Lancaster	0	1
	Loup	1	1
	Madison	1	1
	Otoe	1	1
	Pierce	1	1
	Rock	1	1
	Saline	1	1
	Sarpy	1	1
	Saunders	2	2
	Seward	0	1
	Sioux	1	1
	Wheeler	1	1
NJ	Atlantic	0	2
	Burlington	0	3
	Camden	0	2
	Cape May	0	1
	Cumberland	0	1

Table A-10e (continued). Species co-occurrences for alfalfa hay production for which further analysis is required: by State and County

State Code	County Name	Species Count	
		Supplement	Original plus Supplement
NJ	Gloucester	0	1
	Middlesex	0	1
	Monmouth	0	2
	Morris	0	1
	Ocean	0	2
	Salem	0	1
NM	Cibola	0	1
	Guadalupe	0	1
	Otero	0	2
	Valencia	0	1
NV	Lincoln	0	1
NY	Albany	1	1
	Erie	1	1
	Genesee	1	1
	Niagara	1	1
	Orleans	1	1
OH	Brown	0	1
	Clark	1	1
	Clermont	0	1
	Hamilton	0	1
	Holmes	0	1
	Lawrence	1	1
	Lucas	0	1
	Ottawa	0	1
	Sandusky	0	1
	Warren	0	1
	Wayne	0	1
OK	Craig	0	1
	Rogers	0	1
OR	Baker	0	1
	Benton	1	5
	Clackamas	0	1
	Clatsop	1	1
	Columbia	2	2
	Douglas	0	2
	Jackson	0	1
	Josephine	0	2
	Lane	0	3
	Linn	0	4
	Marion	1	4
	Polk	1	4
	Tillamook	0	1

Table A-10e (continued). Species co-occurrences for alfalfa hay production for which further analysis is required: by State and County

State Code	County Name	Species Count	
		Supplement	Original plus Supplement
OR	Union	0	1
	Wallowa	0	1
	Washington	0	1
	Yamhill	1	3
SC	Charleston	0	1
	Dorchester	0	1
	Florence	0	1
	Greenville	0	1
	Hampton	0	1
	Horry	0	2
	Jasper	0	1
	Lancaster	0	1
	Lee	0	1
	Marlboro	0	1
	Orangeburg	0	1
	Richland	0	1
	Saluda	0	2
	Sumter	0	1
	Williamsburg	0	2
York	0	2	
TN	Cumberland	0	1
	Fentress	0	1
	Morgan	0	1
	Scott	0	1
	White	0	1
	Wilson	0	1
TX	Brazos	0	1
	Burleson	0	1
	Cameron	1	1
	Duval	1	1
	Fort Bend	0	1
	Freestone	0	2
	Grimes	0	1
	Hardin	0	1
	Harris	0	1
	Hidalgo	0	1
	Jasper	0	1
	Jeff Davis	0	1
	Kleberg	0	2
	Leon	0	2
	Madison	0	1
Nueces	0	2	

Table A-10e (continued). Species co-occurrences for alfalfa hay production for which further analysis is required: by State and County

State Code	County Name	Species Count	
		Supplement	Original plus Supplement
TX	Pecos	0	1
	Polk	0	1
	Reeves	0	1
	Robertson	0	1
	Starr	0	3
	Tyler	0	1
	Washington	0	1
	Webb	0	1
	Zapata	0	2
UT	Daggett	0	1
	Duchesne	0	1
	Emery	0	1
	Garfield	0	1
	Salt Lake	0	1
	Tooele	0	1
	Uintah	0	1
	Utah	0	1
	Wasatch	1	1
	Washington	0	1
	Wayne	0	1
	Weber	0	1
	VA	Alleghany	0
Augusta		0	3
Bath		0	1
Brunswick		1	1
Dinwiddie		0	1
Greensville		1	1
Nottoway		0	1
Rockingham		0	2
Sussex		1	1
VT	Windham	0	1
WA	Adams	1	1
	Asotin	0	1
	Chelan	1	2
	Clark	1	2
	Cowlitz	0	1
	Kittitas	1	1
	Lewis	1	2
	Lincoln	0	1
	Okanogan	1	1
	Pierce	3	3
	San Juan	0	1

Table A-10e (continued). Species co-occurrences for alfalfa hay production for which further analysis is required: by State and County

State Code	County Name	Species Count	
		Supplement	Original plus Supplement
WA	Skagit	1	1
	Spokane	0	1
	Thurston	0	1
	Whitman	0	1
WV	Barbour	1	1
	Berkeley	0	1
	Brooke	1	1
	Fayette	0	1
	Monongalia	1	1
	Morgan	0	1
	Pocahontas	1	1
	Randolph	0	1
	Tucker	0	1
	Webster	0	1
WY	Converse	1	1
	Goshen	1	1
	Niobrara	1	1
	Platte	1	1

Table A-10f. Species co-occurrences for alfalfa seed production for which further analysis is required: by State and County

State Code	County Name	Species Count	
		Supplement	Original plus Supplement
CA	Butte	0	2
	Fresno	0	1
	Madera	0	2
	Merced	0	2
	Stanislaus	0	2
	Tulare	0	2
	Yolo	0	1
CO	Moffat	1	1
ID	Jefferson	1	1
KS	Anderson	0	1
	Bourbon	0	1
	Douglas	0	2
	Franklin	0	1
MI	Livingston	0	1
	St Clair	0	1
MN	Pennington	0	1
	Rice	0	2
MO	Barry	0	1
	Franklin	2	2
	Harrison	0	1
	Howell	0	2
	Lincoln	1	1
	Pike	0	1
MT	Broadwater	1	1
NE	Antelope	1	1
	Boone	1	1
	Holt	1	1
	Lancaster	0	1
	Otoe	1	1
	Sarpy	1	1
	Seward	0	1
	Sioux	1	1
NM	Valencia	0	1
NY	Erie	1	1
	Niagara	1	1
OR	Jackson	0	1
	Lane	0	3
	Marion	1	4
TX	Pecos	0	1
UT	Duchesne	0	1
	Emery	0	1
	Salt Lake	0	1

Table A-10f (continued). Species co-occurrences for alfalfa seed production for which further analysis is required: by State and County

State Code	County Name	Species Count	
		Supplement	Original plus Supplement
UT	Utah	0	1
	Wasatch	1	1
	Washington	0	1
	Weber	0	1
WA	Adams	1	1
	Lincoln	0	1
	Spokane	0	1

Table A-10g. Supplement: Species co-occurrences for alfalfa hay production for which further analysis is required: by State, Taxa and Species

Note: This table is a supplement to Table A-10g as it appears in the original report (Priester et al., 2007).

State Code	Tax	Species Name	County Count
AL	Dicots	button, Mohr's Barbara ( <i>Marshallia mohrii</i> )	1
		chaffseed, American ( <i>Schwalbea americana</i> )	1
		Harperella ( <i>Ptilimnium nodosum</i> )	1
	Monocots	water-plantain, Kral's ( <i>Sagittaria secundifolia</i> )	1
AR	Dicots	Harperella ( <i>Ptilimnium nodosum</i> )	4
CO	Dicots	Butterfly plant, Colorado ( <i>Gaura neomexicana</i> var. <i>coloradensis</i> )	2
		phacelia, North Park ( <i>Phacelia formosula</i> )	1
	Monocots	ladies'-tresses, Ute ( <i>Spiranthes diluvialis</i> )	3
CT	Dicots	chaffseed, American ( <i>Schwalbea americana</i> )	1
FL	Dicots	aster, Florida golden ( <i>Chrysopsis floridana</i> )	1
		buckwheat, scrub ( <i>Eriogonum longifolium</i> var. <i>gnaphalifolium</i> )	1
		chaffseed, American ( <i>Schwalbea americana</i> )	1
		mint, longspurred ( <i>Dicerandra cornutissima</i> )	1
		water-willow, Cooley's ( <i>Justicia cooleyi</i> )	1
ID	Monocots	ladies'-tresses, Ute ( <i>Spiranthes diluvialis</i> )	4
IL	Dicots	bush-clover, prairie ( <i>Lespedeza leptostachya</i> )	1
		milkweed, Mead's ( <i>Asclepias meadii</i> )	1
	Monocots	orchid, eastern prairie fringed ( <i>Platanthera leucophaea</i> )	3
IN	Dicots	clover, running buffalo ( <i>Trifolium stoloniferum</i> )	1
		goldenrod, Short's ( <i>Solidago shortii</i> )	1
	Monocots	orchid, eastern prairie fringed ( <i>Platanthera leucophaea</i> )	8
KY	Dicots	chaffseed, American ( <i>Schwalbea americana</i> )	2
		clover, running buffalo ( <i>Trifolium stoloniferum</i> )	8
		rosemary, Cumberland ( <i>Conradina verticillata</i> )	1
LA	Dicots	chaffseed, American ( <i>Schwalbea americana</i> )	1
MD	Dicots	chaffseed, American ( <i>Schwalbea americana</i> )	1
		dropwort, Canby's ( <i>Oxypolis canbyi</i> )	1
MN	Dicots	bush-clover, prairie ( <i>Lespedeza leptostachya</i> )	5
	Monocots	orchid, western prairie fringed ( <i>Platanthera praeclara</i> )	3
MO	Dicots	aster, decurrent false ( <i>Boltonia decurrens</i> )	2
		clover, running buffalo ( <i>Trifolium stoloniferum</i> )	4
		milkweed, Mead's ( <i>Asclepias meadii</i> )	3
		sneezeweed, Virginia ( <i>Helenium virginicum</i> )	5
	Monocots	orchid, eastern prairie fringed ( <i>Platanthera leucophaea</i> )	1
		orchid, western prairie fringed ( <i>Platanthera praeclara</i> )	3
MT	Monocots	ladies'-tresses, Ute ( <i>Spiranthes diluvialis</i> )	5

Table A-10g (continued). Supplement: Species co-occurrences for alfalfa hay production for which further analysis is required: by State, Taxa, and Species

State Code	Tax	Species Name	County Count
NC	Dicots	chaffseed, American ( <i>Schwalbea americana</i> )	1
		sumac, Michaux's ( <i>Rhus michauxii</i> )	1
		sunflower, Schweinitz's ( <i>Helianthus schweinitzii</i> )	5
NE	Monocots	ladies'-tresses, Ute ( <i>Spiranthes diluvialis</i> )	1
		orchid, eastern prairie fringed ( <i>Platanthera leucophaea</i> )	2
		orchid, western prairie fringed ( <i>Platanthera praeclara</i> )	15
NY	Dicots	chaffseed, American ( <i>Schwalbea americana</i> )	1
	Monocots	orchid, eastern prairie fringed ( <i>Platanthera leucophaea</i> )	4
OH	Dicots	clover, running buffalo ( <i>Trifolium stoloniferum</i> )	1
	Monocots	orchid, eastern prairie fringed ( <i>Platanthera leucophaea</i> )	1
OR	Dicots	checker-mallow, Nelson's ( <i>Sidalcea nelsoniana</i> )	2
		howellia, water ( <i>Howellia aquatilis</i> )	5
TX	Dicots	ambrosia, south Texas ( <i>Ambrosia cheiranthifolia</i> )	1
		manioc, Walker's ( <i>Manihot walkerae</i> )	1
UT	Monocots	ladies'-tresses, Ute ( <i>Spiranthes diluvialis</i> )	1
VA	Dicots	chaffseed, American ( <i>Schwalbea americana</i> )	2
		sumac, Michaux's ( <i>Rhus michauxii</i> )	1
WA	Dicots	Catchfly, Spalding's ( <i>Silene spaldingii</i> )	1
		checker-mallow, Nelson's ( <i>Sidalcea nelsoniana</i> )	1
		checkermallow, Wenatchee Mountains ( <i>Sidalcea oregana</i> var. <i>calva</i> )	1
		desert-parsley, Bradshaw's ( <i>Lomatium bradshawii</i> )	1
		howellia, water ( <i>Howellia aquatilis</i> )	1
		paintbrush, golden ( <i>Castilleja levisecta</i> )	2
		sandwort, Marsh ( <i>Arenaria paludicola</i> )	1
	Monocots	ladies'-tresses, Ute ( <i>Spiranthes diluvialis</i> )	2
WV	Dicots	clover, running buffalo ( <i>Trifolium stoloniferum</i> )	4
WY	Dicots	Butterfly plant, Colorado ( <i>Gaura neomexicana</i> var. <i>coloradensis</i> )	1
	Monocots	ladies'-tresses, Ute ( <i>Spiranthes diluvialis</i> )	3

Table A-10h. Supplement: Species co-occurrences for alfalfa seed production for which further analysis is required: by State, Taxa and Species

Note: This table is a supplement to Table A-10h as it appears in the original report (Priester et al., 2007).

State Code	Taxa	Species Name	County Count
CO	Monocots	ladies'-tresses, Ute ( <i>Spiranthes diluvialis</i> )	1
ID	Monocots	ladies'-tresses, Ute ( <i>Spiranthes diluvialis</i> )	1
MO	Dicots	aster, decurrent false ( <i>Boltonia decurrens</i> )	2
		milkweed, Mead's ( <i>Asclepias meadii</i> )	1
MT	Monocots	ladies'-tresses, Ute ( <i>Spiranthes diluvialis</i> )	1
NE	Monocots	ladies'-tresses, Ute ( <i>Spiranthes diluvialis</i> )	1
		orchid, western prairie fringed ( <i>Platanthera praeclara</i> )	5
NY	Monocots	orchid, eastern prairie fringed ( <i>Platanthera leucophaea</i> )	2
OR	Dicots	howellia, water ( <i>Howellia aquatilis</i> )	1
UT	Monocots	ladies'-tresses, Ute ( <i>Spiranthes diluvialis</i> )	1
WA	Dicots	Catchfly, Spalding's ( <i>Silene spaldingii</i> )	1

**Appendix 11. Threatened and endangered plant species with designated critical habitat**

Table A-11a. Supplement: Threatened and endangered plant species with designated critical habitat

Note: This table is a supplement to Table A-11a as it appears in the original report (Priester et al., 2007).

Species*	Critical Habitat Information	CFR/FR Locations
<b>Dicots</b>		
<b>Lifeform: Both</b>		
aster, decurrent false ( <i>Boltonia decurrens</i> )	No	
bittercress, small-anthered ( <i>Cardamine micranthera</i> )	No	
Butterfly plant, Colorado ( <i>Gaura neomexicana</i> var. <i>coloradensis</i> )	Yes	50 CFR 17.96(a)
button, Mohr's Barbara ( <i>Marshallia mohrii</i> )	No	
cactus, black lace ( <i>Echinocereus reichenbachii</i> var. <i>albertii</i> )	No	
checkermallow, Wenatchee Mountains ( <i>Sidalcea oregana</i> var. <i>calva</i> )	Yes	50 CFR 17.96(a)
dropwort, Canby's ( <i>Oxypolis canbyi</i> )	No	
Harperella ( <i>Ptilimnium nodosum</i> )	No	
howellia, water ( <i>Howellia aquatilis</i> )	No	
joint-vetch, sensitive ( <i>Aeschynomene virginica</i> )	No	
leather flower, Morefield's ( <i>Clematis morefieldii</i> )	No	
loosestrife, rough-leaved ( <i>Lysimachia asperulaefolia</i> )	No	
No common name ( <i>Geocarpon minimum</i> )	No	
Pondberry ( <i>Lindera melissifolia</i> )	No	
sandwort, Marsh ( <i>Arenaria paludicola</i> )	No	
sneezeweed, Virginia ( <i>Helenium virginicum</i> )	No	
sunburst, Hartweg's golden ( <i>Pseudobahia bahiifolia</i> )	No	
water-willow, Cooley's ( <i>Justicia cooleyi</i> )	No	
<b>Lifeform: Terrestrial</b>		
amaranth, seabeach ( <i>Amaranthus pumilus</i> )	No	
ambrosia, south Texas ( <i>Ambrosia cheiranthifolia</i> )	No	
aster, Florida golden ( <i>Chrysopsis floridana</i> )	No	
ayenia, Texas ( <i>Ayenia limitaris</i> )	No	
bladderpod, Missouri ( <i>Lesquerella filiformis</i> )	No	
bonamia, Florida ( <i>Bonamia grandiflora</i> )	No	
buckwheat, scrub ( <i>Eriogonum longifolium</i> var. <i>gnaphalifolium</i> )	No	
bush-clover, prairie ( <i>Lespedeza leptostachya</i> )	No	
butterweed, Layne's ( <i>Senecio layneae</i> )	No	

Table A-11a (continued). Supplement: Threatened and endangered plant species with designated critical habitat

Species*	Critical Habitat Information	CFR/FR Locations
cactus, Kuenzler hedgehog ( <i>Echinocereus fendleri</i> var. <i>kuenzleri</i> )	No	
cactus, Sneed pincushion ( <i>Coryphantha sneedii</i> var. <i>sneedii</i> )	No	
Catchfly, Spalding's ( <i>Silene spaldingii</i> )	No	
chaffseed, American ( <i>Schwalbea americana</i> )	No	
checker-mallow, Nelson's ( <i>Sidalcea nelsoniana</i> )	No	
clover, running buffalo ( <i>Trifolium stoloniferum</i> )	No	
coneflower, smooth ( <i>Echinacea laevigata</i> )	No	
desert-parsley, Bradshaw's ( <i>Lomatium bradshawii</i> )	No	
fleabane, Zuni ( <i>Erigeron rhizomatus</i> )	No	
gerardia, sandplain ( <i>Agalinis acuta</i> )	No	
goldenrod, Short's ( <i>Solidago shortii</i> )	No	
heartleaf, dwarf-flowered ( <i>Hexastylis naniflora</i> )	No	
heather, mountain golden ( <i>Hudsonia montana</i> )	Yes	50 CFR 17.96(a)
locoweed, Fassett's ( <i>Oxytropis campestris</i> var. <i>chartacea</i> )	No	
manioc, Walker's ( <i>Manihot walkerae</i> )	No	
milkweed, Mead's ( <i>Asclepias meadii</i> )	No	
mint, longspurred ( <i>Dicerandra cornutissima</i> )	No	
monkshood, northern wild ( <i>Aconitum noveboracense</i> )	No	
oak, Hinckley ( <i>Quercus hinckleyi</i> )	No	
paintbrush, golden ( <i>Castilleja levisecta</i> )	No	
penstemon, blowout ( <i>Penstemon haydenii</i> )	No	
phacelia, clay ( <i>Phacelia argillacea</i> )	No	
phacelia, North Park ( <i>Phacelia formosula</i> )	No	
potato-bean, Price's ( <i>Apios priceana</i> )	No	
prairie-clover, leafy ( <i>Dalea foliosa</i> )	No	
rock-cress, Braun's ( <i>Arabis perstellata</i> )	Yes	50 CFR 17.96(a)
rock-cress, McDonald's ( <i>Arabis mcdonaldiana</i> )	No	
rosemary, Cumberland ( <i>Conradina verticillata</i> )	No	
sandwort, Cumberland ( <i>Arenaria cumberlandensis</i> )	No	
spiraea, Virginia ( <i>Spiraea virginiana</i> )	No	
sumac, Michaux's ( <i>Rhus michauxii</i> )	No	
sunflower, Schweinitz's ( <i>Helianthus schweinitzii</i> )	No	
thistle, Pitcher's ( <i>Cirsium pitcheri</i> )	No	
<b><i>Ferns and Allies</i></b>		
<b><i>Lifeform: Terrestrial</i></b>		
fern, American hart's-tongue ( <i>Asplenium scolopendrium</i> var. <i>americanum</i> )	No	

Table A-11a (continued). Supplement: Threatened and endangered plant species with designated critical habitat

Species*	Critical Habitat Information	CFR/FR Locations
<i>Lichens</i>		
<i>Lifeform: Terrestrial</i>		
lichen, rock gnome ( <i>Gymnoderma lineare</i> )	No	
<i>Monocots</i>		
<i>Lifeform: Aquatic</i>		
water-plantain, Kral's ( <i>Sagittaria secundifolia</i> )	No	
<i>Lifeform: Both</i>		
ladies'-tresses, Ute ( <i>Spiranthes diluvialis</i> )	No	
orchid, eastern prairie fringed ( <i>Platanthera leucophaea</i> )	No	
orchid, western prairie fringed ( <i>Platanthera praeclara</i> )	No	
Orcutt grass, slender ( <i>Orcuttia tenuis</i> )	Yes	50 CFR 17.96(a)
<i>Lifeform: Terrestrial</i>		
pogonia, small whorled ( <i>Isotria medeoloides</i> )	No	
trillium, relict ( <i>Trillium reliquum</i> )	No	

\* Lifeform classification from FESTF IMS (updated September 24, 2007).  
 Table based on information found in the Threatened and Endangered Species Database (USFWS, 2005(m)).

## Appendix 12. Threatened and endangered plant species in this report with name discrepancies

Table A-12a. Threatened and endangered plant species in this supplement report with name discrepancies between the FESTF MJD and the FESTF IMS

FESTF MJD Common Name	FESTF MJD Scientific Name	FESTF IMS Common Name*	FESTF IMS Scientific Name*
<b>Differ by Scientific Name</b>			
Colorado Butterfly Plant	<i>Gaura neomexicana</i> ssp. <i>coloradensis</i>	Colorado Butterfly Plant	<i>Gaura neomexicana</i> var. <i>coloradensis</i>
Cumberland Sandwort	<i>Minuartia cumberlandensis</i>	sandwort, Cumberland	<i>Arenaria cumberlandensis</i>
Houghton's Goldenrod	<i>Oligoneuron houghtonii</i>	goldenrod, Houghton's	<i>Solidago houghtonii</i>
Large-flowered Woolly Meadowfoam	<i>Limnanthes floccosa</i> ssp. <i>grandiflora</i>	Meadowfoam, large-flowered woolly	<i>Limnanthes floccosa grandiflora</i>
Layne's Butterweed	<i>Packera layneae</i>	butterweed, Layne's	<i>Senecio layneae</i>
Lee's Pincushion Cactus	<i>Escobaria sneedii</i> var. <i>leei</i>	cactus, Lee pincushion	<i>Coryphantha sneedii</i> var. <i>leei</i>
Nellie Cory Cactus	<i>Escobaria minima</i>	cactus, Nellie cory	<i>Coryphantha minima</i>
Roughleaf Loosestrife	<i>Lysimachia asperulifolia</i>	loosestrife, rough-leaved	<i>Lysimachia asperulaefolia</i>
Sneed Pincushion Cactus	<i>Escobaria sneedii</i> var. <i>sneedii</i>	cactus, Sneed pincushion	<i>Coryphantha sneedii</i> var. <i>sneedii</i>
<b>Differ by Common Name</b>			
Nelson's Sidalcea	<i>Sidalcea nelsoniana</i>	checker-mallow, Nelson's	<i>Sidalcea nelsoniana</i>
Oregon Checker-mallow	<i>Sidalcea oregana</i> var. <i>calva</i>	checkermallow, Wenatchee Mountains	<i>Sidalcea oregana</i> var. <i>calva</i>
Bradshaw's Lomatium	<i>Lomatium bradshawii</i>	desert-parsley, Bradshaw's	<i>Lomatium bradshawii</i>
Rhizome Fleabane	<i>Erigeron rhizomatus</i>	fleabane, Zuni	<i>Erigeron rhizomatus</i>
Cumberland false rosemary	<i>Conradina verticillata</i>	rosemary, Cumberland	<i>Conradina verticillata</i>
Dune Pitcher's	<i>Cirsium pitcheri</i>	thistle, Pitcher's	<i>Cirsium pitcheri</i>
Little River Arrowhead	<i>Sagittaria secundifolia</i>	water-plantain, Kral's	<i>Sagittaria secundifolia</i>
Confederate Trillium	<i>Trillium reliquum</i>	trillium, relict	<i>Trillium reliquum</i>
Red Mountain Rockcress	<i>Arabis macdonaldiana</i>	rock-cress, McDonald's	<i>Arabis mcdonaldiana</i>
South Texas Ragweed	<i>Ambrosia cheiranthifolia</i>	ambrosia, south Texas	<i>Ambrosia cheiranthifolia</i>
Large-flowered Bonamia	<i>Bonamia grandiflora</i>	bonamia, Florida	<i>Bonamia grandiflora</i>

\* FESTF IMS common and scientific names were supplied by the U. S. Fish and Wildlife Service in June, 2003.

FESTF MJD common and scientific names were supplied by NatureServe in 2007; see

<http://www.natureserve.org/explorer/>.

Appendix 12. Threatened and endangered plant species in this report with name discrepancies between the FESTF MJD and the FESTF IMS

### Appendix 13. Threatened and endangered plant species found in association with alfalfa production with an updated lifeform classification

Table A-13a. Threatened and endangered plant species found in association with alfalfa production (original plus supplement) with an updated lifeform classification from the FESTF IMS

Species	Lifeform from FESTF IMS (prior to update*)	Updated FESTF IMS Lifeform*
<i>Dicots</i>		
allocarya, Calistoga ( <i>Plagiobothrys strictus</i> )	Aquatic	Both <sup>1</sup>
aster, decurrent false ( <i>Boltonia decurrens</i> )	Aquatic	Both
aster, Ruth's golden ( <i>Pityopsis ruthii</i> )	Terrestrial	Both
Barberry, island ( <i>Berberis pinnata</i> ssp. <i>insularis</i> )	Terrestrial	Both
barberry, Nevin's ( <i>Berberis nevinii</i> )	Terrestrial	Both
bellflower, Brooksville ( <i>Campanula robinsiae</i> )	Aquatic	Both
bird's beak, palmate-bracted ( <i>Cordylanthus palmatus</i> )	Aquatic	Terrestrial
bird's-beak, Pennell's ( <i>Cordylanthus tenuis</i> ssp. <i>capillaris</i> )	Aquatic	Terrestrial
bird's-beak, salt marsh ( <i>Cordylanthus maritimus</i> ssp. <i>maritimus</i> )	Aquatic	Both
bird's-beak, soft ( <i>Cordylanthus mollis</i> ssp. <i>mollis</i> )	Aquatic	Both
birds-in-a-nest, white ( <i>Macbridea alba</i> )	Terrestrial	Both
bittercress, small-anthered ( <i>Cardamine micranthera</i> )	Aquatic	Both
bluecurls, Hidden Lake ( <i>Trichostema austromontanum</i> ssp. <i>compactum</i> )	Aquatic	Both
Buttercup, autumn ( <i>Ranunculus aestivalis</i> (= <i>acriformis</i> ))	Terrestrial	Both
Butterfly plant, Colorado ( <i>Gaura neomexicana</i> var. <i>coloradensis</i> )	Terrestrial	Both
butterwort, Godfrey's ( <i>Pinguicula ionantha</i> )	Aquatic	Both
button, Mohr's Barbara ( <i>Marshallia mohrii</i> )	Terrestrial	Both
button-celery, San Diego ( <i>Eryngium aristulatum</i> var. <i>parishii</i> )	Aquatic	Both
cactus, black lace ( <i>Echinocereus reichenbachii</i> var. <i>albertii</i> )	Terrestrial	Both
cactus, Tobusch fishhook ( <i>Ancistrocactus tobuschii</i> )	Terrestrial	Both
centaury, spring-loving ( <i>Centaurium namophilum</i> )	Terrestrial	Both
checker-mallow, Kenwood Marsh ( <i>Sidalcea oregana</i> ssp. <i>valida</i> )	Aquatic	Both
checkermallow, Wenatchee Mountains ( <i>Sidalcea oregana</i> var. <i>calva</i> )	Terrestrial	Both
clover, showy Indian ( <i>Trifolium amoenum</i> )	Terrestrial	Both
crownscale, San Jacinto Valley ( <i>Atriplex coronata</i> var. <i>notatior</i> )	Terrestrial	Both
dawn-flower, Texas prairie ( <i>Hymenoxys texana</i> )	Terrestrial	Both
dropwort, Canby's ( <i>Oxypolis canbyi</i> )	Aquatic	Both

Appendix 13. Threatened and endangered plant species found in association with alfalfa production with an updated lifeform classification

Table A-13a (continued). Threatened and endangered plant species found in association with alfalfa production (original plus supplement) with an updated lifeform classification from the FESTF IMS

Species	Lifeform from FESTF IMS (prior to update*)	Updated FESTF IMS Lifeform*
goldfields, Burke's ( <i>Lasthenia burkei</i> )	Aquatic	Both
goldfields, Contra Costa ( <i>Lasthenia conjugens</i> )	Aquatic	Terrestrial
goldenrod, Houghton's ( <i>Solidago houghtonii</i> )	Aquatic	Terrestrial
gumplant, Ash Meadows ( <i>Grindelia fraxino-pratensis</i> )	Terrestrial	Both
Haha ( <i>Cyanea remyi</i> )	Terrestrial	Both
Harperella ( <i>Ptilimnium nodosum</i> )	Aquatic	Both
Heau ( <i>Exocarpos luteolus</i> )	Terrestrial	Both
howellia, water ( <i>Howellia aquatilis</i> )	Aquatic	Both
ivesia, Ash Meadows ( <i>Ivesia kingii</i> var. <i>eremica</i> )	Terrestrial	Both
jewelflower, California ( <i>Caulanthus californicus</i> )	Terrestrial	Both
joint-vetch, sensitive ( <i>Aeschynomene virginica</i> )	Aquatic	Both
kuahiwi laukahi ( <i>Plantago princeps</i> )	Terrestrial	Both
leather flower, Alabama ( <i>Clematis socialis</i> )	Terrestrial	Both
leather flower, Morefield's ( <i>Clematis morefieldii</i> )	Terrestrial	Both
loosestrife, rough-leaved ( <i>Lysimachia asperulaefolia</i> )	Terrestrial	Both
meadowfoam, Butte County ( <i>Limnanthes floccosa</i> ssp. <i>californica</i> )	Aquatic	Both
meadowfoam, Sebastopol ( <i>Limnanthes vinculans</i> )	Aquatic	Both
mesa-mint, Otay ( <i>Pogogyne nudiuscula</i> )	Aquatic	Both
mesa-mint, San Diego ( <i>Pogogyne abramsii</i> )	Aquatic	Both
monkey-flower, Michigan ( <i>Mimulus glabratus</i> var. <i>michiganensis</i> )	Aquatic	Both
mustard, Penland alpine fen ( <i>Eutrema penlandii</i> )	Terrestrial	Both
mustard, slender-petaled ( <i>Thelypodium stenopetalum</i> )	Terrestrial	Both
nani wai'ale'ale ( <i>Viola kauaiensis</i> var. <i>wahiawaensis</i> )	Terrestrial	Both
navarretia, few-flowered ( <i>Navarretia leucocephala</i> ssp. <i>pauciflora</i> (= <i>N. pauciflora</i> ))	Aquatic	Both
navarretia, many-flowered ( <i>Navarretia leucocephala</i> ssp. <i>plieantha</i> )	Aquatic	Both
navarretia, spreading ( <i>Navarretia fossalis</i> )	Aquatic	Both
niterwort, Amargosa ( <i>Nitrophila mohavensis</i> )	Aquatic	Terrestrial
No common name ( <i>Geocarpon minimum</i> )	Terrestrial	Both
No common name ( <i>Lysimachia filifolia</i> )	Terrestrial	Both
No common name ( <i>Sanicula purpurea</i> )	Terrestrial	Both
owl's-clover, fleshy ( <i>Castilleja campestris</i> ssp. <i>succulenta</i> )	Aquatic	Both
pawpaw, beautiful ( <i>Deeringothamnus pulchellus</i> )	Terrestrial	Both

Table A-13a (continued). Threatened and endangered plant species found in association with alfalfa production (original plus supplement) with an updated lifeform classification from the FESTF IMS

Species	Lifeform from FESTF IMS (prior to update*)	Updated FESTF IMS Lifeform*
pitcher-plant, Alabama canebrake ( <i>Sarracenia rubra alabamensis</i> )	Aquatic	Both
pitcher-plant, green ( <i>Sarracenia oreophila</i> )	Aquatic	Both
pitcher-plant, mountain sweet ( <i>Sarracenia rubra ssp. jonesii</i> )	Aquatic	Both
Pondberry ( <i>Lindera melissifolia</i> )	Aquatic	Both
potentilla, Hickman's ( <i>Potentilla hickmanii</i> )	Terrestrial	Both
roseroot, Leedy's ( <i>Sedum integrifolium ssp. leedyi</i> )	Terrestrial	Both
sandwort, Bear Valley ( <i>Arenaria ursina</i> )	Terrestrial	Both
sandwort, Marsh ( <i>Arenaria paludicola</i> )	Aquatic	Both
seablite, California ( <i>Suaeda californica</i> )	Aquatic	Both
spurge, Hoover's ( <i>Chamaesyce hooveri</i> )	Aquatic	Both
spurge, telephus ( <i>Euphorbia telephioides</i> )	Terrestrial	Both
stonecrop, Lake County ( <i>Parvisedum leiocarpum</i> )	Terrestrial	Both
sunburst, Hartweg's golden ( <i>Pseudobahia bahiifolia</i> )	Terrestrial	Both
sunshine, Sonoma ( <i>Blennosperma bakeri</i> )	Aquatic	Both
thistle, Chorro Creek bog ( <i>Cirsium fontinale var. obispoense</i> )	Aquatic	Both
thistle, fountain ( <i>Cirsium fontinale var. fontinale</i> )	Aquatic	Both
thistle, La Graciosa ( <i>Cirsium loncholepis</i> )	Terrestrial	Both
thistle, Loch Lomond coyote ( <i>Eryngium constancei</i> )	Aquatic	Both
thistle, Suisun ( <i>Cirsium hydrophilum var. hydrophilum</i> )	Terrestrial	Both
vervain, Red Hills ( <i>Verbena californica</i> )	Terrestrial	Both
water-umbel, Huachuca ( <i>Lilaeopsis schaffneriana var. recurva</i> )	Aquatic	Both
water-willow, Cooley's ( <i>Justicia cooleyi</i> )	Aquatic	Both
<b>Ferns and Allies</b>		
quillwort, black spored ( <i>Isoetes melanospora</i> )	Aquatic	Both
quillwort, Louisiana ( <i>Isoetes louisianensis</i> )	Aquatic	Both
quillwort, mat-forming ( <i>Isoetes tegetiformans</i> )	Aquatic	Both
<b>Monocots</b>		
arrowhead, bunched ( <i>Sagittaria fasciculata</i> )	Aquatic	Both
beaked-rush, Knieskern's ( <i>Rhynchospora knieskernii</i> )	Aquatic	Both
bluegrass, Napa ( <i>Poa napensis</i> )	Terrestrial	Both
brodiaea, Chinese Camp ( <i>Brodiaea pallida</i> )	Terrestrial	Both
brodiaea, thread-leaved ( <i>Brodiaea filifolia</i> )	Terrestrial	Both
bulrush, Northeastern ( <i>Scirpus ancistrochaetus</i> )	Aquatic	Both

Table A-13a (continued). Threatened and endangered plant species found in association with alfalfa production (original plus supplement) with an updated lifeform classification from the FESTF IMS

Species	Lifeform from FESTF IMS (prior to update*)	Updated FESTF IMS Lifeform*
grass, Colusa ( <i>Neostapfia colusana</i> )	Aquatic	Both
grass, Solano ( <i>Tuctoria mucronata</i> )	Aquatic	Both
grass, Tennessee yellow-eyed ( <i>Xyris tennesseensis</i> )	Terrestrial	Both
iris, dwarf lake ( <i>Iris lacustris</i> )	Terrestrial	Both
ladies'-tresses, Canelo Hills ( <i>Spiranthes delitescens</i> )	Terrestrial	Both
ladies'-tresses, Ute ( <i>Spiranthes diluvialis</i> )	Terrestrial	Both
lily, Pitkin Marsh ( <i>Lilium pardalinum ssp. pitkinense</i> )	Aquatic	Both
lily, Western ( <i>Lilium occidentale</i> )	Terrestrial	Both
No common name ( <i>Platanthera holochila</i> )	Terrestrial	Both
orchid, eastern prairie fringed ( <i>Platanthera leucophaea</i> )	Terrestrial	Both
orchid, western prairie fringed ( <i>Platanthera praeclara</i> )	Terrestrial	Both
Orcutt grass, California ( <i>Orcuttia californica</i> )	Aquatic	Both
Orcutt grass, hairy ( <i>Orcuttia pilosa</i> )	Aquatic	Both
Orcutt grass, Sacramento ( <i>Orcuttia viscida</i> )	Aquatic	Both
Orcutt grass, slender ( <i>Orcuttia tenuis</i> )	Aquatic	Both
pink, swamp ( <i>Helonias bullata</i> )	Aquatic	Both
piperia, Yadon's ( <i>Piperia yadonii</i> )	Terrestrial	Both
Pu'uka'a ( <i>Cyperus trachysanthos</i> )	Terrestrial	Both
sedge, Navajo ( <i>Carex specuicola</i> )	Aquatic	Both
sedge, white ( <i>Carex albida</i> )	Aquatic	Both
tuctoria, Greene's ( <i>Tuctoria greenei</i> )	Aquatic	Both
wild-rice, Texas ( <i>Zizania texana</i> )	Aquatic	Both

\*Lifeform classifications in the FESTF IMS were verified and updated on September 24, 2007.

<sup>1</sup> Lifeform classification of "Both" indicates that species is considered to have both aquatic and terrestrial lifestages and/or habitats.