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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

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ABSTRACT

This report assesses the proximity of federally-listed threatened and endangered plant species (“listed” species) to areas in the United States where alfalfa hay and alfalfa seed are produced. In particular, it assesses the potential adverse effects on threatened and endangered plant species from the use of glyphosate agricultural herbicides in conventional and Roundup Ready® alfalfa production. It is based, in part, on the use of the FIFRA Endangered Species Task Force Information Management System 2.0 (IMS) and follows, to the extent practicable, the guidance provided in the Joint Counterpart Regulations and EPA’s Overview Document on ecological risk assessment.

The IMS was used to identify the co-occurrence of threatened and endangered plants, including conifers and cycads, dicots, ferns and allies, lichens, and monocots, with the counties identified as having alfalfa production (hay and seed) in 2002. A total of 1,787 species/crop co-occurrences were identified for alfalfa hay-producing counties (262 for alfalfa seed-producing counties). These represent 549 different plant species in 832 counties. The alfalfa hay co-occurrences include all of the alfalfa seed co-occurrences. Each of these co-occurrences was investigated with respect to the current Federal listing status for the species, actual crop and species county-level locations, species biology, and species habitat requirements, in order to determine whether potential 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.

The analysis of 1,787 co-occurrences for alfalfa hay production revealed the following: 295 (for 44 species) can be excluded from concern due to the fact that the species have been delisted or the species is extirpated (not known to still occur) at the county level. Of the remaining co-occurrences, 622 (for 235 species) can be eliminated from concern based on the habitat characteristics of the species in question. In addition, 236 co-occurrences (for 134 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), while 30 co-occurrences (for 10 species) can be excluded on the basis of a lack of spatial proximity (separation distance not specified) of the species and alfalfa culture. In these two proximity exclusions, proximity was determined based on expert judgment, which included an analysis of the distribution of the species and the spatial separation of the species from the use area. Of the remaining co-occurrences, 145 (for 52 species) may also be protected using existing species management practices. Finally, there are 459 co-occurrences for alfalfa hay, representing 138 species in 319 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 endangered species analysis is undertaken to meet the 40 CFR 158 data requirements for special studies to address endangered species risk¹. The endangered species study requirements are more specifically described in “Pesticides: Data Requirement for Conventional Chemicals,” published in the Federal Register in March 2005 (USFWS, 2005(a)). In the Reregistration Eligibility Document (RED) for Glyphosate, the Special Review and Reregistration Division (SRRD) reached the following conclusion: “...many endangered plants may be at risk from the use of glyphosate on the registered use patterns” (USEPA, 1993). The risk assessment addresses the use of glyphosate on alfalfa grown for seed or for terrestrial animal feed uses, but does not specifically state the likelihood of usage of glyphosate on any specific alfalfa acreage.

This endangered species analysis takes into consideration all alfalfa production in the U.S. This analysis considers the best available data for threatened and endangered terrestrial and semi-aquatic plants and aquatic plants (subsequently referred to as “listed plant species”) and provides EPA with additional data to determine under what circumstances, if any, mitigation measures should be considered for these plants.

The report follows, to the extent practicable, the guidance provided in the Joint Counterpart Regulations and EPA’s Overview Document (USEPA, 2004(a)) on ecological risk assessment. The data presented in this report are based, in part, on the use of the FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) Endangered Species Task Force (FESTF) Information Management System 2.0 (IMS), which stores data on species locations, crop locations, and species management decisions.

The IMS was used to identify the number of listed terrestrial, semi-aquatic plants, and aquatic plants in association with the production of alfalfa hay or seed. Each species was then examined with respect to alfalfa culture at the county level to determine the number of species/crop co-occurrences for alfalfa hay and for alfalfa seed production. Each co-occurrence was investigated with respect to the current listing status for the species, actual crop and species locations (at the county level), species biology, and habitat requirements, in order to determine whether or not exposure to glyphosate might occur. The conclusion reached for each co-occurrence is expressed in the form of a simple general statement (a determination statement) supported by reference sources and, where appropriate, by comments.

Conclusions are based on the most current information obtainable from various reference sources, including U.S. Fish and Wildlife Service (USFWS) species accounts, Federal Register documents, county bulletins, federal and state level inventories, departments, expert consultations, the NatureServe databases (2005, 2006), and a “Species by Commodity” index published by California Department of Pesticide Regulation (CDPR, 1997) (updated in 2004). The NatureServe databases (2005, 2006) provided information on species habitat, risk factors, and county-level location. Note, however, that data found in the NatureServe database are often similar to data found in USFWS species accounts or in FWS Redbook entries, although these accounts and/or entries are not always available. Species proximity to crop site (for counties

¹ Species listed by the Endangered Species Act as threatened or endangered. The resources consulted also include consideration of those species proposed for listing and delisting.

outside of California) was determined by expert consultation on a species-by-species basis or from existing information in the species accounts cited above. The proximity of a species habitat to crop site for co-occurrences located in California counties was evaluated using the CDPR (1997) index (with 2004 update), which is based on the overlay of pesticide use and habitats for all federally listed endangered, threatened, and proposed species within a one-mile radius of the use site. The index was updated in Marovich (2004) and made more accurate by utilizing polygons that encompass the related points of a species location.

Appendix 1 lists the scientists contributing to this analysis and report.

SECTION 2.0: CHARACTERISTICS OF GLYPHOSATE

Glyphosate is a broad-spectrum non-selective herbicide used extensively in agricultural and other markets. Glyphosate is typically present in formulated products as a salt (for example, as a potassium salt or an isopropylamine (IPA) salt). The mode of action of glyphosate is inhibition of the enzyme (5-enolpyruvylshikimate-3-phosphate) synthase (EPSPS), which is present in the shikimic acid pathway for the biosynthesis of aromatic amino acids in plants and microorganisms. Inhibition of this enzyme leads to a deficiency in the production of aromatic amino acids and lack of growth in plants. Thus, glyphosate has the potential to have adverse impacts on non-target plant species, including listed plant species.

This report considers the use of Monsanto's glyphosate agricultural herbicides registered for use in conventional and Roundup Ready® alfalfa². The registration status of Monsanto's glyphosate herbicides for use on alfalfa is described below.

- Conventional alfalfa
 - Glyphosate herbicides are registered in all 50 states for use in the control of weeds in conventional alfalfa grown for forage, hay, or seed.
- Roundup Ready alfalfa
 - Glyphosate herbicides are registered in all 50 states for use in Roundup Ready alfalfa grown for forage and hay.
 - At the present time, there are 13 states in which one or more glyphosate herbicides are registered for use in Roundup Ready® alfalfa seed production. These states are: Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oklahoma, Oregon, Texas, Utah, Washington, and Wyoming.

This report relies on the risk assessments reported in the Reregistration Eligibility Decision (RED) (USEPA, 1993(a)) and uses the findings as the screening level baseline for specific endangered species assessment.

² Roundup Ready® alfalfa contains in-plant tolerance to glyphosate. Roundup Ready® is a registered trademark of Monsanto Technology, LLC.

2.1 Use Details

Table 1 contains an overview of the glyphosate use rates specified for conventional and Roundup Ready alfalfa, considering two different formulations used in agriculture: Roundup WeatherMAX® (containing glyphosate as the potassium salt) and Roundup® Original (containing glyphosate as the IPA salt). The use rates in Table 1 reflect the maximum values considering the use directions for these two formulations.

Table 1. Glyphosate herbicide use rates in alfalfa

	Glyphosate (lb a.e./acre) ^{a,b,c}	
	Conventional Alfalfa	Roundup Ready Alfalfa
Combined total per year for all applications	6.0	6.0
Maximum single application rate	3.75	1.55
Maximum single in-crop application rate	not specified	1.55
Total per year of all in-crop applications	not specified	4.61
Maximum pre-harvest rate	1.55	1.55

^a Glyphosate application rates are commonly converted to acid equivalent (a.e.) units.

^b Roundup WeatherMAX® specimen label (EPA Reg. No. 524-537, 2006-1) (Monsanto Company, 2006(a)).

^c Roundup® Original specimen label (EPA Reg. No. 524-445, 2006-1) (Monsanto Company, 2006(b)).

2.2 Taxa of Concern

In the Reregistration Eligibility Decision (RED) for glyphosate (USEPA, 1993(a)), it was concluded that “many endangered plants may be at risk from the use of glyphosate on the registered use patterns.” The EPA did not specify any plant taxa of concern. Therefore, all listed plant taxa were taken into account for this analysis. These include the following taxa:

- Conifers and Cycads
- Dicots
- Ferns and Allies
- Lichens
- Monocots

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.

As mentioned in Section 1.0, the FESTF IMS stores data on species locations at the county level, reflecting the species as listed by the U.S. Fish and Wildlife Service (FWS). The IMS was 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. A total of 549 listed terrestrial, semi-aquatic plants, and aquatic plants were identified for consideration in this assessment.

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):

- 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)

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 geographic distribution of alfalfa production in the U.S. at the county level. Figure 2 depicts the counties where both alfalfa production and listed plant species occur.

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 is 1,787 for alfalfa hay production (262 of these apply to alfalfa seed production). These co-occurrences consist of a total of 549 species in 832 counties in 48 states for alfalfa hay and 128 species in 103 counties in 17 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

SECTION 4.0: ANALYSIS OF SPECIES CO-OCCURRENCES

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

There are 1,787 co-occurrence records for alfalfa hay production (262 for alfalfa seed production) in all states where alfalfa is grown. 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 is 549 as noted in Table 2.

Table 2. 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	1,305	473	182	110
Ferns and Allies	24	13	0	0
Lichens	12	2	0	0
Monocots	444	59	80	18
Total	1,787	549	262	128

Note that more than one determination statement may be assigned to a given species based on the species being present in multiple counties. As a result, there are more determination statements than there are species.

By examining the determinations for alfalfa co-occurrences, described in the following subsections, ~ 74% of the co-occurrences and ~ 75% of the species can be addressed and do not require further analysis.

4.2 Species Co-Occurrences Not of Concern

Appendix 4 details those species co-occurrences that are “Not of Concern”. For example, the federal listing status of eight plant species has changed since the time of the most recent IMS data

update (June, 2003). Three of these species, the Truckee barberry (*Berberis sonnei*), Eggert's sunflower (*Helianthus eggertii*), and Hoover's woolly-star (*Eriastrum hooveri*), have been delisted or removed from the species list (USFWS 2005(n)), and therefore, protection of these species under the U.S. Endangered Species Act (ESA) is no longer required. NatureServe and/or state wildlife heritage databases indicate that the other plant species listed in Appendix 4 no longer occur in the counties identified.

As a result of the factors described in Tables A-4a and A-4b, 295 co-occurrences for alfalfa hay (72 for alfalfa seed) for 44 distinct species can be eliminated from further consideration.

4.3 Species Co-Occurrences for which Habitat Exclusions are Applicable

Characteristics of certain species preclude their being adjacent to land used for alfalfa culture. The co-occurrences eliminated from concern based on these circumstances are detailed in Appendix 5. These exclusions account for the removal of 622 co-occurrences for alfalfa hay (37 for alfalfa seed) for 235 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

Appendix 6 details those species co-occurrences that can be excluded based on the lack of proximity of alfalfa to each species location at the section level³. This exclusion was applied for species in California.

The California Department of Pesticide Regulation (CDPR) has performed GIS overlays of species location data (from the California Department of Fish and Game (DFG) Natural Diversity Database) with crop location data to create a "Commodity by Species" index (CDPR, 1997). Pesticide use and habitat information overlays were conducted at the section (square mile) level. As described on pages 1-3 of the CDPR index (1997), the index was developed through a process that involved overlaying crop data compiled at the section level (based on CDPR Pesticide Use Reports) and species data (sections intersecting species polygons, indicating the species' locations). If any part of a section containing a species polygon intersected a section containing a particular crop, the species was considered to be in proximity to that crop. This index was updated in 2004 by Rich Marovich, a CDPR threatened and endangered species expert, and is used to identify whether or not a crop location and species occurrence intersect at the section level.

This index does not indicate county-specific species or crop locations. For each endangered species in the index, the "pesticide use site" which occurs in proximity to the species is listed. The CDPR's crop groupings represented in the index follow EPA's crop groupings to a large extent. Therefore, only the "pesticide use site" of *alfalfa* was considered to represent all alfalfa uses; the "pesticide use site" of *forage hay/silage* was not considered to include any alfalfa uses. If alfalfa is not listed for a particular species, then the index indicates no overlap of alfalfa and the species in any county in California. Alternately, if alfalfa is listed for a particular species, the

³ 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 1 square mile.

index indicates that there is overlap of alfalfa and the species in California, but does not provide any county-specific information on where that overlap might occur.

Species co-occurrences can be eliminated from concern based on one of two determination statements:

1. No pesticide is used in proximity of species habitat in the specified county, or
2. Species habitat does not occur in proximity to alfalfa in the specified county.

The first determination statement is used to describe situations where no agriculture sites are reported to be in proximity to the species' habitat. Thus, it can be inferred that pesticides are not used on crops in proximity to the species' habitat. The second determination statement is used to describe situations where alfalfa is not listed as being in proximity to a given species' habitat, although other use sites (crops) are listed. Pesticides may be used on other use sites in proximity to a given species' habitat, but alfalfa does not occur near the habitat.

This refinement of location data allowed the elimination of 236 species co-occurrence records for alfalfa hay (68 for alfalfa seed), for 134 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.

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

There were no co-occurrences of this kind identified for the use of glyphosate herbicides in alfalfa production.

4.6 Species Co-Occurrences for which Other Exclusions are Applicable

Appendix 7 details those species co-occurrences that can be excluded based on an assessment of proximity of alfalfa to each species location. For these co-occurrences, the separation between the species and use site (crop) is not a specified distance (as for Proximity Exclusions) but documentation supports the conclusion that the species and use site (crop) are not in spatial proximity within the county.

This further refinement of location data allowed the elimination of 30 species co-occurrence records for alfalfa hay (4 for alfalfa seed), for 10 species, from further concern. The results of this refinement process are presented in Appendix 7.

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

Details of species co-occurrences addressed by species management practices are provided in Appendix 8.

A "Species Management Practice" is a practice (protection) established by a government agency or administration, federal, state, or local legislative body, or by a private company, to protect listed species from the risk that may be caused by pesticide exposure. These practices apply to a variety of pesticides. They may apply to a single species or class of organism, or to several species or classes of organisms. In addition, they may apply to an entire state.

For example, Iowa has a State Program to protect all listed 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 yd buffer for aerial applications) for spraying in areas where threatened or endangered species occur.

Protections may also apply to a single county, an Indian Reservation or Indian Nation, or to an area administered by a government agency or legislative body. Typically, the non-EPA government agency responsible for protection of a particular species would be the U.S. Fish and Wildlife Service, U.S. National Park Service, U.S. National Forest Service, National Oceanic and Atmospheric Administration, Bureau of Land Management, or the Bureau of Indian Affairs. Legislative bodies that may enact laws protecting endangered or threatened species include tribal councils, city councils, county boards, state legislatures, or the federal congress. Also, private organizations may develop formal and well documented practices or methodology for protecting the endangered and threatened species found on their land. Some of the private organizations that may develop “Species Management Practices” include conservancy and wildlife refuge organizations such as the Nature Conservancy and the Audubon Society, or private or cooperatively-owned farms and ranches, public utilities, and private or stockholder-owned timber and paper companies.

California Protections

In California, CDPH has also developed pesticide protections that are applicable to this report. CDPH maintains an on-line county bulletin system which is available to growers to identify endangered species that may occur in their local area. At the time of this report, the CDPH bulletins are entitled “Interim Measures for Use of Pesticides in [county name]”, and each bulletin includes the following text on page 1:

“The information provided in this bulletin is similar to what U.S. EPA expects to distribute once the Endangered Species Protection Program is in effect. Individuals who use pesticides during this interim period are not legally required to comply with these suggested measures. At the present time, compliance with the requirements specified on the pesticide product labeling will satisfy all legal requirements regarding pesticides and endangered species protection. While these pesticide use conditions do not yet have the force of law, they are being provided now for your use in voluntarily protecting endangered and threatened species.”

“The Species Descriptions table lists the taxonomic groups for each species. The Active Ingredients tables list certain pesticides and the activity category (mode of action, etc.) of the pesticide and the taxonomic groups they could adversely affect. The use limitations in this bulletin apply only to listed pesticides where the hazard class of the pesticide matches the hazard class (sensitivity of the taxonomic group) of the species that occur in the section where the pesticide will be used. Within a given section, use limitations only apply to sites that are consistent with habitat as noted in the Species Descriptions table.”

At the time of this report, there are two glyphosate salts listed in the California bulletins which contain glyphosate use restrictions (isopropylamine and monoammonium). For the purpose of this endangered plant assessment, the California protection language has been considered applicable for glyphosate potassium salts; the current Roundup WeatherMax® product contains glyphosate potassium salt as the active ingredient. The California interim measures bulletins are available on-line at <http://www.cdpr.ca.gov/docs/es/colist.htm>.

The two California protections applicable to endangered plants (and cited in this report; CDPR, 2003) are:

CA11: Do not use in currently occupied habitat except: (1) as specified in Habitat Descriptors, (2) in organized habitat recovery programs, or (3) for selective control of invasive exotic plants.

CA17: For sprayable or dust formulations: when the air is calm or moving away from habitat, commence applications on the side nearest the habitat and proceed away from the habitat. When air currents are moving toward habitat, do not make applications within 200 yards by air or 40 yards by ground upwind from occupied habitat. The county agricultural commissioner may reduce or waive buffer zones following a site inspection, if there is an adequate hedgerow, windbreak, riparian corridor or other physical barrier that substantially reduces the probability of drift.

These two California protections are cited in Appendix 8 where applicable for glyphosate.

Federal Protections

The practices (formal protections) developed by the Environmental Protection Agency's Office of Pesticide Programs (EPA-OPP) may be found in the *County Bulletins of the Endangered Species Pesticide Management Program*. These bulletins discuss the pesticides and species of concern and describe what a user of pesticides must do when applying these pesticides to minimize possible exposure of species that may be in proximity to the use site. The area in proximity to the use site represents the area of potential impact, which can be as little as a few feet but can be up to about one-half mile outside the target area. At the time of this report, the EPA-OPP County Bulletins are voluntary and available online at <http://www.epa.gov/espp/usa-map.htm>.

Practices developed by federal (non-EPA-OPP) administrative units are mandated by the Endangered Species Act, which requires that all applications of pesticide on federally owned or controlled land be conducted in such a way that endangered and threatened species are not "taken" by the application, where "take" is defined as follows: "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct". Practices developed by state and local governments are usually similar in that they proscribe the "taking" of endangered and threatened species. Practices developed by private land holders often have similar wording proscribing "take", but practices are put in place as conservation measures for nature reserves or in the spirit of good stewardship for the benefit of both the native wildlife and the general public.

As Appendix 8 shows, 145 co-occurrences for alfalfa hay (35 for alfalfa seed), for 52 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

The current label instructions for Monsanto's glyphosate herbicides contain language to advise the user to avoid drift and specify measures to reduce drift. The following text is included on the first page of all Roundup branded agricultural herbicide labels:

“AVOID CONTACT OF HERBICIDE WITH FOLIAGE, GREEN STEMS, EXPOSED NON-WOODY ROOTS OR FRUIT OF CROPS (EXCEPT AS SPECIFIED FOR INDIVIDUAL ROUNDUP READY® CROPS), DESIRABLE PLANTS AND TREES, BECAUSE SEVERE INJURY OR DESTRUCTION MAY RESULT.”

Appendix 9 contains the content of the “Application Equipment and Techniques” section, taken from the master label for Roundup WeatherMAX® herbicide (approved by the EPA in 2006, EPA Reg. No. 524-537) and the supplemental labels that apply for alfalfa. The instructions are essentially the same on all of Monsanto's glyphosate herbicides registered for use in alfalfa.

The label instructions indicate that the pesticide should not be applied during low-level inversion conditions when winds are gusty or under any other conditions that favor drift, or within buffer zones sufficient to protect desirable vegetation. If the pesticide is applied under these conditions, drift may cause damage to any vegetation to which treatment is not intended.

While the label does not specify which Federal Protections⁴ should be used, the label statements are similar to Federal Protections for glyphosate that are used to protect listed plant species when they are found in proximity to the specified crop. However, since no specific buffer distances are specified, no co-occurrences were excluded from further investigation based on label statements..

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 459 co-occurrences for alfalfa hay (46 for alfalfa seed), for 138 species remain to be addressed. These co-occurrences are presented in Appendix 10.

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

Figure 3 depicts the geographic distribution of the counties for which further analysis is required.

⁴ “Federal Protections” refers to the practices (formal protections) developed by EPA-OPP, as described in Section 4.7 of this report.

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 report. Of the 549 species evaluated in this report, 188 have designated critical habitat.

SECTION 6.0: CONCLUSIONS

An initial analysis using the FESTF IMS (Version 2.0) identified the universe of co-occurrences of glyphosate use in alfalfa culture and federally listed plant species locations at the county level. Additional analysis of the actual circumstances of county-level co-occurrences of endangered species and alfalfa culture (Hay and Seed) revealed that the majority of co-occurrences were not of concern due to findings regarding the sub-county relationships of the species and crop. The results of this analysis are summarized in Table 3.

Table 3. 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	295	44	72	8
Habitat exclusions are applicable	622	235	37	32
Proximity exclusions are applicable	236	134	68	57
Other exclusions are applicable	30	10	4	3
Species management practices are applicable	145	52	35	18

	Alfalfa Hay		Alfalfa Seed	
Further analysis is required	459	138	46	24
Total	1,787	613	262	142
Total distinct species^a		549		128

^a 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.

In this county-level assessment, there are 459 co-occurrences for alfalfa hay and 46 co-occurrences for alfalfa seed, referring to 138 distinct species in 319 counties, for which it has not been possible to identify an exclusion or protection determination at the county level. Of the 139 species, 24 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

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SECTION 8.0: FIGURES

Figure 1. U.S. counties with alfalfa production based on 2002 Census of Agriculture

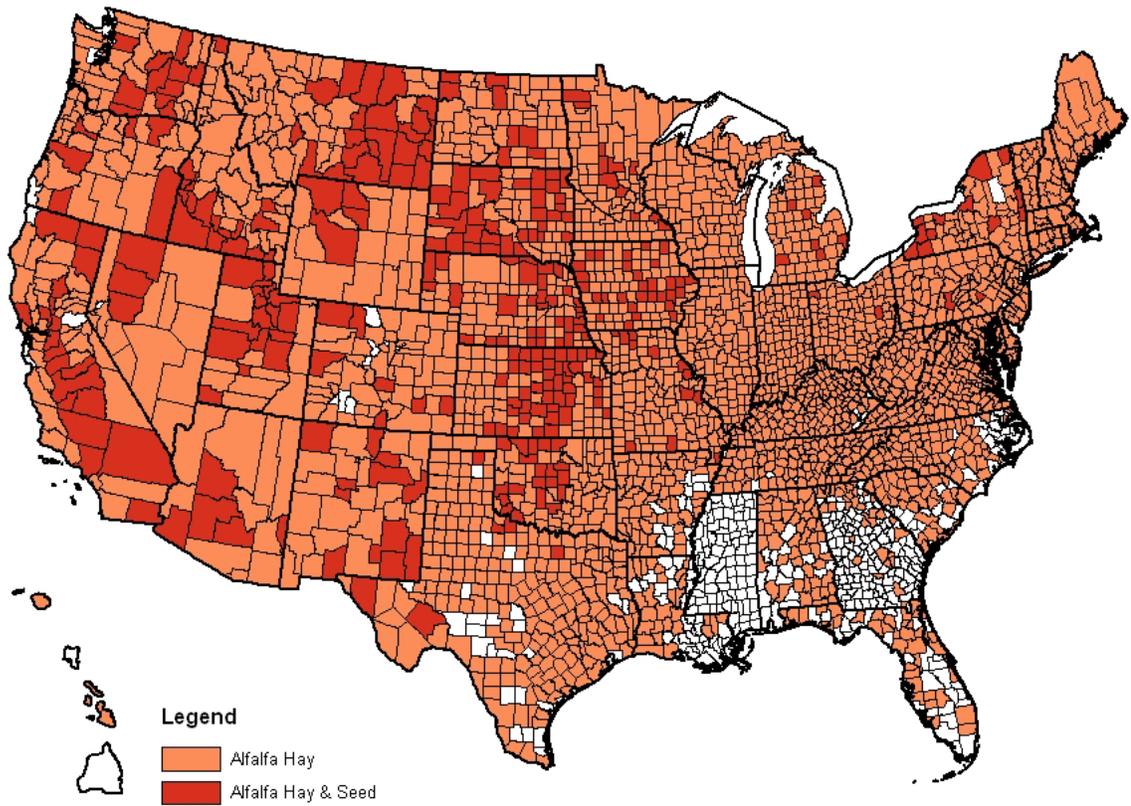


Figure 2. U.S. counties with alfalfa production and listed plant species

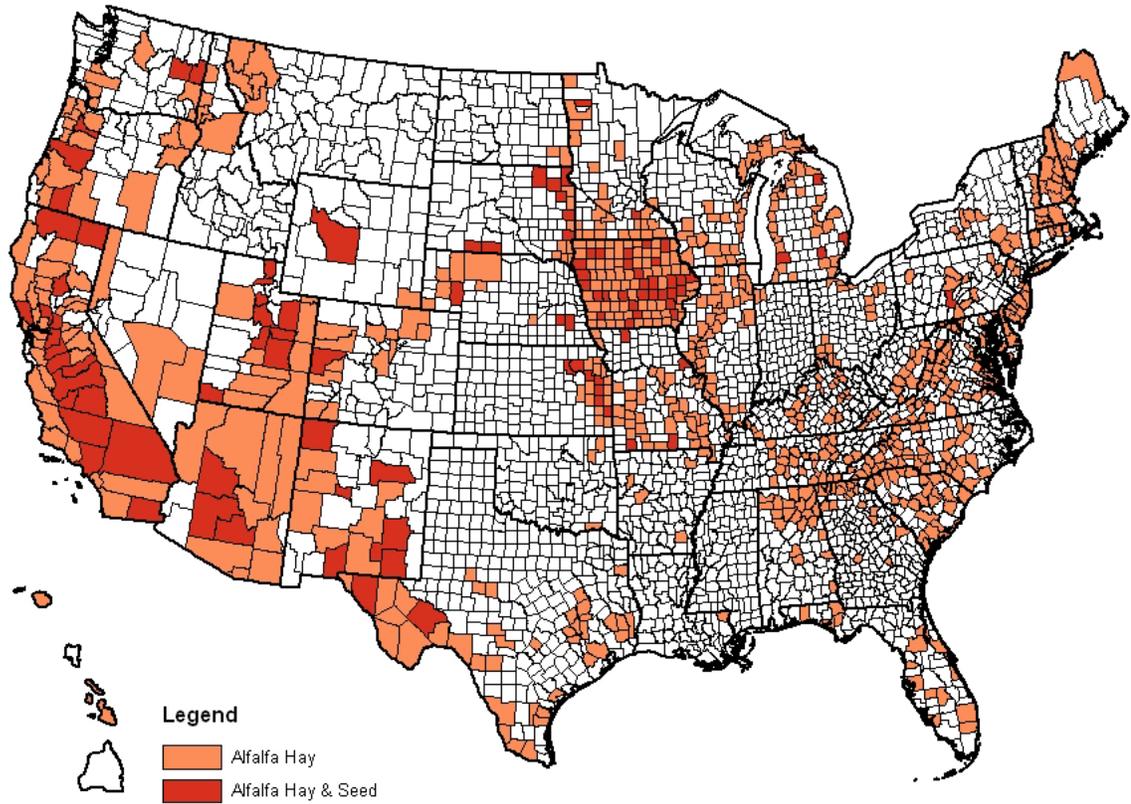
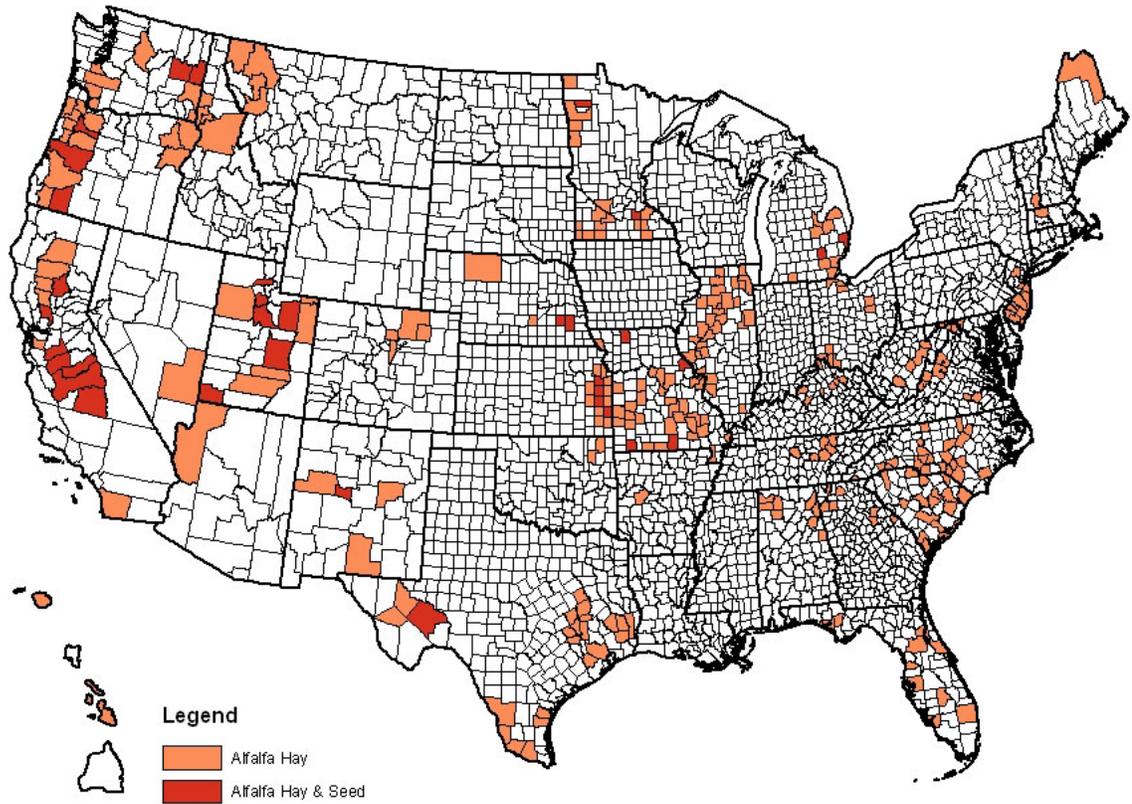


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Appendix 1. Contributing Scientists

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.
- Larry Turner, Ph.D. – Consulting Ecotoxicologist to Compliance Services International. Over 27 years experience at U.S. EPA on chemical risk assessment, including 15 years as a full-time specialist on endangered species.
- 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

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	21	267	6,545	8,847
AR	5	26	815	16,639
AZ	12	649	145,989	232,579
CA	47	4189	1,141,568	1,176,021
CO	13	4150	295,119	770,432
CT	3	159	5,589	9,825
DE	3	278	4,431	(D)
FL	15	39	549	3,494
GA	22	49	214	1,151
HI	2	2	(D)	(D)
IA	99	29114	1,168,668	1,168,668
ID	5	560	35,144	1,033,827
IL	40	5809	154,810	416,997
IN	3	282	6,153	320,210
KS	20	1720	67,495	938,209
KY	26	4249	111,792	310,874
LA	1	11	457	6,040
MA	7	310	8,659	15,756
MD	8	584	16,813	57,104
ME	5	153	7,841	13,944
MI	36	6979	305,153	806,713
MN	25	6898	323,706	1,264,403
MO	41	3208	123,221	399,647
MS	0	0	0	0
MT	5	1287	108,826	1,529,867
NC	41	705	10,764	21,907
ND	2	353	25,679	1,388,395
NE	10	1693	147,809	1,341,230
NH	9	224	7,093	7,938
NJ	12	711	18,038	26,854
NM	13	1714	106,794	188,273
NV	3	145	42,087	304,033
NY	10	1745	114,286	657,019
OH	15	4358	126,489	614,615
OK	3	48	3,926	349,028
OR	18	1972	207,994	487,661
PA	10	2668	95,349	669,130
RI	2	42	620	1,731
SC	25	107	1,678	3,030
SD	16	4898	623,842	2,393,123
TN	28	500	7,483	29,617
TX	40	558	36,844	164,069

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

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 *	
UT	18	5191	304,261	562,326
VA	43	2636	69,448	140,045
VT	2	68	1,898	44,573
WA	11	1183	75,069	535,694
WI	20	12446	552,692	1,657,958
WV	14	662	18,876	52,567
WY	2	664	89,768	489,825
Total	831	116,263	6,728,344	22,631,968

Information based on alfalfa data from 2002 Census of Agriculture and listed plant species locations from FESTF IMS.

*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.

** 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

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	17	149	25,549	27,160
CO	1	1	(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	0	0	0	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	4	6	(D)	362
MS	0	0	0	0
MT	0	0	0	6,824
NC	0	0	0	0
ND	0	0	0	695
NE	3	6	(D)	1,470
NH	0	0	0	0
NJ	0	0	0	0
NM	6	20	182	697
NV	0	0	0	0
NY	0	0	0	1,165
OH	0	0	0	0
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	9	26	272	2,596
VA	0	0	0	0

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

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 *	
VT	0	0	0	0
WA	2	2	(D)	14,161
WI	0	0	0	0
WV	0	0	0	0
WY	1	5	211	4,049
Total	103	321	27,659	102,670

Information based on alfalfa data from 2002 Census of Agriculture and listed plant species locations from FESTF IMS.

* 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.

** 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

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
	Cullman	27	0	497	0
	De Kalb	27	0	915	0
	Etowah	9	0	238	0
	Franklin	22	0	829	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
	Walker	6	0	(D)	0
Winston	7	0	136	0	
AR	Clay	4	0	71	0
	Drew	6	0	159	0
	Franklin	6	0	417	0
	Lawrence	6	0	(D)	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
	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)

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

State Code	County Name	Number of Farms Reported		Harvested Acres Reported*	
		Alfalfa Hay	Alfalfa Seed	Alfalfa Hay	Alfalfa Seed
CA	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
	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	0	0
	Nevada	1	0	0	0
	Orange	5	0	0	0
	Placer	1	0	0	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
	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	

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

State Code	County Name	Number of Farms Reported		Harvested Acres Reported*	
		Alfalfa Hay	Alfalfa Seed	Alfalfa Hay	Alfalfa Seed
CA	Ventura	4	0	430	0
	Yolo	124	3	59,729	(D)
CO	Boulder	241	0	12,768	0
	Delta	528	0	20,008	0
	Garfield	244	0	17,652	0
	Grand	9	0	(D)	0
	Jefferson	29	0	589	0
	La Plata	234	0	15,617	0
	Mesa	662	1	29,306	(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	1,095	0	101,225	0
CT	Litchfield	84	0	3,760	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
	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
	Marion	1	0	(D)	0
	Okaloosa	1	0	(D)	0
	Palm Beach	1	0	(D)	0
	Putnam	3	0	(D)	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

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

State Code	County Name	Number of Farms Reported		Harvested Acres Reported*	
		Alfalfa Hay	Alfalfa Seed	Alfalfa Hay	Alfalfa Seed
GA	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
	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
	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

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

State Code	County Name	Number of Farms Reported		Harvested Acres Reported*	
		Alfalfa Hay	Alfalfa Seed	Alfalfa Hay	Alfalfa Seed
IA	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
	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)	

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

State Code	County Name	Number of Farms Reported		Harvested Acres Reported*	
		Alfalfa Hay	Alfalfa Seed	Alfalfa Hay	Alfalfa Seed
IA	Monona	170	1	7,202	(D)
	Monroe	383	0	25,245	0
	Montgomery	212	1	8,602	(D)
	Muscatine	246	0	6,818	0
	O'Brien	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
	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	Idaho	197	0	17,081	0
	Kootenai	113	0	4,137	0
	Latah	119	0	5,041	0
	Lewis	52	0	4,845	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

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

State Code	County Name	Number of Farms Reported		Harvested Acres Reported*	
		Alfalfa Hay	Alfalfa Seed	Alfalfa Hay	Alfalfa Seed
IL	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
	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
	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
	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	Lake	103	0	2,234	0
	Ohio	35	0	574	0
	Porter	144	0	3,345	0
KS	Allen	73	0	2,365	0
	Anderson	84	1	3,006	(D)
	Atchison	66	0	1,699	0

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

State Code	County Name	Number of Farms Reported		Harvested Acres Reported*	
		Alfalfa Hay	Alfalfa Seed	Alfalfa Hay	Alfalfa Seed
KS	Bourbon	70	1	3,444	(D)
	Coffey	64	0	4,992	0
	Crawford	45	0	1,753	0
	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
	Edmonson	45	0	979	0
	Estill	77	0	1,243	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
	Hart	431	0	11,664	0
	Jefferson	55	0	1,046	0
	Laurel	120	0	1,909	0
	Livingston	20	0	402	0
	Lyon	15	0	339	0
	Mason	300	0	12,181	0
	Menifee	26	0	363	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
	Wolfe	13	0	209	0

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

State Code	County Name	Number of Farms Reported		Harvested Acres Reported*	
		Alfalfa Hay	Alfalfa Seed	Alfalfa Hay	Alfalfa Seed
KY	Woodford	153	0	3,957	0
LA	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
	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
	Cecil	114	0	3,124	0
	Dorchester	7	0	(D)	0
	Prince Georges	30	0	480	0
	Somerset	16	0	534	0
	Washington	229	0	7,144	0
ME	Aroostook	29	0	3,092	0
	Cumberland	22	0	(D)	0
	Kennebec	39	0	1,736	0
	Oxford	20	0	592	0
	York	43	0	2,421	0
MI	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
	Leelanau	90	0	4,267	0
Livingston	292	1	9,918	(D)	
Mackinac	26	0	1,908	0	

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

State Code	County Name	Number of Farms Reported		Harvested Acres Reported*	
		Alfalfa Hay	Alfalfa Seed	Alfalfa Hay	Alfalfa Seed
MI	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
	Crow Wing	172	0	10,094	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
	Jackson	142	0	3,860	0
	Kandiyohi	355	0	16,472	0
	Kittson	122	0	18,659	0
	Mower	281	0	7,485	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	Atchison	124	0	4,227	0

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

State Code	County Name	Number of Farms Reported		Harvested Acres Reported*	
		Alfalfa Hay	Alfalfa Seed	Alfalfa Hay	Alfalfa Seed
MO	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
	Dunklin	10	0	419	0
	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
	Lawrence	178	0	7,244	0
	Madison	14	0	597	0
	Maries	55	0	1,689	0
	Mississippi	9	0	239	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
	Reynolds	15	0	(D)	0
	Ripley	10	0	387	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	
MT	Flathead	414	0	27,854	0
	Lake	434	0	48,555	0

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

State Code	County Name	Number of Farms Reported		Harvested Acres Reported*	
		Alfalfa Hay	Alfalfa Seed	Alfalfa Hay	Alfalfa Seed
MT	Lincoln	97	0	3,436	0
	Missoula	193	0	11,669	0
	Sanders	149	0	17,312	0
NC	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
	Clay	9	0	304	0
	Cleveland	23	0	417	0
	Columbus	3	0	11	0
	Cumberland	1	0	(D)	0
	Davie	10	0	50	0
	Franklin	2	0	(D)	0
	Graham	3	0	(D)	0
	Granville	2	0	(D)	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
	Mecklenburg	4	0	57	0
	Mitchell	9	0	330	0
	Moore	4	0	48	0
	Pender	3	0	21	0
	Polk	12	0	130	0
	Richmond	3	0	(D)	0
	Robeson	4	0	(D)	0
	Rowan	47	0	987	0
	Rutherford	26	0	270	0
	Sampson	6	0	255	0
	Scotland	2	0	0	0
	Stanly	23	0	756	0
Stokes	47	0	458	0	
Surry	52	0	726	0	
Transylvania	6	0	109	0	
Union	9	0	119	0	
Wake	9	0	233	0	

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

State Code	County Name	Number of Farms Reported		Harvested Acres Reported*	
		Alfalfa Hay	Alfalfa Seed	Alfalfa Hay	Alfalfa Seed
NC	Watauga	35	0	306	0
	Yancey	37	0	434	0
ND	Ransom	163	0	14,091	0
	Richland	190	0	11,588	0
NE	Box Butte	92	0	13,514	0
	Cherry	115	0	25,157	0
	Garden	77	1	13,926	(D)
	Hall	178	0	7,363	0
	Hooker	11	0	3,385	0
	Kimball	52	0	7,487	0
	Lancaster	482	3	13,849	(D)
	Morrill	190	0	24,642	0
	Seward	263	2	7,281	(D)
	Sheridan	233	0	31,205	0
	NH	Belknap	14	0	229
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
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

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

State Code	County Name	Number of Farms Reported		Harvested Acres Reported*	
		Alfalfa Hay	Alfalfa Seed	Alfalfa Hay	Alfalfa Seed
NM	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
	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	Cayuga	382	0	30,826	0
	Delaware	200	0	13,222	0
	Madison	345	0	27,186	0
	Nassau	4	0	0	0
	Onondaga	258	0	16,623	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
	Clermont	99	0	1,911	0
	Coshocton	433	0	16,596	0
	Erie	77	0	1,968	0
	Hamilton	38	0	1,368	0
	Holmes	1,152	0	33,434	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
	Summit	51	0	1,501	0
	Warren	201	0	4,117	0
	Wayne	1,018	0	33,400	0
OK	Choctaw	9	0	846	0
	Craig	15	0	2,480	0
	Rogers	24	0	600	0
OR	Baker	274	0	29,232	0
	Benton	11	0	329	0
	Clackamas	63	0	1,504	0
	Coos	4	0	149	0
	Douglas	43	0	1,556	0

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

State Code	County Name	Number of Farms Reported		Harvested Acres Reported*	
		Alfalfa Hay	Alfalfa Seed	Alfalfa Hay	Alfalfa Seed
OR	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	Providence	20	0	(D)	0
	Washington	22	0	620	0
SC	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
	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	

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

State Code	County Name	Number of Farms Reported		Harvested Acres Reported*	
		Alfalfa Hay	Alfalfa Seed	Alfalfa Hay	Alfalfa Seed
SC	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	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
	De Kalb	1	0	(D)	0
	Dickson	15	0	317	0
	Fentress	16	0	107	0
	Hamilton	5	0	122	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

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

State Code	County Name	Number of Farms Reported		Harvested Acres Reported*	
		Alfalfa Hay	Alfalfa Seed	Alfalfa Hay	Alfalfa Seed
TN	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
	Unicoi	8	0	61	0
	Van Buren	2	0	(D)	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
	Coke	1	0	(D)	0
	Culberson	4	0	(D)	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
	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	

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

State Code	County Name	Number of Farms Reported		Harvested Acres Reported*	
		Alfalfa Hay	Alfalfa Seed	Alfalfa Hay	Alfalfa Seed
TX	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	0	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
	Tooele	177	0	12,204	0
	Uintah	461	0	27,022	0
	Utah	983	3	34,287	(D)
	Washington	120	10	5,777	145
	Wayne	128	0	11,175	0
Weber	516	6	16,964	127	
VA	Alleghany	28	0	0	0
	Appomattox	20	0	873	0
	Augusta	446	0	15,292	0
	Bath	11	0	258	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
	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

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

State Code	County Name	Number of Farms Reported		Harvested Acres Reported*	
		Alfalfa Hay	Alfalfa Seed	Alfalfa Hay	Alfalfa Seed
VA	Grayson	103	0	2,075	0
	Halifax	33	0	1,115	0
	Henrico	11	0	249	0
	Highland	20	0	588	0
	James City	2	0	0	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
	Montgomery	115	0	3,621	0
	Nelson	27	0	919	0
	New Kent	8	0	128	0
	Nottoway	35	0	1,413	0
	Page	87	0	2,222	0
	Patrick	57	0	2,069	0
	Prince George	4	0	0	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
	Stafford	25	0	327	0
	Surry	13	0	(D)	0
Westmoreland	7	0	169	0	
Wise	9	0	130	0	
VT	Windham	15	0	364	0
	Windsor	53	0	1,534	0
WA	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
	Lewis	38	0	1,576	0
	Lincoln	137	1	14,416	(D)
	San Juan	12	0	415	0
	Spokane	725	1	46,015	(D)
	Thurston	17	0	607	0
	Whitman	123	0	5,602	0
WI	Brown	535	0	29,988	0

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

State Code	County Name	Number of Farms Reported		Harvested Acres Reported*	
		Alfalfa Hay	Alfalfa Seed	Alfalfa Hay	Alfalfa Seed
WI	Dane	1,002	0	38,419	0
	Door	364	0	16,731	0
	Grant	1,272	0	76,080	0
	Jefferson	606	0	17,992	0
	Kenosha	167	0	5,128	0
	Manitowoc	735	0	36,945	0
	Monroe	1,030	0	43,314	0
	Ozaukee	188	0	8,543	0
	Pierce	717	0	28,559	0
	Portage	567	0	27,599	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
	Vernon	1,322	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	Berkeley	131	0	3,675	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
	Morgan	15	0	370	0
	Nicholas	18	0	452	0
	Pendleton	81	0	3,208	0
	Raleigh	27	0	528	0
	Randolph	42	0	1,053	0
	Tucker	17	0	(D)	0
	Upshur	17	0	333	0
	Webster	8	0	(D)	0
WY	Fremont	550	5	68,977	211
	Laramie	114	0	20,791	0
Totals		116,264	321	6,728,344	27,659

Information based on alfalfa data from 2002 Census of Agriculture and listed plant species locations from FESTF IMS.

* 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. Listed plant species in counties with alfalfa production: By Species, State, and County

Species	State	Affected Counties
<i>Conifers and Cycads</i>		
<i>Lifeform: Terrestrial</i>		
cypress, Gowen (<i>Cupressus goveniana</i> <i>ssp. goveniana</i>)	CA	Monterey
torreya, Florida (<i>Torreya taxifolia</i>)	FL	Jackson
<i>Dicots</i>		
<i>Lifeform: Aquatic</i>		
allocarya, Calistoga (<i>Plagiobothrys strictus</i>)	CA	Napa
amphianthus, little (<i>Amphianthus pusillus</i>)	AL GA SC	Randolph Columbia, Greene, Jackson, Oglethorpe Lancaster, Saluda, York
aster, decurrent false (<i>Boltonia decurrens</i>)	IL MO	Alexander, Brown, Bureau, Calhoun, Cass, Fulton, Greene, Grundy, Jackson, Jersey, La Salle, Madison, Marshall, Mason, Monroe, Morgan, Peoria, Pike, Putnam, Randolph, Schuyler, Scott, St Clair, Tazewell, Union, Woodford Dunklin, Howell, Mississippi, Pike, St Charles
bellflower, Brooksville (<i>Campanula robinsiae</i>)	FL	Hernando
bird's beak, palmate- bracted (<i>Cordylanthus</i> <i>palmatus</i>)	CA	Alameda, Colusa, Fresno, Madera, San Joaquin, Yolo
bird's-beak, Pennell's (<i>Cordylanthus tenuis ssp.</i> <i>capillaris</i>)	CA	Sonoma
bird's-beak, salt marsh (<i>Cordylanthus maritimus</i> <i>ssp. maritimus</i>)	CA	Los Angeles, Orange, San Diego, San Luis Obispo, Santa Barbara, Ventura
bird's-beak, soft (<i>Cordylanthus mollis ssp.</i> <i>mollis</i>)	CA	Contra Costa, Napa, Solano
bittercress, small- anthered (<i>Cardamine</i> <i>micranthera</i>)	NC VA	Stokes Patrick

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

Species	State	Affected Counties
bluecurls, Hidden Lake (<i>Trichostema austromontanum ssp. compactum</i>)	CA	San Bernardino
butterwort, Godfrey's (<i>Pinguicula ionantha</i>)	FL	Bay
button-celery, San Diego (<i>Eryngium aristulatum var. parishii</i>)	CA	Riverside, San Diego
checker-mallow, Kenwood Marsh (<i>Sidalcea oregana ssp. valida</i>)	CA	Sonoma
dropwort, Canby's (<i>Oxypolis canbyi</i>)	GA MD NC SC	Burke Prince Georges Scotland Dorchester, Hampton, Horry, Marlboro, Orangeburg, Richland, Williamsburg
goldenrod, Houghton's (<i>Solidago houghtonii</i>)	MI	Charlevoix, Cheboygan, Chippewa, Crawford, Delta, Emmet, Mackinac, Presque Isle, Schoolcraft
goldfields, Burke's (<i>Lasthenia burkei</i>)	CA	Lake, Mendocino, Sonoma
goldfields, Contra Costa (<i>Lasthenia conjugens</i>)	CA	Alameda, Contra Costa, Mendocino, Napa, Santa Barbara, Santa Clara, Solano
Harperella (<i>Ptilimnium nodosum</i>)	AL AR GA MD NC SC WV	Cherokee, Cullman, De Kalb, Jackson, Lee, Walker Yell Greene Allegany, Washington Chatham, Granville Saluda Jefferson, Morgan
howellia, water (<i>Howellia aquatilis</i>)	ID MT WA	Kootenai, Latah Lake, Missoula Clark, Spokane, Thurston
joint-vetch, sensitive (<i>Aeschynomene virginica</i>)	MD NJ VA	Somerset Burlington, Cumberland Charles City, Essex, James City, King And Queen, King George, King William, New Kent, Prince George, Richmond, Stafford, Surry, Westmoreland
meadowfoam, Butte County (<i>Limnanthes floccosa ssp. californica</i>)	CA	Butte, Tehama
meadowfoam, Sebastopol (<i>Limnanthes vinculans</i>)	CA	Sonoma

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

Species	State	Affected Counties
mesa-mint, Otay (<i>Pogogyne nudiuscula</i>)	CA	Riverside, San Diego
mesa-mint, San Diego (<i>Pogogyne abramsii</i>)	CA	San Diego
monkey-flower, Michigan (<i>Mimulus glabratus</i> var. <i>michiganensis</i>)	MI	Benzie, Charlevoix, Cheboygan, Emmet, Leelanau, Mackinac
navarretia, few-flowered (<i>Navarretia leucocephala</i> <i>ssp. pauciflora</i> (=N. <i>pauciflora</i>))	CA	Alameda, Contra Costa, Mendocino, Napa, Santa Barbara, Santa Clara, Solano
navarretia, many- flowered (<i>Navarretia leucocephala ssp. plieantha</i>)	CA	Alameda, Contra Costa, Mendocino, Napa, Santa Barbara, Santa Clara, Solano
navarretia, spreading (<i>Navarretia fossalis</i>)	CA	Los Angeles, Riverside, San Diego
niterwort, Amargosa (<i>Nitrophila mohavensis</i>)	CA NV	Inyo Nye
owl's-clover, fleshy (<i>Castilleja campestris ssp. succulenta</i>)	CA	Fresno, Madera, Merced, Stanislaus
pitcher-plant, Alabama canebrake (<i>Sarracenia rubra alabamensis</i>)	AL	Autauga, Chilton
pitcher-plant, green (<i>Sarracenia oreophila</i>)	AL GA NC	Cherokee, De Kalb, Etowah, Jackson, Marshall Gilmer, Towns Clay
pitcher-plant, mountain sweet (<i>Sarracenia rubra ssp. jonesii</i>)	NC SC	Buncombe, Henderson, Transylvania Greenville
Pondberry (<i>Lindera melissifolia</i>)	AR GA MO NC SC	Clay, Lawrence Wheeler Butler, Ripley Cumberland, Sampson Charleston, Colleton, Horry
sandwort, Marsh (<i>Arenaria paludicola</i>)	CA	San Luis Obispo
seablite, California (<i>Suaeda californica</i>)	CA	San Luis Obispo
spurge, Hoover's (<i>Chamaesyce hooveri</i>)	CA	Butte, Glenn, Stanislaus, Tehama, Tulare

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

Species	State	Affected Counties
sunshine, Sonoma (<i>Blennosperma bakeri</i>)	CA	Sonoma
thistle, Chorro Creek bog (<i>Cirsium fontinale</i> var. <i>obispoense</i>)	CA	San Luis Obispo
thistle, fountain (<i>Cirsium fontinale</i> var. <i>fontinale</i>)	CA	Santa Barbara, Santa Clara
thistle, Loch Lomond coyote (<i>Eryngium constancei</i>)	CA	Lake
water-umbel, Huachuca (<i>Lilaeopsis schaffneriana</i> var. <i>recurva</i>)	AZ	Cochise, Pima, Santa Cruz
water-willow, Cooley's (<i>Justicia cooleyi</i>)	FL	Hernando
watercress, Gambel's (<i>Rorippa gambellii</i>)	CA	Los Angeles, San Bernardino, San Diego, San Luis Obispo, Ventura
Lifeform: Both		
lomatium, Cook's (<i>Lomatium cookii</i>)	OR	Jackson, Josephine
Meadowfoam, large-flowered woolly (<i>Limnanthes floccosa grandiflora</i>)	OR	Jackson
popcornflower, rough (<i>Plagiobothrys hirtus</i>)	OR	Douglas
sneezeweed, Virginia (<i>Helenium virginicum</i>)	MO VA	Howell Augusta, Rockingham
sunflower, Pecos (=puzzle, =paradox) (<i>Helianthus paradoxus</i>)	NM TX	Chaves, Cibola, Guadalupe, Valencia Pecos, Reeves
thelypody, Howell's spectacular (<i>Thelypodium howellii spectabilis</i>)	OR	Baker, Union
Lifeform: Terrestrial		
'Ahinahina (<i>Argyroxiphium sandwicense</i> ssp. <i>macrocephalum</i>)	HI	Maui
'Ahinahina (<i>Argyroxiphium sandwicense</i> ssp. <i>sandwicense</i>)	HI	Maui

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

Species	State	Affected Counties
'aiakeakua, popolo (<i>Solanum sandwicense</i>)	HI	Kauai
'aiea (<i>Nothocestrum peltatum</i>)	HI	Kauai
'akoko (<i>Euphorbia haeleeleana</i>)	HI	Kauai
'awikiwiki (<i>Canavalia molokaiensis</i>)	HI	Maui
'oha Wai (<i>Clermontia lindseyana</i>)	HI	Maui
'oha wai (<i>Clermontia oblongifolia</i> ssp. <i>brevipes</i>)	HI	Maui
'oha wai (<i>Clermontia oblongifolia</i> ssp. <i>mauiensis</i>)	HI	Maui
'oha Wai (<i>Clermontia samuelii</i>)	HI	Maui
A'e (<i>Zanthoxylum hawaiiense</i>)	HI	Kauai, Maui
Alani (<i>Melicope adscendens</i>)	HI	Maui
Alani (<i>Melicope balloui</i>)	HI	Maui
Alani (<i>Melicope haupuensis</i>)	HI	Kauai
Alani (<i>Melicope knudsenii</i>)	HI	Kauai, Maui
Alani (<i>Melicope mucronulata</i>)	HI	Maui
Alani (<i>Melicope munroi</i>)	HI	Maui
Alani (<i>Melicope ovalis</i>)	HI	Maui
Alani (<i>Melicope pallida</i>)	HI	Kauai
Alani (<i>Melicope quadrangularis</i>)	HI	Kauai
Alani (<i>Melicope reflexa</i>)	HI	Maui
amaranth, seabeach (<i>Amaranthus pumilus</i>)	NC NY SC	Pender Nassau, Suffolk Charleston, Horry
ambrosia, San Diego (<i>Ambrosia pumila</i>)	CA	Riverside, San Diego
ambrosia, south Texas (<i>Ambrosia cheiranthifolia</i>)	TX	Hidalgo, Kleberg, Nueces

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

Species	State	Affected Counties
amole, purple (<i>Chlorogalum purpureum</i>)	CA	Monterey, San Luis Obispo
aster, Florida golden (<i>Chrysopsis floridana</i>)	FL	Hillsborough
aster, Ruth's golden (<i>Pityopsis ruthii</i>)	TN	Polk
Aupaka (<i>Isodendrion laurifolium</i>)	HI	Kauai
Aupaka (<i>Isodendrion longifolium</i>)	HI	Kauai
avens, spreading (<i>Geum radiatum</i>)	NC TN	Ashe, Avery, Burke, Caldwell, Mitchell, Transylvania, Watauga, Yancey Carter, Sevier
awiwi (<i>Centaurium sebaeoides</i>)	HI	Kauai, Maui
awiwi (<i>Hedyotis cookiana</i>)	HI	Kauai
ayenia, Texas (<i>Ayenia limitaris</i>)	TX	Hidalgo, Kleberg, Nueces
baccharis, Encinitas (<i>Baccharis vanessae</i>)	CA	Orange, San Diego
Barberry, island (<i>Berberis pinnata</i> ssp. <i>insularis</i>)	CA	Santa Barbara
barberry, Nevin's (<i>Berberis nevinii</i>)	CA	Los Angeles, Riverside
Barberry, Truckee (<i>Berberis</i> (= <i>Mahonia</i>) <i>sonnei</i>)	CA	Modoc, Nevada, Placer
bear-poppy, dwarf (<i>Arctomecon humilis</i>)	UT	Washington
beardtongue, Penland (<i>Penstemon penlandii</i>)	CO	Grand
bedstraw, island (<i>Galium buxifolium</i>)	CA	Santa Barbara
birch, Virginia round-leaf (<i>Betula uber</i>)	VA	Smyth
birds-in-a-nest, white (<i>Macbridea alba</i>)	FL	Bay
bladderpod, Dudley Bluffs (<i>Lesquerella congesta</i>)	CO	Rio Blanco

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

Species	State	Affected Counties
bladderpod, kodachrome (<i>Lesquerella tumulosa</i>)	UT	Kane
bladderpod, lyrate (<i>Lesquerella lyrata</i>)	AL	Colbert, Franklin, Lawrence
bladderpod, Missouri (<i>Lesquerella filiformis</i>)	MO	Christian, Dade, Greene, Lawrence
bladderpod, San Bernardino Mountains (<i>Lesquerella kingii ssp. bernardina</i>)	CA	San Bernardino
bladderpod, Spring Creek (<i>Lesquerella perforata</i>)	TN	Wilson
bladderpod, Zapata (<i>Lesquerella thamnophila</i>)	TX	Starr, Zapata
blazingstar, Ash Meadows (<i>Mentzelia leucophylla</i>)	NV	Nye
blazingstar, Heller's (<i>Liatris helleri</i>)	NC	Ashe, Avery, Burke, Caldwell, Mitchell, Watauga
blazingstar, scrub (<i>Liatris ohlingerae</i>)	FL	Highlands
blue-star, Kearney's (<i>Amsonia kearneyana</i>)	AZ	Pima
bluet, Roan Mountain (<i>Hedyotis purpurea var. montana</i>)	NC TN	Ashe, Avery, Mitchell, Watauga, Yancey Carter
bonamia, Florida (<i>Bonamia grandiflora</i>)	FL	Hardee, Highlands, Marion
broom, San Clemente Island (<i>Lotus dendroideus ssp. traskiae</i>)	CA	Los Angeles
buckwheat, cushenbury (<i>Eriogonum ovalifolium var. vineum</i>)	CA	San Bernardino
buckwheat, Ione (incl. Irish Hill) (<i>Eriogonum apricum (incl. var. prostratum)</i>)	CA	Amador
buckwheat, scrub (<i>Eriogonum longifolium var. gnaphalifolium</i>)	FL	Highlands, Marion

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

Species	State	Affected Counties
buckwheat, steamboat (<i>Eriogonum ovalifolium</i> <i>var. williamsiae</i>)	NV	Washoe
bush-clover, prairie (<i>Lespedeza leptostachya</i>)	IA	Adair, Adams, Allamakee, Appanoose, Audubon, Benton, Black Hawk, Boone, Bremer, Buchanan, Buena Vista, Butler, Calhoun, Carroll, Cass, Cedar, Cerro Gordo, Cherokee, Chickasaw, Clarke, Clay, Clayton, Clinton, Crawford, Dallas, Davis, Decatur, Delaware, Des Moines, Dickinson, Dubuque, Emmet, Fayette, Floyd, Franklin, Fremont, Greene, Grundy, Guthrie, Hamilton, Hancock, Hardin, Harrison, Henry, Howard, Humboldt, Ida, Iowa, Jackson, Jasper, Jefferson, Johnson, Jones, Keokuk, Kossuth, Lee, Louisa, Lucas, Madison, Mahaska, Marion, Marshall, Mills, Mitchell, Monona, Monroe, Montgomery, Muscatine, O'Brien, Osceola, Page, Palo Alto, Pocahontas, Polk, Pottawattami, Poweshiek, Ringgold, Sac, Scott, Shelby, Sioux, Story, Tama, Taylor, Union, Van Buren, Wapello, Warren, Washington, Wayne, Webster, Winnebago, Winneshiek, Woodbury, Worth, Wright
	IL	Cook, Du Page, Lee, Massac, Ogle, Winnebago
	MN	Brown, Cottonwood, Crow Wing, Goodhue, Jackson, Redwood, Renville, Rice
	WI	Dane, Grant, Pierce, Rock, Sauk
bush-mallow, San Clemente Island (<i>Malacothamnus clementinus</i>)	CA	Los Angeles
bush-mallow, Santa Cruz Island (<i>Malacothamnus fasciculatus var. nesioticus</i>)	CA	Santa Barbara
Buttercup, autumn (<i>Ranunculus aestivalis</i> (= <i>acriiformis</i>))	UT	Garfield
Butterfly plant, Colorado (<i>Gaura neomexicana var. coloradensis</i>)	CO NE WY	Weld Kimball Laramie
butterweed, Layne's (<i>Senecio layneae</i>)	CA	Tuolumne
button, Mohr's Barbara (<i>Marshallia mohrii</i>)	AL GA	Calhoun, Cherokee, Etowah Floyd, Walker
cactus, Arizona hedgehog (<i>Echinocereus triglochidiatus var. arizonicus</i>)	AZ	Gila, Maricopa, Pinal

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

Species	State	Affected Counties
cactus, Bakersfield (<i>Opuntia treleasei</i>)	CA	Kern
cactus, black lace (<i>Echinocereus reichenbachii</i> var. <i>albertii</i>)	TX	Jim Wells, Kleberg, Refugio, Uvalde
cactus, Brady pincushion (<i>Pediocactus bradyi</i>)	AZ	Coconino
Cactus, Chisos Mountain hedgehog (<i>Echinocereus chisoensis</i> var. <i>chisoensis</i>)	TX	Brewster
cactus, Cochise pincushion (<i>Coryphantha robbinsorum</i>)	AZ	Cochise
cactus, Knowlton (<i>Pediocactus knowltonii</i>)	CO NM	La Plata San Juan
cactus, Kuenzler hedgehog (<i>Echinocereus fendleri</i> var. <i>kuenzleri</i>)	NM	Chaves, Lincoln, Otero
cactus, Lee pincushion (<i>Coryphantha sneedii</i> var. <i>leei</i>)	NM	Eddy
cactus, Lloyd's Mariposa (<i>Echinomastus mariposensis</i>)	TX	Brewster, Presidio
cactus, Mesa Verde (<i>Sclerocactus mesae-verdae</i>)	CO NM	Montezuma San Juan
cactus, Nellie cory (<i>Coryphantha minima</i>)	TX	Brewster
cactus, Nichol's Turk's head (<i>Echinocactus horizontalonius</i> var. <i>nicholii</i>)	AZ	Pima, Pinal
cactus, Peebles Navajo (<i>Pediocactus peeblesianus</i> <i>peeblesianus</i>)	AZ	Navajo
cactus, Pima pineapple (<i>Coryphantha scheeri</i> var. <i>robustispina</i>)	AZ	Pima, Santa Cruz
cactus, San Rafael (<i>Pediocactus despainii</i>)	UT	Emery

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

Species	State	Affected Counties
cactus, Siler pincushion (<i>Pediocactus</i> (= <i>Echinocactus</i> ,= <i>Utahia</i>) <i>sileri</i>)	AZ UT	Coconino, Mohave Kane, Washington
cactus, Sneed pincushion (<i>Coryphantha sneedii</i> <i>var. sneedii</i>)	NM TX	Dona Ana Culberson, El Paso, Hudspeth
cactus, star (<i>Astrophytum</i> <i>asterias</i>)	TX	Starr
cactus, Tobusch fishhook (<i>Ancistrocactus</i> <i>tobuschii</i>)	TX	Kerr, Kimble, Kinney, Uvalde, Val Verde
Cactus, Uinta Basin hookless (<i>Sclerocactus</i> <i>glaucus</i>)	CO UT	Delta, Garfield, Mesa, Montrose Carbon, Duchesne, Uintah
cactus, Winkler (<i>Pediocactus winkleri</i>)	UT	Emery, Wayne
cactus, Wright fishhook (<i>Sclerocactus wrightiae</i>)	UT	Emery, Sevier, Wayne
cat's-eye, Terlingua Creek (<i>Cryptantha</i> <i>crassipes</i>)	TX	Brewster
Catchfly, Spalding's (<i>Silene spaldingii</i>)	ID MT OR WA	Idaho, Lewis, Nez Perce Flathead, Lake, Lincoln, Sanders Wallowa Asotin, Lincoln, Spokane, Whitman
ceanothus, coyote (<i>Ceanothus ferrisiae</i>)	CA	Santa Clara
ceanothus, Vail Lake (<i>Ceanothus ophiochilus</i>)	CA	Riverside
centaury, spring-loving (<i>Centaureum</i> <i>namophilum</i>)	CA NV	Inyo Nye
chaffseed, American (<i>Schwalbea americana</i>)	NC NJ SC	Hoke, Moore Burlington Charleston, Florence, Horry, Jasper, Lee, Sumter, Williamsburg
Checker-mallow, Keck's (<i>Sidalcea keckii</i>)	CA	Fresno, Tulare
checker-mallow, Nelson's (<i>Sidalcea nelsoniana</i>)	OR WA	Benton, Clackamas, Linn, Marion, Polk, Tillamook, Washington, Yamhill Cowlitz
checker-mallow, pedate (<i>Sidalcea pedata</i>)	CA	San Bernardino

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

Species	State	Affected Counties
checkermallow, Wenatchee Mountains (<i>Sidalcea oregana</i> var. <i>calva</i>)	WA	Chelan
cinquefoil, Robbins' (<i>Potentilla robbinsiana</i>)	NH	Coos, Grafton
clarkia, Pismo (<i>Clarkia speciosa</i> ssp. <i>immaculata</i>)	CA	San Luis Obispo
clarkia, Presidio (<i>Clarkia franciscana</i>)	CA	Alameda
clarkia, Springville (<i>Clarkia springvillensis</i>)	CA	Tulare
clarkia, Vine Hill (<i>Clarkia imbricata</i>)	CA	Sonoma
Cliff-rose, Arizona (<i>Purshia</i> (= <i>Cowania</i>) <i>subintegra</i>)	AZ	Graham, Maricopa, Mohave, Yavapai
clover, Monterey (<i>Trifolium trichocalyx</i>)	CA	Monterey
clover, running buffalo (<i>Trifolium stoloniferum</i>)	IN KY MO OH WV	Ohio Boone, Bourbon, Estill, Jefferson, Nelson, Woodford Barry, Benton, Boone, Callaway, Carter, Cedar, Cole, Crawford, Dade, Dent, Dunklin, Howard, Madison, Maries, Ozark, Phelps, St Louis, Taney, Texas, Vernon, Wayne Brown, Butler, Clermont, Hamilton, Montgomery, Warren Fayette, Randolph, Tucker, Webster
clover, showy Indian (<i>Trifolium amoenum</i>)	CA	Marin, Sonoma
coneflower, smooth (<i>Echinacea laevigata</i>)	NC SC VA	Granville Lancaster, Lexington, Oconee, Pickens Alleghany, Campbell, Franklin, Halifax, Montgomery, Nottoway, Pulaski, Roanoke
coneflower, Tennessee purple (<i>Echinacea tennesseensis</i>)	TN	Davidson, Rutherford, Wilson
cory cactus, bunched (<i>Coryphantha ramillosa</i>)	TX	Brewster, Terrell
crownbeard, big-leaved (<i>Verbesina dissita</i>)	CA	Orange, San Diego
crownscale, San Jacinto Valley (<i>Atriplex coronata</i> var. <i>notatior</i>)	CA	Riverside
	AZ	Mohave

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

Species	State	Affected Counties
Cycladenia, Jones (<i>Cycladenia jonesii</i> (= <i>humilis</i>))	AZ UT	Mohave Emery, Garfield, Grand, Kane
daisy, lakeside (<i>Hymenoxys herbacea</i>)	IL OH	Tazewell, Will Erie, Ottawa
daisy, Maguire (<i>Erigeron maguirei</i>)	UT	Emery, Wayne
daisy, Parish's (<i>Erigeron parishii</i>)	CA	Riverside, San Bernardino
daisy, Willamette (<i>Erigeron decumbens</i> <i>var. decumbens</i>)	OR	Benton, Lane, Linn, Marion, Polk
dawn-flower, Texas prairie (<i>Hymenoxys texana</i>)	TX	Fort Bend, Harris, Harrison
desert-parsley, Bradshaw's (<i>Lomatium bradshawii</i>)	OR	Benton, Lane, Linn, Marion, Polk
dogweed, ashy (<i>Thymophylla tephroleuca</i>)	TX	Starr, Webb, Zapata
dudleya, Conejo (<i>Dudleya abramsii ssp. parva</i>)	CA	Ventura
dudleya, marcescent (<i>Dudleya cymosa ssp. marcescens</i>)	CA	Los Angeles, Orange, Santa Barbara
dudleya, Santa Clara Valley (<i>Dudleya setchellii</i>)	CA	Alameda, Contra Costa, Fresno, Monterey, San Benito, Santa Clara
dudleya, Santa Cruz Island (<i>Dudleya nesiotica</i>)	CA	Santa Barbara
dudleya, Verity's (<i>Dudleya verityi</i>)	CA	Ventura
dudleyea, Santa Monica Mountains (<i>Dudleya cymosa ssp. ovatifolia</i>)	CA	Los Angeles, Orange, Ventura
dwarf-flax, Marin (<i>Hesperolinon congestum</i>)	CA	Marin

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

Species	State	Affected Counties
evening-primrose, Antioch Dunes (<i>Oenothera deltooides ssp. howellii</i>)	CA	Contra Costa, Sacramento
evening-primrose, Eureka Valley (<i>Oenothera avita ssp. eurekaensis</i>)	CA	Inyo
evening-primrose, San Benito (<i>Camissonia benitensis</i>)	CA	San Benito
fiddleneck, large-flowered (<i>Amsinckia grandiflora</i>)	CA	Alameda, Contra Costa, San Joaquin
flannelbush, Mexican (<i>Fremontodendron mexicanum</i>)	CA	San Diego
fleabane, Zuni (<i>Erigeron rhizomatus</i>)	AZ NM	Apache Catron, Mckinley
four-o'clock, MacFarlane's (<i>Mirabilis macfarlanei</i>)	ID OR	Idaho Wallowa
frankenian, Johnston's (<i>Frankenia johnstonii</i>)	TX	Starr, Zapata
fringe-tree, pygmy (<i>Chionanthus pygmaeus</i>)	FL	Hardee, Highlands
fringepod, Santa Cruz Island (<i>Thysanocarpus conchuliferus</i>)	CA	Santa Barbara
gardenia (=Na'u), Hawaiian (<i>Gardenia brighamii</i>)	HI	Maui
geranium, Hawaiian red-flowered (<i>Geranium arboreum</i>)	HI	Maui
gerardia, sandplain (<i>Agalinis acuta</i>)	CT MA MD NY RI	Windham Barnstable, Dukes Baltimore Nassau, Suffolk Washington
gilia, Hoffmann's slender-flowered (<i>Gilia tenuiflora ssp. hoffmannii</i>)	CA	Santa Barbara
gilia, Monterey (<i>Gilia tenuiflora ssp. arenaria</i>)	CA	Monterey

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

Species	State	Affected Counties
goldenrod, Blue Ridge (<i>Solidago spithamea</i>)	NC TN	Avery, Caldwell, Mitchell, Watauga Carter
goldenrod, Short's (<i>Solidago shortii</i>)	KY	Fleming, Nicholas, Robertson
goldenrod, white-haired (<i>Solidago albopilosa</i>)	KY	Menifee, Powell, Wolfe
gourd, Okeechobee (<i>Cucurbita okeechobeensis</i> ssp. <i>okeechobeensis</i>)	FL	Palm Beach
ground-plum, Guthrie's (=Pyne's) (<i>Astragalus bibullatus</i>)	TN	Rutherford
groundsel, San Francisco Peaks (<i>Senecio franciscanus</i>)	AZ	Coconino
gumplant, Ash Meadows (<i>Grindelia fraxino-pratensis</i>)	CA NV	Inyo Nye
Ha'iwale (<i>Cyrtandra limahuliensis</i>)	HI	Kauai
Ha'iwale (<i>Cyrtandra munroi</i>)	HI	Maui
Haha (<i>Cyanea asarifolia</i>)	HI	Kauai
haha (<i>Cyanea copelandii</i> ssp. <i>haleakalaensis</i>)	HI	Maui
haha (<i>Cyanea dunbarii</i>)	HI	Maui
Haha (<i>Cyanea glabra</i>)	HI	Maui
haha (<i>Cyanea grimesiana</i> ssp. <i>grimesiana</i>)	HI	Maui
haha (<i>Cyanea hamatiflora</i> ssp. <i>hamatiflora</i>)	HI	Maui
haha (<i>Cyanea macrostegia</i> ssp. <i>gibsonii</i>)	HI	Maui
Haha (<i>Cyanea mannii</i>)	HI	Maui
Haha (<i>Cyanea mceldowneyi</i>)	HI	Maui
Haha (<i>Cyanea procera</i>)	HI	Maui
Haha (<i>Cyanea recta</i>)	HI	Kauai
Haha (<i>Cyanea remyi</i>)	HI	Kauai
Haha (<i>Cyanea undulata</i>)	HI	Kauai

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

Species	State	Affected Counties
harebells, Avon Park (<i>Crotalaria avonensis</i>)	FL	Highlands
hau kuahiwi (<i>Hibiscadelphus woodii</i>)	HI	Kauai
heartleaf, dwarf-flowered (<i>Hexastylis naniflora</i>)	NC SC	Burke, Catawba, Cleveland, Lincoln, Rutherford Cherokee, Greenville, Spartanburg
heather, mountain golden (<i>Hudsonia montana</i>)	NC	Burke
Heau (<i>Exocarpos luteolus</i>)	HI	Kauai
hedyotis, Na Pali beach (<i>Hedyotis st.-johnii</i>)	HI	Kauai
hibiscus, Clay's (<i>Hibiscus clayi</i>)	HI	Kauai
hypericum, highlands scrub (<i>Hypericum cumulicola</i>)	FL	Highlands
iliau, dwarf (<i>Wilkesia hobdyi</i>)	HI	Kauai
indian paintbrush, San Clemente Island (<i>Castilleja grisea</i>)	CA	Los Angeles
ipomopsis, Holy Ghost (<i>Ipomopsis sancti- spiritus</i>)	NM	San Miguel
ivesia, Ash Meadows (<i>Ivesia kingii</i> var. <i>eremica</i>)	CA NV	Inyo Nye
jacquemontia, beach (<i>Jacquemontia reclinata</i>)	FL	Broward, Palm Beach
jewelflower, California (<i>Caulanthus californicus</i>)	CA	Fresno, Kern, Kings, San Luis Obispo, Santa Barbara, Tulare
jewelflower, Tiburon (<i>Streptanthus niger</i>)	CA	Marin
Kamakahala (<i>Labordia lydgatei</i>)	HI	Kauai
kamakahala (<i>Labordia tinifolia</i> var. <i>lanaiensis</i>)	HI	Maui
kamakahala (<i>Labordia tinifolia</i> var. <i>wahiawaensis</i>)	HI	Kauai
Kamakahala (<i>Labordia triflora</i>)	HI	Maui

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

Species	State	Affected Counties
kauai hau kuahiwi (<i>Hibiscadelphus distans</i>)	HI	Kauai
Kaulu (<i>Pteralyxia kauaiensis</i>)	HI	Kauai
Kio'ele (<i>Hedyotis coriacea</i>)	HI	Maui
ko'oko'olau (<i>Bidens micrantha ssp. kalealaha</i>)	HI	Maui
Ko'oko'olau (<i>Bidens wiebkei</i>)	HI	Maui
Ko'oloa'ula (<i>Abutilon menziesii</i>)	HI	Maui
Kohe malama malama o kanaloa (<i>Kanaloa kahoolawensis</i>)	HI	Maui
Koki'o (<i>Kokia kauaiensis</i>)	HI	Kauai
koki'o ke'oke'o (<i>Hibiscus arnottianus ssp. immaculatus</i>)	HI	Maui
koki'o ke'oke'o (<i>Hibiscus waimeae ssp. hannerae</i>)	HI	Kauai
Kolea (<i>Myrsine linearifolia</i>)	HI	Kauai
Kopa (<i>Hedyotis schlechtendahliana var. remyi</i>)	HI	Maui
kuahiwi laukahi (<i>Plantago princeps</i>)	HI	Kauai, Maui
Kuawawaenuhu (<i>Alsinidendron lychnoides</i>)	HI	Kauai
Kulu'i (<i>Nototrichium humile</i>)	HI	Maui
larkspur, Baker's (<i>Delphinium bakeri</i>)	CA	Marin
larkspur, San Clemente Island (<i>Delphinium variegatum ssp. kinkiense</i>)	CA	Los Angeles
larkspur, yellow (<i>Delphinium luteum</i>)	CA	Sonoma
Laulihilihi (<i>Schiedea stellarioides</i>)	HI	Kauai

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

Species	State	Affected Counties
layia, beach (<i>Layia carnosa</i>)	CA	Humboldt, Marin, Monterey, Santa Barbara
leather flower, Alabama (<i>Clematis socialis</i>)	AL	Cherokee, Etowah, St Clair
leather flower, Morefield's (<i>Clematis morefieldii</i>)	AL	Madison
liveforever, Laguna Beach (<i>Dudleya stolonifera</i>)	CA	Orange
liveforever, Santa Barbara Island (<i>Dudleya traskiae</i>)	CA	Santa Barbara
locoweed, Fassett's (<i>Oxytropis campestris</i> var. <i>chartacea</i>)	WI	Portage, Waushara
loosestrife, rough-leaved (<i>Lysimachia asperulaefolia</i>)	NC SC	Columbus, Cumberland, Hoke, Moore, Pender, Richmond, Scotland Chesterfield, Greenwood, Horry, Kershaw, Marlboro, Richland
lousewort, Furbish (<i>Pedicularis furbishiae</i>)	ME	Aroostook
lupine, clover (<i>Lupinus tidestromii</i>)	CA	Madera, Marin, Monterey, Sonoma
Lupine, Kincaid's (<i>Lupinus sulphureus</i> (=oreganus) ssp. <i>kincaidii</i> (=var. <i>kincaidii</i>))	OR WA	Benton, Douglas, Lane, Linn, Polk, Yamhill Lewis
lupine, Nipomo Mesa (<i>Lupinus nipomensis</i>)	CA	San Luis Obispo
ma'o hau hele, (=native yellow hibiscus) (<i>Hibiscus brackenridgei</i>)	HI	Maui
Ma'oli'oli (<i>Schiedea apokremnos</i>)	HI	Kauai
Mahoe (<i>Alectryon macrococcus</i>)	HI	Kauai, Maui
Makou (<i>Peucedanum sandwicense</i>)	HI	Kauai, Maui
malacothrix, island (<i>Malacothrix squalida</i>)	CA	Santa Barbara
malacothrix, Santa Cruz Island (<i>Malacothrix indecora</i>)	CA	Santa Barbara, Ventura

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

Species	State	Affected Counties
mallow, Kern (<i>Eremalche kernensis</i>)	CA	Kern
mallow, Peter's Mountain (<i>Iliamna corei</i>)	VA	Giles
manioc, Walker's (<i>Manihot walkerae</i>)	TX	Hidalgo, Starr
manzanita, Del Mar (<i>Arctostaphylos glandulosa ssp. crassifolia</i>)	CA	Orange, San Diego
manzanita, Ione (<i>Arctostaphylos myrtifolia</i>)	CA	Amador, Calaveras
manzanita, Morro (<i>Arctostaphylos morroensis</i>)	CA	San Luis Obispo
manzanita, pallid (<i>Arctostaphylos pallida</i>)	CA	Alameda, Contra Costa
manzanita, Santa Rosa Island (<i>Arctostaphylos confertiflora</i>)	CA	Santa Barbara
Mapele (<i>Cyrtandra cyaneoides</i>)	HI	Kauai
Mehamehame (<i>Flueggea neowawraea</i>)	HI	Kauai, Maui
milk-vetch, Applegate's (<i>Astragalus applegatei</i>)	OR	Klamath
milk-vetch, Ash meadows (<i>Astragalus phoenix</i>)	NV	Nye
milk-vetch, Braunton's (<i>Astragalus brauntonii</i>)	CA	Los Angeles, Orange, Ventura
milk-vetch, Clara Hunt's (<i>Astragalus clarianus</i>)	CA	Napa, Sonoma
milk-vetch, Coachella Valley (<i>Astragalus lentiginosus var. coachellae</i>)	CA	Riverside
milk-vetch, coastal dunes (<i>Astragalus tener var. titi</i>)	CA	Monterey
milk-vetch, Cushenbury (<i>Astragalus albens</i>)	CA	San Bernardino

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

Species	State	Affected Counties
milk-vetch, Deseret (<i>Astragalus desereticus</i>)	UT	Utah
milk-vetch, Fish Slough (<i>Astragalus lentiginosus</i> <i>var. piscinensis</i>)	CA	Inyo, Mono
milk-vetch, heliotrope (<i>Astragalus montii</i>)	UT	Sanpete, Sevier
milk-vetch, Holmgren (<i>Astragalus holmgreniorum</i>)	AZ UT	Mohave Washington
milk-vetch, Jesup's (<i>Astragalus robbinsii</i> <i>var.</i> <i>jesupi</i>)	NH VT	Sullivan Windsor
milk-vetch, Lane Mountain (<i>Astragalus</i> <i>jaegerianus</i>)	CA	San Bernardino
milk-vetch, Mancos (<i>Astragalus humillimus</i>)	CO NM	Montezuma San Juan
milk-vetch, Osterhout (<i>Astragalus osterhoutii</i>)	CO	Grand
milk-vetch, Peirson's (<i>Astragalus magdalenae</i> <i>var. peirsonii</i>)	CA	Imperial
milk-vetch, Sentry (<i>Astragalus cremnophylax</i> <i>var.</i> <i>cremnophylax</i>)	AZ	Coconino
milk-vetch, Shivwitz (<i>Astragalus ampullarioides</i>)	UT	Washington
milk-vetch, triple-ribbed (<i>Astragalus tricarinatus</i>)	CA	Riverside, San Bernardino
Milk-vetch, Ventura Marsh (<i>Astragalus</i> <i>pycnostachyus</i> <i>var.</i> <i>lanosissimus</i>)	CA	Ventura
milkweed, Mead's (<i>Asclepias meadii</i>)	IA IL KS MO	Adair, Clarke, Decatur, Lucas, Madison, Ringgold, Union, Warren, Wayne Ford, Saline Allen, Anderson, Bourbon, Coffey, Crawford, Douglas, Franklin, Jefferson, Johnson, Leavenworth, Linn, Miami, Neosho Barton, Benton, Cass, Cedar, Dade, Harrison, Iron, Pettis, Polk, Reynolds, St Clair, Vernon

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

Species	State	Affected Counties
milkweed, Welsh's (<i>Asclepias welshii</i>)	AZ UT	Coconino Kane
mint, Garrett's (<i>Dicerandra christmanii</i>)	FL	Highlands
mint, longspurred (<i>Dicerandra cornutissima</i>)	FL	Marion
mint, scrub (<i>Dicerandra frutescens</i>)	FL	Highlands
monardella, willowy (<i>Monardella linoides ssp. viminea</i>)	CA	San Diego
monkshood, northern wild (<i>Aconitum noveboracense</i>)	IA NY OH WI	Allamakee, Clayton, Delaware, Dubuque, Jackson Delaware, Sullivan, Ulster Portage, Summit Grant, Monroe, Richland, Sauk, Vernon
mountain balm, Indian Knob (<i>Eriodictyon altissimum</i>)	CA	San Luis Obispo
mountain-mahogany, Catalina Island (<i>Cercocarpus traskiae</i>)	CA	Los Angeles
mustard, Carter's (<i>Warea carteri</i>)	FL	Highlands
mustard, Penland alpine fen (<i>Eutrema penlandii</i>)	CO	Park
mustard, slender-petaled (<i>Thelypodium stenopetalum</i>)	CA	San Bernardino
na'ena'e (<i>Dubautia latifolia</i>)	HI	Kauai
na'ena'e (<i>Dubautia pauciflorula</i>)	HI	Kauai
na'ena'e (<i>Dubautia plantaginea ssp. humilis</i>)	HI	Maui
nani wai'ale'ale (<i>Viola kauaiensis var. wahiawaensis</i>)	HI	Kauai
naupaka, dwarf (<i>Scaevola coriacea</i>)	HI	Maui
Nehe (<i>Lipochaeta fauriei</i>)	HI	Kauai
Nehe (<i>Lipochaeta kamolensis</i>)	HI	Maui

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

Species	State	Affected Counties
nehe (<i>Lipochaeta micrantha</i>)	HI	Kauai
Nehe (<i>Lipochaeta waimeaensis</i>)	HI	Kauai
No common name (<i>Abutilon eremitopetalum</i>)	HI	Maui
No common name (<i>Alsinidendron viscosum</i>)	HI	Kauai
No common name (<i>Bonamia menziesii</i>)	HI	Kauai, Maui
No common name (<i>Chamaesyce halemanui</i>)	HI	Kauai
No common name (<i>Delissea rhytidosperra</i>)	HI	Kauai
No common name (<i>Geocarpon minimum</i>)	AR MO	Drew, Franklin Cedar, Dade, Greene, Henry, Lawrence, Polk, St Clair
No common name (<i>Gouania hillebrandii</i>)	HI	Maui
No common name (<i>Gouania meyenii</i>)	HI	Kauai
No common name (<i>Hesperomannia arborescens</i>)	HI	Maui
No common name (<i>Hesperomannia arbuscula</i>)	HI	Maui
No common name (<i>Hesperomannia lydgatei</i>)	HI	Kauai
No common name (<i>Lobelia niihauensis</i>)	HI	Kauai
No common name (<i>Lysimachia filifolia</i>)	HI	Kauai
No common name (<i>Lysimachia lydgatei</i>)	HI	Maui
No common name (<i>Lysimachia maxima</i>)	HI	Maui
No common name (<i>Munroidendron racemosum</i>)	HI	Kauai
No common name (<i>Neraudia sericea</i>)	HI	Maui

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

Species	State	Affected Counties
No common name (<i>Phyllostegia glabra</i> var. <i>lanaiensis</i>)	HI	Maui
No common name (<i>Phyllostegia knudsenii</i>)	HI	Kauai
No common name (<i>Phyllostegia mannii</i>)	HI	Maui
No common name (<i>Phyllostegia mollis</i>)	HI	Maui
No common name (<i>Phyllostegia waimeae</i>)	HI	Kauai
No common name (<i>Phyllostegia wawrana</i>)	HI	Kauai
No common name (<i>Remya kauaiensis</i>)	HI	Kauai
No common name (<i>Remya montgomeryi</i>)	HI	Kauai
No common name (<i>Sanicula purpurea</i>)	HI	Maui
No common name (<i>Schiedea haleakalensis</i>)	HI	Maui
No common name (<i>Schiedea helleri</i>)	HI	Kauai
No common name (<i>Schiedea kauaiensis</i>)	HI	Kauai
No common name (<i>Schiedea lydgatei</i>)	HI	Maui
No common name (<i>Schiedea membranacea</i>)	HI	Kauai
No common name (<i>Schiedea nuttallii</i>)	HI	Kauai
No common name (<i>Schiedea sarmentosa</i>)	HI	Maui
No common name (<i>Schiedea spergulina</i> var. <i>leiopoda</i>)	HI	Kauai
No common name (<i>Schiedea spergulina</i> var. <i>spergulina</i>)	HI	Kauai
No common name (<i>Silene alexandri</i>)	HI	Maui
No common name (<i>Silene lanceolata</i>)	HI	Kauai, Maui

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

Species	State	Affected Counties
No common name (<i>Spermolepis hawaiiensis</i>)	HI	Kauai, Maui
No common name (<i>Stenogyne bifida</i>)	HI	Maui
No common name (<i>Stenogyne campanulata</i>)	HI	Kauai
No common name (<i>Tetramolopium remyi</i>)	HI	Maui
No common name (<i>Tetramolopium rockii</i>)	HI	Maui
No common name (<i>Vigna o-wahuensis</i>)	HI	Kauai, Maui
No common name (<i>Viola helenae</i>)	HI	Kauai
No common name (<i>Viola lanaiensis</i>)	HI	Maui
No common name (<i>Xylosma crenatum</i>)	HI	Kauai
Nohoanu (<i>Geranium multiflorum</i>)	HI	Maui
oak, Hinckley (<i>Quercus hinckleyi</i>)	TX	Presidio
oha (<i>Delissea rivularis</i>)	HI	Kauai
ohai (<i>Sesbania tomentosa</i>)	HI	Kauai, Maui
olulu (<i>Brighamia insignis</i>)	HI	Kauai
oxytheca, cushenbury (<i>Oxytheca parishii</i> var. <i>goodmaniana</i>)	CA	San Bernardino
paintbrush, ash-grey (<i>Castilleja cinerea</i>)	CA	San Bernardino
paintbrush, golden (<i>Castilleja levisecta</i>)	WA	Island, San Juan, Thurston
paintbrush, soft-leaved (<i>Castilleja mollis</i>)	CA	Santa Barbara
paintbrush, Tiburon (<i>Castilleja affinis</i> ssp. <i>neglecta</i>)	CA	Marin, Napa, Santa Clara
Pamakani (<i>Tetramolopium capillare</i>)	HI	Maui

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

Species	State	Affected Counties
pawpaw, beautiful (<i>Deeringothamnus pulchellus</i>)	FL	Lee
pawpaw, four-petal (<i>Asimina tetramera</i>)	FL	Palm Beach
pawpaw, Rugel's (<i>Deeringothamnus rugelii</i>)	FL	Volusia
penny-cress, Kneeland Prairie (<i>Thlaspi californicum</i>)	CA	Humboldt
pennyroyal, Todsens (<i>Hedeoma todsenii</i>)	NM	Otero, Sierra
penstemon, blowout (<i>Penstemon haydenii</i>)	NE	Box Butte, Cherry, Garden, Hooker, Morrill, Sheridan
pentachaeta, Lyon's (<i>Pentachaeta lyonii</i>)	CA	Los Angeles, Ventura
pentachaeta, white-rayed (<i>Pentachaeta bellidiflora</i>)	CA	Marin
phacelia, clay (<i>Phacelia argillacea</i>)	UT	Utah
phacelia, island (<i>Phacelia insularis ssp. insularis</i>)	CA	Santa Barbara
phlox, Texas trailing (<i>Phlox nivalis ssp. texensis</i>)	TX	Hardin, Polk, Tyler
phlox, Yreka (<i>Phlox hirsuta</i>)	CA	Siskiyou
Pigeon Wings (<i>Clitoria fragrans</i>)	FL	Highlands
Pilo (<i>Hedyotis mannii</i>)	HI	Maui
pinkroot, gentian (<i>Spigelia gentianoides</i>)	FL	Calhoun, Jackson
pitaya, Davis' green (<i>Echinocereus viridiflorus var. davisii</i>)	TX	Brewster
plum, scrub (<i>Prunus geniculata</i>)	FL	Highlands
Po'e (<i>Portulaca sclerocarpa</i>)	HI	Maui
polygala, Lewton's (<i>Polygala lewtonii</i>)	FL	Highlands, Marion

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

Species	State	Affected Counties
poppy, Sacramento prickly (<i>Argemone pleiacantha ssp. pinnatisecta</i>)	NM	Otero
poppy-mallow, Texas (<i>Callirhoe scabriuscula</i>)	TX	Coke, Mitchell, Runnels
potato-bean, Price's (<i>Apios priceana</i>)	AL IL KY TN	Autauga, Madison, Marshall Union Livingston, Lyon, Trigg De Kalb, Marion, Montgomery, Williamson
potentilla, Hickman's (<i>Potentilla hickmanii</i>)	CA	Monterey
prairie-clover, leafy (<i>Dalea foliosa</i>)	AL IL TN	Franklin, Lawrence, Morgan Williamson Davidson, Marshall, Maury, Rutherford, Williamson, Wilson
primrose, Maguire (<i>Primula maguirei</i>)	UT	Cache
Pua 'ala (<i>Brighamia rockii</i>)	HI	Maui
pussypaws, Mariposa (<i>Calyptridium pulchellum</i>)	CA	Fresno, Madera, Mariposa
reed-mustard, Barneby (<i>Schoenocrambe barnebyi</i>)	UT	Emery, Wayne
reed-mustard, clay (<i>Schoenocrambe argillacea</i>)	UT	Uintah
reed-mustard, shrubby (<i>Schoenocrambe suffrutescens</i>)	UT	Duchesne, Uintah
remya, Maui (<i>Remya mauiensis</i>)	HI	Maui
ridge-cress, Barneby (<i>Lepidium barnebyanum</i>)	UT	Duchesne
rock-cress, Braun's (<i>Arabis perstellata</i>)	KY TN	Franklin, Owen Rutherford
rock-cress, Hoffmann's (<i>Arabis hoffmannii</i>)	CA	Santa Barbara
rock-cress, McDonald's (<i>Arabis mcdonaldiana</i>)	CA	Mendocino
rock-cress, shale barren (<i>Arabis serotina</i>)	VA WV	Alleghany, Augusta, Bath, Highland, Page, Rockbridge, Shenandoah Greenbrier, Hardy, Pendleton

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

Species	State	Affected Counties
rockcress, Santa Cruz Island (<i>Sibara filifolia</i>)	CA	Los Angeles
rosemary, Cumberland (<i>Conradina verticillata</i>)	KY TN	Mason Cumberland, Fentress, Morgan, Scott, White
rosemary, Etonia (<i>Conradina etonia</i>)	FL	Putnam
rosemary, short-leaved (<i>Conradina brevifolia</i>)	FL	Highlands
roseroot, Leedy's (<i>Sedum integrifolium ssp. leedyi</i>)	MN NY	Fillmore, Olmsted Cayuga, Schuyler, Yates
rush-pea, slender (<i>Hoffmannseggia tenella</i>)	TX	Kleberg, Nueces
rush-rose, island (<i>Helianthemum greenei</i>)	CA	Los Angeles
sand-verbena, large-fruited (<i>Abronia macrocarpa</i>)	TX	Freestone, Leon, Robertson
sandalwood, Lanai (= 'iliahi) (<i>Santalum freycinetianum var. lanaiense</i>)	HI	Maui
sandwort, Bear Valley (<i>Arenaria ursina</i>)	CA	San Bernardino
sandwort, Cumberland (<i>Arenaria cumberlandensis</i>)	KY TN	Mason Fentress, Morgan, Pickett, Scott
skullcap, large-flowered (<i>Scutellaria montana</i>)	GA TN	Catoosa, Dade, Floyd, Murray, Walker, Whitfield Hamilton, Marion, Sequatchie
Snakeroot (<i>Eryngium cuneifolium</i>)	FL	Highlands, Putnam
snowbells, Texas (<i>Styrax texanus</i>)	TX	Kimble, Uvalde, Val Verde
spineflower, Howell's (<i>Chorizanthe howellii</i>)	CA	Mendocino
spineflower, Monterey (<i>Chorizanthe pungens var. pungens</i>)	CA	Monterey
spineflower, Orcutt's (<i>Chorizanthe orcuttiana</i>)	CA	Orange, San Diego
spineflower, Robust (incl. Scotts Valley) (<i>Chorizanthe robusta (incl. vars. robusta and hartwegii)</i>)	CA	Monterey

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

Species	State	Affected Counties
spineflower, slender-horned (<i>Dodecahema leptoceras</i>)	CA	Los Angeles, Riverside, San Bernardino, San Diego
spineflower, Sonoma (<i>Chorizanthe valida</i>)	CA	Marin, Sonoma
spiraea, Virginia (<i>Spiraea virginiana</i>)	GA KY NC TN VA WV	Dade, Walker Laurel, Pulaski, Rockcastle Ashe, Buncombe, Clay, Graham, Macon, Mitchell, Yancey Blount, Bradley, Cumberland, Morgan, Roane, Scott, Unicoi, Van Buren Carroll, Dickenson, Grayson, Wise Fayette, Greenbrier, Mercer, Nicholas, Raleigh, Upshur
spurge, telephus (<i>Euphorbia telephioides</i>)	FL	Bay
stickseed, showy (<i>Hackelia venusta</i>)	WA	Chelan
stonecrop, Lake County (<i>Parvisedum leiocarpum</i>)	CA	Alameda, Contra Costa, Mendocino, Napa, Santa Barbara, Santa Clara, Solano
sumac, Michaux's (<i>Rhus michauxii</i>)	NC VA	Cumberland, Davie, Franklin, Hoke, Moore, Richmond, Robeson, Scotland, Wake Dinwiddie, Nottoway
sunburst, Hartweg's golden (<i>Pseudobahia bahiifolia</i>)	CA	Fresno, Madera, Stanislaus
sunburst, San Joaquin adobe (<i>Pseudobahia peirsonii</i>)	CA	Fresno, Madera, Stanislaus
sunflower, Eggert's (<i>Helianthus eggertii</i>)	AL KY TN	Blount Barren, Edmonson, Grayson, Hardin, Hart Coffee, Dickson, Lawrence, Marion, Maury, Williamson
sunflower, Schweinitz's (<i>Helianthus schweinitzii</i>)	NC SC	Cabarrus, Mecklenburg, Rowan, Stanly, Stokes, Union Horry, Lexington, York
sunray, Ash Meadows (<i>Enceliopsis nudicaulis</i> var. <i>corrugata</i>)	NV	Nye
taraxacum, California (<i>Taraxacum californicum</i>)	CA	San Bernardino
tarplant, Gaviota (<i>Hemizonia increscens</i> ssp. <i>villosa</i>)	CA	Santa Barbara
tarplant, Otay (<i>Deinandra</i> (= <i>Hemizonia</i>) <i>conjugens</i>)	CA	San Diego

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

Species	State	Affected Counties
tarplant, Santa Cruz (<i>Holocarpha macradenia</i>)	CA	Contra Costa, Monterey
thistle, La Graciosa (<i>Cirsium loncholepis</i>)	CA	San Luis Obispo, Santa Barbara
thistle, Pitcher's (<i>Cirsium pitcheri</i>)	IN MI WI	Lake, Porter Alger, Allegan, Alpena, Antrim, Arenac, Benzie, Berrien, Charlevoix, Cheboygan, Chippewa, Delta, Emmet, Grand Traverse, Iosco, Leelanau, Mackinac, Manistee, Mason, Muskegon, Oceana, Ottawa, Presque Isle, Schoolcraft, Van Buren Door, Manitowoc, Sheboygan
thistle, Sacramento Mountains (<i>Cirsium vinaceum</i>)	NM	Otero
thistle, Suisun (<i>Cirsium hydrophilum</i> var. <i>hydrophilum</i>)	CA	Solano
thornmint, San Diego (<i>Acanthomintha ilicifolia</i>)	CA	San Diego
townsendia, Last Chance (<i>Townsendia aprica</i>)	UT	Emery, Sevier, Wayne
twinpod, Dudley Bluffs (<i>Physaria obcordata</i>)	CO	Rio Blanco
Uhiuhi (<i>Caesalpinia kavaense</i>)	HI	Maui
vervain, Red Hills (<i>Verbena californica</i>)	CA	Tuolumne
wallflower, Contra Costa (<i>Erysimum capitatum</i> var. <i>angustatum</i>)	CA	Contra Costa
wallflower, Menzies' (<i>Erysimum menziesii</i>)	CA	Humboldt, Mendocino, Monterey
whitlow-wort, papery (<i>Paronychia chartacea</i>)	FL	Highlands
wild-buckwheat, clay- loving (<i>Eriogonum pelinophilum</i>)	CO	Delta, Montrose
wild-buckwheat, gypsum (<i>Eriogonum gypsophilum</i>)	NM	Eddy

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

Species	State	Affected Counties
wild-buckwheat, southern mountain (<i>Eriogonum kennedyi</i> var. <i>austromontanum</i>)	CA	San Bernardino
wire-lettuce, Malheur (<i>Stephanomeria malheurensis</i>)	OR	Harney
Wireweed (<i>Polygonella basiramia</i>)	FL	Highlands
woodland-star, San Clemente Island (<i>Lithophragma maximum</i>)	CA	Los Angeles
woolly-star, Hoover's (<i>Eriastrum hooveri</i>)	CA	Fresno, Kern, Kings, San Luis Obispo, Santa Barbara
woolly-star, Santa Ana River (<i>Eriastrum densifolium</i> ssp. <i>sanctorum</i>)	CA	Orange, Riverside, San Bernardino
wooly-threads, San Joaquin (<i>Monolopia</i> (= <i>Lembertia</i>) <i>congdonii</i>)	CA	Fresno, Kern, Kings, San Benito, San Luis Obispo, Santa Barbara, Tulare
yellowhead, desert (<i>Yermo xanthocephalus</i>)	WY	Fremont
yerba santa, Lompoc (<i>Eriodictyon capitatum</i>)	CA	Santa Barbara
ziziphus, Florida (<i>Ziziphus celata</i>)	FL	Highlands
<i>Ferns and Allies</i>		
<i>Lifeform: Aquatic</i>		
quillwort, black spored (<i>Isoetes melanospora</i>)	GA SC	Greene, Jackson Lancaster
quillwort, Louisiana (<i>Isoetes louisianensis</i>)	LA	Washington Parish
quillwort, mat-forming (<i>Isoetes tegetiformans</i>)	GA	Columbia, Greene, Jackson
<i>Lifeform: Terrestrial</i>		
diellia, asplenium-leaved (<i>Diellia erecta</i>)	HI	Mau
fern, Alabama streak-sorus (<i>Thelypteris pilosa</i> var. <i>alabamensis</i>)	AL	Winston

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

Species	State	Affected Counties
fern, American hart's-tongue (<i>Asplenium scolopendrium</i> var. <i>americanum</i>)	AL IA MI NY TN	Jackson, Morgan Cerro Gordo Mackinac Madison, Onondaga Marion
fern, pendant kihi (<i>Adenophorus periens</i>)	HI	Kauai, Maui
No common name (<i>Diellia pallida</i>)	HI	Kauai
No common name (<i>Diellia unisora</i>)	HI	Maui
No common name (<i>Diplazium molokaiense</i>)	HI	Maui
No common name (<i>Pteris lidgatei</i>)	HI	Maui
Pauoa (<i>Ctenitis squamigera</i>)	HI	Maui
wawae`iole (<i>Huperzia manni</i>)	HI	Maui
Lichens		
Lifeform: Terrestrial		
cladonia, Florida perforate (<i>Cladonia perforata</i>)	FL	Highlands, Okaloosa
lichen, rock gnome (<i>Gymnoderma lineare</i>)	NC TN	Ashe, Avery, Buncombe, Haywood, Jackson, Mitchell, Rutherford, Transylvania, Yancey Sevier
Monocots		
Lifeform: Aquatic		
arrowhead, bunched (<i>Sagittaria fasciculata</i>)	NC SC	Buncombe, Henderson Greenville
beaked-rush, Knieskern's (<i>Rhynchospora knieskernii</i>)	NJ	Atlantic, Burlington, Camden, Monmouth, Ocean
bulrush, Northeastern (<i>Scirpus ancistrochaetus</i>)	MA MD PA VA VT WV	Franklin Washington Clinton, Cumberland, Dauphin, Franklin, Huntingdon, Lackawanna, Monroe, Union Alleghany, Augusta, Bath, Rockingham Windham Berkeley

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

Species	State	Affected Counties
grass, Colusa (<i>Neostapfia colusana</i>)	CA	Merced, Solano, Stanislaus, Yolo
grass, Solano (<i>Tuctoria mucronata</i>)	CA	Solano
lily, Pitkin Marsh (<i>Lilium pardalinum ssp. pitkinense</i>)	CA	Sonoma
Orcutt grass, California (<i>Orcuttia californica</i>)	CA	Riverside, San Diego, Ventura
Orcutt grass, hairy (<i>Orcuttia pilosa</i>)	CA	Glenn, Madera, Merced, Stanislaus, Tehama
Orcutt grass, Sacramento (<i>Orcuttia viscida</i>)	CA	Sacramento
Orcutt grass, slender (<i>Orcuttia tenuis</i>)	CA	Lake, Plumas, Sacramento, Shasta, Siskiyou, Tehama
pink, swamp (<i>Helonias bullata</i>)	DE MD NC NJ SC VA	Kent, New Castle, Sussex Anne Arundel, Cecil, Dorchester Henderson, Jackson, Transylvania Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester, Middlesex, Monmouth, Morris, Ocean, Salem Greenville Augusta, Caroline, Henrico, Nelson
pondweed, Little Aguja Creek (<i>Potamogeton clystocarpus</i>)	TX	Jeff Davis
seagrass, Johnson's (<i>Halophila johnsonii</i>)	FL	Brevard, Broward, Palm Beach
sedge, Navajo (<i>Carex specuicola</i>)	AZ UT	Apache, Coconino, Navajo San Juan
sedge, white (<i>Carex albida</i>)	CA	Sonoma
tuctoria, Greene's (<i>Tuctoria greenei</i>)	CA	Butte, Merced, Shasta, Tehama
water-plantain, Kral's (<i>Sagittaria secundifolia</i>)	AL	De Kalb, Winston
wild-rice, Texas (<i>Zizania texana</i>)	TX	Hays
Lifeform: Both		
sedge, golden (<i>Carex lutea</i>)	NC	Pender
Lifeform: Terrestrial		

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

Species	State	Affected Counties
agave, Arizona (<i>Agave arizonica</i>)	AZ	Gila, Maricopa, Yavapai
alopecurus, Sonoma (<i>Alopecurus aequalis</i> var. <i>sonomensis</i>)	CA	Marin, Sonoma
beargrass, Britton's (<i>Nolina brittoniana</i>)	FL	Hernando, Highlands
bluegrass, Hawaiian (<i>Poa sandvicensis</i>)	HI	Kauai
bluegrass, Mann's (<i>Poa mannii</i>)	HI	Kauai
bluegrass, Napa (<i>Poa napensis</i>)	CA	Napa
bluegrass, San Bernardino (<i>Poa atropurpurea</i>)	CA	San Bernardino, San Diego
brodiaea, Chinese Camp (<i>Brodiaea pallida</i>)	CA	Tuolumne
brodiaea, thread-leaved (<i>Brodiaea filifolia</i>)	CA	Los Angeles, Orange, Riverside, San Bernardino, San Diego
Fritillary, Gentner's (<i>Fritillaria gentneri</i>)	OR	Jackson, Josephine
grass, Eureka Dune (<i>Swallenia alexandrae</i>)	CA	Inyo
grass, Tennessee yellow-eyed (<i>Xyris tennesseensis</i>)	AL GA	Calhoun, Franklin Bartow, Whitfield
iris, dwarf lake (<i>Iris lacustris</i>)	MI WI	Alpena, Charlevoix, Cheboygan, Chippewa, Delta, Emmet, Mackinac, Menominee, Presque Isle, Schoolcraft Brown, Door
irisette, white (<i>Sisyrinchium dichotomum</i>)	NC SC	Henderson, Polk, Rutherford Greenville
ischaemum, Hilo (<i>Ischaemum byrone</i>)	HI	Kauai, Maui
Kamanomano (<i>Cenchrus agrimonioides</i>)	HI	Maui
ladies'-tresses, Canelo Hills (<i>Spiranthes delitescens</i>)	AZ	Cochise, Santa Cruz
ladies'-tresses, Navasota (<i>Spiranthes parksii</i>)	TX	Brazos, Burleson, Freestone, Grimes, Jasper, Leon, Madison, Robertson, Washington
ladies'-tresses, Ute (<i>Spiranthes diluvialis</i>)	CO NV	Boulder, Jefferson, Morgan, Weld Lincoln

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

Species	State	Affected Counties
	UT	Daggett, Duchesne, Garfield, Salt Lake, Tooele, Uintah, Utah, Wayne, Weber
lau 'ehu (<i>Panicum niuhauense</i>)	HI	Kauai
lily, Minnesota dwarf trout (<i>Erythronium propullans</i>)	MN	Goodhue, Rice, Steele
lily, Western (<i>Lilium occidentale</i>)	CA OR	Humboldt Coos
lo'ulu (<i>Pritchardia munroi</i>)	HI	Maui
lo'ulu (<i>Pritchardia napaliensis</i>)	HI	Kauai
lo'ulu (<i>Pritchardia viscosa</i>)	HI	Kauai
No common name (<i>Gahnia lanaiensis</i>)	HI	Maui
No common name (<i>Mariscus fauriei</i>)	HI	Maui
No common name (<i>Mariscus pennatiformis</i>)	HI	Kauai, Maui
No common name (<i>Platanthera holochila</i>)	HI	Kauai, Maui
No common name (<i>Poa siphonoglossa</i>)	HI	Kauai
onion, Munz's (<i>Allium munzii</i>)	CA	Riverside
orchid, eastern prairie fringed (<i>Platanthera leucophaea</i>)	IA IL ME MI OH OK VA WI	Appanoose, Cedar, Davis, Decatur, Des Moines, Henry, Iowa, Jefferson, Johnson, Keokuk, Lee, Louisa, Lucas, Monroe, Muscatine, Scott, Van Buren, Wapello, Washington, Wayne Cook, Du Page, Grundy, Henry, Iroquois, Kane, Lake, Massac Aroostook Bay, Huron, Livingston, Monroe, Saginaw, St Clair, St Joseph, Tuscola, Washtenaw, Wayne Coshocton, Holmes, Lucas, Ottawa, Sandusky, Wayne Choctaw Augusta Dane, Jefferson, Kenosha, Ozaukee, Rock, Walworth, Waukesha, Winnebago

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

Species	State	Affected Counties
orchid, western prairie fringed (<i>Platanthera praeclara</i>)	IA KS MN MO ND NE OK SD	Adair, Appanoose, Audubon, Benton, Black Hawk, Boone, Bremer, Buchanan, Buena Vista, Butler, Calhoun, Carroll, Cass, Cedar, Cerro Gordo, Cherokee, Chickasaw, Clarke, Clayton, Clinton, Crawford, Dallas, Davis, Decatur, Delaware, Des Moines, Dickinson, Dubuque, Emmet, Fayette, Floyd, Franklin, Fremont, Greene, Grundy, Guthrie, Hamilton, Hancock, Hardin, Harrison, Henry, Howard, Humboldt, Ida, Iowa, Jackson, Jasper, Jefferson, Johnson, Keokuk, Kossuth, Lee, Linn, Louisa, Lucas, Lyon, Madison, Mahaska, Marion, Marshall, Mills, Mitchell, Monroe, Montgomery, Muscatine, O'Brien, Osceola, Page, Palo Alto, Plymouth, Polk, Pottawattami, Poweshiek, Ringgold, Sac, Scott, Shelby, Sioux, Story, Tama, Taylor, Union, Van Buren, Wapello, Warren, Washington, Wayne, Webster, Winnebago, Woodbury, Worth, Wright Anderson, Atchison, Coffey, Crawford, Douglas, Franklin, Jackson, Jefferson, Johnson, Leavenworth, Lyon, Osage, Pottawatomie, Riley, Shawnee Clay, Dodge, Douglas, Faribault, Fillmore, Freeborn, Kandiyohi, Kittson, Mower, Nobles, Norman, Pennington, Pipestone, Polk, Rock Atchison, Harrison, Holt Ransom, Richland Cherry, Hall, Lancaster, Seward Craig, Rogers Bennett, Brookings, Brown, Clay, Codington, Day, Deuel, Grant, Lincoln, Minnehaha, Moody, Roberts, Todd, Turner, Union, Yankton
panicgrass, Carter's (<i>Panicum fauriei</i> var. <i>carteri</i>)	HI	Maui
piperia, Yadon's (<i>Piperia yadonii</i>)	CA	Monterey
pogonia, small whorled (<i>Isotria medeoloides</i>)	CT DE GA IL MA ME MI NC NH NJ	Litchfield, Tolland New Castle Bartow, Catoosa, Dade, Dawson, Fannin, Floyd, Gilmer, Lumpkin, Murray, Towns, Union, Walker, White, Whitfield Randolph Essex, Hampden, Hampshire, Worcester Cumberland, Kennebec, Oxford, York Berrien Burke, Haywood, Henderson, Jackson, Macon, Surry Belknap, Carroll, Hillsborough, Merrimack, Rockingham, Strafford Sussex

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

Species	State	Affected Counties
	NY	Onondaga
	PA	Centre, Venango
	RI	Providence
	SC	Oconee
	TN	Hamilton
	VA	Appomattox, Buckingham, Caroline, Gloucester, James City, King William, Lee, New Kent, Prince William, Stafford, Wise
Pu'uka'a (<i>Cyperus trachysanthos</i>)	HI	Kauai
trillium, persistent (<i>Trillium persistens</i>)	GA	Stephens
	SC	Oconee
trillium, relict (<i>Trillium reliquum</i>)	AL	Henry, Lee
	GA	Columbia, Macon
Wahane (<i>Pritchardia aylmer-robinsonii</i>)	HI	Kauai

* Lifeform classification from FESTF IMS.

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

State	Taxa Name	Species Name	County Count
AL	Dicots	amphianthus, little (<i>Amphianthus pusillus</i>)	1
		bladderpod, lyrate (<i>Lesquerella lyrata</i>)	3
		button, Mohr's Barbara (<i>Marshallia mohrii</i>)	3
		Harperella (<i>Ptilimnium nodosum</i>)	6
		leather flower, Alabama (<i>Clematis socialis</i>)	3
		leather flower, Morefield's (<i>Clematis morefieldii</i>)	1
		pitcher-plant, Alabama canebrake (<i>Sarracenia rubra alabamensis</i>)	2
		pitcher-plant, green (<i>Sarracenia oreophila</i>)	5
		potato-bean, Price's (<i>Apios priceana</i>)	3
		prairie-clover, leafy (<i>Dalea foliosa</i>)	3
		sunflower, Eggert's (<i>Helianthus eggertii</i>)	1
	Ferns and Allies	fern, Alabama streak-sorus (<i>Thelypteris pilosa</i> var. <i>alabamensis</i>)	1
		fern, American hart's-tongue (<i>Asplenium scolopendrium</i> var. <i>americanum</i>)	2
	Monocots	grass, Tennessee yellow-eyed (<i>Xyris tennesseensis</i>)	2
		trillium, relict (<i>Trillium reliquum</i>)	2
water-plantain, Kral's (<i>Sagittaria secundifolia</i>)		2	
AR	Dicots	Harperella (<i>Ptilimnium nodosum</i>)	1
		No common name (<i>Geocarpon minimum</i>)	2
		Pondberry (<i>Lindera melissifolia</i>)	2
AZ	Dicots	blue-star, Kearney's (<i>Amsonia kearneyana</i>)	1
		cactus, Arizona hedgehog (<i>Echinocereus triglochidiatus</i> var. <i>arizonicus</i>)	3
		cactus, Brady pincushion (<i>Pediocactus bradyi</i>)	1
		cactus, Cochise pincushion (<i>Coryphantha robbinsorum</i>)	1
		cactus, Nichol's Turk's head (<i>Echinocactus horizonthalonius</i> var. <i>nicholii</i>)	2
		cactus, Peebles Navajo (<i>Pediocactus peeblesianus</i> var. <i>peeblesianus</i>)	1
		cactus, Pima pineapple (<i>Coryphantha scheeri</i> var. <i>robustispina</i>)	2
		cactus, Siler pincushion (<i>Pediocactus</i> (= <i>Echinocactus</i> , = <i>Utahia</i>) <i>sileri</i>)	2
		Cliff-rose, Arizona (<i>Purshia</i> (= <i>Cowania</i>) <i>subintegra</i>)	4
		Cycladenia, Jones (<i>Cycladenia jonesii</i> (= <i>humilis</i>))	1
		fleabane, Zuni (<i>Erigeron rhizomatus</i>)	1
		groundsel, San Francisco Peaks (<i>Senecio franciscanus</i>)	1
		milk-vetch, Holmgren (<i>Astragalus holmgreniorum</i>)	1
		milk-vetch, Sentry (<i>Astragalus cremnophylax</i> var. <i>cremnophylax</i>)	1
		milkweed, Welsh's (<i>Asclepias welshii</i>)	1

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

State	Taxa Name	Species Name	County Count
AZ	Dicots	water-umbel, Huachuca (<i>Lilaeopsis schaffneriana</i> var. <i>recurva</i>)	3
	Monocots	agave, Arizona (<i>Agave arizonica</i>)	3
		ladies'-tresses, Canelo Hills (<i>Spiranthes delitescens</i>)	2
		sedge, Navajo (<i>Carex specuicola</i>)	3
CA	Conifers and Cycads	cypress, Gowen (<i>Cupressus goveniana</i> ssp. <i>goveniana</i>)	1
	Dicots	allocarya, Calistoga (<i>Plagiobothrys strictus</i>)	1
		ambrosia, San Diego (<i>Ambrosia pumila</i>)	2
		amole, purple (<i>Chlorogalum purpureum</i>)	2
		baccharis, Encinitas (<i>Baccharis vanessae</i>)	2
		Barberry, island (<i>Berberis pinnata</i> ssp. <i>insularis</i>)	1
		barberry, Nevin's (<i>Berberis nevinii</i>)	2
		Barberry, Truckee (<i>Berberis</i> (= <i>Mahonia</i>) <i>sonnei</i>)	3
		bedstraw, island (<i>Galium buxifolium</i>)	1
		bird's beak, palmate-bracted (<i>Cordylanthus palmatus</i>)	6
		bird's-beak, Pennell's (<i>Cordylanthus tenuis</i> ssp. <i>capillaris</i>)	1
		bird's-beak, salt marsh (<i>Cordylanthus maritimus</i> ssp. <i>maritimus</i>)	6
		bird's-beak, soft (<i>Cordylanthus mollis</i> ssp. <i>mollis</i>)	3
		bladderpod, San Bernardino Mountains (<i>Lesquerella kingii</i> ssp. <i>bernardina</i>)	1
		bluecurls, Hidden Lake (<i>Trichostema austromontanum</i> ssp. <i>compactum</i>)	1
		broom, San Clemente Island (<i>Lotus dendroideus</i> ssp. <i>traskiae</i>)	1
		buckwheat, cushenbury (<i>Eriogonum ovalifolium</i> var. <i>vineum</i>)	1
		buckwheat, Ione (incl. Irish Hill) (<i>Eriogonum apricum</i> (incl. var. <i>prostratum</i>))	1
		bush-mallow, San Clemente Island (<i>Malacothamnus clementinus</i>)	1
		bush-mallow, Santa Cruz Island (<i>Malacothamnus fasciculatus</i> var. <i>nesioticus</i>)	1
		butterweed, Layne's (<i>Senecio layneae</i>)	1
		button-celery, San Diego (<i>Eryngium aristulatum</i> var. <i>parishii</i>)	2
		cactus, Bakersfield (<i>Opuntia treleasei</i>)	1
		ceanothus, coyote (<i>Ceanothus ferrisae</i>)	1
		ceanothus, Vail Lake (<i>Ceanothus ophiochilus</i>)	1
		centaury, spring-loving (<i>Centaureium namophilum</i>)	1
		Checker-mallow, Keck's (<i>Sidalcea keckii</i>)	2
		checker-mallow, Kenwood Marsh (<i>Sidalcea oregana</i> ssp. <i>valida</i>)	1
		checker-mallow, pedate (<i>Sidalcea pedata</i>)	1

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

State	Taxa Name	Species Name	County Count
CA	Dicots	clarkia, Pismo (<i>Clarkia speciosa</i> ssp. <i>immaculata</i>)	1
		clarkia, Presidio (<i>Clarkia franciscana</i>)	1
		clarkia, Springville (<i>Clarkia springvillensis</i>)	1
		clarkia, Vine Hill (<i>Clarkia imbricata</i>)	1
		clover, Monterey (<i>Trifolium trichocalyx</i>)	1
		clover, showy Indian (<i>Trifolium amoenum</i>)	2
		crownbeard, big-leaved (<i>Verbesina dissita</i>)	2
		crownscale, San Jacinto Valley (<i>Atriplex coronata</i> var. <i>notatior</i>)	1
		daisy, Parish's (<i>Erigeron parishii</i>)	2
		dudleya, Conejo (<i>Dudleya abramsii</i> ssp. <i>parva</i>)	1
		dudleya, marcescent (<i>Dudleya cymosa</i> ssp. <i>marcescens</i>)	3
		dudleya, Santa Clara Valley (<i>Dudleya setchellii</i>)	6
		dudleya, Santa Cruz Island (<i>Dudleya nesiotica</i>)	1
		dudleya, Verity's (<i>Dudleya verityi</i>)	1
		dudleyea, Santa Monica Mountains (<i>Dudleya cymosa</i> ssp. <i>ovatifolia</i>)	3
		dwarf-flax, Marin (<i>Hesperolinon congestum</i>)	1
		evening-primrose, Antioch Dunes (<i>Oenothera deltoides</i> ssp. <i>howellii</i>)	2
		evening-primrose, Eureka Valley (<i>Oenothera avita</i> ssp. <i>eurekensis</i>)	1
		evening-primrose, San Benito (<i>Camissonia benitensis</i>)	1
		fiddleneck, large-flowered (<i>Amsinckia grandiflora</i>)	3
		flannelbush, Mexican (<i>Fremontodendron mexicanum</i>)	1
		fringepod, Santa Cruz Island (<i>Thysanocarpus conchuliferus</i>)	1
		gilia, Hoffmann's slender-flowered (<i>Gilia tenuiflora</i> ssp. <i>hoffmannii</i>)	1
		gilia, Monterey (<i>Gilia tenuiflora</i> ssp. <i>arenaria</i>)	1
		goldfields, Burke's (<i>Lasthenia burkei</i>)	3
		goldfields, Contra Costa (<i>Lasthenia conjugens</i>)	7
		gumplant, Ash Meadows (<i>Grindelia fraxino-pratensis</i>)	1
		indian paintbrush, San Clemente Island (<i>Castilleja grisea</i>)	1
		ivesia, Ash Meadows (<i>Ivesia kingii</i> var. <i>eremica</i>)	1
		jewelflower, California (<i>Caulanthus californicus</i>)	6
		jewelflower, Tiburon (<i>Streptanthus niger</i>)	1
		larkspur, Baker's (<i>Delphinium bakeri</i>)	1
		larkspur, San Clemente Island (<i>Delphinium variegatum</i> ssp. <i>kinkiense</i>)	1
		larkspur, yellow (<i>Delphinium luteum</i>)	1
		layia, beach (<i>Layia carnosa</i>)	4
		liveforever, Laguna Beach (<i>Dudleya stolonifera</i>)	1
		liveforever, Santa Barbara Island (<i>Dudleya traskiae</i>)	1

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

State	Taxa Name	Species Name	County Count
CA	Dicots	lupine, clover (<i>Lupinus tidestromii</i>)	4
		lupine, Nipomo Mesa (<i>Lupinus nipomensis</i>)	1
		malacothrix, island (<i>Malacothrix squalida</i>)	1
		malacothrix, Santa Cruz Island (<i>Malacothrix indecora</i>)	2
		mallow, Kern (<i>Eremalche kernensis</i>)	1
		manzanita, Del Mar (<i>Arctostaphylos glandulosa</i> ssp. <i>crassifolia</i>)	2
		manzanita, Ione (<i>Arctostaphylos myrtifolia</i>)	2
		manzanita, Morro (<i>Arctostaphylos morroensis</i>)	1
		manzanita, pallid (<i>Arctostaphylos pallida</i>)	2
		manzanita, Santa Rosa Island (<i>Arctostaphylos confertiflora</i>)	1
		meadowfoam, Butte County (<i>Limnanthes floccosa</i> ssp. <i>californica</i>)	2
		meadowfoam, Sebastopol (<i>Limnanthes vinculans</i>)	1
		mesa-mint, Otay (<i>Pogogyne nudiuscula</i>)	2
		mesa-mint, San Diego (<i>Pogogyne abramsii</i>)	1
		milk-vetch, Braunton's (<i>Astragalus brauntonii</i>)	3
		milk-vetch, Clara Hunt's (<i>Astragalus clarianus</i>)	2
		milk-vetch, Coachella Valley (<i>Astragalus lentiginosus</i> var. <i>coachellae</i>)	1
		milk-vetch, coastal dunes (<i>Astragalus tener</i> var. <i>titi</i>)	1
		milk-vetch, Cushenbury (<i>Astragalus albens</i>)	1
		milk-vetch, Fish Slough (<i>Astragalus lentiginosus</i> var. <i>piscinensis</i>)	2
		milk-vetch, Lane Mountain (<i>Astragalus jaegerianus</i>)	1
		milk-vetch, Peirson's (<i>Astragalus magdalenae</i> var. <i>peirsonii</i>)	1
		milk-vetch, triple-ribbed (<i>Astragalus tricarinatus</i>)	2
		Milk-vetch, Ventura Marsh (<i>Astragalus pycnostachyus</i> var. <i>lanosissimus</i>)	1
		monardella, willowy (<i>Monardella linoides</i> ssp. <i>viminea</i>)	1
		mountain balm, Indian Knob (<i>Eriodictyon altissimum</i>)	1
		mountain-mahogany, Catalina Island (<i>Cercocarpus traskiae</i>)	1
		mustard, slender-petaled (<i>Thelypodium stenopetalum</i>)	1
		navarretia, few-flowered (<i>Navarretia leucocephala</i> ssp. <i>pauciflora</i> (=N. <i>pauciflora</i>))	7
		navarretia, many-flowered (<i>Navarretia leucocephala</i> ssp. <i>plieantha</i>)	7
		navarretia, spreading (<i>Navarretia fossalis</i>)	3
		niterwort, Amargosa (<i>Nitrophila mohavensis</i>)	1
		owl's-clover, fleshy (<i>Castilleja campestris</i> ssp. <i>succulenta</i>)	4

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

State	Taxa Name	Species Name	County Count
CA	Dicots	oxytheca, cushenbury (<i>Oxytheca parishii</i> var. <i>goodmaniana</i>)	1
		paintbrush, ash-grey (<i>Castilleja cinerea</i>)	1
		paintbrush, soft-leaved (<i>Castilleja mollis</i>)	1
		paintbrush, Tiburon (<i>Castilleja affinis</i> ssp. <i>neglecta</i>)	3
		penny-cress, Kneeland Prairie (<i>Thlaspi californicum</i>)	1
		pentachaeta, Lyon's (<i>Pentachaeta lyonii</i>)	2
		pentachaeta, white-rayed (<i>Pentachaeta bellidiflora</i>)	1
		phacelia, island (<i>Phacelia insularis</i> ssp. <i>insularis</i>)	1
		phlox, Yreka (<i>Phlox hirsuta</i>)	1
		potentilla, Hickman's (<i>Potentilla hickmanii</i>)	1
		pussypaws, Mariposa (<i>Calyptridium pulchellum</i>)	3
		rock-cress, Hoffmann's (<i>Arabis hoffmannii</i>)	1
		rock-cress, McDonald's (<i>Arabis mcdonaldiana</i>)	1
		rockcress, Santa Cruz Island (<i>Sibara filifolia</i>)	1
		rush-rose, island (<i>Helianthemum greenei</i>)	1
		sandwort, Bear Valley (<i>Arenaria ursina</i>)	1
		sandwort, Marsh (<i>Arenaria paludicola</i>)	1
		seablite, California (<i>Suaeda californica</i>)	1
		spineflower, Howell's (<i>Chorizanthe howellii</i>)	1
		spineflower, Monterey (<i>Chorizanthe pungens</i> var. <i>pungens</i>)	1
		spineflower, Orcutt's (<i>Chorizanthe orcuttiana</i>)	2
		spineflower, Robust (incl. Scotts Valley) (<i>Chorizanthe robusta</i> (incl. vars. <i>robusta</i> and <i>hartwegii</i>))	1
		spineflower, slender-horned (<i>Dodecahema leptoceras</i>)	4
		spineflower, Sonoma (<i>Chorizanthe valida</i>)	2
		spurge, Hoover's (<i>Chamaesyce hooveri</i>)	5
		stonecrop, Lake County (<i>Parvisedum leiocarpum</i>)	7
		sunburst, Hartweg's golden (<i>Pseudobahia bahiifolia</i>)	3
		sunburst, San Joaquin adobe (<i>Pseudobahia peirsonii</i>)	3
		sunshine, Sonoma (<i>Blennosperma bakeri</i>)	1
		taraxacum, California (<i>Taraxacum californicum</i>)	1
		tarplant, Gaviota (<i>Hemizonia increscens</i> ssp. <i>villosa</i>)	1
		tarplant, Otay (<i>Deinandra</i> (= <i>Hemizonia</i>) <i>conjugens</i>)	1
		tarplant, Santa Cruz (<i>Holocarpha macradenia</i>)	2
		thistle, Chorro Creek bog (<i>Cirsium fontinale</i> var. <i>obispoense</i>)	1
		thistle, fountain (<i>Cirsium fontinale</i> var. <i>fontinale</i>)	2
		thistle, La Graciosa (<i>Cirsium loncholepis</i>)	2
		thistle, Loch Lomond coyote (<i>Eryngium constancei</i>)	1
		thistle, Suisun (<i>Cirsium hydrophilum</i> var. <i>hydrophilum</i>)	1
		thornmint, San Diego (<i>Acanthomintha ilicifolia</i>)	1
		vervain, Red Hills (<i>Verbena californica</i>)	1

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

State	Taxa Name	Species Name	County Count
CA	Dicots	wallflower, Contra Costa (<i>Erysimum capitatum</i> var. <i>angustatum</i>)	1
		wallflower, Menzies' (<i>Erysimum menziesii</i>)	3
		watercress, Gambel's (<i>Rorippa gambellii</i>)	5
		wild-buckwheat, southern mountain (<i>Eriogonum kennedyi</i> var. <i>austromontanum</i>)	1
		woodland-star, San Clemente Island (<i>Lithophragma maximum</i>)	1
		woolly-star, Hoover's (<i>Eriastrum hooveri</i>)	5
		woolly-star, Santa Ana River (<i>Eriastrum densifolium</i> ssp. <i>sanctorum</i>)	3
		wooly-threads, San Joaquin (<i>Monolopia</i> (=Lembertia) <i>congdonii</i>)	7
		yerba santa, Lompoc (<i>Eriodictyon capitatum</i>)	1
	Monocots	alopecurus, Sonoma (<i>Alopecurus aequalis</i> var. <i>sonomensis</i>)	2
		bluegrass, Napa (<i>Poa napensis</i>)	1
		bluegrass, San Bernardino (<i>Poa atropurpurea</i>)	2
		brodiaea, Chinese Camp (<i>Brodiaea pallida</i>)	1
		brodiaea, thread-leaved (<i>Brodiaea filifolia</i>)	5
		grass, Colusa (<i>Neostaffia colusana</i>)	4
		grass, Eureka Dune (<i>Swallenia alexandrae</i>)	1
		grass, Solano (<i>Tuctoria mucronata</i>)	1
		lily, Pitkin Marsh (<i>Lilium pardalinum</i> ssp. <i>pitkinense</i>)	1
		lily, Western (<i>Lilium occidentale</i>)	1
		onion, Munz's (<i>Allium munzii</i>)	1
		Orcutt grass, California (<i>Orcuttia californica</i>)	3
		Orcutt grass, hairy (<i>Orcuttia pilosa</i>)	5
		Orcutt grass, Sacramento (<i>Orcuttia viscida</i>)	1
		Orcutt grass, slender (<i>Orcuttia tenuis</i>)	6
		piperia, Yadon's (<i>Piperia yadonii</i>)	1
		sedge, white (<i>Carex albida</i>)	1
		tuctoria, Greene's (<i>Tuctoria greenei</i>)	4
CO	Dicots	beardtongue, Penland (<i>Penstemon penlandii</i>)	1
		bladderpod, Dudley Bluffs (<i>Lesquerella congesta</i>)	1
		Butterfly plant, Colorado (<i>Gaura neomexicana</i> var. <i>coloradensis</i>)	1
		cactus, Knowlton (<i>Pediocactus knowltonii</i>)	1
		cactus, Mesa Verde (<i>Sclerocactus mesae-verdae</i>)	1
		Cactus, Uinta Basin hookless (<i>Sclerocactus glaucus</i>)	4
		milk-vetch, Mancos (<i>Astragalus humillimus</i>)	1
		milk-vetch, Osterhout (<i>Astragalus osterhoutii</i>)	1
		mustard, Penland alpine fen (<i>Eutrema penlandii</i>)	1
		twinpod, Dudley Bluffs (<i>Physaria obcordata</i>)	1

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

State	Taxa Name	Species Name	County Count	
CO	Dicots	wild-buckwheat, clay-loving (<i>Eriogonum pelinophilum</i>)	2	
	Monocots	ladies'-tresses, Ute (<i>Spiranthes diluvialis</i>)	4	
CT	Dicots	gerardia, sandplain (<i>Agalinis acuta</i>)	1	
	Monocots	pogonia, small whorled (<i>Isotria medeoloides</i>)	2	
DE	Monocots	pink, swamp (<i>Helonias bullata</i>)	3	
		pogonia, small whorled (<i>Isotria medeoloides</i>)	1	
FL	Conifers and Cycads	torreya, Florida (<i>Torreya taxifolia</i>)	1	
	Dicots	aster, Florida golden (<i>Chrysopsis floridana</i>)	1	
		bellflower, Brooksville (<i>Campanula robinsiae</i>)	1	
		birds-in-a-nest, white (<i>Macbridea alba</i>)	1	
		blazingstar, scrub (<i>Liatris ohlingerae</i>)	1	
		bonamia, Florida (<i>Bonamia grandiflora</i>)	3	
		buckwheat, scrub (<i>Eriogonum longifolium</i> var. <i>gnaphalifolium</i>)	2	
		butterwort, Godfrey's (<i>Pinguicula ionantha</i>)	1	
		fringe-tree, pygmy (<i>Chionanthus pygmaeus</i>)	2	
		gourd, Okeechobee (<i>Cucurbita okeechobeensis</i> ssp. <i>okeechobeensis</i>)	1	
		harebells, Avon Park (<i>Crotalaria avonensis</i>)	1	
		hypericum, highlands scrub (<i>Hypericum cumulicola</i>)	1	
		jacquemontia, beach (<i>Jacquemontia reclinata</i>)	2	
		mint, Garrett's (<i>Dicerandra christmanii</i>)	1	
		mint, longspurred (<i>Dicerandra cornutissima</i>)	1	
		mint, scrub (<i>Dicerandra frutescens</i>)	1	
		mustard, Carter's (<i>Warea carteri</i>)	1	
		pawpaw, beautiful (<i>Deeringothamnus pulchellus</i>)	1	
		pawpaw, four-petal (<i>Asimina tetramera</i>)	1	
		pawpaw, Rugel's (<i>Deeringothamnus rugelii</i>)	1	
		Pigeon Wings (<i>Clitoria fragrans</i>)	1	
		pinkroot, gentian (<i>Spigelia gentianoides</i>)	2	
		plum, scrub (<i>Prunus geniculata</i>)	1	
		polygala, Lewton's (<i>Polygala lewtonii</i>)	2	
		rosemary, Etonia (<i>Conradina etonia</i>)	1	
		rosemary, short-leaved (<i>Conradina brevifolia</i>)	1	
		Snakeroot (<i>Eryngium cuneifolium</i>)	2	
		spurge, telephus (<i>Euphorbia telephioides</i>)	1	
		water-willow, Cooley's (<i>Justicia cooleyi</i>)	1	
		whitlow-wort, papery (<i>Paronychia chartacea</i>)	1	
		Wireweed (<i>Polygonella basiramia</i>)	1	
		ziziphus, Florida (<i>Ziziphus celata</i>)	1	
		Lichens	cladonia, Florida perforate (<i>Cladonia perforata</i>)	2
		Monocots	beargrass, Britton's (<i>Nolina brittoniana</i>)	2
			seagrass, Johnson's (<i>Halophila johnsonii</i>)	3

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

State	Taxa Name	Species Name	County Count
GA	Dicots	amphianthus, little (<i>Amphianthus pusillus</i>)	4
		button, Mohr's Barbara (<i>Marshallia mohrii</i>)	2
		dropwort, Canby's (<i>Oxypolis canbyi</i>)	1
		Harperella (<i>Ptilimnium nodosum</i>)	1
		pitcher-plant, green (<i>Sarracenia oreophila</i>)	2
		Pondberry (<i>Lindera melissifolia</i>)	1
		skullcap, large-flowered (<i>Scutellaria montana</i>)	6
		spiraea, Virginia (<i>Spiraea virginiana</i>)	2
	Ferns and Allies	quillwort, black spored (<i>Isoetes melanospora</i>)	2
		quillwort, mat-forming (<i>Isoetes tegetiformans</i>)	3
	Monocots	grass, Tennessee yellow-eyed (<i>Xyris tennesseensis</i>)	2
		pogonia, small whorled (<i>Isotria medeoloides</i>)	14
		trillium, persistent (<i>Trillium persistens</i>)	1
		trillium, relict (<i>Trillium reliquum</i>)	2
HI	Dicots	'Ahinahina (<i>Argyroxiphium sandwicense</i> ssp. <i>macrocephalum</i>)	1
		'Ahinahina (<i>Argyroxiphium sandwicense</i> ssp. <i>sandwicense</i>)	1
		'aiakeakua, popolo (<i>Solanum sandwicense</i>)	1
		'aiea (<i>Nothocestrum peltatum</i>)	1
		'akoko (<i>Euphorbia haeleleana</i>)	1
		'awikiwiki (<i>Canavalia molokaiensis</i>)	1
		'oha Wai (<i>Clermontia lindseyana</i>)	1
		'oha wai (<i>Clermontia oblongifolia</i> ssp. <i>brevipes</i>)	1
		'oha wai (<i>Clermontia oblongifolia</i> ssp. <i>mauiensis</i>)	1
		'oha Wai (<i>Clermontia samuelii</i>)	1
		A'e (<i>Zanthoxylum hawaiiense</i>)	2
		Alani (<i>Melicope adscendens</i>)	1
		Alani (<i>Melicope balloui</i>)	1
		Alani (<i>Melicope haupuensis</i>)	1
		Alani (<i>Melicope knudsenii</i>)	2
		Alani (<i>Melicope mucronulata</i>)	1
		Alani (<i>Melicope munroi</i>)	1
		Alani (<i>Melicope ovalis</i>)	1
		Alani (<i>Melicope pallida</i>)	1
		Alani (<i>Melicope quadrangularis</i>)	1
		Alani (<i>Melicope reflexa</i>)	1
		Aupaka (<i>Isodendron laurifolium</i>)	1
		Aupaka (<i>Isodendron longifolium</i>)	1
		awiwi (<i>Centaurium sebaeoides</i>)	2
		awiwi (<i>Hedyotis cookiana</i>)	1
		gardenia (=Na'u), Hawaiian (<i>Gardenia brighamii</i>)	1
		geranium, Hawaiian red-flowered (<i>Geranium arboreum</i>)	1

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

State	Taxa Name	Species Name	County Count
HI	Dicots	Ha'iwale (<i>Cyrtandra limahuliensis</i>)	1
		Ha'iwale (<i>Cyrtandra munroi</i>)	1
		Haha (<i>Cyanea asarifolia</i>)	1
		haha (<i>Cyanea copelandii ssp. haleakalaensis</i>)	1
		haha (<i>Cyanea dunbarii</i>)	1
		Haha (<i>Cyanea glabra</i>)	1
		haha (<i>Cyanea grimesiana ssp. grimesiana</i>)	1
		haha (<i>Cyanea hamatiflora ssp. hamatiflora</i>)	1
		haha (<i>Cyanea macrostegia ssp. gibsonii</i>)	1
		Haha (<i>Cyanea manni</i>)	1
		Haha (<i>Cyanea mceldowneyi</i>)	1
		Haha (<i>Cyanea procera</i>)	1
		Haha (<i>Cyanea recta</i>)	1
		Haha (<i>Cyanea remyi</i>)	1
		Haha (<i>Cyanea undulata</i>)	1
		hau kuahiwi (<i>Hibiscadelphus woodii</i>)	1
		Heau (<i>Exocarpos luteolus</i>)	1
		hedyotis, Na Pali beach (<i>Hedyotis st.-johnii</i>)	1
		hibiscus, Clay's (<i>Hibiscus clayi</i>)	1
		iliau, dwarf (<i>Wilkesia hobdyi</i>)	1
		Kamakahala (<i>Labordia lydgatei</i>)	1
		kamakahala (<i>Labordia tinifolia var. lanaiensis</i>)	1
		kamakahala (<i>Labordia tinifolia var. wahiawaensis</i>)	1
		Kamakahala (<i>Labordia triflora</i>)	1
		kauai hau kuahiwi (<i>Hibiscadelphus distans</i>)	1
		Kaulu (<i>Pteralyxia kauaiensis</i>)	1
		Kio'ele (<i>Hedyotis coriacea</i>)	1
		ko'oko'olau (<i>Bidens micrantha ssp. kalealaha</i>)	1
		Ko'oko'olau (<i>Bidens wiebkei</i>)	1
		Ko'oloa'ula (<i>Abutilon menziesii</i>)	1
		Kohe malama malama o kanaloa (<i>Kanaloa kahoowawensis</i>)	1
		Koki'o (<i>Kokia kauaiensis</i>)	1
		koki'o ke'oke'o (<i>Hibiscus arnottianus ssp. immaculatus</i>)	1
		koki'o ke'oke'o (<i>Hibiscus waimeae ssp. hannerae</i>)	1
		Kolea (<i>Myrsine linearifolia</i>)	1
		Kopa (<i>Hedyotis schlechtendahlana var. remyi</i>)	1
		kuahiwi laukahi (<i>Plantago princeps</i>)	2
		Kuawawaenuhu (<i>Alsindendron lychnoides</i>)	1
		Kulu'i (<i>Nototrichium humile</i>)	1
		Laulihilihi (<i>Schiedea stellarioides</i>)	1
		ma'o hau hele, (=native yellow hibiscus) (<i>Hibiscus brackenridgei</i>)	1
		Ma'oli'oli (<i>Schiedea apokremnos</i>)	1

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

State	Taxa Name	Species Name	County Count
HI	Dicots	Mahoe (<i>Alectryon macrococcus</i>)	2
		Makou (<i>Peucedanum sandwicense</i>)	2
		Mapele (<i>Cyrtandra cyaneoides</i>)	1
		Mehamehame (<i>Flueggea neowawraea</i>)	2
		na'ena'e (<i>Dubautia latifolia</i>)	1
		na'ena'e (<i>Dubautia pauciflorula</i>)	1
		na'ena'e (<i>Dubautia plantaginea ssp. humilis</i>)	1
		nani wai'ale'ale (<i>Viola kauaiensis var. wahiawaensis</i>)	1
		naupaka, dwarf (<i>Scaevola coriacea</i>)	1
		Nehe (<i>Lipochaeta fauriei</i>)	1
		Nehe (<i>Lipochaeta kamolensis</i>)	1
		nehe (<i>Lipochaeta micrantha</i>)	1
		Nehe (<i>Lipochaeta waimeaensis</i>)	1
		No common name (<i>Abutilon eremitopetalum</i>)	1
		No common name (<i>Alsinidendron viscosum</i>)	1
		No common name (<i>Bonamia menziesii</i>)	2
		No common name (<i>Chamaesyce halemanui</i>)	1
		No common name (<i>Delissea rhytidosperma</i>)	1
		No common name (<i>Gouania hillebrandii</i>)	1
		No common name (<i>Gouania meyenii</i>)	1
		No common name (<i>Hesperomannia arborescens</i>)	1
		No common name (<i>Hesperomannia arbuscula</i>)	1
		No common name (<i>Hesperomannia lydgatei</i>)	1
		No common name (<i>Lobelia niihauensis</i>)	1
		No common name (<i>Lysimachia filifolia</i>)	1
		No common name (<i>Lysimachia lydgatei</i>)	1
		No common name (<i>Lysimachia maxima</i>)	1
		No common name (<i>Munroidendron racemosum</i>)	1
		No common name (<i>Neraudia sericea</i>)	1
		No common name (<i>Phyllostegia glabra var. lanaiensis</i>)	1
		No common name (<i>Phyllostegia knudsenii</i>)	1
		No common name (<i>Phyllostegia mannii</i>)	1
		No common name (<i>Phyllostegia mollis</i>)	1
		No common name (<i>Phyllostegia waimeae</i>)	1
		No common name (<i>Phyllostegia wawrana</i>)	1
		No common name (<i>Remya kauaiensis</i>)	1
		No common name (<i>Remya montgomeryi</i>)	1
		No common name (<i>Sanicula purpurea</i>)	1
		No common name (<i>Schiedea haleakalensis</i>)	1
		No common name (<i>Schiedea helleri</i>)	1
		No common name (<i>Schiedea kauaiensis</i>)	1
		No common name (<i>Schiedea lydgatei</i>)	1
		No common name (<i>Schiedea membranacea</i>)	1
		No common name (<i>Schiedea nuttallii</i>)	1

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

State	Taxa Name	Species Name	County Count	
HI	Dicots	No common name (<i>Schiedea sarmentosa</i>)	1	
		No common name (<i>Schiedea spergulina</i> var. <i>leiopoda</i>)	1	
		No common name (<i>Schiedea spergulina</i> var. <i>spergulina</i>)	1	
		No common name (<i>Silene alexandri</i>)	1	
		No common name (<i>Silene lanceolata</i>)	2	
		No common name (<i>Spermolepis hawaiiensis</i>)	2	
		No common name (<i>Stenogyne bifida</i>)	1	
		No common name (<i>Stenogyne campanulata</i>)	1	
		No common name (<i>Tetramolopium remyi</i>)	1	
		No common name (<i>Tetramolopium rockii</i>)	1	
		No common name (<i>Vigna o-wahuensis</i>)	2	
		No common name (<i>Viola helenae</i>)	1	
		No common name (<i>Viola lanaiensis</i>)	1	
		No common name (<i>Xylosma crenatum</i>)	1	
		Nohoanu (<i>Geranium multiflorum</i>)	1	
		oha (<i>Delissea rivularis</i>)	1	
		ohai (<i>Sesbania tomentosa</i>)	2	
		olulu (<i>Brighamia insignis</i>)	1	
		Pamakani (<i>Tetramolopium capillare</i>)	1	
		Pilo (<i>Hedyotis manni</i>)	1	
		Po'e (<i>Portulaca sclerocarpa</i>)	1	
		Pua 'ala (<i>Brighamia rockii</i>)	1	
		remya, Maui (<i>Remya mauiensis</i>)	1	
		sandalwood, Lanai (= 'iliahi) (<i>Santalum freycinetianum</i> var. <i>lanaiense</i>)	1	
		Uhiuhi (<i>Caesalpinia kawaiense</i>)	1	
		Ferns and Allies	diellia, asplenium-leaved (<i>Diellia erecta</i>)	1
			fern, pendant kihi (<i>Adenophorus periens</i>)	2
			No common name (<i>Diellia pallida</i>)	1
			No common name (<i>Diellia unisora</i>)	1
			No common name (<i>Diplazium molokaiense</i>)	1
	No common name (<i>Pteris lidgatei</i>)		1	
	Pauoa (<i>Ctenitis squamigera</i>)		1	
	wawae'iole (<i>Huperzia manni</i>)		1	
	Monocots	bluegrass, Hawaiian (<i>Poa sandvicensis</i>)	1	
		bluegrass, Mann's (<i>Poa manni</i>)	1	
		ischaemum, Hilo (<i>Ischaemum byrone</i>)	2	
		Kamanomano (<i>Cenchrus agrimonioides</i>)	1	
		lau 'ehu (<i>Panicum niihauense</i>)	1	
		lo'ulu (<i>Pritchardia munroi</i>)	1	
		lo'ulu (<i>Pritchardia napaliensis</i>)	1	
		lo'ulu (<i>Pritchardia viscosa</i>)	1	
		No common name (<i>Gahnia lanaiensis</i>)	1	

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

State	Taxa Name	Species Name	County Count
HI	Monocots	No common name (<i>Mariscus fauriei</i>)	1
		No common name (<i>Mariscus pennatiformis</i>)	2
		No common name (<i>Platanthera holochila</i>)	2
		No common name (<i>Poa siphonoglossa</i>)	1
		panicgrass, Carter's (<i>Panicum fauriei</i> var. <i>carteri</i>)	1
		Pu'uka'a (<i>Cyperus trachysanthos</i>)	1
		Wahane (<i>Pritchardia aylmer-robinsonii</i>)	1
IA	Dicots	bush-clover, prairie (<i>Lespedeza leptostachya</i>)	96
		milkweed, Mead's (<i>Asclepias meadii</i>)	9
		monkshood, northern wild (<i>Aconitum noveboracense</i>)	5
	Ferns and Allies	fern, American hart's-tongue (<i>Asplenium scolopendrium</i> var. <i>americanum</i>)	1
	Monocots	orchid, eastern prairie fringed (<i>Platanthera leucophaea</i>)	20
		orchid, western prairie fringed (<i>Platanthera praeclara</i>)	92
ID	Dicots	Catchfly, Spalding's (<i>Silene spaldingii</i>)	3
		four-o'clock, MacFarlane's (<i>Mirabilis macfarlanei</i>)	1
		howellia, water (<i>Howellia aquatilis</i>)	2
IL	Dicots	aster, decurrent false (<i>Boltonia decurrens</i>)	26
		bush-clover, prairie (<i>Lespedeza leptostachya</i>)	6
		daisy, lakeside (<i>Hymenoxys herbacea</i>)	2
		milkweed, Mead's (<i>Asclepias meadii</i>)	2
		potato-bean, Price's (<i>Apios priceana</i>)	1
		prairie-clover, leafy (<i>Dalea foliosa</i>)	1
	Monocots	orchid, eastern prairie fringed (<i>Platanthera leucophaea</i>)	8
		pogonia, small whorled (<i>Isotria medeoloides</i>)	1
IN	Dicots	clover, running buffalo (<i>Trifolium stoloniferum</i>)	1
		thistle, Pitcher's (<i>Cirsium pitcheri</i>)	2
KS	Dicots	milkweed, Mead's (<i>Asclepias meadii</i>)	13
	Monocots	orchid, western prairie fringed (<i>Platanthera praeclara</i>)	15
KY	Dicots	clover, running buffalo (<i>Trifolium stoloniferum</i>)	6
		goldenrod, Short's (<i>Solidago shortii</i>)	3
		goldenrod, white-haired (<i>Solidago albopilosa</i>)	3
		potato-bean, Price's (<i>Apios priceana</i>)	3
		rock-cress, Braun's (<i>Arabis perstellata</i>)	2
		rosemary, Cumberland (<i>Conradina verticillata</i>)	1
		sandwort, Cumberland (<i>Arenaria cumberlandensis</i>)	1
		spiraea, Virginia (<i>Spiraea virginiana</i>)	3
		sunflower, Eggert's (<i>Helianthus eggertii</i>)	5
LA	Ferns and Allies	quillwort, Louisiana (<i>Isoetes louisianensis</i>)	1
MA	Dicots	gerardia, sandplain (<i>Agalinis acuta</i>)	2
	Monocots	bulrush, Northeastern (<i>Scirpus ancistrochaetus</i>)	1
		pogonia, small whorled (<i>Isotria medeoloides</i>)	4
MD	Dicots	dropwort, Canby's (<i>Oxypolis canbyi</i>)	1

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

State	Taxa Name	Species Name	County Count
MD	Dicots	gerardia, sandplain (<i>Agalinis acuta</i>)	1
		Harperella (<i>Ptilimnium nodosum</i>)	2
		joint-vetch, sensitive (<i>Aeschynomene virginica</i>)	1
	Monocots	bulrush, Northeastern (<i>Scirpus ancistrochaetus</i>)	1
		pink, swamp (<i>Helonias bullata</i>)	3
ME	Dicots	lousewort, Furbish (<i>Pedicularis furbishiae</i>)	1
	Monocots	orchid, eastern prairie fringed (<i>Platanthera leucophaea</i>)	1
		pogonia, small whorled (<i>Isotria medeoloides</i>)	4
MI	Dicots	goldenrod, Houghton's (<i>Solidago houghtonii</i>)	9
		monkey-flower, Michigan (<i>Mimulus glabratus</i> var. <i>michiganensis</i>)	6
		thistle, Pitcher's (<i>Cirsium pitcheri</i>)	24
	Ferns and Allies	fern, American hart's-tongue (<i>Asplenium scolopendrium</i> var. <i>americanum</i>)	1
	Monocots	iris, dwarf lake (<i>Iris lacustris</i>)	10
		orchid, eastern prairie fringed (<i>Platanthera leucophaea</i>)	10
		pogonia, small whorled (<i>Isotria medeoloides</i>)	1
MN	Dicots	bush-clover, prairie (<i>Lespedeza leptostachya</i>)	8
		roseroot, Leedy's (<i>Sedum integrifolium</i> ssp. <i>leedyi</i>)	2
	Monocots	lily, Minnesota dwarf trout (<i>Erythronium propullans</i>)	3
		orchid, western prairie fringed (<i>Platanthera praeclara</i>)	15
MO	Dicots	aster, decurrent false (<i>Boltonia decurrens</i>)	5
		bladderpod, Missouri (<i>Lesquerella filiformis</i>)	4
		clover, running buffalo (<i>Trifolium stoloniferum</i>)	21
		milkweed, Mead's (<i>Asclepias meadii</i>)	12
		No common name (<i>Geocarpum minimum</i>)	7
		Pondberry (<i>Lindera melissifolia</i>)	2
		sneezeweed, Virginia (<i>Helenium virginicum</i>)	1
	Monocots	orchid, western prairie fringed (<i>Platanthera praeclara</i>)	3
MT	Dicots	Catchfly, Spalding's (<i>Silene spaldingii</i>)	4
		howellia, water (<i>Howellia aquatilis</i>)	2
NC	Dicots	amaranth, seabeach (<i>Amaranthus pumilus</i>)	1
		avens, spreading (<i>Geum radiatum</i>)	8
		bittercress, small-anthered (<i>Cardamine micranthera</i>)	1
		blazingstar, Heller's (<i>Liatris helleri</i>)	6
		bluet, Roan Mountain (<i>Hedyotis purpurea</i> var. <i>montana</i>)	5
		chaffseed, American (<i>Schwalbea americana</i>)	2
		coneflower, smooth (<i>Echinacea laevigata</i>)	1
		dropwort, Canby's (<i>Oxypolis canbyi</i>)	1
		goldenrod, Blue Ridge (<i>Solidago spithamaea</i>)	4
		Harperella (<i>Ptilimnium nodosum</i>)	2
		heartleaf, dwarf-flowered (<i>Hexastylis naniflora</i>)	5
		heather, mountain golden (<i>Hudsonia montana</i>)	1
		loosestrife, rough-leaved (<i>Lysimachia asperulaefolia</i>)	7

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

State	Taxa Name	Species Name	County Count
NC	Dicots	pitcher-plant, green (<i>Sarracenia oreophila</i>)	1
		pitcher-plant, mountain sweet (<i>Sarracenia rubra</i> ssp. <i>jonesii</i>)	3
		Pondberry (<i>Lindera melissifolia</i>)	2
		spiraea, Virginia (<i>Spiraea virginiana</i>)	7
		sumac, Michaux's (<i>Rhus michauxii</i>)	9
		sunflower, Schweinitz's (<i>Helianthus schweinitzii</i>)	6
	Lichens	lichen, rock gnome (<i>Gymnoderma lineare</i>)	9
	Monocots	arrowhead, bunched (<i>Sagittaria fasciculata</i>)	2
		irisette, white (<i>Sisyrinchium dichotomum</i>)	3
		pink, swamp (<i>Helonias bullata</i>)	3
		pogonia, small whorled (<i>Isotria medeoloides</i>)	6
sedge, golden (<i>Carex lutea</i>)		1	
ND	Monocots	orchid, western prairie fringed (<i>Platanthera praeclara</i>)	2
NE	Dicots	Butterfly plant, Colorado (<i>Gaura neomexicana</i> var. <i>coloradensis</i>)	1
		penstemon, blowout (<i>Penstemon haydenii</i>)	6
	Monocots	orchid, western prairie fringed (<i>Platanthera praeclara</i>)	4
NH	Dicots	cinquefoil, Robbins' (<i>Potentilla robbinsiana</i>)	2
		milk-vetch, Jesup's (<i>Astragalus robbinsii</i> var. <i>jesupi</i>)	1
	Monocots	pogonia, small whorled (<i>Isotria medeoloides</i>)	6
NJ	Dicots	chaffseed, American (<i>Schwalbea americana</i>)	1
		joint-vetch, sensitive (<i>Aeschynomene virginica</i>)	2
	Monocots	beaked-rush, Knieskern's (<i>Rhynchospora knieskernii</i>)	5
		pink, swamp (<i>Helonias bullata</i>)	11
		pogonia, small whorled (<i>Isotria medeoloides</i>)	1
NM	Dicots	cactus, Knowlton (<i>Pediocactus knowltonii</i>)	1
		cactus, Kuenzler hedgehog (<i>Echinocereus fendleri</i> var. <i>kuenzleri</i>)	3
		cactus, Lee pincushion (<i>Coryphantha sneedii</i> var. <i>leei</i>)	1
		cactus, Mesa Verde (<i>Sclerocactus mesae-verdae</i>)	1
		cactus, Sneed pincushion (<i>Coryphantha sneedii</i> var. <i>sneedii</i>)	1
		fleabane, Zuni (<i>Erigeron rhizomatus</i>)	2
		ipomopsis, Holy Ghost (<i>Ipomopsis sancti-spiritus</i>)	1
		milk-vetch, Mancos (<i>Astragalus humillimus</i>)	1
		pennyroyal, Todsens' (<i>Hedeoma todsenii</i>)	2
		poppy, Sacramento prickly (<i>Argemone pleiacantha</i> ssp. <i>pinnatisecta</i>)	1
		sunflower, Pecos (=puzzle, =paradox) (<i>Helianthus paradoxus</i>)	4
		thistle, Sacramento Mountains (<i>Cirsium vinaceum</i>)	1
		wild-buckwheat, gypsum (<i>Eriogonum gypsophilum</i>)	1
NV	Dicots	blazingstar, Ash Meadows (<i>Mentzelia leucophylla</i>)	1

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

State	Taxa Name	Species Name	County Count	
NV	Dicots	buckwheat, steamboat (<i>Eriogonum ovalifolium</i> var. <i>williamsiae</i>)	1	
		centaury, spring-loving (<i>Centaureum namophilum</i>)	1	
		gumplant, Ash Meadows (<i>Grindelia fraxino-pratensis</i>)	1	
		ivesia, Ash Meadows (<i>Ivesia kingii</i> var. <i>eremica</i>)	1	
		milk-vetch, Ash meadows (<i>Astragalus phoenix</i>)	1	
		niterwort, Amargosa (<i>Nitrophila mohavensis</i>)	1	
		sunray, Ash Meadows (<i>Enceliopsis nudicaulis</i> var. <i>corrugata</i>)	1	
	Monocots	ladies'-tresses, Ute (<i>Spiranthes diluvialis</i>)	1	
NY	Dicots	amaranth, seabeach (<i>Amaranthus pumilus</i>)	2	
		gerardia, sandplain (<i>Agalinis acuta</i>)	2	
		monkshood, northern wild (<i>Aconitum noveboracense</i>)	3	
		roseroot, Leedy's (<i>Sedum integrifolium</i> ssp. <i>leedyi</i>)	3	
	Ferns and Allies	fern, American hart's-tongue (<i>Asplenium scolopendrium</i> var. <i>americanum</i>)	2	
	Monocots	pogonia, small whorled (<i>Isotria medeoloides</i>)	1	
OH	Dicots	clover, running buffalo (<i>Trifolium stoloniferum</i>)	6	
		daisy, lakeside (<i>Hymenoxys herbacea</i>)	2	
		monkshood, northern wild (<i>Aconitum noveboracense</i>)	2	
	Monocots	orchid, eastern prairie fringed (<i>Platanthera leucophaea</i>)	6	
OK	Monocots	orchid, eastern prairie fringed (<i>Platanthera leucophaea</i>)	1	
		orchid, western prairie fringed (<i>Platanthera praeclara</i>)	2	
OR	Dicots	Catchfly, Spalding's (<i>Silene spaldingii</i>)	1	
		checker-mallow, Nelson's (<i>Sidalcea nelsoniana</i>)	8	
		daisy, Willamette (<i>Erigeron decumbens</i> var. <i>decumbens</i>)	5	
		desert-parsley, Bradshaw's (<i>Lomatium bradshawii</i>)	5	
		four-o'clock, MacFarlane's (<i>Mirabilis macfarlanei</i>)	1	
		lomatium, Cook's (<i>Lomatium cookii</i>)	2	
		Lupine, Kincaid's (<i>Lupinus sulphureus</i> (=oreganus) ssp. <i>kincaidii</i> (=var. <i>kincaidii</i>))	6	
		Meadowfoam, large-flowered wooly (<i>Limnanthes floccosa grandiflora</i>)	1	
		milk-vetch, Applegate's (<i>Astragalus applegatei</i>)	1	
		popcornflower, rough (<i>Plagiobothrys hirtus</i>)	1	
		thelypody, Howell's spectacular (<i>Thelypodium howellii spectabilis</i>)	2	
		wire-lettuce, Malheur (<i>Stephanomeria malheurensis</i>)	1	
			Monocots	Fritillary, Gentner's (<i>Fritillaria gentneri</i>)
			lily, Western (<i>Lilium occidentale</i>)	1
PA	Monocots	bulrush, Northeastern (<i>Scirpus ancistrochaetus</i>)	8	
		pogonia, small whorled (<i>Isotria medeoloides</i>)	2	
RI	Dicots	gerardia, sandplain (<i>Agalinis acuta</i>)	1	
	Monocots	pogonia, small whorled (<i>Isotria medeoloides</i>)	1	

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

State	Taxa Name	Species Name	County Count
SC	Dicots	amaranth, seabeach (<i>Amaranthus pumilus</i>)	2
		amphianthus, little (<i>Amphianthus pusillus</i>)	3
		chaffseed, American (<i>Schwalbea americana</i>)	7
		coneflower, smooth (<i>Echinacea laevigata</i>)	4
		dropwort, Canby's (<i>Oxypolis canbyi</i>)	7
		Harperella (<i>Ptilimnium nodosum</i>)	1
		heartleaf, dwarf-flowered (<i>Hexastylis naniflora</i>)	3
		loosestrife, rough-leaved (<i>Lysimachia asperulaefolia</i>)	6
		pitcher-plant, mountain sweet (<i>Sarracenia rubra</i> ssp. <i>jonesii</i>)	1
		Pondberry (<i>Lindera melissifolia</i>)	3
		sunflower, Schweinitz's (<i>Helianthus schweinitzii</i>)	3
	Ferns and Allies	quillwort, black spored (<i>Isoetes melanospora</i>)	1
	Monocots	arrowhead, bunched (<i>Sagittaria fasciculata</i>)	1
		irisette, white (<i>Sisyrinchium dichotomum</i>)	1
		pink, swamp (<i>Helonias bullata</i>)	1
pogonia, small whorled (<i>Isotria medeoloides</i>)		1	
trillium, persistent (<i>Trillium persistens</i>)		1	
SD	Monocots	orchid, western prairie fringed (<i>Platanthera praeclara</i>)	16
TN	Dicots	aster, Ruth's golden (<i>Pityopsis ruthii</i>)	1
		avens, spreading (<i>Geum radiatum</i>)	2
		bladderpod, Spring Creek (<i>Lesquerella perforata</i>)	1
		bluet, Roan Mountain (<i>Hedyotis purpurea</i> var. <i>montana</i>)	1
		coneflower, Tennessee purple (<i>Echinacea tennesseensis</i>)	3
		goldenrod, Blue Ridge (<i>Solidago spithamea</i>)	1
		ground-plum, Guthrie's (=Pyne's) (<i>Astragalus bibullatus</i>)	1
		potato-bean, Price's (<i>Apios priceana</i>)	4
		prairie-clover, leafy (<i>Dalea foliosa</i>)	6
		rock-cress, Braun's (<i>Arabis perstellata</i>)	1
		rosemary, Cumberland (<i>Conradina verticillata</i>)	5
		sandwort, Cumberland (<i>Arenaria cumberlandensis</i>)	4
		skullcap, large-flowered (<i>Scutellaria montana</i>)	3
		spiraea, Virginia (<i>Spiraea virginiana</i>)	8
	sunflower, Eggert's (<i>Helianthus eggertii</i>)	6	
	Ferns and Allies	fern, American hart's-tongue (<i>Asplenium scolopendrium</i> var. <i>americanum</i>)	1
	Lichens	lichen, rock gnome (<i>Gymnoderma lineare</i>)	1
Monocots	pogonia, small whorled (<i>Isotria medeoloides</i>)	1	
TX	Dicots	ambrosia, south Texas (<i>Ambrosia cheiranthifolia</i>)	3
		ayenia, Texas (<i>Ayenia limitaris</i>)	3
		bladderpod, Zapata (<i>Lesquerella thamnophila</i>)	2
		cactus, black lace (<i>Echinocereus reichenbachii</i> var. <i>albertii</i>)	4

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

State	Taxa Name	Species Name	County Count	
TX	Dicots	Cactus, Chisos Mountain hedgehog (<i>Echinocereus chisoensis</i> var. <i>chisoensis</i>)	1	
		cactus, Lloyd's Mariposa (<i>Echinomastus mariposensis</i>)	2	
		cactus, Nellie cory (<i>Coryphantha minima</i>)	1	
		cactus, Sneed pincushion (<i>Coryphantha sneedii</i> var. <i>sneedii</i>)	3	
		cactus, star (<i>Astrophytum asterias</i>)	1	
		cactus, Tobusch fishhook (<i>Ancistrocactus tobuschii</i>)	5	
		cat's-eye, Terlingua Creek (<i>Cryptantha crassipes</i>)	1	
		cory cactus, bunched (<i>Coryphantha ramillosa</i>)	2	
		dawn-flower, Texas prairie (<i>Hymenoxys texana</i>)	3	
		dogweed, ashy (<i>Thymophylla tephroleuca</i>)	3	
		frankenian, Johnston's (<i>Frankenia johnstonii</i>)	2	
		manioc, Walker's (<i>Manihot walkerae</i>)	2	
		oak, Hinckley (<i>Quercus hinckleyi</i>)	1	
		phlox, Texas trailing (<i>Phlox nivalis</i> ssp. <i>texensis</i>)	3	
		pitaya, Davis' green (<i>Echinocereus viridiflorus</i> var. <i>davisii</i>)	1	
		poppy-mallow, Texas (<i>Callirhoe scabriuscula</i>)	3	
		rush-pea, slender (<i>Hoffmannseggia tenella</i>)	2	
		sand-verbena, large-fruited (<i>Abronia macrocarpa</i>)	3	
		snowbells, Texas (<i>Styrax texanus</i>)	3	
		sunflower, Pecos (=puzzle, =paradox) (<i>Helianthus paradoxus</i>)	2	
		Monocots	ladies'-tresses, Navasota (<i>Spiranthes parksii</i>)	9
			pondweed, Little Aguja Creek (<i>Potamogeton clystocarpus</i>)	1
			wild-rice, Texas (<i>Zizania texana</i>)	1
	UT	Dicots	bear-poppy, dwarf (<i>Arctomecon humilis</i>)	1
			bladderpod, kodachrome (<i>Lesquerella tumulosa</i>)	1
			Buttercup, autumn (<i>Ranunculus aestivalis</i> (= <i>acriiformis</i>))	1
			cactus, San Rafael (<i>Pediocactus despainii</i>)	1
cactus, Siler pincushion (<i>Pediocactus</i> (= <i>Echinocactus</i> , = <i>Utahia</i>) <i>sileri</i>)			2	
Cactus, Uinta Basin hookless (<i>Sclerocactus glaucus</i>)			3	
cactus, Winkler (<i>Pediocactus winkleri</i>)			2	
cactus, Wright fishhook (<i>Sclerocactus wrightiae</i>)			3	
Cycladenia, Jones (<i>Cycladenia jonesii</i> (= <i>humilis</i>))			4	
daisy, Maguire (<i>Erigeron maguirei</i>)			2	
milk-vetch, Deseret (<i>Astragalus desereticus</i>)			1	
milk-vetch, heliotrope (<i>Astragalus montii</i>)			2	
milk-vetch, Holmgren (<i>Astragalus holmgreniorum</i>)			1	
milk-vetch, Shivwitz (<i>Astragalus ampullarioides</i>)			1	
milkweed, Welsh's (<i>Asclepias welshii</i>)	1			

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

State	Taxa Name	Species Name	County Count
UT	Dicots	phacelia, clay (<i>Phacelia argillacea</i>)	1
		primrose, Maguire (<i>Primula maguirei</i>)	1
		reed-mustard, Barneby (<i>Schoenocrambe barnebyi</i>)	2
		reed-mustard, clay (<i>Schoenocrambe argillacea</i>)	1
		reed-mustard, shrubby (<i>Schoenocrambe suffrutescens</i>)	2
		ridge-cress, Barneby (<i>Lepidium barnebyanum</i>)	1
		townsendia, Last Chance (<i>Townsendia aprica</i>)	3
	Monocots	ladies'-tresses, Ute (<i>Spiranthes diluvialis</i>)	9
	sedge, Navajo (<i>Carex specuicola</i>)	1	
VA	Dicots	birch, Virginia round-leaf (<i>Betula uber</i>)	1
		bittercress, small-anthered (<i>Cardamine micranthera</i>)	1
		coneflower, smooth (<i>Echinacea laevigata</i>)	8
		joint-vetch, sensitive (<i>Aeschynomene virginica</i>)	12
		mallow, Peter's Mountain (<i>Iliamna corei</i>)	1
		rock-cress, shale barren (<i>Arabis serotina</i>)	7
		sneezeweed, Virginia (<i>Helenium virginicum</i>)	2
		spiraea, Virginia (<i>Spiraea virginiana</i>)	4
		sumac, Michaux's (<i>Rhus michauxii</i>)	2
	Monocots	bulrush, Northeastern (<i>Scirpus ancistrochaetus</i>)	4
		orchid, eastern prairie fringed (<i>Platanthera leucophaea</i>)	1
		pink, swamp (<i>Helonias bullata</i>)	4
		pogonia, small whorled (<i>Isotria medeoloides</i>)	11
VT	Dicots	milk-vetch, Jesup's (<i>Astragalus robbinsii</i> var. <i>jesupi</i>)	1
	Monocots	bulrush, Northeastern (<i>Scirpus ancistrochaetus</i>)	1
WA	Dicots	Catchfly, Spalding's (<i>Silene spaldingii</i>)	4
		checker-mallow, Nelson's (<i>Sidalcea nelsoniana</i>)	1
		checkermallow, Wenatchee Mountains (<i>Sidalcea oregana</i> var. <i>calva</i>)	1
		howellia, water (<i>Howellia aquatilis</i>)	3
		Lupine, Kincaid's (<i>Lupinus sulphureus</i> (=oreganus) ssp. <i>kincaidii</i> (=var. <i>kincaidii</i>))	1
		paintbrush, golden (<i>Castilleja levisecta</i>)	3
		stickseed, showy (<i>Hackelia venusta</i>)	1
WI	Dicots	bush-clover, prairie (<i>Lespedeza leptostachya</i>)	5
		locoweed, Fassett's (<i>Oxytropis campestris</i> var. <i>chartacea</i>)	2
		monkshood, northern wild (<i>Aconitum noveboracense</i>)	5
		thistle, Pitcher's (<i>Cirsium pitcheri</i>)	3
	Monocots	iris, dwarf lake (<i>Iris lacustris</i>)	2
	orchid, eastern prairie fringed (<i>Platanthera leucophaea</i>)	8	
WV	Dicots	clover, running buffalo (<i>Trifolium stoloniferum</i>)	4
		Harperella (<i>Ptilimnium nodosum</i>)	2
		rock-cress, shale barren (<i>Arabis serotina</i>)	3
		spiraea, Virginia (<i>Spiraea virginiana</i>)	6
	Monocots	bulrush, Northeastern (<i>Scirpus ancistrochaetus</i>)	1

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

State	Taxa Name	Species Name	County Count
WY	Dicots	Butterfly plant, Colorado (<i>Gaura neomexicana</i> var. <i>coloradensis</i>)	1
		yellowhead, desert (<i>Yermo xanthocephalus</i>)	1

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

Table A-4a. Species co-occurrences for alfalfa hay production that are Not of Concern

Species *	State	Affected Counties
	Synopsis of the Reason for Exclusion	
Dicots		
Lifeform: Aquatic		
amphianthus, little (<i>Amphianthus pusillus</i>)	GA	Jackson
	Conclusion: No potential for exposure exists. Rationale: According to the USFWS (undated(b)) this species does not occur in this county.	
aster, decurrent false (<i>Boltonia decurrens</i>)	IL	Alexander, Brown, Calhoun, Greene, Grundy, Jackson, Monroe, Randolph, Union
	Conclusion: No potential for exposure exists. Rationale: According to USFWS (2005(b)) species list for this county and the Natural Heritage Records (NatureServe, 2005) this species does not occur in this county.	
bird's beak, palmate-bracted (<i>Cordylanthus palmatus</i>)	CA	San Joaquin
	Conclusion: No potential for exposure exists. Rationale: According to the Natural Heritage Program (NatureServe, 2006), this species was last seen in this county in 1881; species does not currently occur in this county.	
dropwort, Canby's (<i>Oxypolis canbyi</i>)	MD	Prince Georges
	Conclusion: No potential for exposure exists. Rationale: According to the USFWS (1991(a)) and the Natural Heritage Records (NatureServe, 2005), this species does not occur in this county.	
goldenrod, Houghton's (<i>Solidago houghtonii</i>)	MI	Delta
	Conclusion: No potential for exposure exists. Rationale: According to USFWS (2005(f)) species by county list for Michigan, this species does not occur in this county.	
Harperella (<i>Ptilimnium nodosum</i>)	WV	Jefferson
	Conclusion: No potential for exposure exists. Rationale: According to the Natural Heritage Records in West Virginia (NatureServe, 2005) and USFWS Species Account (1992(b)), this species does not occur in this county.	
Harperella (<i>Ptilimnium nodosum</i>)	AL	Cullman, Jackson, Lee, Walker
	Conclusion: No potential for exposure exists. Rationale: According to the Natural History Records (NatureServe, 2005) and the USFWS (2005(d)) species list, species does not occur in this county.	
howellia, water (<i>Howellia aquatilis</i>)	ID	Kootenai
	Conclusion: No potential for exposure exists. Rationale: According to the USFWS (1994(e)) this species has been extirpated in this county.	
howellia, water (<i>Howellia aquatilis</i>)	WA	Thurston
	Conclusion: No potential for exposure exists. Rationale: According to the Washington State DNR (2005) and the Idaho Fish and Game (2006), this species does not occur in this county.	
joint-vetch, sensitive (<i>Aeschynomene virginica</i>)	VA	King George, Surry
	Conclusion: No potential for exposure exists. Rationale: According to the Natural Heritage Records (NatureServe, 2005) and the USFWS (1995) this species does not occur in this county.	
Lifeform: Terrestrial		
	TX	Hidalgo

Table A-4a (continued). Species co-occurrences for alfalfa hay production that are Not of Concern

Species *	State	Affected Counties
	Synopsis of the Reason for Exclusion	
ambrosia, south Texas (<i>Ambrosia cheiranthifolia</i>)	TX	Hidalgo
	Conclusion: No potential for exposure exists. Rationale: According to the USFWS (undated (a)) this species does not occur in this county.	
Barberry, Truckee (<i>Berberis (=Mahonia) sonnei</i>)	CA	Modoc, Nevada, Placer
	Conclusion: No potential for exposure exists. Rationale: According to USFWS (2003(a)), this species has been delisted due to a taxonomic revision.	
bluet, Roan Mountain (<i>Hedyotis purpurea</i> var. <i>montana</i>)	TN	Carter
	Conclusion: No potential for exposure exists. Rationale: According to the USFWS (1990(b)) this species does not occur in this county.	
bush-clover, prairie (<i>Lespedeza leptostachya</i>)	MN	Crow Wing
	Conclusion: No potential for exposure exists. Rationale: According to the USFWS (2004(a)) endangered species list for Minnesota, this species does not occur in this county.	
bush-clover, prairie (<i>Lespedeza leptostachya</i>)	IL	Massac
	Conclusion: No potential for exposure exists. Rationale: According to the USFWS (2005(b)) endangered species list for Illinois and the Natural Heritage Records (NatureServe, 2005), this species does not occur in this county.	
bush-clover, prairie (<i>Lespedeza leptostachya</i>)	IA	Cerro Gordo
	Conclusion: No potential for exposure exists. Rationale: According to the USFWS (2005(c)) endangered species list for Iowa and the Natural Heritage Records (NatureServe, 2006) this species does not occur in this county (NatureServe indicates this species has not been recorded in this county since 1917). 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.	
bush-clover, prairie (<i>Lespedeza leptostachya</i>)	IA	Cherokee, Chickasaw, Clayton, Clinton, Crawford, Dallas, Davis, Decatur
	Conclusion: No potential for exposure exists. Rationale: According to the USFWS (2005(c)) endangered species list for Iowa and the Natural Heritage Records (NatureServe, 2006), this species does not occur in this county. 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.	
bush-clover, prairie (<i>Lespedeza leptostachya</i>)	IA	Adair, Adams, Allamakee, Appanoose, Audubon, Benton, Black Hawk, Boone, Bremer, Buchanan, Calhoun, Carroll, Cass, Cedar, Dubuque, Fayette
	Conclusion: No potential for exposure exists. Rationale: According to the USFWS (2005(c)) endangered species list for Iowa and the Natural Heritage Records (NatureServe, 2006), this species does not occur in this county. 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.	

Table A-4a (continued). Species co-occurrences for alfalfa hay production that are Not of Concern

Species *	State	Affected Counties
		Synopsis of the Reason for Exclusion
bush-clover, prairie (<i>Lespedeza leptostachya</i>)	IA	Des Moines, Franklin, Fremont, Greene, Grundy, Guthrie, Hamilton, Hancock, Hardin, Harrison, Henry, Humboldt, Ida, Iowa, Jackson, Jasper, Jefferson, Johnson, Jones, Keokuk, Lee, Louisa, Madison, Mahaska, Marion, Marshall, Mills, Mitchell, Monona, Monroe, Montgomery, Muscatine, Page, Palo Alto, Pocahontas, Polk, Pottawattami, Poweshiek, Ringgold, Sac, Scott, Shelby, Sioux, Tama, Taylor, Union, Van Buren, Wapello, Washington, Wayne, Webster, Winnebago, Woodbury, Worth, Wright <i>Conclusion: No potential for exposure exists. Rationale: According to the USFWS (2005(c)) endangered species list for Iowa and the USFWS (1987(a)) this species does not occur in this county. 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>
bush-clover, prairie (<i>Lespedeza leptostachya</i>)	IA	Floyd <i>Conclusion: No potential for exposure exists. Rationale: According to the USFWS (2005(c)) endangered species list for Iowa this species does not occur in this county. Also, according to the Natural Heritage Records (NatureServe, 2006), this species has not been observed in this county since 1889. 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>
button, Mohr's Barbara (<i>Marshallia mohrii</i>)	GA	Walker <i>Conclusion: No potential for exposure exists. Rationale: According to the species list by county for Walker County, Georgia, this species does not occur in this county (USFWS, 2004(c))</i>
cactus, Arizona hedgehog (<i>Echinocereus triglochidiatus</i> var. <i>arizonicus</i>)	AZ	Maricopa <i>Conclusion: No potential for exposure exists. Rationale: According to the USFWS (2006(a)) Arizona species list and the Natural Heritage Records (NatureServe, 2006), this species does not occur in this county.</i>
cactus, Lloyd's Mariposa (<i>Echinomastus mariposensis</i>)	TX	Presidio <i>Conclusion: No potential for exposure exists. Rationale: Species does not occur in Presidio County, TX based on Natural Heritage Records (NatureServe, 2005).</i>
cactus, Sneed pincushion (<i>Coryphantha sneedii</i> var. <i>sneedii</i>)	TX	Culberson <i>Conclusion: No potential for exposure exists. Rationale: According to the USFWS (undated(a)), Texas species list, this species does not occur in this county.</i>
	MT	Sanders

Table A-4a (continued). Species co-occurrences for alfalfa hay production that are Not of Concern

Species *	State	Affected Counties
	Synopsis of the Reason for Exclusion	
Catchfly, Spalding's (<i>Silene spaldingii</i>)	MT	Sanders
	Conclusion: No potential for exposure exists. Rationale: According to the USFWS (2006(c)) listed species in Montana by county, this species does not occur in this county.	
clover, running buffalo (<i>Trifolium stoloniferum</i>)	OH	Butler, Montgomery
	Conclusion: No potential for exposure exists. Rationale: According to the species by county list for Ohio (USFWS, 2004(b)) this species does not occur in this county.	
clover, running buffalo (<i>Trifolium stoloniferum</i>)	KY	Estill
	Conclusion: No potential for exposure exists. Rationale: Both the Natural Heritage Records (NatureServe, 2005) and USFWS (2002(a)) endangered species list for this county, do not list this species in this county.	
coneflower, smooth (<i>Echinacea laevigata</i>)	VA	Nottoway
	Conclusion: No potential for exposure exists. Rationale: According to the Natural Heritage Records (NatureServe, 2006), this species has not been seen in this county since 1937 and does not currently occur in this county.	
dawn-flower, Texas prairie (<i>Hymenoxys texana</i>)	TX	Harrison
	Conclusion: No potential for exposure exists. Rationale: According to the Natural Heritage Records (NatureServe, 2005) this species does not occur in this county.	
desert-parsley, Bradshaw's (<i>Lomatium bradshawii</i>)	OR	Polk
	Conclusion: No potential for exposure exists. Rationale: According to the Natural Heritage Records (NatureServe, 2005) this species does not occur in the indicated county.	
dogweed, ashy (<i>Thymophylla tephroleuca</i>)	TX	Starr
	Conclusion: No potential for exposure exists. Rationale: According to the USFWS (1984(b)) and the Natural Heritage Records (NatureServe, 2005), this species does not occur in this county; this species only occurs in Webb and Zapata County, TX.	
fringe-tree, pygmy (<i>Chionanthus pygmaeus</i>)	FL	Hardee
	Conclusion: No potential for exposure exists. Rationale: According to the USFWS (2000) species by county list for South Florida, this species does not occur in this county.	
ivesia, Ash Meadows (<i>Ivesia kingii</i> var. <i>eremica</i>)	CA	Inyo
	Conclusion: No potential for exposure exists. Rationale: The Federal Register for this species notes that "The Ash Meadows ivesia occurs only in Nevada in Saline sea area of light colored clay uplands" (USFWS, 1985(c)). NatureServe (2005) confirms that Nye, Nevada is the only known county where this species occurs. Turner (1997) notes that habitat is highly alkaline clay depressions near saline seeps and only documents this species in Nevada with most of the population occurring on the Ash Meadows Wildlife Refuge; also according to Turner (1997), an FWS opinion notes that this species is not an agricultural pesticide concern. The predominance of evidence indicates that this species no longer occurs in Inyo County, California and in the opinion of the risk assessor (T. Priester) if this species occurs in Inyo County it only occurs in the Death Valley area and probably only on the Death Valley National Monument where it would be protected.	
loosestrife, rough-leaved (<i>Lysimachia asperulaefolia</i>)	SC	Chesterfield, Greenwood, Horry, Kershaw, Marlboro
	Conclusion: No potential for exposure exists. Rationale: According to the USFWS (1999(b)) species list for South Carolina, species does not occur in this county.	
	NC	Moore

Table A-4a (continued). Species co-occurrences for alfalfa hay production that are Not of Concern

Species *	State	Affected Counties
	Synopsis of the Reason for Exclusion	
loosestrife, rough-leaved (<i>Lysimachia asperulaefolia</i>)	NC	Moore <i>Conclusion: No potential for exposure exists. Rationale: According to the USFWS (2003(g)) North Carolina species list, this species does not occur in this county.</i>
loosestrife, rough-leaved (<i>Lysimachia asperulaefolia</i>)	NC	Columbus <i>Conclusion: No potential for exposure exists. Rationale: According to the USFWS (2003(g)), this species does not occur in indicated county. Species is only known from historical record in this county; species has not been observed in this county since 1938 (NatureServe, 2006).</i>
milkweed, Mead's (<i>Asclepias meadii</i>)	IA	Lucas, Madison, Union, Wayne <i>Conclusion: No potential for exposure exists. Rationale: According to the USFWS (2005(c)) endangered species list for Iowa this species does not occur in this county. 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>
mint, Garrett's (<i>Dicerandra christmanii</i>)	FL	Highlands <i>Conclusion: No potential for exposure exists. Rationale: According to the USFWS (2000) endangered species by county list for South Florida, this species does not occur in this county.</i>
prairie-clover, leafy (<i>Dalea foliosa</i>)	IL	Williamson <i>Conclusion: No potential for exposure exists. Rationale: According to the USFWS (2005(b)) endangered species by county list for Illinois and the Natural Heritage Program (NatureServe, 2005), this species does not occur in this county.</i>
rock-cress, shale barren (<i>Arabis serotina</i>)	VA	Page <i>Conclusion: No potential for exposure exists. Rationale: According to the USFWS (1989(b)), this species does not occur in this county.</i>
rosemary, Cumberland (<i>Conradina verticillata</i>)	KY	Mason <i>Conclusion: No potential for exposure exists. Rationale: According to the USFWS (2002(a)) endangered species by county list, this species does not occur in this county.</i>
sand-verbena, large-fruited (<i>Abronia macrocarpa</i>)	TX	Robertson <i>Conclusion: No potential for exposure exists. Rationale: According to the USFWS (undated(a)) endangered species by county list, this species does not occur in this county.</i>
Snakeroot (<i>Eryngium cuneifolium</i>)	FL	Putnam <i>Conclusion: No potential for exposure exists. Rationale: According to the USFWS (2005(k)) endangered species by county list and NatureServe, (2005), this species does not occur in this county.</i>
snowbells, Texas (<i>Styrax texanus</i>)	TX	Uvalde <i>Conclusion: No potential for exposure exists. Rationale: The only documented occurrences made by the Texas Parks and Wildlife Department (2005(c)) are in Edwards, Real and Val Verde Counties; populations of this species do not occur in Uvalde County.</i>
sunflower, Eggert's (<i>Helianthus eggertii</i>)	AL KY TN	Blount Barren, Edmonson, Grayson, Hardin, Hart Coffee, Dickson, Lawrence, Marion, Maury, Williamson

Table A-4a (continued). Species co-occurrences for alfalfa hay production that are Not of Concern

Species *	State	Affected Counties
	Synopsis of the Reason for Exclusion	
<i>Conclusion: No potential for exposure exists. Rationale: According to the USFWS (2005(g)), this species has been de-listed throughout its entire range as of August 18, 2005.</i>		
sunflower, Schweinitz's (<i>Helianthus schweinitzii</i>)	SC	Horry
<i>Conclusion: No potential for exposure exists. Rationale: According to the Natural Heritage Records (NatureServe, 2006), this species does not occur in this county.</i>		
sunflower, Schweinitz's (<i>Helianthus schweinitzii</i>)	SC	Lexington
<i>Conclusion: No potential for exposure. Rationale: According to the Natural Heritage Records (NatureServe, 2006) and the USFWS (1992(g)) species account, this species does not occur in this county.</i>		
woolly-star, Hoover's (<i>Eriastrum hooveri</i>)	CA	Fresno, Kern, Kings, San Luis Obispo, Santa Barbara
<i>Conclusion: No potential for exposure exists. Rationale: According to the USFWS (2003(f)), this species has been delisted throughout its entire range as of October 7, 2003.</i>		
<i>Ferns and Allies</i>		
<i>Lifeform: Aquatic</i>		
quillwort, black spored (<i>Isoetes melanospora</i>)	GA	Jackson
<i>Conclusion: No potential for exposure exists. Rationale: According to the USFWS (1991(e)), this species does not occur in this county; species has only been observed in Dekalb, Rockford, and Gwinnett Counties, GA.</i>		
quillwort, mat-forming (<i>Isoetes tegetiformans</i>)	GA	Jackson
<i>Conclusion: No potential for exposure exists. Rationale: According to the USFWS (1991(e)) and the USFWS (2004(f)) endangered species list by county for Georgia, this species does not occur in this county.</i>		
<i>Lifeform: Terrestrial</i>		
fern, American hart's-tongue (<i>Asplenium scolopendrium</i> var. <i>americanum</i>)	IA	Cerro Gordo
<i>Conclusion: No potential for exposure exists. Rationale: According to the USFWS (2005(e)) endangered species list for Iowa this species does not occur in this county. 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>		
<i>Monocots</i>		
<i>Lifeform: Aquatic</i>		
	NC	Buncombe

Table A-4a (continued). Species co-occurrences for alfalfa hay production that are Not of Concern

Species *	State	Affected Counties
	Synopsis of the Reason for Exclusion	
arrowhead, bunched (<i>Sagittaria fasciculata</i>)	NC	Buncombe <i>Conclusion: No potential for exposure exists. Rationale: Species has been extirpated or was never found in Buncomb County, NC. According to the USFWS (1991(f)) "There is one questionable record for Buncombe County, North Carolina, based on an 1896 herbarium specimen which only gives general locality information. Efforts to relocate the plants have failed and it is now speculated that the Buncombe County site was either destroyed by the extensive development of the general area since 1896, or that the plant was actually collected from near East Flat Rock in Henderson County."</i>
seagrass, Johnson's (<i>Halophila johnsonii</i>)	FL	Brevard <i>Conclusion: No potential for exposure exists. Rationale: According to the USFWS (2005(j)), this species does not occur in this county.</i>
Lifeform: Terrestrial		
ladies'-tresses, Canelo Hills (<i>Spiranthes delitescens</i>)	AZ	Cochise <i>Conclusion: No potential for exposure exists. Rationale: According to the Center for Plant Conservation (undated(b)), this species does not occur in Cochise County; "Numbers left: There are only four known populations in Santa Cruz County, AZ. This species may also occur in Mexico (Sheviak, 1990)." This statement indicates lack of presence in Cochise County.</i>
orchid, eastern prairie fringed (<i>Platanthera leucophaea</i>)	OH	Coshocton <i>Conclusion: No potential for exposure exists. Rationale: According to the USFWS (2004(b)) species by county list for Ohio and Jim McCormac, Botanist with the Ohio Natural Heritage Database, (Division of Natural Area & Preserves, Department of Natural Resources, pers. comm.), this species does not occur in this county.</i>
orchid, eastern prairie fringed (<i>Platanthera leucophaea</i>)	IL	Massac <i>Conclusion: No potential for exposure exists. Rationale: According to the USFWS (2005(b)) species by county list for Illinois, this species does not occur in this county.</i>
orchid, eastern prairie fringed (<i>Platanthera leucophaea</i>)	IA	Appanoose, Cedar, Davis, Des Moines, Henry, Iowa, Jefferson, Keokuk, Lee, Louisa, Lucas, Monroe, Muscatine, Scott, Van Buren, Wapello, Washington, Wayne <i>Conclusion: No potential for exposure exists. Rationale: According to the USFWS (2005(c)) endangered species list for Iowa this species does not occur in this county. 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>
orchid, eastern prairie fringed (<i>Platanthera leucophaea</i>)	OK	Choctaw <i>Conclusion: No potential for exposure exists. Rationale: According to the USFWS (undated(j)) endangered species list for Oklahoma, this species does not occur in this county.</i>
orchid, western prairie fringed (<i>Platanthera praeclara</i>)	SD	Bennett, Brookings, Brown, Clay, Codington, Day, Deuel, Grant, Lincoln, Minnehaha, Moody, Roberts, Todd, Turner, Union, Yankton

Table A-4a (continued). Species co-occurrences for alfalfa hay production that are Not of Concern

Species *	State	Affected Counties
	Synopsis of the Reason for Exclusion	
<i>Conclusion: No potential for exposure exists. Rationale: According to Dave Ode (South Dakota Natural Heritage Database Coordinator, pers. com. May 25, 2004) and the Natural Heritage Records (NatureServe, 2006), this species does not occur in this county.</i>		
orchid, western prairie fringed (<i>Platanthera praeclara</i>)	IA	Wright
	<i>Conclusion: No potential for exposure exists. Rationale: According to the USFWS (2005(c)) species by county list for Iowa and the Natural Heritage Records (NatureServe, 2006), this species does not occur in this county (NatureServe indicates this is a historic occurrence from 1902). 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>	
orchid, western prairie fringed (<i>Platanthera praeclara</i>)	IA	Webster
	<i>Conclusion: No potential for exposure exists. Rationale: According to the USFWS (2005(c)) species by county list for Iowa and the Natural Heritage Records (NatureServe, 2006), this species does not occur in this county (NatureServe indicates this is a historic occurrence from 1904). 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>	
orchid, western prairie fringed (<i>Platanthera praeclara</i>)	IA	Palo Alto, Union
	<i>Conclusion: No potential for exposure exists. Rationale: According to the USFWS (2005(c)) species by county list for Iowa and the Natural Heritage Records (NatureServe, 2006), this species does not occur in this county (NatureServe indicates this is a historic occurrence). 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>	
orchid, western prairie fringed (<i>Platanthera praeclara</i>)	IA	Tama
	<i>Conclusion: No potential for exposure exists. Rationale: According to the USFWS (2005(c)) species by county list for Iowa and the Natural Heritage Records (NatureServe, 2006), this species does not occur in this county (NatureServe indicates this is a historic population not observed since 1908). 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>	
	IA	Ida, Iowa

Table A-4a (continued). Species co-occurrences for alfalfa hay production that are Not of Concern

Species *	State	Affected Counties
	Synopsis of the Reason for Exclusion	
orchid, western prairie fringed (<i>Platanthera praeclara</i>)	IA	Ida, Iowa
	Conclusion: No potential for exposure exists. Rationale: According to the USFWS (2005(c)) species by county list for Iowa and the Natural Heritage Records (NatureServe, 2006), this species does not occur in this county (NatureServe indicates this is a historical occurrence). 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.	
orchid, western prairie fringed (<i>Platanthera praeclara</i>)	IA	Linn
	Conclusion: No potential for exposure exists. Rationale: According to the USFWS (2005(c)) species by county list for Iowa and the Natural Heritage Records (NatureServe, 2006), this species does not occur in this county (NatureServe indicates this species has not been seen in this county since 1928). 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.	
orchid, western prairie fringed (<i>Platanthera praeclara</i>)	IA	Appanoose, Audubon, Benton, Black Hawk, Boone, Buchanan, Butler, Calhoun, Carroll, Cass, Cedar, Cerro Gordo, Chickasaw, Clarke, Clayton, Clinton, Dallas, Davis, Decatur, Delaware, Des Moines, Dubuque, Floyd, Franklin, Fremont, Greene, Grundy, Hamilton, Hancock, Hardin, Harrison, Henry, Humboldt, Jackson, Jasper, Jefferson, Johnson, Keokuk, Lee, Louisa, Lucas, Lyon, Madison, Mahaska, Marion, Marshall, Mitchell, Monroe, Montgomery, Muscatine, Obrien, Osceola, Page, Plymouth, Poweshiek, Ringgold, Sac, Scott, Sioux, Van Buren, Wapello, Warren, Washington, Wayne, Winnebago, Woodbury, Worth
	Conclusion: No potential for exposure exists. Rationale: According to the USFWS (2005(c)) species by county list for Iowa and the Natural Heritage Records (NatureServe, 2006), this species does not occur in this county. 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.	
orchid, western prairie fringed (<i>Platanthera praeclara</i>)	KS	Anderson, Atchison, Coffey, Crawford, Franklin, Jackson, Johnson, Lyon, Pottawatomie, Riley, Shawnee
	Conclusion: No potential for exposure exists. Rationale: According to the USFWS (2005(i)) species list by county for Kansas, this species does not occur in this county.	
orchid, western prairie fringed (<i>Platanthera praeclara</i>)	MN	Douglas, Faribault, Fillmore, Freeborn, Kandiyohi
	Conclusion: No potential for exposure exists. Rationale: According to USFWS (2004(a)) endangered species list for Minnesota and the Natural Heritage Records (NatureServe, 2005), this species does not occur in this county.	

* Lifeform classification from FESTF IMS.

Table A-4b: Species co-occurrences for alfalfa seed production that are Not of Concern

Species *	State	Affected Counties
	Synopsis of the Reason for Exclusion	
Dicots		
Lifeform: Aquatic		
bird's beak, palmate-bracted (<i>Cordylanthus palmatus</i>)	CA	San Joaquin
	Conclusion: No potential for exposure exists. Rationale: According to the Natural Heritage Program (NatureServe, 2006), this species was last seen in this county in 1881; species does not currently occur in this county.	
Lifeform: Terrestrial		
Barberry, Truckee (<i>Berberis (=Mahonia) sonnei</i>)	CA	Modoc
	Conclusion: No potential for exposure exists. Rationale: According to USFWS (2003(a)), this species has been delisted due to a taxonomic revision.	
bush-clover, prairie (<i>Lespedeza leptostachya</i>)	IA	Dallas, Decatur
	Conclusion: No potential for exposure exists. Rationale: According to the USFWS (2005(c)) endangered species list for Iowa and the Natural Heritage Records (NatureServe, 2006), this species does not occur in this county. 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.	
bush-clover, prairie (<i>Lespedeza leptostachya</i>)	IA	Audubon, Bremer, Cedar
	Conclusion: No potential for exposure exists. Rationale: According to the USFWS (2005(c)) endangered species list for Iowa and the Natural Heritage Records (NatureServe, 2006), this species does not occur in this county. 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.	
bush-clover, prairie (<i>Lespedeza leptostachya</i>)	IA	Hancock, Hardin, Henry, Iowa, Jackson, Jasper, Johnson, Jones, Marshall, Mitchell, Monona, Montgomery, Poweshiek, Shelby, Tama, Washington, Woodbury, Wright
	Conclusion: No potential for exposure exists. Rationale: According to the USFWS (2005(c)) endangered species list for Iowa and the USFWS (1987) this species does not occur in this county. 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.	
cactus, Arizona hedgehog (<i>Echinocereus triglochidiatus var. arizonicus</i>)	AZ	Maricopa
	Conclusion: No potential for exposure exists. Rationale: According to the USFWS (2006(a)) Arizona species list and the Natural Heritage Records (NatureServe, 2006), this species does not occur in this county.	
	IA	Lucas

Table A-4b (continued). Species co-occurrences for alfalfa seed production that are Not of Concern

Species *	State	Affected Counties
	Synopsis of the Reason for Exclusion	
milkweed, Mead's (<i>Asclepias meadii</i>)	IA	Lucas
	Conclusion: No potential for exposure exists. Rationale: According to the USFWS (2005(c)) endangered species list for Iowa and the USFWS (1987) this species does not occur in this county. 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.	
woolly-star, Hoover's (<i>Eriastrum hooveri</i>)	CA	Fresno, Kern, Kings
	Conclusion: No potential for exposure exists. Rationale: According to the USFWS (2003(f)), this species has been delisted throughout its entire range as of October 7, 2003.	
Monocots		
Lifeform: Terrestrial		
orchid, eastern prairie fringed (<i>Platanthera leucophaea</i>)	IA	Cedar, Henry, Iowa, Lucas, Washington
	Conclusion: No potential for exposure exists. Rationale: According to the USFWS (2005(c)) endangered species list for Iowa and the USFWS (1987) this species does not occur in this county. 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.	
orchid, western prairie fringed (<i>Platanthera praeclara</i>)	SD	Bennett, Brookings, Brown, Codington, Day, Minnehaha, Roberts, Todd
	Conclusion: No potential for exposure exists. Rationale: According to Dave Ode (South Dakota Natural Heritage Database Coordinator, pers. comm.) and the Natural Heritage Records (NatureServe, 2006), this species does not occur in this county.	
orchid, western prairie fringed (<i>Platanthera praeclara</i>)	IA	Wright
	Conclusion: No potential for exposure exists. Rationale: According to the USFWS (2005(c)) species by county list for Iowa and the Natural Heritage Records (NatureServe, 2006), this species does not occur in this county (NatureServe indicates this is a historic occurrence from 1902). 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.	
	IA	Tama

Table A-4b (continued). Species co-occurrences for alfalfa seed production that are Not of Concern

Species *	State	Affected Counties
	Synopsis of the Reason for Exclusion	
orchid, western prairie fringed (<i>Platanthera praeclara</i>)	IA	Tama <i>Conclusion: No potential for exposure exists. Rationale: According to the USFWS (2005(c)) species by county list for Iowa and the Natural Heritage Records (NatureServe, 2006), this species does not occur in this county (NatureServe indicates this is a historic population not observed since 1908). 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>
orchid, western prairie fringed (<i>Platanthera praeclara</i>)	IA	Iowa <i>Conclusion: No potential for exposure exists. Rationale: According to the USFWS (2005(c)) species by county list for Iowa and the Natural Heritage Records (NatureServe, 2006), this species does not occur in this county (NatureServe indicates this is a historical occurrence). 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>
orchid, western prairie fringed (<i>Platanthera praeclara</i>)	IA	Linn <i>Conclusion: No potential for exposure exists. Rationale: According to the USFWS (2005(c)) species by county list for Iowa and the Natural Heritage Records (NatureServe, 2006), this species does not occur in this county (NatureServe indicates this species has not been seen in this county since 1928). 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>
orchid, western prairie fringed (<i>Platanthera praeclara</i>)	IA	Audubon, Cedar, Dallas, Decatur, Hancock, Hardin, Henry, Jackson, Jasper, Johnson, Lucas, Marshall, Mitchell, Montgomery, O'Brien, Plymouth, Poweshiek, Warren, Washington, Woodbury <i>Conclusion: No potential for exposure exists. Rationale: According to the USFWS (2005(c)) species by county list for Iowa and the Natural Heritage Records (NatureServe, 2006), this species does not occur in this county. 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>
orchid, western prairie fringed (<i>Platanthera praeclara</i>)	KS	Anderson, Franklin, Pottawatomie, Riley, Shawnee <i>Conclusion: No potential for exposure exists. Rationale: According to the USFWS (2005(i)) species list by county for Kansas, this species does not occur in this county.</i>

* Lifeform classification from FESTF IMS.

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

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

Species*	State	Affected Counties
	Synopsis of the Reason for Exclusion	
<i>Conifers and Cycads</i>		
<i>Lifeform: Terrestrial</i>		
torreya, Florida (<i>Torreya taxifolia</i>)	FL	Jackson
	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: Florida torreya grows on hardwood hammock slopes, ravines and bluffs (NatureServe, 2005). The USFWS (1984(c)) specifically states that conditions of habitat preclude the presence of agricultural crops.	
<i>Dicots</i>		
<i>Lifeform: Aquatic</i>		
bittercress, small-anthered (<i>Cardamine micranthera</i>)	NC	Stokes
	VA	Patrick
		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).
goldenrod, Houghton's (<i>Solidago houghtonii</i>)	MI	Charlevoix, Cheboygan, Chippewa, Crawford, Emmet, Mackinac, Presque Isle, Schoolcraft
	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.	
howellia, water (<i>Howellia aquatilis</i>)	WA	Spokane
	Conclusion: Species habitat and use site spatial characteristics support the conclusion that sufficient physical separation exists such that either exposure of the species is not likely to occur. Rationale: Species occurs in the forested portions of the channeled scablands in this county (Washington State DNR, 2005). These forested areas are not at risk from agricultural sprays.	
joint-vetch, sensitive (<i>Aeschynomene virginica</i>)	MD	Somerset
	NJ	Burlington, Cumberland
	VA	Charles City, Essex, James City, King And Queen, King William, New Kent, Prince George, Richmond, Stafford, Westmoreland

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

Species*	State	Affected Counties
	Synopsis of the Reason for Exclusion	
monkey-flower, Michigan (<i>Mimulus glaberratus</i> var. <i>michiganensis</i>)	MI	Charlevoix 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: Michigan Monkey flower's forested wetland habitat on the shores of the great lakes and adjacent areas are likely to have soils that are saturated with cold spring water (NatureServe, 2005; Midwest USFWS, undated). Alfalfa would not be commercially grown in such areas because alfalfa is only grown in areas that are well drained.
monkey-flower, Michigan (<i>Mimulus glaberratus</i> var. <i>michiganensis</i>)	MI	Benzie, Cheboygan, Emmet, Leelanau, Mackinac 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 the edge of forested wetland areas that are saturated or covered by cold flowing spring water, near the shorelines of the Great Lakes (NatureServe, 2005; USFWS Midwest, undated). Such cold-water wetlands are not suitable for crop agriculture like alfalfa or for fodder planted grazing areas.
pitcher-plant, mountain sweet (<i>Sarracenia rubra</i> ssp. <i>jonesii</i>)	NC	Buncombe, Henderson, Transylvania 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: Mountain sweet pitcher-plant grows in very wet depression bogs or adjacent to waterfalls in mountain valley bottoms that are not subject to flooding (NatureServe, 2005). Although cultivation (crop agriculture) is known to be a risk factor, due to the wetness of the habitat and adjacent areas, it seems highly unlikely that alfalfa would be in proximity to the habitat (USFWS, 1988(b)).
pitcher-plant, mountain sweet (<i>Sarracenia rubra</i> ssp. <i>jonesii</i>)	SC	Greenville 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: Mountain sweet pitcher-plant grows in very wet depression bogs or adjacent to waterfalls in mountain valley bottoms that are not subject to flooding (NatureServe, 2005). Although cultivation (crop agriculture) is known to be a risk factor, due to the wetness of the habitat and adjacent areas, it seems highly unlikely that alfalfa would be in proximity to the habitat. Additionally, two populations are located on land administered by the South Carolina State Government, where the species would be protected and eight populations are on private land (USFWS, 1988(b)).
Pondberry (<i>Lindera melissifolia</i>)	AR GA MO NC	Clay, Lawrence Wheeler Butler, Ripley Cumberland, Sampson

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

Species*	State	Affected Counties
Synopsis of the Reason for Exclusion		
	SC	Charleston, Colleton, Horry
	<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>	
water-umbel, Huachuca (<i>Lilaeopsis schaffneriana</i> var. <i>recurva</i>)	AZ	Cochise, Pima, Santa Cruz
	<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 inhabits cienegas at over 3,000 feet in elevation; wetlands surrounded by semi-arid desert communities (NatureServe, 2005). This species' habitat is not suitable for agriculture. Diminishing water supplies are the main threat to this species.</i>	
Lifeform: Both		
lomatium, Cook's (<i>Lomatium cookii</i>)	OR	Jackson
	<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: In Jackson County, the habitat of this species is located in the Agate Desert and the soil is Agate-Winlow complex with agates on surface (USFWS, 2002(b)). This kind of rock soil is not suitable (due to edaphic factors) for crop agriculture unless it is extensively modified or amended.</i>	
Meadowfoam, large-flowered wooly (<i>Limnanthes floccosa grandiflora</i>)	OR	Jackson
	<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: In Jackson County, the habitat of this species is located in the Agate Desert and the soil is Agate-Winlow complex with agates on the surface (USFWS, 2002(b)). This kind of rock soil is not suitable (due to edaphic factors) for crop agriculture unless it is extensively modified or amended.</i>	
Lifeform: Terrestrial		
'Ahinahina (<i>Argyroxiphium sandwicense</i> ssp. <i>macrocephalum</i>)	HI	Maui
	<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 at high altitudes (8,500 to 12,000 feet) (USFWS, undated(g)). Cultivated crops are not likely to be grown at these high elevations. In addition, even if drift were a nearby concern, the forested habitat would intercept most, if not all.</i>	
'Ahinahina (<i>Argyroxiphium sandwicense</i> ssp. <i>sandwicense</i>)	HI	Maui
	<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 at high altitudes (8,500 to 12,000 feet) (USFWS, undated(g)). Cultivated crops occur at much lower elevations where drift would not reach the habitat. In addition, even if drift were a nearby concern, the forested habitat would intercept most, if not all.</i>	
	HI	Kauai

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

Species*	State	Affected Counties
	Synopsis of the Reason for Exclusion	
'aiakeakua, popolo (<i>Solanum sandwicense</i>)	HI	Kauai 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).
'aiea (<i>Nothoestrum peltatum</i>)	HI	Kauai 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).
'oha Wai (<i>Clermontia lindseyana</i>)	HI	Maui 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: Moist and wet forest dwelling species (NatureServe, 2005).
'oha wai (<i>Clermontia oblongifolia</i> ssp. <i>brevipes</i>)	HI	Maui 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 is wet rain forest (NatureServe, 2006). Wet forest species will not be directly impacted by crop agriculture.
'oha Wai (<i>Clermontia samuelii</i>)	HI	Maui 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 (NatureServe, 2005).
Alani (<i>Melicope adscendens</i>)	HI	Maui 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).
Alani (<i>Melicope balloui</i>)	HI	Maui 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).
Alani (<i>Melicope haupuensis</i>)	HI	Kauai 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 wet forests on ridges and gulches (NatureServe, 2005). Ridges are above agricultural areas and gulches are not suitable for modern mechanized agriculture.
Alani (<i>Melicope knudsenii</i>)	HI	Kauai, Maui 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).
Alani (<i>Melicope ovalis</i>)	HI	Maui

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

Species*	State	Affected Counties
	Synopsis of the Reason for Exclusion	
	<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>	
Alani (<i>Melicope quadrangularis</i>)	HI	Kauai <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>
Alani (<i>Melicope reflexa</i>)	HI	Maui <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 is a wet forest plant that grows on ridge crests and on gulch slopes (Nature Serve, 2006). Wet forest species will not be directly impacted by crop agriculture. Ridge crests and gulch slopes are unsuitable for agriculture due to edaphic factors and topography unsuitable to mechanized farming.</i>
amaranth, seabeach (<i>Amaranthus pumilus</i>)	NC NY SC	Pender Nassau, Suffolk Charleston, Horry <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>
Aupaka (<i>Isodendrion laurifolium</i>)	HI	Kauai <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 dense moist and wet forests (NatureServe, 2005).</i>
Aupaka (<i>Isodendrion longifolium</i>)	HI	Kauai <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 dense moist and wet forests (NatureServe, 2005).</i>
avens, spreading (<i>Geum radiatum</i>)	NC TN	Ashe, Avery, Burke, Caldwell, Mitchell, Transylvania, Watauga, Yancey Carter, Sevier <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: Spreading avens are located on isolated mountain tops surrounded by forests (NatureServe, 2005). Crops are not grown near this species' habitat because mountain tops are not suitable for crop agriculture. Also, true forest species should not be in proximity to crop agriculture and will be protected from drift by tall trees.</i>
awiwi (<i>Hedyotis cookiana</i>)	HI	Kauai

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

Species*	State	Affected Counties
		Synopsis of the Reason for Exclusion
		<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>
ayenia, Texas (<i>Ayenia limitaris</i>)	TX	Hidalgo, Kleberg, Nueces <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>
bear-poppy, dwarf (<i>Arctomecon humilis</i>)	UT	Washington <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: Dwarf bear-poppy occurs on outcrops in gypsum-rich soils in “badlands” (USFWS, 1979(a)); this habitat is not suitable for cultivated crops.</i>
beardtongue, Penland (<i>Penstemon penlandii</i>)	CO	Grand <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 grows in soils that contain selenium (NatureServe, 2005). Selenium is toxic to most plants and crop agriculture would not be practiced in such soils.</i>
birds-in-a-nest, white (<i>Macbridea alba</i>)	FL	Bay <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 grows in poorly drained peat soils (NatureServe, 2005). Alfalfa is not grown in or near this soil type.</i>
bladderpod, Dudley Bluffs (<i>Lesquerella congesta</i>)	CO	Rio Blanco <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 on flat top mesas & ridges at 6,000+ feet elevation and is surrounded by pinyon-juniper woodlands (USFWS, 1990(c)). No crops are grown at this elevation or in pinyon-juniper woodlands (Turner, 1997).</i>
	UT	Kane

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

Species*	State	Affected Counties
	Synopsis of the Reason for Exclusion	
bladderpod, kodachrome (<i>Lesquerella tumulosa</i>)	UT	Kane <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: This species is found at lower elevations of the Kodachrome Basin -- Paria River drainage on poorly developed soil derived from the Carmel formation. Sufficient research has not been conducted to evaluate this species and it is not known to be at risk from crop agriculture. The current risk factors include: off-road recreational vehicle use; mineral development (oil, gas, quarrying and mining exploration and extraction); vandalism; grazing by domestic livestock. Additionally, this species only occurs on Utah State land managed by the Federal BLM (USFWS, 1993(a)) so adverse impact from farming or pesticide is not likely.</i>
bladderpod, Missouri (<i>Lesquerella filiformis</i>)	MO	Christian, Dade, Greene, Lawrence <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>
blazingstar, Heller's (<i>Liatris helleri</i>)	NC	Ashe, Avery, Burke, Caldwell, Mitchell, Watauga <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: Heller's blazingstar occurs in acidic soils that form on and around exposed granite ledges, outcrops, and balds at high elevations of 3,500 to 6,000 feet (1067-1829 m) in full sun with grasses, sedges and other composites (Conservation Management Institute, 1996); this species is known to occur only on summits of Blue Ridge Mountains (NatureServe, 2005). Agriculture is not practiced near these areas. Cultivated crops occur at much lower elevations where drift would not reach the habitat; even if drift were a nearby concern, the forested habitat would intercept most, if not all.</i>
blue-star, Kearney's (<i>Amsonia kearneyana</i>)	AZ	Pima <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: The habitat description (stable alluvial deposits of small boulders and cobbles along a dry wash) indicates that field crops are not grown in proximity to Kearney's blue-star habitat. This species is surrounded by Sonoran desert scrub and land with boulders, cobbles and steep slopes (NatureServe, 2005). This habitat has poor contours that will not support mechanized agriculture.</i>
bluet, Roan Mountain (<i>Hedyotis purpurea</i> var. <i>montana</i>)	NC	Ashe, Avery, Mitchell, Watauga, Yancey <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, 1990(b)).</i>
bonamia, Florida (<i>Bonamia grandiflora</i>)	FL	Hardee, Highlands, Marion <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>

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

Species*	State	Affected Counties
	Synopsis of the Reason for Exclusion	
buckwheat, steamboat (<i>Eriogonum ovalifolium</i> var. <i>williamsiae</i>)	NV	Washoe <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: Crop agriculture or grazing seem unlikely to be risk factors for steamboat buckwheat. Species only occurs at one site and the soil supporting this species is not suitable for alfalfa culture; soil is an almost unique type derived from hot spring deposits and this species cannot survive for protracted periods on any other soil type. Known risk factors for this species include development of geothermal power and recreational facilities at the natural hot springs (USFWS, 1986). Alfalfa would not be found in this habitat.</i>
cactus, Arizona hedgehog (<i>Echinocereus triglochidiatus</i> var. <i>arizonicus</i>)	AZ	Gila, Pinal <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: Arizona hedgehog cactus plants typically occur at > 4,000 ft and are found on dacite or granite bedrock, open slopes, in narrow cracks between boulders, and in the understory of shrubs in the ecotone between Madrean Evergreen Woodland and Interior Chaparral (USFWS, undated(c)). This crop is usually grown below 4,000 ft in elevation and species' habitat is unsuitable for agriculture due to poor farm contours that interfere with agricultural practice.</i>
cactus, black lace (<i>Echinocereus reichenbachii</i> var. <i>albertii</i>)	TX	Jim Wells, Kleberg, Refugio, Uvalde <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>
cactus, Brady pincushion (<i>Pediocactus bradyi</i>)	AZ	Coconino <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: The Brady pincushion cactus is a desert species that inhabits areas with extremely thin soils and grows at over 4,000 ft in elevation (USFWS, undated(d)). Alfalfa is not grown in these types of soils.</i>
Cactus, Chisos Mountain hedgehog (<i>Echinocereus chisoensis</i> var. <i>chisoensis</i>)	TX	Brewster <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: The Chisos Mountains hedgehog cactus occurs in desert grasslands and shrublands (Texas Dept. of Ag, 2006). Therefore, this species is unlikely to be found near agricultural areas. Also, agricultural chemicals are rarely used in Brewster County.</i>
	AZ	Cochise

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

Species*	State	Affected Counties
	Synopsis of the Reason for Exclusion	
cactus, Cochise pincushion (<i>Coryphantha robbinsorum</i>)	AZ	Cochise <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: The Cochise pincushion cactus is a desert species that inhabits areas with extremely thin soils; it is found on the bedrock and stony soils of the Permian Limestone Foundation and grows at over 4,000 ft in elevation (USFWS, 1993(e)). Alfalfa is not grown in these types of soils.</i>
cactus, Kuenzler hedgehog (<i>Echinocereus fendleri</i> var. <i>kuenzleri</i>)	NM	Chaves, Lincoln, Otero <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, Lee pincushion (<i>Coryphantha sneedii</i> var. <i>leei</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: Lee pincushion cactus primarily inhabits cracks in limestone in areas of broken terrain and steep slopes of Chihuahuan desert scrub; 1,200-1,500 m (4,000-5,000 ft) (New Mexico Rare Plant Technical Council, 2005(a)). The Chihuahuan desert does not support agriculture.</i>
cactus, Lloyd's Mariposa (<i>Echinomastus mariposensis</i>)	TX	Brewster <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: Lloyd's mariposa cactus occurs in alkaline, limestone soils within the Chihuahuan Desert (Texas Dept. of Ag, 2006). Therefore, this species is unlikely to be found near agricultural areas. Also, agricultural chemicals are rarely used in Brewster County.</i>
cactus, Mesa Verde (<i>Sclerocactus mesae-verdae</i>)	CO NM	Montezuma San Juan <i>Conclusion: The physical separation between the soil types underlying the species habitat and use site is sufficient to support the conclusion that exposure of the species is not likely to occur. Rationale: Selenite soils, in the badlands area of Colorado, are required by the Mesa Verde cactus (NatureServe, 2005). Such soils are inappropriate for agriculture because high concentrations of selenium are toxic to humans and livestock. Crops would not be grown near these areas and drift and/or run-off would not be an issue for this species.</i>
cactus, Nellie cory (<i>Coryphantha minima</i>)	TX	Brewster <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: The Nellie Cory cactus occurs in full sun within the Chihuahuan Desert scrub (Texas Dept. of Ag, 2006). Therefore, this species is unlikely to be found near agricultural areas. Also, agricultural chemicals are rarely used in Brewster County.</i>
	AZ	Pima, Pinal

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

Species*	State	Affected Counties
	Synopsis of the Reason for Exclusion	
cactus, Nichol's Turk's head (<i>Echinocactus horizonthalonius</i> <i>var. nicholii</i>)	AZ	Pima, Pinal <i>Conclusion: The physical separation between the soil types underlying the species habitat and use site is sufficient to support the conclusion that exposure of the species is not likely to occur. Rationale: Species' only habitat occurs in the Waterman and Vekol Mountains and agriculture is not known to be a risk factor there. The only known risks to this species are mining, quarrying, urban development off-road vehicle use, collecting and possibly grazing (Desert Botanical Garden, 2000). Any other use seems unlikely and known crop agriculture is down slope from the habitat so runoff and drift from crop agriculture are unlikely risk factors. Additionally, this species occurs on lands administered by the Bureau of Land Management, the Papago Indian Reservation, and on a small piece of private land. BLM, the principal Federal agency involved, is aware of the location of this plant (USFWS, 1979(b)) and therefore, land administered by the BLM would be managed so that exposure risk to this species would be unlikely.</i>
cactus, Peebles Navajo (<i>Pediocactus peeblesianus</i> <i>peeblesianus</i>)	AZ	Navajo <i>Conclusion: Species habitat and use site spatial characteristics support the conclusion that sufficient physical separation exists such that either exposure of the species is not likely to occur. Rationale: Peebles Navajo cactus grows in gravelly desert soils (USFWS, 2006(a)). The crop in question is not grown in or near these gravelly desert soils.</i>
cactus, Pima pineapple (<i>Coryphantha scheeri</i> <i>var.</i> <i>robustispina</i>)	AZ	Pima, Santa Cruz <i>Conclusion: Species habitat and use site spatial characteristics support the conclusion that sufficient physical separation exists such that either exposure of the species is not likely to occur. Rationale: Field crops will not be grown on or near ridge tops where this species is found (USFWS, undated(f)).</i>
cactus, Siler pincushion (<i>Pediocactus</i> (= <i>Echinocactus</i> , = <i>Utahia</i>) <i>sileri</i>)	AZ UT	Coconino, Mohave Kane, Washington <i>Conclusion: Species habitat and use site spatial characteristics support the conclusion that sufficient physical separation exists such that either exposure of the species is not likely to occur. Rationale: Primary risks to Siler pincushion cactus are mining and collection. Arizona State law prohibits taking of this species (particularly by collectors) (USFWS, 1993(b)). Species occurs on barren, rolling, clay hills in gypsiferous clay to sandy soils that are high in soluble salts within desert shrub communities; soils with such high levels of soluble salt will not support crop agriculture.</i>
cactus, Sneed pincushion (<i>Coryphantha sneedii</i> <i>var.</i> <i>sneedii</i>)	NM TX	Dona Ana El Paso, Hudspeth <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>
cactus, Tobusch fishhook (<i>Ancistrocactus tobuschii</i>)	TX	Kerr, Kimble, Kinney, Uvalde, Val Verde <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 site specific to shallow calcareous soils; field crops are not grown near these areas due to edaphic unsuitability (Mike McMurry, Texas Department of Agriculture, pers. comm.).</i>

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

Species*	State	Affected Counties
	Synopsis of the Reason for Exclusion	
Cactus, Uinta Basin hookless (<i>Sclerocactus glaucus</i>)	CO	Delta, Garfield, Mesa, Montrose
	UT	Carbon, Duchesne, Uintah
	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 cobbly, gravelly, rocky soils in dry alluvial fans (Utah Division of Natural Resources, undated). Crops are not grown in these areas (Turner, 1997).	
cactus, Winkler (<i>Pediocactus winkleri</i>)	UT	Emery, Wayne
	Conclusion: The physical separation between the soil types underlying the species habitat and use site is sufficient to support the conclusion that exposure of the species is not likely to occur. Rationale: Soils with high salinity that are common to salt desert scrub are required by this species (NatureServe, 2005). High salinity soils are minerally toxic; it is unlikely that crops would be near this soil type because these soils would not be appropriate for alfalfa culture.	
cactus, Wright fishhook (<i>Sclerocactus wrightiae</i>)	UT	Emery, Sevier, Wayne
	Conclusion: The physical separation between the soil types underlying the species habitat and use site is sufficient to support the conclusion that exposure of the species is not likely to occur. Rationale: Habitat for this species is semi-desert scrub, with widely scattered shrubs, perennial herbs, bunch grasses, or scattered pinyon and juniper on barren, alkaline soils at 1,460-1,865 m (4,782 to 6,108 ft) elevation. Soils vary from clay, to sandy silts, to fine sands with varying gypsum content. Soil crusts are usually present and the ground surface is usually littered with sandstone or basalt gravels, cobbles, and boulders (NatureServe, 2005). Soils with hard heavy crusts are unsuitable for agriculture and ground surfaces littered with rocks and gravel are unsuitable for mechanized agriculture.	
cat's-eye, Terlingua Creek (<i>Cryptantha crassipes</i>)	TX	Brewster
	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: The Terlingua Creek cat's-eye grows in full sunlight on xeric, gypsiferous and chalky shales (Texas Dept. of Ag, 2006). Therefore, this species is unlikely to be found near agricultural areas. Also, agricultural chemicals are rarely used in Brewster County.	
cinquefoil, Robbins' (<i>Potentilla robbinsiana</i>)	NH	Coos, Grafton
	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: Robbins' cinquefoil occurs at high altitudes (> 1550 m) in areas characterized by high winds and extremely low temperatures (NatureServe, 2005). Crops are not grown in or near such areas or would not be grown in a temporal frame when temperatures are extremely low. Therefore, this species would not be at risk from agricultural sprays.	
Cliff-rose, Arizona (<i>Purshia</i> (= <i>Cowania</i>) <i>subintegra</i>)	AZ	Graham, Maricopa, Mohave, Yavapai
	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: The infertile white calcareous deposits where Arizona cliff-rose is found (NatureServe, 2005; USFWS, 1984(a)) are not found near crop agriculture. This species' habitat should be above agriculture on rolling hills.	
	NC	Granville

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

Species*	State	Affected Counties
	Synopsis of the Reason for Exclusion	
coneflower, smooth (<i>Echinacea laevigata</i>)	NC	Granville
	SC VA	Lancaster, Lexington, Oconee, Pickens Alleghany, Campbell, Franklin, Halifax, Montgomery, Pulaski, Roanoke
<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: 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></p>		
coneflower, Tennessee purple (<i>Echinacea tennesseensis</i>)	TN	Davidson, Rutherford, Wilson
	<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>	
cory cactus, bunched (<i>Coryphantha ramillosa</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: The Bunched Cory cactus occurs on rocky slopes, ledges and flats within the Chihuahuan Desert and are only known to occur in Big Bend National Park (Texas Dept. of Ag, 2006). Therefore, this species is unlikely to be found near agricultural areas. Also, agricultural chemicals are rarely used in Brewster County.</i></p>	
cory cactus, bunched (<i>Coryphantha ramillosa</i>)	TX	Terrell
	<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 inhabits rocky areas over limestone in the Chihuahuan Desert (NatureServe, 2005). Crops are not grown in or near this area.</i></p>	
Cycladenia, Jones (<i>Cycladenia jonesii</i> (=humilis))	AZ	Mohave
	UT	Emery, Garfield, Grand, Kane
<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: Jones cycladenia species grows on barren clay hills forming the steep side slopes and bases of mesas in the canyon country (NatureServe, 2005). In addition, the harsh soils and "badland" typically highly dissected by erosion, precludes the presence of cultivated crops (Turner, 1997).</i></p>		
daisy, lakeside (<i>Hymenoxys herbacea</i>)	IL	Tazewell, Will
	OH	Erie, Ottawa

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

Species*	State	Affected Counties
Synopsis of the Reason for Exclusion		
<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: Lakeside daisy is known only from limestone and dolomite outcrops in restricted areas of Ontario, Illinois, Michigan, and Ohio (NatureServe, 2005). Such habitat and accompanying shallow soil does not support alfalfa. Alfalfa fields would also be sufficiently removed from these areas so that spray drift and runoff would not be a concern.</i></p>		
fleabane, Zuni (<i>Erigeron rhizomatus</i>)	AZ NM	Apache Catron, Mckinley
<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>		
four-o'clock, MacFarlane's (<i>Mirabilis macfarlanei</i>)	ID OR	Idaho Wallowa
<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 occurs on rugged terrain and slopes where crops are unlikely (NatureServe, 2006). Also, management practices (Turner, 1997) on land owned or controlled by USFS and BLM minimizes adverse impact on MacFarlane's four-o'clock (USFWS, 1979(c)). Predominance of evidence indicates that this species will not be adversely impacted by (crop) agriculture.</i></p>		
fringe-tree, pygmy (<i>Chionanthus pygmaeus</i>)	FL	Highlands
<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: Crops are not grown in this species habitat; species grows in xeric sands, scrub oaks, pinelands and other dry habitats (NatureServe, 2005).</i></p>		
geranium, Hawaiian red-flowered (<i>Geranium arboreum</i>)	HI	Maui
<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: The USFWS (1992(a)) notes that this species is found at elevations of 5,000 to 7,000 ft on the northern and western slopes of Haleakala. Alfalfa is not grown at these elevations. Spray drift from any crops grown at lower elevations is unlikely to reach this elevation.</i></p>		
gerardia, sandplain (<i>Agalinis acuta</i>)	CT MA MD NY RI	Windham Barnstable, Dukes Baltimore Nassau, Suffolk Washington
<p><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></p>		
	TN	Carter

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

Species*	State	Affected Counties
	Synopsis of the Reason for Exclusion	
goldenrod, Blue Ridge (<i>Solidago spithamea</i>)	TN	Carter <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 on both public land administered by USFWS and private land, on high mountain granite peaks in North Carolina and Tennessee (USFWS, 1985(b)). Species is found above 4,600 ft in elevation; well above agricultural areas. The only reported risk factor is recreational use of the land (NatureServe, 2005).</i>
goldenrod, Blue Ridge (<i>Solidago spithamea</i>)	NC	Avery, Caldwell, Mitchell, Watauga <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 on both public land administered by USFWS and private land, on high mountain granite peaks in North Carolina, (USFWS, 1985(b)). Species is found above 4,600 ft in elevation; well above agricultural areas. The only reported risk factor is recreational use of the land (NatureServe, 2005).</i>
goldenrod, white-haired (<i>Solidago albopilosa</i>)	KY	Menifee, Powell, Wolfe <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 inhabits shallow, sandstone cave-like structures called "rock houses" and beneath overhanging sandstone ledges where the plants root in loose sand and soil-filled crevices (NatureServe, 2005). Such habitat does not support alfalfa. Alfalfa fields would also be sufficiently removed from these areas so that spray drift and run-off would not be concerns.</i>
ground-plum, Guthrie's (=Pyne's) (<i>Astragalus bibullatus</i>)	TN	Rutherford <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>
groundsel, San Francisco Peaks (<i>Senecio franciscanus</i>)	AZ	Coconino <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 consists of alpine tundra slopes at high elevations (NatureServe, 2005). Crops are not grown in this habitat; alpine tundra slopes are at too high an elevation for crops.</i>
Ha'iwale (<i>Cyrtandra limahuliensis</i>)	HI	Kauai <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 (USFWS, 1994(b)).</i>
Ha'iwale (<i>Cyrtandra munroi</i>)	HI	Mauai <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 is a wet forest plant that grows on ridge crests and on gulch slopes (Nature Serve, 2006). Wet forest species will not be directly impacted by crop agriculture. Ridge crests and gulch slopes are unsuitable for agriculture due to edaphic factors and topography unsuitable to mechanized farming.</i>
Haha (<i>Cyanea asarifolia</i>)	HI	Kauai

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

Species*	State	Affected Counties
Synopsis of the Reason for Exclusion		
<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 (USFWS, 1994(b)).</i></p>		
haha (<i>Cyanea copelandii</i> ssp. <i>haleakalaensis</i>)	HI	Maui <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 (NatureServe, 2005).</i>
haha (<i>Cyanea dunbarii</i>)	HI	Maui <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 is a wet forest plant that grows on ridge crests and on gulch slopes (Nature Serve, 2006). Wet forest species will not be directly impacted by crop agriculture. Ridge crests and gulch slopes are unsuitable for agriculture due to edaphic factors and topography unsuitable to mechanized farming.</i>
Haha (<i>Cyanea glabra</i>)	HI	Maui <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 (USFWS, 1999(a)).</i>
haha (<i>Cyanea grimesiana</i> ssp. <i>grimesiana</i>)	HI	Maui <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: Mesic forest dwelling species found at high elevations (USFWS, 1996(b)). It is highly unlikely that alfalfa is grown in Hawaii at elevations where this species occurs.</i>
haha (<i>Cyanea hamatiflora</i> ssp. <i>hamatiflora</i>)	HI	Maui <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: Montane forest dwelling species (USFWS, 1996(b)). Montane areas are rugged mountainous areas surrounded by trees; crop agriculture is extremely unlikely in this habitat.</i>
Haha (<i>Cyanea mceldowneyi</i>)	HI	Maui <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/moist forest dwelling species (USFWS, 2003(c)).</i>
Haha (<i>Cyanea procera</i>)	HI	Maui <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 is a wet forest plant that grows on gulch slopes and gulch bottoms (Nature Serve, 2006). Wet forest species will not be directly impacted by crop agriculture. Gulch slopes are unsuitable for agriculture due to edaphic factors and topography unsuitable to mechanized farming.</i>
Haha (<i>Cyanea recta</i>)	HI	Kauai

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

Species*	State	Affected Counties
	Synopsis of the Reason for Exclusion	
	<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/moist forest dwelling species (USFWS, 1996(b)).</i>	
Haha (<i>Cyanea undulata</i>)	HI	Kauai <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/moist forest dwelling species (USFWS, 2003(d)).</i>
harebells, Avon Park (<i>Crotalaria avonensis</i>)	FL	Highlands <i>Alfalfa is not grown in bare white sandy soils where this species is found; the USFWS (1999(d)) notes that "Avon Park harebells is one of the most narrowly distributed of the Lake Wales Ridge endemics, having been identified at three sites in Polk and Highlands counties (DeLaney and Wunderlin 1989, The Nature Conservancy, 1991). Specifically, its distribution includes the Avon Park Lakes acquisition area and the Saddleblanket Lakes State Preserve in Polk County, and the Carter Creek acquisition area in Highlands County... This species inhabits scrub communities found on the Lake Wales Ridge where it typically grows in full sun, on bare white sand, or in association with clumps of Cladonia lichens. However, it may also occur in the partial shade of other plants (DeLaney and Wunderlin 1989)." Additionally, it appears that the Lake Wales Ridge Ecosystem Working Group acquired these tracts and are currently managing them for preservation of this and other endangered species (Lake Wales Ridge Ecosystem, 2000). Therefore, this species is not at risk from agricultural sprays.</i>
hau kuahiwi (<i>Hibiscadelphus woodii</i>)	HI	Kauai <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 (ESIS, 1996(a)); the USFWS (1996(b)) notes that "Hibiscadelphus woodii is known only from the site of its discovery in Kalalau Valley on the island of Kauai within the Na Pali Coast State Park, from about 990 to 1,000 m (3,250 to 3,280 ft) elevation. Only four trees of this species are known. The plants grow on cliff walls in an 'ohi'a montane mesic forest." Deep forest species are not at risk from agriculture.</i>
heartleaf, dwarf-flowered (<i>Hexastylis naniflora</i>)	NC SC	Burke, Catawba, Cleveland, Lincoln, Rutherford Cherokee, Greenville, Spartanburg <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>
	NC	Burke

Table A-5a (continued). 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>)	NC	Burke <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>
Heau (<i>Exocarpos luteolus</i>)	HI	Kauai <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: The USFWS (1994(b)) notes that all populations of this species are found on state land at elevations between 2,000 and 3,600 ft (600 and 1,100 m) in a variety of habitats: wet places bordering swamps; on open, dry ridges; and lowland to montane, 'ohi'a-dominated wet forest communities. Crops are not grown on state lands nor in moist/wet forests.</i>
hedyotis, Na Pali beach (<i>Hedyotis st.-johnii</i>)	HI	Kauai <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: The USFWS (2003(d)) notes that "This plant grows in the crevices of north-facing, near-vertical coastal cliff faces within the spray zone in sparse dry coastal shrublands at elevations between 0 and 187m." Coastal Hawaiian cliff slopes and rocky ledges are not near agriculture; agricultural sprays would not effect this species.</i>
hibiscus, Clay's (<i>Hibiscus clayi</i>)	HI	Kauai <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: Moist and wet forest dwelling species (USFWS, 1994(b)).</i>
hypericum, highlands scrub (<i>Hypericum cumulicola</i>)	FL	Highlands <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: The USFWS (undated(i)) notes that this species "is limited to upland areas with well-drained, sterile white sands." Crops are not grown in or near sterile white sands. Crop agriculture is not an issue for this species; only grazing could potentially be in or adjacent to habitat.</i>
	NM	San Miguel

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

Species*	State	Affected Counties
	Synopsis of the Reason for Exclusion	
ipomopsis, Holy Ghost (<i>Ipomopsis sancti-spiritus</i>)	NM	San Miguel <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 species habitat is under pine trees (NatureServe, 2005) and as such is not a suitable alfalfa-growing habitat (Turner, 1997). Also, this species is found entirely on USFS and BLM land; management practices on land owned or controlled by USFS and BLM minimize adverse impact on Holy Ghost ipomopsis (Turner, 1997). Agriculture is very unlikely in or in proximity to species habitat (Turner, L. 1997).</i>
jacquemontia, beach (<i>Jacquemontia reclinata</i>)	FL	Broward, Palm Beach <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 only occurs on the barrier islands (USFWS, 1994(d)). This land is either urbanized, publicly owned or large private (non-agricultural) estates. Exposure to glyphosate from farm activities seems unlikely.</i>
Kamakahala (<i>Labordia lydgatei</i>)	HI	Kauai <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 found on ridgetops (NatureServe, 2005).</i>
kamakahala (<i>Labordia tinifolia</i> var. <i>lanaiensis</i>)	HI	Maui <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 is a wet to mesic (moderately wet) forest plant (Nature Serve, 2006). Wet forest species will not be directly impacted by crop agriculture.</i>
kamakahala (<i>Labordia tinifolia</i> var. <i>wahiawaensis</i>)	HI	Kauai <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 found on ridgetops (NatureServe, 2005).</i>
Kamakahala (<i>Labordia triflora</i>)	HI	Maui <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 is a wet forest plant that grows on ridge crests and on gulch slopes (Nature Serve, 2006). Wet forest species will not be directly impacted by crop agriculture. Ridge crests and gulch slopes are unsuitable for agriculture due to edaphic factors and topography unsuitable to mechanized farming.</i>
kauai hau kuahiwi (<i>Hibiscadelphus distans</i>)	HI	Kauai <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: ESIS (1996(a)) notes that "The only known population of Hibiscadelphus distans is located within the State-owned Pu'u Ka Pele Forest Reserve. It lives within an area of approximately 0.02 hectares (2,000 sq. ft) on a steep rock bluff above Koai'e Stream, Kaua'i, at an elevation of about 350 m (1,150 ft) (01,06)." Agriculture is not practiced on state forest reserve lands. Bluffs and cliff ledges where habitat is found are above cropland.</i>

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

Species*	State	Affected Counties
	Synopsis of the Reason for Exclusion	
Kaulu (<i>Pteralyxia kauaiensis</i>)	HI	Kauai
	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: Moist and wet forest dwelling species (NatureServe, 2005).	
Kohe malama malama o kanaloa (<i>Kanaloa kahoolawensis</i>)	HI	Maui
	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 is dry rocky slope with sparse native shrubland on the island of Kahoolawe. There are only two known individual plants representing this entire species (NatureServe, 2006). The island of Kahoolawe does not have any agriculture.	
Koki'o (<i>Kokia kauaiensis</i>)	HI	Kauai
	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: Moist forest dwelling species (NatureServe, 2005).	
koki'o ke'oke'o (<i>Hibiscus arnottianus</i> ssp. <i>immaculatus</i>)	HI	Maui
	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 is a wet forest plant that grows on ridge crests and on gulch slopes (Nature Serve, 2006). Wet forest species will not be directly impacted by crop agriculture. Ridge crests and gulch slopes are unsuitable for agriculture due to edaphic factors and topography unsuitable to mechanized farming.	
Kolea (<i>Myrsine linearifolia</i>)	HI	Kauai
	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: Moist and wet forest dwelling species (NatureServe, 2005).	
Kopa (<i>Hedyotis schlehtendahlia</i> var. <i>remyi</i>)	HI	Maui
	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 is mesic (medium moist) to wet forest, sometimes on windswept ridges (Nature Serve, 2006). Crop agriculture is not practiced in mesic to wet forested areas. Windswept ridges should be above agricultural areas.	
Kuawawaenuhu (<i>Alsiniidendron lychnoides</i>)	HI	Kauai
	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 (NatureServe, 2005).	
Laulihilihi (<i>Schiedea stellarioides</i>)	HI	Kauai
	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: Moist forest dwelling species (NatureServe, 2005).	
	AL	Etowah

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

Species*	State	Affected Counties
	Synopsis of the Reason for Exclusion	
leather flower, Alabama (<i>Clematis socialis</i>)	AL	Etowah
	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: The only site where this species occurs in Etowah County is located in a wetland reserve area of Gadsden Airport (NatureServe, 2006). This reserve is managed so that exposure to glyphosate from agricultural practices is unlikely.	
leather flower, Morefield's (<i>Clematis morefieldii</i>)	AL	Madison
	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.	
loosestrife, rough-leaved (<i>Lysimachia asperulaefolia</i>)	NC	Cumberland, Hoke, Pender, Richmond, Scotland
	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.	
loosestrife, rough-leaved (<i>Lysimachia asperulaefolia</i>)	SC	Richland
	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. Additionally, this species may be located entirely on Federal property at Fort Jackson Army Base.	
lousewort, Furbish (<i>Pedicularis furbishiae</i>)	ME	Aroostook
	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: The critical habitat for Furbish lousewort consists of steep banks near the St. John River, between open river cobbles and boreal forest (NatureServe, 2005). Species is noted to occur in proximity to recreational summer homes but not associated with cultivated crops. Critical habitat for this species has land contours that are not suitable for farming.	
Ma'oli'oli (<i>Schiedea apokremnos</i>)	HI	Kauai
	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 inhabits dry shrublands on steep slopes and cliff faces (NatureServe, 2005). Crops are not grown on or near steep slopes and cliff faces due to topography that is not suitable for mechanized agriculture. Species' habitat on steep slopes leading up to cliff faces should be above agricultural areas.	
Mahoe (<i>Alectryon macrococcus</i>)	HI	Kauai, Maui
	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: Moist forest dwelling species (NatureServe, 2005).	
	HI	Kauai, Maui

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

Species*	State	Affected Counties
	Synopsis of the Reason for Exclusion	
Makou (<i>Peucedanum sandwicense</i>)	HI	Kauai, Maui
	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 inhabits steep slopes (leading up to cliffs) and cliffs (NatureServe, 2005). Crops are not grown on or near steep slopes and cliffs and habitat should be above agricultural areas.	
Mapele (<i>Cyrtandra cyaneoides</i>)	HI	Kauai
	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 (NatureServe, 2005).	
Mehamehame (<i>Flueggea neowawraea</i>)	HI	Kauai, Maui
	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: Moist forest dwelling species (NatureServe, 2005).	
milk-vetch, heliotrope (<i>Astragalus montii</i>)	UT	Sanpete, Sevier
	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: The only known population of heliotrope milk-vetch is on National Forest Land, at elevations greater than 9,000 feet (Utah Rare Plants, 2005). Alfalfa is not grown at alpine elevations (>9,000 feet). This elevation is above the tree line and the known population is on managed land (Turner, 1997).	
milk-vetch, Jesup's (<i>Astragalus robbinsii</i> var. <i>jesupi</i>)	NH	Sullivan
	VT	Windsor
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 grows only in silt-filled crevices over ice-scoured bedrock along the Connecticut River; habitat sites are apparently adjacent to transitional boreal hardwood forests (NatureServe, 2005). Although unclear, crop agriculture and grazing seem unlikely to be in proximity to species habitat. Only known risk factors are trampling by recreational users, and inundation from the development of dams for hydroelectric power.		
milk-vetch, Mancos (<i>Astragalus humillimus</i>)	CO	Montezuma
	NM	San Juan
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: Mancos milk-vetch is site specific to loose sandy depressions over sandstone bedrock (NatureServe, 2005; University of New Mexico Rare Plants, 2005(b); Dave Anderson, Botany Team Leader for the State of Colorado Natural Heritage Program pers. comm., 5/26/04). Alfalfa is not grown near these areas due to edaphic unsuitability (Turner, 1997).		
	CO	Grand

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

Species*	State	Affected Counties
	Synopsis of the Reason for Exclusion	
milk-vetch, Osterhout (<i>Astragalus osterhoutii</i>)	CO	Grand
	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 at high elevations (> 7,200 ft) in highly seleniferous soils (NatureServe, 2005); crop agriculture would not be grown in this habitat.	
milk-vetch, Sentry (<i>Astragalus cremnophylax</i> var. <i>cremnophylax</i>)	AZ	Coconino
	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 at 7,000 feet elevation; likely only within the Grand Canyon National Park (Brian, 2000).	
milk-vetch, Shivwitz (<i>Astragalus ampullarioides</i>)	UT	Washington
	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 purple gray soils in a petrified forest (USFWS, 2001; NatureServe, 2005). Crops are not grown in or near such soils. Also, the petrified forest and adjacent areas are inhospitable to farm practice.	
milkweed, Welsh's (<i>Asclepias welshii</i>)	AZ	Coconino
	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 coral pink sand dunes at 1700 to 1900 meters in elevation (NatureServe, 2005). Crops are not grown at or near this elevation and are also not associated with coral pink sand dunes.	
milkweed, Welsh's (<i>Asclepias welshii</i>)	UT	Kane
	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 coral pink sand dunes at 1700 to 1900 meters in elevation (NatureServe, 2005). This habitat is located on Utah State Park Land; extensive mapping of this species has been done in the Coral Pink Sand Dunes by the BLM, and another small population is located in the Sand Hills and administered by the Federal BLM (USFWS, 1987(c)). Crops are not grown in association with coral pink sand dunes in State Park Land. No agriculture in or in proximity to species habitat. (Turner, L. 1997) and species is mostly on government land.	
monkshood, northern wild (<i>Aconitum noveboracense</i>)	NY	Delaware, Sullivan, Ulster
	OH	Portage, Summit
	WI	Grant, Monroe, Richland, Sauk, Vernon
		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).
	IA	Allamakee, Clayton, Delaware, Dubuque, Jackson

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

Species*	State	Affected Counties
	Synopsis of the Reason for Exclusion	
monkshood, northern wild (<i>Aconitum noveboracense</i>)	IA	Allamakee, Clayton, Delaware, Dubuque, Jackson <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>
mustard, Carter's (<i>Warea carteri</i>)	FL	Highlands <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: The USFWS (1991(g)) notes for Carter's mustard that "these plants are restricted to sand pine (Pinus clausa) and evergreen oak scrub vegetation (referred to as Florida scrub or scrub: the vegetation is shrubland except for presence of sand pines). The major evergreen scrub oaks are myrtle oak (Quercus myrtifolia); Chapman oak (Quercus chapmanii); sand live oak (Quercus geminata); and inopina oak (Quercus inopina), which tends to occur on slightly less dry sites than the other species. Scrub often occupies ancient sand dunes (White 1958) and on other excessively-drained sand soils where scrub mingles with high pineland (sandhills) vegetation consisting of longleaf pine (Pinus palustris); turkey oak (Quercus laevis); and wiregrass (Aristida stricta) (Meyers 1985). Scrub is the primary or only habitat for a number of plants, but scrub varies in composition so that some areas may have a number of endemic plants, while others have none". Alfalfa culture is not an issue for this species; alfalfa is not grown on excessively well drained soils. Only grazing would be practiced in proximity to habitat.</i>
mustard, Penland alpine fen (<i>Eutrema penlandii</i>)	CO	Park <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 at 12,000 ft in elevation (NatureServe, 2005). Crops are not grown at this elevation.</i>
na'ena'e (<i>Dubautia latifolia</i>)	HI	Kauai <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: Moist forest dwelling species (NatureServe, 2005).</i>
na'ena'e (<i>Dubautia pauciflorula</i>)	HI	Kauai <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: Moist forest dwelling species (NatureServe, 2005).</i>
	HI	Maui

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

Species*	State	Affected Counties
	Synopsis of the Reason for Exclusion	
na'ena'e (<i>Dubautia plantaginea</i> ssp. <i>humilis</i>)	HI	Maui 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: The cliffs this species inhabits (USFWS, 1999(a)) are above agricultural sites and have topography that is not suitable to mechanized agriculture.
Nehe (<i>Lipochaeta fauriei</i>)	HI	Kauai 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 inhabits moist forests on gulch slopes (NatureServe, 2005). Gulch slopes are not suitable to crop agriculture due to poor soil quality and topography unsuitable for mechanized farming; crops are not associated with this species' habitat.
nehe (<i>Lipochaeta micrantha</i>)	HI	Kauai 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: Moist forest dwelling species (NatureServe, 2005).
No common name (<i>Abutilon eremitopetalum</i>)	HI	Maui 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 is dry leeward slopes of a ridge on Lanai Island (Turner, 1997). These areas are upslope from agricultural areas. Species main threat is invasive exotic plants.
No common name (<i>Alsinidendron viscosum</i>)	HI	Kauai 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 (NatureServe, 2005).
No common name (<i>Chamaesyce halemanui</i>)	HI	Kauai 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 Moist to wet forest dwelling species (NatureServe, 2005).
No common name (<i>Delissea rhytidosperma</i>)	HI	Kauai 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 Moist to wet forest dwelling species (NatureServe, 2005).
	AR	Drew, Franklin

Table A-5a (continued). 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>)	AR	Drew, 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: 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>
No common name (<i>Geocarpon minimum</i>)	MO	Cedar, Dade, Greene, Henry, Lawrence, Polk, St Clair <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; in Missouri grows on the Channel sands formation (moist sandy soils and sandstone outcrops) (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" and the USFWS (1987(d)) notes that State agencies and the Army Corp of Engineers are aware of locations for this species; this 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>
No common name (<i>Gouania hillebrandii</i>)	HI	Maui <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: Moist forest dwelling species (NatureServe, 2005).</i>
No common name (<i>Hesperomannia lydgatei</i>)	HI	Kauai <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 (NatureServe, 2005).</i>
No common name (<i>Lobelia niihauensis</i>)	HI	Kauai <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: The vertical rock cliffs this species inhabits are above agriculture and have topography not suitable to mechanized agriculture (NatureServe, 2005).</i>
No common name (<i>Lysimachia filifolia</i>)	HI	Kauai <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 on faces of waterfalls (NatureServe, 2005).</i>
	HI	Maui

Table A-5a (continued). 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>Lysimachia lydgatei</i>)	HI	Maui <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: The ridges in moist shrub lands where this species is found are above agricultural sites and are topographically unsuitable for mechanized agriculture (NatureServe, 2005).</i>
No common name (<i>Lysimachia maxima</i>)	HI	Maui <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 is wet forests on ridge slopes (Nature Serve, 2006). Crop agriculture is unlikely in wet forested areas. Habitat should be protected from drift and runoff by surrounding trees and ridge slopes should be above agricultural areas.</i>
No common name (<i>Munroidendron racemosum</i>)	HI	Kauai <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: Moist forest dwelling species (NatureServe, 2005); cliffs, ridges, and slopes leading to them are above agriculture.</i>
No common name (<i>Phyllostegia glabra</i> var. <i>lanaiensis</i>)	HI	Maui <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 is wet forests on ridge slopes (Nature Serve, 2006). Crop agriculture is unlikely in wet forested areas. Habitat should be protected from drift and runoff by surrounding trees and ridge slopes should be above agricultural areas.</i>
No common name (<i>Phyllostegia knudsenii</i>)	HI	Kauai <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: Moist forest dwelling species (NatureServe, 2005).</i>
No common name (<i>Phyllostegia mannii</i>)	HI	Maui <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 is wet and moist forests on gulch lands and ridgetops (Nature Serve, 2006). Wet forest species will not be directly impacted by crop agriculture. Ridgetops are unsuitable for agriculture due to edaphic factors and topography unsuitable to mechanized farming.</i>
No common name (<i>Phyllostegia waimeae</i>)	HI	Kauai <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: Moist forest dwelling species (NatureServe, 2005).</i>
No common name (<i>Phyllostegia wawrana</i>)	HI	Kauai <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: Moist forest dwelling species (NatureServe, 2005).</i>
	HI	Kauai

Table A-5a (continued). 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>Remya kauaiensis</i>)	HI	Kauai <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: Moist to wet forest dwelling species (NatureServe, 2005).</i>
No common name (<i>Remya montgomeryi</i>)	HI	Kauai <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: The cliffs in moist shrub lands that this species inhabits are above agricultural sites and are topographically unsuitable for mechanized agriculture (NatureServe, 2005).</i>
No common name (<i>Schiedea haleakalensis</i>)	HI	Maui <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 inhabits dry subalpine cliffs with native shrubs; the substrate is cinder or weathered volcanic ash of bare lava with little or no soil development (NatureServe, 2005; USFWS, 1992(d)). The shrublands this species inhabits are not near agriculture; "Hawaiian shrublands are also found from coastal to alpine elevations. The majority of Hawaiian shrubland types are in dry and mesic settings, or on cliffs and slopes too steep to support trees. Wet montane shrublands are typically dominated by Metrosideros ('ohi'a)" (USFWS, 1994(e)). Montane areas are rugged and mountainous and surrounded by conifer shrubs and trees. Agriculture is not likely to adversely impact montane areas.</i>
No common name (<i>Schiedea helleri</i>)	HI	Kauai <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: Moist forest dwelling species (NatureServe, 2005).</i>
No common name (<i>Schiedea membranacea</i>)	HI	Kauai <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: Moist forest dwelling species (NatureServe, 2005).</i>
No common name (<i>Schiedea nuttallii</i>)	HI	Kauai <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: Moist forest dwelling species (NatureServe, 2005).</i>
No common name (<i>Stenogyne bifida</i>)	HI	Maui <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 is wet and moist forests on gulch lands and ridgetops (Nature Serve, 2006). Wet forest species will not be directly impacted by crop agriculture. Ridgetops are unsuitable for agriculture due to edaphic factors and topography unsuitable to mechanized farming.</i>
	HI	Kauai

Table A-5a (continued). 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>Stenogyne campanulata</i>)	HI	Kauai <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: Moist forest dwelling species (NatureServe, 2005).</i>
No common name (<i>Tetramolopium remyi</i>)	HI	Maui <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 is dry shrubland on ridgetops and above agricultural areas (Nature Serve, 2006). Shrubland may grow in proximity to agriculture these ridgetops are however, above agricultural areas.</i>
No common name (<i>Tetramolopium rockii</i>)	HI	Maui <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 is dry coastal shrubland on solidified calcareous sand dunes. Only specified threats are sand mining, damage from vehicles, alien weeds, deer, and cattle (Nature Serve, 2006). Grazing is the only agriculture practiced on sand dunes.</i>
No common name (<i>Viola lanaiensis</i>)	HI	Maui <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 is moist forests and wet cloud forests on gulch slopes and gulch bottoms (Nature Serve, 2006). Cloud forests are above agricultural areas. Gulchlands are unsuitable for agriculture due to edaphic factors and topography unsuitable to mechanized farming.</i>
No common name (<i>Xylosma crenatum</i>)	HI	Kauai <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: Moist forest dwelling species (NatureServe, 2005).</i>
oak, Hinckley (<i>Quercus hinckleyi</i>)	TX	Presidio <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. Currently, this species only occurs on private rangeland where ranchers are protective of this species (NatureServe, 2005).</i>
oha (<i>Delissea rivularis</i>)	HI	Kauai <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 (NatureServe, 2005).</i>
pawpaw, four-petal (<i>Asimina tetramera</i>)	FL	Palm Beach <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: Four-petal pawpaw inhabits sand pine scrub on old dunes inland from the present coast line (USFWS, 1991(d)). Crop agriculture is not practiced in sand dunes and alfalfa will not be planted as grazing forage on marginal sand dune rangeland.</i>

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

Species*	State	Affected Counties
	Synopsis of the Reason for Exclusion	
pennyroyal, Todsen's (<i>Hedeoma todsenii</i>)	NM	Sierra <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 only occurs on the White Sands Missile Range controlled and managed by the U.S. Army (USFWS, 1981). Crops are not grown on the missile range, nor are they grown adjacent to the range; range is located in the desert.</i>
penstemon, blowout (<i>Penstemon haydenii</i>)	NE	Box Butte, Cherry, Garden, Hooker, Morrill, Sheridan <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>
phacelia, clay (<i>Phacelia argillacea</i>)	UT	Utah <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>
Pigeon Wings (<i>Clitoria fragrans</i>)	FL	Highlands <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 undisturbed clearings of xeric sandhill areas (NatureServe, 2005). Alfalfa cannot be grown commercially in sandy areas.</i>
Pilo (<i>Hedyotis mannii</i>)	HI	Maui <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: Moist and wet forest dwelling species (NatureServe, 2005).</i>
pinkroot, gentian (<i>Spigelia gentianoides</i>)	FL	Jackson <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: The only population of this species currently known to exist is at the Three Rivers State Recreation Area, Lake Seminole, Jackson County (NatureServe, 2005). This location is not in proximity to crop agriculture. The state does not allow agriculture in/on recreation areas and would actively protect this species on state land.</i>
pitaya, Davis' green (<i>Echinocereus viridiflorus</i> var. <i>davisii</i>)	TX	Brewster <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: The Davis' green pitaya is found in crevices on novaculite formations on ridgetops and slopes in full sun in the Chihuahuan Desert scrub (Texas Dept. of Ag, 2006). Therefore, this species is unlikely to be found near agricultural areas. Also, agricultural chemicals are rarely used in Brewster County.</i>
	FL	Highlands

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

Species*	State	Affected Counties
	Synopsis of the Reason for Exclusion	
plum, scrub (<i>Prunus geniculata</i>)	FL	Highlands
	<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: Scrub plum grows in deep, yellow sands of longleaf pine-turkey oak sandhill and white, excessively leached, wind-deposited soils of evergreen scrub oak-sand pine scrub (NatureServe, 2005). Alfalfa does not grow in/or adjacent to these areas.</i>	
poppy-mallow, Texas (<i>Callirhoe scabriuscula</i>)	TX	Coke, Mitchell, Runnels
	<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: The Texas poppy-mallow grows only in wind-blown, river-deposited deep sands near the upper Colorado River (Texas Parks and Wildlife, 2005(b); Turner, 1997). There is no cultivated agriculture in these areas (Turner, 1997).</i>	
potato-bean, Price's (<i>Apios priceana</i>)	AL	Autauga, Madison, Marshall
	IL	Union
	KY	Livingston, Lyon, Trigg
	TN	De Kalb, Marion, Montgomery, Williamson
<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>)	AL	Franklin, Lawrence, Morgan
	TN	Davidson, Marshall, Maury, Rutherford, Williamson, Wilson
<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>		
Pua 'ala (<i>Brighamia rockii</i>)	HI	Mauui
	<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 is usually on exposed ledges and steep moist coastal cliffs, with native grasses, shrubs and trees (Nature serve, 2006). Ledges and coastal cliffs are above agricultural areas.</i>	
reed-mustard, Barneby (<i>Schoenocrambe barnebyi</i>)	UT	Emery, Wayne
	<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 in selenium rich soils (NatureServe, 2005). Crop agriculture does not occur in proximity to this species' habitat because these soils are not suitable for field crop culture.</i>	
	UT	Duchesne, Uintah

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

Species*	State	Affected Counties
	Synopsis of the Reason for Exclusion	
reed-mustard, shrubby (<i>Schoenocrambe suffrutescens</i>)	UT	Duchesne, Uintah
	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: All known populations of shrubby reed-mustard are on Federal lands leased for oil and gas energy reserves; the entire range of the species is underlain by oil shale and subject to petroleum extraction (USFWS, 1994(f)). BLM manages land to protect this species (NatureServe, 2005; Turner, 1997) and habitat is not suitable for cultivated crops.	
remya, Maui (<i>Remya mauiensis</i>)	HI	Maui
	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: Moist forest dwelling species (NatureServe, 2005).	
ridge-cress, Barneby (<i>Lepidium barnebyanum</i>)	UT	Duchesne
	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 mixed desert shrub communities and, at some locations, in pinyon-juniper and desert shrub, on semi-barren, white-shale layers of the Evacuation Creek Member of the Green River Formation. It commonly occurs on level to moderately sloping ground surfaces at 1,555-1,981 m in elevation. Soils in which this species occurs are dry, shallow, and fine-textured, and are usually overlain by shale fragments (NatureServe, 2005); soil supporting this species is not suitable for alfalfa culture.	
rock-cress, Braun's (<i>Arabis perstellata</i>)	KY	Franklin, Owen
	TN	Rutherford
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).		
rock-cress, shale barren (<i>Arabis serotina</i>)	VA	Alleghany, Augusta, Bath, Highland, Rockbridge, Shenandoah
	WV	Greenbrier, Hardy, Pendleton
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 with habitat characterized by steep southern exposure in shale barrens in the mountains (NatureServe, 2005; USFWS, 1989(b)); not suitable for agriculture.		
roseroot, Leedy's (<i>Sedum integrifolium ssp. leedyi</i>)	MN	Fillmore, Olmsted
	NY	Cayuga, Schuyler, Yates
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: Leedy's roseroot lives on talus slopes or cliffs in which groundwater maintains a cool, wet environment throughout the summer (Sather, 1996 as cited in NatureServe, 2005; USFWS, 1993(h)). These areas are located above areas of crop agriculture.		
	HI	Maui

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

Species*	State	Affected Counties
	Synopsis of the Reason for Exclusion	
sandalwood, Lanai (=‘iliahi) (<i>Santalum freycinetianum</i> var. <i>lanaiense</i>)	HI	Maui
	<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: Lanai sandalwood only grows on a shield volcano that is shallow (three feet or less over bedrock) and the summit is rough mountainous land (ESIS, 1996(b)). This shield volcano land would be upslope from agriculture and the habitat itself is unsuitable for agriculture.</i>	
sandwort, Cumberland (<i>Arenaria cumberlandensis</i>)	KY	Mason
	TN	Fentress, Morgan, Pickett, Scott
<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>		
skullcap, large-flowered (<i>Scutellaria montana</i>)	GA	Catoosa, Dade, Murray, Whitfield
	TN	Hamilton, Marion, Sequatchie
<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 is dry soil on rocky slopes within undisturbed, mature oak and hickory woodlands (Turner, 1997). Agricultural uses near this species are unknown, but unlikely based on habitat.</i>		
snowbells, Texas (<i>Styrax texanus</i>)	TX	Kimble, Val Verde
	<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: Texas snowbells inhabit steep limestone bluffs, cliff faces, rock ledges, or gravel bars along rivers or stream would not be used for crop agriculture or grazing (Texas Parks and Wildlife Department, 2005(c)). The soils this species inhabits are too rocky/gravelly and the land is too steep for typical agriculture.</i>	
spiraea, Virginia (<i>Spiraea virginiana</i>)	GA	Dade, Walker
	KY	Laurel, Pulaski, Rockcastle
NC	Ashe, Buncombe, Clay, Graham, Macon, Mitchell, Yancey	
TN	Blount, Bradley, Cumberland, Morgan, Roane, Scott, Unicoi, Van Buren	
VA	Carroll, Dickenson, Grayson, Wise	
WV	Fayette, Greenbrier, Mercer, Nicholas, Raleigh, Upshur	
<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>		
	FL	Bay

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

Species*	State	Affected Counties
	Synopsis of the Reason for Exclusion	
spurge, telephus (<i>Euphorbia telephoides</i>)	FL	Bay
	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 pine savannahs, mesic flatwoods and sandy, scrub areas (Center for Plant Conservation, undated(c)). Crops are not grown in or near these areas. Pine savannahs and mesic flatwoods do not support crops, and sandy soils are not suitable for most crop agriculture including alfalfa culture.	
stickseed, showy (<i>Hackelia venusta</i>)	WA	Chelan
	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: <i>Hackelia venusta</i> grows on steep slopes (25-70 degrees) composed of loose, well-drained granitic sand and broken rocks at an elevation of approximately 1,600 to 2,500 ft (480 -765 m) in the dry eastern slopes of the Washington Cascades. The plants grow in openings within the Ponderosa pine and Douglas-fir forests which are maintained by occasional wildfires (Center for Plant Conservation, undated(d)). Agriculture is not practiced in glades or openings in ponderosa pine and Douglas fir forests. Additionally, the only known population of this species is found entirely on USDA Forest Service Land (USFWS, 2002(c)). Land is managed such that exposure risk is greatly reduced.	
thistle, Pitcher's (<i>Cirsium pitcheri</i>)	IN	Lake, Porter
	MI	Alger, Allegan, Alpena, Antrim, Arenac, Benzie, Berrien, Charlevoix, Cheboygan, Chippewa, Delta, Emmet, Grand Traverse, Iosco, Leelanau, Mackinac, Manistee, Mason, Muskegon, Oceana, Ottawa, Presque Isle, Schoolcraft, Van Buren
	WI	Door, Manitowoc, Sheboygan
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.		
thistle, Sacramento Mountains (<i>Cirsium vinaceum</i>)	NM	Otero
	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 only grows above 7,991 feet in elevation (NatureServe, 2005). No serious agriculture is practiced at this elevation although some grazing of livestock occurs at this elevation.	
townsendia, Last Chance (<i>Townsendia aprica</i>)	UT	Emery, Sevier, Wayne
	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: Last Chance townsendia occurs in Pinyon-juniper and salt desert shrub communities on barren, silty clay, or gravelly clay soils of the Mancos Shale Formation (NatureServe, 2005); crops are 'unlikely' in or near this habitat (Turner, 1997).	
	CO	Rio Blanco

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

Species*	State	Affected Counties
	Synopsis of the Reason for Exclusion	
twinpod, Dudley Bluffs (<i>Physaria obcordata</i>)	CO	Rio Blanco
	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: Dudley Bluffs twinpod habitat is "surrounded" by pinyon oak-juniper at altitudes of >6,000 feet; this species is found along drainages on barren white outcrops of the Green River and Uinta Formations (Turner, 1997; USFWS, 1990(c)). This habitat is not suitable for crop agriculture; therefore, this species will not be exposed to agricultural sprays.	
Uhiuhi (<i>Caesalpinia kavaiense</i>)	HI	Maui
	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: Primary threats are deforestation, cattle grazing, feral goats, and rats eating seeds. Agricultural uses are unknown; habitat is arid with open forests on rough weathered lava slopes up to 3000 feet (NatureServe, 2006). This area is unsuitable for agriculture due to edaphic factors and topography unsuitable to mechanized farming.	
whitlow-wort, papery (<i>Paronychia chartacea</i>)	FL	Highlands
	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: The USFWS (1991(g)) notes that "these plants are restricted to sand pine (<i>Pinus clausa</i>) and evergreen oak scrub vegetation (referred to as Florida scrub or scrub: the vegetation is shrubland except for presence of sand pines). The major evergreen scrub oaks are myrtle oak (<i>Quercus myrtifolia</i>); Chapman oak (<i>Quercus chapmanii</i>); sand live oak (<i>Quercus geminata</i>); and inopina oak (<i>Quercus inopina</i>), which tends to occur on slightly less dry sites than the other species. Scrub often occupies ancient sand dunes (White 1958) and on other excessively-drained sand soils where scrub mingles with high pineland (sandhills) vegetation consisting of longleaf pine (<i>Pinus palustris</i>); turkey oak (<i>Quercus laevis</i>); and wiregrass (<i>Aristida stricta</i>) (Meyers 1985). Scrub is the primary or only habitat for a number of plants, but scrub varies in composition so that some areas may have a number of endemic plants, while others have none". Alfalfa is not grown on excessively well drained sandy soils. Soils typical of alfalfa are silt loam, sandy silt loam and occasionally muck. Alfalfa culture is not an issue for this species.	
wild-buckwheat, clay-loving (<i>Eriogonum pelinophilum</i>)	CO	Delta, Montrose
	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: Clay-loving wild-buckwheats habitat is semi-arid badland scrub with soils that are too dry and salty for crop agriculture (NatureServe, 2005).	
wild-buckwheat, gypsum (<i>Eriogonum gypsophilum</i>)	NM	Eddy
	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 found in semi-arid open habitats in gypsum in grama grassland, at about 1,500 m (4,920 feet elevation) (NatureServe, 2005). Agriculture is not grown in gypsum soils and alfalfa is usually not grown at this elevation.	
	FL	Highlands

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

Species*	State	Affected Counties
	Synopsis of the Reason for Exclusion	
Wireweed (<i>Polygonella basiramia</i>)	FL	Highlands 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: The USFWS (1991(g)) notes that "these plants are restricted to sand pine (<i>Pinus clausa</i>) and evergreen oak scrub vegetation (referred to as Florida scrub or scrub: the vegetation is shrubland except for presence of sand pines). The major evergreen scrub oaks are myrtle oak (<i>Quercus myrtifolia</i>); Chapman oak (<i>Quercus chapmanii</i>); sand live oak (<i>Quercus geminata</i>); and inopina oak (<i>Quercus inopina</i>), which tends to occur on slightly less dry sites than the other species. Scrub often occupies ancient sand dunes (White 1958) and on other excessively-drained sand soils where scrub mingles with high pineland (sandhills) vegetation consisting of longleaf pine (<i>Pinus palustris</i>); turkey oak (<i>Quercus laevis</i>); and wiregrass (<i>Aristida stricta</i>) (Meyers 1985). Scrub is the primary or only habitat for a number of plants, but scrub varies in composition so that some areas may have a number of endemic plants, while others have none". Alfalfa is not grown on excessively well drained sandy soils.
yellowhead, desert (<i>Yermo xanthocephalus</i>)	WY	Fremont 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 shallow loamy soils that are surrounded by sagebrush at 6,700 feet elevation (USFWS, 2004(e); Center for Plant Conservation, undated(a)). Alfalfa would not be grown in these soils.
ziziphus, Florida (<i>Ziziphus celata</i>)	FL	Highlands 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: The USFWS (1990(d)) habitat information for Florida ziziphus and another species note that "both species are restricted to areas with sand pine scrub vegetation, although one site for the Florida ziziphus is in a transitional period between sand pine scrub and long leaf pine-wiregrass vegetation. These areas have excessively drained, nutrient-poor sand soils. The sites received some natural fire protection from a nearby lake or swamp (Christman 1988). Population sites are usually dominated by evergreen oaks and other shrubs, with some sand pine, buckwheat, woody mints, small herbs, and a few grasses. Scrub vegetation on the Lake Wales Ridge has 13 federally-listed endangered and threatened plants, and 33 of the 39 plants known to be restricted to sand pine scrub vegetation have populations on this Ridge (Christman 1988)". Crops are not grown on excessively drained, nutrient-poor sand soils; crop agriculture is not an issue for this species.
<i>Ferns and Allies</i>		
<i>Lifeform: Aquatic</i>		
quillwort, black spored (<i>Isoetes melanospora</i>)	GA SC	Greene Lancaster

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

Species*	State	Affected Counties
	Synopsis of the Reason for Exclusion	
	<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: Black spored quillwort grows on granitic outcrops, associated with other rare and endangered granite outcrop endemics (NatureServe, 2005). Edaphic requirements for this species prevent habitat being used for agriculture.</i>	
quillwort, Louisiana (<i>Isoetes louisianensis</i>)	LA	Washington Parish
	<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: Terrestrial		
fern, Alabama streak-sorus (<i>Thelypteris pilosa</i> var. <i>alabamensis</i>)	AL	Winston
	<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; occurring in 'rockhouses' beneath overhangs on cliff-faces (USFWS, 1992(f)).</i>	
fern, American hart's-tongue (<i>Asplenium scolopendrium</i> var. <i>americanum</i>)	AL MI NY TN	Jackson, Morgan Mackinac Madison, Onondaga Marion
	<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>	
fern, pendant kihi (<i>Adenophorus periens</i>)	HI	Maui
	<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: Plant grows on trees in wet forests (Nature Serve, 2006). Wet forest species will not be directly impacted by crop agriculture. Surrounding trees in wet forests will prevent drift and runoff from agricultural sites.</i>	
fern, pendant kihi (<i>Adenophorus periens</i>)	HI	Kauai
	<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 (USFWS, 1994(e)).</i>	
No common name (<i>Diellia pallida</i>)	HI	Kauai
	<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 growing on trees in wet forests (NatureServe, 2005; USFWS, 1994(e)).</i>	
No common name (<i>Diplazium molokaiense</i>)	HI	Maui
	<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: Moist forest dwelling species (USFWS, 1994(e)).</i>	

Table A-5a (continued). 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>Pteris lidgatei</i>)	HI	Maui
	<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: Moist forest dwelling species (USFWS, 1994(e)).</i>	
Pauoa (<i>Ctenitis squamigera</i>)	HI	Maui
	<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: Moist forest dwelling species (USFWS, 1994(e)).</i>	
wawae`iole (<i>Huperzia mannii</i>)	HI	Maui
	<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 (NatureServe, 2005).</i>	
Lichens		
Lifeform: Terrestrial		
cladonia, Florida perforate (<i>Cladonia perforata</i>)	FL	Highlands, Okaloosa
	<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: Florida perforate cladonia are found in sand scrub communities (NatureServe, 2005) and are not associated with agriculture. Sandy soils are nutrient poor and do not hold water and thus do not support agriculture.</i>	
lichen, rock gnome (<i>Gymnoderma lineare</i>)	NC	Ashe, Avery, Buncombe, Haywood, Jackson, Mitchell, Rutherford, Transylvania, Yancey
	TN	Sevier
<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>		
Monocots		
Lifeform: Aquatic		
arrowhead, bunched (<i>Sagittaria fasciculata</i>)	SC	Greenville
	<i>The Greenville County South Carolina population of bunched arrowhead occurs only in a power line right-of-way, along the headwaters of a river (NatureServe, 2005). The open nature of this habitat, which is maintained by Duke Power Company, is probably responsible for the vigorous nature of bunched arrowhead on the Greenville South Carolina site. Species grows only on Duke Power company land (USFWS, 1979(d)). Species does not appear to be endangered by agriculture at the present time.</i>	
bulrush, Northeastern (<i>Scirpus ancistrochaetus</i>)	PA	Clinton, Cumberland, Dauphin, Franklin, Huntingdon, Lackawanna, Monroe, Union

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

Species*	State	Affected Counties
Synopsis of the Reason for Exclusion		
<p><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: John Kunsman, Botanist for the Pennsylvania Natural Heritage Program (contacted June 26, 2007) indicated that Northeastern bulrush is not found near agriculture. He stated that most occurrences are on state forest land or wildlife areas that are not near agricultural areas. In addition, he also noted that the species is found in vernal pool areas that are both mountainous and forested that are not near agriculture.</i></p>		
seagrass, Johnson's (<i>Halophila johnsonii</i>)	FL	Broward, Palm Beach
<p><i>Conclusion: Species habitat and use site spatial characteristics support the conclusion that sufficient physical separation exists such that either exposure of the species is not likely to occur. Rationale: Johnson's seagrass has a disjunct and patchy distribution along the east coast of Florida from central Biscayne Bay to Sebastian Inlet and is found in coarse sand and muddy substrates and in areas of turbid waters and high tidal currents (NatureServe, 2005). Crop agriculture should not found near area where Johnson's seagrass occurs.</i></p>		
Lifeform: Terrestrial		
beargrass, Britton's (<i>Nolina brittoniana</i>)	FL	Hernando, Highlands
<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: The USFWS (1993(f)) final rule for this species notes "Nolina brittoniana occurs in scrub, high pine, and even occasionally in hammocks (Christman 1988). Its range is from the south end of the Lake Wales Ridge in Highlands County north to Orange County (Orlando) and northern Lake County. An apparently isolated locality was reported from Hernando County, north of Tampa". The USFWS (1993(f)) defines scrub as follows: "Scrub is "a xeromorphic shrub community dominated by a layer of evergreen, or nearly evergreen oaks * * * or Florida rosemary (Ceratiola ericoides), or both, with or without a pine overstory, occupying well drained, infertile, sandy soils (Myers 1990, pp. 154- 155)". Alfalfa is not grown in or near Xeromorphic scrub communities on well drained infertile sandy soils. Infertile, sandy soils do not support agriculture. Such habitat is usually very far from agricultural sites in Florida. Citrus culture is the only known agriculture practiced in proximity to species' habitat (NatureServe, 2005).</i></p>		
bluegrass, Hawaiian (<i>Poa sandvicensis</i>)	HI	Kauai
<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: Moist forest dwelling species on shaded slopes and ledges (NatureServe, 2005).</i></p>		
bluegrass, Mann's (<i>Poa mannii</i>)	HI	Kauai

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

Species*	State	Affected Counties
Synopsis of the Reason for Exclusion		
<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 inhabits dry and moist forests and shrublands on gulch slopes and old lava flows (NatureServe, 2005). The shrublands this species inhabits are not near agriculture; "Hawaiian shrublands are also found from coastal to alpine elevations. The majority of Hawaiian shrubland types are in dry and mesic settings, or on cliffs and slopes too steep to support trees. Wet montane shrublands are typically dominated by Metrosideros ('ohi'a)" (USFWS, 1994(g)).</i></p>		
iris, dwarf lake (<i>Iris lacustris</i>)	MI	Alpena, Charlevoix, Cheboygan, Chippewa, Delta, Emmet, Mackinac, Menominee, Presque Isle, Schoolcraft <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: The USFWS (undated(e)) indicates that dwarf lake iris occurs "close to Great Lakes shorelines in cool, moist lakeshore air," and that this species is found on sand or in thin soil over limestone-rich gravel or bedrock. Habitat of this species is found along old beach ridges or behind open dunes and changing water levels can open new habitat for the plants. Crops are not grown near beach ridges or open dunes of the Great Lakes so crops would not occur in proximity to this species. The main, and possibly only, significant threat to this species is shoreline development for residential purposes. If agriculture is a risk to this species, it would only be grazing.</i></p>
iris, dwarf lake (<i>Iris lacustris</i>)	WI	Brown, Door <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: The USFWS (undated(e)) indicates that dwarf lake iris occurs "close to Great Lakes shorelines in cool, moist lakeshore air," and that this species is found on sand or in thin soil over limestone-rich gravel or bedrock. Habitat of this species is found along old beach ridges or behind open dunes and changing water levels can open new habitat for the plants. Crops are not grown near beach ridges or open dunes of the Great Lakes so crops would not occur in proximity to this species. The main, and possibly only, significant threat to this species is shoreline development for residential purposes. If agriculture is a risk to this species, it would only be grazing. Species Management Practice also applies. Wisconsin's protection plan for threatened and endangered plant species is likely to protect this species (L. Turner, pers. comm., 2005).</i></p>
ladies'-tresses, Canelo Hills (<i>Spiranthes delitescens</i>)	AZ	Santa Cruz <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 plant inhabits cienegas at 5,000 feet in elevation (Center for Plant Conservation (undated(b)). Crops are not grown in these areas although grazing does occur.</i></p>
lau 'ehu (<i>Panicum niuhauense</i>)	HI	Kauai

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

Species*	State	Affected Counties
	Synopsis of the Reason for Exclusion	
	<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 is known to occur in dry coastal habitats on calcareous sand dunes and rocky knolls, surrounded by coastal shrubland in a state park (NatureServe, 2005). Such habitat is edaphically unsuitable for crop agriculture or has topography unsuitable for mechanized agriculture and additionally, no crops are grown in state parks. Only agriculture that would be potentially adjacent to habitat would be grazing.</i></p>	
lily, Western (<i>Lilium occidentale</i>)	OR	Coos
	<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 is found in coastal areas (within 4 miles of the coast) (Pacific Biodiversity Institute, undated). Corn is not grown in these areas.</i></p>	
lo'ulu (<i>Pritchardia viscosa</i>)	HI	Kauai
	<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 (dense, almost jungle-like) dwelling species (NatureServe, 2005).</i></p>	
No common name (<i>Platanthera holochila</i>)	HI	Kauai
	<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: On Kauai, this species is found above areas where crop agriculture is practiced on tops and sides of ridges (NatureServe, 2005).</i></p>	
No common name (<i>Poa siphonoglossa</i>)	HI	Kauai
	<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 (NatureServe, 2005).</i></p>	
pogonia, small whorled (<i>Isotria medeoloides</i>)	CT DE GA IL MA ME MI NC NH NJ NY PA	Litchfield, Tolland New Castle Bartow, Catoosa, Dade, Dawson, Fannin, Floyd, Gilmer, Lumpkin, Murray, Towns, Union, Walker, White, Whitfield Randolph Essex, Hampden, Hampshire, Worcester Cumberland, Kennebec, Oxford, York Berrien Burke, Haywood, Henderson, Jackson, Macon, Surry Belknap, Carroll, Hillsborough, Merrimack, Rockingham, Strafford Sussex Onondaga Centre, Venango

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

Species*	State	Affected Counties
	Synopsis of the Reason for Exclusion	
	RI SC TN VA	Providence Oconee Hamilton Appomattox, Buckingham, Caroline, Gloucester, James City, King William, Lee, New Kent, Prince William, Stafford, Wise
	<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>	
Pu'uka'a (<i>Cyperus trachysanthos</i>)	HI	Kauai
	<i>Conclusion: Species habitat and use site spatial characteristics support the conclusion that sufficient physical separation exists such that either exposure of the species is not likely to occur. Rationale: The USFWS (1996(b)) Final Rule notes that this species "is usually found in wet sites (mud flats, wet clay soil, or wet cliff seeps) on coastal cliffs or talus slopes". Crops are not normally grown on or near coastal cliffs or talus slopes.</i>	
trillium, persistent (<i>Trillium persistens</i>)	SC	Oconee
	<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>	
trillium, persistent (<i>Trillium persistens</i>)	GA	Stephens
	<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). This species is also protected specifically in the Stephens County Endangered Species Protection Program (County Bulletin) by Valid Federal Protection Number 28: Do not apply within 100 yards of species habitat for aerial applications or within 20 yards of species habitat for ground applications.</i>	
trillium, relict (<i>Trillium reliquum</i>)	AL GA	Henry, Lee Columbia, Macon
	<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.

** 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. Species co-occurrences for alfalfa seed production for which habitat exclusions are applicable

Species *	State	Affected Counties
	Synopsis of the Reason for Exclusion **	
Dicots		
Lifeform: Aquatic		
howellia, water (<i>Howellia aquatilis</i>)	WA	Spokane
	Conclusion: Species habitat and use site spatial characteristics support the conclusion that sufficient physical separation exists such that either exposure of the species is not likely to occur. Rationale: Species occurs in the forested portions of the channeled scablands in this county (Washington State DNR, 2005). These forested areas are not at risk from agricultural sprays.	
Lifeform: Both		
lomatium, Cook's (<i>Lomatium cookii</i>)	OR	Jackson
	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: In Jackson County, the habitat of this species is located in the Agate Desert and the soil is Agate-Winlow complex with agates on surface (USFWS, 2002(b)). This kind of rock soil is not suitable (due to edaphic factors) for crop agriculture unless it is extensively modified or amended.	
Meadowfoam, large-flowered wooly (<i>Limnanthes floccosa grandiflora</i>)	OR	Jackson
	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: In Jackson County, the habitat of this species is located in the Agate Desert and the soil is Agate-Winlow complex with agates on the surface (USFWS, 2002(b)). This kind of rock soil is not suitable (due to edaphic factors) for crop agriculture unless it is extensively modified or amended.	
Lifeform: Terrestrial		
bear-poppy, dwarf (<i>Arctomecon humilis</i>)	UT	Washington
	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: Dwarf bear-poppy occurs on outcrops in gypsum-rich soils in "badlands" (USFWS, 1979(a)); this habitat is not suitable for cultivated crops.	
cactus, Arizona hedgehog (<i>Echinocereus triglochidiatus</i> var. <i>arizonicus</i>)	AZ	Pinal
	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: Arizona hedgehog cactus plants typically occur at > 4,000 ft and are found on dacite or granite bedrock, open slopes, in narrow cracks between boulders, and in the understory of shrubs in the ecotone between Madrean Evergreen Woodland and Interior Chaparral (USFWS, undated(c)). This crop is usually grown below 4,000 ft in elevation and species' habitat is unsuitable for agriculture due to poor farm contours that interfere with agricultural practice.	
	NM	Chaves

Table A-5b (continued). Species co-occurrences for alfalfa seed for which habitat exclusions are applicable

Species *	State	Affected Counties
	Synopsis of the Reason for Exclusion **	
cactus, Kuenzler hedgehog (<i>Echinocereus fendleri</i> var. <i>kuenzleri</i>)	NM	Chaves <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, Lee pincushion (<i>Coryphantha sneedii</i> var. <i>leei</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: Lee pincushion cactus primarily inhabits cracks in limestone in areas of broken terrain and steep slopes of Chihuahuan desert scrub; 1,200-1,500 m (4,000-5,000 ft) (New Mexico Rare Plant Technical Council, 2005(a)). The Chihuahuan desert does not support agriculture.</i>
cactus, Mesa Verde (<i>Sclerocactus mesae-verdae</i>)	NM	San Juan <i>Conclusion: The physical separation between the soil types underlying the species habitat and use site is sufficient to support the conclusion that exposure of the species is not likely to occur. Rationale: Selenite soils, in the badlands area of Colorado, are required by the Mesa Verde cactus (NatureServe, 2005). Such soils are inappropriate for agriculture because high concentrations of selenium are toxic to humans and livestock. Crops would not be grown near these areas and drift and/or run-off would not be an issue for this species.</i>
cactus, Nichol's Turk's head (<i>Echinocactus horizonthalonius</i> var. <i>nicholii</i>)	AZ	Pinal <i>Conclusion: The physical separation between the soil types underlying the species habitat and use site is sufficient to support the conclusion that exposure of the species is not likely to occur. Rationale: Species' only habitat occurs in the Waterman and Vekol Mountains and agriculture is not known to be a risk factor there. The only known risks to this species are mining, quarrying, urban development off-road vehicle use, collecting and possibly grazing (Desert Botanical Garden, 2000). Any other use seems unlikely and known crop agriculture is down slope from the habitat so runoff and drift from crop agriculture are unlikely risk factors. Additionally, this species occurs on lands administered by the Bureau of Land Management, the Papago Indian Reservation, and on a small piece of private land. BLM, the principal Federal agency involved, is aware of the location of this plant (USFWS, 1979(b)) and therefore, land administered by the BLM would be managed so that exposure risk to this species would be unlikely.</i>
cactus, Siler pincushion (<i>Pediocactus</i> (= <i>Echinocactus</i> , = <i>Utahia</i>) <i>sileri</i>)	UT	Washington <i>Conclusion: Species habitat and use site spatial characteristics support the conclusion that sufficient physical separation exists such that either exposure of the species is not likely to occur. Rationale: Primary risks to Siler pincushion cactus are mining and collection. Arizona State law prohibits taking of this species (particularly by collectors) (USFWS, 1993(b)). Species occurs on barren, rolling, clay hills in gypsiferous clay to sandy soils that are high in soluble salts within desert shrub communities; soils with such high levels of soluble salt will not support crop agriculture.</i>
cactus, Sneed pincushion (<i>Coryphantha sneedii</i> var.	NM TX	Dona Ana Hudspeth

Table A-5b (continued). Species co-occurrences for alfalfa seed for which habitat exclusions are applicable

Species *	State	Affected Counties
<i>sneedii</i>)		Synopsis of the Reason for Exclusion **
		<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>
Cactus, Uinta Basin hookless (<i>Sclerocactus glaucus</i>)	CO UT	Mesa Carbon, Duchesne
		<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 cobbly, gravelly, rocky soils in dry alluvial fans (Utah Division of Natural Resources, undated). Crops are not grown in these areas (Turner, 1997).</i>
cactus, Winkler (<i>Pediocactus winkleri</i>)	UT	Emery
		<i>Conclusion: The physical separation between the soil types underlying the species habitat and use site is sufficient to support the conclusion that exposure of the species is not likely to occur. Rationale: Soils with high salinity that are common to salt desert scrub are required by this species (NatureServe, 2005). High salinity soils are minerally toxic; it is unlikely that crops would be near this soil type because these soils would not be appropriate for alfalfa culture.</i>
cactus, Wright fishhook (<i>Sclerocactus wrightiae</i>)	UT	Emery
		<i>Conclusion: The physical separation between the soil types underlying the species habitat and use site is sufficient to support the conclusion that exposure of the species is not likely to occur. Rationale: Habitat for this species is semi-desert scrub, with widely scattered shrubs, perennial herbs, bunch grasses, or scattered pinyon and juniper on barren, alkaline soils at 1,460-1,865 m (4,782 to 6,108 ft) elevation. Soils vary from clay, to sandy silts, to fine sands with varying gypsum content. Soil crusts are usually present and the ground surface is usually littered with sandstone or basalt gravels, cobbles, and boulders (NatureServe, 2005). Soils with hard heavy crusts are unsuitable for agriculture and ground surfaces littered with rocks and gravel are unsuitable for mechanized agriculture.</i>
Cliff-rose, Arizona (<i>Purshia (=Cowania) subintegra</i>)	AZ	Maricopa, Yavapai
		<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: The infertile white calcareous deposits where Arizona cliff-rose is found (NatureServe, 2005; USFWS, 1984(a)) are not found near crop agriculture. This species' habitat should be above agriculture on rolling hills.</i>
Cycladenia, Jones (<i>Cycladenia jonesii (=humilis)</i>)	UT	Emery
		<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: Jones cycladenia species grows on barren clay hills forming the steep side slopes and bases of mesas in the canyon country (NatureServe, 2005). In addition, the harsh soils and "badland" typically highly dissected by erosion, precludes the presence of cultivated crops (Turner, 1997).</i>
	NM	San Miguel

Table A-5b (continued). Species co-occurrences for alfalfa seed for which habitat exclusions are applicable

Species *	State	Affected Counties
	Synopsis of the Reason for Exclusion **	
ipomopsis, Holy Ghost (<i>Ipomopsis sancti-spiritus</i>)	NM	San Miguel <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 species habitat is under pine trees (NatureServe, 2005) and as such is not a suitable alfalfa-growing habitat (Turner, 1997). Also, this species is found entirely on USFS and BLM land; management practices on land owned or controlled by USFS and BLM minimize adverse impact on Holy Ghost ipomopsis (Turner, 1997). Agriculture is very unlikely in or in proximity to species habitat (Turner, L. 1997).</i>
milk-vetch, heliotrope (<i>Astragalus montii</i>)	UT	Sanpete <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: The only known population of heliotrope milk-vetch is on National Forest Land, at elevations greater than 9,000 feet (Utah Rare Plants, 2005). Alfalfa is not grown at alpine elevations (>9,000 feet). This elevation is above the tree line and the known population is on managed land (Turner, 1997).</i>
milk-vetch, Mancos (<i>Astragalus humillimus</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: Mancos milk-vetch is site specific to loose sandy depressions over sandstone bedrock (NatureServe, 2005; University of New Mexico Rare Plants, 2005(b); Dave Anderson, Botany Team Leader for the State of Colorado Natural Heritage Program pers. comm., 5/26/04). Alfalfa is not grown near these areas due to edaphic unsuitability (Turner, 1997).</i>
milk-vetch, Shivwitz (<i>Astragalus ampullarioides</i>)	UT	Washington <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 purple gray soils in a petrified forest (USFWS, 2001; NatureServe, 2005). Crops are not grown in or near such soils. Also, the petrified forest and adjacent areas are inhospitable to farm practice.</i>
monkshood, northern wild (<i>Aconitum noveboracense</i>)	IA	Jackson <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>
penstemon, blowout (<i>Penstemon haydenii</i>)	NE	Garden <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>

Table A-5b (continued). Species co-occurrences for alfalfa seed for which habitat exclusions are applicable

Species *	State	Affected Counties
	Synopsis of the Reason for Exclusion **	
phacelia, clay (<i>Phacelia argillacea</i>)	UT	Utah <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>
reed-mustard, Barneby (<i>Schoenocrambe barnebyi</i>)	UT	Emery <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 in selenium rich soils (NatureServe, 2005). Crop agriculture does not occur in proximity to this species' habitat because these soils are not suitable for field crop culture.</i>
reed-mustard, shrubby (<i>Schoenocrambe suffrutescens</i>)	UT	Duchesne <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: All known populations of shrubby reed-mustard are on Federal lands leased for oil and gas energy reserves; the entire range of the species is underlain by oil shale and subject to petroleum extraction (USFWS, 1994(f)). BLM manages land to protect this species (NatureServe, 2005; Turner, 1997) and habitat is not suitable for cultivated crops.</i>
ridge-cress, Barneby (<i>Lepidium barnebyanum</i>)	UT	Duchesne <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 mixed desert shrub communities and, at some locations, in pinyon-juniper and desert shrub, on semi-barren, white-shale layers of the Evacuation Creek Member of the Green River Formation. It commonly occurs on level to moderately sloping ground surfaces at 1,555-1,981 m in elevation. Soils in which this species occurs are dry, shallow, and fine-textured, and are usually overlain by shale fragments (NatureServe, 2005); soil supporting this species is not suitable for alfalfa culture.</i>
thistle, Pitcher's (<i>Cirsium pitcheri</i>)	MI	Allegan, Alpena <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>
townsendia, Last Chance (<i>Townsendia aprica</i>)	UT	Emery <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: Last Chance townsendia occurs in Pinyon-juniper and salt desert shrub communities on barren, silty clay, or gravelly clay soils of the Mancos Shale Formation (NatureServe, 2005); crops are 'unlikely' in or near this habitat (Turner, 1997).</i>
	NM	Eddy

Table A-5b (continued). Species co-occurrences for alfalfa seed for which habitat exclusions are applicable

Species *	State	Affected Counties
Synopsis of the Reason for Exclusion **		
wild-buckwheat, gypsum (<i>Eriogonum gypsophilum</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: This species is found in semi-arid open habitats in gypsum in grama grassland, at about 1,500 m (4,920 feet elevation) (NatureServe, 2005). Agriculture is not grown in gypsum soils and alfalfa is usually not grown at this elevation.</i>
yellowhead, desert (<i>Yermo xanthocephalus</i>)	WY	Fremont <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 shallow loamy soils that are surrounded by sagebrush at 6,700 feet elevation (USFWS, 2004(e); Center for Plant Conservation, undated(a)). Alfalfa would not be grown in these soils.</i>
Monocots		
Lifeform: Aquatic		
bulrush, Northeastern (<i>Scirpus ancistrochaetus</i>)	PA	Huntingdon <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: John Kunsman, Botanist for the Pennsylvania Natural Heritage Program (contacted June 26, 2007) indicated that Northeastern bulrush is not found near agriculture. He stated that most occurrences are on state forest land or wildlife areas that are not near agricultural areas. In addition, he also noted that the species is found in vernal pool areas that are both mountainous and forested that are not near agriculture.</i>
Lifeform: Terrestrial		
iris, dwarf lake (<i>Iris lacustris</i>)	MI	Alpena <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: The USFWS (undated(e)) indicates that dwarf lake iris occurs "close to Great Lakes shorelines in cool, moist lakeshore air," and that this species is found on sand or in thin soil over limestone-rich gravel or bedrock. Habitat of this species is found along old beach ridges or behind open dunes and changing water levels can open new habitat for the plants. Crops are not grown near beach ridges or open dunes of the Great Lakes so crops would not occur in proximity to this species. The main, and possibly only, significant threat to this species is shoreline development for residential purposes. If agriculture is a risk to this species, it would only be grazing.</i>

* Lifeform classification from FESTF IMS.

** 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. Species co-occurrences for alfalfa hay production for which proximity exclusions are applicable

Species *	State	Affected Counties	Species Management Practice Applies ¹
<i>Conifers and Cycads</i>			
<i>Lifeform: Terrestrial</i>			
cypress, Gowen (<i>Cupressus goveniana ssp. goveniana</i>)	CA	Monterey ²	No
<i>Dicots</i>			
<i>Lifeform: Aquatic</i>			
allocarya, Calistoga (<i>Plagiobothrys strictus</i>)	CA	Napa ³	Yes
bird's-beak, Pennell's (<i>Cordylanthus tenuis ssp. capillaris</i>)	CA	Sonoma ³	No
bird's-beak, salt marsh (<i>Cordylanthus maritimus ssp. maritimus</i>)	CA	Los Angeles ³ , Orange ³ , San Diego ³ , San Luis Obispo ³ , Santa Barbara ³ , Ventura ³	No
bird's-beak, soft (<i>Cordylanthus mollis ssp. mollis</i>)	CA	Contra Costa ³ , Napa ³ , Solano ³	No
bluecurls, Hidden Lake (<i>Trichostema austromontanum ssp. compactum</i>)	CA	San Bernardino ²	No
checker-mallow, Kenwood Marsh (<i>Sidalcea oregana ssp. valida</i>)	CA	Sonoma ³	Yes
goldfields, Burke's (<i>Lasthenia burkei</i>)	CA	Lake ³ , Mendocino ³ , Sonoma ³	No
goldfields, Contra Costa (<i>Lasthenia conjugens</i>)	CA	Alameda ³ , Contra Costa ³ , Mendocino ³ , Napa ³ , Santa Barbara ³ , Santa Clara ³ , Solano ³	Yes
meadowfoam, Butte County (<i>Limnanthes floccosa ssp. californica</i>)	CA	Butte ³ , Tehama ³	No
meadowfoam, Butte County (<i>Limnanthes floccosa ssp. californica</i>)	CA	Butte ³ , Tehama ³	Yes

Table A-6a (continued). Species co-occurrences for alfalfa hay for which proximity exclusions are applicable

Species *	State	Affected Counties	Species Management Practice Applies ¹
meadowfoam, Sebastopol (<i>Limnanthes vinculans</i>)	CA	Sonoma ³	No
mesa-mint, Otay (<i>Pogogyne nudiuscula</i>)	CA	Riverside ² , San Diego ²	No
mesa-mint, Otay (<i>Pogogyne nudiuscula</i>)	CA	Riverside ² , San Diego ²	Yes
mesa-mint, San Diego (<i>Pogogyne abramsii</i>)	CA	San Diego ³	No
navarretia, few-flowered (<i>Navarretia leucocephala</i> ssp. <i>pauciflora</i> (=N. <i>pauciflora</i>))	CA	Alameda ³ , Contra Costa ³ , Mendocino ³ , Napa ³ , Santa Barbara ³ , Santa Clara ³ , Solano ³	No
navarretia, few-flowered (<i>Navarretia leucocephala</i> ssp. <i>pauciflora</i> (=N. <i>pauciflora</i>))	CA	Alameda ³ , Contra Costa ³ , Mendocino ³ , Napa ³ , Santa Barbara ³ , Santa Clara ³ , Solano ³	Yes
navarretia, many-flowered (<i>Navarretia leucocephala</i> ssp. <i>plieantha</i>)	CA	Alameda ³ , Contra Costa ³ , Mendocino ³ , Napa ³ , Santa Barbara ³ , Santa Clara ³ , Solano ³	No
owl's-clover, fleshy (<i>Castilleja campestris</i> ssp. <i>succulenta</i>)	CA	Fresno ³ , Madera ³ , Merced ³ , Stanislaus ³	No
seablite, California (<i>Suaeda californica</i>)	CA	San Luis Obispo ³	No
sunshine, Sonoma (<i>Blennosperma bakeri</i>)	CA	Sonoma ³	Yes
thistle, Chorro Creek bog (<i>Cirsium fontinale</i> var. <i>obispoense</i>)	CA	San Luis Obispo ²	No
thistle, fountain (<i>Cirsium fontinale</i> var. <i>fontinale</i>)	CA	Santa Barbara ² , Santa Clara ²	No
thistle, Loch Lomond coyote (<i>Eryngium constancei</i>)	CA	Lake ³	No
watercress, Gambel's (<i>Rorippa gambellii</i>)	CA	Los Angeles ³ , San Bernardino ³ , San Diego ³ , San Luis Obispo ³ , Ventura ³	No
Lifeform: Terrestrial			
ambrosia, San Diego (<i>Ambrosia pumila</i>)	CA	Riverside ³ , San Diego ³	No

Table A-6a (continued). Species co-occurrences for alfalfa hay for which proximity exclusions are applicable

Species *	State	Affected Counties	Species Management Practice Applies ¹
amole, purple (<i>Chlorogalum purpureum</i>)	CA	Monterey ² , San Luis Obispo ²	No
baccharis, Encinitas (<i>Baccharis vanessae</i>)	CA	Orange ³ , San Diego ³	No
baccharis, Encinitas (<i>Baccharis vanessae</i>)	CA	Orange ³ , San Diego ³	Yes
Barberry, island (<i>Berberis pinnata ssp. insularis</i>)	CA	Santa Barbara ²	No
barberry, Nevin's (<i>Berberis nevinii</i>)	CA	Los Angeles ³ , Riverside ³	No
bedstraw, island (<i>Galium buxifolium</i>)	CA	Santa Barbara ²	No
bladderpod, San Bernardino Mountains (<i>Lesquerella kingii ssp. bernardina</i>)	CA	San Bernardino ²	No
broom, San Clemente Island (<i>Lotus dendroideus ssp. traskiae</i>)	CA	Los Angeles ²	No
buckwheat, cushenbury (<i>Eriogonum ovalifolium var. vineum</i>)	CA	San Bernardino ²	No
bush-mallow, San Clemente Island (<i>Malacothamnus clementinus</i>)	CA	Los Angeles ²	No
bush-mallow, Santa Cruz Island (<i>Malacothamnus fasciculatus var. nesioticus</i>)	CA	Santa Barbara ²	No
butterweed, Layne's (<i>Senecio layneae</i>)	CA	Tuolumne ³	No
ceanothus, coyote (<i>Ceanothus ferrisae</i>)	CA	Santa Clara ²	No
ceanothus, Vail Lake (<i>Ceanothus ophiochilus</i>)	CA	Riverside ²	Yes
Checker-mallow, Keck's (<i>Sidalcea keckii</i>)	CA	Fresno ² , Tulare ²	No
checker-mallow, pedate (<i>Sidalcea pedata</i>)	CA	San Bernardino ²	No
clarkia, Pismo (<i>Clarkia speciosa ssp. immaculata</i>)	CA	San Luis Obispo ³	Yes
clarkia, Presidio (<i>Clarkia franciscana</i>)	CA	Alameda ²	No

Table A-6a (continued). Species co-occurrences for alfalfa hay for which proximity exclusions are applicable

Species *	State	Affected Counties	Species Management Practice Applies ¹
clarkia, Springville (<i>Clarkia springvillensis</i>)	CA	Tulare ³	Yes
clarkia, Vine Hill (<i>Clarkia imbricata</i>)	CA	Sonoma ³	Yes
clover, Monterey (<i>Trifolium trichocalyx</i>)	CA	Monterey ²	No
crownbeard, big-leaved (<i>Verbesina dissita</i>)	CA	Orange ² , San Diego ²	No
daisy, Parish's (<i>Erigeron parishii</i>)	CA	Riverside ² , San Bernardino ²	No
dudleya, Conejo (<i>Dudleya abramsii ssp. parva</i>)	CA	Ventura ³	Yes
dudleya, marcescent (<i>Dudleya cymosa ssp. marcescens</i>)	CA	Los Angeles ² , Orange ² , Santa Barbara ²	No
dudleya, Santa Clara Valley (<i>Dudleya setchellii</i>)	CA	Alameda ³ , Contra Costa ³ , Fresno ³ , Monterey ³ , San Benito ³ , Santa Clara ³	No
dudleya, Santa Clara Valley (<i>Dudleya setchellii</i>)	CA	Alameda ³ , Contra Costa ³ , Fresno ³ , Monterey ³ , San Benito ³ , Santa Clara ³	Yes
dudleya, Santa Cruz Island (<i>Dudleya nesiotica</i>)	CA	Santa Barbara ²	No
dudleya, Verity's (<i>Dudleya verityi</i>)	CA	Ventura ³	No
dudleyea, Santa Monica Mountains (<i>Dudleya cymosa ssp. ovatifolia</i>)	CA	Los Angeles ² , Orange ² , Ventura ²	No
dwarf-flax, Marin (<i>Hesperolinon congestum</i>)	CA	Marin ²	No
evening-primrose, Antioch Dunes (<i>Oenothera deltoides ssp. howellii</i>)	CA	Contra Costa ³ , Sacramento ³	No
evening-primrose, Eureka Valley (<i>Oenothera avita ssp. eurekaensis</i>)	CA	Inyo ²	No
evening-primrose, San Benito (<i>Camissonia benitensis</i>)	CA	San Benito ²	No
fiddleneck, large-flowered (<i>Amsinckia grandiflora</i>)	CA	Alameda ³ , Contra Costa ³ , San Joaquin ³	No
flannelbush, Mexican (<i>Fremontodendron mexicanum</i>)	CA	San Diego ²	No

Table A-6a (continued). Species co-occurrences for alfalfa hay for which proximity exclusions are applicable

Species *	State	Affected Counties	Species Management Practice Applies ¹
fringe pod, Santa Cruz Island (<i>Thysanocarpus conchuliferus</i>)	CA	Santa Barbara ²	No
gilia, Hoffmann's slender-flowered (<i>Gilia tenuiflora</i> ssp. <i>hoffmannii</i>)	CA	Santa Barbara ³	No
indian paintbrush, San Clemente Island (<i>Castilleja grisea</i>)	CA	Los Angeles ²	No
jewelflower, Tiburon (<i>Streptanthus niger</i>)	CA	Marin ²	No
larkspur, Baker's (<i>Delphinium bakeri</i>)	CA	Marin ²	No
larkspur, San Clemente Island (<i>Delphinium variegatum</i> ssp. <i>kinkiense</i>)	CA	Los Angeles ²	No
larkspur, yellow (<i>Delphinium luteum</i>)	CA	Sonoma ³	No
layia, beach (<i>Layia carnosa</i>)	CA	Humboldt ² , Marin ² , Monterey ² , Santa Barbara ²	No
liveforever, Laguna Beach (<i>Dudleya stolonifera</i>)	CA	Orange ³	No
liveforever, Santa Barbara Island (<i>Dudleya traskiae</i>)	CA	Santa Barbara ²	No
lupine, clover (<i>Lupinus tidestromii</i>)	CA	Madera ² , Marin ² , Monterey ² , Sonoma ²	No
lupine, Nipomo Mesa (<i>Lupinus nipomensis</i>)	CA	San Luis Obispo ³	Yes
malacothrix, island (<i>Malacothrix squalida</i>)	CA	Santa Barbara ²	No
malacothrix, Santa Cruz Island (<i>Malacothrix indecora</i>)	CA	Santa Barbara ² , Ventura ²	No
manzanita, Del Mar (<i>Arctostaphylos glandulosa</i> ssp. <i>crassifolia</i>)	CA	Orange ³ , San Diego ³	No
manzanita, Morro (<i>Arctostaphylos morroensis</i>)	CA	San Luis Obispo ³	Yes
manzanita, pallid (<i>Arctostaphylos pallida</i>)	CA	Alameda ³ , Contra Costa ³	No
manzanita, Santa Rosa Island (<i>Arctostaphylos confertiflora</i>)	CA	Santa Barbara ²	No

Table A-6a (continued). Species co-occurrences for alfalfa hay for which proximity exclusions are applicable

Species *	State	Affected Counties	Species Management Practice Applies ¹
milk-vetch, Braunton's (<i>Astragalus brauntonii</i>)	CA	Los Angeles ³ , Orange ³ , Ventura ³	No
milk-vetch, Clara Hunt's (<i>Astragalus clarianus</i>)	CA	Napa ² , Sonoma ²	No
milk-vetch, Coachella Valley (<i>Astragalus lentiginosus</i> var. <i>coachellae</i>)	CA	Riverside ²	No
milk-vetch, Cushenbury (<i>Astragalus albens</i>)	CA	San Bernardino ²	No
milk-vetch, Fish Slough (<i>Astragalus lentiginosus</i> var. <i>piscinensis</i>)	CA	Inyo ² , Mono ²	No
milk-vetch, Lane Mountain (<i>Astragalus jaegerianus</i>)	CA	San Bernardino ²	No
milk-vetch, Peirson's (<i>Astragalus magdalenae</i> var. <i>peirsonii</i>)	CA	Imperial ³	No
milk-vetch, triple-ribbed (<i>Astragalus tricarinatus</i>)	CA	Riverside ² , San Bernardino ²	No
Milk-vetch, Ventura Marsh (<i>Astragalus pycnostachyus</i> var. <i>lanosissimus</i>)	CA	Ventura ³	No
monardella, willowy (<i>Monardella linoides</i> ssp. <i>viminea</i>)	CA	San Diego ³	No
mountain balm, Indian Knob (<i>Eriodictyon altissimum</i>)	CA	San Luis Obispo ²	No
mountain-mahogany, Catalina Island (<i>Cercocarpus traskiae</i>)	CA	Los Angeles ²	No
mustard, slender-petaled (<i>Thelypodium stenopetalum</i>)	CA	San Bernardino ²	No
oxytheca, cushenbury (<i>Oxytheca parishii</i> var. <i>goodmaniana</i>)	CA	San Bernardino ²	No
paintbrush, ash-grey (<i>Castilleja cinerea</i>)	CA	San Bernardino ²	Yes
paintbrush, soft-leaved (<i>Castilleja mollis</i>)	CA	Santa Barbara ²	No
paintbrush, Tiburon (<i>Castilleja affinis</i> ssp. <i>neglecta</i>)	CA	Marin ² , Napa ² , Santa Clara ²	No

Table A-6a (continued). Species co-occurrences for alfalfa hay for which proximity exclusions are applicable

Species *	State	Affected Counties	Species Management Practice Applies ¹
penny-cress, Kneeland Prairie (<i>Thlaspi californicum</i>)	CA	Humboldt ²	No
pentachaeta, Lyon's (<i>Pentachaeta lyonii</i>)	CA	Los Angeles ³ , Ventura ³	No
pentachaeta, white-rayed (<i>Pentachaeta bellidiflora</i>)	CA	Marin ²	No
phacelia, island (<i>Phacelia insularis ssp. insularis</i>)	CA	Santa Barbara ²	No
phlox, Yreka (<i>Phlox hirsuta</i>)	CA	Siskiyou ²	No
potentilla, Hickman's (<i>Potentilla hickmanii</i>)	CA	Monterey ³	No
pussypaws, Mariposa (<i>Calyptridium pulchellum</i>)	CA	Fresno ² , Madera ² , Mariposa ²	Yes
rock-cress, Hoffmann's (<i>Arabis hoffmannii</i>)	CA	Santa Barbara ²	No
rock-cress, McDonald's (<i>Arabis mcdonaldiana</i>)	CA	Mendocino ²	No
rockcress, Santa Cruz Island (<i>Sibara filifolia</i>)	CA	Los Angeles ²	No
rush-rose, island (<i>Helianthemum greenei</i>)	CA	Los Angeles ²	No
sandwort, Bear Valley (<i>Arenaria ursina</i>)	CA	San Bernardino ²	Yes
spineflower, Howell's (<i>Chorizanthe howellii</i>)	CA	Mendocino ³	No
spineflower, Orcutt's (<i>Chorizanthe orcuttiana</i>)	CA	Orange ³ , San Diego ³	No
spineflower, Sonoma (<i>Chorizanthe valida</i>)	CA	Marin ³ , Sonoma ³	No
spineflower, Sonoma (<i>Chorizanthe valida</i>)	CA	Marin ³ , Sonoma ³	Yes
stonecrop, Lake County (<i>Parvisedum leiocarpum</i>)	CA	Alameda ³ , Contra Costa ³ , Mendocino ³ , Napa ³ , Santa Barbara ³ , Santa Clara ³ , Solano ³	No
sunburst, Hartweg's golden (<i>Pseudobahia bahiifolia</i>)	CA	Fresno ³ , Madera ³ , Stanislaus ³	No
taraxacum, California (<i>Taraxacum californicum</i>)	CA	San Bernardino ²	Yes
tarplant, Gaviota (<i>Hemizonia increscens ssp. villosa</i>)	CA	Santa Barbara ²	No

Table A-6a (continued). Species co-occurrences for alfalfa hay for which proximity exclusions are applicable

Species *	State	Affected Counties	Species Management Practice Applies ¹
tarplant, Otay (<i>Deinandra</i> (= <i>Hemizonia</i>) <i>conjugens</i>)	CA	San Diego ²	Yes
tarplant, Santa Cruz (<i>Holocarpha macradenia</i>)	CA	Contra Costa ³ , Monterey ³	Yes
thistle, La Graciosa (<i>Cirsium loncholepis</i>)	CA	San Luis Obispo ³ , Santa Barbara ³	Yes
thistle, Suisun (<i>Cirsium hydrophilum</i> var. <i>hydrophilum</i>)	CA	Solano ²	No
vervain, Red Hills (<i>Verbena californica</i>)	CA	Tuolumne ²	No
wallflower, Contra Costa (<i>Erysimum capitatum</i> var. <i>angustatum</i>)	CA	Contra Costa ²	No
wallflower, Menzies' (<i>Erysimum menziesii</i>)	CA	Humboldt ³ , Mendocino ³ , Monterey ³	No
wild-buckwheat, southern mountain (<i>Eriogonum kennedyi</i> var. <i>austromontanum</i>)	CA	San Bernardino ²	No
woodland-star, San Clemente Island (<i>Lithophragma maximum</i>)	CA	Los Angeles ²	No
woolly-star, Santa Ana River (<i>Eriastrum densifolium</i> ssp. <i>sanctorum</i>)	CA	Orange ³ , Riverside ³ , San Bernardino ³	Yes
yerba santa, Lompoc (<i>Eriodictyon capitatum</i>)	CA	Santa Barbara ²	No
Monocots			
Lifeform: Aquatic			
grass, Solano (<i>Tuctoria mucronata</i>)	CA	Solano ²	No
Orcutt grass, Sacramento (<i>Orcuttia viscida</i>)	CA	Sacramento ²	No
Orcutt grass, slender (<i>Orcuttia tenuis</i>)	CA	Lake ³ , Plumas ³ , Sacramento ³ , Shasta ³ , Siskiyou ³ , Tehama ³	Yes
sedge, white (<i>Carex albida</i>)	CA	Sonoma ³	Yes
Lifeform: Terrestrial			

Table A-6a (continued). Species co-occurrences for alfalfa hay for which proximity exclusions are applicable

Species *	State	Affected Counties	Species Management Practice Applies ¹
alopecurus, Sonoma (<i>Alopecurus aequalis</i> var. <i>sonomensis</i>)	CA	Marin ³ , Sonoma ³	No
alopecurus, Sonoma (<i>Alopecurus aequalis</i> var. <i>sonomensis</i>)	CA	Marin ³ , Sonoma ³	Yes
bluegrass, Napa (<i>Poa napensis</i>)	CA	Napa ³	Yes
bluegrass, San Bernardino (<i>Poa atropurpurea</i>)	CA	San Bernardino ² , San Diego ²	Yes
brodiaea, Chinese Camp (<i>Brodiaea pallida</i>)	CA	Tuolumne ²	No
brodiaea, thread-leaved (<i>Brodiaea filifolia</i>)	CA	Los Angeles ³ , Orange ³ , Riverside ³ , San Bernardino ³ , San Diego ³	Yes
grass, Eureka Dune (<i>Swallenia alexandrae</i>)	CA	Inyo ²	No
onion, Munz's (<i>Allium munzii</i>)	CA	Riverside ³	No
piperia, Yadon's (<i>Piperia yadonii</i>)	CA	Monterey ³	No

* Lifeform classification from FESTF IMS.

¹ 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>.

² The following statement holds: No pesticide is used in proximity of species habitat in the specified county.

³ The following statement holds: Species habitat does not occur in proximity to alfalfa in the specified county.

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

Species *	State	Affected Counties	Species Management Practice Applies ¹
Dicots			
Lifeform: Aquatic			
bird's-beak, Pennell's (<i>Cordylanthus tenuis</i> ssp. <i>capillaris</i>)	CA	Sonoma ³	No
bird's-beak, salt marsh (<i>Cordylanthus maritimus</i> ssp. <i>maritimus</i>)	CA	Los Angeles ³	No
bluecurls, Hidden Lake (<i>Trichostema austromontanum</i> ssp. <i>compactum</i>)	CA	San Bernardino ²	No
checker-mallow, Kenwood Marsh (<i>Sidalcea oregana</i> ssp. <i>valida</i>)	CA	Sonoma ³	Yes
goldfields, Burke's (<i>Lasthenia burkei</i>)	CA	Sonoma ³	No
meadowfoam, Butte County (<i>Limnanthes floccosa</i> ssp. <i>californica</i>)	CA	Butte ³	Yes
meadowfoam, Sebastopol (<i>Limnanthes vinculans</i>)	CA	Sonoma ³	No
owl's-clover, fleshy (<i>Castilleja campestris</i> ssp. <i>succulenta</i>)	CA	Fresno ³ , Madera ³ , Merced ³ , Stanislaus ³	No
sunshine, Sonoma (<i>Blennosperma bakeri</i>)	CA	Sonoma ³	Yes
watercress, Gambel's (<i>Rorippa gambellii</i>)	CA	Los Angeles ³ , San Bernardino ³	No
Lifeform: Terrestrial			
barberry, Nevin's (<i>Berberis nevinii</i>)	CA	Los Angeles ³	No
bladderpod, San Bernardino Mountains (<i>Lesquerella kingii</i> ssp. <i>bernardina</i>)	CA	San Bernardino ²	No
broom, San Clemente Island (<i>Lotus dendroideus</i> ssp. <i>traskiae</i>)	CA	Los Angeles ²	No
buckwheat, cushenbury (<i>Eriogonum ovalifolium</i> var. <i>vineum</i>)	CA	San Bernardino ²	No
bush-mallow, San Clemente Island (<i>Malacothamnus clementinus</i>)	CA	Los Angeles ²	No
Checker-mallow, Keck's (<i>Sidalcea keckii</i>)	CA	Fresno ² , Tulare ²	No
checker-mallow, pedate (<i>Sidalcea pedata</i>)	CA	San Bernardino ²	No
clarkia, Springville (<i>Clarkia springvillensis</i>)	CA	Tulare ³	Yes
clarkia, Vine Hill (<i>Clarkia imbricata</i>)	CA	Sonoma ³	Yes
daisy, Parish's (<i>Erigeron parishii</i>)	CA	San Bernardino ²	No

Table A-6b (continued). Species co-occurrences for alfalfa seed for which proximity exclusions are applicable

Species *	State	Affected Counties	Species Management Practice Applies ¹
dudleya, marcescent (<i>Dudleya cymosa</i> ssp. <i>marcescens</i>)	CA	Los Angeles ²	No
dudleya, Santa Clara Valley (<i>Dudleya setchellii</i>)	CA	Fresno ³	No
dudleyea, Santa Monica Mountains (<i>Dudleya cymosa</i> ssp. <i>ovatifolia</i>)	CA	Los Angeles ²	No
evening-primrose, Antioch Dunes (<i>Oenothera deltooides</i> ssp. <i>howellii</i>)	CA	Sacramento ³	No
fiddleneck, large-flowered (<i>Amsinckia grandiflora</i>)	CA	San Joaquin ³	No
indian paintbrush, San Clemente Island (<i>Castilleja grisea</i>)	CA	Los Angeles ²	No
larkspur, San Clemente Island (<i>Delphinium variegatum</i> ssp. <i>kinkiense</i>)	CA	Los Angeles ²	No
larkspur, yellow (<i>Delphinium luteum</i>)	CA	Sonoma ³	No
lupine, clover (<i>Lupinus tidestromii</i>)	CA	Madera ² , Sonoma ²	No
milk-vetch, Braunton's (<i>Astragalus brauntonii</i>)	CA	Los Angeles ³	No
milk-vetch, Clara Hunt's (<i>Astragalus clarianus</i>)	CA	Sonoma ²	No
milk-vetch, Cushenbury (<i>Astragalus albens</i>)	CA	San Bernardino ²	No
milk-vetch, Lane Mountain (<i>Astragalus jaegerianus</i>)	CA	San Bernardino ²	No
milk-vetch, Peirson's (<i>Astragalus magdalenae</i> var. <i>peirsonii</i>)	CA	Imperial ³	No
milk-vetch, triple-ribbed (<i>Astragalus tricarinatus</i>)	CA	San Bernardino ²	No
mountain-mahogany, Catalina Island (<i>Cercocarpus traskiae</i>)	CA	Los Angeles ²	No
mustard, slender-petaled (<i>Thelypodium stenopetalum</i>)	CA	San Bernardino ²	No
oxytheca, cushenbury (<i>Oxytheca parishii</i> var. <i>goodmaniana</i>)	CA	San Bernardino ²	No
paintbrush, ash-grey (<i>Castilleja cinerea</i>)	CA	San Bernardino ²	Yes
pentachaeta, Lyon's (<i>Pentachaeta lyonii</i>)	CA	Los Angeles ³	No
phlox, Yreka (<i>Phlox hirsuta</i>)	CA	Siskiyou ²	No
pussypaws, Mariposa (<i>Calyptridium pulchellum</i>)	CA	Fresno ² , Madera ²	Yes
rockcress, Santa Cruz Island (<i>Sibara filifolia</i>)	CA	Los Angeles ²	No

Table A-6b (continued). Species co-occurrences for alfalfa seed for which proximity exclusions are applicable

Species *	State	Affected Counties	Species Management Practice Applies ¹
rush-rose, island (<i>Helianthemum greenei</i>)	CA	Los Angeles ²	No
sandwort, Bear Valley (<i>Arenaria ursina</i>)	CA	San Bernardino ²	Yes
spineflower, Sonoma (<i>Chorizanthe valida</i>)	CA	Sonoma ³	No
sunburst, Hartweg's golden (<i>Pseudobahia bahiifolia</i>)	CA	Fresno ³ , Madera ³ , Stanislaus ³	No
taraxacum, California (<i>Taraxacum californicum</i>)	CA	San Bernardino ²	Yes
wild-buckwheat, southern mountain (<i>Eriogonum kennedyi</i> var. <i>austromontanum</i>)	CA	San Bernardino ²	No
woodland-star, San Clemente Island (<i>Lithophragma maximum</i>)	CA	Los Angeles ²	No
woolly-star, Santa Ana River (<i>Eriastrum densifolium</i> ssp. <i>sanctorum</i>)	CA	San Bernardino ³	Yes
Monocots			
Lifeform: Aquatic			
Orcutt grass, Sacramento (<i>Orcuttia viscida</i>)	CA	Sacramento ²	No
Orcutt grass, slender (<i>Orcuttia tenuis</i>)	CA	Sacramento ³ , Siskiyou ³	Yes
sedge, white (<i>Carex albida</i>)	CA	Sonoma ³	Yes
Lifeform: Terrestrial			
alopecurus, Sonoma (<i>Alopecurus aequalis</i> var. <i>sonomensis</i>)	CA	Sonoma ³	No
bluegrass, San Bernardino (<i>Poa atropurpurea</i>)	CA	San Bernardino ²	Yes
brodiaea, thread-leaved (<i>Brodiaea filifolia</i>)	CA	Los Angeles ³ , San Bernardino ³	Yes

* Lifeform classification from FESTF IMS.

¹ 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>.

² The following statement holds: No pesticide is used in proximity of species habitat in the specified county.

³ 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

Table A-7a. Species co-occurrences for alfalfa hay production for which other exclusions are applicable

Species *	State	Affected Counties
	Synopsis of the Reason for Exclusion	
Dicots		
Lifeform: Terrestrial		
aster, Ruth's golden (<i>Pityopsis ruthii</i>)	TN	Polk
	<i>Conclusion: Species and use site (crop) are not in spatial proximity (separation distance not specified) within the county. Rationale: Agriculture is not practiced on TVA and USFWS land where Ruth's Golden aster is found (Turner, 1997). Management practices on land owned or controlled by TVA and USFWS minimizes adverse impact on Ruth's golden aster.</i>	
birch, Virginia round-leaf (<i>Betula uber</i>)	VA	Smyth
	<i>Conclusion: Species and use site (crop) are not in spatial proximity (separation distance not specified) within the county. Rationale: No agriculture in or in proximity to species habitat (Turner, L, 1997). This species has only been seen historically at Rye Valley Station and Cressy Creek in Smyth County, VA (USFWS, 1978). It is unlikely that Virginia round-leaf birch still occurs in Smyth County. Also, most trees occur on private land; a few are located in the Jefferson National Forest where they are not likely to be impacted adversely. Private landholders are making attempts to prevent adverse impact to this species by actively protecting it; protecting it from poachers and other adverse impact -- on private land; individual species are fenced off to protect them.</i>	
cactus, Knowlton (<i>Pediocactus knowltonii</i>)	CO NM	La Plata San Juan
	<i>Conclusion: Species and use site (crop) are not in spatial proximity (separation distance not specified) within the county. Rationale: Turner, L (1997) notes that there are no apparent agriculture uses in or in proximity to species; this cactus is found on high desert ridge, juniper-pinyon sagebrush habitat where no crops are grown (NatureServe, 2005; Turner, 1997). Also, management practices on land owned or controlled by Indian Nations and USBIA minimizes adverse impact on Knowlton's cactus. The predominance of evidence indicates that (crop) agriculture will have no adverse impact on this species.</i>	
daisy, Maguire (<i>Erigeron maguirei</i>)	UT	Emery, Wayne
	<i>Conclusion: Species and use site (crop) are not in spatial proximity (separation distance not specified) within the county. Rationale: According to Turner, L. (1997), no pesticide use in or in proximity to habitat. Also, this species is found entirely on Federal BLM land where land management practices likely protect it (USFWS, 1985(a); 1996(a)). Crops are not grown in proximity to this species habitat and, therefore, drift and run-off are not issues for this species.</i>	
reed-mustard, clay (<i>Schoenocrambe argillacea</i>)	UT	Uintah
	<i>Conclusion: Species and use site (crop) are not in spatial proximity (separation distance not specified) within the county. Rationale: The entire population of this species is on Federal BLM land (USFWS, 1992(e)) where exposure from agricultural practice is unlikely due to prevailing management practice. Turner L. (1997) notes that there is no apparent agriculture other than grazing in or in proximity to species habitat. Mineral leases could potentially threaten this species. Predominance of evidence indicates that (crop) agriculture does not adversely impact this species.</i>	
	OR	Harney

Table A7-a (continued). Species co-occurrences for alfalfa hay for which other exclusions are applicable

Species *	State	Affected Counties
Synopsis of the Reason for Exclusion		
wire-lettuce, Malheur (<i>Stephanomeria malheurensis</i>)	OR	Harney
<i>Conclusion: Species and use site (crop) are not in spatial proximity (separation distance not specified) within the county. Rationale: This species occurs entirely on land managed by the BLM (USFWS, 1982); agriculture is not an issue for this species. Also, Larry Turner (pers. comm.) indicates that Malheur wire-lettuce is at least one mile from any crop agriculture in Harney County, OR. No pesticide use in or in proximity to species habitat (Turner, L. 1997).</i>		
Monocots		
Lifeform: Aquatic		
pink, swamp (<i>Helonias bullata</i>)	DE	Kent, New Castle, Sussex
	MD	Anne Arundel, Cecil, Dorchester
	NC	Henderson, Jackson, Transylvania
	SC	Greenville
	VA	Augusta, Caroline, Henrico, Nelson
<i>Conclusion: Species and use site (crop) are not in spatial proximity (separation distance not specified) within the county. Rationale: Crop agriculture is not known to be in proximity to swamp pink in these states. Only known crop agriculture associated with this species is in New Jersey (L. Turner, pers. com., 2005).</i>		
sedge, Navajo (<i>Carex specuicola</i>)	AZ	Apache, Coconino
<i>Conclusion: Species and use site (crop) are not in spatial proximity (separation distance not specified) within the county. Rationale: The Navajo Sedge only occurs on the Navajo Indian Reservation in Arizona in areas > 5,500 ft in elevation. Crops are not grown at or near these elevations and it is protected by tribal law and BIA (Bureau of Indian Affairs) land management practices (USFWS, 1985(e)). This species is not endangered by crop agriculture based on personal discussion with Fritz Roanhorse of the Navajo Indian Nation.</i>		
sedge, Navajo (<i>Carex specuicola</i>)	AZ	Navajo
	UT	San Juan
<i>The Navajo Sedge only occurs on the Navajo Indian Reservation in Arizona in areas > 5,500 ft in elevation. Crops are not grown at or near these elevations and it is protected by tribal law and BIA (Bureau of Indian Affairs) land management practices (USFWS, 1985(e)). This species is not endangered by crop agriculture based on personal discussion with Fritz Roanhorse of the Navajo Indian Nation.</i>		
wild-rice, Texas (<i>Zizania texana</i>)	TX	Hays
<i>Conclusion: Species and use site (crop) are not in spatial proximity (separation distance not specified) within the county. Rationale: Species only grows in municipal areas where crop agriculture and grazing do not occur (Turner, 1997).</i>		

Table A7-a (continued). Species co-occurrences for alfalfa hay for which other exclusions are applicable

Species *	State	Affected Counties
Synopsis of the Reason for Exclusion		
<i>Lifeform: Terrestrial</i>		
agave, Arizona (<i>Agave arizonica</i>)	AZ	Gila, Maricopa, Yavapai <i>Conclusion: Species and use site (crop) are not in spatial proximity (separation distance not specified) within the county. Rationale: All on plants are found on National Forest Land; no crops in or in proximity to habitat (Turner, L. 1997). Arizona agave populations are only found in the Tonto National forest (USFWS, 1984(d)) where exposure from agricultural practice is not likely due to prevailing management practice. There are very few individual plants remaining (<100 individuals) and additionally, this species has been determined to be a hybrid (USFWS, 2005(h)) and should be delisted soon.</i>

* Lifeform classification from FESTF IMS.

Table A-7b. Species co-occurrences for alfalfa seed production for which other exclusions are applicable

Species *	State	Affected Counties
Synopsis of the Reason for Exclusion		
Dicots		
Lifeform: Terrestrial		
cactus, Knowlton (<i>Pediocactus knowltonii</i>)	NM	San Juan
<p><i>Conclusion: Species and use site (crop) are not in spatial proximity (separation distance not specified) within the county. Rationale: Turner, L (1997) notes that there are no apparent agriculture uses in or in proximity to species; this cactus is found on high desert ridge, juniper-pinyon sagebrush habitat where no crops are grown (NatureServe, 2005; Turner, 1997). Also, management practices on land owned or controlled by Indian Nations and USBIA minimizes adverse impact on Knowlton's cactus. The predominance of evidence indicates that (crop) agriculture will have no adverse impact on this species.</i></p>		
daisy, Maguire (<i>Erigeron maguirei</i>)	UT	Emery
<p><i>Conclusion: Species and use site (crop) are not in spatial proximity (separation distance not specified) within the county. Rationale: According to Turner, L. (1997), no pesticide use in or in proximity to habitat. Also, this species is found entirely on Federal BLM land where land management practices likely protect it (USFWS, 1985(a); 1996(a)). Crops are not grown in proximity to this species habitat and, therefore, drift and run-off are not issues for this species.</i></p>		
Monocots		
Lifeform: Terrestrial		
agave, Arizona (<i>Agave arizonica</i>)	AZ	Maricopa, Yavapai
<p><i>Conclusion: Species and use site (crop) are not in spatial proximity (separation distance not specified) within the county. Rationale: All on plants are found on National Forest Land; no crops in or in proximity to habitat (Turner, L. 1997). Arizona agave populations are only found in the Tonto National forest (USFWS, 1984(d)) where exposure from agricultural practice is not likely due to prevailing management practice. There are very few individual plants remaining (<100 individuals) and additionally, this species has been determined to be a hybrid (USFWS, 2005(h)) and should be delisted soon.</i></p>		

* Lifeform classification from FESTF IMS.

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

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

Species*	State	Affected Counties
	Synopsis of the Reason for Protection	
<i>Dicots</i>		
<i>Lifeform: Aquatic</i>		
button-celery, San Diego (<i>Eryngium aristulatum</i> var. <i>parishii</i>)	CA	Riverside, San Diego
	<i>Species is protected by CA11 and CA17 (California DPR, 2003).</i>	
dropwort, Canby's (<i>Oxypholis canbyi</i>)	GA	Burke
	<i>This species is protected specifically in the Burke County, Georgia Endangered Species Protection Program (USEPA, 2006(a)) by Pesticide Use Limitation #29: Do not apply this pesticide in this species' primary habitat (described under the Shading Key). For ground applications do not apply within 20 yards of the habitat, nor within 100 yards for aerial applications.</i>	
navarretia, spreading (<i>Navarretia fossalis</i>)	CA	Los Angeles, Riverside, San Diego
	<i>Species is protected by CA11 and CA17 (California DPR, 2003).</i>	
niterwort, Amargosa (<i>Nitrophila mohavensis</i>)	CA	Inyo
	<i>Species occurs on alkaline flats in the Ash Meadows Refuge (USFWS, 1985(c)); crops are not grown in or adjacent to these areas and agricultural sprays are not an issue to this species. Amargosa niterwort can be removed from any future consideration for cultivated crop pesticides, although rangeland spraying is conceivable off the refuge and noxious weed control very likely on the refuge (Interpreted by Turner, 2005 from pers. com. with Charles Sullivan, BLM, Barstow, CA). No crop uses in or in proximity to habitat; protected by BLM (Turner, L. 1997).</i>	
niterwort, Amargosa (<i>Nitrophila mohavensis</i>)	NV	Nye
	<i>Species occurs on alkaline flats in the Ash Meadows Refuge (USFWS, 1985(c)); crops are not grown in or adjacent to these areas and agricultural sprays are not an issue to this species. Amargosa niterwort can be removed from any future consideration for cultivated crop pesticides, although rangeland spraying is conceivable off the refuge and noxious weed control very likely on the refuge (Interpreted by Turner, 2005 from pers. com. with Sharon McElvey, Refuge Manager for the Ash Meadows National Wildlife Refuge). No crop uses in or in proximity to habitat; protected by BLM (Turner, L. 1997).</i>	
pitcher-plant, Alabama canebrake (<i>Sarracenia</i> <i>rubra alabamensis</i>)	AL	Chilton
	<i>According to the county bulletin (USEPA, 2004(d)), Federal Protection #29 applies to this species: Do not apply this pesticide in the species habitat (described under the shading key). For ground applications do not apply within 20 yards of the habitat, nor within 100 yards for aerial applications.</i>	
pitcher-plant, Alabama canebrake (<i>Sarracenia</i> <i>rubra alabamensis</i>)	AL	Autauga
	<i>Species is protected by county bulletin (USEPA, 2004(c)) under Federal Protection #29 "Do not apply this pesticide in the species habitat (described under the shading key). For ground applications do not apply within 20 yards of the habitat, nor within 100 yards for aerial applications."</i>	
	AL	Etowah

Table A8-a (continued). Species co-occurrences for alfalfa hay for which species management practice protections are applicable

Species*	State	Affected Counties
	Synopsis of the Reason for Protection	
pitcher-plant, green (<i>Sarracenia oreophila</i>)	AL	Etowah <i>According to the county bulletin (USEPA, 2004(b)), Federal Protection #29 applies to this species: Do not apply this pesticide in the species habitat (described under the shading key). For ground applications do not apply within 20 yards of the habitat, nor within 100 yards for aerial applications.</i>
pitcher-plant, green (<i>Sarracenia oreophila</i>)	AL	De Kalb <i>According to the county bulletin (USEPA, 2004(e)), Federal Protection #29 applies to this species: Do not apply this pesticide in the species habitat (described under the shading key). For ground applications do not apply within 20 yards of the habitat, nor within 100 yards for aerial applications.</i>
pitcher-plant, green (<i>Sarracenia oreophila</i>)	AL	Jackson <i>According to the county bulletin (USEPA, 2004(f)), Federal Protection #29 applies to this species: Do not apply this pesticide in the species habitat (described under the shading key). For ground applications do not apply within 20 yards of the habitat, nor within 100 yards for aerial applications.</i>
pitcher-plant, green (<i>Sarracenia oreophila</i>)	AL	Marshall <i>According to the county bulletin (USEPA, 2004(g)), Federal Protection #29 applies to this species: Do not apply this pesticide in the species habitat (described under the shading key). For ground applications do not apply within 20 yards of the habitat, nor within 100 yards for aerial applications.</i>
pitcher-plant, green (<i>Sarracenia oreophila</i>)	AL	Cherokee <i>According to the county bulletin (USEPA, 2004(k)), Federal Protection #29 applies to this species: Do not apply this pesticide in the species habitat (described under the shading key). For ground applications do not apply within 20 yards of the habitat, nor within 100 yards for aerial applications.</i>
pitcher-plant, green (<i>Sarracenia oreophila</i>)	GA	Towns <i>This species is protected specifically in the Townes County, Georgia Endangered Species Protection Program (USEPA 2004(h)); Federal Protection #28 applies to this species: Do not apply within 100 yards of species habitat for aerial applications or within 20 yards of species habitat for ground applications.</i>
sandwort, Marsh (<i>Arenaria paludicola</i>)	CA	San Luis Obispo <i>Species is protected by CA11 and CA17 (California DPR, 2003).</i>
Lifeform: Both		
sunflower, Pecos (=puzzle, =paradox) (<i>Helianthus paradoxus</i>)	NM	Chaves <i>This species occurs on lands where it is protected; two sites where this species occurs in Chaves County are on the Bitter Lake Wildlife Refuge where it is protected by Federal management practices, another site in this county is on protected National Fish Hatchery grounds (USFWS, 1999(c)). Some sites near Roswell are on municipal property and not likely to be adversely impacted by agriculture. It is not clear if any of this land is leased for agricultural uses.</i>
Lifeform: Terrestrial		
	NV	Nye

Table A8-a (continued). Species co-occurrences for alfalfa hay for which species management practice protections are applicable

Species*	State	Affected Counties
	Synopsis of the Reason for Protection	
blazingstar, Ash Meadows (<i>Mentzelia leucophylla</i>)	NV	Nye <i>Ash Meadows blazingstar populations are entirely on the Ash Meadows National Wildlife Refuge (USFWS, 1985(c)). There is no cultivation or grazing of any kind, and has not been for a number of years now (Sharon McElvey, refuge manager for the Ash Meadows National Wildlife Refuge, pers. comm., July 21, 2005). Therefore, there is no alfalfa or concern for glyphosate on that use.</i>
buckwheat, Ione (incl. Irish Hill) (<i>Eriogonum apricum</i> (incl. var. <i>prostratum</i>))	CA	Amador <i>Species is protected by CA11 and CA17 (California DPR, 2003).</i>
bush-clover, prairie (<i>Lespedeza leptostachya</i>)	IA	Buena Vista, Butler, Clarke, Clay, Delaware, Dickinson, Emmet, Howard, Kossuth, Lucas, Obrien, Osceola, Story, Warren, Winneshiek <i>Iowa has a State Program to protect all endangered plant species from herbicides (Iowa State University Extension Service, 2003). 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>
bush-clover, prairie (<i>Lespedeza leptostachya</i>)	WI	Dane, Grant, Pierce, Rock, Sauk <i>Wisconsin's protection plan for threatened and endangered plant species is likely to protect this species (L. Turner, pers. com., 2005).</i>
Buttercup, autumn (<i>Ranunculus aestivalis</i> (= <i>acriformis</i>))	UT	Garfield <i>The Nature Conservancy now owns the property on which the last known population of this species occurs and protects it from both natural and man-caused impact. Species is functionally extinct and only occurs on private nature reserves in the wild although the Arboretum in Flagstaff, AZ has a few plants. Current habitat and population is less than 0.01 acre in area and total population of plant consists of only a couple of dozen plants. Entire population is located on a raised peat bog near the Sevier River (USFWS, 1989(a)). Crop agriculture is not noted as a risk factor. The main risk factor is grazing by small wild herbivorous mammals (probably voles) and domestic herbivores (cattle, sheep and the like); and other natural or man-caused alterations of the environment.</i>
Butterfly plant, Colorado (<i>Gaura neomexicana</i> var. <i>coloradensis</i>)	NE	Kimball <i>Conclusion: When followed the measures described in the State Program provide protection for this species such that exposure of the species is not likely to occur. Rationale: According to Mary Jennings in the Wyoming USFWS field office (pers. com.), common restrictions already in place for broadcast use of herbicides to protect riparian areas would be sufficient to protect this species. Presumably this applies to all occurrences within the Mountain States Region 6 of USFWS.</i>
Butterfly plant, Colorado (<i>Gaura neomexicana</i> var. <i>coloradensis</i>)	WY	Laramie <i>Conclusion: When followed the measures described in the USFWS Land Owners Agreement Program provide protection for this species such that exposure of the species is not likely to occur. Rationale: The USFWS (2005(e)) and Mary Jennings (with the Wyoming USFWS Office, pers. comm.) note that land owner agreements largely protect critical habitat for this species in Wyoming.</i>
	CO	Weld

Table A8-a (continued). Species co-occurrences for alfalfa hay for which species management practice protections are applicable

Species*	State	Affected Counties
	Synopsis of the Reason for Protection	
Butterfly plant, Colorado (<i>Gaura neomexicana</i> var. <i>coloradensis</i>)	CO	Weld <i>This species occurs primarily in the Meadow Springs Ranch. According to Fertig (2000) the Meadow Springs Ranch population is owned by the City of Fort Collins and managed for municipal sewage treatment. Therefore, state public management practices protect this species in this county.</i>
button, Mohr's Barbara (<i>Marshallia mohrii</i>)	AL	Etowah <i>Species is protected by county bulletin (USEPA, 2004(b)) under Federal Protection #29 "Do not apply this pesticide in the species habitat (described under the shading key). For ground applications do not apply within 20 yards of the habitat, nor within 100 yards for aerial applications."</i>
button, Mohr's Barbara (<i>Marshallia mohrii</i>)	AL	Cherokee <i>Species is protected by county bulletin (USEPA, 2004(k)) under Federal Protection #29 "Do not apply this pesticide in the species habitat (described under the shading key). For ground applications do not apply within 20 yards of the habitat, nor within 100 yards for aerial applications."</i>
cactus, Bakersfield (<i>Opuntia treleasei</i>)	CA	Kern <i>Species is protected by CA11 and CA17 (California DPR, 2003).</i>
centaury, spring-loving (<i>Centaurium namophilum</i>)	CA	Inyo <i>No crops uses in or in proximity to Ash Meadows Population. This would include the populations found in Inyo County CA (Turner, L, 1997).The Spring-loving centaury occurs on and around Ash Meadows National Wildlife Refuge (USFWS, 1985(c)). Agriculture is not practiced on National Wildlife Refuges. Spring-loving centaury can be removed from any future consideration for cultivated crop pesticides, there is no cultivation in the vicinity (Charles Sullivan, BLM, Barstow, CA, pers. comm. with Larry Turner).</i>
centaury, spring-loving (<i>Centaurium namophilum</i>)	NV	Nye <i>The Spring-loving centaury occurs on and around Ash Meadows National Wildlife Refuge (USFWS, 1985(c)). Agriculture is not practiced on National Wildlife Refuges. Spring-loving centaury can be removed from any future consideration for cultivated crop pesticides, although rangeland spraying is conceivable off the refuge and noxious weed control very likely on the refuge (Interpreted by Turner, 2005 from pers com. with Sharon McElvey, Refuge Manager for the Ash Meadows National Wildlife Refuge).</i>
clover, showy Indian (<i>Trifolium amoenum</i>)	CA	Marin, Sonoma <i>Species is protected by CA11 and CA17 (California DPR, 2003).</i>
crownscale, San Jacinto Valley (<i>Atriplex coronata</i> var. <i>notatior</i>)	CA	Riverside <i>Species is protected by CA11 and CA17 (California DPR, 2003).</i>
frankenian, Johnston's (<i>Frankenia johnstonii</i>)	TX	Starr, Zapata <i>Conservation agreements are being signed by private landowners to protect this plant (USFWS, 2003(b)). Additionally, this species has been proposed for delisting because of new information (NatureServe, 2005).</i>
gilia, Monterey (<i>Gilia tenuiflora</i> ssp. <i>arenaria</i>)	CA	Monterey <i>Species is protected by CA11 and CA17 (California DPR, 2003).</i>
	NV	Nye

Table A8-a (continued). Species co-occurrences for alfalfa hay for which species management practice protections are applicable

Species*	State	Affected Counties
	Synopsis of the Reason for Protection	
gumplant, Ash Meadows (<i>Grindelia fraxinoprartensis</i>)	NV	Nye <i>No crops in or in proximity to species habitat (Turner, L. 1997). Ash Meadows gumplant populations are entirely on the Ash Meadows National Wildlife Refuge (USFWS, 1985(c)). There is no cultivation and limited, if any, grazing on the refuge; has not been for a number of years now (Interpreted by Turner, 2005 from pers comm. with Sharon McElvey, Refuge Manager for the Ash Meadows National Wildlife Refuge). Species Management Practice - Federal (non EPA-OPP) management practices protect this species in the specified county.</i>
gumplant, Ash Meadows (<i>Grindelia fraxinoprartensis</i>)	CA	Inyo <i>No crops in or in proximity to species habitat (Turner, L. 1997). Only obvious risk to this species in Inyo California is due to road construction and mining. Ash Meadows gumplant populations are entirely on the Ash Meadows National Wildlife Refuge (USFWS, 1985(c)). There is no cultivation and limited, if any, grazing on the refuge (Interpreted by Turner, 2005 from pers. comm. with Charles Sullivan, BLM, Barstow, CA). Species Management Practice - Federal (non EPA-OPP) management practices protect this species in the specified county.</i>
ivesia, Ash Meadows (<i>Ivesia kingii</i> var. <i>eremica</i>)	NV	Nye <i>Ash Meadows ivesia populations are entirely on the Ash Meadows National Wildlife Refuge and that the salty, clay soils of Ash Meadows are not suitable for agriculture (USFWS, 1985(c)). There is no cultivation or grazing of any kind, and has not been for a number of years now (Interpreted by Turner, 2005 from pers com. with Sharon McElvey, Refuge Manager for the Ash Meadows National Wildlife Refuge). Species Management Practice - Federal (non EPA-OPP) management practices protect this species in the specified county.</i>
jewelflower, California (<i>Caulanthus californicus</i>)	CA	Fresno, Kern, Kings, San Luis Obispo, Santa Barbara, Tulare <i>Species is protected by CA11 and CA17 (California DPR, 2003).</i>
leather flower, Alabama (<i>Clematis socialis</i>)	AL	St Clair <i>Alabama leather flower populations in Saint Clair County are on an actively managed preserve or on public land where this species is protected (NatureServe, 2005). This species is also protected specifically in the Saint Claire County Endangered Species Protection Program (USEPA, 2006(b)) by Valid Federal Protection Number 29: Do not apply this pesticide in the species habitat (described under the Shading Key). In addition, for ground applications do not apply within 20 yard of the habitat, nor within 100 yards for aerial applications.</i>
leather flower, Alabama (<i>Clematis socialis</i>)	AL	Cherokee <i>Species is protected by county bulletin (USEPA, 2004(k)) under Federal Protection #29 "Do not apply this pesticide in the species habitat (described under the shading key). For ground applications do not apply within 20 yards of the habitat, nor within 100 yards for aerial applications."</i>
locoweed, Fassett's (<i>Oxytropis campestris</i> var. <i>chartacea</i>)	WI	Portage, Waushara <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>
mallow, Kern (<i>Eremalche kernensis</i>)	CA	Kern <i>Species is protected by CA11 and CA17 (California DPR, 2003).</i>

Table A8-a (continued). Species co-occurrences for alfalfa hay for which species management practice protections are applicable

Species*	State	Affected Counties
	Synopsis of the Reason for Protection	
mallow, Peter's Mountain (<i>Iliamna corei</i>)	VA	Giles <i>Peter's mountain mallow only occurs only on a Nature Conservancy Reserve in Giles County, VA (NatureServe, 2005); species would be actively protected at this location.</i>
manzanita, Ione (<i>Arctostaphylos myrtifolia</i>)	CA	Amador, Calaveras <i>Species is protected by CA11 and CA17 (California DPR, 2003).</i>
milk-vetch, Applegate's (<i>Astragalus applegatei</i>)	OR	Klamath <i>This species is only found at two current sites in Klamath County; all habitat is located on land leased by the Nature Conservancy to manage applegate's Milk-Vetch, or on land owned by the State of Oregon (USFWS, 1993(g)). Therefore it is unlikely to be exposed to adverse impact from glyphosate use.</i>
milk-vetch, Ash meadows (<i>Astragalus phoenix</i>)	NV	Nye <i>Ash Meadows milk-vetch populations are entirely on the Ash Meadows National Wildlife Refuge (USFWS, 1985(c)). There is no cultivation or grazing of any kind, and has not been for a number of years now (Sharon McElvey, refuge manager for the Ash Meadows National Wildlife Refuge, pers. comm., July 21, 2005). Therefore, there is no alfalfa or concern for glyphosate on that use. Turner, L (1997) notes that species is (fully) protected on Ash Meadows Wildlife Refuge.</i>
milk-vetch, coastal dunes (<i>Astragalus tener var. titi</i>)	CA	Monterey <i>Species is protected by CA11 and CA17 (USEPA, 2000, California DPR, 2003).</i>
milk-vetch, Deseret (<i>Astragalus desereticus</i>)	UT	Utah <i>Conclusion: When followed the measures described in the State and privately owned Wildlife Management Area Programs provide protection for this species such that exposure of the species is not likely to occur. Rationale: Deseret milk-vetch occurs on sandstone outcrops and steep slopes (NatureServe, 2005). State and privately owned wildlife management areas protect known populations, which are located where crop agriculture is not likely to be practiced and pesticide use is limited (State of Utah Natural Resources, undated(a)).</i>
milkweed, Mead's (<i>Asclepias meadii</i>)	IA	Adair, Clarke, Decatur, Ringgold, Warren <i>Iowa has a State Program to protect all endangered plant species from herbicides (Iowa State University Extension Service, 2003). 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>
paintbrush, golden (<i>Castilleja levisecta</i>)	WA	Island <i>This species is located on Whidbey Island on land owned by the Department of Defense (Turner, 1997). Agriculture is not practiced on DOD lands. It is unclear if private agricultural land holdings abutting military land on Whidbey Island will have any impact on this species.</i>
	UT	Cache

Table A8-a (continued). Species co-occurrences for alfalfa hay for which species management practice protections are applicable

Species*	State	Affected Counties
	Synopsis of the Reason for Protection	
primrose, Maguire (<i>Primula maguirei</i>)	UT	Cache <i>Conclusion: When followed the measures described in the USFWS and BLM Land Management Program provides protection for this species such that exposure of the species is not likely to occur. Rationale: Maguire primrose inhabits ledges and crevices on steep cliff walls, primarily on Forest Service and BLM lands; management practices on land owned or controlled by USFS and BLM minimize adverse impact on Maguire primrose (NatureServe, 2005; USFWS, 1985(d); Turner, 1997). Alfalfa is not grown near these areas. Turner, L. 1997 notes that species is protected on Forest Service land and does not mention agriculture as a threat to this species. Only documented threats are from collection, rock climbers and road construction in the bottom of Logan Canyon, which is only known location. Predominance of evidence indicates that this species is not adversely impacted by agriculture.</i>
skullcap, large-flowered (<i>Scutellaria montana</i>)	GA	Floyd <i>This species is protected specifically in the Floyd County, Georgia Endangered Species Protection Program (USEPA 2004(i)); Federal Protection #28 applies to this species: Do not apply within 100 yards of species habitat for aerial applications or within 20 yards of species habitat for ground applications.</i>
skullcap, large-flowered (<i>Scutellaria montana</i>)	GA	Walker <i>This species is protected specifically in the Walker County, Georgia Endangered Species Protection Program (USEPA 2004(j)); Federal Protection #28: Do not apply within 100 yards of species habitat for aerial applications or within 20 yards of species habitat for ground applications.</i>
spineflower, Monterey (<i>Chorizanthe pungens</i> var. <i>pungens</i>)	CA	Monterey <i>Species is protected by CA11 and CA17 (California DPR, 2003).</i>
spineflower, Robust (incl. Scotts Valley) (<i>Chorizanthe robusta</i> (incl. vars. <i>robusta</i> and <i>hartwegii</i>))	CA	Monterey <i>Species is protected by CA11 and CA17 (California DPR, 2003).</i>
spineflower, slender- horned (<i>Dodecahema</i> <i>leptoceras</i>)	CA	Los Angeles, Riverside, San Bernardino <i>Species is protected by CA11 and CA17 (California DPR, 2003).</i>
sunburst, San Joaquin adobe (<i>Pseudobahia</i> <i>peirsonii</i>)	CA	Fresno <i>Species is protected by CA11 and CA17 (California DPR, 2003).</i>
sunray, Ash Meadows (<i>Enceliopsis nudicaulis</i> var. <i>corrugata</i>)	NV	Nye <i>Ash Meadows sunray populations are entirely on the Ash Meadows National Wildlife Refuge (USFWS, 1985(c)). There is no cultivation or grazing of any kind, and has not been for a number of years now (Sharon McElvey, refuge manager for the Ash Meadows National Wildlife Refuge, pers. comm., July 21, 2005). Therefore, there is no alfalfa or concern for glyphosate on that use.</i>
thornmint, San Diego (<i>Acanthomintha ilicifolia</i>)	CA	San Diego <i>Species is protected by CA11 and CA17 (California DPR, 2003).</i>

Table A8-a (continued). Species co-occurrences for alfalfa hay for which species management practice protections are applicable

Species*	State	Affected Counties
	Synopsis of the Reason for Protection	
wooly-threads, San Joaquin (<i>Monolopia (=Lembertia) congdonii</i>)	CA	Fresno, Kern, Kings, San Benito, San Luis Obispo, Santa Barbara
	<i>Species is protected by CA11 and CA17 (California DPR, 2003).</i>	
Monocots		
Lifeform: Aquatic		
arrowhead, bunched (<i>Sagittaria fasciculata</i>)	NC	Henderson
	<i>The two North Carolina colonies in Henderson County, NC currently receive protection through cooperative management agreements between the landowners and The Nature Conservancy. Management and protection of the sites are implemented through a management team composed of the agreement signatories and representatives from the U.S. Fish and Wildlife Service, the North Carolina Natural Heritage Program, the North Carolina Plant Conservation Program, and a local botanical group (USFWS, 1991(f)).</i>	
grass, Colusa (<i>Neostapfia colusana</i>)	CA	Merced, Solano, Stanislaus, Yolo
	<i>Species is protected by CA11 and CA17 (California DPR, 2003).</i>	
lily, Pitkin Marsh (<i>Lilium pardalinum ssp. pitkinense</i>)	CA	Sonoma
	<i>Species is protected by CA11 and CA17 (California DPR, 2003).</i>	
Orcutt grass, California (<i>Orcuttia californica</i>)	CA	Riverside, San Diego, Ventura
	<i>Species is protected by CA11 and CA17 (California DPR, 2003).</i>	
Orcutt grass, hairy (<i>Orcuttia pilosa</i>)	CA	Glenn, Madera, Stanislaus, Tehama
	<i>Species is protected by CA11 and CA17 (California DPR, 2003).</i>	
Lifeform: Terrestrial		
lily, Western (<i>Lilium occidentale</i>)	CA	Humboldt
	<i>Species is protected by CA11 and CA17 (California DPR, 2003).</i>	
lo'ulu (<i>Pritchardia munroi</i>)	HI	Maui
	<i>Conclusion: Species is protected by private land. Rationale: Species grows on private land and it is protected by a fence. The last known plant of this species grew near the base of a small ravine in remnant dry to mesic forests at an elevation of 2,000 feet, located on private land (USFWS, 2003(h)). This species is found in the leeward East Moakai (Maui County) above Kamalo and near Kapuaokoolau. Historically, this species has been adversely impacted by domestic livestock and wild ungulates as well as pineapple culture. However, since the 1970s this has not been an issue. Agriculture no longer appears to be a threat and the single plant is protected by the owner of this private land.</i>	
orchid, eastern prairie fringed (<i>Platanthera leucophaea</i>)	IA	Decatur, Johnson
	<i>Iowa has a State Program to protect all endangered plant species from herbicides (Iowa State University Extension Service, 2003). 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>	

Table A8-a (continued). Species co-occurrences for alfalfa hay for which species management practice protections are applicable

Species*	State	Affected Counties
	Synopsis of the Reason for Protection	
orchid, eastern prairie fringed (<i>Platanthera leucophaea</i>)	WI	Dane, Jefferson, Kenosha, Ozaukee, Rock, Walworth, Waukesha, Winnebago
	<i>Wisconsin's protection plan for threatened and endangered plant species is likely to protect this species (L. Turner, pers. comm., 2005).</i>	
orchid, western prairie fringed (<i>Platanthera praeclara</i>)	MO	Atchison, Harrison
	<i>According to T. Smith, Botanist with the Endangered Species Section of the Missouri Department of Agriculture (pers. comm., May 4, 2004), State Land Management Practices in sensitive areas are in place to protect this species. The broadcast use of herbicides to protect riparian areas would be sufficient to protect this species.</i>	
orchid, western prairie fringed (<i>Platanthera praeclara</i>)	IA	Adair, Bremer, Buena Vista, Cherokee, Crawford, Dickinson, Emmet, Fayette, Guthrie, Howard, Kossuth, Mills, Polk, Pottawattami, Shelby, Story, Taylor
	<i>Iowa has a State Program to protect all endangered plant species from herbicides (Iowa State University Extension Service, 2003). 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>	
orchid, western prairie fringed (<i>Platanthera praeclara</i>)	ND	Ransom, Richland
	<i>This species is protected under North Dakota's approach to protecting threatened and endangered species from pesticides. Landowners with this species on their land or adjacent land have been talked to about mitigation measures to deal with this species (contact Jim Gray, Pesticide Registration/Endangered Species Coordinator with the North Dakota Department of Agriculture at 701-328-1505 for greater detail of North Dakota's threatened and endangered plant program). Most of the remaining population is on federally owned (USFWS, 2004(d)) and prairie land located in the Shawnee National Grassland (USFWS, 1989(c)). Private landowners, government agencies and conservation organizations often protect this species on lands that they control (USFWS, 2004(d)).</i>	

* Lifeform classification from FESTF IMS.

Table A-8b. Species co-occurrences for alfalfa seed production for which species management practice protections are applicable

Species*	State	Affected Counties
Synopsis of the Reason for Protection		
Dicots		
Lifeform: Aquatic		
navarretia, spreading (<i>Navarretia fossalis</i>)	CA	Los Angeles
<i>Species is protected by CA11 and CA17 (California DPR, 2003).</i>		
Lifeform: Both		
sunflower, Pecos (=puzzle, =paradox) (<i>Helianthus paradoxus</i>)	NM	Chaves
<i>This species occurs on lands where it is protected; two sites where this species occurs in Chaves County are on the Bitter Lake Wildlife Refuge where it is protected by Federal management practices, another site in this county is on protected National Fish Hatchery grounds (USFWS, 1999(c)). Some sites near Roswell are on municipal property and not likely to be adversely impacted by agriculture. It is not clear if any of this land is leased for agricultural uses.</i>		
Lifeform: Terrestrial		
bush-clover, prairie (<i>Lespedeza leptostachya</i>)	IA	Clay, Lucas, Obrien, Warren, Winneshiek
<i>Iowa has a State Program to protect all endangered plant species from herbicides (Iowa State University Extension Service, 2003). 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>		
cactus, Bakersfield (<i>Opuntia treleasei</i>)	CA	Kern
<i>Species is protected by CA11 and CA17 (California DPR, 2003).</i>		
clover, showy Indian (<i>Trifolium amoenum</i>)	CA	Sonoma
<i>Species is protected by CA11 and CA17 (California DPR, 2003).</i>		
jewelflower, California (<i>Caulanthus californicus</i>)	CA	Fresno, Kern, Kings, Tulare
<i>Species is protected by CA11 and CA17 (California DPR, 2003).</i>		
mallow, Kern (<i>Eremalche kernensis</i>)	CA	Kern
<i>Species is protected by CA11 and CA17 (California DPR, 2003).</i>		
milk-vetch, Deseret (<i>Astragalus desereticus</i>)	UT	Utah
<i>Conclusion: When followed the measures described in the State and privately owned Wildlife Management Area Programs provide protection for this species such that exposure of the species is not likely to occur. Rationale: Deseret milk-vetch occurs on sandstone outcrops and steep slopes (NatureServe, 2005). State and privately owned wildlife management areas protect known populations, which are located where crop agriculture is not likely to be practiced and pesticide use is limited (State of Utah Natural Resources, undated(a)).</i>		
	IA	Decatur, Warren

Table A-8b (continued). Species co-occurrences for Alfalfa Seed for which species management practice protections are applicable

Species*	State	Affected Counties
Synopsis of the Reason for Protection		
milkweed, Mead's (<i>Asclepias meadii</i>)	IA	Decatur, Warren <i>Iowa has a State Program to protect all endangered plant species from herbicides (Iowa State University Extension Service, 2003). 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>
primrose, Maguire (<i>Primula maguirei</i>)	UT	Cache <i>Conclusion: When followed the measures described in the USFWS and BLM Land Management Program provides protection for this species such that exposure of the species is not likely to occur. Rationale: Maguire primrose inhabits ledges and crevices on steep cliff walls, primarily on Forest Service and BLM lands; management practices on land owned or controlled by USFS and BLM minimize adverse impact on Maguire primrose (NatureServe, 2005; USFWS, 1985(d); Turner, 1997). Alfalfa is not grown near these areas. Turner, L. 1997 notes that species is protected on Forest Service land and does not mention agriculture as a threat to this species. Only documented threats are from collection, rock climbers and road construction in the bottom of Logan Canyon, which is only known location. Predominance of evidence indicates that this species is not adversely impacted by agriculture.</i>
spineflower, slender-horned (<i>Dodecahema leptoceras</i>)	CA	Los Angeles, San Bernardino <i>Species is protected by CA11 and CA17 (California DPR, 2003).</i>
sunburst, San Joaquin adobe (<i>Pseudobahia peirsonii</i>)	CA	Fresno <i>Species is protected by CA11 and CA17 (California DPR, 2003).</i>
wooly-threads, San Joaquin (<i>Monolopia (=Lembertia) congdonii</i>)	CA	Fresno, Kern, Kings <i>Species is protected by CA11 and CA17 (California DPR, 2003).</i>
Monocots		
Lifeform: Aquatic		
grass, Colusa (<i>Neostapfia colusana</i>)	CA	Merced, Stanislaus, Yolo <i>Species is protected by CA11 and CA17 (California DPR, 2003).</i>
lily, Pitkin Marsh (<i>Lilium pardalinum ssp. pitkinense</i>)	CA	Sonoma <i>Species is protected by CA11 and CA17 (California DPR, 2003).</i>
Orcutt grass, hairy (<i>Orcuttia pilosa</i>)	CA	Madera, Stanislaus <i>Species is protected by CA11 and CA17 (California DPR, 2003).</i>
Lifeform: Terrestrial		
	IA	Decatur, Johnson

Table A-8b (continued). Species co-occurrences for Alfalfa Seed for which species management practice protections are applicable

Species*	State	Affected Counties
Synopsis of the Reason for Protection		
orchid, eastern prairie fringed (<i>Platanthera leucophaea</i>)	IA	Decatur, Johnson
<i>Iowa has a State Program to protect all endangered plant species from herbicides (Iowa State University Extension Service, 2003). 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>		
orchid, western prairie fringed (<i>Platanthera praeclara</i>)	MO	Harrison
<i>According to T. Smith, Botanist with the Endangered Species Section of the Missouri Department of Agriculture (pers. comm., May 4, 2004), State Land Management Practices in sensitive areas are in place to protect this species. The broadcast use of herbicides to protect riparian areas would be sufficient to protect this species.</i>		
orchid, western prairie fringed (<i>Platanthera praeclara</i>)	IA	Bremer, Shelby
<i>Iowa has a State Program to protect all endangered plant species from herbicides (Iowa State University Extension Service, 2003). 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>		

* Lifeform classification from FESTF IMS.

Appendix 9. Application Guidance from Roundup WeatherMAX® Labels

Application Guidance from the Roundup WeatherMax® Master Label (2006)

8.0 APPLICATION EQUIPMENT AND TECHNIQUES

Do not apply this product through any type of irrigation system.

This product may be applied with the following application equipment:

Aerial—Fixed-wing and helicopter

Ground Broadcast Spray—Boom or boomless systems, pull-type sprayers, floaters, pick-up sprayers, spray coupes and other ground broadcast equipment

Hand-Held or Backpack Equipment—Backpack sprayers, pump-up pressure sprayers, handguns, handwands, mistblowers*, lances and other hand-held and motorized spray equipment used to direct the spray onto weed foliage

*This product is not registered in California or Arizona for use in mistblowers.

Selective Equipment— Shielded and hooded sprayers, wiper applicators and sponge bars

Injection Systems—Aerial or ground injection sprayers

Controlled Droplet Applicator (CDA)—Hand-held or boom-mounted applicators that produce a spray consisting of a narrow range of droplet sizes

APPLY THESE SPRAY SOLUTIONS IN PROPERLY MAINTAINED AND CALIBRATED EQUIPMENT CAPABLE OF DELIVERING THE DESIRED VOLUMES.

8.1 Aerial Equipment

All labeled treatments may be made by aerial equipment where appropriate, provided that the applicator complies with the precautions and restrictions specified on this label and in separate supplemental labeling published by Monsanto for this product.

DO NOT APPLY THIS PRODUCT USING AERIAL SPRAY EQUIPMENT EXCEPT UNDER CONDITIONS SPECIFIED IN THIS LABEL.

Use the recommended rates of this herbicide in 3 to 15 gallons of water per acre unless otherwise specified on this label, or in separate supplemental labeling or fact sheets published by Monsanto for this product. Unless otherwise specified, do not exceed 44 fluid ounces per acre using aerial spray equipment. Refer to the individual use area sections of this label for recommended volumes, application rates, and additional use instructions.

FOR AERIAL APPLICATION IN ARKANSAS AND CALIFORNIA, OR SPECIFIC COUNTIES THEREIN, REFER TO THE FEDERAL SUPPLEMENTAL LABEL FOR AERIAL APPLICATIONS IN THAT STATE OR COUNTY FOR SPECIFIC INSTRUCTIONS, RESTRICTIONS AND REQUIREMENTS.

This product, when tank-mixed with dicamba, may not be applied by air in California.

When tank-mixing this product with 2,4-D, only 2,4-D amine formulations may be used for aerial application in California. Tank mixtures with 2,4-D amine

Application Guidance from Roundup WeatherMAX® Master Label (2006) (continued)

formulations may be applied by air in California for fallow and reduced tillage systems, and for alfalfa and pasture renovation applications only.

Ensure uniform application. To avoid streaked, uneven or overlapped application, use appropriate marking devices.

AERIAL SPRAY DRIFT MANAGEMENT

The following drift management requirements must be followed to avoid off-target drift movement from aerial applications to agricultural field crops.

1. The distance of the outermost nozzles on the boom must not exceed 3/4 the length of the wingspan or rotor.
2. Nozzles must always point backward, parallel with the air stream and never be pointed downwards more than 45 degrees. Where states have more stringent regulations, they should be observed.

Importance of Droplet Size

The most effective way to reduce drift potential is to apply large droplets. The best drift management strategy is to apply the largest droplets that provide sufficient coverage and control. Applying larger droplets reduces drift potential, but will not prevent drift if applications are made improperly, or under unfavorable environmental conditions (see the “**Wind**”, “**Temperature and Humidity**” and “**Temperature Inversions**” sections of this label).

Controlling Droplet Size

- **Volume:** Use high flow rate nozzles to apply the highest practical spray volume. Nozzles with the higher rated flows produce larger droplets.
- **Pressure:** Use the lower spray pressures recommended for the nozzle. Higher pressure reduces droplet size and does not improve canopy penetration. When higher flow rates are needed, use higher flow rate nozzles instead of increasing pressure.
- **Number of nozzles:** Use the minimum number of nozzles that provide uniform coverage.
- **Nozzle orientation:** Orienting nozzles so that the spray is released backwards, parallel to the air stream, will produce larger droplets than other orientations. Significant deflection from the horizontal will reduce droplet size and increase drift potential.
- **Nozzle type:** Use a nozzle type that is designed for the intended application. With most nozzle types, narrower spray angles produce larger droplets. Consider using low-drift nozzles. Solid stream nozzles oriented straight back produce larger droplets than other nozzle types.
- **Boom length:** For some use patterns, reducing the effective boom length to less than 3/4 of the wingspan or rotor length may further reduce drift without reducing swath width.
- **Application height:** Applications should not be made at a height greater than 10 feet above the top of the largest plants unless a greater height is

Application Guidance from Roundup WeatherMAX® Master Label (2006) (continued)

required for aircraft safety. Making applications at the lowest height that is safe reduces the exposure of the droplets to evaporation and wind.

Swath Adjustment

When applications are made with a crosswind, the swath will be displaced downwind. Therefore, on the up and downwind edges of the field, the applicator must compensate for this displacement by adjusting the path of the aircraft upwind. Swath adjustment distance should increase, with increasing drift potential (higher wind, smaller droplets, etc.).

Wind

Drift potential is lowest between wind speeds of 2 to 10 miles per hour. However, many factors, including droplet size and equipment type determine drift potential at any given speed. Application should be avoided below 2 miles per hour due to variable wind direction and high inversion potential. **NOTE:** Local terrain can influence wind patterns. Every applicator should be familiar with local wind patterns and how they affect drift.

Temperature and Humidity

When making applications in low relative humidity, set up equipment to produce larger droplets to compensate for evaporation. Droplet evaporation is most severe when conditions are both hot and dry.

Temperature Inversions

Applications should not occur during a temperature inversion because drift potential is high. Temperature inversions restrict vertical air mixing, which causes small, suspended droplets to remain in a concentrated cloud. This cloud can move in unpredictable directions due to the light variable winds common during inversions. Temperature inversions are characterized by increasing temperatures with altitude and are common on nights with limited cloud cover and light to no wind. They begin to form as the sun sets and often continue into the morning. Their presence can be indicated by ground fog; however, if fog is not present, inversions can also be identified by the movement of smoke from a ground source or an aircraft smoke generator. Smoke that layers and moves laterally in a concentrated cloud (under low wind conditions) indicates an inversion, while smoke that moves upward and rapidly dissipates indicates good vertical air mixing.

Sensitive Areas

The product should only be applied when the potential for drift to adjacent sensitive areas (e.g., residential areas, bodies of water, known habitat for threatened or endangered species, non-target crops) is minimal (e.g., when wind is blowing away from the sensitive areas).

Avoid direct application to any body of water.

Aircraft Maintenance

Thoroughly wash aircraft, especially landing gear, after each day of spraying to remove residues of this product accumulated during spraying or from spills. PROLONGED EXPOSURE OF THIS PRODUCT TO UNCOATED STEEL SURFACES MAY RESULT IN CORROSION AND POSSIBLE FAILURE OF THE PART. LANDING GEAR IS MOST SUSCEPTIBLE. The maintenance of an

Application Guidance from Roundup WeatherMAX® Master Label (2006) (continued)

organic coating (paint), which meets aerospace specification MIL-C-38413 may prevent corrosion.

8.2 Ground Broadcast Equipment

Apply the recommended rates of this product in 3 to 40 gallons of water per acre as a broadcast spray, unless otherwise specified on this label, or in separate supplemental labeling or fact sheets published by Monsanto for this product. As density of weeds increases, spray volume should be increased within the recommended range to ensure complete coverage. Carefully select proper nozzles to avoid generating a fine mist. For best results with ground application equipment, use flat spray nozzles. Check spray pattern for uniform distribution.

8.3 Hand-Held or Backpack Equipment

Apply to foliage of vegetation to be controlled. Spray coverage should be uniform and complete. Use coarse sprays only. For applications made on a spray-to-wet basis, do not spray to the point of runoff. For recommended rates and timing, refer to the "ANNUAL WEEDS—HAND-HELD OR BACKPACK EQUIPMENT" section of this product label.

8.4 Selective Equipment

This product may be diluted in water and applied through shielded sprayers, hooded sprayers, wiper applicators or sponge bars to weeds listed on this label growing in any non-crop site specified on this label.

In cropping systems, shielded sprayers, hooded sprayers, and wipers may be used in row middles (in between rows of crop plants). Wipers may be used over the top of crops only when specifically recommended in this label. Such equipment must be capable of preventing all crop contact with the herbicide solutions and operated without leakage of spray mists or dripping onto crop.

AVOID CONTACT OF HERBICIDE WITH DESIRABLE VEGETATION.

Contact of this product with desirable vegetation may result in unwanted plant damage or destruction.

Shielded and Hooded Sprayers

This product, when applied at recommended rates under the conditions described in the following paragraphs for shielded and hooded sprayers, will control those weeds listed in the "ANNUAL WEEDS RATE SECTION" and "PERENNIAL WEEDS RATE SECTION" of this label. A hooded sprayer is a type of shielded sprayer where the spray pattern is fully enclosed, including the top, sides, front and back, thereby shielding the crop from the spray solution. Adjust the shields on these sprayers to protect desirable vegetation. When applying to crops grown on raised beds, ensure that the hood is capable of completely enclosing the spray pattern. If necessary, extend the front and rear flaps of the hooded applicator downward to reach the ground in deep furrows. EXTREME CARE MUST BE TAKEN TO AVOID CONTACT OF THIS HERBICIDE WITH DESIRABLE VEGETATION.

This equipment must be configured and operated in a manner that minimizes bouncing and avoids raising the hood up off the ground surface at any time. If the hood is raised, spray particles may escape and come into contact with the crop,

Application Guidance from Roundup WeatherMAX® Master Label (2006) (continued)

causing damage to or destruction of the crop. Avoid operating this equipment on rough or sloping terrain where the spray hood might be raised up off the ground surface.

Use hoods designed to minimize excessive dripping or run-off down the insides of the hoods. A single, low pressure, low-drift, flat-fan nozzle with an 80 to 95 degree spray angle positioned at the top center of the hood is recommended. Spray volume should be 20 to 30 gallons per acre.

These procedures will reduce the potential for crop injury:

- Spray hoods must be operated on the ground or skimming across the ground surface.
- Leave at least an 8-inch untreated strip over the drill row. (For example, if the crop row width is 38 inches, the maximum width of the spray hood should be 30 inches.)
- Operate at ground speeds of no greater than 5 miles per hour to avoid bouncing of the spray hoods.
- Apply when wind speeds are 10 miles per hour or less.
- Use low-drift nozzles that provide uniform coverage within the treated area.

Crop injury may occur when foliage of treated weeds comes into direct contact with leaves of the crop. Do not apply this product when crop leaves are growing in direct contact with weeds to be treated. Droplets, mist, foam or splatter of the herbicide solution settling onto desirable vegetation may result in discoloration, stunting or destruction.

Wiper Applicators

Wiper applicators are devices that physically wipe appropriate amounts of this product directly onto the weed. Equipment must be designed, maintained and operated to prevent the herbicide solution from contacting desirable vegetation.

Application equipment used over the top of desirable vegetation should be adjusted so that the wiper contact point is at least 2 inches above the desirable vegetation. Better results may be obtained when more of the weed is exposed to the herbicide solution. Weeds should be a minimum of 6 inches above the desirable vegetation. Adjust height of applicator to ensure adequate contact with weeds. Weeds not contacted by the herbicide solution will not be affected. Poor contact may occur when weeds are growing in dense clumps, in severe weed infestations or when weed height varies dramatically. In these instances, repeat treatments may be necessary.

Operate this equipment at ground speeds no greater than 5 miles per hour. Performance may be improved by reducing speed in areas of heavy weed infestations to provide adequate wiper saturation with the herbicide solution. Better results may be obtained when two applications are made in opposite directions.

Droplets, mist, foam or splatter of the herbicide solution settling onto desirable vegetation may result in discoloration, stunting or destruction. Avoid leakage or dripping onto desirable vegetation. Keep wiping surfaces clean. Be aware that on sloping ground the herbicide solution may migrate, causing dripping on the lower end and drying of the wicks on the upper end of the wiper applicator.

Application Guidance from Roundup WeatherMAX® Master Label (2006) (continued)

Do not use wiper applicators when weeds are wet.

Mix only the amount of this product to be used during a 1-day period, as reduced product performance may result from the use of solutions held in storage. Clean wiper parts immediately after using this product by thoroughly flushing with water.

Do not add surfactant to the herbicide solution.

For Rope or Sponge Wick Applicators—Use solutions ranging from 33 to 75 percent of this product in water.

For Panel Applicators—Use solutions ranging from 33 to 100 percent of this product in water.

8.5 Injection Systems

This product may be used in aerial or ground injection spray systems. It may be used as a liquid concentrate or diluted prior to injecting into the spray stream. Do not mix this product with the concentrate of other products for use in injection systems.

8.6 CDA Equipment

The rate of this product applied per acre by vehicle-mounted controlled droplet applicator (CDA) equipment must not be less than the amount recommended in this label when applied by conventional broadcast equipment. For vehicle-mounted CDA equipment, apply in 2 to 15 gallons of water per acre.

For control of annual weeds with hand-held CDA units, apply a 20-percent solution of this product at a flow rate of 2 fluid ounces per minute and a walking speed of 1.5 miles per hour (1 quart per acre). For the control of perennial weeds, apply a 20- to 30-percent solution of this product at a flow rate of 2 fluid ounces per minute and a walking speed of 0.75 mile per hour (2 to 3 quarts per acre).

Controlled droplet applicators produce a spray pattern that is not easily visible. Extreme care must be taken to avoid spray or drift from contacting the foliage or any other green tissue of desirable vegetation, as damage or destruction of the plant may result.

**Application Guidance from Roundup WeatherMAX® Federal Supplemental Label:
For Weed Control Applications In Seed Production Of Roundup Ready® Alfalfa**

Application Instructions

This product will control many troublesome emerged weeds with over-the-top applications in Roundup Ready alfalfa grown for seed. In-crop applications may be made from emergence through the late vegetative stage, and spot treatments may be made from early bud stage through seed harvest.

For ground applications with broadcast equipment, apply this product in 3 to 40 gallons of spray solution per acre. Carefully select proper nozzle and spray pressure to avoid spraying a fine mist. For best results with ground application equipment, use flat fan nozzles. Check for even distribution of spray droplets.

For aerial application: Use the recommended rates of this product in 3 to 15 gallons of spray solution per acre.

DO NOT EXCEED 44 FLUID OUNCES OF THIS PRODUCT PER ACRE WHEN MAKING APPLICATIONS BY AIR. FOR AERIAL APPLICATION IN CALIFORNIA, REFER TO THE FEDERAL SUPPLEMENTAL LABEL FOR AERIAL APPLICATION IN THAT STATE. AVOID DRIFT. EXTREME CARE MUST BE USED WHEN APPLYING THIS PRODUCT TO PREVENT INJURY TO DESIRABLE PLANTS AND CROPS WHICH DO NOT CONTAIN A GLYPHOSATE TOLERANT GENE. Do not apply during low-level inversion conditions, when winds are gusty or under any other conditions that favor drift. Drift may cause damage to any vegetation contacted to which treatment is not intended. To prevent injury to adjacent desirable vegetation, appropriate buffer zones must be maintained.

See the "APPLICATION EQUIPMENT AND TECHNIQUES" section of the label booklet for procedures to avoid spray drift that may cause injury to any vegetation not intended for treatment.

**Application Guidance from Roundup WeatherMAX® Federal Supplemental
Label: For Aerial Application in Arkansas Only**

DIRECTIONS FOR USE

AVOID DRIFT. DO NOT APPLY INTO STILL AIR WHERE THERE IS A TEMPERATURE INVERSION LAYER LOW ENOUGH FOR FINE SPRAY PARTICLES TO BECOME SUSPENDED AND MOVE OUTSIDE THE TARGET AREA WHEN THE INVERSION LAYER MOVES. DO NOT APPLY WHEN WINDS ARE GUSTY OR UNDER ANY OTHER CONDITION THAT FAVORS DRIFT. DRIFT IS LIKELY TO CAUSE DAMAGE TO ANY VEGETATION CONTACTED. TO PREVENT INJURY TO ADJACENT DESIRABLE VEGETATION, APPROPRIATE BUFFER ZONES MUST BE MAINTAINED.

Use the recommended rate of this product in 3 to 15 gallons of water per acre.

Use sufficient carrier volume and appropriate equipment set-up to form droplets large enough to avoid drift potential. Coarse droplets in the 300 to 500 (VMD) micron range are recommended.

Applications should typically be made with the nozzle release point at 8 to 15 feet above the top of the target plants unless a greater height is required for aircraft safety.

The distance of the outermost nozzles on the boom must not exceed 75 percent of the length of the wingspan or rotor. In many cases, reducing this distance to 65 percent of the length of the wingspan or rotor will improve drift control without affecting the swath width.

Nozzles must always discharge backward parallel with the air stream and never discharge downwards more than 45 degrees on fixed wing aircraft or forward of the prevailing airflow on rotary winged aircraft. Avoid the use of nozzles with wide-angle discharge.

Do not apply this product when winds are in excess of 10 miles per hour.

Do not apply when there is a low-level inversion where fine spray particles could be suspended in still air and move outside the target area when the inversion layer moves. These conditions may occur when wind speeds are less than 2 miles per hour.

Use the following guidelines when applications are made near crops or other desirable vegetation:

1. Do not apply within 100 feet of any desirable vegetation or crops.
2. If wind up to 5 miles per hour is blowing toward desirable vegetation or crops, do not apply within 500 feet upwind of the desirable vegetation or crops.
3. Winds blowing from 5 to 10 miles per hour toward desirable vegetation or crops will likely require buffer zones in excess of 500 feet.

**Application Guidance from Roundup WeatherMAX® Federal Supplemental Label:
Limitations On Aerial Application In California Only, Including Fresno County, California**

DIRECTIONS FOR USE

All labeled treatments may be made by aerial equipment where appropriate, provided that the applicator complies with the precautions and restrictions specified on this supplemental labeling and in the product label booklet. Refer to Aerial Equipment in the "APPLICATION EQUIPMENT AND TECHNIQUES" section of the product label for additional information. Refer to the individual use site section of the product label, or to other supplemental labeling or technical fact sheets published separately for this product by Monsanto, for specific use instructions.

AVOID DRIFT—DO NOT APPLY WHEN WINDS ARE GUSTY OR UNDER ANY OTHER CONDITION WHICH FAVORS DRIFT. DRIFT MAY CAUSE DAMAGE TO ANY VEGETATION CONTACTED TO WHICH TREATMENT IS NOT INTENDED. TO PREVENT INJURY TO ADJACENT DESIRABLE VEGETATION, APPROPRIATE BUFFER ZONES MUST BE MAINTAINED.

Use the following guidelines when aerial applications are made near crops or desirable perennial vegetation after bud break and before total leaf drop, and/or near other desirable vegetation or annual crops.

1. Do not apply within 100 feet of all desirable vegetation or crop(s).
2. If wind up to 5 miles per hour is blowing toward desirable vegetation or crop(s), do not apply within 500 feet of the desirable vegetation or crop(s).
3. Winds blowing from 5 to 10 miles per hour toward desirable vegetation or crop(s) may require buffer zones in excess of 500 feet.
4. Do not apply when winds are in excess of 10 miles per hour or when inversion conditions exist.

When applied as recommended under the conditions described, this product controls annual and perennial weeds listed in the label booklet.

When tank-mixing this product with 2,4-D, only 2,4-D amine formulations may be used for aerial application in California. Tank mixtures with 2,4-D amine formulations may be applied by air in California for fallow and reduced tillage systems, and for alfalfa and pasture renovation applications only.

This product, when tank-mixed with dicamba, may not be applied by air in California.

ADDITIONAL INFORMATION FOR FRESNO COUNTY, CALIFORNIA

The following information applies only from February 15 through March 31 within the following boundaries of Fresno County, California:

- North: Fresno County line
- South: Fresno County line
- East: State Highway 99
- West: Fresno County line

Application Guidance from Roundup WeatherMAX® Supplemental Label for California
(continued)

Always read and follow the label directions and precautionary statements for all products used in the aerial application.

Observe the following directions to minimize off-site movement during aerial application of this product. Minimization of off-site movement is the responsibility of the grower, Pest Control Advisor and aerial applicator.

Written Recommendations

A written recommendation **MUST** be submitted by or on behalf of the applicator to the Fresno County Agricultural Commissioner 24 hours prior to the application. This written recommendation **MUST** state the proximity of surrounding crops, and that conditions of each manufacturer's product label and this label have been satisfied.

Aerial Applicator Training and Equipment

Aerial application of this product is limited to pilots who have successfully completed a Fresno County Agricultural Commissioner and California Department of Pesticide Regulation approved training program for aerial application of herbicides. All aircraft must be inspected, critiqued in flight and certified at a Fresno County Agricultural Commissioner approved fly-in. Test and calibrate spray equipment at intervals sufficient to insure that proper rates of herbicides and adjuvants are being applied during commercial use. Applicator must document such calibrations and testing. Demonstration of performance at Fresno County Agricultural Commissioner approved fly-ins constitutes such documentation, or other written records showing calculations and measurements of flight and spray parameters acceptable to the Fresno County Agricultural Commissioner.

Applications at Night—Do not apply this product by air earlier than 30 minutes prior to sunrise and/or later than 30 minutes after sunset without prior permission from the Fresno County Agricultural Commissioner.

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

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

Species*	State	Affected Counties
<i>Dicots</i>		
Lifeform: Aquatic		
amphianthus, little (<i>Amphianthus pusillus</i>)	AL GA SC	Randolph Columbia, Greene, Oglethorpe Lancaster, Saluda, York
aster, decurrent false (<i>Boltonia decurrens</i>)	IL MO	Bureau, Cass, Fulton, Jersey, La Salle, Madison, Marshall, Mason, Morgan, Peoria, Pike, Putnam, Schuyler, Scott, St Clair, Tazewell, Woodford Dunklin, Howell, Mississippi, Pike, St Charles
bellflower, Brooksville (<i>Campanula robinsiae</i>)	FL	Hernando
bird's beak, palmate-bracted (<i>Cordylanthus palmatus</i>)	CA	Alameda, Colusa, Fresno, Madera, Yolo
butterwort, Godfrey's (<i>Pinguicula ionantha</i>)	FL	Bay
dropwort, Canby's (<i>Oxypolis canbyi</i>)	NC SC	Scotland Dorchester, Hampton, Horry, Marlboro, Orangeburg, Richland, Williamsburg
Harperella (<i>Ptilimnium nodosum</i>)	AL AR GA MD NC SC WV	Cherokee, De Kalb Yell Greene Allegany, Washington Chatham, Granville Saluda Morgan
howellia, water (<i>Howellia aquatilis</i>)	ID MT WA	Latah Lake, Missoula Clark
pitcher-plant, green (<i>Sarracenia oreophila</i>)	GA NC	Gilmer Clay
spurge, Hoover's (<i>Chamaesyce hooveri</i>)	CA	Butte, Glenn, Stanislaus, Tehama, Tulare
water-willow, Cooley's (<i>Justicia cooleyi</i>)	FL	Hernando
Lifeform: Both		
lomatium, Cook's (<i>Lomatium cookii</i>)	OR	Josephine

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

Species*	State	Affected Counties
popcornflower, rough (<i>Plagiobothrys hirtus</i>)	OR	Douglas
sneezeweed, Virginia (<i>Helenium virginicum</i>)	MO VA	Howell Augusta, Rockingham
sunflower, Pecos (=puzzle, =paradox) (<i>Helianthus paradoxus</i>)	NM TX	Cibola, Guadalupe, Valencia Pecos, Reeves
thelypody, Howell's spectacular (<i>Thelypodium howellii spectabilis</i>)	OR	Baker, Union
Lifeform: Terrestrial		
'akoko (<i>Euphorbia haelealeana</i>)	HI	Kauai
'awikiwiki (<i>Canavalia molokaiensis</i>)	HI	Maui
'oha wai (<i>Clermontia oblongifolia ssp. mauiensis</i>)	HI	Maui
A'e (<i>Zanthoxylum hawaiiense</i>)	HI	Kauai, Maui
Alani (<i>Melicope mucronulata</i>)	HI	Maui
Alani (<i>Melicope munroi</i>)	HI	Maui
Alani (<i>Melicope pallida</i>)	HI	Kauai
ambrosia, south Texas (<i>Ambrosia cheiranthifolia</i>)	TX	Kleberg, Nueces
aster, Florida golden (<i>Chrysopsis floridana</i>)	FL	Hillsborough
awiwi (<i>Centaurium sebaeoides</i>)	HI	Kauai, Maui
bladderpod, lyrate (<i>Lesquerella lyrata</i>)	AL	Colbert, Franklin, Lawrence
bladderpod, Spring Creek (<i>Lesquerella perforata</i>)	TN	Wilson
bladderpod, Zapata (<i>Lesquerella thamnophila</i>)	TX	Starr, Zapata
blazingstar, scrub (<i>Liatris ohlingerae</i>)	FL	Highlands
buckwheat, scrub (<i>Eriogonum longifolium var. gnaphalifolium</i>)	FL	Highlands, Marion
bush-clover, prairie (<i>Lespedeza leptostachya</i>)	IL MN	Cook, Du Page, Lee, Ogle, Winnebago Brown, Cottonwood, Goodhue, Jackson, Redwood, Renville, Rice
button, Mohr's Barbara (<i>Marshallia mohrii</i>)	AL GA	Calhoun Floyd
cactus, San Rafael (<i>Pediocactus despainii</i>)	UT	Emery
cactus, star (<i>Astrophytum asterias</i>)	TX	Starr

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

Species*	State	Affected Counties
Catchfly, Spalding's (<i>Silene spaldingii</i>)	ID	Idaho, Lewis, Nez Perce
	MT	Flathead, Lake, Lincoln
	OR	Wallowa
	WA	Asotin, Lincoln, Spokane, Whitman
chaffseed, American (<i>Schwalbea americana</i>)	NC	Hoke, Moore
	NJ	Burlington
	SC	Charleston, Florence, Horry, Jasper, Lee, Sumter, Williamsburg
checker-mallow, Nelson's (<i>Sidalcea nelsoniana</i>)	OR	Benton, Clackamas, Linn, Marion, Polk, Tillamook, Washington, Yamhill
	WA	Cowlitz
checkermallow, Wenatchee Mountains (<i>Sidalcea oregana</i> var. <i>calva</i>)	WA	Chelan
clover, running buffalo (<i>Trifolium stoloniferum</i>)	IN	Ohio
	KY	Boone, Bourbon, Jefferson, Nelson, Woodford
	MO	Barry, Benton, Boone, Callaway, Carter, Cedar, Cole, Crawford, Dade, Dent, Dunklin, Howard, Madison, Maries, Ozark, Phelps, St Louis, Taney, Texas, Vernon, Wayne
	OH	Brown, Clermont, Hamilton, Warren
	WV	Fayette, Randolph, Tucker, Webster
daisy, Willamette (<i>Erigeron decumbens</i> var. <i>decumbens</i>)	OR	Benton, Lane, Linn, Marion, Polk
dawn-flower, Texas prairie (<i>Hymenoxys texana</i>)	TX	Fort Bend, Harris
desert-parsley, Bradshaw's (<i>Lomatium bradshawii</i>)	OR	Benton, Lane, Linn, Marion
dogweed, ashy (<i>Thymophylla tephroleuca</i>)	TX	Webb, Zapata
gardenia (=Na'u), Hawaiian (<i>Gardenia brighamii</i>)	HI	Maui
goldenrod, Short's (<i>Solidago shortii</i>)	KY	Fleming, Nicholas, Robertson
gourd, Okeechobee (<i>Cucurbita okeechobeensis</i> ssp. <i>okeechobeensis</i>)	FL	Palm Beach
haha (<i>Cyanea macrostegia</i> ssp. <i>gibsonii</i>)	HI	Maui
Haha (<i>Cyanea mannii</i>)	HI	Maui
Haha (<i>Cyanea remyi</i>)	HI	Kauai
iliau, dwarf (<i>Wilkesia hobyi</i>)	HI	Kauai

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

Species*	State	Affected Counties
Kio'ele (<i>Hedyotis coriacea</i>)	HI	Maui
ko'oko'olau (<i>Bidens micrantha</i> ssp. <i>kalealaha</i>)	HI	Maui
Ko'oko'olau (<i>Bidens wiebkei</i>)	HI	Maui
Ko'oloa'ula (<i>Abutilon menziesii</i>)	HI	Maui
koki'o ke'oke'o (<i>Hibiscus waimeae</i> ssp. <i>hannerae</i>)	HI	Kauai
kuahiwi laukahi (<i>Plantago princeps</i>)	HI	Kauai, Maui
Kulu'i (<i>Nototrichium humile</i>)	HI	Maui
Lupine, Kincaid's (<i>Lupinus sulphureus</i> (=oreganus) ssp. <i>kincaidii</i> (=var. <i>kincaidii</i>))	OR WA	Benton, Douglas, Lane, Linn, Polk, Yamhill Lewis
ma'o hau hele, (=native yellow hibiscus) (<i>Hibiscus brackenridgei</i>)	HI	Maui
manioc, Walker's (<i>Manihot walkerae</i>)	TX	Hidalgo, Starr
milk-vetch, Holmgren (<i>Astragalus holmgreniorum</i>)	AZ UT	Mohave Washington
milkweed, Mead's (<i>Asclepias meadii</i>)	IL KS MO	Ford, Saline Allen, Anderson, Bourbon, Coffey, Crawford, Douglas, Franklin, Jefferson, Johnson, Leavenworth, Linn, Miami, Neosho Barton, Benton, Cass, Cedar, Dade, Harrison, Iron, Pettis, Polk, Reynolds, St Clair, Vernon
mint, longspurred (<i>Dicerandra cornutissima</i>)	FL	Marion
mint, scrub (<i>Dicerandra frutescens</i>)	FL	Highlands
nani wai'ale'ale (<i>Viola kauaiensis</i> var. <i>wahiawaensis</i>)	HI	Kauai
naupaka, dwarf (<i>Scaevola coriacea</i>)	HI	Maui
Nehe (<i>Lipochaeta kamolensis</i>)	HI	Maui
Nehe (<i>Lipochaeta waimeaensis</i>)	HI	Kauai
No common name (<i>Bonamia menziesii</i>)	HI	Kauai, Maui
No common name (<i>Gouania meyenii</i>)	HI	Kauai
No common name (<i>Hesperomannia arborescens</i>)	HI	Maui

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

Species*	State	Affected Counties
No common name (<i>Hesperomannia arbuscula</i>)	HI	Maui
No common name (<i>Neraudia sericea</i>)	HI	Maui
No common name (<i>Phyllostegia mollis</i>)	HI	Maui
No common name (<i>Sanicula purpurea</i>)	HI	Maui
No common name (<i>Schiedea kauaiensis</i>)	HI	Kauai
No common name (<i>Schiedea lydgatei</i>)	HI	Maui
No common name (<i>Schiedea sarmentosa</i>)	HI	Maui
No common name (<i>Schiedea spergulina</i> var. <i>leiopoda</i>)	HI	Kauai
No common name (<i>Schiedea spergulina</i> var. <i>spergulina</i>)	HI	Kauai
No common name (<i>Silene alexandri</i>)	HI	Maui
No common name (<i>Silene lanceolata</i>)	HI	Kauai, Maui
No common name (<i>Spermolepis hawaiiensis</i>)	HI	Kauai, Maui
No common name (<i>Vigna o-wahuensis</i>)	HI	Kauai, Maui
No common name (<i>Viola helenae</i>)	HI	Kauai
Nohoanu (<i>Geranium multiflorum</i>)	HI	Maui
ohai (<i>Sesbania tomentosa</i>)	HI	Kauai, Maui
olulu (<i>Brighamia insignis</i>)	HI	Kauai
paintbrush, golden (<i>Castilleja levisecta</i>)	WA	San Juan, Thurston
Pamakani (<i>Tetramolopium capillare</i>)	HI	Maui
pawpaw, beautiful (<i>Deeringothamnus pulchellus</i>)	FL	Lee
pawpaw, Rugel's (<i>Deeringothamnus rugelii</i>)	FL	Volusia
pennyroyal, Todsens's (<i>Hedeoma todsenii</i>)	NM	Otero
phlox, Texas trailing (<i>Phlox nivalis</i> ssp. <i>texensis</i>)	TX	Hardin, Polk, Tyler

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

Species*	State	Affected Counties
pinkroot, gentian (<i>Spigelia gentianoides</i>)	FL	Calhoun
Po'e (<i>Portulaca sclerocarpa</i>)	HI	Maui
polygala, Lewton's (<i>Polygala lewtonii</i>)	FL	Highlands, Marion
poppy, Sacramento prickly (<i>Argemone pleiacantha</i> ssp. <i>pinnatisecta</i>)	NM	Otero
rosemary, Cumberland (<i>Conradina verticillata</i>)	TN	Cumberland, Fentress, Morgan, Scott, White
rosemary, Etonia (<i>Conradina etonia</i>)	FL	Putnam
rosemary, short-leaved (<i>Conradina brevifolia</i>)	FL	Highlands
rush-pea, slender (<i>Hoffmannseggia tenella</i>)	TX	Kleberg, Nueces
sand-verbena, large-fruited (<i>Abronia macrocarpa</i>)	TX	Freestone, Leon
Snakeroot (<i>Eryngium cuneifolium</i>)	FL	Highlands
spineflower, slender-horned (<i>Dodecahema leptoceras</i>)	CA	San Diego
sumac, Michaux's (<i>Rhus michauxii</i>)	NC VA	Cumberland, Davie, Franklin, Hoke, Moore, Richmond, Robeson, Scotland, Wake Dinwiddie, Nottoway
sunburst, San Joaquin adobe (<i>Pseudobahia peirsonii</i>)	CA	Madera, Stanislaus
sunflower, Schweinitz's (<i>Helianthus schweinitzii</i>)	NC SC	Cabarrus, Mecklenburg, Rowan, Stanly, Stokes, Union York
wooly-threads, San Joaquin (<i>Monolopia (=Lembertia) congdonii</i>)	CA	Tulare
<i>Ferns and Allies</i>		
<i>Lifeform: Aquatic</i>		
quillwort, mat-forming (<i>Isoetes tegetiformans</i>)	GA	Columbia, Greene
<i>Lifeform: Terrestrial</i>		
diellia, asplenium-leaved (<i>Diellia erecta</i>)	HI	Maui

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

Species*	State	Affected Counties
No common name (<i>Diellia unisora</i>)	HI	Maui
Monocots		
Lifeform: Aquatic		
beaked-rush, Knieskern's (<i>Rhynchospora knieskernii</i>)	NJ	Atlantic, Burlington, Camden, Monmouth, Ocean
bulrush, Northeastern (<i>Scirpus ancistrochaetus</i>)	MA MD VA VT WV	Franklin Washington Alleghany, Augusta, Bath, Rockingham Windham Berkeley
Orcutt grass, hairy (<i>Orcuttia pilosa</i>)	CA	Merced
pink, swamp (<i>Helonias bullata</i>)	NJ	Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester, Middlesex, Monmouth, Morris, Ocean, Salem
pondweed, Little Aguja Creek (<i>Potamogeton clystocarpus</i>)	TX	Jeff Davis
tuctoria, Greene's (<i>Tuctoria greenei</i>)	CA	Butte, Merced, Shasta, Tehama
water-plantain, Kral's (<i>Sagittaria secundifolia</i>)	AL	De Kalb, Winston
Lifeform: Both		
sedge, golden (<i>Carex lutea</i>)	NC	Pender
Lifeform: Terrestrial		
Fritillary, Gentner's (<i>Fritillaria gentneri</i>)	OR	Jackson, Josephine
grass, Tennessee yellow-eyed (<i>Xyris tennesseensis</i>)	AL GA	Calhoun, Franklin Bartow, Whitfield
irisette, white (<i>Sisyrinchium dichotomum</i>)	NC SC	Henderson, Polk, Rutherford Greenville
ischaemum, Hilo (<i>Ischaemum byrone</i>)	HI	Kauai, Maui
Kamanomano (<i>Cenchrus agrimonioides</i>)	HI	Maui
ladies'-tresses, Navasota (<i>Spiranthes parksii</i>)	TX	Brazos, Burleson, Freestone, Grimes, Jasper, Leon, Madison, Robertson, Washington
ladies'-tresses, Ute (<i>Spiranthes diluvialis</i>)	CO NV	Boulder, Jefferson, Morgan, Weld Lincoln

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

Species*	State	Affected Counties
	UT	Daggett, Duchesne, Garfield, Salt Lake, Tooele, Uintah, Utah, Wayne, Weber
lily, Minnesota dwarf trout (<i>Erythronium propullans</i>)	MN	Goodhue, Rice, Steele
lo'ulu (<i>Pritchardia napaliensis</i>)	HI	Kauai
No common name (<i>Gahnia lanaiensis</i>)	HI	Maui
No common name (<i>Mariscus fauriei</i>)	HI	Maui
No common name (<i>Mariscus pennatiformis</i>)	HI	Kauai, Maui
No common name (<i>Platanthera holochila</i>)	HI	Maui
orchid, eastern prairie fringed (<i>Platanthera leucophaea</i>)	IL ME MI OH VA	Cook, Du Page, Grundy, Henry, Iroquois, Kane, Lake Aroostook Bay, Huron, Livingston, Monroe, Saginaw, St Clair, St Joseph, Tuscola, Washtenaw, Wayne Holmes, Lucas, Ottawa, Sandusky, Wayne Augusta
orchid, western prairie fringed (<i>Platanthera praeclara</i>)	KS MN MO NE OK	Douglas, Jefferson, Leavenworth, Osage Clay, Dodge, Kittson, Mower, Nobles, Norman, Pennington, Pipestone, Polk, Rock Holt Cherry, Hall, Lancaster, Seward Craig, Rogers
panicgrass, Carter's (<i>Panicum fauriei</i> var. <i>carteri</i>)	HI	Maui
Wahane (<i>Pritchardia aylmer-robinsonii</i>)	HI	Kauai

* Lifeform classification from FESTF IMS.

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

Species*	State	Affected Counties
Dicots		
Lifeform: Aquatic		
aster, decurrent false (<i>Boltonia decurrens</i>)	MO	Howell, Pike
bird's beak, palmate-bracted (<i>Cordylanthus palmatus</i>)	CA	Fresno, Madera, Yolo
spurge, Hoover's (<i>Chamaesyce hooveri</i>)	CA	Butte, Stanislaus, Tulare
Lifeform: Both		
sneezeweed, Virginia (<i>Helenium virginicum</i>)	MO	Howell
sunflower, Pecos (=puzzle, =paradox) (<i>Helianthus paradoxus</i>)	NM TX	Valencia Pecos
Lifeform: Terrestrial		
bush-clover, prairie (<i>Lespedeza leptostachya</i>)	MN	Rice
cactus, San Rafael (<i>Pediocactus despainii</i>)	UT	Emery
Catchfly, Spalding's (<i>Silene spaldingii</i>)	WA	Lincoln, Spokane
checker-mallow, Nelson's (<i>Sidalcea nelsoniana</i>)	OR	Marion
clover, running buffalo (<i>Trifolium stoloniferum</i>)	MO	Barry
daisy, Willamette (<i>Erigeron decumbens</i> var. <i>decumbens</i>)	OR	Lane, Marion
desert-parsley, Bradshaw's (<i>Lomatium bradshawii</i>)	OR	Lane, Marion
Lupine, Kincaid's (<i>Lupinus sulphureus</i> (=oreganus) ssp. <i>kincaidii</i> (=var. <i>kincaidii</i>))	OR	Lane
milk-vetch, Holmgren (<i>Astragalus holmgreniorum</i>)	UT	Washington
milkweed, Mead's (<i>Asclepias meadii</i>)	KS MO	Anderson, Bourbon, Douglas, Franklin Harrison
sunburst, San Joaquin adobe (<i>Pseudobahia peirsonii</i>)	CA	Madera, Stanislaus
wooly-threads, San Joaquin (<i>Monolopia</i> (=Lembertia) <i>congdonii</i>)	CA	Tulare
Monocots		
Lifeform: Aquatic		
Orcutt grass, hairy (<i>Orcuttia pilosa</i>)	CA	Merced
tuctoria, Greene's (<i>Tuctoria greenei</i>)	CA	Butte, Merced

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

Species*	State	Affected Counties
<i>Lifeform: Terrestrial</i>		
Fritillary, Gentner's (<i>Fritillaria gentneri</i>)	OR	Jackson
ladies'-tresses, Ute (<i>Spiranthes diluvialis</i>)	UT	Duchesne, Salt Lake, Utah, Weber
lily, Minnesota dwarf trout (<i>Erythronium propullans</i>)	MN	Rice
orchid, eastern prairie fringed (<i>Platanthera leucophaea</i>)	MI	Livingston, St Clair
orchid, western prairie fringed (<i>Platanthera praeclara</i>)	KS MN NE	Douglas Pennington Lancaster, Seward

* Lifeform classification from FESTF IMS.

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

State Name	County Count	Species Count
AL	8	6
AR	1	1
AZ	1	1
CA	13	7
CO	4	1
FL	10	16
GA	7	6
HI	2	58
ID	4	2
IL	29	4
IN	1	1
KS	14	2
KY	8	2
MA	1	1
MD	2	2
ME	1	1
MI	10	1
MN	18	3
MO	34	5
MT	4	2
NC	22	8
NE	4	1
NJ	11	3
NM	4	3
NV	1	1
OH	9	2
OK	2	1
OR	15	9
SC	16	6
TN	6	2
TX	23	12
UT	11	3
VA	6	4
VT	1	1
WA	10	6
WV	6	3
Total	319¹	138²

¹ Number of counties.

² Number of distinct species.

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

State Name	County Count	Species Count
CA	7	6
KS	4	2
MI	2	1
MN	2	3
MO	4	4
NE	2	1
NM	1	1
OR	3	5
TX	1	1
UT	6	3
WA	2	1
Total	34¹	24²

¹ Number of counties.

² 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 Name	County Name	Species Count
AL	Calhoun	2
	Cherokee	1
	Colbert	1
	De Kalb	2
	Franklin	2
	Lawrence	1
	Randolph	1
	Winston	1
AR	Yell	1
AZ	Mohave	1
CA	Alameda	1
	Butte	2
	Colusa	1
	Fresno	1
	Glenn	1
	Madera	2
	Merced	2
	San Diego	1
	Shasta	1
	Stanislaus	2
	Tehama	2
	Tulare	2
	Yolo	1
CO	Boulder	1
	Jefferson	1
	Morgan	1
	Weld	1
FL	Bay	1
	Calhoun	1
	Hernando	2
	Highlands	6
	Hillsborough	1
	Lee	1
	Marion	3
	Palm Beach	1
	Putnam	1
	Volusia	1
GA	Bartow	1
	Columbia	2
	Floyd	1
	Gilmer	1
	Greene	3

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

State Name	County Name	Species Count
	Oglethorpe	1
	Whitfield	1
HI	Kauai	25
	Maui	43
ID	Idaho	1
	Latah	1
	Lewis	1
	Nez Perce	1
IL	Bureau	1
	Cass	1
	Cook	2
	Du Page	2
	Ford	1
	Fulton	1
	Grundy	1
	Henry	1
	Iroquois	1
	Jersey	1
	Kane	1
	La Salle	1
	Lake	1
	Lee	1
	Madison	1
	Marshall	1
	Mason	1
	Morgan	1
	Ogle	1
	Peoria	1
	Pike	1
	Putnam	1
	Saline	1
	Schuyler	1
	Scott	1
	St Clair	1
	Tazewell	1
	Winnebago	1
Woodford	1	
IN	Ohio	1
KS	Allen	1
	Anderson	1
	Bourbon	1
	Coffey	1

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

State Name	County Name	Species Count
	Crawford	1
	Douglas	2
	Franklin	1
	Jefferson	2
	Johnson	1
	Leavenworth	2
	Linn	1
	Miami	1
	Neosho	1
	Osage	1
KY	Boone	1
	Bourbon	1
	Fleming	1
	Jefferson	1
	Nelson	1
	Nicholas	1
	Robertson	1
	Woodford	1
MA	Franklin	1
MD	Allegany	1
	Washington	2
ME	Aroostook	1
MI	Bay	1
	Huron	1
	Livingston	1
	Monroe	1
	Saginaw	1
	St Clair	1
	St Joseph	1
	Tuscola	1
	Washtenaw	1
	Wayne	1
MN	Brown	1
	Clay	1
	Cottonwood	1
	Dodge	1
	Goodhue	2
	Jackson	1
	Kittson	1
	Mower	1
	Nobles	1
	Norman	1

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

State Name	County Name	Species Count
	Pennington	1
	Pipestone	1
	Polk	1
	Redwood	1
	Renville	1
	Rice	2
	Rock	1
	Steele	1
MO	Barry	1
	Barton	1
	Benton	2
	Boone	1
	Callaway	1
	Carter	1
	Cass	1
	Cedar	2
	Cole	1
	Crawford	1
	Dade	2
	Dent	1
	Dunklin	2
	Harrison	1
	Holt	1
	Howard	1
	Howell	2
	Iron	1
	Madison	1
	Maries	1
	Mississippi	1
	Ozark	1
	Pettis	1
	Phelps	1
	Pike	1
	Polk	1
	Reynolds	1
	St Charles	1
	St Clair	1
	St Louis	1
Taney	1	
Texas	1	
Vernon	2	
Wayne	1	

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

State Name	County Name	Species Count
MT	Flathead	1
	Lake	2
	Lincoln	1
	Missoula	1
NC	Cabarrus	1
	Chatham	1
	Clay	1
	Cumberland	1
	Davie	1
	Franklin	1
	Granville	1
	Henderson	1
	Hoke	2
	Mecklenburg	1
	Moore	2
	Pender	1
	Polk	1
	Richmond	1
	Robeson	1
	Rowan	1
	Rutherford	1
	Scotland	2
	Stanly	1
	Stokes	1
Union	1	
Wake	1	
NE	Cherry	1
	Hall	1
	Lancaster	1
	Seward	1
NJ	Atlantic	2
	Burlington	3
	Camden	2
	Cape May	1
	Cumberland	1
	Gloucester	1
	Middlesex	1
	Monmouth	2
	Morris	1
	Ocean	2
Salem	1	
NM	Cibola	1

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

State Name	County Name	Species Count
	Guadalupe	1
	Otero	2
	Valencia	1
NV	Lincoln	1
OH	Brown	1
	Clermont	1
	Hamilton	1
	Holmes	1
	Lucas	1
	Ottawa	1
	Sandusky	1
	Warren	1
	Wayne	1
OK	Craig	1
	Rogers	1
OR	Baker	1
	Benton	4
	Clackamas	1
	Douglas	2
	Jackson	1
	Josephine	2
	Lane	3
	Linn	4
	Marion	3
	Polk	3
	Tillamook	1
	Union	1
	Wallowa	1
	Washington	1
Yamhill	2	
SC	Charleston	1
	Dorchester	1
	Florence	1
	Greenville	1
	Hampton	1
	Horry	2
	Jasper	1
	Lancaster	1
	Lee	1
	Marlboro	1
	Orangeburg	1
	Richland	1

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

State Name	County Name	Species Count
	Saluda	2
	Sumter	1
	Williamsburg	2
	York	2
TN	Cumberland	1
	Fentress	1
	Morgan	1
	Scott	1
	White	1
	Wilson	1
TX	Brazos	1
	Burleson	1
	Fort Bend	1
	Freestone	2
	Grimes	1
	Hardin	1
	Harris	1
	Hidalgo	1
	Jasper	1
	Jeff Davis	1
	Kleberg	2
	Leon	2
	Madison	1
	Nueces	2
	Pecos	1
	Polk	1
	Reeves	1
	Robertson	1
	Starr	3
	Tyler	1
	Washington	1
Webb	1	
Zapata	2	
UT	Daggett	1
	Duchesne	1
	Emery	1
	Garfield	1
	Salt Lake	1
	Tooele	1
	Uintah	1
	Utah	1
	Washington	1

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

State Name	County Name	Species Count
	Wayne	1
	Weber	1
VA	Alleghany	1
	Augusta	3
	Bath	1
	Dinwiddie	1
	Nottoway	1
	Rockingham	2
VT	Windham	1
WA	Asotin	1
	Chelan	1
	Clark	1
	Cowlitz	1
	Lewis	1
	Lincoln	1
	San Juan	1
	Spokane	1
	Thurston	1
	Whitman	1
	WV	Berkeley
Fayette		1
Morgan		1
Randolph		1
Tucker		1
Webster		1

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

State Name	County Name	Species Count
CA	Butte	2
	Fresno	1
	Madera	2
	Merced	2
	Stanislaus	2
	Tulare	2
	Yolo	1
KS	Anderson	1
	Bourbon	1
	Douglas	2
	Franklin	1
MI	Livingston	1
	St Clair	1
MN	Pennington	1
	Rice	2
MO	Barry	1
	Harrison	1
	Howell	2
	Pike	1
NE	Lancaster	1
	Seward	1
NM	Valencia	1
OR	Jackson	1
	Lane	3
	Marion	3
TX	Pecos	1
UT	Duchesne	1
	Emery	1
	Salt Lake	1
	Utah	1
	Washington	1
	Weber	1
WA	Lincoln	1
	Spokane	1

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

State Name	Taxa Name	Species Name	County Count
AL	Dicots	amphianthus, little (<i>Amphianthus pusillus</i>)	1
		bladderpod, lyrate (<i>Lesquerella lyrata</i>)	3
		button, Mohr's Barbara (<i>Marshallia mohrii</i>)	1
		Harperella (<i>Ptilimnium nodosum</i>)	2
	Monocots	grass, Tennessee yellow-eyed (<i>Xyris tennesseensis</i>)	2
		water-plantain, Kral's (<i>Sagittaria secundifolia</i>)	2
AR	Dicots	Harperella (<i>Ptilimnium nodosum</i>)	1
AZ	Dicots	milk-vetch, Holmgren (<i>Astragalus holmgreniorum</i>)	1
CA	Dicots	bird's beak, palmate-bracted (<i>Cordylanthus palmatus</i>)	5
		spineflower, slender-horned (<i>Dodecahema leptoceras</i>)	1
		spurge, Hoover's (<i>Chamaesyce hooveri</i>)	5
		sunburst, San Joaquin adobe (<i>Pseudobahia peirsonii</i>)	2
		wooly-threads, San Joaquin (<i>Monolopia (=Lembertia) congdonii</i>)	1
	Monocots	Orcutt grass, hairy (<i>Orcuttia pilosa</i>)	1
		tuctoria, Greene's (<i>Tuctoria greenei</i>)	4
CO	Monocots	ladies'-tresses, Ute (<i>Spiranthes diluvialis</i>)	4
FL	Dicots	aster, Florida golden (<i>Chrysopsis floridana</i>)	1
		bellflower, Brooksville (<i>Campanula robinsiae</i>)	1
		blazingstar, scrub (<i>Liatris ohlingerae</i>)	1
		buckwheat, scrub (<i>Eriogonum longifolium</i> var. <i>gnaphalifolium</i>)	2
		butterwort, Godfrey's (<i>Pinguicula ionantha</i>)	1
		gourd, Okeechobee (<i>Cucurbita okeechobeensis</i> ssp. <i>okeechobeensis</i>)	1
		mint, longspurred (<i>Dicerandra cornutissima</i>)	1
		mint, scrub (<i>Dicerandra frutescens</i>)	1
		pawpaw, beautiful (<i>Deeringothamnus pulchellus</i>)	1
		pawpaw, Rugel's (<i>Deeringothamnus rugelii</i>)	1
		pinkroot, gentian (<i>Spigelia gentianoides</i>)	1
		polygala, Lewton's (<i>Polygala lewtonii</i>)	2
		rosemary, Etonia (<i>Conradina etonia</i>)	1
		rosemary, short-leaved (<i>Conradina brevifolia</i>)	1
		Snakeroot (<i>Eryngium cuneifolium</i>)	1
water-willow, Cooley's (<i>Justicia cooleyi</i>)	1		
GA	Dicots	amphianthus, little (<i>Amphianthus pusillus</i>)	3
		button, Mohr's Barbara (<i>Marshallia mohrii</i>)	1
		Harperella (<i>Ptilimnium nodosum</i>)	1
		pitcher-plant, green (<i>Sarracenia oreophila</i>)	1
	Ferns and Allies	quillwort, mat-forming (<i>Isoetes tegetiformans</i>)	2

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

State Name	Taxa Name	Species Name	County Count
	Monocots	grass, Tennessee yellow-eyed (<i>Xyris tennesseensis</i>)	2
HI	Dicots	'akoko (<i>Euphorbia haeleeleana</i>)	1
		'awikiwiki (<i>Canavalia molokaiensis</i>)	1
		'oha wai (<i>Clermontia oblongifolia ssp. mauiensis</i>)	1
		A'e (<i>Zanthoxylum hawaiiense</i>)	2
		Alani (<i>Melicope mucronulata</i>)	1
		Alani (<i>Melicope munroi</i>)	1
		Alani (<i>Melicope pallida</i>)	1
		awiwi (<i>Centaurium sebaeoides</i>)	2
		gardenia (=Na'u), Hawaiian (<i>Gardenia brighamii</i>)	1
		haha (<i>Cyanea macrostegia ssp. gibsonii</i>)	1
		Haha (<i>Cyanea mannii</i>)	1
		Haha (<i>Cyanea remyi</i>)	1
		iliau, dwarf (<i>Wilkesia hobdyi</i>)	1
		Kio'ele (<i>Hedyotis coriacea</i>)	1
		ko'oko'olau (<i>Bidens micrantha ssp. kalealaha</i>)	1
		Ko'oko'olau (<i>Bidens wiebkei</i>)	1
		Ko'oloa'ula (<i>Abutilon menziesii</i>)	1
		koki'o ke'oke'o (<i>Hibiscus waimeae ssp. hannerae</i>)	1
		kuahiwi laukahi (<i>Plantago princeps</i>)	2
		Kulu'i (<i>Nototrichium humile</i>)	1
		ma'o hau hele, (=native yellow hibiscus) (<i>Hibiscus brackenridgei</i>)	1
		nani wai'ale'ale (<i>Viola kauaiensis var. wahiawaensis</i>)	1
		naupaka, dwarf (<i>Scaevola coriacea</i>)	1
		Nehe (<i>Lipochaeta kamolensis</i>)	1
		Nehe (<i>Lipochaeta waimeaensis</i>)	1
		No common name (<i>Bonamia menziesii</i>)	2
		No common name (<i>Gouania meyenii</i>)	1
		No common name (<i>Hesperomannia arborescens</i>)	1
		No common name (<i>Hesperomannia arbuscula</i>)	1
		No common name (<i>Neraudia sericea</i>)	1
		No common name (<i>Phyllostegia mollis</i>)	1
		No common name (<i>Sanicula purpurea</i>)	1
		No common name (<i>Schiedea kauaiensis</i>)	1
		No common name (<i>Schiedea lydgatei</i>)	1
		No common name (<i>Schiedea sarmentosa</i>)	1
		No common name (<i>Schiedea spergulina var. leiopoda</i>)	1
		No common name (<i>Schiedea spergulina var. spergulina</i>)	1
		No common name (<i>Silene alexandri</i>)	1
		No common name (<i>Silene lanceolata</i>)	2

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

State Name	Taxa Name	Species Name	County Count
		No common name (<i>Spermolepis hawaiiensis</i>)	2
		No common name (<i>Vigna o-wahuensis</i>)	2
		No common name (<i>Viola helena</i>)	1
		Nohoanu (<i>Geranium multiflorum</i>)	1
		ohai (<i>Sesbania tomentosa</i>)	2
		olulu (<i>Brighamia insignis</i>)	1
		Pamakani (<i>Tetramolopium capillare</i>)	1
		Po'e (<i>Portulaca sclerocarpa</i>)	1
	Ferns and Allies	diellia, asplenium-leaved (<i>Diellia erecta</i>)	1
		No common name (<i>Diellia unisora</i>)	1
	Monocots	ischaemum, Hilo (<i>Ischaemum byrone</i>)	2
		Kamanomano (<i>Cenchrus agrimonioides</i>)	1
		lo'ulu (<i>Pritchardia napaliensis</i>)	1
		No common name (<i>Gahnia lanaiensis</i>)	1
		No common name (<i>Mariscus fauriei</i>)	1
		No common name (<i>Mariscus pennatiformis</i>)	2
		No common name (<i>Platanthera holochila</i>)	1
		panicgrass, Carter's (<i>Panicum fauriei</i> var. <i>carteri</i>)	1
		Wahane (<i>Pritchardia aylmer-robinsonii</i>)	1
		ID	Dicots
howellia, water (<i>Howellia aquatilis</i>)	1		
IL	Dicots	aster, decurrent false (<i>Boltonia decurrens</i>)	17
		bush-clover, prairie (<i>Lespedeza leptostachya</i>)	5
		milkweed, Mead's (<i>Asclepias meadii</i>)	2
	Monocots	orchid, eastern prairie fringed (<i>Platanthera leucophaea</i>)	7
IN	Dicots	clover, running buffalo (<i>Trifolium stoloniferum</i>)	1
KS	Dicots	milkweed, Mead's (<i>Asclepias meadii</i>)	13
	Monocots	orchid, western prairie fringed (<i>Platanthera praeclara</i>)	4
KY	Dicots	clover, running buffalo (<i>Trifolium stoloniferum</i>)	5
		goldenrod, Short's (<i>Solidago shortii</i>)	3
MA	Monocots	bulrush, Northeastern (<i>Scirpus ancistrochaetus</i>)	1
MD	Dicots	Harperella (<i>Ptilimnium nodosum</i>)	2
	Monocots	bulrush, Northeastern (<i>Scirpus ancistrochaetus</i>)	1
ME	Monocots	orchid, eastern prairie fringed (<i>Platanthera leucophaea</i>)	1
MI	Monocots	orchid, eastern prairie fringed (<i>Platanthera leucophaea</i>)	10
MN	Dicots	bush-clover, prairie (<i>Lespedeza leptostachya</i>)	7
	Monocots	lily, Minnesota dwarf trout (<i>Erythronium propullans</i>)	3
		orchid, western prairie fringed (<i>Platanthera praeclara</i>)	10
MO	Dicots	aster, decurrent false (<i>Boltonia decurrens</i>)	5
		clover, running buffalo (<i>Trifolium stoloniferum</i>)	21

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

State Name	Taxa Name	Species Name	County Count
		milkweed, Mead's (<i>Asclepias meadii</i>)	12
		sneezeweed, Virginia (<i>Helenium virginicum</i>)	1
	Monocots	orchid, western prairie fringed (<i>Platanthera praeclara</i>)	1
MT	Dicots	Catchfly, Spalding's (<i>Silene spaldingii</i>)	3
		howellia, water (<i>Howellia aquatilis</i>)	2
NC	Dicots	chaffseed, American (<i>Schwalbea americana</i>)	2
		dropwort, Canby's (<i>Oxypolis canbyi</i>)	1
		Harperella (<i>Ptilimnium nodosum</i>)	2
		pitcher-plant, green (<i>Sarracenia oreophila</i>)	1
		sumac, Michaux's (<i>Rhus michauxii</i>)	9
		sunflower, Schweinitz's (<i>Helianthus schweinitzii</i>)	6
	Monocots	irisette, white (<i>Sisyrinchium dichotomum</i>)	3
		sedge, golden (<i>Carex lutea</i>)	1
NE	Monocots	orchid, western prairie fringed (<i>Platanthera praeclara</i>)	4
NJ	Dicots	chaffseed, American (<i>Schwalbea americana</i>)	1
	Monocots	beaked-rush, Knieskern's (<i>Rhynchospora knieskernii</i>)	5
		pink, swamp (<i>Helonias bullata</i>)	11
NM	Dicots	pennyroyal, Todsens's (<i>Hedeoma todsenii</i>)	1
		poppy, Sacramento prickly (<i>Argemone pleiacantha</i> ssp. <i>pinnatisecta</i>)	1
		sunflower, Pecos (=puzzle, =paradox) (<i>Helianthus paradoxus</i>)	3
NV	Monocots	ladies'-tresses, Ute (<i>Spiranthes diluvialis</i>)	1
OH	Dicots	clover, running buffalo (<i>Trifolium stoloniferum</i>)	4
	Monocots	orchid, eastern prairie fringed (<i>Platanthera leucophaea</i>)	5
OK	Monocots	orchid, western prairie fringed (<i>Platanthera praeclara</i>)	2
OR	Dicots	Catchfly, Spalding's (<i>Silene spaldingii</i>)	1
		checker-mallow, Nelson's (<i>Sidalcea nelsoniana</i>)	8
		daisy, Willamette (<i>Erigeron decumbens</i> var. <i>decumbens</i>)	5
		desert-parsley, Bradshaw's (<i>Lomatium bradshawii</i>)	4
		lomatium, Cook's (<i>Lomatium cookii</i>)	1
		Lupine, Kincaid's (<i>Lupinus sulphureus</i> (=oreganus) ssp. <i>kincaidii</i> (=var. <i>kincaidii</i>))	6
		popcornflower, rough (<i>Plagiobothrys hirtus</i>)	1
		thelypody, Howell's spectacular (<i>Thelypodium howellii</i> <i>spectabilis</i>)	2
	Monocots	Fritillary, Gentner's (<i>Fritillaria gentneri</i>)	2
SC	Dicots	amphianthus, little (<i>Amphianthus pusillus</i>)	3
		chaffseed, American (<i>Schwalbea americana</i>)	7
		dropwort, Canby's (<i>Oxypolis canbyi</i>)	7
		Harperella (<i>Ptilimnium nodosum</i>)	1

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

State Name	Taxa Name	Species Name	County Count
		sunflower, Schweinitz's (<i>Helianthus schweinitzii</i>)	1
	Monocots	irisette, white (<i>Sisyrinchium dichotomum</i>)	1
TN	Dicots	bladderpod, Spring Creek (<i>Lesquerella perforata</i>)	1
		rosemary, Cumberland (<i>Conradina verticillata</i>)	5
TX	Dicots	ambrosia, south Texas (<i>Ambrosia cheiranthifolia</i>)	2
		bladderpod, Zapata (<i>Lesquerella thamnophila</i>)	2
		cactus, star (<i>Astrophytum asterias</i>)	1
		dawn-flower, Texas prairie (<i>Hymenoxys texana</i>)	2
		dogweed, ashy (<i>Thymophylla tephroleuca</i>)	2
		manioc, Walker's (<i>Manihot walkerae</i>)	2
		phlox, Texas trailing (<i>Phlox nivalis</i> ssp. <i>texensis</i>)	3
		rush-pea, slender (<i>Hoffmannseggia tenella</i>)	2
		sand-verbena, large-fruited (<i>Abronia macrocarpa</i>)	2
		sunflower, Pecos (=puzzle, =paradox) (<i>Helianthus paradoxus</i>)	2
	Monocots	ladies'-tresses, Navasota (<i>Spiranthes parksii</i>)	9
		pondweed, Little Aguja Creek (<i>Potamogeton clystocarpus</i>)	1
UT	Dicots	cactus, San Rafael (<i>Pediocactus despainii</i>)	1
		milk-vetch, Holmgren (<i>Astragalus holmgreniorum</i>)	1
	Monocots	ladies'-tresses, Ute (<i>Spiranthes diluvialis</i>)	9
VA	Dicots	sneezeweed, Virginia (<i>Helenium virginicum</i>)	2
		sumac, Michaux's (<i>Rhus michauxii</i>)	2
	Monocots	bulrush, Northeastern (<i>Scirpus ancistrochaetus</i>)	4
		orchid, eastern prairie fringed (<i>Platanthera leucophaea</i>)	1
VT	Monocots	bulrush, Northeastern (<i>Scirpus ancistrochaetus</i>)	1
WA	Dicots	Catchfly, Spalding's (<i>Silene spaldingii</i>)	4
		checker-mallow, Nelson's (<i>Sidalcea nelsoniana</i>)	1
		checkermallow, Wenatchee Mountains (<i>Sidalcea oregana</i> var. <i>calva</i>)	1
		howellia, water (<i>Howellia aquatilis</i>)	1
		Lupine, Kincaid's (<i>Lupinus sulphureus</i> (=oreganus) ssp. <i>kincaidii</i> (=var. <i>kincaidii</i>))	1
		paintbrush, golden (<i>Castilleja levisecta</i>)	2
WV	Dicots	clover, running buffalo (<i>Trifolium stoloniferum</i>)	4
		Harperella (<i>Ptilimnium nodosum</i>)	1
	Monocots	bulrush, Northeastern (<i>Scirpus ancistrochaetus</i>)	1

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

State Name	Taxa Name	Species Name	County Count
CA	Dicots	bird's beak, palmate-bracted (<i>Cordylanthus palmatus</i>)	3
		spurge, Hoover's (<i>Chamaesyce hooveri</i>)	3
		sunburst, San Joaquin adobe (<i>Pseudobahia peirsonii</i>)	2
		wooly-threads, San Joaquin (<i>Monolopia (=Lembertia) congdonii</i>)	1
	Monocots	Orcutt grass, hairy (<i>Orcuttia pilosa</i>)	1
		tuctoria, Greene's (<i>Tuctoria greenei</i>)	2
KS	Dicots	milkweed, Mead's (<i>Asclepias meadii</i>)	4
	Monocots	orchid, western prairie fringed (<i>Platanthera praeclara</i>)	1
MI	Monocots	orchid, eastern prairie fringed (<i>Platanthera leucophaea</i>)	2
MN	Dicots	bush-clover, prairie (<i>Lespedeza leptostachya</i>)	1
	Monocots	lily, Minnesota dwarf trout (<i>Erythronium propullans</i>)	1
		orchid, western prairie fringed (<i>Platanthera praeclara</i>)	1
MO	Dicots	aster, decurrent false (<i>Boltonia decurrens</i>)	2
		clover, running buffalo (<i>Trifolium stoloniferum</i>)	1
		milkweed, Mead's (<i>Asclepias meadii</i>)	1
		sneezeweed, Virginia (<i>Helenium virginicum</i>)	1
NE	Monocots	orchid, western prairie fringed (<i>Platanthera praeclara</i>)	2
NM	Dicots	sunflower, Pecos (=puzzle, =paradox) (<i>Helianthus paradoxus</i>)	1
OR	Dicots	checker-mallow, Nelson's (<i>Sidalcea nelsoniana</i>)	1
		daisy, Willamette (<i>Erigeron decumbens</i> var. <i>decumbens</i>)	2
		desert-parsley, Bradshaw's (<i>Lomatium bradshawii</i>)	2
		Lupine, Kincaid's (<i>Lupinus sulphureus (=oreganus) ssp. kincaidii (=var. kincaidii)</i>)	1
	Monocots	Fritillary, Gentner's (<i>Fritillaria gentneri</i>)	1
TX	Dicots	sunflower, Pecos (=puzzle, =paradox) (<i>Helianthus paradoxus</i>)	1
UT	Dicots	cactus, San Rafael (<i>Pediocactus despainii</i>)	1
		milk-vetch, Holmgren (<i>Astragalus holmgreniorum</i>)	1
	Monocots	ladies'-tresses, Ute (<i>Spiranthes diluvialis</i>)	4
WA	Dicots	Catchfly, Spalding's (<i>Silene spaldingii</i>)	2

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

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

Species *	Critical Habitat Information	CFR/FR Locations
Conifers and Cycads		
Lifeform: Terrestrial		
cypress, Gowen (<i>Cupressus goveniana</i> ssp. <i>goveniana</i>)	No	
torreya, Florida (<i>Torreya taxifolia</i>)	No	
Dicots		
Lifeform: Aquatic		
allocarya, Calistoga (<i>Plagiobothrys strictus</i>)	No	
amphianthus, little (<i>Amphianthus pusillus</i>)	No	
aster, decurrent false (<i>Boltonia decurrens</i>)	No	
bellflower, Brooksville (<i>Campanula robinsiae</i>)	No	
bird's beak, palmate-bracted (<i>Cordylanthus palmatus</i>)	No	
bird's-beak, Pennell's (<i>Cordylanthus tenuis</i> ssp. <i>capillaris</i>)	No	
bird's-beak, salt marsh (<i>Cordylanthus maritimus</i> ssp. <i>maritimus</i>)	No	
bird's-beak, soft (<i>Cordylanthus mollis</i> ssp. <i>mollis</i>)	No	
bittercress, small-anthered (<i>Cardamine micranthera</i>)	No	
bluecurls, Hidden Lake (<i>Trichostema austromontanum</i> ssp. <i>compactum</i>)	No	
butterwort, Godfrey's (<i>Pinguicula ionantha</i>)	No	
button-celery, San Diego (<i>Eryngium aristulatum</i> var. <i>parishii</i>)	No	
checker-mallow, Kenwood Marsh (<i>Sidalcea oregana</i> ssp. <i>valida</i>)	No	
dropwort, Canby's (<i>Oxypolis canbyi</i>)	No	
goldenrod, Houghton's (<i>Solidago houghtonii</i>)	No	
goldfields, Burke's (<i>Lasthenia burkei</i>)	No	
goldfields, Contra Costa (<i>Lasthenia conjugens</i>)	Yes	50 CFR 17.96(a)
Harperella (<i>Ptilimnium nodosum</i>)	No	
howellia, water (<i>Howellia aquatilis</i>)	No	
joint-vetch, sensitive (<i>Aeschynomene virginica</i>)	No	
meadowfoam, Butte County (<i>Limnanthes floccosa</i> ssp. <i>californica</i>)	Yes	50 CFR 17.96(a)
meadowfoam, Sebastopol (<i>Limnanthes vinculans</i>)	No	
mesa-mint, Otay (<i>Pogogyne nudiuscula</i>)	No	
mesa-mint, San Diego (<i>Pogogyne abramsii</i>)	No	
monkey-flower, Michigan (<i>Mimulus glabratus</i> var. <i>michiganensis</i>)	No	

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

Species *	Critical Habitat Information	CFR/FR Locations
navarretia, few-flowered (<i>Navarretia leucocephala</i> ssp. <i>pauciflora</i> (=N. <i>pauciflora</i>))	No	
navarretia, many-flowered (<i>Navarretia leucocephala</i> ssp. <i>plieantha</i>)	No	
navarretia, spreading (<i>Navarretia fossalis</i>)	No	
niterwort, Amargosa (<i>Nitrophila mohavensis</i>)	Yes	50 CFR 17.96(a)
owl's-clover, fleshy (<i>Castilleja campestris</i> ssp. <i>succulenta</i>)	Yes	50 CFR 17.96(a)
pitcher-plant, Alabama canebrake (<i>Sarracenia rubra alabamensis</i>)	No	
pitcher-plant, green (<i>Sarracenia oreophila</i>)	No	
pitcher-plant, mountain sweet (<i>Sarracenia rubra</i> ssp. <i>jonesii</i>)	No	
Pondberry (<i>Lindera melissifolia</i>)	No	
sandwort, Marsh (<i>Arenaria paludicola</i>)	No	
seablite, California (<i>Suaeda californica</i>)	No	
spurge, Hoover's (<i>Chamaesyce hooveri</i>)	Yes	50 CFR 17.96(a)
sunshine, Sonoma (<i>Blennosperma bakeri</i>)	No	
thistle, Chorro Creek bog (<i>Cirsium fontinale</i> var. <i>obispoense</i>)	No	
thistle, fountain (<i>Cirsium fontinale</i> var. <i>fontinale</i>)	No	
thistle, Loch Lomond coyote (<i>Eryngium constancei</i>)	No	
water-umbel, Huachuca (<i>Lilaeopsis schaffneriana</i> var. <i>recurva</i>)	Yes	50 CFR 17.96(a)
water-willow, Cooley's (<i>Justicia cooleyi</i>)	No	
watercress, Gambel's (<i>Rorippa gambellii</i>)	No	
Lifeform: Both		
lomatium, Cook's (<i>Lomatium cookii</i>)	No	
Meadowfoam, large-flowered wooly (<i>Limnanthes floccosa grandiflora</i>)	No	
popcornflower, rough (<i>Plagiobothrys hirtus</i>)	No	
sneezeweed, Virginia (<i>Helenium virginicum</i>)	No	
sunflower, Pecos (=puzzle, =paradox) (<i>Helianthus paradoxus</i>)	No	
thelypody, Howell's spectacular (<i>Thelypodium howellii spectabilis</i>)	No	
Lifeform: Terrestrial		
'Ahinahina (<i>Argyroxiphium sandwicense</i> ssp. <i>macrocephalum</i>)	Yes	50 CFR 17.96(a)

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

Species *	Critical Habitat Information	CFR/FR Locations
'Ahinahina (<i>Argyroxiphium sandwicense ssp. sandwicense</i>)	No	
'aiakeakua, popolo (<i>Solanum sandwicense</i>)	Yes	50 CFR 17.96(a)
'aiea (<i>Nothocestrum peltatum</i>)	Yes	50 CFR 17.96(a)
'akoko (<i>Euphorbia haeleleana</i>)	Yes	50 CFR 17.96(a)
'awikiwiki (<i>Canavalia molokaiensis</i>)	Yes	50 CFR 17.96(a)
'oha Wai (<i>Clermontia lindseyana</i>)	Yes	50 CFR 17.96(a)
'oha wai (<i>Clermontia oblongifolia ssp. brevipes</i>)	Yes	50 CFR 17.96(a)
'oha wai (<i>Clermontia oblongifolia ssp. mauiensis</i>)	Yes	50 CFR 17.96(a)
'oha Wai (<i>Clermontia samuelii</i>)	Yes	50 CFR 17.96(a)
A'e (<i>Zanthoxylum hawaiiense</i>)	Yes	50 CFR 17.96(a)
Alani (<i>Melicope adscendens</i>)	No	
Alani (<i>Melicope balloui</i>)	No	
Alani (<i>Melicope haupuensis</i>)	No	
Alani (<i>Melicope knudsenii</i>)	No	
Alani (<i>Melicope mucronulata</i>)	No	
Alani (<i>Melicope munroi</i>)	No	
Alani (<i>Melicope ovalis</i>)	No	
Alani (<i>Melicope pallida</i>)	No	
Alani (<i>Melicope quadrangularis</i>)	No	
Alani (<i>Melicope reflexa</i>)	No	
amaranth, seabeach (<i>Amaranthus pumilus</i>)	No	
ambrosia, San Diego (<i>Ambrosia pumila</i>)	No	
ambrosia, south Texas (<i>Ambrosia cheiranthifolia</i>)	No	
amole, purple (<i>Chlorogalum purpureum</i>)	No	
aster, Florida golden (<i>Chrysopsis floridana</i>)	No	
aster, Ruth's golden (<i>Pityopsis ruthii</i>)	No	
Aupaka (<i>Isodendrion laurifolium</i>)	Yes	50 CFR 17.96(a)
Aupaka (<i>Isodendrion longifolium</i>)	Yes	50 CFR 17.96(a)
avens, spreading (<i>Geum radiatum</i>)	No	
awiwi (<i>Centaurium sebaeoides</i>)	Yes	50 CFR 17.96(a)

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

Species *	Critical Habitat Information	CFR/FR Locations
awiwi (<i>Hedyotis cookiana</i>)	Yes	50 CFR 17.96(a)
ayenia, Texas (<i>Ayenia limitaris</i>)	No	
baccharis, Encinitas (<i>Baccharis vanessae</i>)	No	
Barberry, island (<i>Berberis pinnata ssp. insularis</i>)	No	
barberry, Nevin's (<i>Berberis nevinii</i>)	No	
Barberry, Truckee (<i>Berberis (=Mahonia) sonnei</i>)	No	
bear-poppy, dwarf (<i>Arctomecon humilis</i>)	No	
beardtongue, Penland (<i>Penstemon penlandii</i>)	No	
bedstraw, island (<i>Galium buxifolium</i>)	No	
birch, Virginia round-leaf (<i>Betula uber</i>)	No	
birds-in-a-nest, white (<i>Macbridea alba</i>)	No	
bladderpod, Dudley Bluffs (<i>Lesquerella congesta</i>)	No	
bladderpod, kodachrome (<i>Lesquerella tumulosa</i>)	No	
bladderpod, lyrate (<i>Lesquerella lyrata</i>)	No	
bladderpod, Missouri (<i>Lesquerella filiformis</i>)	No	
bladderpod, San Bernardino Mountains (<i>Lesquerella kingii ssp. bernardina</i>)	Yes	50 CFR 17.96(a)
bladderpod, Spring Creek (<i>Lesquerella perforata</i>)	No	
bladderpod, Zapata (<i>Lesquerella thamnophila</i>)	Yes	50 CFR 17.96(a)
blazingstar, Ash Meadows (<i>Mentzelia leucophylla</i>)	Yes	50 CFR 17.96(a)
blazingstar, Heller's (<i>Liatris helleri</i>)	No	
blazingstar, scrub (<i>Liatris ohlingeriae</i>)	No	
blue-star, Kearney's (<i>Amsonia kearneyana</i>)	No	
bluet, Roan Mountain (<i>Hedyotis purpurea var. montana</i>)	No	
bonamia, Florida (<i>Bonamia grandiflora</i>)	No	
broom, San Clemente Island (<i>Lotus dendroideus ssp. traskiae</i>)	No	
buckwheat, cushenbury (<i>Eriogonum ovalifolium var. vineum</i>)	Yes	50 CFR 17.96(a)
buckwheat, Ione (incl. Irish Hill) (<i>Eriogonum apricum (incl. var. prostratum)</i>)	No	
buckwheat, scrub (<i>Eriogonum longifolium var. gnaphalifolium</i>)	No	
buckwheat, steamboat (<i>Eriogonum ovalifolium var. williamsiae</i>)	No	
bush-clover, prairie (<i>Lespedeza leptostachya</i>)	No	
bush-mallow, San Clemente Island (<i>Malacothamnus clementinus</i>)	No	
bush-mallow, Santa Cruz Island (<i>Malacothamnus fasciculatus var. nesioticus</i>)	No	

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

Species *	Critical Habitat Information	CFR/FR Locations
Buttercup, autumn (<i>Ranunculus aestivalis</i> (= <i>acriformis</i>))	No	
Butterfly plant, Colorado (<i>Gaura neomexicana</i> var. <i>coloradensis</i>)	Yes	50 CFR 17.96(a)
butterweed, Layne's (<i>Senecio layneae</i>)	No	
button, Mohr's Barbara (<i>Marshallia mohrii</i>)	No	
cactus, Arizona hedgehog (<i>Echinocereus triglochidiatus</i> var. <i>arizonicus</i>)	No	
cactus, Bakersfield (<i>Opuntia treleasei</i>)	No	
cactus, black lace (<i>Echinocereus reichenbachii</i> var. <i>albertii</i>)	No	
cactus, Brady pincushion (<i>Pediocactus bradyi</i>)	No	
Cactus, Chisos Mountain hedgehog (<i>Echinocereus chisoensis</i> var. <i>chisoensis</i>)	No	
cactus, Cochise pincushion (<i>Coryphantha robbinsorum</i>)	No	
cactus, Knowlton (<i>Pediocactus knowltonii</i>)	No	
cactus, Kuenzler hedgehog (<i>Echinocereus fendleri</i> var. <i>kuenzleri</i>)	No	
cactus, Lee pincushion (<i>Coryphantha sneedii</i> var. <i>leei</i>)	No	
cactus, Lloyd's Mariposa (<i>Echinomastus mariposensis</i>)	No	
cactus, Mesa Verde (<i>Sclerocactus mesae-verdae</i>)	No	
cactus, Nellie cory (<i>Coryphantha minima</i>)	No	
cactus, Nichol's Turk's head (<i>Echinocactus horizonthalonius</i> var. <i>nicholii</i>)	No	
cactus, Peebles Navajo (<i>Pediocactus peeblesianus</i> var. <i>peeblesianus</i>)	No	
cactus, Pima pineapple (<i>Coryphantha scheeri</i> var. <i>robustispina</i>)	No	
cactus, San Rafael (<i>Pediocactus despainii</i>)	No	
cactus, Siler pincushion (<i>Pediocactus</i> (= <i>Echinocactus</i> , = <i>Utahia</i>) <i>sileri</i>)	No	
cactus, Sneed pincushion (<i>Coryphantha sneedii</i> var. <i>sneedii</i>)	No	
cactus, star (<i>Astrophytum asterias</i>)	No	
cactus, Tobusch fishhook (<i>Ancistrocactus tobuschii</i>)	No	
Cactus, Uinta Basin hookless (<i>Sclerocactus glaucus</i>)	No	
cactus, Winkler (<i>Pediocactus winkleri</i>)	No	
cactus, Wright fishhook (<i>Sclerocactus wrightiae</i>)	No	
cat's-eye, Terlingua Creek (<i>Cryptantha crassipes</i>)	No	
Catchfly, Spalding's (<i>Silene spaldingii</i>)	No	
ceanothus, coyote (<i>Ceanothus ferrisae</i>)	No	
ceanothus, Vail Lake (<i>Ceanothus ophiophilus</i>)	No	
centaury, spring-loving (<i>Centaureum namophilum</i>)	Yes	50 CFR 17.96(a)

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

Species *	Critical Habitat Information	CFR/FR Locations
chaffseed, American (<i>Schwalbea americana</i>)	No	
Checker-mallow, Keck's (<i>Sidalcea keckii</i>)	Yes	50 CFR 17.96(a)
checker-mallow, Nelson's (<i>Sidalcea nelsoniana</i>)	No	
checker-mallow, pedate (<i>Sidalcea pedata</i>)	No	
checkermallow, Wenatchee Mountains (<i>Sidalcea oregana</i> var. <i>calva</i>)	Yes	50 CFR 17.96(a)
cinquefoil, Robbins' (<i>Potentilla robbinsiana</i>)	No	
clarkia, Pismo (<i>Clarkia speciosa</i> ssp. <i>immaculata</i>)	No	
clarkia, Presidio (<i>Clarkia franciscana</i>)	No	
clarkia, Springville (<i>Clarkia springvillensis</i>)	No	
clarkia, Vine Hill (<i>Clarkia imbricata</i>)	No	
Cliff-rose, Arizona (<i>Purshia</i> (= <i>Cowania</i>) <i>subintegra</i>)	No	
clover, Monterey (<i>Trifolium trichocalyx</i>)	No	
clover, running buffalo (<i>Trifolium stoloniferum</i>)	No	
clover, showy Indian (<i>Trifolium amoenum</i>)	No	
coneflower, smooth (<i>Echinacea laevigata</i>)	No	
coneflower, Tennessee purple (<i>Echinacea tennesseensis</i>)	No	
cory cactus, bunched (<i>Coryphantha ramillosa</i>)	No	
crownbeard, big-leaved (<i>Verbesina dissita</i>)	No	
crownscale, San Jacinto Valley (<i>Atriplex coronata</i> var. <i>notatior</i>)	No	
Cycladenia, Jones (<i>Cycladenia jonesii</i> (= <i>humilis</i>))	No	
daisy, lakeside (<i>Hymenoxys herbacea</i>)	No	
daisy, Maguire (<i>Erigeron maguirei</i>)	No	
daisy, Parish's (<i>Erigeron parishii</i>)	Yes	50 CFR 17.96(a)
daisy, Willamette (<i>Erigeron decumbens</i> var. <i>decumbens</i>)	No	
dawn-flower, Texas prairie (<i>Hymenoxys texana</i>)	No	
desert-parsley, Bradshaw's (<i>Lomatium bradshawii</i>)	No	
dogweed, ashy (<i>Thymophylla tephroleuca</i>)	No	
dudleya, Conejo (<i>Dudleya abramsii</i> ssp. <i>parva</i>)	No	
dudleya, marcescent (<i>Dudleya cymosa</i> ssp. <i>marcescens</i>)	No	
dudleya, Santa Clara Valley (<i>Dudleya seichellii</i>)	No	
dudleya, Santa Cruz Island (<i>Dudleya nesiotica</i>)	No	
dudleya, Verity's (<i>Dudleya verityi</i>)	No	
dudleyea, Santa Monica Mountains (<i>Dudleya cymosa</i> ssp. <i>ovatifolia</i>)	No	
dwarf-flax, Marin (<i>Hesperolinon congestum</i>)	No	
evening-primrose, Antioch Dunes (<i>Oenothera deltoides</i> ssp. <i>howellii</i>)	No	

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

Species *	Critical Habitat Information	CFR/FR Locations
evening-primrose, Eureka Valley (<i>Oenothera avita</i> ssp. <i>eurekaensis</i>)	No	
evening-primrose, San Benito (<i>Camissonia benitensis</i>)	Yes	50 CFR 17.96(a)
fiddleneck, large-flowered (<i>Amsinckia grandiflora</i>)	Yes	50 CFR 17.96(a)
flannelbush, Mexican (<i>Fremontodendron mexicanum</i>)	No	
fleabane, Zuni (<i>Erigeron rhizomatus</i>)	No	
four-o'clock, MacFarlane's (<i>Mirabilis macfarlanei</i>)	No	
frankenia, Johnston's (<i>Frankenia johnstonii</i>)	No	
fringe-tree, pygmy (<i>Chionanthus pygmaeus</i>)	No	
fringe-pod, Santa Cruz Island (<i>Thysanocarpus conchuliferus</i>)	No	
gardenia (=Na'u), Hawaiian (<i>Gardenia brighamii</i>)	No	
geranium, Hawaiian red-flowered (<i>Geranium arboreum</i>)	Yes	50 CFR 17.96(a)
gerardia, sandplain (<i>Agalinis acuta</i>)	No	
gilia, Hoffmann's slender-flowered (<i>Gilia tenuiflora</i> ssp. <i>hoffmannii</i>)	No	
gilia, Monterey (<i>Gilia tenuiflora</i> ssp. <i>arenaria</i>)	No	
goldenrod, Blue Ridge (<i>Solidago spithamea</i>)	No	
goldenrod, Short's (<i>Solidago shortii</i>)	No	
goldenrod, white-haired (<i>Solidago albopilosa</i>)	No	
gourd, Okeechobee (<i>Cucurbita okeechobeensis</i> ssp. <i>okeechobeensis</i>)	No	
ground-plum, Guthrie's (=Pyne's) (<i>Astragalus bibullatus</i>)	No	
groundsel, San Francisco Peaks (<i>Senecio franciscanus</i>)	No	
gumplant, Ash Meadows (<i>Grindelia fraxino-pratensis</i>)	Yes	50 CFR 17.96(a)
Ha'iwale (<i>Cyrtandra limahuliensis</i>)	Yes	50 CFR 17.96(a)
Ha'iwale (<i>Cyrtandra munroi</i>)	Yes	50 CFR 17.96(a)
Haha (<i>Cyanea asarifolia</i>)	Yes	50 CFR 17.96(a)
haha (<i>Cyanea copelandii</i> ssp. <i>haleakalaensis</i>)	Yes	50 CFR 17.96(a)
haha (<i>Cyanea dunbarii</i>)	Yes	50 CFR 17.96(a)
Haha (<i>Cyanea glabra</i>)	Yes	50 CFR 17.96(a)
haha (<i>Cyanea grimesiana</i> ssp. <i>grimesiana</i>)	Yes	50 CFR 17.96(a)

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

Species *	Critical Habitat Information	CFR/FR Locations
haha (<i>Cyanea hamatiflora</i> ssp. <i>hamatiflora</i>)	Yes	50 CFR 17.96(a)
haha (<i>Cyanea macrostegia</i> ssp. <i>gibsonii</i>)	No	
Haha (<i>Cyanea mannii</i>)	Yes	50 CFR 17.96(a)
Haha (<i>Cyanea mceldowneyi</i>)	Yes	50 CFR 17.96(a)
Haha (<i>Cyanea procera</i>)	Yes	50 CFR 17.96(a)
Haha (<i>Cyanea recta</i>)	Yes	50 CFR 17.96(a)
Haha (<i>Cyanea remyi</i>)	Yes	50 CFR 17.96(a)
Haha (<i>Cyanea undulata</i>)	Yes	50 CFR 17.96(a)
harebells, Avon Park (<i>Crotalaria avonensis</i>)	No	
hau kuahiwi (<i>Hibiscadelphus woodii</i>)	Yes	50 CFR 17.96(a)
heartleaf, dwarf-flowered (<i>Hexastylis naniflora</i>)	No	
heather, mountain golden (<i>Hudsonia montana</i>)	Yes	50 CFR 17.96(a)
Heau (<i>Exocarpos luteolus</i>)	Yes	50 CFR 17.96(a)
hedyotis, Na Pali beach (<i>Hedyotis st.-johnii</i>)	Yes	50 CFR 17.96(a)
hibiscus, Clay's (<i>Hibiscus clayi</i>)	Yes	50 CFR 17.96(a)
hypericum, highlands scrub (<i>Hypericum cumulicola</i>)	No	
iliau, dwarf (<i>Wilkesia hobbdi</i>)	Yes	50 CFR 17.96(a)
indian paintbrush, San Clemente Island (<i>Castilleja grisea</i>)	No	
ipomopsis, Holy Ghost (<i>Ipomopsis sancti-spiritus</i>)	No	
ivesia, Ash Meadows (<i>Ivesia kingii</i> var. <i>eremica</i>)	Yes	50 CFR 17.96(a)
jacquemontia, beach (<i>Jacquemontia reclinata</i>)	No	
jewelflower, California (<i>Caulanthus californicus</i>)	No	
jewelflower, Tiburon (<i>Streptanthus niger</i>)	No	
Kamakahala (<i>Labordia lydgatei</i>)	Yes	50 CFR 17.96(a)
kamakahala (<i>Labordia tinifolia</i> var. <i>lanaiensis</i>)	No	
kamakahala (<i>Labordia tinifolia</i> var. <i>wahiawaensis</i>)	Yes	50 CFR 17.96(a)
Kamakahala (<i>Labordia triflora</i>)	No	

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

Species *	Critical Habitat Information	CFR/FR Locations
kauai hau kuahiwi (<i>Hibiscadelphus distans</i>)	No	
Kaulu (<i>Pteralyxia kauaiensis</i>)	Yes	50 CFR 17.96(a)
Kio'ele (<i>Hedyotis coriacea</i>)	Yes	50 CFR 17.96(a)
ko'oko'olau (<i>Bidens micrantha ssp. kalealaha</i>)	Yes	50 CFR 17.96(a)
Ko'oko'olau (<i>Bidens wiebkei</i>)	Yes	50 CFR 17.96(a)
Ko'oloa'ula (<i>Abutilon menziesii</i>)	No	
Kohe malama malama o kanaloa (<i>Kanaloa kahoowawensis</i>)	Yes	50 CFR 17.96(a)
Koki'o (<i>Kokia kauaiensis</i>)	Yes	50 CFR 17.96(a)
koki'o ke'oke'o (<i>Hibiscus arnottianus ssp. immaculatus</i>)	Yes	50 CFR 17.96(a)
koki'o ke'oke'o (<i>Hibiscus waimeae ssp. hanneriae</i>)	Yes	50 CFR 17.96(a)
Kolea (<i>Myrsine linearifolia</i>)	Yes	50 CFR 17.96(a)
Kopa (<i>Hedyotis schlechtendahlia</i> var. <i>remyi</i>)	No	
kuahiwi laukahi (<i>Plantago princeps</i>)	Yes	50 CFR 17.96(a)
Kuawawaenuhu (<i>Alsiniidendron lychnoides</i>)	Yes	50 CFR 17.96(a)
Kulu'i (<i>Nototrichium humile</i>)	Yes	50 CFR 17.96(a)
larkspur, Baker's (<i>Delphinium bakeri</i>)	Yes	50 CFR 17.96(a)
larkspur, San Clemente Island (<i>Delphinium variegatum ssp. kinkiense</i>)	No	
larkspur, yellow (<i>Delphinium luteum</i>)	Yes	50 CFR 17.96(a)
Laulihilihi (<i>Schiedea stellarioides</i>)	Yes	50 CFR 17.96(a)
layia, beach (<i>Layia carnosa</i>)	No	
leather flower, Alabama (<i>Clematis socialis</i>)	No	
leather flower, Morefield's (<i>Clematis morefieldii</i>)	No	
liveforever, Laguna Beach (<i>Dudleya stolonifera</i>)	No	
liveforever, Santa Barbara Island (<i>Dudleya traskiae</i>)	No	
locoweed, Fassett's (<i>Oxytropis campestris var. chartacea</i>)	No	
loosestrife, rough-leaved (<i>Lysimachia asperulaefolia</i>)	No	
lousewort, Furbish (<i>Pedicularis furbishiae</i>)	No	

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

Species *	Critical Habitat Information	CFR/FR Locations
lupine, clover (<i>Lupinus tidedromii</i>)	No	
Lupine, Kincaid's (<i>Lupinus sulphureus</i> (=oreganus) ssp. <i>kincaidii</i> (=var. <i>kincaidii</i>))	No	
lupine, Nipomo Mesa (<i>Lupinus nipomensis</i>)	No	
ma'o hau hele, (=native yellow hibiscus) (<i>Hibiscus brackenridgei</i>)	Yes	50 CFR 17.96(a)
Ma'oli'oli (<i>Schiedea apokremnos</i>)	Yes	50 CFR 17.96(a)
Mahoe (<i>Alectryon macrococcus</i>)	Yes	50 CFR 17.96(a)
Makou (<i>Peucedanum sandwicense</i>)	Yes	50 CFR 17.96(a)
malacothrix, island (<i>Malacothrix squalida</i>)	No	
malacothrix, Santa Cruz Island (<i>Malacothrix indecora</i>)	No	
mallow, Kern (<i>Eremalche kernensis</i>)	No	
mallow, Peter's Mountain (<i>Iliamna corei</i>)	No	
manioc, Walker's (<i>Manihot walkerae</i>)	No	
manzanita, Del Mar (<i>Arctostaphylos glandulosa</i> ssp. <i>crassifolia</i>)	No	
manzanita, Ione (<i>Arctostaphylos myrtifolia</i>)	No	
manzanita, Morro (<i>Arctostaphylos morroensis</i>)	No	
manzanita, pallid (<i>Arctostaphylos pallida</i>)	No	
manzanita, Santa Rosa Island (<i>Arctostaphylos confertiflora</i>)	No	
Mapele (<i>Cyrtandra cyaneoides</i>)	Yes	50 CFR 17.96(a)
Mehamehame (<i>Flueggea neowawraea</i>)	Yes	50 CFR 17.96(a)
milk-vetch, Applegate's (<i>Astragalus applegatei</i>)	No	
milk-vetch, Ash meadows (<i>Astragalus phoenix</i>)	Yes	50 CFR 17.96(a)
milk-vetch, Braunton's (<i>Astragalus brauntonii</i>)	No	
milk-vetch, Clara Hunt's (<i>Astragalus clarianus</i>)	No	
milk-vetch, Coachella Valley (<i>Astragalus lentiginosus</i> var. <i>coachellae</i>)	No	
milk-vetch, coastal dunes (<i>Astragalus tener</i> var. <i>titi</i>)	No	
milk-vetch, Cushenbury (<i>Astragalus albens</i>)	Yes	50 CFR 17.96(a)
milk-vetch, Deseret (<i>Astragalus desereticus</i>)	No	
milk-vetch, Fish Slough (<i>Astragalus lentiginosus</i> var. <i>piscinensis</i>)	No	
milk-vetch, heliotrope (<i>Astragalus montii</i>)	Yes	50 CFR 17.96(a)
milk-vetch, Holmgren (<i>Astragalus holmgreniorum</i>)	No	

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

Species *	Critical Habitat Information	CFR/FR Locations
milk-vetch, Jesup's (<i>Astragalus robbinsii</i> var. <i>jesupi</i>)	No	
milk-vetch, Lane Mountain (<i>Astragalus jaegerianus</i>)	Yes	50 CFR 17.96(a)
milk-vetch, Mancos (<i>Astragalus humillimus</i>)	No	
milk-vetch, Osterhout (<i>Astragalus osterhoutii</i>)	No	
milk-vetch, Peirson's (<i>Astragalus magdalenae</i> var. <i>peirsonii</i>)	Yes	50 CFR 17.96(a)
milk-vetch, Sentry (<i>Astragalus cremnophylax</i> var. <i>cremnophylax</i>)	No	
milk-vetch, Shivwitz (<i>Astragalus ampullarioides</i>)	No	
milk-vetch, triple-ribbed (<i>Astragalus tricarinatus</i>)	No	
Milk-vetch, Ventura Marsh (<i>Astragalus pycnostachyus</i> var. <i>lanosissimus</i>)	Yes	50 CFR 17.96(a)
milkweed, Mead's (<i>Asclepias meadii</i>)	No	
milkweed, Welsh's (<i>Asclepias welshii</i>)	Yes	50 CFR 17.96(a)
mint, Garrett's (<i>Dicerandra christmanii</i>)	No	
mint, longspurred (<i>Dicerandra cornutissima</i>)	No	
mint, scrub (<i>Dicerandra frutescens</i>)	No	
monardella, willowy (<i>Monardella linoides</i> ssp. <i>viminea</i>)	No	
monkshood, northern wild (<i>Aconitum noveboracense</i>)	No	
mountain balm, Indian Knob (<i>Eriodictyon altissimum</i>)	No	
mountain-mahogany, Catalina Island (<i>Cercocarpus traskiae</i>)	No	
mustard, Carter's (<i>Warea carteri</i>)	No	
mustard, Penland alpine fen (<i>Eutrema penlandii</i>)	No	
mustard, slender-petaled (<i>Thelypodium stenopetalum</i>)	No	
na'ena'e (<i>Dubautia latifolia</i>)	Yes	50 CFR 17.96(a)
na'ena'e (<i>Dubautia pauciflorula</i>)	Yes	50 CFR 17.96(a)
na'ena'e (<i>Dubautia plantaginea</i> ssp. <i>humilis</i>)	Yes	50 CFR 17.96(a)
nani wai'ale'ale (<i>Viola kauaiensis</i> var. <i>wahiawaensis</i>)	Yes	50 CFR 17.96(a)
naupaka, dwarf (<i>Scaevola coriacea</i>)	No	
Nehe (<i>Lipochaeta fauriei</i>)	Yes	50 CFR 17.96(a)
Nehe (<i>Lipochaeta kamolensis</i>)	Yes	50 CFR 17.96(a)
nehe (<i>Lipochaeta micrantha</i>)	Yes	50 CFR 17.96(a)

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

Species *	Critical Habitat Information	CFR/FR Locations
Nehe (<i>Lipochaeta waimeaensis</i>)	Yes	50 CFR 17.96(a)
No common name (<i>Abutilon eremitopetalum</i>)	Yes	50 CFR 17.96(a)
No common name (<i>Alsinidendron viscosum</i>)	Yes	50 CFR 17.96(a)
No common name (<i>Bonamia menziesii</i>)	Yes	50 CFR 17.96(a)
No common name (<i>Chamaesyce halemanui</i>)	Yes	50 CFR 17.96(a)
No common name (<i>Delissea rhytidosperma</i>)	Yes	50 CFR 17.96(a)
No common name (<i>Geocarpon minimum</i>)	No	
No common name (<i>Gouania hillebrandii</i>)	Yes	50 CFR 17.96(a)
No common name (<i>Gouania meyenii</i>)	Yes	50 CFR 17.96(a)
No common name (<i>Hesperomannia arborescens</i>)	Yes	50 CFR 17.96(a)
No common name (<i>Hesperomannia arbuscula</i>)	Yes	50 CFR 17.96(a)
No common name (<i>Hesperomannia lydgatei</i>)	Yes	50 CFR 17.96(a)
No common name (<i>Lobelia niihauensis</i>)	Yes	50 CFR 17.96(a)
No common name (<i>Lysimachia filifolia</i>)	Yes	50 CFR 17.96(a)
No common name (<i>Lysimachia lydgatei</i>)	Yes	50 CFR 17.96(a)
No common name (<i>Lysimachia maxima</i>)	Yes	50 CFR 17.96(a)
No common name (<i>Munroidendron racemosum</i>)	Yes	50 CFR 17.96(a)
No common name (<i>Neraudia sericea</i>)	Yes	50 CFR 17.96(a)
No common name (<i>Phyllostegia glabra</i> var. <i>lanaiensis</i>)	No	
No common name (<i>Phyllostegia knudsenii</i>)	Yes	50 CFR 17.96(a)
No common name (<i>Phyllostegia mannii</i>)	Yes	50 CFR 17.96(a)
No common name (<i>Phyllostegia mollis</i>)	Yes	50 CFR 17.96(a)

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

Species *	Critical Habitat Information	CFR/FR Locations
No common name (<i>Phyllostegia waimeae</i>)	Yes	50 CFR 17.96(a)
No common name (<i>Phyllostegia wawrana</i>)	Yes	50 CFR 17.96(a)
No common name (<i>Remya kauaiensis</i>)	Yes	50 CFR 17.96(a)
No common name (<i>Remya montgomeryi</i>)	Yes	50 CFR 17.96(a)
No common name (<i>Sanicula purpurea</i>)	Yes	50 CFR 17.96(a)
No common name (<i>Schiedea haleakalensis</i>)	Yes	50 CFR 17.96(a)
No common name (<i>Schiedea helleri</i>)	Yes	50 CFR 17.96(a)
No common name (<i>Schiedea kauaiensis</i>)	Yes	50 CFR 17.96(a)
No common name (<i>Schiedea lydgatei</i>)	Yes	50 CFR 17.96(a)
No common name (<i>Schiedea membranacea</i>)	Yes	50 CFR 17.96(a)
No common name (<i>Schiedea nuttallii</i>)	Yes	50 CFR 17.96(a)
No common name (<i>Schiedea sarmentosa</i>)	Yes	50 CFR 17.96(a)
No common name (<i>Schiedea spergulina</i> var. <i>leiopoda</i>)	Yes	50 CFR 17.96(a)
No common name (<i>Schiedea spergulina</i> var. <i>spergulina</i>)	Yes	50 CFR 17.96(a)
No common name (<i>Silene alexandri</i>)	Yes	50 CFR 17.96(a)
No common name (<i>Silene lanceolata</i>)	Yes	50 CFR 17.96(a)
No common name (<i>Spermolepis hawaiiensis</i>)	Yes	50 CFR 17.96(a)
No common name (<i>Stenogyne bifida</i>)	Yes	50 CFR 17.96(a)
No common name (<i>Stenogyne campanulata</i>)	Yes	50 CFR 17.96(a)
No common name (<i>Tetramolopium remyi</i>)	Yes	50 CFR 17.96(a)
No common name (<i>Tetramolopium rockii</i>)	Yes	50 CFR 17.96(a)

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

Species *	Critical Habitat Information	CFR/FR Locations
No common name (<i>Vigna o-wahuensis</i>)	Yes	50 CFR 17.96(a)
No common name (<i>Viola helenae</i>)	Yes	50 CFR 17.96(a)
No common name (<i>Viola lanaiensis</i>)	No	
No common name (<i>Xylosma crenatum</i>)	Yes	50 CFR 17.96(a)
Nohoanu (<i>Geranium multiflorum</i>)	Yes	50 CFR 17.96(a)
oak, Hinckley (<i>Quercus hinckleyi</i>)	No	
oha (<i>Delissea rivularis</i>)	Yes	50 CFR 17.96(a)
ohai (<i>Sesbania tomentosa</i>)	Yes	50 CFR 17.96(a)
olulu (<i>Brighamia insignis</i>)	Yes	50 CFR 17.96(a)
oxytheca, cushenbury (<i>Oxytheca parishii</i> var. <i>goodmaniana</i>)	Yes	50 CFR 17.96(a)
paintbrush, ash-grey (<i>Castilleja cinerea</i>)	No	
paintbrush, golden (<i>Castilleja levisecta</i>)	No	
paintbrush, soft-leaved (<i>Castilleja mollis</i>)	No	
paintbrush, Tiburon (<i>Castilleja affinis</i> ssp. <i>neglecta</i>)	No	
Pamakani (<i>Tetramolopium capillare</i>)	Yes	50 CFR 17.96(a)
pawpaw, beautiful (<i>Deeringothamnus pulchellus</i>)	No	
pawpaw, four-petal (<i>Asimina tetramera</i>)	No	
pawpaw, Rugel's (<i>Deeringothamnus rugelii</i>)	No	
penny-cress, Kneeland Prairie (<i>Thlaspi californicum</i>)	Yes	50 CFR 17.96(a)
pennyroyal, Todsens (<i>Hedeoma todsenii</i>)	Yes	50 CFR 17.96(a)
penstemon, blowout (<i>Penstemon haydenii</i>)	No	
pentachaeta, Lyon's (<i>Pentachaeta lyonii</i>)	No	
pentachaeta, white-rayed (<i>Pentachaeta bellidiflora</i>)	No	
phacelia, clay (<i>Phacelia argillacea</i>)	No	
phacelia, island (<i>Phacelia insularis</i> ssp. <i>insularis</i>)	No	
phlox, Texas trailing (<i>Phlox nivalis</i> ssp. <i>texensis</i>)	No	
phlox, Yreka (<i>Phlox hirsuta</i>)	No	
Pigeon Wings (<i>Clitoria fragrans</i>)	No	
Pilo (<i>Hedyotis mannii</i>)	Yes	50 CFR 17.96(a)
pinkroot, gentian (<i>Spigelia gentianoides</i>)	No	
pitaya, Davis' green (<i>Echinocereus viridiflorus</i> var. <i>davisii</i>)	No	

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

Species *	Critical Habitat Information	CFR/FR Locations
plum, scrub (<i>Prunus geniculata</i>)	No	
Po'e (<i>Portulaca sclerocarpa</i>)	Yes	50 CFR 17.96(a)
polygala, Lewton's (<i>Polygala lewtonii</i>)	No	
poppy, Sacramento prickly (<i>Argemone pleiacantha ssp. pinnatisecta</i>)	No	
poppy-mallow, Texas (<i>Callirhoe scabriuscula</i>)	No	
potato-bean, Price's (<i>Apios priceana</i>)	No	
potentilla, Hickman's (<i>Potentilla hickmanii</i>)	No	
prairie-clover, leafy (<i>Dalea foliosa</i>)	No	
primrose, Maguire (<i>Primula maguirei</i>)	No	
Pua 'ala (<i>Brighamia rockii</i>)	Yes	50 CFR 17.96(a)
pussypaws, Mariposa (<i>Calyptridium pulchellum</i>)	No	
reed-mustard, Barneby (<i>Schoenocrambe barnebyi</i>)	No	
reed-mustard, clay (<i>Schoenocrambe argillacea</i>)	No	
reed-mustard, shrubby (<i>Schoenocrambe suffrutescens</i>)	No	
remya, Maui (<i>Remya mauiensis</i>)	Yes	50 CFR 17.96(a)
ridge-cress, Barneby (<i>Lepidium barnebyanum</i>)	No	
rock-cress, Braun's (<i>Arabis perstellata</i>)	Yes	50 CFR 17.96(a)
rock-cress, Hoffmann's (<i>Arabis hoffmannii</i>)	No	
rock-cress, McDonald's (<i>Arabis mcdonaldiana</i>)	No	
rock-cress, shale barren (<i>Arabis serotina</i>)	No	
rockcress, Santa Cruz Island (<i>Sibara filifolia</i>)	No	
rosemary, Cumberland (<i>Conradina verticillata</i>)	No	
rosemary, Etonia (<i>Conradina etonia</i>)	No	
rosemary, short-leaved (<i>Conradina brevifolia</i>)	No	
roseroot, Leedy's (<i>Sedum integrifolium ssp. leedyi</i>)	No	
rush-pea, slender (<i>Hoffmannseggia tenella</i>)	No	
rush-rose, island (<i>Helianthemum greenei</i>)	No	
sand-verbena, large-fruited (<i>Abronia macrocarpa</i>)	No	
sandalwood, Lanai (= 'iliahi) (<i>Santalum freycinetianum var. lanaiense</i>)	No	
sandwort, Bear Valley (<i>Arenaria ursina</i>)	No	
sandwort, Cumberland (<i>Arenaria cumberlandensis</i>)	No	
skullcap, large-flowered (<i>Scutellaria montana</i>)	No	
Snakeroot (<i>Eryngium cuneifolium</i>)	No	
snowbells, Texas (<i>Styrax texanus</i>)	No	
spineflower, Howell's (<i>Chorizanthe howellii</i>)	No	

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

Species *	Critical Habitat Information	CFR/FR Locations
spineflower, Monterey (<i>Chorizanthe pungens</i> var. <i>pungens</i>)	Yes	50 CFR 17.96(a)
spineflower, Orcutt's (<i>Chorizanthe orcuttiana</i>)	No	
spineflower, Robust (incl. Scotts Valley) (<i>Chorizanthe robusta</i> (incl. vars. <i>robusta</i> and <i>hartwegii</i>))	Yes	50 CFR 17.96(a)
spineflower, slender-horned (<i>Dodecahema leptoceras</i>)	No	
spineflower, Sonoma (<i>Chorizanthe valida</i>)	No	
spiraea, Virginia (<i>Spiraea virginiana</i>)	No	
spurge, telephus (<i>Euphorbia telephioides</i>)	No	
stickseed, showy (<i>Hackelia venusta</i>)	No	
stonecrop, Lake County (<i>Parvisedum leiocarpum</i>)	No	
sumac, Michaux's (<i>Rhus michauxii</i>)	No	
sunburst, Hartweg's golden (<i>Pseudobahia bahiifolia</i>)	No	
sunburst, San Joaquin adobe (<i>Pseudobahia peirsonii</i>)	No	
sunflower, Eggert's (<i>Helianthus eggertii</i>)	No	
sunflower, Schweinitz's (<i>Helianthus schweinitzii</i>)	No	
sunray, Ash Meadows (<i>Enceliopsis nudicaulis</i> var. <i>corrugata</i>)	No	
taraxacum, California (<i>Taraxacum californicum</i>)	No	
tarplant, Gaviota (<i>Hemizonia increscens</i> ssp. <i>villosa</i>)	Yes	50 CFR 17.96(a)
tarplant, Otay (<i>Deinandra</i> (= <i>Hemizonia</i>) <i>conjugens</i>)	Yes	50 CFR 17.96(a)
tarplant, Santa Cruz (<i>Holocarpha macradenia</i>)	Yes	50 CFR 17.96(a)
thistle, La Graciosa (<i>Cirsium loncholepis</i>)	Yes	50 CFR 17.96(a)
thistle, Pitcher's (<i>Cirsium pitcheri</i>)	No	
thistle, Sacramento Mountains (<i>Cirsium vinaceum</i>)	No	
thistle, Suisun (<i>Cirsium hydrophilum</i> var. <i>hydrophilum</i>)	No	
thornmint, San Diego (<i>Acanthomintha ilicifolia</i>)	No	
townsendia, Last Chance (<i>Townsendia aprica</i>)	No	
twinpod, Dudley Bluffs (<i>Physaria obcordata</i>)	No	
Uhiuhi (<i>Caesalpinia kawaiense</i>)	No	
vervain, Red Hills (<i>Verbena californica</i>)	No	
wallflower, Contra Costa (<i>Erysimum capitatum</i> var. <i>angustatum</i>)	Yes	50 CFR 17.96(a)
wallflower, Menzies' (<i>Erysimum menziesii</i>)	No	
whitlow-wort, papery (<i>Paronychia chartacea</i>)	No	
wild-buckwheat, clay-loving (<i>Eriogonum pelinophilum</i>)	Yes	50 CFR 17.96(a)
wild-buckwheat, gypsum (<i>Eriogonum gypsophilum</i>)	Yes	50 CFR 17.96(a)

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

Species *	Critical Habitat Information	CFR/FR Locations
wild-buckwheat, southern mountain (<i>Eriogonum kennedyi</i> var. <i>austromontanum</i>)	No	
wire-lettuce, Malheur (<i>Stephanomeria malheurensis</i>)	Yes	50 CFR 17.96(a)
Wireweed (<i>Polygonella basiramia</i>)	No	
woodland-star, San Clemente Island (<i>Lithophragma maximum</i>)	No	
woolly-star, Hoover's (<i>Eriastrum hooveri</i>)	No	
woolly-star, Santa Ana River (<i>Eriastrum densifolium</i> ssp. <i>sanctorum</i>)	No	
wooly-threads, San Joaquin (<i>Monolopia</i> (= <i>Lembertia</i>) <i>congdonii</i>)	No	
yellowhead, desert (<i>Yermo xanthocephalus</i>)	Yes	50 CFR 17.96(a)
yerba santa, Lompoc (<i>Eriodictyon capitatum</i>)	Yes	50 CFR 17.96(a)
ziziphus, Florida (<i>Ziziphus celata</i>)	No	
Ferns and Allies		
Lifeform: Aquatic		
quillwort, black spored (<i>Isoetes melanospora</i>)	No	
quillwort, Louisiana (<i>Isoetes louisianensis</i>)	No	
quillwort, mat-forming (<i>Isoetes tegetiformans</i>)	No	
Lifeform: Terrestrial		
diellia, asplenium-leaved (<i>Diellia erecta</i>)	Yes	50 CFR 17.96(a)
fern, Alabama streak-sorus (<i>Thelypteris pilosa</i> var. <i>alabamensis</i>)	No	
fern, American hart's-tongue (<i>Asplenium scolopendrium</i> var. <i>americanum</i>)	No	
fern, pendant kihi (<i>Adenophorus periens</i>)	Yes	50 CFR 17.96(a)
No common name (<i>Diellia pallida</i>)	Yes	50 CFR 17.96(a)
No common name (<i>Diellia unisora</i>)	Yes	50 CFR 17.96(a)
No common name (<i>Diplazium molokaiense</i>)	Yes	50 CFR 17.96(a)
No common name (<i>Pteris lidgatei</i>)	Yes	50 CFR 17.96(a)

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

Species *	Critical Habitat Information	CFR/FR Locations
Pauoa (<i>Ctenitis squamigera</i>)	Yes	50 CFR 17.96(a)
wawae`iole (<i>Huperzia mannii</i>)	Yes	50 CFR 17.96(a)
Lichens		
Lifeform: Terrestrial		
cladonia, Florida perforate (<i>Cladonia perforata</i>)	No	
lichen, rock gnome (<i>Gymnoderma lineare</i>)	No	
Monocots		
Lifeform: Aquatic		
arrowhead, bunched (<i>Sagittaria fasciculata</i>)	No	
beaked-rush, Knieskern's (<i>Rhynchospora knieskernii</i>)	No	
bulrush, Northeastern (<i>Scirpus ancistrochaetus</i>)	No	
grass, Colusa (<i>Neostapfia colusana</i>)	No	
grass, Solano (<i>Tuctoria mucronata</i>)	Yes	50 CFR 17.96(a)
lily, Pitkin Marsh (<i>Lilium pardalinum ssp. pitkinense</i>)	No	
Orcutt grass, California (<i>Orcuttia californica</i>)	No	
Orcutt grass, hairy (<i>Orcuttia pilosa</i>)	Yes	50 CFR 17.96(a)
Orcutt grass, Sacramento (<i>Orcuttia viscida</i>)	Yes	50 CFR 17.96(a)
Orcutt grass, slender (<i>Orcuttia tenuis</i>)	Yes	50 CFR 17.96(a)
pink, swamp (<i>Helonias bullata</i>)	No	
pondweed, Little Aguja Creek (<i>Potamogeton clystocarpus</i>)	No	
seagrass, Johnson's (<i>Halophila johnsonii</i>)	Yes	50 CFR 226.213
sedge, Navajo (<i>Carex specuicola</i>)	Yes	50 CFR 17.96(a)
sedge, white (<i>Carex albida</i>)	No	
tuctoria, Greene's (<i>Tuctoria greenei</i>)	Yes	50 CFR 17.96(a)
water-plantain, Kral's (<i>Sagittaria secundifolia</i>)	No	
wild-rice, Texas (<i>Zizania texana</i>)	Yes	50 CFR 17.96(a)
Lifeform: Both		
sedge, golden (<i>Carex lutea</i>)	No	

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

Species *	Critical Habitat Information	CFR/FR Locations
Lifeform: Terrestrial		
agave, Arizona (<i>Agave arizonica</i>)	No	
alopecurus, Sonoma (<i>Alopecurus aequalis</i> var. <i>sonomensis</i>)	No	
beargrass, Britton's (<i>Nolina brittoniana</i>)	No	
bluegrass, Hawaiian (<i>Poa sandvicensis</i>)	Yes	50 CFR 17.96(a)
bluegrass, Mann's (<i>Poa mannii</i>)	Yes	50 CFR 17.96(a)
bluegrass, Napa (<i>Poa napensis</i>)	No	
bluegrass, San Bernardino (<i>Poa atropurpurea</i>)	No	
brodiaea, Chinese Camp (<i>Brodiaea pallida</i>)	No	
brodiaea, thread-leaved (<i>Brodiaea filifolia</i>)	No	
Fritillary, Gentner's (<i>Fritillaria gentneri</i>)	No	
grass, Eureka Dune (<i>Swallenia alexandrae</i>)	No	
grass, Tennessee yellow-eyed (<i>Xyris tennesseensis</i>)	No	
iris, dwarf lake (<i>Iris lacustris</i>)	No	
irisette, white (<i>Sisyrinchium dichotomum</i>)	No	
ischaemum, Hilo (<i>Ischaemum byrone</i>)	Yes	50 CFR 17.96(a)
Kamanomano (<i>Cenchrus agrimonoides</i>)	Yes	50 CFR 17.96(a)
ladies'-tresses, Canelo Hills (<i>Spiranthes delitescens</i>)	No	
ladies'-tresses, Navasota (<i>Spiranthes parksii</i>)	No	
ladies'-tresses, Ute (<i>Spiranthes diluvialis</i>)	No	
lau 'ehu (<i>Panicum niuhauense</i>)	Yes	50 CFR 17.96(a)
lily, Minnesota dwarf trout (<i>Erythronium propullans</i>)	No	
lily, Western (<i>Lilium occidentale</i>)	No	
lo'ulu (<i>Pritchardia munroi</i>)	Yes	50 CFR 17.96(a)
lo'ulu (<i>Pritchardia napaliensis</i>)	No	
lo'ulu (<i>Pritchardia viscosa</i>)	No	
No common name (<i>Gahnia lanaiensis</i>)	No	
No common name (<i>Mariscus fauriei</i>)	Yes	50 CFR 17.96(a)
No common name (<i>Mariscus pennatiformis</i>)	Yes	50 CFR 17.96(a)
No common name (<i>Platanthera holochila</i>)	Yes	50 CFR 17.96(a)
No common name (<i>Poa siphonoglossa</i>)	Yes	50 CFR 17.96(a)
onion, Munz's (<i>Allium munzii</i>)	No	

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

Species *	Critical Habitat Information	CFR/FR Locations
orchid, eastern prairie fringed (<i>Platanthera leucophaea</i>)	No	
orchid, western prairie fringed (<i>Platanthera praeclara</i>)	No	
panicgrass, Carter's (<i>Panicum fauriei</i> var. <i>carteri</i>)	Yes	50 CFR 17.96(a)
piperia, Yadon's (<i>Piperia yadonii</i>)	No	
pogonia, small whorled (<i>Isotria medeoloides</i>)	No	
Pu'uka'a (<i>Cyperus trachysanthos</i>)	Yes	50 CFR 17.96(a)
trillium, persistent (<i>Trillium persistens</i>)	No	
trillium, relict (<i>Trillium reliquum</i>)	No	
Wahane (<i>Pritchardia aylmer-robinsonii</i>)	No	

* Lifeform classification from FESTF IMS.

Table based on information found in the Threatened and Endangered Species Database (USFWS, 2005(m)).