Species at Risk on

Department of Defense Installations

Revised Report and Documentation

Prepared for:

Department of Defense

U.S. Fish and Wildlife Service

Submitted by:

NatureServe

January 2004

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1.0 Executive Summary

Department of Defense lands play an essential role in maintaining homeland security, and are also important for safeguarding the nation's natural heritage. Managing DOD lands in a way that both supports military readiness and sustains ecological integrity requires an understanding of the species and ecosystems that are found on and around these bases. What species at risk are found on these military lands? On which installations are they most abundant? How can management of habitat on military lands help maintain these species and avoid the need for their listing under the Endangered Species Act? This report helps the Department of Defense to answer these important questions.

Department of Defense lands are thought to support more federally listed species than any other major federal agency, and to harbor more imperiled species than lands managed by either the National Park Service or U.S. Fish and Wildlife Service (Groves et al. 2000a). Many military bases are located in biologically rich areas of the United States, including coastal areas where human development is a major threat to biodiversity. Some of these bases have become the last refuges of imperiled species habitat in rapidly urbanizing landscapes. Proactive conservation of imperiled species and their habitats on and around DOD installations can help preclude the need for federal listing, reduce recovery costs, and protect significant biological diversity, while enabling the services to continue providing high quality military training. NatureServe's work under this project is intended to assist the military in focusing conservation efforts towards species that may warrant federal listing if population declines occur or continue.

In this report we define ***species at risk*** as plant and animal species that are not yet federally listed as threatened or endangered under the Endangered Species Act, but that are either designated as candidates for listing or are regarded by NatureServe as critically imperiled or imperiled throughout their range. NatureServe provides two major types of analyses in the report: (1) analyses of species at risk that are highly dependent on DOD lands and management for their survival, and (2) analyses of installations with high numbers or densities of species at risk. These analyses aim to help DOD to direct resources towards both high priority species and high priority installations.

The key findings of our assessment are:

- Of the 729 DOD installations analyzed in this report, 224 (30%) contain species at risk, representing a total of 523 different species.
- Of these 523 species at risk, 47 are federal candidates, 136 are regarded by NatureServe as critically imperiled, and 340 are imperiled.
- The majority (67%) of these species at risk on a national basis are vascular plants.
- Geographic patterns for species at risk on military lands conform to nationwide patterns of species imperilment (Chaplin et al. 2000), with particularly high *numbers* of at-risk species occurring on installations in Hawaii, central and southern California, southern New Mexico, and parts of Florida. Geographic patterns of species at risk *density* further emphasize the importance of conservation efforts on installations in Hawaii, California, and Florida.

- In terms of total *numbers*, Army installations contain almost twice the number of at-risk species as Air Force and Navy installations. In terms of species at risk *density*, Army and Navy installations contain roughly three-fold greater densities than do Air Force, Marine Corps, and Army Corps of Engineers installations.
- Of the 729 DOD installations analyzed in this report, the majority harbor very few species at risk. Sixty-five percent of installations contain 1-2 species, 20% support 3-5 species, and 15% have 6 or more species.
- Twenty-four species at risk appear to be restricted to individual DOD installations, and occur nowhere else. Overall, 82 species at risk have at least half of their occurrences residing on individual installations.
- Twenty-four installations have five or more at-risk species occurring in their buffer areas. Many of these species are candidates for federal listing.

The key management implications that follow from our assessment are:

- The majority of species at risk that warrant management and conservation on a national basis are vascular plants, although reptiles and freshwater species may also deserve special attention.
- DOD should focus efforts and funding on protecting at-risk species and associated habitats on installations in biologically rich areas of the country, particularly central and southern California, Florida, and Hawaii.
- Several ecoregions contain installations with particularly high numbers of species at risk: Hawaii, California Central and South Coasts, Chihuahuan Desert, East Gulf Coastal Plain, and the South and Mid-Atlantic Coastal Plains. Given that many DOD installations occupy significant areas in these ecoregions, especially in the western United States (Leslie et al. 1996), conservation of at-risk species on these installations would likely contribute to overall efforts to conserve biodiversity within these ecoregions.
- If DOD sets priorities for species conservation funding by military service, resources could be directed toward the Army and Navy, both of which have significantly higher numbers and densities of species at risk than the other military services.
- On installations with relatively few species at risk, DOD may be able to implement single species management strategies. In contrast, for installations with many at-risk species, DOD may need to implement multi-species or ecosystem level management plans.
- Natural resource managers of installations have an important responsibility to conserve and protect species at risk that are nearly (58 species) or completely (24 species) restricted to DOD lands. Conservation efforts on the 12 installations shown in Table 1 (see section 4.3.2) that contain at-risk species that occur nowhere else are perhaps the most vital because these species are so highly dependent on military management activities.
- DOD should focus resources on protecting closely adjoining lands from encroachment, particularly on installations with high numbers and/or densities of at-risk species. DOD also should work with neighboring landowners to protect species at risk that occur in buffer areas surrounding installations.

2.0 Introduction – Project Description

Managing Department of Defense lands in a way that both supports military readiness and sustains ecological integrity requires an understanding of the species and ecosystems that are found on and around these bases. The information and analyses supplied through this project by NatureServe and its member natural heritage programs provides the U.S. Department of Defense (DOD) and the U.S. Fish and Wildlife Service (FWS) with key findings about species at risk on military bases.

Department of Defense lands are thought to support more federally listed species than any other major federal agency, and to harbor more imperiled species than lands managed by either the National Park Service or U.S. Fish and Wildlife Service (Groves et al. 2000a). Many military bases are located in biologically rich areas of the United States, including coastal areas where human development is a major threat to biodiversity. Some of these bases have become the last refuges of imperiled species habitat in rapidly urbanizing landscapes.

This report should assist the military in focusing efforts towards conservation of species that may soon need federal listing if population declines occur or continue. Some of these at-risk species may be endemic to military landholdings or dependent on military efforts to remain viable or achieve recovery. Proactive conservation of imperiled species and their habitats on and around DOD installations can help preclude the need for federal listing, reduce recovery costs, and protect significant biological diversity, while enabling the services to continue providing high quality military training.

For the purposes of this project we define ***species at risk*** (also referred to as *at-risk species*) as plant and animal species that are not federally listed as threatened or endangered under the U.S. Endangered Species Act, but that are either federally listed as candidates or are ranked by NatureServe as critically imperiled or imperiled throughout their range. Species at risk included in this report must also have at least one population that occurs on or near (within a 2-kilometer/1.24-mile buffer) a Department of Defense installation.

In this report, NatureServe provides two major types of analyses which are detailed in the results section: (1) analyses of species at risk that occur only or mostly on DOD lands or that are otherwise highly dependent on DOD management for their survival, and (2) analyses of installations with high numbers or densities of species at risk. These analyses aim to help DOD to direct resources towards both high priority species at risk and high priority installations.

This report is an extension of the report completed by NatureServe for the Department of Defense in July 2002, "Species of Concern on Department of Defense Installations" (note name change from "species of concern" to "species at risk"). In the original 2002 report, NatureServe provided preliminary analyses in the form of reports, tables and maps. This January 2004 revised report uses the same data set, but expands on the analyses from the preliminary project report and highlights key findings in a results

section (section 4). We also did more in-depth analyses of species at risk within installations and in buffer areas surrounding installations. In addition, NatureServe has included some new key analyses in this revised report, including:

- A figure showing the number of bases that fall into different ranges of numbers of species at risk
- Several analyses of the *density* of species at risk on DOD installations

This report contains the following major sections:

- Section 3 (Methods) describes the general methods NatureServe and its member natural heritage programs employ to gather and maintain standardized information on biological diversity, as well as the methodology and analyses used in this assessment.
- Section 4 (Results) outlines key findings of the assessment and provides suggestions and guidelines for the use of the project results.
- Section 5 (Conclusion) offers management recommendations for DOD that follow from the findings of the assessment.
- Section 6 (Future Directions) describes a current project underway to write management guidelines for four species at risk on DOD lands.
- Appendices contain supporting documents useful for interpretation.

For additional information, contact NatureServe project manager Nancy Benton (nancy_benton@natureserve.org), or senior database conservation specialist Marcos Robles (marcos_robles@natureserve.org), at 703-908-1800.

3.0 Methods

NatureServe is the leading source of the "best available" information on the status of rare and imperiled species and ecosystems in the United States. Many organizations and federal agencies, including the U.S. Fish and Wildlife Service, use NatureServe's conservation status ranks to guide their conservation priorities. This information is developed centrally by NatureServe and by each member natural heritage program using a standardized methodology. In this section we define the methodology and analyses used in this report.

In order to help DOD focus conservation efforts on rare and imperiled species on DOD installations, NatureServe conducted an analysis based on the actual locations of species, specifically ***species at risk*** (defined in Section 3.3 below), occurring on or near DOD installations. The fundamental units of this analysis, which we define below, are the **element**, representing a full or infraspecies taxa, and the **element occurrence**, representing an observed location of an element. The analysis also utilized the NatureServe **conservation status ranks** (defined in Section 3.1.3 below)**.**

3.1 NatureServe Data

3.1.1 Element

An **Element** is defined as a unit of natural biological diversity, representing species (or infraspecies taxa), ecological communities, or other non-taxonomic biological entities, such as migratory species aggregation areas. For the purposes of the analysis of species at risk on DOD installations, these elements of diversity refer to the locations of **species** and **infraspecies taxa** (e.g. varieties, subspecies, populations) only. No ecological communities or other element units such as migratory stopover points are included in the datasets or analyses provided.

3.1.2 Element Occurrence

The **Element Occurrence** is the mapping unit developed by natural heritage programs for documenting the distribution of species populations. Formally defined as "an area of land and/or water in which a species or natural community is, or was, present," an element occurrence ideally reflects species population units: either a distinct population, part of a population (subpopulation), or a group of populations (metapopulation). For the purposes of this report, the element occurrence is the basic unit used to determine whether a species at risk occurs on a DOD installation, as described in Section 3.3.2. Element occurrence records that are unmappable, known to be misidentified, or have been determined by NatureServe to be historical or extirpated are excluded from the analysis.

3.1.3 NatureServe Conservation Status Ranks

3.1.3.1 Description of NatureServe Conservation Status Rank Criteria

An element is assigned a NatureServe conservation status rank for three specific geographic scales: (a) a global rank (called a GRANK), which applies across its entire range; (b) a national rank (NRANK) which applies to the range of the geographic United States; (c) and a subnational rank (SRANK) for each state, or other subnational jurisdiction in its range. For the purpose of this assessment, the global rank is the most important rank used to determine species at risk.

The NatureServe conservation status rank of an element within a given geographic scale is designated by a whole number from 1 to 5, preceded by a G (Global), N (National), or S (Subnational) as appropriate. The numbers have the following meaning:

1 = critically imperiled
2 = imperiled
3 = vulnerable to extirpation or extinction
4 = apparently secure
5 = demonstrably widespread, abundant, and secure

Elements that are imperiled or vulnerable everywhere they occur will have a global rank of G1, G2, or G3 and equally high or higher national and subnational ranks. (The lower the number, the "higher" the rank, and therefore the higher the conservation priority.) On the other hand, it is possible for an element to be more rare or more vulnerable in a given nation or subnation than it is range-wide. In that case, it might be ranked N1, N2, or N3, or S1, S2, or S3 even though its global rank is G4 or G5. The three levels of the ranking system give a more complete picture of the conservation status of a species or community than either a range-wide or local rank by itself. They also make it easier to set appropriate conservation priorities in different places and at different geographic levels.

Use of standard ranking criteria and definitions makes NatureServe conservation status ranks comparable across element groups—thus G1 has the same basic meaning whether applied to a salamander, a moss, or a forest community. Additionally, standardization also makes ranks comparable across jurisdictions, which in turn allows NatureServe scientists to use the national and subnational ranks assigned by local data centers to determine and refine or reaffirm global ranks.

For species elements, the following factors are considered in assigning a rank:

- **total number and condition of element occurrences**
- **population size**
- **range extent and area of element occupancy**
- **short- and long-term trends in the foregoing factors**
- **threats**
- **environmental specificity**
- **fragility**

For a more comprehensive treatment of NatureServe **elements** and **conservation status ranks**, see Appendix 8.1 (Metadata) or http://www.natureserve.org/explorer/.

3.1.3.2 Rounded Global Conservation Status Ranks

Rounded global ranks simplify complex conservation status rank values. They may be useful when performing tallies or analyses, or when summarizing complex element status information. Rounded ranks serve as an approximate substitute only; they are not intended as a replacement for the detailed element status information contained in the global, national, and subnational conservation status rank. For the purposes of this report, the rounded global rank of an element is used to categorize species at risk (see section 3.3.1 below), but the global rank value is also provided for each species at risk in Appendices 8.2 and 8.3. Details regarding rounded ranks including the algorithm used to calculate the ranks are found in Appendix 8.1f. (Metadata).

3.1.4 NatureServe Field Definitions

For a complete description of the data fields used in the analysis and deliverables for this report, please see Appendix 8.1i (Metadata).

3.2 DOD Installations

3.2.1 Installation Boundaries

For the purposes of this report, military installation boundaries are determined based on military installations identified in the U.S. Geological Survey data set "Federal Land Features of the United States" (National Atlas 2002). In coordination with DOD, we determined that this layer best represents the location and boundaries of military installations across the country. Since the minimum map resolution of the USGS coverage is 640 acres or one square mile, installations that are under this size are generally not shown.

3.2.2 Fort Bliss Military Reservation and White Sands Missile Range

Element occurrence data are not currently available for species on Fort Bliss Military Reservation (FBMR) or White Sands Missile Range (WSMR) in New Mexico and Texas. The data that are presented for these installations in this report is based on a species list obtained directly from FBMR and WSMR. Global, national, and state level data for those species that could be taxonomically matched up with species data in NatureServe's central databases were included in the species at risk analysis; however, statistics that are based on specific locational information such as occurrence or base / buffer counts do not include numbers for FBMR or WSMR.

In addition, Fort Bliss is represented on the USGS "Federal Land Features of the United States" coverage as two polygons (National Atlas 2002). The first is titled "Fort Bliss" and is entirely in Texas, and the second is titled "Fort Bliss – McGregor Range" and is entirely in New Mexico. For the purposes of this analysis "Fort Bliss" and "Fort Bliss – McGregor Range" were treated as one unit.

3.3 Species at Risk

3.3.1 Species at Risk Conservation Status Criteria

For the purpose of this report, ***species at risk*** are defined as native, regularly occurring species in the United States that are not federally listed under the U.S. Endangered Species Act, but are either:

- *Candidates* for listing under the U.S. Endangered Species Act, or
- *Critically imperiled* (rounded global rank of G1 or T1) or *Imperiled* (rounded global rank of G2 or T2), according to the NatureServe conservation status rank criteria.

Accordingly, three categories of species are used for most analyses in this report:

- Category 1: Federal Candidates
- Category 2: Critically Imperiled (rounded global rank = G1/T1)
- Category 3: Imperiled (rounded global rank = G2/T2)

Note that categories 2 and 3 are mutually exclusive (e.g. a species can only have a rank of G1/T1 or G2/T2), while species in category 1 may also have rounded global ranks of G1/T1 or G2/T2 (or other global ranks). Federal status designations (according to the U.S. Fish and Wildlife Service listing process under the Endangered Species Act) and NatureServe conservation status ranks are not always consistent as they use different systems and criteria to designate rare species.

3.3.2 Species at Risk Location Criteria

Species at risk are considered to be located on a DOD installation(s) if one or more element occurrence(s) of that species resides:

- completely or partially (e.g. across installation border) within the boundaries of an installation; or
- within a 2 km (1.24 mi) distance of a DOD installation according to the USGS coverage described previously.

Given these location criteria, it is important to note that results indicating species presence on any particular installation may include species occurrences that reside in the 2 km buffer zone. This buffer zone (also referred to in the report as "closely adjoining lands") has been included for several reasons:

- the location of a species at risk occurrence near an installation may indicate that the occurrence is actually found on both sides of the fence;
- the analyses are being conducted using the centrum points of occurrences that actually occupy a certain spatial extent; occurrences should not be excluded because the centrum falls slightly outside an installation boundary;
- there may be data gaps on installations due to a lack of inventory and/or data sharing with NatureServe's member state natural heritage programs.

We did conduct a separate analysis to evaluate those species occurrences that reside only within the buffer zones of installations (Results section 4.3.3) to inform encroachment issues.

3.3.3 Species at Risk Metrics

Two metrics of at-risk species are assessed in this report: (1) *number* of species at risk on DOD installations and (2) *density* of species at risk density on DOD installations. The latter metric, calculated as number of species per 100 square miles, is needed to compare species presence on DOD installations of varying sizes.

4.0 Results

4.1 Nationwide Assessment of Species at Risk on DOD Installations

4.1.1 Species at Risk

A total of 523 species at risk are found on the 729 DOD installations analyzed in this report. In terms of federal and conservation status, 47 are federal candidates, 136 are critically imperiled (G1/T1) and 340 are imperiled (G2/T2)[1] (Figure 1). Species found on DOD lands represent roughly 15% of the nationwide list of at-risk species in the United States. Appendix 8.2 lists these at-risk species found on DOD installations, along with information about their federal and conservation rank statuses. Appendix 8.3 lists these species along with the installations on which they occur.

The majority of species at risk on military lands are vascular plants (352), followed by invertebrate animals (107) and vertebrate animals (64) (Figure 2). This proportion of at-risk species by group is similar to patterns of species imperilment found on all U.S. lands (Master et al. 2000). While the number of reptiles that are at-risk on DOD installations is relatively low (14), these reptiles represent over one third of the reptiles at-risk nationwide (39). In addition, our report does not highlight freshwater aquatic species, even though previous nationwide reports indicate that freshwater species groups (e.g. freshwater mussels and crayfishes) contain a particularly high *percentage* (>50%) of imperiled species (Master et al. 2000, Master et al. 1998). Therefore, the majority of species at risk that warrant management and conservation on a national basis are vascular plants, though reptiles and perhaps freshwater species may also deserve special attention. Prioritizing species for conservation often depends on regional or even installation specific conditions. We assess these factors in report sections 4.1.2 and 4.3.

Figure 1. Summary of federal status and NatureServe conservation status rank of species at risk on DOD installations.

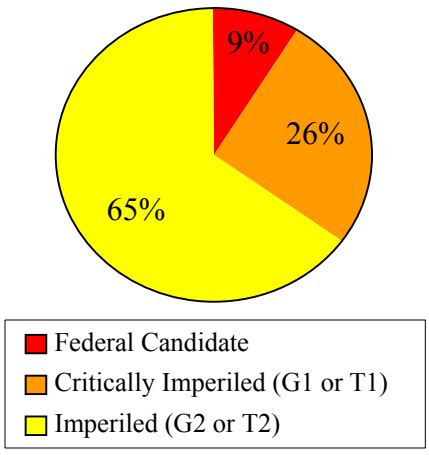
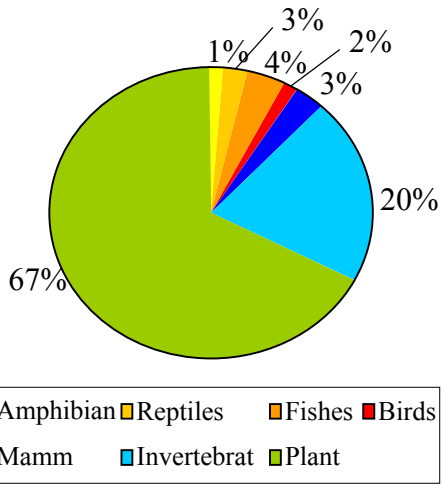


Figure 2. Percentage of species at risk present on DOD installations by species group.



[1] Note: Species designated as Federal Candidates may also have a NatureServe conservation status rank of G1/T1 or G2/T2. However, species designated as critically imperiled (G1/T1) cannot also be classified as imperiled (G2/T2) because these two categories are mutally exclusive (see section 3.3.1 for more details).

4.1.2 Geography of Species at Risk

Geographic patterns of species at risk on military lands follow nationwide patterns of species imperilment found on all U.S. lands (Chaplin et al. 2000), with particularly high numbers of at-risk species occurring on installations in Hawaii, central and southern California, southern New Mexico, and parts of Florida (Figure 3a). Other installations with high numbers of species at risk occur in portions of the southeastern United States, including Alabama, Georgia, Florida, and North Carolina.

Using ecoregions as a frame of reference, the following TNC ecoregions (Groves et al. 2000b) contain installations with high numbers of species at risk: Hawaii, California Central and South Coasts, Chihuahuan Desert, East Gulf Coastal Plain, and the South and Mid-Atlantic Coastal Plains (Figure 3b). Given that many DOD installations occupy significant areas in these ecoregions, especially in the western United States (Leslie et al. 1996), conservation of at-risk species on these installations would likely contribute to conserving many characteristic species and communities within these ecoregions.

An analysis of raw numbers of species at risk on DOD installations tends to skew results towards large installations because, all other factors being equal, the likelihood of species presence on large installations is higher than on small installations. For example, some western DOD installations, which are significantly larger than installations in other parts of the country, have high numbers of at-risk species (e.g. White Sands Missile Range in New Mexico and Nellis Air Force Base in Nevada). We therefore conducted an analysis of species at risk *density* (number of species per 100 square miles) on DOD installations. This measurement normalizes area differences, and thus pinpoints installations with high concentrations of species regardless of installation size. Geographic patterns of at-risk density, shown in Figure 3c, further emphasize the importance of conservation efforts on installations in Hawaii, California and Florida. Large installations in the Southwest, in contrast, diminish in importance when evaluated from a species density perspective, while other installations in the Pacific Northwest (Camp Adair Military Reservation in Oregon), the Southeast (Pope Air Force Base in North Carolina), the Northeast (McGuire Air Defense in New Jersey) and the Mid-Atlantic (U.S. Naval Supply Center in Virginia) are shown to contain significant species densities.

Figure 3a. Map depicting the number of species at risk found on DOD installations across the fifty U.S. states. Top 20 installations are labeled (see Figure 6a for actual number of at-risk species found on these installations). Species at risk occurrence data for Pennsylvania and Massachusetts is not available. The absence of data in any particular geographic area does not necessarily indicate that species at risk are not present. SOURCES: NatureServe 2003, National Atlas 2002.

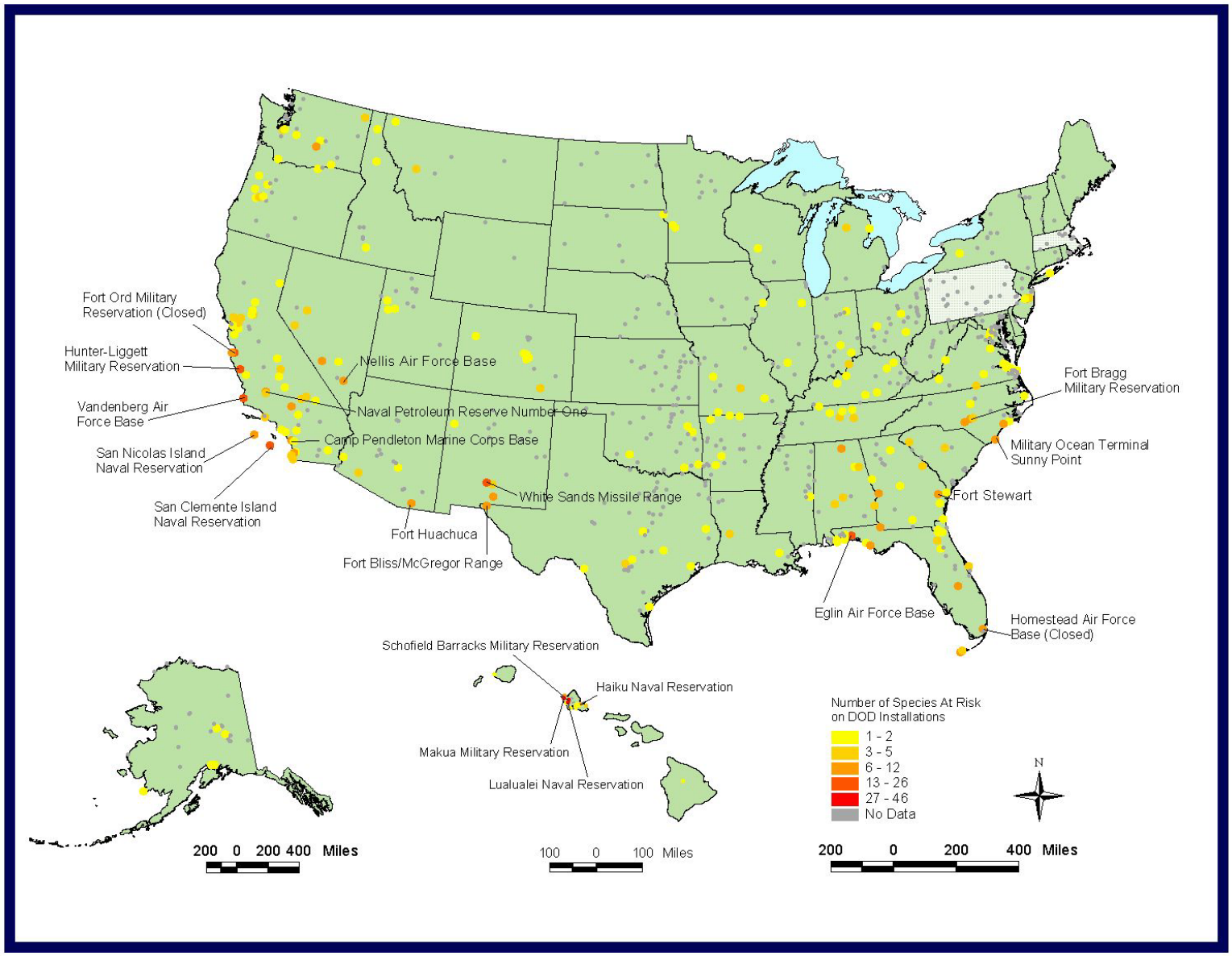


Figure 3b. Map depicting the number of species at risk found on DOD installations, framed by TNC ecoregion boundaries. Species at risk occurrence data for Pennsylvania and Massachusetts is not available. The absence of data in any particular geographic area does not necessarily indicate that species at risk are not present. SOURCES: NatureServe 2003, National Atlas 2002, Groves et al. 2000b.

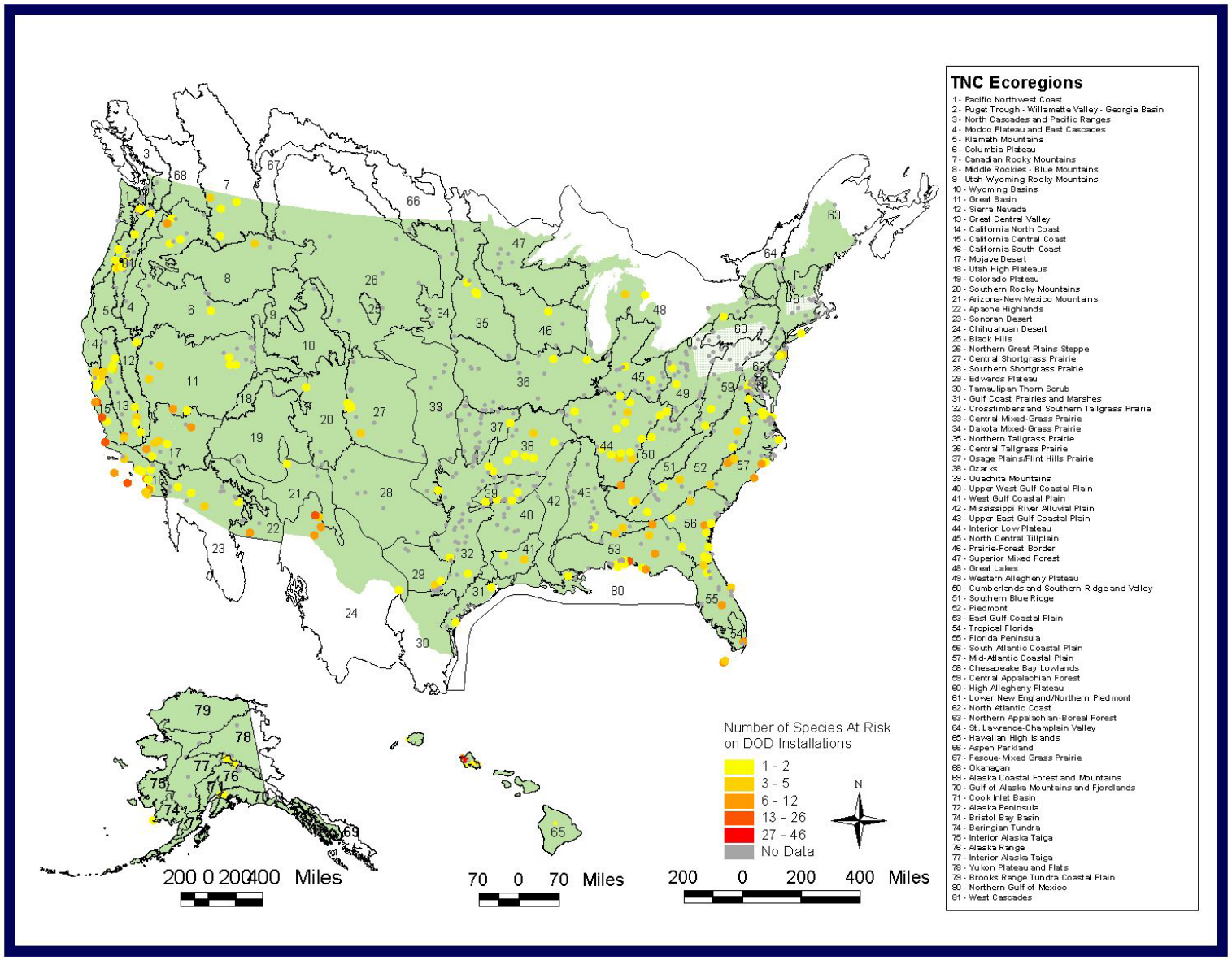
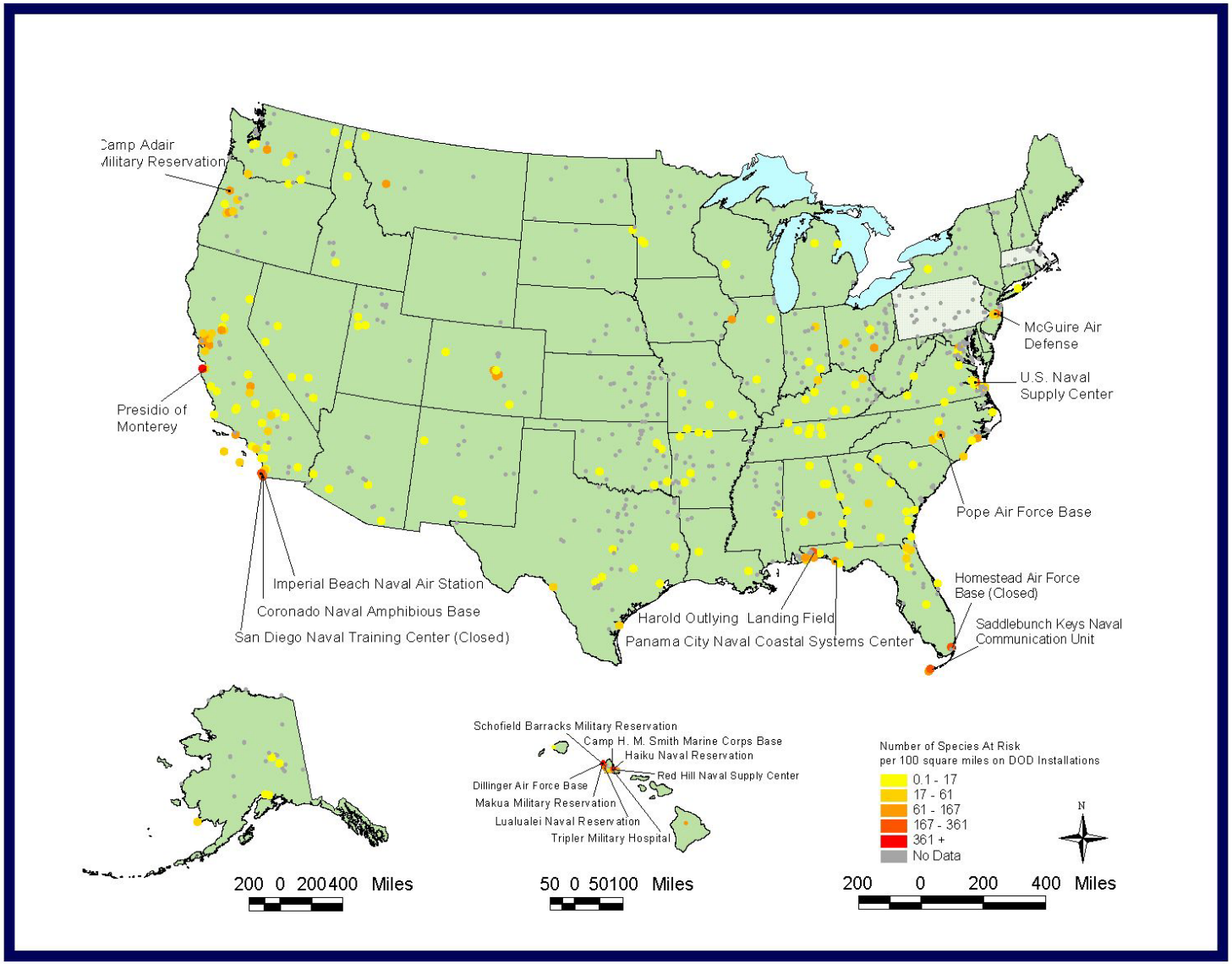


Figure 3c. Map depicting the density of at-risk species (no. species/100 square miles) occurring on DOD installations across the fifty U.S. States. Top 20 installations are labeled (see Figure 6b for actual densities found on these installations). Species at risk occurrence data for Pennsylvania and Massachusetts is not available. The absence of data in any particular geographic area does not necessarily indicate that species at risk are not present. SOURCES: NatureServe 2003, National Atlas 2002.



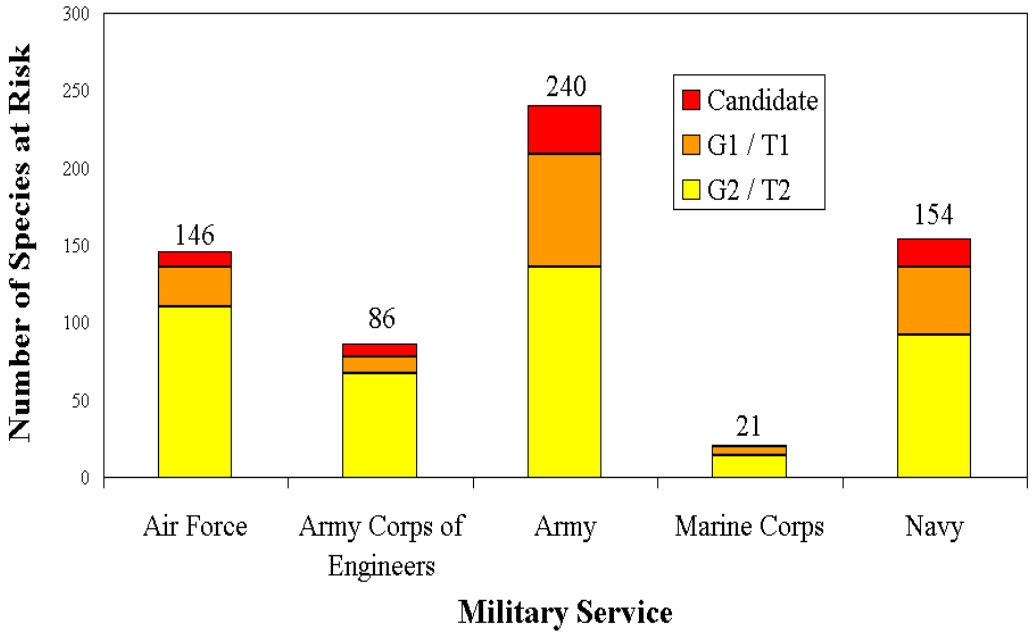
4.2 Assessment of Species at Risk by Military Service

Given that each military service may implement unique strategies to address species biodiversity conservation, we assessed species at risk patterns among the five military services. In terms of total *numbers*, Army installations contain almost twice the number of at-risk species than Air Force and Navy installations, followed by lower numbers on Army Corps of Engineers and Marine Corps installations (Figure 4a). In terms of species at risk *density*, Army and Navy installations contain roughly three fold greater densities than found on Air Force, Marine Corps and Army Corps of Engineers installations (Figure 4b).

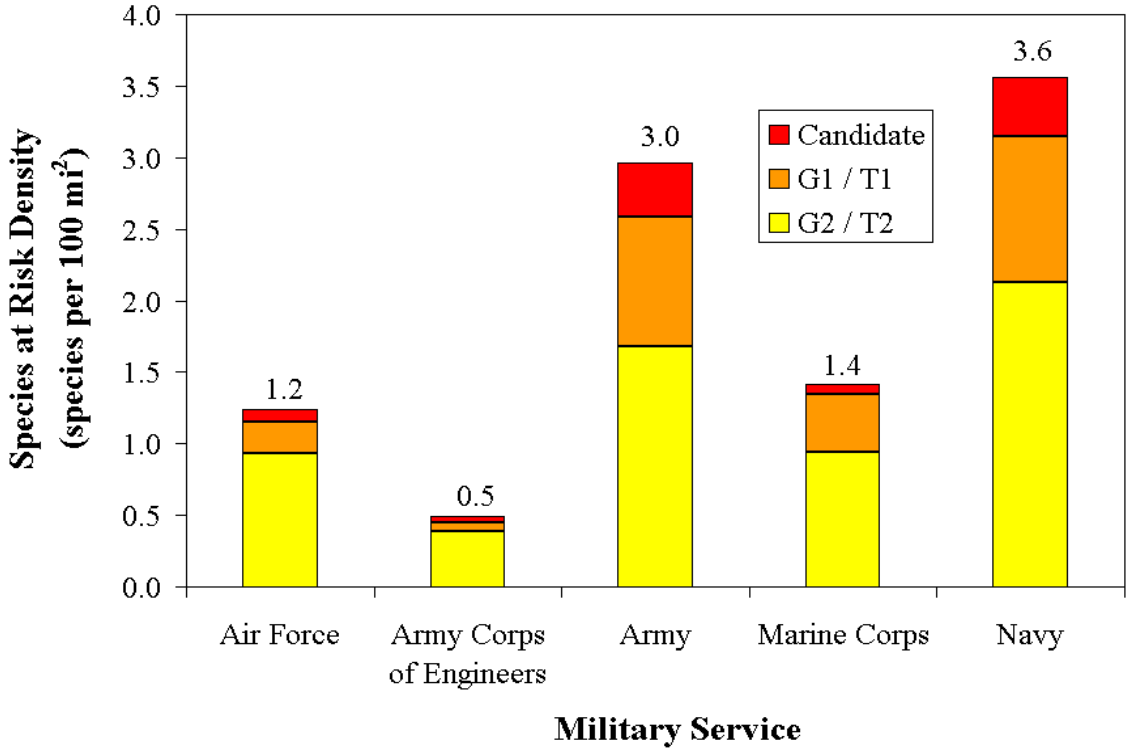
Different patterns emerge when comparing species at risk numbers and densities on Army versus Navy installations. Of the installations that contain at-risk species, Army installations (11.1 million acres) occupy four times the amount of land as do Navy installations (2.8 million acres). Given this, it is not surprising that more species at risk occur on Army installations (Figure 4a), but it is significant that at-risk density is higher on Navy installations (Figure 4b). Many of the organisms on Navy installations are coastal species that require unique habitat and management efforts to ensure their survival. A similar contrast in numbers and densities occurs on Army Corps of Engineers versus Marine Corps installations, where a higher number of at-risk species occur on Army Corps of Engineers land (86 species on 8,091 acres) than Marine Corps lands (21 species on 1,487 acres), but higher densities are found on Marine Corps lands (Figure 4b).

Figure 4. (a) Number and (b) density of species at risk by military service.

(a)



(b)

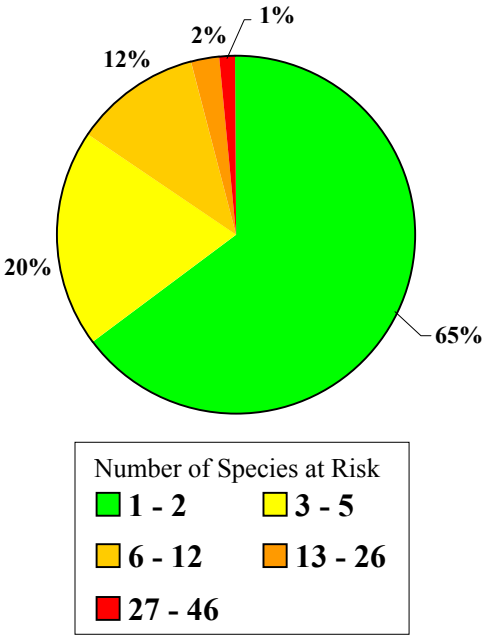


4.3 Assessment of Species at Risk on Installations

4.3.1 Installation Highlights

Of the 729 DOD installations analyzed in this report, 224 (30%) contain species at risk (see Appendix 8.4 and Appendix 8.5 for summarized and detailed information about these installations, respectively). The majority of these installations contain very few species at risk (Figure 5). Sixty-five percent contain only 1-2 species, followed by 20% containing 3-5 species, and 15% containing more than 6 species.

Figure 5. Of the DOD installations with species at risk, percent of installations with varying amounts of species.

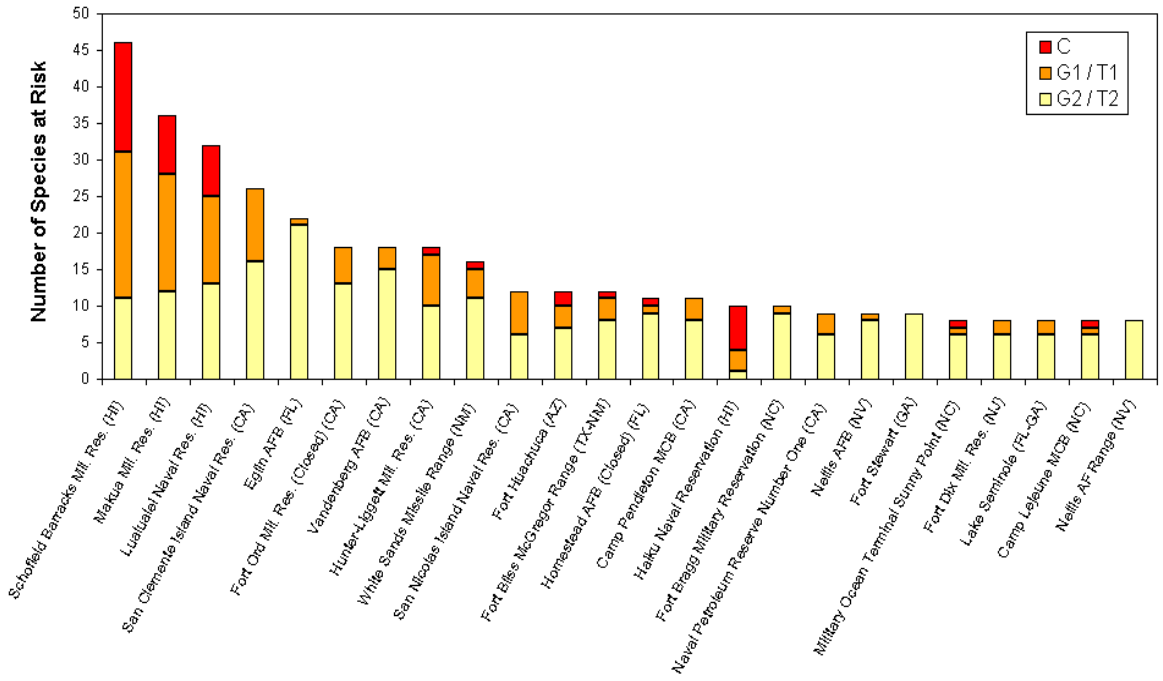


Installations with the highest numbers and densities of species at risk are shown in Figure 6a and 6b, respectively. As noted earlier, installations with particularly high numbers and densities of species at risk are located in central and southern California, Hawaii, and Florida (Figure 3, Figure 6). Schofield Barracks Military Reservation, Makua Military Reservation, Lualualei Naval Reservation, and Haiku Naval Reservation in Hawaii and Homestead Air Force Base in Florida are notable because they rank in the top 20 installations for both total number and density of at-risk species.

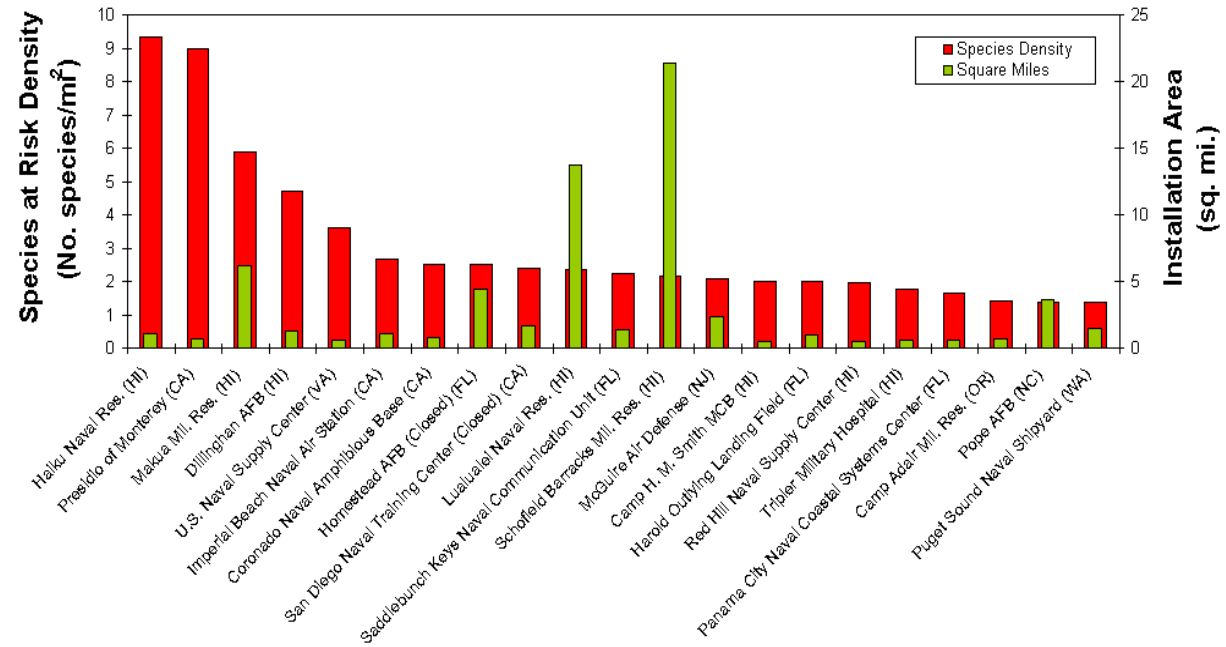
Some installations in the Southwest contain high numbers of species at risk (White Sands, Ft. Bliss McGregor Range, Ft Huachuca), while other installations in the pacific northwest (Camp Adair Military Reservation in Oregon), mid-atlantic (U.S. Naval Supply Center in Virginia), southeast (Pope Air Force Base in North Carolina) and northeast (McGuire Air Defense in New Jersey) contain high species densities (Figure 6). This contrasting pattern of species number and densities is an artifact of two co-occurring factors: (1) the highly variable size of installations (Figure 6b), and (2) changing patterns of species diversity. Given that management and other factors may be quite different on installations of different sizes, a future analysis of large versus small installations may help clarify species at risk patterns. Again, the measurement of species at risk *density* normalizes differences in installation size, and is perhaps the most accurate metric of the presence of at-risk species on installations (though it may tend to overemphasize small installations – see Figure 6b).

Figure 6. DOD installations with (a) highest number and (b) highest densities of species at risk. Numbers of species at risk by federal status and conservation status are shown in (a). Species density (no. species/square mile) and installation size shown in (b).

(a)



(b)



The absence of species at risk on the other 70% of U.S. installations that we analyzed does not necessarily indicate that these species do not occur on these installations (see Appendix 8.6 for a list of DOD installations in USGS reference layer *without* species at risk). It is important to reiterate here that species location data in Pennsylvania and Massachusetts was not available at the time the analysis for this report was conducted. In addition, we do not have the information needed to distinguish between installations that have been inventoried (and no at-risk species were found) from those that have not been inventoried. For those installations that have been inventoried, there is no data available to indicate whether the level of effort was adequate to rule out species at risk presence. Further, this report does not include DOD installations that are not represented in the USGS coverage (e.g. installations of areas less than one square mile and others) used to identify installations for analysis (Appendix 8.7 contains a partial list of these installations). Although beyond the scope of this report, an analysis of these data artifacts would complement the results of this report. Specifically, it would help DOD balance efforts between conservation of at-risk species known to occur on military lands versus inventory of areas to fill species at risk data gaps.

Notwithstanding these data limitations, and given the national scope of this analysis, some potential management strategies and prioritization activities follow from the results of this report. For example, DOD may be able to implement distinct management strategies on installations with relatively few species at risk versus those with many at-risk species. For those installations with very few species at risk (e.g. 65% installations with one or two species), single species management plans may be adequate. In contrast, for installations with many at-risk species (e.g. 35% installations with more than two species), DOD may need to implement landscape or ecosystem level management plans in order to adequately protect these species. Of course, many other factors would help refine this strategy, including installation size, military operations, habitat conditions, hydrological conditions, and the surrounding landscape. We address the last issue, the number of species at risk in areas immediately bordering DOD installations, in section 4.3.3.

4.3.2 Species Restricted to DOD Installations

Twenty-four species are restricted to only *one* DOD installation (Table 1) (Appendix 8.5 contains detailed habitat and threat information for these species within each installation where they occur). Overall, 82 species at risk have at least half (>50%) of their occurrences residing on DOD installations (Figure 7) (Appendix 8.3 includes a complete list of these species).

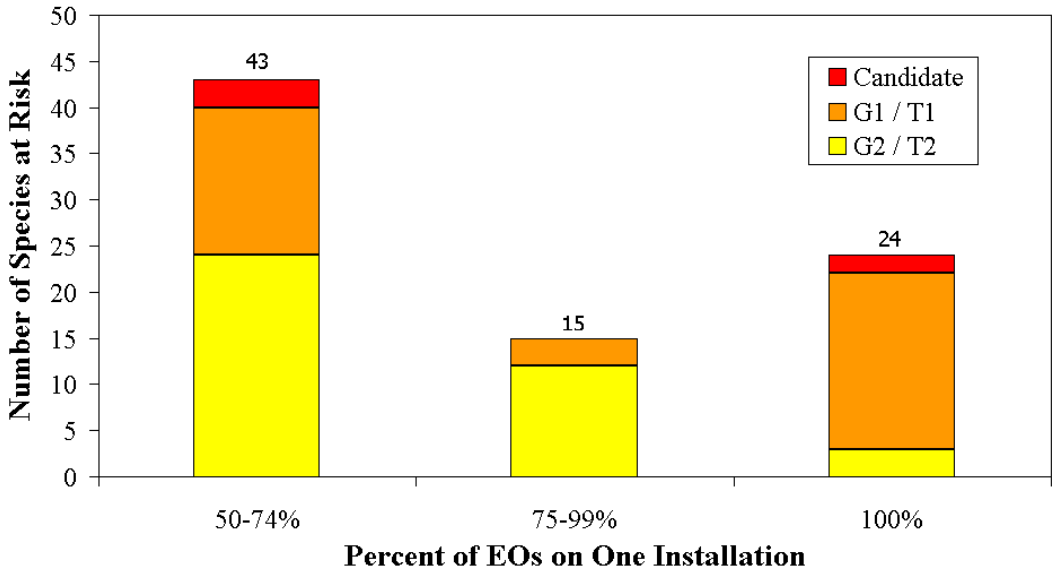
Natural resource managers of these installations have a unique opportunity and important responsibility to conserve and protect these species with very restricted ranges. For example, San Clemente and San Nicholas Island Naval Reservations in southern coastal California contain 10 vascular plant and 3 terrestrial snail species that are restricted to these installations, and are found nowhere else. These are narrowly distributed endemic species that are restricted due to their isolation on these islands. On a

nationwide basis, conservation efforts on the 12 installations shown in Table 1 are perhaps the most vital to ensure at-risk species persistence on DOD installations because these species are so highly dependent on military management activities.

Table 1. Species with all known occurrences residing in one DOD installation.

Military Service	Installation Name	State	Species Group	Scientific Name	Common Name	Number of EOs
Air Force	Holloman Air Force Base	NM	Mammals	Neotoma micropus leucophaea	White Sands Woodrat	7
Air Force	Wendover Range	UT	Flowering Plants	Atriplex canescens var. gigantea		1
Army	Fort Belvoir Military Reservation	VA	Amphipods	Stygobromus phreaticus	Northern Virginia Well Amphipod	1
Army	Fort Huachuca	AZ	Flowering Plants	Erigeron lemmonii	Lemmon's Fleabane	1
Army	Fort McClellan Military Reservation (Closed)	AL	Caddisflies	Hydroptila setigera	A Caddisfly	1
Army	Hunter-Liggett Military Reservation	CA	Flowering Plants	Pogogyne clareana	Santa Lucia Pogogyne	8
Army	Makua Military Reservation	HI	Flowering Plants	Korthalsella degeneri	Degener Korthalsella	1
Army	Makua Military Reservation	HI	Terrestrial Snails	Partulina dubia	Achatinellid Land Snail	1
Army	Schofield Barracks Military Reservation	HI	Flowering Plants	Melicope cinerea	Manena	1
Marine Corps	Camp Pendleton Marine Corps Base	CA	Flowering Plants	Eryngium pendletonensis		1
Navy	Chocolate Mountain Naval Aerial Gunnery Range	CA	Flowering Plants	Opuntia munzii	Munz Cholla	2
Navy	San Clemente Island Naval Reservation	CA	Flowering Plants	Astragalus nevinii	San Clemente Island Milkvetch	17
Navy	San Clemente Island Naval Reservation	CA	Flowering Plants	Brodiaea kinkiensis	San Clemente Island Brodiaea	17
Navy	San Clemente Island Naval Reservation	CA	Flowering Plants	Camissonia guadalupensis ssp. clementina	San Clemente Island Evening-Primrose	7
Navy	San Clemente Island Naval Reservation	CA	Flowering Plants	Delphinium variegatum ssp. thornei	Thorne's Royal Larkspur	7
Navy	San Clemente Island Naval Reservation	CA	Flowering Plants	Hazardia cana	San Clemente Island Hazardia	14
Navy	San Clemente Island Naval Reservation	CA	Flowering Plants	Linanthus pygmaeus ssp. pygmaeus		1
Navy	San Clemente Island Naval Reservation	CA	Flowering Plants	Triteleia clementina	San Clemente Island Triteleia	9
Navy	San Clemente Island Naval Reservation	CA	Terrestrial Snails	Micrarionta gabbi	San Clemente Islandsnail	2
Navy	San Clemente Island Naval Reservation	CA	Terrestrial Snails	Xerarionta intercisa	Plain Cactussnail	1
Navy	San Clemente Island Naval Reservation	CA	Terrestrial Snails	Xerarionta redimita	Wreathed Cactussnail	1
Navy	San Nicolas Island Naval Reservation	CA	Flowering Plants	Eriogonum grande var. timorum	San Nicolas Island Buckwheat	2
Navy	San Nicolas Island Naval Reservation	CA	Terrestrial Snails	Micrarionta feralis	San Nicolas Islandsnail	1
Navy	San Nicolas Island Naval Reservation	CA	Terrestrial Snails	Micrarionta opuntia	Pricklypear Islandsnail	1

Figure 7. Numbers of species at risk in which at least 50% of all known occurrences (EOs) reside in one installation.



4.3.3 Installation Buffer Analysis

On many military installations there are concerns regarding encroachment of non-compatible land uses in surrounding areas that may adversely impact DOD training missions. At the same time, many of these land uses may hinder or restrict the continued persistence and survival of species at risk. We therefore analyzed species at risk presence within a two-kilometer 'buffer' area immediately surrounding DOD installations.

Twenty-four installations have five or more at-risk species occurring in their buffer areas (Figure 8). Many of these species, especially in Hawaii, are candidates for listing. In the buffer of one installation alone – Schofield Barracks Military Reservation in Hawaii – there are 15 Federal candidate species, 16 critically imperiled species, and 9 imperiled species.

In an analysis of species with restricted ranges (similar to the analysis in section 4.3.2 above, but this analysis examined buffer areas only), we found 11 species that had 75% or more of their total known occurrences restricted to the buffer area of a single installation (Table 2). For example, again on Schofield Barracks Military Reservation in Hawaii, 3 species -- one flowering plant (*Cyrtandra sessilis*) and two land snails – are known to occur only within two kilometers of this reservation boundary. These species are highly dependent on land management and conservation actions in and around the installations where they occur.

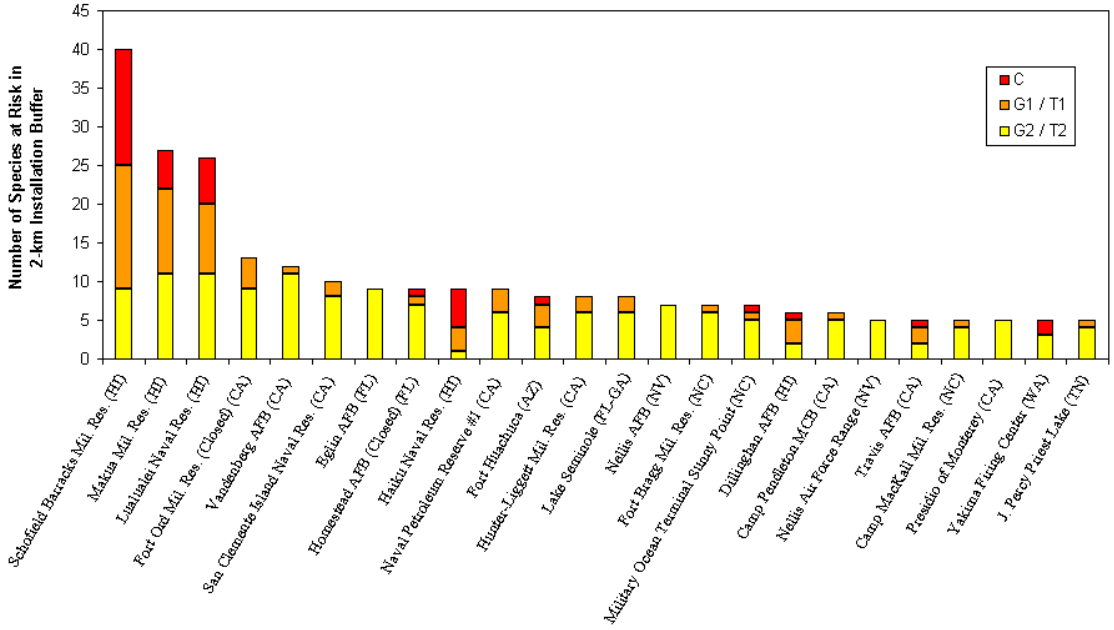
In a final species occurrence analysis of lands adjoining military installations, we highlight some installations that do not have any at-risk species directly within their boundaries, but that do have species at risk within two kilometers of their border. Seventy-two installations fall into this category, with 100% of the species occurrences residing in the buffer area, and zero known species occurrences from within the installation boundary. A list of these installations is included in Appendix 8.8.

If the conservation needs of species at risk on closely adjoining lands are not addressed with appropriate management strategies, then some may become listed by the U.S. Fish and Wildlife Service under the Endangered Species Act -- a consequence that may impede military operations on these installations. If, however, the DOD works cooperatively with neighboring landowners to help protect these species and their habitats, then perhaps goals for both species conservation and enabling military readiness can be met concurrently.

Table 2. Species at risk with 75% or more known occurrences (EOs) restricted to buffer areas of a single installation.

Species Group	Scientific Name	Common Name	Military Service	Installation Name	State	Total Number SAR EOs	Number SAR EOs in Buffer	% Total SAR EOs in Buffer
Terrestrial Snails	Auriculella tenella	Achatinellid land snail	Army	Schofield Barracks Military Reservation	HI	2	2	100%
Flowering Plants	Carex wahuensis ssp. herbstii	A sedge	Navy	Haiku Naval Reservation	HI	1	1	100%
Flowering Plants	Cyrtandra sessilis		Army	Schofield Barracks Military Reservation	HI	1	1	100%
Reptiles	Diadophis punctatus similis	San diego ringneck snake	Marine Corps	Camp Pendleton Marine Corps Base	CA	1	1	100%
Terrestrial Snails	Helminthoglypta mohaveana	Victorville shoulderband	Air Force	George Air Force Base (Closed)	CA	1	1	100%
Ferns / Fern Allies	Isoetes hyemalis	Winter quillwort	Army Corps of Engineers	John H. Kerr Reservoir	VA	4	3	75%
Terrestrial Snails	Lyropupa sp. 1	Pupillid land snail (lyropupa or lyropupilla)	Army	Schofield Barracks Military Reservation	HI	1	1	100%
Terrestrial Snails	Oreohelix sp. 3	Bearmouth mountainsnail	Army	Bearmouth National Guard Training Area	MT	1	1	100%
Freshwater Snails	Planorbella magnifica	Magnificent rams-horn	Army	Military Ocean Terminal Sunny Point	NC	1	1	100%
Other Insects	Pnirontis brimleyi	An assassin bug	Army	Fort Story Military Reservation	VA	1	1	100%
Flowering Plants	Symphyotrichum racemosum var. 2	Apalachicola river aster	Army Corps of Engineers	Lake Seminole	FL	1	1	100%

Figure 8. DOD installations with the highest number of species at risk in a 2-km installation buffer area. Includes summary of at-risk status: C = Candidate; G1/T1 = Critically imperiled; G2/T2 = imperiled.



5.0 Conclusion and Management Recommendations

The U.S. Department of Defense contains the largest number of federally listed species of all major federal agencies, and its lands also hold more imperiled species than either National Park Service or Fish and Wildlife Service lands (Groves et al. 2000a). NatureServe's work under this project aims to assist the military in focusing efforts towards conservation of imperiled species that may soon need federal listing if population declines occur or continue. Below are some of the key management recommendations that follow from our assessment in this report.

- The majority of species at risk that warrant management and conservation on a national basis are vascular plants, although reptiles and freshwater species may also deserve special attention.

- DOD should focus efforts and funding on protecting at-risk species and associated habitats on installations in biologically rich areas of the country, particularly central and southern California, Florida, and Hawaii.

- Several ecoregions contain installations with particularly high numbers of species at risk: Hawaii, California Central and South Coasts, Chihuahuan Desert, East Gulf Coastal Plain, and the South and Mid-Atlantic Coastal Plains. Given that many DOD installations occupy significant areas in these ecoregions, especially in the western United States (Leslie et al. 1996), conservation of at-risk species on these installations would likely contribute to overall efforts to conserve biodiversity within these ecoregions.

- If DOD sets priorities for species conservation funding by military service, resources could be directed toward the Army and Navy, both of which have significantly higher numbers and densities of species at risk than the other military services.

- On installations with relatively few species at risk, DOD may be able to implement single species management strategies. In contrast, for installations with many at-risk species, DOD may need to implement multi-species or ecosystem level management plans.

- Natural resource managers of installations have an important responsibility to conserve and protect species at risk that are nearly or completely restricted to DOD lands. Conservation efforts on the 12 installations shown in Table 1 (see section 4.3.2) that contain at-risk species that occur nowhere else are perhaps the most vital because these species are so highly dependent on military management activities.

- DOD should focus resources on protecting closely adjoining lands from encroachment, particularly on installations with high numbers and/or densities of

at-risk species. DOD also should work with neighboring landowners to protect species at risk that occur in buffer areas surrounding installations.

In conclusion, DOD has a unique opportunity to use the findings in this report to help focus efforts on early conservation of species at risk on and around DOD installations, helping to both preserve biological diversity and prevent restrictive land use policies on DOD lands in the future.

6.0 Future Directions

A new phase of this project funded by the DOD Legacy program involves the U.S. Department of Defense, the U.S. Fish and Wildlife Service (FWS), NatureServe, and NatureServe's member state natural heritage programs. In this cooperative project, four species at risk were chosen as initial pilot species based on scientific criteria developed by NatureServe and the recommendations of the military services. The goal was to choose one species for each of the four services: Army, Navy, Marines, and Air Force. The species and installations selected for this pilot project are:

1) Army: Round leaf four o'clock (*Mirabilis rotundifolia*) on Fort Carson in Colorado
2) Navy: San Clemente Island fox (*Urocyon littoralis clementae*) on San Clemente Island Naval Reserve in California
3) Marines: Coastal goldenrod (*Solidago villosicarpa*) on Camp Lejeune in North Carolina
4) Air Force: Florida bog frog (*Rana okaloosae*) on Eglin Air Force Base in Florida

Currently, local species at risk project teams with members from the pertinent FWS field office, DOD installation, and state natural heritage program are working cooperatively to write management guidelines for these species. The sample management guidance template, which was developed by NatureServe with input from the FWS and DOD, is attached (see Appendix 8.9). The final work from these four pilot projects will be highlighted in press releases and on web sites by DOD, FWS, and NatureServe. The hope is that in the future this effort will be expanded beyond these four initial species to many more species at risk on DOD installations across the U.S.

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8.0 Appendices

8.1 Metadata

Appendix 8.1a. Data Use Suggestions and Guidelines

The information about species at risk on military bases is provided to the Department of Defense (DOD) and the U.S. Fish and Wildlife Service (FWS) for planning, assessment, and informational purposes. NatureServe reserves all rights in data provided.

This is intended as an initial coarse filter to help identify and prioritize conservation efforts for species at risk on or near DOD installations on a national level. The analyses and reports described in the next section can be used, for example, to identify installations that have a significant number of conservation targets or to identify species that are known to occur mostly on DOD lands. In both cases, conservation efforts by the DOD would have a major impact on protecting biodiversity in the United States.

The data presented in these analyses, however, should not be considered a definitive statement on the presence, absence, or condition of biological elements at any given location. The lack of data for any installation cannot be construed to mean that no species at risk or other significant features are present. Installation-specific projects or activities should be reviewed for potential environmental impacts with appropriate regulatory agencies. It is suggested that the appropriate state natural heritage program(s) be contacted for a site-specific review of the area and/or for input on the creation of management plans. For natural heritage program contact information, please see the NatureServe web site: http://www.natureserve.org/.

Distribution of the complete data set or subsets of the species at risk data to other than agreed upon parties, or posting of these data in whole or in part on any public computer network may only be done with prior written permission of NatureServe. All parties receiving these data must be informed of these restrictions.

Please provide appropriate and mutually agreed acknowledgment of NatureServe and as data contributors to any reports or other products derived from this data. The following citation and acknowledgement statement should be used. As appropriate, NatureServe's logo should also be used on publications or other products where NatureServe contributed data or information.

> Citation:
> NatureServe. 2004. NatureServe Central Databases. Arlington, VA. U.S.A.
>
> Acknowledgement Statement:
> *This information is provided by NatureServe (http://www.natureserve.org/) and its natural heritage member programs, a leading source of information about rare and endangered species, and threatened ecosystems.*

Please provide a copy of materials produced which include the data or portions of the data. Please send these documents to NatureServe's Network Operations Division:

Attn: Marcos Robles
NatureServe
1101 Wilson Blvd., 15th Floor
Arlington, VA 22209

As your time permits, please note any errors or omissions that you find in the data. Such comments will be valuable in improving the quality of our databases for the network of users.

Appendix 8.1b. NatureServe Data Completeness, Quality, and Currentness

Completeness

The completeness of NatureServe's data varies between species. The data aggregated by NatureServe from the natural heritage programs (NHPs) is particularly strong and very complete in tracking the terrestrial and freshwater vertebrate species, vascular plants and entities that are imperiled and/or have federal status under the Endangered Species Act (ESA). Many invertebrate groups are completely tracked, but the databases on these elements continue to expand. The non-vascular plant data (lichens, mosses, liverworts & hornworts, fungi) is being actively developed and element occurrences of these groups will expand over the next few years. Marine species, even in coastal areas are not completely tracked and documented with element occurrences, however this varies across NHPs.

Note that data for Native American tribal lands are not available for most western states.

NatureServe conducted analyses on all available data that met the criteria for the project as described above.

Quality

All the data fields which are considered necessary for the DOD species at risk analyses have been quality controlled either by the individual heritage program or NatureServe staff to meet minimum standards for spatial representation, taxonomy and status as defined below:

- **Conservation Status Ranks:** NatureServe has conducted quality control checks to assure that the global conservation status ranks of the individual state datasets are consistent with the most current ranks in the NatureServe Central Databases.

- **Federal Status Designations:** NatureServe has conducted quality control checks to assure that the federal listed status for each species and element occurrence correlates with the most recent U.S. Fish and Wildlife Service listing of Threatened and Endangered species.

- **Spatial Data:** All element occurrence records are mapped as accurately as recorded by NHPs with at least a general (defined as within 8 kilometers, 5 miles, or to quad or place name) precision. Any Element Occurrences known to be incorrectly identified or mapped have been excluded.

Currentness and Updates

Federal status designations are updated in the NatureServe Central Databases within two weeks of publication of listings or proposed status changes in the Federal Register and updated within four weeks of publication in Notices of Review in the Federal Register.

Taxonomy is constantly being updated based on the publication of new sources. See Appendix 8.1f for a current list of sources for all taxonomic groups potentially included in the dataset.

Spatial data are updated and reviewed by the NHPs annually in preparation for their annual data exchange with NatureServe.

Appendix 8.1c. Data Exchange Cycle and Data Upload

NatureServe is linked to the NHPs through a process of regular annual data exchanges conducted between the NatureServe Central Databases and each of the individual heritage programs in the U.S. and Canada. Each month a set of NHPs send their data to NatureServe for upload of the past year's updates to status ranking and inventory work. The exchange process includes both taxonomic and status reconciliation. New or updated Element Occurrence data are uploaded to NatureServe and in return centrally developed scientific information is distributed to the state and provincial programs.

Appendix 8.1d. U.S. Endangered Species Act Status: Data Management Procedures

The U.S. Fish and Wildlife Service (USFWS) and the U.S. National Marine Fisheries Service designate and/or propose federal status in accordance with the U.S. Endangered Species Act of 1973, as amended (U.S. ESA). Plant and animal species, subspecies (including plant varieties), and vertebrate populations are considered for Endangered or Threatened status according to the criteria established under the U.S. ESA.

Proposals and determinations to add taxa or populations to the Lists of Endangered and Threatened Wildlife and Plants are published in the Federal Register. Additionally, USFWS periodically publishes a Notice of Review in the Federal Register that presents an updated list of plant and animal taxa that are regarded as candidates or proposed for possible addition to the Lists of Endangered and Threatened Wildlife and Plants.

How NatureServe Manages U.S. Federal Status Data

The U.S. Federal Status Date represents the date of publication in the Federal Register of notification of an official status for a taxon or population. Dates appear only for taxa and populations which are specifically named in a Federal Register Notice of Review Table or in the section of a Federal Register Proposed or Final Rule that proposes or declares an amendment to 50 CFR Part 17 Section 11 or 12 (i.e., changes to the Lists of Endangered and Threatened Wildlife and Plants).

Dates Represent

For listed endangered and threatened taxa and populations: the date recorded in the USESADATE field is the date of publication of the Federal Register "Final Rule" for the taxon or population. For proposed taxa and populations: the date of publication of the most recent Federal Register "Proposed Rule" for the taxon or population. For candidate taxa and populations: the date of publication of the most recent "Notice of Reclassification" or "Notice of Review" in which the candidate appears.

Staff update the NatureServe Central Databases with changes in status due to proposals and determinations to add taxa to the Lists of Endangered and Threatened Wildlife and Plants within two weeks of publication in the Federal Register. Addition and removal of candidates in Notices of Review are entered within four weeks of their publication.

Status Due to Taxonomic Relationship (Values in Parentheses)

The taxonomic relationships between species and their infraspecific taxa may determine whether a taxon has federal protection. Section 17.11(g) of the U. S. ESA states, "the listing of a particular taxon includes all lower taxonomic units." Also, if an infraspecific taxon or population has federal status, then by default, some part of the species has federal protection. Some taxa show values indicating U.S. Federal Status even though the element may not be specifically named in the Federal Register. Where status is implied due to a taxonomic relationship alone, the status abbreviation appears in parentheses and no date of listing is given.

Nomenclature for Taxa and Populations with U.S. Federal Status

For most species which have U.S. Federal Status, any available distribution, conservation, and management information is maintained in records under the same scientific name as the one used by USFWS (and printed in the Federal Register). For animal subspecies and populations that have U.S. Federal Status, most of this information is maintained in the species record associated with the subspecies or population. Where the names used by USFWS and NatureServe differ, data may be found using either name.

U.S. Federal Status Designations and Definitions

Abbreviation	U.S. Federal Status
LE	Listed endangered
LT	Listed threatened
PE	Proposed endangered
PT	Proposed threatened
C	Candidate
PDL	Proposed for delisting
E(S/A) or T(S/A)	Listed endangered or threatened because of similarity of appearance
XE	Essential experimental population
XN	Experimental nonessential population
Combination values	The taxon has one status currently, but a more recent proposal has been made to change that status with no final action yet published. For example, LE-PDL indicates that the species is currently listed as endangered, but has been proposed for delisting.
Values in parentheses	The taxon itself is not named in the Federal Register as having federal status; however, it does have federal status as a result of its taxonomic relationship to a named entity. For example, if a species is federally listed with endangered status, then by default, all of its recognized subspecies also have endangered status. The subspecies in this example would have the value "(LE)" under U.S. Federal Status. Likewise, if all of a species' infraspecific taxa (worldwide) have the same federal status, then that status appears in the record for the "full" species as well. In this case, if the taxon at the species level is not mentioned in the Federal Register, the status appears in parentheses in that record.
Combination values in parentheses	The taxon itself is not named in the Federal Register as having official federal status; however, all of its infraspecific taxa (worldwide) do have official status. The statuses shown in parentheses indicate the statuses that apply to infraspecific taxa or populations within this taxon.
(PS)	Indicates "partial status" - status in only a portion of the species' range. Typically indicated in a "full" species record where an infraspecific taxon or population has federal status, but the entire species does not.
Null value	Usually indicates that the taxon does not have any federal status. However, because of potential lag time between publication in the Federal Register and entry in the NHCD, some taxa may have a status that does not yet appear.

Appendix 8.1e. NatureServe Conservation Status Ranks

Listed below are definitions for interpreting the global (i.e., range-wide) conservation status ranks. Global ranks are assigned by NatureServe scientists.

Global Conservation Status Rank Definitions

Rank	Definition
GX	Presumed Extinct (species)—Believed to be extinct throughout its range. Not located despite intensive searches of historical sites and other appropriate habitat, and virtually no likelihood that it will be rediscovered.
GH	Possibly Extinct (species)—Known from only historical occurrences, but may nevertheless still be extant; further searching needed.
G1	Critically Imperiled—Critically imperiled globally because of extreme rarity or because of some factor(s)making it especially vulnerable to extinction. Typically 5 or fewer occurrences or very few remaining individuals (<1,000) or acres (<2,000) or linear miles (<10).
G2	Imperiled—Imperiled globally because of rarity or because of some factor(s) making it very vulnerable to extinction or elimination. Typically 6 to 20 occurrences or few remaining individuals (1,000 to 3,000) or acres (2,000 to 10,000) or linear miles (10 to 50).
G3	Vulnerable—Vulnerable globally either because very rare and local throughout its range, found only in a restricted range (even if abundant at some locations), or because of other factors making it vulnerable to extinction or elimination. Typically 21 to 100 occurrences or between 3,000 and 10,000 individuals.
G4	Apparently Secure—Uncommon but not rare (although it may be rare in parts of its range, particularly on the periphery), and usually widespread. Apparently not vulnerable in most of its range, but possibly cause for long-term concern. Typically more than 100 occurrences and more than 10,000 individuals.
G5	Secure—Common, widespread, and abundant (although it may be rare in parts of its range, particularly on the periphery). Not vulnerable in most of its range. Typically with considerably more than 100 occurrences and more than 10,000 individuals.

Variant Global Ranks

Rank	Definition
G#G#	Range Rank—A numeric range rank (e.g., G2G3) is used to indicate uncertainty about the exact status of a taxon. Ranges cannot skip more than one rank (e.g., GU should be used rather than G1G4).
GU	Unrankable—-Currently unrankable due to lack of information or due to substantially conflicting information about status or trends. NOTE: Whenever possible, the most likely rank is assigned and the question mark qualifier is added (e.g., G2?) to express uncertainty, or a range rank (e.g., G2G3) is used to

	delineate the limits (range) of uncertainty.
G?	Unranked—Global rank not yet assessed.
HYB	Hybrid—(species elements only) Element not ranked because it represents an interspecific hybrid and not a species. (Note, however, that hybrid-derived species are ranked as species, not as hybrids.)

Rank Qualifiers

Rank	**Definition**
?	Inexact Numeric Rank—Denotes inexact numeric rank
Q	Questionable taxonomy that may reduce conservation priority. Distinctiveness of this entity as a taxon at the current level is questionable; resolution of this uncertainty may result in change from a species to a subspecies or hybrid, or inclusion of this taxon in another taxon, with the resulting taxon having a lower-priority (numerically higher) conservation status rank.
C	Captive or Cultivated Only—Taxon at present is extant only in captivity or cultivation, or as a reintroduced population not yet established.

Infraspecific Taxon Ranks

Rank	**Definition**
T_	Infraspecific Taxon (trinomial)—The status of infraspecific taxa (subspecies or varieties) are indicated by a "T-rank" following the species' global rank. Rules for assigning T ranks follow the same principles outlined above. For example, the global rank of a critically imperiled subspecies of an otherwise widespread and common species would be G5T1. A T subrank cannot imply the subspecies or variety is more abundant than the species (e.g., a G1T2 subrank should not occur). A vertebrate animal population (e.g., listed under the U.S. Endangered Species Act or assigned candidate status) may be tracked as an infraspecific taxon and given a T rank; in such cases a Q is used after the T rank to denote the taxon's informal taxonomic status.

National and Subnational Conservation Status Ranks

Elements are assigned a numeric rank of relative imperilment based on standard rank factors applied at national or subnational (e.g. state, province, or regional governmental level such as the Tennessee Valley Authority) levels as appropriate. A subnational rank cannot imply the element is more abundant at the subnational level than it is nationally or globally (i.e., a G1/S2 rank should not occur). Subnational ranks may occasionally be subdivided by using decimal extensions .1, .2, and .3 (e.g., S1.3) to permit a province or state to further prioritize its

vulnerable elements. National and subnational ranks are usually assigned by natural heritage data centers, if one exists for the jurisdiction, otherwise by NatureServe scientists. The same basic ranks and qualifiers used for subnational ranks are used for national ranks. Therefore, the definitions below may be used interchangeably for national and subnational ranks (e.g., N1, NH = S1, SH).

National (N) and Subnational (S) Conservation Status Rank Definitions

Rank	Definition
NX **SX**	Presumed Extirpated—Element is believed to be extirpated from the nation or subnation. Not located despite intensive searches of historical sites and other appropriate habitat, and virtually no likelihood that it will be rediscovered.
NH **SH**	Possibly Extirpated (Historical)—Element occurred historically in the nation or subnation, and there is some expectation that it may be rediscovered. Its presence may not have been verified in the past 20 years. An element would become NH or SH without such a 20-year delay if the only known occurrences in a nation or subnation were destroyed or if it had been extensively and unsuccessfully looked for. Upon verification of an extant occurrence, NH or SH-ranked elements would typically receive an N1 or S1 rank. The NH or SH rank should be reserved for elements for which some effort has been made to relocate occurrences, rather than simply using this rank for all elements not known from verified extant occurrences.
N1 **S1**	Critically Imperiled—Critically imperiled in the nation or subnation because of extreme rarity or because of some factor(s) making it especially vulnerable to extirpation from the subnation. Typically 5 or fewer occurrences or very few remaining individuals (<1,000).
N2 **S2**	Imperiled—Imperiled in the nation or subnation because of rarity or because of some factor(s) making it very vulnerable to extirpation from the nation or subnation. Typically 6 to 20 occurrences or few remaining individuals (1,000 to 3,000).
N3 **S3**	Vulnerable—Vulnerable in the nation or subnation either because rare and uncommon, or found only in a restricted range (even if abundant at some locations), or because of other factors making it vulnerable to extirpation. Typically 21 to 100 occurrences or between 3,000 and 10,000 individuals.
N4 S4	Apparently Secure—Uncommon but not rare, and usually widespread in the nation or subnation. Possible cause of long-term concern. Usually more than 100 occurrences and more than 10,000 individuals.
N5 **S5**	Secure—Common, widespread, and abundant in the nation or subnation. Essentially ineradicable under present conditions. Typically with considerably more than 100 occurrences and more than 10,000 individuals.
N? **S?**	Unranked—Nation or subnation rank not yet assessed.
NU SU	Unrankable—Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.

Rank	Definition
N#N# S#S#	Range Rank—A numeric range rank (e.g., S2S3) is used to indicate the range of uncertainty about the exact status of the element. Ranges cannot skip more than one rank (e.g., SU should be used rather than S1S4).
HYB	Hybrid—Element not ranked because it represents an interspecific hybrid, not a species.
NE **SE**	Exotic—An exotic established in the nation or subnation; may be native in nearby regions (e.g., house finch or catalpa in eastern U.S.).
NE# SE#	Exotic Numeric—An exotic established in the nation or subnation that has been assigned a numeric rank to indicate its status, as defined for N1 or S1 through N5 or S5.
NA **SA**	Accidental—Accidental or casual in the nation or subnation (i.e., infrequent and outside usual range). Includes species (usually birds or butterflies) recorded once or only a few times. A few of these species may have bred on the one or two occasions they were recorded. Examples include European strays or western birds on the East Coast and vice-versa.
NZ **SZ**	Zero Occurrences—Present but lacking practical conservation concern in the nation or subnation because there are no definable occurrences, although the taxon is native and appears regularly in the nation or subnation. An NZ or SZ rank will generally be used for long distance migrants whose occurrences during their migrations have little or no conservation value for the migrant, as they are typically too irregular (in terms of repeated visitation to the same locations), transitory, and dispersed to be reliably identified, mapped, and protected. In other words, the migrant regularly passes through the nation or state, but enduring, mappable Element Occurrences cannot be defined. Typically, the NZ or SZ rank applies to a non-breeding population in the nation or subnation - for example, birds on migration. An NZ or SZ rank may in a few instances also apply to a breeding population, for example, certain Lepidoptera which regularly die out every year with no significant return migration. Although the NZ or SZ ranks typically apply to migrants, it should not be used indiscriminately. NZ or SZ only apply when the migrants occur in an irregular, transitory, and dispersed manner.
NP **SP**	Potential—Potential that element occurs in the nation or subnation but no extant or historic occurrences are accepted.
NR **SR**	Reported—Element reported in the nation or subnation but without a basis for either accepting or rejecting the report, or the report not yet reviewed locally. Some of these are very recent discoveries for which the program hasn't yet received first-hand information; others are old, obscure reports.
NRF **SRF**	Reported Falsely—Element erroneously reported in the nation or subnation (e.g., misidentified specimen) and the error has persisted in the literature.
NSYN SSYN	Synonym—Element reported as occurring in the nation or subnation, but the national or state data center does not recognize the taxon; therefore the element is not assigned a national or subnational rank.
*****	N or S rank has been assigned and is under review. Contact the individual subnational natural heritage program for assigned rank.

Breeding Status Qualifiers

Note: A breeding status subrank is only used for species that have distinct breeding and/or non-breeding populations in the nation or subnation. A breeding-status SRANK can be coupled with its complementary non-breeding-status SRANK. The two are separated by a comma, with the higher-priority rank listed first in their pair (e.g., "S2B,S3N" or "SHN,S4S5B").

Rank	Definition
B	Breeding—Basic rank refers to the breeding population of the Element in the nation or subnation.
N	Nonbreeding—Basic rank refers to the non-breeding population of the Element in the nation or subnation.

Other Rank Qualifiers

Rank	Definition
?	Inexact or Uncertain—Denotes inexact or uncertain numeric rank. For SE denotes uncertainty of exotic status. (The ? qualifies the character immediately preceding it in the SRANK.)
C	Captive or Cultivated—Native element presently extant in the nation or subnation only in captivity or cultivation, or as a reintroduced population not yet established.

Appendix 8.1f. Rounded Global Conservation Status Ranks

Rounded GRANK are generated by a calculated field, ROUNDED.GRANK. In general, the rounding algorithm eliminates range ranks, strips the qualifiers "?", "C", and "Q" off the GRANK, and focuses on the "T" subrank for infraspecific taxa. There are 21 possible values for a rounded global rank as listed in the following table. (Note that 9 of these values reflect rounded ranks for infra-specific taxa.).

Comprehensive List of ROUNDED.GRANK values

G1	T1	HYB
G2	T2	*
G3	T3	[null]
G4	T4	
G5	T5	
GH	TH	
GX	TX	
GU	TU	
G?	T?	

Calculating ROUNDED.GRANK

Rounded global ranks are determined according to the following procedures and rules:

1) If GRANK = null, then ROUNDED.GRANK = null

2) If GRANK = invalid, then ROUNDED.GRANK = *

   [Note: the asterisk indicates that the GRANK value does not conform to valid global rank syntax and therefore a rounded global rank can not be calculated.]

3) If GRANK = GXC or contains the value TXC,
   then ROUNDED.GRANK = GH or TH, respectively.

   [According to this rule, Elements that are but still extant ex situ, are treated with the same conservation importance as globally historic Elements. In contrast, Elements that are nationally or state extirpated, but still extant in those jurisdictions (i.e., NRANK = NXC or SRANK = SXC), are treated separately from nationally or state historic Elements.]

4) For all remaining GRANK values, strip the basic rank qualifiers "?", "C", and "Q" and the "T" subrank qualifiers "?", "C", and "Q" off the GRANK value.

   a) if the stripped GRANK value contains no "T" subrank and

      i) is not a range rank (G_n), then ROUNDED.GRANK = stripped GRANK value

      ii) is a range rank (with range G_nG_{n+1}), then ROUNDED.RANK = G_n

      iii) is a range rank (with range G_nG_{n+2}), then ROUNDED.RANK = G_{n+1}

   b) if the stripped GRANK value contains a "T" subrank, then further strip the basic rank (i.e., the G portion) off the value. If the remaining "T" portion of the stripped GRANK value

      i) is not a range rank (T_n), then ROUNDED.GRANK = stripped GRANK value

      ii) is a range rank (with range T_nT_{n+1}), then ROUNDED.GRANK = T_n

      iii) is a range rank (with range T_nT_{n+2}), then ROUNDED.GRANK = T_{n+1}

Examples of ROUNDED.GRANKs

The following examples are not a comprehensive list of rounded ranks derived from rank combinations and variations, but serve to illustrate the use of the rounding algorithm.

GRANK	ROUNDED.GRANK	Explanation
		a null GRANK
G2G4?	*	an invalid GRANK
GX	GX	
GH	GH	
GXC	GH	despite extinction in native habitat, round to historic rank since still captive/cultivated
G2TXC	TH	despite extinction in native habitat, round to historic rank since still captive/cultivated
G1THC	TH	
G3T1	T1	
G2	G2	
G2Q	G2	
G2G3	G2	round to low point of 1 point range
G2G4	G3	round to midpoint of 2 point range
G3?	G3	the "?" qualifier stripped off
G4T2T4	T3	
G4T3?	T3	
G?	G?	"?" represents a basic rank already, not a qualifier
G3T?	T?	
HYB	HYB	

Appendix 8.1g. Standard Global Taxonomic Sources

Classification of Vertebrates and Invertebrates

Standard vertebrate and invertebrate names are defined by NatureServe zoologists who use a set of major references generally accepted by researchers working on a given taxonomic group. However, many of these major references are updated infrequently, typically only every 10 years. Because taxonomy is a dynamic field, the central Heritage zoologists review numerous journals and monographs each year for taxonomic and nomenclature changes, and they may accept these changes before the major source(s) for each group are updated to reflect them. In addition, taxa of conservation concern for which names have not yet been published may be tracked in the NatureServe Central Databases.

Major References for Vertebrate and Invertebrate Names

Higher Taxonomy

- Margulis L, Schwartz KV. 1998. Five kingdoms: an illustrated guide to the phyla of life on earth. 3rd ed. New York: WH Freeman and Co. 520 p.

- Integrated Taxonomic Information System. 1999 [last updated Feb. 17]. Integrated Taxonomic Information System: biological names. Online. Available: http://www.itis.usda.gov/itis/status.htm. [Used for higher taxonomy below the phylum level.]

- Ruppert EE, Barnes RD. 1994. Invertebrate zoology. 6th ed. New York: Saunders College Publishing. 1056 p. [Used for higher taxonomy below the phylum level.]

Phylum Craniata (Vertebrates)

Class Mammalia (Mammals)

- Wilson DE, Reeder DM, editors. 1993. Mammal species of the world: a taxonomic and geographic reference. 2nd ed. Washington, DC: Smithsonian Institution. 1206 p.

- Jones C, Hoffman RS, Rice DW, Engstrom MD, Bradley RD, Schmidly DJ, Jones CA, Baker RJ. 1997. Revised checklist of North American mammals north of Mexico, 1997.Occas Pap Mus Texas Tech Univ 173:1-19. [Used for North American common names and for scientific names based on information since development of the ASC reference above.]

- American Society of Mammalogists. 1969 et seq. Mammalian Species.

Subspecies:

Hall ER. 1981. The mammals of North America. 2nd ed. New York: John Wiley & Sons. 1181+ p. [Used for North American mammal subspecies names, within the framework of the species classification of the major sources above.]

Class Aves (Birds)

- American Ornithologists' Union (AOU). 1998. Checklist of North American birds. 7th ed. Washington, DC: American Ornithologists' Union. 829 p. [as modified by any supplements and corrections].

- Monroe BL Jr, Sibley CG. 1993. A world checklist of birds. New Haven: Yale University Press. 393 p. [Used only for scientific and common names for birds occurring in South America; higher taxonomy for South American birds follows the AOU checklist.]

Subspecies:

American Ornithologists' Union. 1957. Checklist of North American birds. 5th ed. Baltimore, MD: Port City Press, Inc. [Used for North American bird subspecies names, within the framework of the species classification in AOU checklist.]

Class Reptilia (Reptiles)

- King WF, Burke RL. 1989. Crocodilian, tuatara, and turtle species of the world. Association of Systematics Collections. 216 p.

- Collins JT. 1997. Standard common and current scientific names for North American amphibians and reptiles. 4th ed. Society for the Study of Amphibians and Reptiles. 40 p. (Herp. Circ. No. 25.) [Used especially for North American common names for reptiles and amphibians]

- Schwartz A, Henderson RW. 1988. West Indian amphibians and reptiles: a check-list. Milwaukee Public Mus, Contrib Biol Geol 74:1-264. [Major source for West Indian reptiles]

- Iverson JB. 1992. A revised checklist with distribution maps of the turtles of the world. Earlham, IN: Privately printed. xiii + 363 p.

- Ernst CH, Barbour RW. 1989. Turtles of the world. Washington, DC: Smithsonian Institution Press. xii + 313 pp.

- Ernst CH, Barbour RW, Lovich JE. 1994. Turtles of the United States and Canada. Washington, DC: Smithsonian Institution Press. xxxviii + 578 p.

- Society for the Study of Amphibians and Reptiles. 1971 et seq. Catalogue of American amphibians and reptiles. (Published by the American Society of Ichthyologists and Herpetologists, 1963-1970.)

Class Amphibia (Amphibians)

- Frost DR. 1985. Amphibian species of the world: a taxonomic and geographic reference. Lawrence, KS: Allen Press, Inc., and The Association of Systematics Collections. 732 p.

- Duellman WE. 1993. Amphibian species of the world: additions and corrections. Univ Kansas Mus Nat Hist, Spec Publ 21: 1-372.

- Collins JT. 1997. Standard common and current scientific names for North American amphibians and reptiles. 4th ed. Society for the Study of Amphibians and Reptiles. 40 p. (Herp. Circ. No. 25.) [Used especially for North American common names for reptiles and amphibians]

- Petranka JW. 1998. Salamanders of the United States and Canada. Washington, DC: Smithsonian Institution Press. xvi + 587 p.

- Society for the Study of Amphibians and Reptiles. 1971 et seq. Catalogue of American Amphibians and Reptiles. (Published by the American Society of Ichthyologists and Herpetologists, 1963-1970.)

Classes Osteichthyes, Cephalaspidomorphi, Elasmobranchiomorphi, Myxini (Fishes)

- Robins CR, Bailey RM, Bond CE, Brooker JR, Lachner EA, Lea RN, Scott WB. 1991. Common and scientific names of fishes from the United States and Canada. 5th ed. American Fisheries Society. 183 p. (Special Publication No. 20.)

- Page LM, Burr BM. 1991. A field guide to freshwater fishes: North America north of Mexico. New York: Houghton Mifflin. 432 p.

Subspecies:

- Lee DS, Gilbert CR, Hocutt CH, Jenkins RE, McAllister DE, Stauffer JR Jr. 1980. Atlas of North American freshwater fishes. Raleigh: NC State Museum of Natural History. 867 p. [Used for North American fish subspecies names, within the framework of the species classification of the major source above.]

- Lee DS, Platania SP, Burgess GH. 1983. Atlas of North American freshwater fishes. 1983 supplement. Raleigh: NC State Museum of Natural History, 67 p.

Freshwater Invertebrates (general)

- Pennak RW. 1989. Fresh-water invertebrates of the United States. 3rd ed. New York: John Wiley and Sons, Inc. 628 p.

- Thorp JH, Covich AP, editors. 1991. Ecology and classification of North American freshwater invertebrates. New York: Academic Press. 911 p.

Phylum Mollusca

- Turgeon DD, Quinn JF, Bogan AE, Coan EV, Hochberg FG, Lyons WG, Mikkelsen PM, Neves RJ, Roper CFE, Rosenberg G, Roth B, Scheltema A, Thompson FG, Vecchione M, and Williams JD. 1998. Common and scientific names of aquatic invertebrates from the United States and Canada: mollusks. 2nd ed. American Fisheries Society. 526 p. (Spec. Publ. No. 26.)

- Cowie RH, Evenhuis NL, Christensen CC. 1995. Catalog of the native land and freshwater molluscs of the Hawaiian Islands. Leiden: Backhuys Publ. 248 p.

Phylum Crustacea

- Fitzpatrick JF Jr. 1983. How to know the freshwater crustacea. Iowa: Wm. C. Brown Company Publishers. 227 p. [Used as a source for names of freshwater crustaceans in groups other than those listed below.]

Class Malacostrata, Order Decapoda (Crayfishes and other decapods)

- Williams AB, Abele LG, Felder DL, Hobbs HH, Manning RB, McLaughlin PA, Farfante IP. 1989. A list of common and scientific names of decapod crustaceans from America north of Mexico. American Fisheries Society. 77 p. (Special Publ. No. 17.)

- Hobbs HH Jr. 1989. An illustrated checklist of the American crayfishes (Decapoda: Astacidae, Cambaridae and Parastacidae). Washington, DC: Smithsonian Institution Press. 236 p. (Smithsonian Contributions to Zoology 480.) [Used for synonyms]

Class Branchiopoda (Fairy, Clam, and Tadpole Shrimps)

Belk, Denton, 840 E. Mulberry Ave., San Antonio, TX 78212-3194

Phylum Mandibulata (insects, centipedes, millipedes)

Groups not covered by the sources listed below follow:

- Poole RW, Gentili P, editors. 1996-97. Nomina insecta nearctica: a check list of the insects of North America. 4 volumes. Rockville, MD: Entomological Information Services. [Used for groups not covered by other sources below.]

- Nishida GM, editor. 1994. Hawaiian terrestrial Arthropoda checklist. 2nd ed. Honolulu: Bishop Museum. 287 p. (Hawaii Biological Survey, Contribution No. 94-04.) [Used for Hawaiian species.]

Order Lepidoptera, Superfamilies Papilionidae (True Butterflies) and Hesperioidae (Skippers)

- Opler PA (chair), Burns JM, LaFontaine JD, Robbins RK, Sperling F. 1999. Scientific names of North American butterflies. Fort Collins, CO. Unpublished review draft.

- Emmel TC, editor. 1998. Systematics of western Butterflies. Gainesville, FL: Mariposa Press. 878 p.

- Layberry RA, Hall PW, Lafontaine JD. 1998. The butterflies of Canada. Toronto: University of Toronto Press. 280 p.

- Opler PA. 1999. Western butterflies. Boston: Houghton Mifflin Co. [Life list used for common names.] Mostly follows:

- Cassie B, Glassberg J, Opler P, Robbins R, Tudor G. 1995. North American Butterfly Association (NABA) checklist and English names of North American butterflies. Morristown, NJ: North American Butterfly Association. 43 p. Online. Available: http://www.naba.org/pubs/checklst.htm [Used for common names.]

Order Lepidoptera, Families Saturniidae (Silk Moths) and Sphingidae (Sphinx Moths)

- Opler PA. 1995. Lepidoptera of North America. 1, Distribution of silkmoths (Saturniidae) and hawkmoths (Sphingidae) of eastern North America. Fort Collins: Contributions of the CP

- Gillette Insect Biodiversity Museum, Department of Entomology, Colorado State University. Unpaginated.

- Peigler RS, Opler PA. 1993. Moths of western North America. 1, Distribution of Saturniidae of western North America. Fort Collins: Contributions of the CP Gillette Insect Biodiversity Museum, Department of Entomology, Colorado State University. Unpaginated.

- Smith MJ. 1993. Moths of western North America. 2, Distribution of Sphingidae of western North America. Fort Collins: Contributions of the CP Gillette Insect Biodiversity Museum, Department of Entomology, Colorado State University. 27 p.

- Tuskes PM, Tuttle JP, Collins MM. 1996. The wild silk moths of North America. Ithaca, NY: Cornell University Press. 280 p.

Order Lepidoptera, Family Noctuidae, Genus Catocala (Underwing Moths)

- Gall Lawrence F. 1999. Unpublished database containing county level data for the North American species of Catocala. Entomology Division, Peabody Museum of Natural History, Yale University, New Haven, CT 06520-8118, USA.

Order Lepidoptera, Genus Papaipema

- Quinter EL. 1983. Papaipema. In Hodges RW, et al, editors. Check list of the Lepidoptera of America north of Mexico. EW Classey Lmtd. and The Wedge Entomological Research Foundation. p 138-139.

- Quinter Eric L. Senior Scientific Assistant, Department of Entomology, American Museum of Natural History, Central Park West at 79th St., New York, NY 10024-5192

Order Coleoptera, Family Cicindelidae (Tiger Beetles)

- Boyd HP and Associates. 1982. Checklist of Cicindelidae, the tiger beetles. Marlton, NJ: Plexus Publishing. 31 pp.

- Pearson DL, Barraclough TG, Vogler AP. 1997. Distributional maps for North American species of tiger beetles (Coleoptera: Cicindelidae). Cicindela 29:33-40.

Order Odonata (Dragonflies and Damselflies)

- Paulson DR, Dunkle SW, editors. 1998, November 13. The Odonata of North America. Dragonfly Society of the Americas. Online. Available: http://www.ups.edu/biology/museum/NAdragons.htm.

Order Plecoptera (Stoneflies)

- Stark BP. 1998, October 12. North American stonefly list. Online. Available: http://www.mc.edu/~stark/stonefly.htm.

Order Trichoptera (Caddisflies)

- Morse JC. 1993. A checklist of the Trichoptera of North America, including Greenland and Mexico. Transactions of the American Entomological Society 119(1):47-93. [Updates available from World Trichoptera Checklist at: http://entweb.clemson.edu/database/trichopt/.]

Order Ephemeroptera (Mayflies)

- McCaffrey WP. 1999, January 15. The mayflies of North America. Online. Available: http://www.entm.purdue.edu/entomology/mayfly/contents.htm.

Classification of Plants

Plant names as defined by NatureServe's standard references, represent the consensus standards for researchers working in a given geographic area.

Major References for Vascular Plants

- Kartesz, JT. 1999. A synonymized checklist and atlas with biological attributes for the vascular flora of the United States, Canada, and Greenland. 1st edition. In: Meacham, CA. Synthesis of the north american flora [computer program]. Version 1.0. North Carolina Botanical Garden, Chapel Hill (NC). System requirements: IBM Windows 3.1, 95, 98, NT, or 2000 operating systems; 25 MB available hard-disk space, 32 MB RAM, Pentium or faster processor, or any 100% compatible computer and components.

- Kartesz JT. 1994. A synonymized checklist of the vascular flora of the United States, Canada, and Greenland. 2nd ed. 2 vols. Portland, (OR): Timber Press.

Major References for Nonvascular Plants and Fungi

- Anderson LE, Crum HA, Buck WR. 1990. List of the mosses of North America north of Mexico. The Bryologist 93(4):448-499.
- Anderson LE. 1990. A checklist of sphagnum in North America north of Mexico. The Bryologist 93(4):500-501.
- Stotler R, Crandall-Stotler B. 1977. A checklist of the liverworts and hornworts of North America. The Bryologist 80(3):405-428.
- Esslinger TL, Egan RS. 1995. A sixth checklist of the lichen-forming, lichenicolous, and allied fungi of the continental United States and Canada. The Bryologist 98(4):467-549.
- Farr DF, Bills GF, Chamuris GP, Rossman AY. 1989. Fungi on plants and plant products in the United States. St. Paul, MN: APS Press.

Appendix 8.1h. Supplemental State-Specific Documentation

This supplement provides state-specific documentation as part of the species at risk on DOD Installations project.

State Protection Status (SPROT)

The State Protection Status (SPROT) field is an abbreviation used by state for the level of legal protection afforded to the element by that entity. Abbreviations and definitions will vary by state or subnation. Those SPROT values used in this data set are shown in the table below. States that are not included in this table did not have any SOC with SPROT values.

State Protection Statuses and Definitions

STATE	SPROT CODE	SPROT DEFINITION	LEGAL STATUS / COMMENTS
AL	SP	State Protected (animals)	AL: Nongame animals given legal status under AL Regulations Game & Fish & Furbearing Animals.
AR	ST	State Threatened (plants)	AR: AR codes only apply to plants; SE and ST designation is "administrative" - there is no special legal protection for state endangered or threatened plants.
CA	CT	Threatened (plants and vertebrates)	

State Protection Statuses and Definitions			
STATE	**SPROT CODE**	**SPROT DEFINITION**	**LEGAL STATUS / COMMENTS**
CA	Endangered	Endangered (plants and vertebrates)	CA: 1-5, and Endangered, Threatened, Rare, Candidate, and None are all legal designations
CA	NONE	None (plants and vertebrates)	
CA	Rare	Rare (any taxa)	
CA	Threatened	Threatened (plants and vertebrates)	
FL	LE	Listed Endangered (plants and animals)	FL: Plants - (CE, LC, LE, and LT) are listed in the Preservation of Native Flora of Florida Act: other SPROT codes for plants are for administrative purposes only. Animals - (LE, LS, SSC and LT) are listed by the Florida Game and Fresh Water Fish Commission (FGFWFC): these are legal designations.
FL	LS	Listed Species of Special Concern (animals)	
FL	LT	Listed Threatened (plants and animals)	
FL	LT*	Listed Threatened, only protected in certain counties (plants and animals)	
GA	E	Endangered (animals and plants)	GA: (E, T, R, U) plant and animal species are state protected; the following categories do not have legal status: PE, PT, PU.
GA	R	Rare (animals and plants)	
GA	T	Threatened (animals and plants)	
HI	LE	Listed Endangered	HI: The state follows the federal listing codes except for LELA and LEOA, but these still denote federal status LE.
HI	LEOA	Listed Endangered, Oahu only (animals)	
HI	NONE	None	
ID	GP2	Global priority 2; species with GRANK G2 or T2 (plants)	ID: For plant species, the following codes: 1, 2, M, R, S, and X are Idaho Native Plant Society categories that do not carry legal status although are considered by all state and federal agencies. For animal (not inverts) species, Endangered, Game endangered, Game special concern, Game threatened, Protected, Special Concern, and Threatened are legally protected, see Idaho Code, sections 36-106(e)5 & 36-1107, or Commission regulation.
ID	GP3	Global priority 3; species with GRANK G3 or T3 (plants)	
IL	LE	Listed Endangered (plants and animals)	IL: Listing and removal of species from Endangered and Threatened species list is made by Endangered Species Protection Board; this is a legal status.
IL	LT	Listed Threatened (plants and animals)	

State Protection Statuses and Definitions			
STATE	**SPROT CODE**	**SPROT DEFINITION**	**LEGAL STATUS / COMMENTS**
IN	SE	State Endangered (animals and plants)	IN: IN Nongame Animal Act protects mammals, birds, reptiles, amphibians, and mussels if designated SE. SSC taxa are listed but have no protection. All other codes have no legal status.
IN	SR	State Rare (plants and insects)	
IN	SSC	State Special Concern (animals)	
IN	ST	State Threatened (animals and plants)	
KY	E	Endangered (plants and animals)	KY: KY State Nature Preserves Commission state status: Endangered, Historic, None, Special Concern, Threatened, and Extirpated. Administrative only, no regulatory statute protects them.
KY	S	Special Concern (plants and animals)	
KY	T	Threatened (plants and animals)	
MI	SC	Special Concern (any species) (no legal protection - could become threatened in the near future)	MI: E, T, and X are of legal status according to MI ESA (now under new name). Special Concern status has no legal protection.
MN	SPC	Species of Special Concern (extremely uncommon or has unique habitat requirements and deserve careful monitoring)	MN: MN Endangered Species Statute (MN Statutes, Section 84.0895) gives definitions of Endangered, Threatened, and Special Concern. Species of Special Concern are not protected although this is a legal status.
MN	THR	Threatened (plants and animals)	
MT	NONE	None	MT: State legal status in MT (GA, GF, FB, MB, UB, E, NG, P, U, CS, RH and code combinations) applies only to vertebrates as listed in the 1989 Statutes of MT for the Dept. of Fish, Wildlife and Parks - plants have no status.
NC	C	Candidate (plants)	NC: Animal legal status: E, T and SC (mammals, birds, reptiles, amphibians, freshwater fishes, and mollusks) from NC Endangered Species Act; Plant legal status (E, T, and SC) legally protected through the NC Plant Conservation Program, GS 19B 106:202.12. SR and C do not have legal status.
NC	E	Endangered (animals and plants)	
NC	SC	Special Concern (animals and plants)	
NC	SR	Significantly Rare (animals and plants)	
NC	T	Threatened (animals and plants)	
NJ	E	Endangered (animals and plants)	NJ: Legal status for endangered animals and endangered plants.

State Protection Statuses and Definitions			
STATE	**SPROT CODE**	**SPROT DEFINITION**	**LEGAL STATUS / COMMENTS**
NM	E	Endangered (plants and animals) - survival in NM in jeopardy or likely to become so in the foreseeable future	NM: Animal status (E, T) determined by NM Dept. of Game and Fish; plant status (E, S, R, and D) determined by Energy, Minerals and Natural Resources Dept. Plants: E, S, R, and D correspond to the legal designations 1, 2, 3, 4 respectively under the NM Endangered Plant Species Act, but only E status provides protection under the law.
NM	S	Sensitive (plants) - rare because of restricted distribution of low numerical density	
NM	T	Threatened (animals) - likely to become endangered within the foreseeable future throughout all or a significant portion of its range in New Mexico	
NY	U	Unprotected (plants and animals)	NY: plant legal status (E, T, R, and V), see 6NYCRR part 193.3, applies to NY State Environmental Conservation Law (NYSECL) sections 9-1503 & 11-0103; animal legal status (E, T, SC, P, and G), see NYSECL sections 11-0535 & 11-0103 and 6NYCRR 182.5.
NY	U SC	Unprotected, Special Concern (animals)	
OH	E	Endangered (plants and animals)	OH: Animals: legal status: (E): see 1531.25 ORC; other designations for animals are for administrative /planning purposes only. Plants: legal status: (E, T), under OH Revised Code Chp. 1518, OH Endangered Plant Law
OH	T	Threatened (plants and animals)	
OR	C	Candidate (plants); Sensitive-Critical (animals)	OR: Animals, OR Dept of Fish & Wildlife Status, Plants - OR Dept. of Agriculture status. Only LE and LT are legal designations.
OR	LE	Listed Endangered (plants and animals)	
OR	LT	Listed Threatened (plants and animals)	
TN	D	Deemed in need of management (nongame animals)	TN: Plants formally listed under the authority of the TN Dept. of Environment and Conservation; E, PE, T, S, CE, and P are legal designations. D is an administrative designation. Animals formally listed (E,T) under the authority of the TN Wildlife Resources Agency (T.C.A. 70-8-104, 70-8-105, 70-8-107).
TN	E	Endangered (plants and animals)	
TN	S	Special Concern (plants)	
TN	T	Threatened (plants and animals)	

State Protection Statuses and Definitions			
STATE	**SPROT CODE**	**SPROT DEFINITION**	**LEGAL STATUS / COMMENTS**
TX	T	State Threatened (plants and animals)	TX: legal status (E, T) under the TX Parks & Wildlife Code.
UT	CS	Conservation Species - special management under Conservation Agreement (wildlife species and subspecies)	UT: XNCT, XTRP, E, T, S1, S2, S1S2, GAME, NGP, NGN are abbreviations from the UT DNR 1993 Draft Species of Special Concern list: these designations are allowed under the UT Code but do not provide any legal protection. Wildlife = vertebrates, crustaceans incl. brine shrimp and crayfish, and mollusks, except for feral animals. A management program is needed for these species if a recovery plan has not been developed.
UT	None	None (plants and vertebrates)	
VA	LE	Listed Endangered	VA: status (LE and LT) determined by VA Dept. of Game and Inland Fisheries, or Dept. of Agriculture and Consumer Services, under authority of Virginia Code. SC is not a legal designation - for administrative purposes only.
VA	LT	Listed Threatened	
VA	SC	Special Concern (animals on a non-regulatory list)	
WA	C	Candidate for listing (animals)	WA: legal protection status for animals (E, T): see WA Administrative Codes 232-12-011, 232-12-014, and 232-12-297. Plants have no legal status.
WA	E	Endangered (animals and plants)	
WA	S	Sensitive (vulnerable or declining) (animals and plants)	
WA	T	Threatened (animals and plants)	
WI	END	Endangered (plants and animals)	WI: Protection category (END, THR, RULE, NONE, PEND, PTHR, SC) designated by the Wisconsin DNR.
WI	SC/N	Special concern - no laws regulating use, possession, or harvesting	

State-Specific Documentation and Data Issues

State-specific documentation and data issues are described in the following pages.

NatureServe worked with the data from the natural heritage programs within which the 726 DOD Installations in the USGS federal lands file are located. State-specific issues are shown in the table below.

State / Program	State / Program Specific Data Comments
Alabama Natural Heritage Program	The geographic region of the Tennessee Valley Authority (TVA) Heritage Program overlaps a portion of Alabama. While known duplicate records have been removed from the project dataset, there is a possibility of an Element Occurrence (EO) being tracked by both the state and TVA programs. For more details, please see the comments for the TVA program below.
Alaska Natural Heritage Program	In Alaska, many of the element occurrence locations have only been recorded to the precision of degrees and minutes, not to the level of seconds. This has the effect of "fuzzing" the Alaska locational information. For the SPECIES AT RISK analyses, there may be some additional species that were not captured as being either on a DOD Installation or in it's buffer zone.
Arizona Heritage Data Management System	The Arizona Natural Heritage Program (NHP) is required to randomize, or "fuzz," all element occurrence (EO) data on private lands. The NHP is also required to fuzz EOs on public lands unless specific permission is received from those Federal Agencies managing the lands. Data are "fuzzed" by up to 30 seconds in latitude and up to 30 seconds in longitude. For this project, the EOs on DOD installations were fuzzed. Because of data access constraints, NatureServe and the Arizona Natural Heritage Program cannot provide records for locations on Native American Tribal lands (other than those provided by the Navajo Nation Natural Heritage Program). Data from the tribal lands of Navajo Nation are tracked by the Navajo Nation Natural Heritage Program and are supplied separately for use in this project. This division of responsibility results in an apparent "hole" in the Arizona data set.
Arkansas Natural Heritage Program	No state-specific data issues.
California Natural Heritage Program, California Natural Diversity Database	No state-specific data issues.
Colorado Natural Heritage Program	Data from the tribal lands of Navajo Nation are tracked by the Navajo Nation Natural Heritage Program and are supplied separately for use in this project. This division of responsibility results in an apparent "hole" in the Colorado data set.
Connecticut Natural Diversity Database	No state-specific data issues.
Delaware Natural Heritage Program	No state-specific data issues.
Florida Natural Areas Inventory	No state-specific data issues.

State / Program	State / Program Specific Data Comments
Georgia Natural Heritage Program	The geographic region of the Tennessee Valley Authority (TVA) Heritage Program overlaps a portion of Georgia. While known duplicate records have been removed from the project dataset, there is a possibility of an Element Occurrence (EO) being tracked by both the state and TVA programs. For more details, please see the comments for the TVA program below.
Hawaii Natural Heritage Program	No state-specific data issues.
Idaho Conservation Data Center	The Idaho Conservation Data Center (the state NHP) does not maintain locational data for fish. The fish locational data are maintained by Streamnet and are represented by state-wide distribution in rivers rather than Element Occurrences. Since these data do not follow standard Natural Heritage data methodology, they have not been included in the DOD-SPECIES AT RISK analyses. For the Idaho fish Streamnet data, please contact: Bart Butterfield Idaho Fish and Game 600 S. Walnut, Box 25 Boise, ID 83707 (208) 334-3180 x262 bbutterf@idfg.state.id.us
Illinois Natural Heritage Database Program	No state-specific data issues.
Indiana Natural Heritage Data Center	No state-specific data issues.
Iowa Natural Areas Inventory	No state-specific data issues.
Kansas Natural Heritage Inventory	Kansas NHP notes that it has no recorded species occurrences on Tribal Lands; only ecological community surveys have been conducted on Tribal Lands.
Kentucky Natural Heritage Program	The geographic region of the Tennessee Valley Authority (TVA) Heritage Program overlaps a portion of Kentucky. While known duplicate records have been removed from the project dataset, there is a possibility of an Element Occurrence (EO) being tracked by both the state and TVA programs. For more details, please see the comments for the TVA program below.
Louisiana Natural Heritage Program	No state-specific data issues.
Maine Natural Areas Program	In the state of Maine, species locational data are maintained by two entities: The Maine Natural Areas Program maintains the plant data, this program is a Natural Heritage Program and follows Natural Heritage data methodology. These data are included in the DOD-SPECIES AT RISK analyses. The Maine Endangered and Threatened Species Program maintains animal locational data. This program is not a Natural Heritage Program but works closely with the Maine Natural Heritage Program and does follow Natural Heritage data methodology. Because of data access constraints, however, NatureServe does not have access to the Maine animal data and they therefore were <u>not</u> included in this project. For DOD installations in Maine, it is likely that there are additional animals that should be considered as SPECIES AT RISK but due to the above data limitation do not appear in the installation species lists and summary numbers.

State / Program	State / Program Specific Data Comments
Maryland Natural Heritage Program	No state-specific data issues.
Massachusetts Natural Heritage & Endangered Species Program	Specific locational data (i.e. lat / long coordinates) for Massachusetts was not available for the NatureServe Species at risk project work. Available species distributions in this state are identified only to the level of county or watershed of occurrence, both of which are significantly larger than installations in Massachusetts. If requested, it is possible to provide a list of SPECIES AT RISK for the county or watershed in which an installation is located, but this is a much coarser analysis and could include many species not actually found on or near installations.
Michigan Natural Features Inventory	No state-specific data issues.
Minnesota Natural Heritage & Nongame Research	No state-specific data issues.
Mississippi Natural Heritage Program	The geographic region of the Tennessee Valley Authority (TVA) Heritage Program overlaps a portion of Mississippi. While known duplicate records have been removed from the project dataset, there is a possibility of an Element Occurrence (EO) being tracked by both the state and TVA programs. For more details, please see the comments for the TVA program below.
Missouri Natural Heritage Program	No state-specific data issues.
Montana Natural Heritage Program	No state-specific data issues.
Navajo Natural Heritage Program	Data from the tribal lands of Navajo Nation are tracked by the Navajo Natural Heritage Program and include portions of Arizona, New Mexico, Utah, and Colorado. Data from the Navajo Nation Heritage Program includes selected information for Hopi lands.
Nebraska Natural Heritage Program	No state-specific data issues.
Nevada Natural Heritage Program	No state-specific data issues.
New Hampshire Natural Heritage Inventory	No state-specific data issues.
New Jersey Natural Heritage Program	No state-specific data issues.

State / Program	State / Program Specific Data Comments
New Mexico Natural Heritage Program	Due to data sensitivity concerns, locational data used in these analyses had been randomized, or "fuzzed," to 1 mile. Because of data access constraints, the New Mexico Natural Heritage Program cannot provide to NatureServe records for: Locations on Native American Tribal lands (other than those provided by the Navajo Nation Natural Heritage Program) Locations on the lands of White Sands Missile Range and Fort Bliss Military Reservation. As noted in Section 3.2 "Additional Data Sources", species lists for White Sands Missile Range and Fort Bliss Military Reservation were provided by these installations for use in the NatureServe DOD-SPECIES AT RISK project. The summary statistics for these two locations therefore includes only numbers of SPECIES AT RISK on the installation and does not include information about the numbers of element occurrences. Data from the tribal lands of Navajo Nation are tracked by the Navajo Nation Natural Heritage Program and are included in these analyses. All other tribal areas in New Mexico are not represented in the NatureServe DOD-SPECIES AT RISK analyses.
New York Natural Heritage Program	No state-specific data issues.
North Carolina Natural Heritage Program	The geographic region of the Tennessee Valley Authority (TVA) Heritage Program overlaps a portion of North Carolina. While known duplicate records have been removed from the project dataset, there is a possibility of an Element Occurrence (EO) being tracked by both the state and TVA programs. For more details, please see the comments for the TVA program below.
North Dakota Natural Heritage Inventory	No state-specific data issues.
Ohio Natural Heritage Database	No state-specific data issues.
Oklahoma Natural Heritage Inventory	No state-specific data issues.
Oregon Natural Heritage Program	No state-specific data issues.
Pennsylvania Natural Diversity Inventory	Specific locational data (i.e. lat / long coordinates) for Pennsylvania was not available for the NatureServe Species at risk project work. Available species distributions in this state are identified only to the level of county or watershed of occurrence, both of which are significantly larger than installations in Pennsylvania. If requested, it is possible to provide a list of SPECIES AT RISK for the county or watershed in which an installation is located, but this is a much coarser analysis and could include many species not actually found on or near installations.
Rhode Island Natural Heritage Program	No state-specific data issues.
South Carolina Heritage Trust	The South Carolina NHP uses a slightly different approach in the management of their EO last observed (LASTOBS) dates. In SC, if the LASTOBS date for an EO is the same as the first observation date, then they have left the LASTOBS field blank. In the installation-specific lists of SPECIES AT RISK, this could result in some blank and/or under-represented most recent observation dates.

State / Program	State / Program Specific Data Comments
South Dakota Natural Heritage Data Base	No state-specific data issues.
Tennessee Division of Natural Heritage	The geographic region of the Tennessee Valley Authority (TVA) Heritage Program overlaps a portion of Tennessee state. While known duplicate records have been removed from the project dataset, there is a possibility of an Element Occurrence (EO) being tracked by both the state and TVA programs. For more details, please see the comments for the TVA program below.
Tennessee Valley Authority (TVA) Regional Natural Heritage	The TVA Heritage Program's geographic region overlaps portions of the following states: Tennessee, Kentucky, Virginia, North Carolina, Georgia, Alabama, and Mississippi. This creates the possibility of an Element Occurrence (EO) being tracked by both a state Natural Heritage Program (NHP) and the TVA program. Known duplicates have been flagged by TVA, were removed by NatureServe from the DOD-SPECIES AT RISK project dataset, and were not included in the analyses. However, some of the records in the TVA data do fall very close to EO's of the same species maintained by state NHPs, yet they have not yet reconciled these EO's to flag them as duplicates. In these cases, therefore, both EO records are included in the analyses and could result in a slightly inflated count of numbers of occurrences. There is no impact on the SPECIES AT RISK installation-specific species lists and the species-level summary numbers.
Texas Conservation Data Center	No state-specific data issues.
Utah Natural Heritage Program	As is required by Utah state law, all specific locational data have been randomized, or "fuzzed," within the square mile by "fuzzing" up to 0.5 miles north or south and up to 0.5 miles east or west. Because of data access constraints, the Utah Natural Heritage Program cannot provide records to NatureServe for locations on Native American Tribal lands (other than those provided by the Navajo Nation Natural Heritage Program). Therefore, this information was not included in the NatureServe DOD-SPECIES AT RISK project analyses Data from the tribal lands of Navajo Nation are tracked by the Navajo Nation Natural Heritage Program and are supplied separately. This division of responsibility results in an apparent "hole" in the Utah data set.
Vermont Nongame & Natural Heritage Program	No state-specific data issues.
Virginia Division of Natural Heritage	The geographic region of the Tennessee Valley Authority (TVA) Heritage Program overlaps a portion of Virginia. While known duplicate records have been removed from the project dataset, there is a possibility of an Element Occurrence (EO) being tracked by both the state and TVA programs. For more details, please see the comments for the TVA program above.

State / Program	State / Program Specific Data Comments
Washington Natural Heritage Program	In the state of Washington, species locational data are maintained by two entities: The Washington Natural Heritage Program (WA-NHP) in the Department of Natural Resources maintains plant data and data on a small number of non-game animals including butterflies / skippers and mussels. This program is a Natural Heritage Program and follows Natural Heritage data methodology. These data are included in the DOD-SPECIES AT RISK analyses. The Washington Department of Fish and Wildlife (WA-DFW) maintains animal locational data. This program is not a Natural Heritage Program and does not follow Natural Heritage data methodology. Accordingly, animal data from WA-DFW were not included in this project. For DOD installations in Washington state, it is likely that there are additional animals that should be considered as SPECIES AT RISK but due to the above data limitation do not appear in the installation species lists and summary numbers.
West Virginia Natural Heritage Program	No state-specific data issues.
Wisconsin Natural Heritage Program	No state-specific data issues.
Wyoming Natural Diversity Database	Because of legal and security constraints, Wyoming Natural Heritage Program (WYHP) can not provide to NatureServe the precise locations of restricted data records. Therefore, NatureServe can not include these records in the DOD-SPECIES AT RISK project analyses. Restricted data records may include: 1. Certain private land information. 2. Data that has been shared with WYHP but has specific security constraints imposed by the individual or agency that provided the data. 3. Data for certain species or communities or for certain locations of species or communities that have been determined as sensitive for the continuing existence of the species or community.

Appendix 8.1i. Data Field Definitions

Common Name (GCOMNAME) - The standard global (i.e., rangewide) common name of species adopted for use in the NatureServe Central Databases (e.g. the common name for *Haliaeetus leucocephalus* is bald eagle).

Distant Migrant - Indicates that some populations of the taxon annually migrate 200 km or more, at the specified geographic level (i.e., range-wide for global, within-nation populations for national, or within-state or province populations for subnational).

ELCODE - Unique identifier for an Element previously used in the Biological and Conservation Data system (BCD). The Element code (ELCODE) consisted of a 10-character structure.

Federal Listing Status (USESA) - Official federal status assigned under the U.S. Endangered Species Act.

Federal Listing Status Date (USESADATE) - Date when the US Federal species category was published in the Federal Register.

Global Conservation Status (GRANK) - The conservation status according to NatureServe and the NHPs of a species from a global (i.e., rangewide) perspective, characterizing the relative rarity or imperilment of the species.

Global Conservation Status Date (GRANKDATE) - The date the Global Conservation Status (GRANK) was originally entered or last changed by the lead responsible office.

Global Range Comments - Comments that describe the global range of the species.

Global Rank Reasons - Reasons that the global (i.e., range-wide) NatureServe Conservation Status Rank for the Element was assigned, including key ranking variables and other considerations used.

Global Scientific Name (GNAME) - The standard global (i.e., rangewide) scientific name (genus and species) adopted for use by the NatureServe Central Databases based on selected standard taxonomic references.

Habitat (GHABCOM) - Summary of the habitats and microhabitats commonly used at a particular geographic level (i.e., range-wide for global, within-nation for national, or within-state or province for subnational), including any daily, seasonal, and geographic variation in habitat use.

Local Migrant - Indicates that the taxon, relative to daily movement patterns, makes local extended movements (generally less than 200 km) at particular times of the year (e.g., to breeding or wintering grounds, to hibernation sites) at the specified geographic level (i.e., range-wide for global, within-nation populations for national, or within-state or province populations for subnational).

Long Term Trend - Code that best describes the observed, estimated, inferred, or suspected degree of change in population size, extent of occurrence, area of occupancy, number of occurrences (EOs), and/or viability/ecological integrity of occurrences over the long-term (ca. the past 200 years) within the specified geographic level (i.e., range-wide for global, within-nation for national, or within-state or province for subnational). Values include: A = Very large decline (decline of >90%, with <10% of population size, range, area occupied, and/or

number or condition of occurrences remaining); B = Large decline (decline of 75-90%); C = Substantial decline (decline of 50-75%); D = Moderate decline (decline of 25-50%); E = Relatively stable (±25% change); F = Increasing (increase of >25%); U = Unknown (long-term trend in population size, range, area occupied, or number or condition of occurrences unknown)
(null) = Rank factor not assessed.

Long Term Trend Comments - Comments on long-term trends of the Element (including the trend quantified in the preceding Long-Term Trend field), within the specified geographic level (i.e., range-wide for global, within-nation for national, or within-state or province for subnational).

Most Recent Year Last Observed (LASTOBS) - The date that an Element Occurrence for the species was last observed to be extant at the site. This is not necessarily the date the site was last visited. See "Most Recent Year Surveyed", below.

Most Recent Year Surveyed (SURVEYDATE) – The date of the most recent field survey. If the Element Occurrence (EO) was found, then the LASTOBS is also updated. If the EO was not found, then only the SURVEYDATE is updated.

If the survey date is older than the most recent last observed date, please use the last observed date.

It is common for the most recent survey date to be greater (i.e. more current) than the most recent last observation date. Example: A particular EO was last observed in 1995 (LASTOBS = 1995). A biologist conducts a field survey in 2001 and does NOT find that EO. The SURVEYDATE is updated in the databases to "2001", but the LASTOBS value is still "1995".

The Nature Conservancy (TNC) Ecoregion - The Nature Conservancy (TNC) Ecoregion(s) where the installation occurs. This information is provided to create a larger context for the SPECIES AT RISK analyses, and is potentially useful for DOD / FWS work with The Nature Conservancy on ecoregional planning efforts.

Occurrences General Description (GENDESC) - A description of the general area where the EO is located. This information is summarized for all occurrences of a SPECIES AT RISK on a particular installation. NOTE: The level of detail and completeness of the occurrence-level descriptions varies from state to state; this information is provided "as-is" and should not be considered as comprehensive. For additional information, please contact the appropriate state natural heritage program(s).

Please refer to Appendix 8.1j. for the Occurrences General Description for *Pyxidanthera brevifolia* (Well's Pixie-Moss) and *Cimicifuga elata* (Tall

Bugbane). For these two species, the occurrences general description data was too long to be incorporated into the spreadsheet.

Rounded GRANK – Global conservation status "rounded" to a single character.

Rounded SRANK - State conservation status "rounded" to a single character.

Short Term Trend - Code that best describes the observed, estimated, inferred, suspected, or projected short-term trend in population size, extent of occurrence, area of occupancy, number of occurrences (EOs), and/or viability/ecological integrity of occurrences (whichever most significantly affects the NatureServe Conservation Status Rank) within the specified geographic level (i.e., range-wide for global, within-nation for national, or within-state or province for subnational). Short-term trends may be recent, current, or projected, and a trend may or may not be known to be continuing. For species, short-term trends are typically considered over the a period spanning the past 10 years or 3 generations (whichever is longer up to a maximum of 100 years). In considering short-term trends, newly discovered but presumably long existing occurrences should not be considered to represent an increasing trend, nor newly discovered individuals in previously little-known occurrences. Also, increases in the number of occurrences due to fragmentation of previously larger occurrences into more but smaller occurrences should not be considered to represent an increasing trend, but instead fragmentation of occurrences should be considered as indicative of a decreasing area of occupancy. Values include: A = Severely declining (decline of >70% in population size, range, area occupied, and/or number or condition of occurrences); B = Very rapidly declining (decline of 50-70%); C = Rapidly declining (decline of 30-50%); D = Declining (decline of 10-30%); E = Stable (unchanged or remaining within ±10% fluctuation); F = Increasing (increase of >10%); U = Unknown (short-term trend unknown); (null) = Rank factor not assessed.

Short Term Trend Comments - Comments on short-term trends of the Element (including the trend quantified in the preceding Short-Term Trend field), within the specified geographic level (i.e., range-wide for global, within-nation for national, or within-state or province for subnational). For example, if the short-term trend for an ecological community relates to changes in the condition of Element Occurrences (EOs), especially their landscape context, discuss the situation here. For example, are occurrences of this Element, which is maintained by frequent surface fires, surrounded by rural subdivisions? Has alteration of disturbance regimes led to altered landscape relations (e.g., is fire suppression resulting in fewer, smaller, and further separated patches of this community type)?

Species of Common Conservation Concern in North America – Indicates whether or not the species is on the "Species of Common Conservation Concern" (SCCC) list, a selected group of 17 North American migratory and transboundary species,

mostly birds. The SCCC list is created and maintained by the Commission for Environmental Cooperation (CEC), an international organization created by Canada, Mexico, and the United States under the North American Agreement on Environmental Cooperation (NAAEC). The NAAEC agreement complements the environmental provisions of the North America Free Trade Agreement. For more information, please see: http://www.cec.org/

Species Habitat Types - For animal species only, a text field that combines the values from several fields that characterize habitat at a global or range-wide level. These values are selected from a set of standardized domain tables.

Species Group (Informal taxonomy of the species) - the name of the species' group in plain English (mammals, birds, freshwater mussels, etc.)

Species-Level Threats (GTHREATCOM) – A description of the degree to which the species is directly or indirectly threatened globally (range-wide). Actual threats are cited where known. NOTE: Animal species – the threat information was last updated in August 2001. Plant species – the threat information has not been systematically reviewed and has not been systematically updated in several years. Some of the species-level threat information may be old and no longer relevant. All of the species-level threat data should be treated as background information and as a potential starting point for additional research.

State Conservation Status (SRANK) - The conservation status of a species from the state/subnation perspective, characterizing the relative rarity or imperilment of the species. Together these values provide national distribution data.

State Protection Status (SPROT) - Abbreviation used by state/subnation for the level of legal protection afforded to the element by that entity. Abbreviations and definitions will vary by state or subnation.

Synonym - A recognized synonym for this species Element.

Threat – Overall degree to which the species, ecological community or System is observed, inferred, or suspected to be directly or indirectly threatened within the specified geographic level (i.e., range-wide for global, within-nation for national, or within-state or province for subnational) by the threat with the greatest overall impact on the Element.

Threat Comments – Comments concerning global threats to this Element.

Threat Immediacy – Indicates, for the threat with the greatest overall impact on the Element (see threats table), the imminence of the threat to the Element (i.e., how likely the threat to the Element is and how soon it is expected to be realized) at the global level level.
Values are: High = Threat is operational (happening now) or imminent (within a year); Moderate = Threat is likely to be operational within 2-5 years; Low =

Threat is likely to be operational within 5-20 years; Insignificant = Threat not likely to be operational within 20 years; Unknown = Unknown (how soon the threat will likely be realized is unknown); (null) = Rank factor not assessed.

Threat Scope – Indicates, for the threat with the greatest overall impact on the Element (see threats table), the proportion of the Element that is observed, inferred, or suspected to be directly or indirectly affected by this threat at the global level. Values are: High = > 60% of total population, occurrences, or area affected; Moderate = 20-60% of total population, occurrences, or area affected; Low = 5-20% of total population, occurrences, or area affected; Insignificant = < 5% of total population, occurrences, or area affected; Unknown = Unknown (proportion of population, occurrences, or area affected is unknown); (null) = Rank factor not assessed.

Threat Severity – Indicates, for the threat with the greatest overall impact on the Element (see threats table), how badly and irreversibly the Element is observed, inferred, or suspected to be directly or indirectly affected by the threat at the global level. Values are: High = Loss of species population (all individuals) or destruction of species habitat or ecological community in area affected, with effects essentially irreversible or requiring long-term recovery (>100 years); Moderate = Major reduction of species population or long-term degradation or reduction of species habitat or ecological community in area affected, requiring 50-100 years for recovery; Low = Low but nontrivial reduction of species population or reversible degradation or reduction of species habitat or ecological community in area affected, with recovery expected in 10-50 years; Insignificant = Essentially no reduction of species population or degradation of species habitat, ecological community or System due to threats, with ability to recover quickly (within 10 years) from minor temporary loss; Unknown = Unknown (degree of impact on population, occurrences, or area due to threat is unknown); (null) = Rank factor not assessed.

Appendix 8.1j. Additional species at risk data

Additional data for two species, *Pyxidanthera brevifolia* (Well's pixie-moss) *and Cimicifuga elata* (Tall bugbane), was too large to present in Excel tables (specifically Appendix 8.3).

This data was included as a word document on CD-ROM (DOD_SAR: A81j_SAR_additional_data.doc).

8.2 Species at Risk on DOD Installations: Summary Information

Summarized identification and status information of all species at risk occurring on DOD installations. Species are grouped into three categories: (a) federal candidates, (b) critically imperiled (G1/T1), and (c) imperiled (G2/T2). Note: All federal candidate species (USESA = "C") are in category (a) for all analyses in report. Some of these species may also have a NatureServe Conservation Status of G1/T1 or G2/T2.

Note: Data shown here is included in speadsheet format on CD-ROM (**DOD_SAR_Data: A2_SAR_summarized.xls**).

A) U.S. Endangered Species Act Candidates - 47 species

High-level group	Species Group	Scientific Name	Common Name	GRANK	Rounded GRANK	GRANK Date	USESA	USESA Date
Inverts	Amphipods	Metabetaeus lohena	Anchialine Pool Shrimp	G1G2	G1	2000-09-06	C	2001-10-31
Inverts	Butterflies and Skippers	Euphydryas editha taylori	Taylor's Checkerspot	G5T1	T1	1998-09-01	C	2001-10-31
Inverts	Butterflies and Skippers	Polites mardon	Mardon Skipper	G2G3	G2	1998-09-01	C	2001-10-31
Inverts	Dragonflies and Damselflies	Megalagrion leptodemas	Crimson Hawaiian Damselfly	G1	G1	1997-02-07	C	2001-10-31
Inverts	Dragonflies and Damselflies	Megalagrion nigrohamatum nigrolineatum	Blackline Megalagrion Damselfly	G4T2	T2	1997-02-07	C	2001-10-31
Inverts	Dragonflies and Damselflies	Megalagrion oceanicum	Oceanic Megalagrion Damselfly	G2	G2	1997-02-07	C	2001-10-31
Inverts	Dragonflies and Damselflies	Megalagrion xanthomelas	Orange-Black Megalagrion Damselfly	G1G3	G2	1997-02-07	C	2001-10-31
Inverts	Freshwater Mussels	Lampsilis rafinesqueana	Neosho Mucket	G2	G2	1997-04-29	C	2001-10-31
Inverts	Freshwater Snails	Pyrgulopsis thompsoni	Huachuca Springsnail	G2	G2	1999-09-14	C	2001-10-31
Inverts	Tiger Beetles	Cicindela highlandensis	Florida Scrub Tiger Beetle	G1G2	G1	2000-08-03	C	2001-10-31
Plants	Flowering Plants	Arabis georgiana	Georgia Rock-Cress	G2	G2	1995-05-12	C	2001-10-30
Plants	Flowering Plants	Argythamnia blodgettii	Blodgett's Wild-Mercury	G2	G2	1984-06-06	C	2001-10-30
Plants	Flowering Plants	Artemisia campestris var. wormskioldii	Northern Wormwood	G5T1	T1	1984-08-07	C	2001-10-30
Plants	Flowering Plants	Bidens amplectens	Ko`Oko`Olau, Koko`Olau	G1	G1	1998-12-17	C	2001-10-30
Plants	Flowering Plants	Cyanea calycina		G1	G1	1999-10-29	C	2001-10-30
Plants	Flowering Plants	Cyanea lanceolata		G1	G1	1999-10-29	C	2001-10-30
Plants	Flowering Plants	Cyrtandra sessilis		G1	G1	1993-06-28	C	2001-10-30
Plants	Flowering Plants	Erigeron basalticus	Basalt Daisy	G1	G1	1983-00-00	C	2001-10-30
Plants	Flowering Plants	Erigeron lemmonii	Lemmon's Fleabane	G1	G1	1990-05-30	C	2001-10-30
Plants	Flowering Plants	Joinvillea ascendens ssp. ascendens	`Ohe	G5T1	T1	1993-08-20	C	2001-10-30
Plants	Flowering Plants	Korthalsella degeneri	Degener Korthalsella	G1Q	G1	1993-06-21	C	2001-10-30
Plants	Flowering Plants	Lesquerella globosa	Lesquereux's Mustard	G2	G2	1984-11-05	C	2001-10-30
Plants	Flowering Plants	Linum carteri var. carteri	Carter's Small-Flowered Flax	G2T1	T1	1984-12-18	C	2001-10-30
Plants	Flowering Plants	Melicope christophersenii	Christophersen's Pelea	G1	G1	1990-08-07	C	2001-10-30
Plants	Flowering Plants	Melicope hiiakae		G1	G1	1998-09-21	C	2001-10-30
Plants	Flowering Plants	Melicope makahae		G1	G1	1990-08-07	C	2001-10-30
Plants	Flowering Plants	Myrsine fosbergii		G1	G1	1996-11-23	C	2001-10-30
Plants	Flowering Plants	Nothocestrum latifolium	`Aiea	G1	G1	1990-08-07	C	2001-10-30

High-level group	Species Group	Scientific Name	Common Name	GRANK	Rounded GRANK	GRANK Date	USESA	USESA Date
Plants	Flowering Plants	Panicum hirstii	Hirsts' Panic Grass	G1	G1	1985-11-05	C	2001-10-30
Plants	Flowering Plants	Penstemon debilis	Parachute Penstemon	G1	G1	1988-05-02	C	2001-10-30
Plants	Flowering Plants	Platanthera integrilabia	White Fringeless Orchid	G2G3	G2	1997-03-31	C	2001-10-30
Plants	Flowering Plants	Platydesma cornuta var. cornuta		G1T1	T1	1993-06-28	C	2001-10-30
Plants	Flowering Plants	Platydesma cornuta var. decurrens		G1T1	T1	2000-10-30	C	2001-10-30
Plants	Flowering Plants	Pleomele forbesii	Forbes Dracaena	G1	G1	1990-08-07	C	2001-10-30
Plants	Flowering Plants	Pteralyxia macrocarpa	Kaulu	G1	G1	1996-11-23	C	2001-10-30
Plants	Flowering Plants	Symphyotrichum georgianum	Georgia Aster	G2G3	G2	1992-04-23	C	2001-10-30
Plants	Flowering Plants	Zanthoxylum oahuense	Oahu Prickly-Ash	G1	G1	1996-11-23	C	2001-10-30
Verts	Amphibians	Ambystoma californiense	California Tiger Salamander	G2G3	G2	2001-05-21	(PS:LE,C)	
Verts	Freshwater Fishes	Acipenser oxyrinchus oxyrinchus	Atlantic Sturgeon	G3T3	T3	2000-02-18	C	1999-06-23
Verts	Freshwater Fishes	Alosa alabamae	Alabama Shad	G3	G3	2000-02-07	C	1999-06-23
Verts	Freshwater Fishes	Etheostoma cragini	Arkansas Darter	G3	G3	1996-09-23	C	2001-10-30
Verts	Freshwater Fishes	Microphis brachyurus	Opossum Pipefish	G4G5	G4	1999-03-12	(PS:C)	
Verts	Mammals	Cynomys ludovicianus	Black-Tailed Prairie Dog	G4	G4	1996-11-06	C	2001-10-30
Verts	Mammals	Spermophilus washingtoni	Washington Ground Squirrel	G2	G2	2000-08-24	C	2001-10-30
Verts	Marine Fishes	Menidia conchorum	Key Silverside	G3Q	G3	1998-08-31	C	1999-06-23
Verts	Reptiles	Pituophis ruthveni	Louisiana Pine Snake	G3Q	G3	2001-01-18	C	2001-10-30
Verts	Reptiles	Sistrurus catenatus catenatus	Eastern Massasauga	G3G4T3T4	T3	1996-10-31	C	2001-10-30

B) Critically Imperiled (G1 or T1) - 136 Species

High-level group	Species Group	Scientific Name	Common Name	GRANK	Rounded GRANK	GRANK Date	USESA	USESA Date
Inverts	Amphipods	Allocrangonyx hubrichti	Central Missouri Cave Amphipod	G1	G1	1998-06-26		
Inverts	Amphipods	Stygobromus phreaticus	Northern Virginia Well Amphipod	G1	G1	1997-04-23		
Inverts	Butterflies and Skippers	Atrytone arogos arogos	Arogos Skipper	G3G4T1T2	T1	1999-05-01		
Inverts	Butterflies and Skippers	Euphilotes pallescens calneva	Pallid Blue	G3G4T1	T1	1999-06-01		
Inverts	Caddisflies	Hydroptila setigera	A Caddisfly	G1	G1	1994-04-22		
Inverts	Crayfishes	Fallicambarus strawni	A Crayfish	G1G2	G1	1996-02-19		
Inverts	Crayfishes	Orconectes jeffersoni	Louisville Crayfish	G1	G1	1999-11-03		
Inverts	Freshwater Mussels	Anodonta heardi	Apalachicola Floater	G1	G1	2000-11-13		
Inverts	Freshwater Mussels	Villosa fabalis	Rayed Bean	G1G2	G1	1998-03-17		
Inverts	Freshwater Snails	Planorbella magnifica	Magnificent Rams-Horn	G1	G1	1999-09-14		
Inverts	Freshwater Snails	Pyrgulopsis wongi	Wong's Springsnail	G1G2	G1	2001-06-01		
Inverts	Other Beetles	Aegialia hardyi	Hardy's Aegialian Scarab Beetle	G1	G1	1995-09-11		
Inverts	Other Beetles	Coelus globosus	Globose Dune Beetle	G1	G1	1989-04-28		
Inverts	Other Beetles	Coenonycha pygmaea	A Beetle	G1?	G1	1999-01-29		

High-level group	Species Group	Scientific Name	Common Name	GRANK	Rounded GRANK	GRANK Date	USESA	USESA Date
Inverts	Other Beetles	Lytta hoppingi	Hopping's Blister Beetle	G1G2	G1	1989-04-28		
Inverts	Other Beetles	Pentarthrum obscurum	Obscure Pentarthrum Weevil	G1	G1	1990-08-07		
Inverts	Other Beetles	Pseudanophthalmus barri	A Ground Beetle	G1	G1	1997-10-01		
Inverts	Other Beetles	Pseudanophthalmus lodingi	A Ground Beetle	G1G2	G1	1997-10-01		
Inverts	Other Insects	Aflexia rubranura	Red Veined Prairie Leafhopper	G1G2	G1	1997-09-04		
Inverts	Other Insects	Litocampa henroti	A Hexapod	G1G2	G1	1997-10-01		
Inverts	Other Insects	Panorpa braueri	A Panorpid Scorpionfly	G1	G1	1985-04-17		
Inverts	Other Invertebrates	Pseudotremia conservata	A Cave Obligate Millipede	G1G2	G1	2000-08-03		
Inverts	Other Invertebrates	Pseudotremia nefanda	A Diplopod	G1G2	G1	1997-10-01		
Inverts	Other Moths	Hedylepta monogramma	(Moth)	G1	G1	1990-08-07		
Inverts	Other Moths	Richia sp. 2		G1Q	G1	1995-04-27		
Inverts	Terrestrial Snails	Amastra micans	Amastrid Land Snail	G1	G1	1990-08-07		
Inverts	Terrestrial Snails	Amastra rubens	Amastrid Land Snail	G1	G1	1990-08-07		
Inverts	Terrestrial Snails	Amastra spirizona	Amastrid Land Snail	G1	G1	1990-08-07		
Inverts	Terrestrial Snails	Ashmunella harrisi	Goat Mountain Woodlandsnail	G1	G1	1982-12-10		
Inverts	Terrestrial Snails	Ashmunella todseni	Maple Canyon Woodlandsnail	G1	G1	1982-12-10		
Inverts	Terrestrial Snails	Auriculella aff. castanea n. sp. 1	Achatinellid Land Snail	G1	G1	1986-12-31		
Inverts	Terrestrial Snails	Auriculella aff. perpusilla n. sp. 1	Achatinellid Land Snail	G1	G1	1986-12-31		
Inverts	Terrestrial Snails	Auriculella ambusta	Achatinellid Land Snail	G1	G1	1994-07-20		
Inverts	Terrestrial Snails	Auriculella malleata	Achatinellid Land Snail	G1	G1	1990-08-07		
Inverts	Terrestrial Snails	Auriculella pulchra	Achatinellid Land Snail	G1	G1	1990-08-07		
Inverts	Terrestrial Snails	Auriculella tenella	Achatinellid Land Snail	G1	G1	1990-08-07		
Inverts	Terrestrial Snails	Cookeconcha sp. 1	Endodontid Land Snail	G1	G1	1990-08-07		
Inverts	Terrestrial Snails	Helminthoglypta mohaveana	Victorville Shoulderband	G1	G1	1989-04-28		
Inverts	Terrestrial Snails	Laminella sanguinea	Amastrid Land Snail	G1	G1	1990-08-07		
Inverts	Terrestrial Snails	Leptachatina sp. 8	Amastrid Land Snail (Oahu)	G1	G1	1990-08-07		
Inverts	Terrestrial Snails	Lyropupa sp. 1	Pupillid Land Snail (Lyropupa or Lyropupilla)	G1	G1	1990-08-07		
Inverts	Terrestrial Snails	Micrarionta feralis	San Nicolas Islandsnail	G1	G1	1989-04-28		
Inverts	Terrestrial Snails	Micrarionta gabbi	San Clemente Islandsnail	G1	G1	1989-04-28		
Inverts	Terrestrial Snails	Micrarionta opuntia	Pricklypear Islandsnail	G1	G1	1989-04-28		
Inverts	Terrestrial Snails	Oreohelix carinifera	Keeled Mountainsnail	G1	G1	1986-01-02		
Inverts	Terrestrial Snails	Oreohelix socorroensis	Socorro Mountainsnail	G1	G1	1996-04-03		

High-level group	Species Group	Scientific Name	Common Name	GRANK	Rounded GRANK	GRANK Date	USESA	USESA Date
Inverts	Terrestrial Snails	Oreohelix sp. 3	Bearmouth Mountainsnail	G1G2	G1	1996-03-04		
Inverts	Terrestrial Snails	Partulina dubia	Achatinellid Land Snail	G1	G1	1990-08-07		
Inverts	Terrestrial Snails	Pleuropoma sandwichiensis	Helicinid Land Snail	G1	G1	1992-06-12		
Inverts	Terrestrial Snails	Sterkia clementina	Insular Birddrop	G1	G1	1989-04-28		
Inverts	Terrestrial Snails	Xerarionta intercisa	Plain Cactussnail	G1	G1	1989-04-28		
Inverts	Terrestrial Snails	Xerarionta redimita	Wreathed Cactussnail	G1	G1	1989-04-28		
Inverts	Tiger Beetles	Cicindela senilis frosti	A Tiger Beetle	G4T1	T1	1997-09-01		
Plants	Ferns / Fern Allies	Doodia lyonii	Lyon's Hacksaw Fern	G1	G1	1993-06-28		
Plants	Ferns / Fern Allies	Dryopteris rossii		G1Q	G1	1991-01-24		
Plants	Ferns / Fern Allies	Isoetes virginica	Virginia Quillwort	G1	G1	1998-08-10		
Plants	Flowering Plants	Aquilegia chrysantha var. rydbergii	Golden Columbine	G4T1Q	T1	1998-11-24		
Plants	Flowering Plants	Astragalus hypoxylus	Huachuca Milk-Vetch	G1	G1	1988-09-20		
Plants	Flowering Plants	Astragalus lentiginosus var. pohlii	Pohl's Milkvetch	G5T1	T1	1995-04-20		
Plants	Flowering Plants	Astragalus tener var. tener	Alkali Milk Vetch	G1T1	T1	1993-07-06		
Plants	Flowering Plants	Atriplex canescens var. gigantea		G5T1	T1	1991-07-19		
Plants	Flowering Plants	Atriplex vallicola	Lost Hills Saltbush	G1	G1	1988-03-08		
Plants	Flowering Plants	Baccharis plummerae ssp. glabrata	Hoover's Baccharis	G3T1	T1	1997-03-14		
Plants	Flowering Plants	Basiphyllaea corallicola	Carter's Orchid	G1	G1	1997-03-28		
Plants	Flowering Plants	Berberis harrisoniana	Kofka Barberry	G1G2	G1	1999-08-11		
Plants	Flowering Plants	Bobea sandwicensis	`Ahakea	G1	G1	1996-11-23		
Plants	Flowering Plants	Bobea timonioides	`Ahakea	G1	G1	1996-11-23		
Plants	Flowering Plants	Camissonia guadalupensis ssp. clementina	San Clemente Island Evening-Primrose	G1T1	T1	1988-03-08		
Plants	Flowering Plants	Camissonia hardhamiae	Hardham's Evening-Primrose	G1Q	G1	1988-03-08		
Plants	Flowering Plants	Carex impressinervia	Impressed-Nerved Sedge	G1G2	G1	1995-05-10		
Plants	Flowering Plants	Carex wahuensis ssp. herbstii	A Sedge	G3T1	T1	1999-01-04		
Plants	Flowering Plants	Chorizanthe rectispina	One-Awned Chorizanthe	G1	G1	1996-04-26		
Plants	Flowering Plants	Cordylanthus rigidus ssp. littoralis	Seaside Bird's-Beak	G5T1	T1	1989-05-01		
Plants	Flowering Plants	Corethrogyne filaginifolia var. incana	San Diego Sand Aster	G4T1	T1	1993-07-06		
Plants	Flowering Plants	Crataegus ashei		G1	G1	1997-11-12		
Plants	Flowering Plants	Croton alabamensis var. texensis	Texabama Croton	G3T1	T1	1992-03-02		
Plants	Flowering Plants	Delphinium variegatum ssp. thornei	Thorne's Royal Larkspur	G4T1	T1	1989-05-01		
Plants	Flowering Plants	Dicerandra radfordiana	Radford Dicerandra	G1Q	G1	1992-12-29		
Plants	Flowering Plants	Dubautia sherffiana	Sherff Railliardia	G1	G1	1990-08-07		
Plants	Flowering Plants	Dudleya virens ssp. virens		G2T1	T1	1993-07-07		
Plants	Flowering Plants	Eriogonum grande var. timorum	San Nicolas Island Buckwheat	G3T1	T1	2000-06-14		
Plants	Flowering Plants	Eryngium pendletonensis		G1	G1	2000-11-02		

High-level group	Species Group	Scientific Name	Common Name	GRANK	Rounded GRANK	GRANK Date	USESA	USESA Date
Plants	Flowering Plants	Exocarpos gaudichaudii	Gaudichaud's Exocarpus	G1	G1	1990-08-07		
Plants	Flowering Plants	Glossopetalon pungens var. glabrum	Smooth Dwarf Greasebush	G2G3T1Q	T1	1996-05-24		
Plants	Flowering Plants	Hemizonia parryi ssp. congdonii	Pappose Spikeweed	G4?T1	T1	1997-03-14		
Plants	Flowering Plants	Hibiscus kokio ssp. kokio	Koki`O `Ula`Ula	G2T1	T1	2000-10-30		
Plants	Flowering Plants	Horkelia cuneata ssp. sericea	Kellogg's Horkelia	G4T1	T1	1993-07-01		
Plants	Flowering Plants	Isocoma arguta	Suisun Goldenbush	G1	G1	1993-07-07		
Plants	Flowering Plants	Juncus leiospermus var. ahartii	Ahart Rush	G2T1	T1	1996-06-20		
Plants	Flowering Plants	Labordia kaalae		G1	G1	1990-08-07		
Plants	Flowering Plants	Layia heterotricha	Pale-Yellow Tidy-Tips	G1	G1	1996-11-24		
Plants	Flowering Plants	Lesquerella carinata var. languida		G3G4T1	T1	1994-04-12		
Plants	Flowering Plants	Lesquerella stonensis	Stones River Bladderpod	G1	G1	1998-03-02		
Plants	Flowering Plants	Linanthus pygmaeus ssp. pygmaeus		G4T1	T1	2000-06-14		
Plants	Flowering Plants	Linanthus serrulatus	Madera Linanthus	G1?	G1	1997-03-14		
Plants	Flowering Plants	Lipochaeta remyi	Remy's Nehe	G1	G1	1990-08-07		
Plants	Flowering Plants	Lotus argophyllus var. adsurgens	San Clemente Island Bird's-Foot Trefoil	G5T1	T1	1998-04-20		
Plants	Flowering Plants	Lotus nuttallianus	Nuttall's Lotus	G1	G1	1993-07-07		
Plants	Flowering Plants	Malacothamnus abbottii	Abbott's Bush Mallow	G1	G1	1991-08-08		
Plants	Flowering Plants	Malacothamnus davidsonii	Davidson Bush-Mallow	G1	G1	1996-11-24		
Plants	Flowering Plants	Melicope cinerea	Manena	G1	G1	1990-08-07		
Plants	Flowering Plants	Opuntia munzii	Munz Cholla	G1	G1	1995-01-03		
Plants	Flowering Plants	Perityle huecoensis	Hueco Mountains Rockdaisy	G1	G1	1989-11-14		
Plants	Flowering Plants	Phacelia stellaris	Brand's Phacelia	G1G2	G1	1993-07-07		
Plants	Flowering Plants	Pogogyne clareana	Santa Lucia Pogogyne	G1	G1	1984-06-26		
Plants	Flowering Plants	Polygala rimulicola var. mescalerorum	Mescalero Milkwort	G3T1	T1	1989-11-13		
Plants	Flowering Plants	Rhynchospora crinipes	Hairy-Peduncled Beak-Rush	G1	G1	1984-04-09		
Plants	Flowering Plants	Schizachyrium niveum	Scrub Bluestem	G1	G1	1991-05-23		
Plants	Flowering Plants	Sicyos lanceoloideus		G1	G1	1990-08-07		
Plants	Flowering Plants	Solidago villosicarpa	Leblond's Goldenrod	G1	G1	1993-07-19		
Plants	Flowering Plants	Stylocline citroleum	Oil Neststraw	G1	G1	1993-07-07		
Plants	Flowering Plants	Symphyotrichum racemosum var. 2	Apalachicola River Aster	G4G5T1Q	T1	2000-06-27		
Plants	Flowering Plants	Trifolium buckwestiorum		G1	G1	1993-07-07		
Plants	Flowering Plants	Trifolium polyodon	Pacific Grove Clover	G1Q	G1	1997-08-19		
Plants	Flowering Plants	Triteleia clementina	San Clemente Island Triteleia	G1	G1	1987-08-06		
Plants	Flowering Plants	Vaccinium crassifolium ssp. sempervirens	Rayner's Blueberry	G4G5T1	T1	1993-02-18		
Plants	Flowering Plants	Vauquelinia californica ssp. sonorensis		G4T1	T1	1999-08-02		

High-level group	Species Group	Scientific Name	Common Name	GRANK	Rounded GRANK	GRANK Date	USESA	USESA Date
Plants	Flowering Plants	Xyris isoetifolia	Quillwort Yellow-Eyed Grass	G1	G1	2000-06-23		
Plants	Mosses	Campylopus carolinae	Savanna Campylopus	G1G2	G1	1999-01-29		
Verts	Amphibians	Eurycea neotenes	Texas Salamander	G1	G1	2001-10-18		
Verts	Amphibians	Eurycea tridentifera	Comal Blind Salamander	G1	G1	2001-10-18		
Verts	Amphibians	Rana subaquavocalis	Ramsey Canyon Leopard Frog	G1	G1	1998-02-23		
Verts	Birds	Laterallus jamaicensis coturniculus	California Black Rail	G4T1	T1	1996-11-25		
Verts	Birds	Vestiaria coccinea (Oahu only)	`I`Iwi	G4T1	T1	1996-12-04		
Verts	Freshwater Fishes	Cyprinodon tularosa	White Sands Pupfish	G1	G1	1996-09-20		
Verts	Freshwater Fishes	Etheostoma ditrema	Coldwater Darter	G1G2	G1	1997-07-02		
Verts	Freshwater Fishes	Ioticht hys phlegethontis	Least Chub	G1	G1	1996-03-04		
Verts	Freshwater Fishes	Noturus taylori	Caddo Madtom	G1	G1	1996-09-19		
Verts	Mammals	Dipodomys nitratoides brevinasus	Short-Nosed Kangaroo Rat	G3T1T2	T1	1996-11-08		
Verts	Mammals	Neotoma micropus leucophaea	White Sands Woodrat	G5T1T2Q	T1	1993-05-25		
Verts	Mammals	Perognathus longimembris brevinasus	Los Angeles Pocket Mouse	G5T1T2	T1	1989-04-28		
Verts	Mammals	Sorex ornatus sinuosus	Suisun Shrew	G5T1	T1	1996-11-01		
Verts	Mammals	Sorex sp. 1	A Shrew	G1G2Q	G1	1997-09-11		
Verts	Mammals	Tamias quadrivittatus australis	Organ Mountains Chipmunk	G5T1	T1	1994-12-02		
Verts	Mammals	Urocyon littoralis	Island Gray Fox	G1?	G1	2001-07-31	(PS)	
Verts	Reptiles	Elgaria panamintina	Panamint Alligator Lizard	G1G2	G1	1996-10-23		

C) Imperiled (G2 or T2) - 340 Species

High-level group	Species Group	Scientific Name	Common Name	GRANK	Rounded GRANK	GRANK Date	USESA	USESA Date
Inverts	Amphipods	Stygobromus abditus	James Cave Amphipod	G2	G2	2001-06-07		
Inverts	Amphipods	Stygobromus araeus	Tidewater Interstitial Amphipod	G2G3	G2	1997-10-01		
Inverts	Ants Wasps and Bees	Myrmecocystus arenarius		G2?	G2	1998-02-25		
Inverts	Butterflies and Skippers	Celastrina humulus	Hops Azure	G2G3	G2	2000-01-24		
Inverts	Butterflies and Skippers	Fixsenia polingi	Poling's Hairstreak	G2	G2	1998-09-01		
Inverts	Butterflies and Skippers	Hesperia dacotae	Dakota Skipper	G2G3	G2	1998-09-01		
Inverts	Butterflies and Skippers	Limenitis weidemeyerii nevadae	Nevada Admiral	G5T2T3	T2	2000-03-24		
Inverts	Butterflies and Skippers	Oarisma powesheik	Powesheik Skipperling	G2	G2	1998-09-30		
Inverts	Butterflies and Skippers	Pyrgus wyandot	Appalachian Checkered-Skipper	G2	G2	1998-09-01		
Inverts	Caddisflies	Manophylax butleri	A Caddisfly	G2	G2	1991-01-26		
Inverts	Caddisflies	Polycentropus carlsoni	Carlson's Polycentropus Caddisfly	G1G3	G2	1984-09-07		

High-level group	Species Group	Scientific Name	Common Name	GRANK	Rounded GRANK	GRANK Date	USESA	USESA Date
Inverts	Crayfishes	Cambarus jonesi	Alabama Cave Crayfish	G2	G2	2000-01-25		
Inverts	Crayfishes	Fallicambarus jeanae	A Crayfish	G2	G2	1999-11-03		
Inverts	Crayfishes	Orconectes maletae	A Crayfish	G2	G2	1996-02-19		
Inverts	Crayfishes	Orconectes williamsi	A Crayfish	G2	G2	1999-11-03		
Inverts	Crayfishes	Procambarus lagniappe	Lagniappe Crayfish	G2	G2	1996-02-19		
Inverts	Dragonflies and Damselflies	Gomphus septima	Septima's Clubtail	G2	G2	1999-01-22		
Inverts	Dragonflies and Damselflies	Macromia wabashensis	Wabash River Cruiser	G1G3Q	G2	1998-05-08		
Inverts	Fairy Clam and Tadpole Shrimp	Linderiella occidentalis	California Fairy Shrimp	G2G3	G2	2001-06-01		
Inverts	Flatworms	Sphalloplana weingartneri	Weingartner's Cave Flatworm	G2G3	G2	1997-10-01		
Inverts	Freshwater Mussels	Cumberlandia monodonta	Spectaclecase	G2G3	G2	1996-11-25		
Inverts	Freshwater Mussels	Cyprogenia aberti	Western Fanshell	G2	G2	1998-08-27		
Inverts	Freshwater Mussels	Elliptio roanokensis	Roanoke Slabshell	G2G3	G2	1998-10-25		
Inverts	Freshwater Mussels	Fusconaia masoni	Atlantic Pigtoe	G2	G2	1998-11-01		
Inverts	Freshwater Mussels	Toxolasma lividus	Purple Lilliput	G2	G2	1997-08-21		
Inverts	Freshwater Mussels	Villosa ortmanni	Kentucky Creekshell	G2	G2	1998-06-12		
Inverts	Freshwater Snails	Tryonia imitator	Mimic Tryonia	G2G3	G2	1999-09-14		
Inverts	Giant Silkworm and Royal Moths	Hemileuca maia ssp. 5	Coastal Barrens Buckmoth	G5T2T3	T2	2000-05-19		
Inverts	Grasshoppers	Appalachia arcana	Michigan Bog Grasshopper	G2G3	G2	2000-12-01		
Inverts	Grasshoppers	Cibolacris samalayucae	A Grasshopper	G2?	G2	2000-12-01		
Inverts	Isopods	Caecidotea stiladactyla	An Isopod	G2G3	G2	1997-10-01		
Inverts	Other Beetles	Lytta mirifica	Anthony Blister Beetle	G2	G2	1991-01-08		
Inverts	Other Insects	Pnirontis brimleyi	An Assassin Bug	G2	G2	1994-01-13		
Inverts	Other Moths	Agrotis buchholzi	Buchholz's Dart Moth	G2	G2	1999-09-21		
Inverts	Other Moths	Crambus daeckellus	Daecke's Pyralid Moth	G1G3	G2	1999-09-18		
Inverts	Other Moths	Spartiniphaga carterae		G2G3	G2	1999-09-18		
Inverts	Stoneflies	Hansonoperla hokolesqua	A Stonefly	G2	G2	1999-09-20		
Inverts	Terrestrial Snails	Ashmunella auriculata	Boulder Canyon Woodlandsnail	G2	G2	1994-10-24		
Inverts	Terrestrial Snails	Ashmunella organensis	Organ Mountain Woodlandsnail	G2	G2	1994-10-24		
Inverts	Terrestrial Snails	Sonorella metcalfi	Franklin Mountain Talussnail	G2	G2	1998-02-15		
Inverts	Terrestrial Snails	Triodopsis soelneri	Cape Fear Threetooth	G2	G2	1988-12-22		
Inverts	Tiger Beetles	Cicindela marginipennis	Cobblestone Tiger Beetle	G2G3	G2	1997-09-01		
Inverts	Tiger Beetles	Cicindela patruela huberi	A Tiger Beetle	G3T2	T2	1997-09-01		
Inverts	Underwing Moths	Catocala pretiosa pretiosa	Precious Underwing	G4T2T3	T2	1998-12-17		
Plants	Ferns / Fern Allies	Botrychium ascendens	Upward-Lobed Moonwort	G2G3	G2	1999-05-18		
Plants	Ferns / Fern Allies	Botrychium paradoxum	Peculiar Moonwort	G2	G2	1995-07-06		
Plants	Ferns / Fern Allies	Botrychium pedunculosum	Stalked Moonwort	G2G3	G2	2000-11-15		
Plants	Ferns / Fern Allies	Isoetes hyemalis	Winter Quillwort	G2G3	G2	1993-07-19		

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Plants	Ferns / Fern Allies	Lindsaea repens var. macraeana		G5T2	T2	1999-01-04		
Plants	Ferns / Fern Allies	Ophioglossum concinnum	Pololei	G2Q	G2	1997-09-30		
Plants	Flowering Plants	Acleisanthes crassifolia	Texas Trumpets	G2	G2	1988-05-06		
Plants	Flowering Plants	Aesculus parviflora	Small-Flowered Buckeye	G2G3	G2	1996-11-01		
Plants	Flowering Plants	Agave shawii	Shaw Agave	G2G3	G2	2000-06-18		
Plants	Flowering Plants	Allium elmendorfii	Elmendorf Onion	G2	G2	1988-05-06		
Plants	Flowering Plants	Allium hickmanii	Hickman's Onion	G2	G2	1987-06-16		
Plants	Flowering Plants	Amorpha georgiana var. confusa		G3T2	T2	1993-07-01		
Plants	Flowering Plants	Amorpha georgiana var. georgiana	Georgia Leadplant	G3T2	T2	1993-07-01		
Plants	Flowering Plants	Amsonia tabernaemontana var. gattingeri	A Blue-Star	G5T2T3Q	T2	1995-11-15		
Plants	Flowering Plants	Apacheria chiricahuensis	Cliff Brittlebush	G2	G2	1998-01-26		
Plants	Flowering Plants	Aphanisma blitoides	Aphanisma	G2	G2	1987-08-06		
Plants	Flowering Plants	Arabis bodiensis	Bodie Hill Rock Cress	G2	G2	1995-07-03		
Plants	Flowering Plants	Arctostaphylos hookeri ssp. hookeri	Hooker's Manzanita	G3T2?	T2	2000-02-27		
Plants	Flowering Plants	Arctostaphylos montereyensis	Toro Manzanita	G2	G2	1988-03-08		
Plants	Flowering Plants	Arctostaphylos pajaroensis	Pajaro Manzanita	G2	G2	1993-07-07		
Plants	Flowering Plants	Arctostaphylos pumila	Sandmat Manzanita	G2	G2	1988-03-08		
Plants	Flowering Plants	Arctostaphylos purissima	La Purisima Manzanita	G2?	G2	1993-07-07		
Plants	Flowering Plants	Arctostaphylos rudis	Shagbark Manzanita	G2	G2	1987-06-18		
Plants	Flowering Plants	Arctostaphylos tomentosa ssp. eastwoodiana	Eastwood's Tomentose Manzanita	G4T2?	T2	1993-07-06		
Plants	Flowering Plants	Argythamnia aphoroides	Hill Country Wild Mercury	G2	G2	1984-07-20		
Plants	Flowering Plants	Asclepias eastwoodiana	Eastwood's Milkweed	G2Q	G2	1988-08-03		
Plants	Flowering Plants	Asclepias viridula	Southern Milkweed	G2	G2	1984-06-07		
Plants	Flowering Plants	Astragalus ackermanii	Ackerman's Milk-Vetch	G2	G2	1984-04-06		
Plants	Flowering Plants	Astragalus amphioxys var. musimonum	Sheep Mountain Milkvetch	G5T2	T2	1992-04-28		
Plants	Flowering Plants	Astragalus columbianus	Columbia Milk-Vetch	G2	G2	1983-00-00		
Plants	Flowering Plants	Astragalus debequaeus	Debeque Milkvetch	G2	G2	1988-12-05		
Plants	Flowering Plants	Astragalus funereus	Black Milkvetch	G2	G2	1990-09-05		
Plants	Flowering Plants	Astragalus nevinii	San Clemente Island Milkvetch	G2	G2	1988-03-08		
Plants	Flowering Plants	Astragalus oophorus var. clokeyanus	Charleston Milk-Vetch	G4T2	T2	1999-01-12		
Plants	Flowering Plants	Astragalus pseudiodanthus	Tonopah Milkvetch	G2Q	G2	1996-05-24		
Plants	Flowering Plants	Astragalus traskiae	Trask's Milkvetch	G2	G2	1988-03-08		
Plants	Flowering Plants	Atriplex cordulata	Heart-Leaf Saltbush	G2?	G2	1993-07-07		

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Plants	Flowering Plants	Atriplex coulteri	Coulter's Saltbush	G2	G2	1997-03-15		
Plants	Flowering Plants	Atriplex depressa	Bittlescale	G2Q	G2	1993-06-29		
Plants	Flowering Plants	Atriplex patula ssp. spicata	San Joaquin Saltbush	G5T2	T2	1996-02-27		
Plants	Flowering Plants	Balduina atropurpurea	Purple Balduina	G2G3	G2	1984-04-26		
Plants	Flowering Plants	Baptisia megacarpa	Apalachicola Wild Indigo	G2	G2	1997-04-19		
Plants	Flowering Plants	Bartonia texana	Texas Screwstem	G2	G2	1988-05-06		
Plants	Flowering Plants	Brickellia cordifolia	Flyr's Brickell-Bush	G2G3	G2	1987-03-24		
Plants	Flowering Plants	Brodiaea insignis	Kaweah Brodiaea	G2	G2	1990-11-27		
Plants	Flowering Plants	Brodiaea kinkiensis	San Clemente Island Brodiaea	G2	G2	1990-11-27		
Plants	Flowering Plants	Calochortus striatus	Alkali Mariposa Lily	G2	G2	1990-09-05		
Plants	Flowering Plants	Calochortus weedii var. vestus		G3?T2	T2	1993-07-07		
Plants	Flowering Plants	Calopogon multiflorus	Many-Flowered Grass-Pink	G2G3	G2	2000-06-18		
Plants	Flowering Plants	Calycadenia villosa	Dwarf Rosin-Weed	G2	G2	2001-05-01		
Plants	Flowering Plants	Capparis sandwichiana	Native Caper	G2	G2	1991-08-20		
Plants	Flowering Plants	Castilleja cryptantha	Obscure Indian-Paintbrush	G2	G2	1983-11-10		
Plants	Flowering Plants	Chamaesyce cumulicola	Sand-Dune Spurge	G2	G2	1984-06-21		
Plants	Flowering Plants	Chamaesyce olowaluana		G2	G2	1999-01-04		
Plants	Flowering Plants	Chamaesyce porteriana	Porter's Broom Spurge	G2	G2	1985-01-22		
Plants	Flowering Plants	Chloris texensis	Texas Windmill-Grass	G2	G2	1988-05-06		
Plants	Flowering Plants	Chrysopsis godfreyi	Godfrey's Golden-Aster	G2	G2	1987-06-02		
Plants	Flowering Plants	Chrysopsis gossypina ssp. cruiseana	Cruise's Golden-Aster	G5T2	T2	1993-05-28		
Plants	Flowering Plants	Cimicifuga elata	Tall Bugbane	G2	G2	1991-02-08		
Plants	Flowering Plants	Cirsium crassicaule	Slough Thistle	G2	G2	1988-03-08		
Plants	Flowering Plants	Cirsium rhothophilum	Surf Thistle	G2	G2	1988-03-08		
Plants	Flowering Plants	Comarostaphylis diversifolia ssp. diversifolia	Summer Holly	G3?T2	T2	1989-05-01		
Plants	Flowering Plants	Cordylanthus orcuttianus	Orcutt Bird's-Beak	G2?	G2	1990-11-27		
Plants	Flowering Plants	Crataegus triflora	Three-Flowered Hawthorn	G2	G2	1997-12-08		
Plants	Flowering Plants	Crossopetalum ilicifolium	Christmas Berry	G2	G2	1996-11-15		
Plants	Flowering Plants	Croton elliottii	Elliott's Croton	G2G3	G2	1986-11-04		
Plants	Flowering Plants	Cryptantha leucophaea	Gray Cryptantha	G2G3	G2	1994-02-08		
Plants	Flowering Plants	Cryptantha traskiae	Trask's Cryptantha	G2	G2	1987-08-06		
Plants	Flowering Plants	Ctenium floridanum	Florida Orange-Grass	G2	G2	1991-05-23		
Plants	Flowering Plants	Cuscuta attenuata	A Dodder	G2	G2	1994-11-25		
Plants	Flowering Plants	Cyanea membranacea	Membranaceous Cyanea	G2	G2	1996-11-23		
Plants	Flowering Plants	Cymopterus acaulis var. greeleyorum	Greeley's Wavewing	G5T2	T2	1992-05-07		
Plants	Flowering Plants	Cymopterus acaulis var. parvus		G5T2T3	T2	1999-01-20		
Plants	Flowering Plants	Cymopterus cinerarius	Gray Wavewing	G2G3	G2	1988-08-04		

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Plants	Flowering Plants	Cymopterus deserticola	Desert Cymopterus	G2	G2	1985-11-07		
Plants	Flowering Plants	Cymopterus ripleyi var. ripleyi	Ripley Cymopterus	G3G4T2?Q	T2	1999-01-21		
Plants	Flowering Plants	Delphinium parryi ssp. blochmaniae	Dune Larkspur	G4T2	T2	1997-03-14		
Plants	Flowering Plants	Delphinium recurvatum	Byron Larkspur	G2	G2	1993-07-07		
Plants	Flowering Plants	Dissochondrus biflorus		G2	G2	1990-08-07		
Plants	Flowering Plants	Dithyrea maritima	Beach Spectacle-Pod	G2	G2	1989-05-02		
Plants	Flowering Plants	Douglasia alaskana	Alaska Rockjasmine	G2G3	G2	1995-06-28		
Plants	Flowering Plants	Draba standleyi	Standley's Whitlow-Grass	G2G3	G2	1997-12-05		
Plants	Flowering Plants	Dudleya blochmaniae ssp. blochmaniae	Blochman Dudleya	G2T2	T2	1993-07-07		
Plants	Flowering Plants	Dudleya multicaulis	Many-Stemmed Dudleya	G2	G2	1984-11-05		
Plants	Flowering Plants	Dudleya variegata	Variegated Dudleya	G2	G2	1993-07-07		
Plants	Flowering Plants	Dudleya viscida	Sticky Dudleya	G2	G2	1987-08-06		
Plants	Flowering Plants	Echinacea paradoxa	Bush's Purple Coneflower	G2	G2	2000-02-27		
Plants	Flowering Plants	Elliottia racemosa	Georgia Plume	G2G3	G2	1987-03-24		
Plants	Flowering Plants	Elymus svensonii	Svenson's Wild-Rye	G2G3	G2	1991-03-21		
Plants	Flowering Plants	Ericameria compacta		G2?	G2	1997-03-04		
Plants	Flowering Plants	Ericameria fasciculata	Eastwood's Goldenweed	G2	G2	1985-11-13		
Plants	Flowering Plants	Erigeron arisolius		G2	G2	1999-08-11		
Plants	Flowering Plants	Erigeron blochmaniae	Blochman Leafy Daisy	G2	G2	1993-07-06		
Plants	Flowering Plants	Erigeron ovinus	Sheep Fleabane	G2	G2	1996-05-09		
Plants	Flowering Plants	Erigeron sivinskii	Sivinski's Fleabane	G2	G2	1996-10-23		
Plants	Flowering Plants	Eriogonum concinnum	Darin Buckwheat	G2	G2	1993-01-26		
Plants	Flowering Plants	Eriogonum giganteum var. formosum	San Clemente Island Buckwheat	G2T2	T2	1993-06-30		
Plants	Flowering Plants	Eriogonum longifolium var. harperi	Harper's Umbrella-Plant	G4T2	T2	1996-08-20		
Plants	Flowering Plants	Eriogonum nudum var. murinum	Mouse Buckwheat	G5T2	T2	1989-05-01		
Plants	Flowering Plants	Eriophyllum mohavense	Barstow Wooly-Sunflower	G2	G2	1984-04-06		
Plants	Flowering Plants	Eriophyllum nevinii	Nevin's Woolly-Sunflower	G2	G2	1987-08-06		
Plants	Flowering Plants	Eryngium spinosepalum	Spiny Sepaled Coyote-Thistle	G2	G2	1989-05-01		
Plants	Flowering Plants	Erysimum ammophilum	Coast Wallflower	G2	G2	1993-07-07		
Plants	Flowering Plants	Eschscholzia minutiflora ssp. twisselmannii	Twisselmann's Poppy	G5T2	T2	1993-06-30		
Plants	Flowering Plants	Escobaria organensis	Organ Mountain Foxtail-Cactus	G2	G2	1998-12-07		
Plants	Flowering Plants	Escobaria sandbergii		G2	G2	1994-10-26		
Plants	Flowering Plants	Escobaria villardii		G2	G2	1998-01-26		
Plants	Flowering Plants	Eucephalus vialis	Wayside Aster	G2	G2	1991-02-05		
Plants	Flowering Plants	Euphorbia pinetorum	Pineland Poinsettia	G2	G2	1993-06-01		
Plants	Flowering Plants	Fimbristylis perpusilla	Harper's Fimbristylis	G2	G2	1992-11-04		

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Plants	Flowering Plants	Forestiera godfreyi	Godfrey's Privet	G2	G2	2000-06-23		
Plants	Flowering Plants	Forestiera segregata var. pinetorum	Florida Pinewood Privet	G4T2	T2	1987-07-13		
Plants	Flowering Plants	Fritillaria striata	Striped Adobe Lily	G2	G2	1984-06-26		
Plants	Flowering Plants	Galium californicum ssp. luciense	Cone Peak Bedstraw	G5T2	T2	1989-05-01		
Plants	Flowering Plants	Galium catalinense ssp. acrispum	San Clemente Island Bedstraw	G4T2	T2	1989-05-01		
Plants	Flowering Plants	Galium hardhamiae	Hardham's Bedstraw	G2	G2	1987-08-06		
Plants	Flowering Plants	Galium hilendiae ssp. kingstonense	Kingston Bedstraw	G4T2	T2	1997-03-17		
Plants	Flowering Plants	Gambelia speciosa	Showy Island Snapdragon	G2	G2	1987-08-06		
Plants	Flowering Plants	Glossopetalon pungens var. pungens		G2G3T2Q	T2	1998-01-07		
Plants	Flowering Plants	Guajacum sanctum	Holywood Lignumvitae	G2	G2	2000-07-14		
Plants	Flowering Plants	Hackelia hispida var. disjuncta	Sagebrush Stickseed	G4T2T3	T2	1998-01-27		
Plants	Flowering Plants	Hartwrightia floridana	Hartwrightia	G2	G2	1988-05-12		
Plants	Flowering Plants	Hazardia cana	San Clemente Island Hazardia	G2	G2	1987-08-06		
Plants	Flowering Plants	Hedeoma pulcherrima	White Mountain False-Penny-Royal	G2	G2	1997-02-20		
Plants	Flowering Plants	Helianthus deserticola	Utah Sunflower	G2G3Q	G2	1998-01-26		
Plants	Flowering Plants	Helianthus smithii	Smith's Sunflower	G2Q	G2	1997-01-02		
Plants	Flowering Plants	Hemizonia parryi ssp. australis	Southern Tarweed	G4?T2	T2	1996-07-29		
Plants	Flowering Plants	Heterotheca rutteri	Rutter's Golden-Aster	G2	G2	1999-08-11		
Plants	Flowering Plants	Hexalectris warnockii	Purple-Spike Coralroot	G2	G2	1992-03-02		
Plants	Flowering Plants	Horkelia congesta ssp. Congesta	Shaggy Horkelia	G4T2	T2	1996-01-24		
Plants	Flowering Plants	Hulsea vestita ssp. inyoensis	Inyo Hulsea	G5T2	T2	2000-10-16		
Plants	Flowering Plants	Hymenocallis henryae	Henry's Spider-Lily	G2Q	G2	1999-06-11		
Plants	Flowering Plants	Hymenoxys vaseyi	Vasey's Bitter-Weed	G2?	G2	1990-11-08		
Plants	Flowering Plants	Hypericum edisonianum	Edison's Ascyrum	G2	G2	1984-07-19		
Plants	Flowering Plants	Illicium parviflorum	Yellow Anise-Tree	G2	G2	1999-06-04		
Plants	Flowering Plants	Ipomoea microdactyla	Wild Potato Morning-Glory	G2	G2	1999-06-15		
Plants	Flowering Plants	Jacquemontia curtissii	Pineland Jacquemontia	G2	G2	1984-11-21		
Plants	Flowering Plants	Juncus caesariensis	New Jersey Rush	G2	G2	1983-07-27		
Plants	Flowering Plants	Lachnocaulon beyrichianum	Southern Bog-Button	G2G3	G2	1987-03-24		
Plants	Flowering Plants	Lantana depressa var. floridana		G3T2	T2	1993-06-01		
Plants	Flowering Plants	Lasthenia glabrata ssp. coulteri	Coulter's Goldfields	G4T2	T2	1997-03-14		
Plants	Flowering Plants	Lathyrus jepsonii ssp. jepsonii	Delta Tule-Pea	G5T2	T2	1989-05-01		
Plants	Flowering Plants	Lavatera assurgentiflora ssp. assurgentiflora	Island Mallow, Malva Real	G2T2	T2	2001-05-16		

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Plants	Flowering Plants	Lavatera assurgentiflora ssp. glabra	Southern Island Mallow	G2T2	T2	1997-08-14		
Plants	Flowering Plants	Leavenworthia aurea	Golden Glade Cress	G2	G2	1990-09-18	(PS)	
Plants	Flowering Plants	Legenere limosa	Legenere	G2	G2	1984-06-26		
Plants	Flowering Plants	Lepidium bidentatum var. owaihiense	`Anaunau, Naunau, Kunana	G5T2	T2	1990-08-07		
Plants	Flowering Plants	Liatris cymosa	Branched Gay-Feather	G2	G2	1989-09-21		
Plants	Flowering Plants	Lilium iridollae	Panhandle Lily	G2	G2	2001-05-01		
Plants	Flowering Plants	Lindera subcoriacea	Bog Spicebush	G2	G2	1988-06-30		
Plants	Flowering Plants	Linum sulcatum var. harperi	Harper's Grooved-Yellow Flax	G5T2	T2	1985-01-25		
Plants	Flowering Plants	Linum westii	West's Flax	G2	G2	1984-03-30		
Plants	Flowering Plants	Lipochaeta lobata var. lobata	A Lobed Nehe	G2T2	T2	1990-08-07		
Plants	Flowering Plants	Lipochaeta tenuis	Slender Nehe	G2	G2	1988-04-01		
Plants	Flowering Plants	Lobelia boykinii	Boykin's Lobelia	G2G3	G2	1996-05-06		
Plants	Flowering Plants	Lobelia yuccoides	Panaunau	G2	G2	1988-04-01		
Plants	Flowering Plants	Loeflingia squarrosa ssp. artemisiarum	Sage-Like Loeflingia	G5T2T3	T2	1997-09-23		
Plants	Flowering Plants	Lomatium insulare	San Nicolas Island Lomatium	G2	G2	1993-07-06		
Plants	Flowering Plants	Lomatium tuberosum	Hoover's Desert-Parsley	G2	G2	1983-00-00		
Plants	Flowering Plants	Lupinus guadalupensis	Guadalupe Island Lupine	G2	G2	1987-08-06		
Plants	Flowering Plants	Lupinus huachucanus	Huachuca Mountain Lupine	G2	G2	1999-08-12		
Plants	Flowering Plants	Lupinus westianus	Gulf Coast Lupine	G2	G2	1985-01-02	(PS)	
Plants	Flowering Plants	Lyonothamnus floribundus ssp. aspleniifolius	Fern-Leaved Ironwood	G2T2	T2	1989-05-01		
Plants	Flowering Plants	Lysimachia fraseri	Fraser Loosestrife	G2	G2	1998-09-23		
Plants	Flowering Plants	Macbridea caroliniana	Carolina Bird-In-A-Nest	G2G3	G2	1992-04-23		
Plants	Flowering Plants	Magnolia ashei	Ashe's Magnolia	G2	G2	1997-04-08		
Plants	Flowering Plants	Malacothamnus palmeri var. involucratus	Carmel Valley Bush-Mallow	G3T2Q	T2	1993-07-07		
Plants	Flowering Plants	Matelea alabamensis	Alabama Anglepod	G2	G2	1999-05-28		
Plants	Flowering Plants	Matelea floridana	Florida Milkvine	G2	G2	1984-11-26		
Plants	Flowering Plants	Melicope sandwicensis	Gray's Pelea	G2	G2	1996-11-23		
Plants	Flowering Plants	Microseris decipiens	Thomas Microseris	G2	G2	1987-08-06		
Plants	Flowering Plants	Mimulus norrisii	Kaweah Monkeyflower	G2	G2	1985-11-07		
Plants	Flowering Plants	Mimulus pictus	Calico Monkeyflower	G2	G2	1997-03-18		
Plants	Flowering Plants	Mirabilis rotundifolia	Round-Leaf Four-O'Clock	G2	G2	2000-01-03		
Plants	Flowering Plants	Monardella crispa	Crisp Monardella	G2	G2	1989-05-02		
Plants	Flowering Plants	Monardella frutescens	San Luis Obispo County Monardella	G2	G2	1988-03-08		
Plants	Flowering Plants	Muilla clevelandii	San Diego Goldenstar	G2	G2	1993-07-07		

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Plants	Flowering Plants	Myosurus minimus ssp. apus	Little Mousetail	G5T2Q	T2	1997-03-14		
Plants	Flowering Plants	Neraudia melastomifolia	Ma`Aloa, Ma`Oloa, `Oloa	G2	G2	1990-08-07		
Plants	Flowering Plants	Nesaea longipes		G2G3	G2	2000-07-12		
Plants	Flowering Plants	Nesoluma polynesicum	Island Nesoluma	G2	G2	1990-08-07		
Plants	Flowering Plants	Nuphar lutea ssp. ulvacea	West Florida Cowlily	G5T2	T2	1984-12-18		
Plants	Flowering Plants	Nyssa ursina	Bear Tupelo	G2	G2	2000-09-29		
Plants	Flowering Plants	Oenothera harringtonii	Arkansas Valley Evening Primrose	G2	G2	1996-03-27		
Plants	Flowering Plants	Oenothera organensis	Organ Mountain Evening-Primrose	G2	G2	1995-01-24		
Plants	Flowering Plants	Oonopsis foliosa		G2G3	G2	2001-07-04		
Plants	Flowering Plants	Opuntia californica var. californica	Snake Cholla	G3T2	T2	2001-05-11		
Plants	Flowering Plants	Oryctes nevadensis	Nevada Oryctes	G2G3	G2	1999-01-12		
Plants	Flowering Plants	Oxalis illinoensis	Illinois Woodsorrel	G2G3Q	G2	1996-07-31		
Plants	Flowering Plants	Oxytropis tananensis		G2G3Q	G2	1998-02-12		
Plants	Flowering Plants	Panicum beecheyi	Beechey Panic Grass	G2	G2	1996-11-23		
Plants	Flowering Plants	Paxistima canbyi	Canby's Mountain-Lover	G2	G2	1994-11-03		
Plants	Flowering Plants	Pedicularis rainierensis	Mount Rainier Lousewort	G2G3	G2	1997-07-30		
Plants	Flowering Plants	Peniocereus greggii var. greggii	Desert Night-Blooming Cereus	G3G4T2	T2	1999-01-14		
Plants	Flowering Plants	Penstemon ramosus	Branching Penstemon	G2G3Q	G2	2000-01-31		
Plants	Flowering Plants	Penstemon rubicundus	Wassuk Beardtongue	G2G3	G2	1985-09-17		
Plants	Flowering Plants	Penstemon thompsoniae ssp. jaegeri	Jaeger's Beardtongue	G4T2	T2	1987-08-06		
Plants	Flowering Plants	Perityle staurophylla var. homoflora	San Andres Rock Daisy	G4T2	T2	1992-03-24		
Plants	Flowering Plants	Phacelia covillei	Buttercup Scorpion-Weed	G2	G2	1999-02-05		
Plants	Flowering Plants	Phacelia floribunda	Island Phacelia	G2	G2	1987-08-06		
Plants	Flowering Plants	Phlox richardsonii ssp. richardsonii	Richardson's Phlox	G4T2T3Q	T2	1994-05-03		
Plants	Flowering Plants	Pholisma sonorae	Sand Food	G2	G2	1999-08-16		
Plants	Flowering Plants	Phyllanthus pentaphyllus var. floridanus	Florida Five-Petal Leaf-Flower	G4G5T2	T2	1991-08-02		
Plants	Flowering Plants	Physostegia correllii	Correll's False Dragon-Head	G2	G2	1989-09-21		
Plants	Flowering Plants	Polygonella macrophylla	Large-Leaved Jointweed	G2	G2	1988-01-04		
Plants	Flowering Plants	Porophyllum pygmaeum	Pygmy Poreleaf	G2	G2	1996-05-09		
Plants	Flowering Plants	Potamogeton tennesseensis	Tennessee Pondweed	G2	G2	1994-11-03		
Plants	Flowering Plants	Primula tschuktschorum	Chukchi Primrose	G2G3	G2	2000-06-14		
Plants	Flowering Plants	Pteroglossaspis ecristata	Crested Fringed Orchid	G2	G2	1997-09-23		
Plants	Flowering Plants	Ptilagrostis mongholica ssp. porteri	Porter Feathergrass	G3G5T2	T2	1995-11-29		
Plants	Flowering Plants	Puccinellia parishii	Parish's Alkali Grass	G2	G2	1997-03-18		

High-level group	Species Group	Scientific Name	Common Name	GRANK	Rounded GRANK	GRANK Date	USESA	USESA Date
Plants	Flowering Plants	Pycnanthemum torrei	Torrey's Mountain Mint	G2	G2	1992-11-16		
Plants	Flowering Plants	Pyxidanthera brevifolia	Well's Pixie-Moss	G2Q	G2	1994-04-28		
Plants	Flowering Plants	Quercus dumosa	California Scrub Oak	G2	G2	1993-07-07		
Plants	Flowering Plants	Rhexia parviflora	Small-Flowered Meadowbeauty	G2	G2	1985-05-10		
Plants	Flowering Plants	Rhexia salicifolia	Panhandle Meadowbeauty	G2	G2	1985-01-05		
Plants	Flowering Plants	Rhynchospora pleiantha	Brown Beaked-Rush	G2	G2	1999-05-28		
Plants	Flowering Plants	Rudbeckia scabrifolia	Bog Coneflower	G2G3	G2	2001-03-21		
Plants	Flowering Plants	Rudbeckia triloba var. pinnatiloba	Pinnate-Lobed Black-Eyed Susan	G4G5T2?	T2	1994-11-03		
Plants	Flowering Plants	Sabatia capitata	Rose Gentian	G2	G2	1986-12-07		
Plants	Flowering Plants	Sachsia polycephala	Bahama Sachsia	G2	G2	2001-04-27		
Plants	Flowering Plants	Salvia greatae	Orocopia Sage	G2	G2	1997-03-18		
Plants	Flowering Plants	Schiedea ligustrina	Privet-Leaf Schiedea	G2	G2	1990-08-07		
Plants	Flowering Plants	Schiedea mannii	Mann's Schiedea	G2	G2	1990-08-07		
Plants	Flowering Plants	Schiedea pubescens var. purpurascens		G2T2	T2	1996-01-22		
Plants	Flowering Plants	Scirpus hallii	Hall's Bulrush	G2	G2	1992-02-07		
Plants	Flowering Plants	Scrophularia atrata	Black-Flowered Figwort	G2	G2	1997-03-18		
Plants	Flowering Plants	Scrophularia laevis	Smooth Figwort	G2	G2	1983-00-00		
Plants	Flowering Plants	Scrophularia villosa	Santa Catalina Island Figwort	G2	G2	1987-08-06		
Plants	Flowering Plants	Scutellaria alabamensis	Alabama Skullcap	G2	G2	1994-11-25		
Plants	Flowering Plants	Scutellaria ocmulgee	Ocmulgee Skullcap	G2	G2	1996-10-02		
Plants	Flowering Plants	Senecio multidentatus var. huachucanus	Huachuca Groundsel	G2G4T2	T2	1999-08-11		
Plants	Flowering Plants	Sida hermaphrodita	Virginia Mallow	G2	G2	1994-11-03		
Plants	Flowering Plants	Sidalcea hickmanii ssp. hickmanii	Hickman's Checker-Mallow	G3T2	T2	1997-03-18		
Plants	Flowering Plants	Sidalcea hirtipes	Bristly-Stemmed Sidalcea	G2	G2	1991-02-08		
Plants	Flowering Plants	Sideroxylon thornei	Swamp Buckthorn	G2	G2	1996-10-02		
Plants	Flowering Plants	Silene ovata	Ovate Catchfly	G2G3	G2	1998-06-05		
Plants	Flowering Plants	Silphium brachiatum	Cumberland Rosinweed	G2	G2	1984-06-15		
Plants	Flowering Plants	Stephanomeria blairii	Blair's Munzothamnus	G2	G2	1989-04-28		
Plants	Flowering Plants	Stephanomeria schottii	Schott's Wire-Lettuce	G2	G2	1991-01-24		
Plants	Flowering Plants	Streptanthus albidus ssp. peramoenus	Most Beautiful Jewelflower	G2T2	T2	1993-07-07		
Plants	Flowering Plants	Streptanthus bracteatus	Bracted Twistflower	G2	G2	1989-09-21		
Plants	Flowering Plants	Streptanthus squamiformis	A Jewelflower	G2	G2	1997-01-29		
Plants	Flowering Plants	Stylisma pickeringii var. pickeringii	Pickering's Morning-Glory	G4T2T3	T2	1994-11-03		
Plants	Flowering Plants	Symphyotrichum jessicae	Jessica's Aster	G2	G2	1990-04-02		
Plants	Flowering Plants	Symphyotrichum lentum	Suisun Marsh Aster	G2	G2	1999-10-04		
Plants	Flowering Plants	Symphyotrichum potosinum		G2	G2	1999-08-11		

High-level group	Species Group	Scientific Name	Common Name	GRANK	Rounded GRANK	GRANK Date	USESA	USESA Date
Plants	Flowering Plants	Talinum marginatum	Tepic Flame Flower	G2	G2	1991-01-24		
Plants	Flowering Plants	Tauschia hooveri	Hoover's Tauschia	G2	G2	1992-06-09		
Plants	Flowering Plants	Thaspium pinnatifidum	Cutleaf Meadow-Parsnip	G2G3	G2	2001-07-04		
Plants	Flowering Plants	Tragia saxicola	Florida Key Noseburn	G2	G2	1984-12-20		
Plants	Flowering Plants	Trichostema sp. 1	Dune Bluecurls	G2	G2	1992-04-23		
Plants	Flowering Plants	Trillium parviflorum	Small-Flowered Trillium	G2G3	G2	1999-09-16		
Plants	Flowering Plants	Trillium pusillum var. 1	Interior Least Trillium	G3T2Q	T2	1999-06-02		
Plants	Flowering Plants	Trillium pusillum var. pusillum	Least Trillium	G3T2	T2	1994-11-26		
Plants	Flowering Plants	Trillium pusillum var. virginianum	Virginia Least Trillium	G3T2	T2	1984-04-09		
Plants	Flowering Plants	Verbesina heterophylla	Diverse-Leaf Crownbeard	G2	G2	1984-11-29		
Plants	Flowering Plants	Xyris longisepala	Kral's Yellow-Eyed-Grass	G2	G2	1984-03-30		
Plants	Mosses	Sphagnum fitzgeraldii	Fitzgerald's Peatmoss	G2G3	G2	1991-04-29		
Verts	Amphibians	Gyrinophilus palleucus	Tennessee Cave Salamander	G2G3	G2	1998-05-15		
Verts	Amphibians	Notophthalmus perstriatus	Striped Newt	G2G3	G2	2001-10-30		
Verts	Amphibians	Rana okaloosae	Florida Bog Frog	G2	G2	1996-10-18		
Verts	Birds	Ardea herodias occidentalis		G5T2	T2	1989-09-21		
Verts	Birds	Asio flammeus sandwichensis	Pueo	G5T2	T2	1996-11-27		
Verts	Birds	Geothlypis trichas sinuosa	Saltmarsh Common Yellowthroat	G5T2	T2	1996-12-03		
Verts	Birds	Grus canadensis pratensis	Florida Sandhill Crane	G5T2T3	T2	1989-09-21		
Verts	Birds	Melospiza melodia maxillaris	Suisun Song Sparrow	G5T2	T2	1996-12-04		
Verts	Birds	Melospiza melodia samuelis	San Pablo Song Sparrow	G5T2?	T2	2001-07-26		
Verts	Freshwater Fishes	Cyprinella callitaenia	Bluestripe Shiner	G2G3	G2	2000-02-09		
Verts	Freshwater Fishes	Cyprinella zanema pop. 2	Santee Chub - Coastal Plain	G4T2Q	T2	2000-01-20		
Verts	Freshwater Fishes	Elassoma okatie	Bluebarred Pygmy Sunfish	G2G3	G2	1996-02-01		
Verts	Freshwater Fishes	Etheostoma maculatum	Spotted Darter	G2	G2	1996-09-23		
Verts	Freshwater Fishes	Etheostoma microlepidum	Smallscale Darter	G2G3	G2	1996-02-20		
Verts	Freshwater Fishes	Etheostoma tuscumbia	Tuscumbia Darter	G2	G2	1996-09-24		
Verts	Freshwater Fishes	Gila orcutti	Arroyo Chub	G2	G2	2001-05-16		
Verts	Freshwater Fishes	Percina cymatotaenia	Bluestripe Darter	G2	G2	2001-09-07		
Verts	Freshwater Fishes	Percina sp. 12	Ouachita Darter	G2?	G2	1996-09-25		
Verts	Freshwater Fishes	Thoburnia atripinnis	Blackfin Sucker	G2	G2	1997-10-09		
Verts	Mammals	Ammospermophilus nelsoni	Nelson's Antelope Squirrel	G2?	G2	2001-07-31		
Verts	Mammals	Condylura cristata pop. 1	Star-Nosed Mole - Eastern North Carolina	G5T2Q	T2	2000-02-23		
Verts	Mammals	Geomys personatus maritimus	Maritime Pocket Gopher	G4T2	T2	1991-09-30		

High-level group	Species Group	Scientific Name	Common Name	GRANK	Rounded GRANK	GRANK Date	USESA	USESA Date
Verts	Mammals	Perognathus inornatus inornatus	San Joaquin Pocket Mouse	G4T2T3	T2	1997-01-15		
Verts	Mammals	Sciurus niger shermani	Sherman's Fox Squirrel	G5T2	T2	1996-11-06		
Verts	Mammals	Spermophilus mohavensis	Mohave Ground Squirrel	G2G3	G2	1996-11-06		
Verts	Mammals	Ursus americanus floridanus	Florida Black Bear	G5T2	T2	1996-11-18		
Verts	Reptiles	Anniella pulchra nigra	Black Legless Lizard	G3G4T2T3Q	T2	2001-02-07		
Verts	Reptiles	Clemmys marmorata pallida	Southwestern Pond Turtle	G3G4T2T3	T2	2001-05-21		
Verts	Reptiles	Clonophis kirtlandii	Kirtland's Snake	G2	G2	2001-09-12		
Verts	Reptiles	Cnemidophorus burti xanthonotus	Redback Whiptail	G4T2	T2	1996-10-31		
Verts	Reptiles	Cnemidophorus neotesselatus	Triploid Colorado Checkered Whiptail	G2Q	G2	1997-09-12		
Verts	Reptiles	Diadophis punctatus similis	San Diego Ringneck Snake	G5T2T3	T2	1997-01-09		
Verts	Reptiles	Eumeces egregius egregius	Florida Keys Mole Skink	G4T2	T2	1996-10-28		
Verts	Reptiles	Graptemys barbouri	Barbour's Map Turtle	G2	G2	1996-10-21		
Verts	Reptiles	Graptemys ernsti	Escambia Map Turtle	G2	G2	1996-10-21		
Verts	Reptiles	Heterodon simus	Southern Hognose Snake	G2	G2	1998-04-09		

8.3 Species at Risk on DOD Installations: Comprehensive Information

Comprehensive information pertaining to species at risk occurring on DOD installations, including information about their conservation status, biology, habitat, and installations where they are found. Note that the 82 species at risk that have at least half of their occurrences residing on DOD installations (as shown in Figure 7 in Results section 4.3.2) can be found by sorting on the "% of total EOs on base" column.

This information is not shown here because there is too much information to display on a letter-sized page. Data included in speadsheet format on CD-ROM (**DOD_SAR_Data: A3_SAR_comprehensive.xls**).

8.4 DOD Installations with Species at Risk: Summary Information

Summary of DOD installations with species at risk, including the number of species at risk found on installations and installation size (square miles).

Note: Data shown here is included in speadsheet format on CD-ROM (**DOD_SAR_Data: A4_install_summary.xls**).

Military Service	State	FWS Region	Installation Name	Total Number SAR	Square Miles
Air Force	FL	Region 4	**Avon Park Air Force Bombing Range**	6	167
Air Force	AZ	Region 2	**Barry M. Goldwater Air Force Range**	5	2,898
Air Force	CA	Region 1	**Beale Air Force Base**	2	34
Air Force	HI	Region 1	**Bellows Air Force Station**	3	3
Air Force	FL	Region 4	**Cape Canaveral Air Force Station**	3	28
Air Force	AK	Region 7	**Cape Newenham Long Range Radar Site**	1	3
Air Force	CA	Region 1	**Cuddeback Lake Air Force Range**	3	14
Air Force	WA	Region 1	**Cusick Survival Training Site**	3	265
Air Force	NC	Region 4	**Dare County Range**	1	74
Air Force	UT	Region 6	**Deseret Test Center**	1	635
Air Force	WA	Region 1	**Desert Survival Training Site**	2	5
Air Force	HI	Region 1	**Dillinghan Air Force Base**	6	1
Air Force	CA	Region 1	**Edwards Air Force Base**	7	483
Air Force	FL	Region 4	**Eglin Air Force Base**	22	719
Air Force	TX	Region 2	**Ellington Air Force Base**	1	10
Air Force	CA	Region 1	**George Air Force Base (Closed)**	2	9
Air Force	HI	Region 1	**Hickam Air Force Base**	1	4
Air Force	NM	Region 2	**Holloman Air Force Base**	3	82
Air Force	FL	Region 4	**Homestead Air Force Base (Closed)**	11	4
Air Force	VA	Region 5	**Langley Air Force Base**	1	6
Air Force	TX	Region 2	**Laughlin Air Force Base**	2	8
Air Force	CA	Region 1	**March Air Force Base (Closed)**	1	16
Air Force	CA	Region 1	**Mather Air Force Base (Closed)**	3	10
Air Force	CA	Region 1	**McClellan Air Force Base (Scheduled to close)**	1	8
Air Force	WA	Region 1	**McCord Air Force Base**	1	8
Air Force	NJ	Region 5	**McGuire Air Defense**	5	2
Air Force	NJ	Region 5	**McGuire Air Force Base**	1	4
Air Force	GA	Region 4	**Moody Air Force Base**	1	17
Air Force	NV	Region 1	**Nellis Air Force Base**	9	123
Air Force	NV	Region 1	**Nellis Air Force Range**	8	2,890
Air Force	NV	Region 1	**Nevada Test Site**	1	428
Air Force	CO	Region 6	**NORAD COC Center**	1	1
Air Force	CO	Region 6	**Peterson Air Force Base**	1	1
Air Force	NC	Region 4	**Pope Air Force Base**	5	4
Air Force	GA	Region 4	**Robins Air Force Base**	2	10
Air Force	ID	Region 1	**Saylor Creek Air Force Range**	1	163
Air Force	CA	Region 1	**Travis Air Force Base**	5	10
Air Force	FL	Region 4	**Tyndall Air Force Base**	7	45
Air Force	CO	Region 6	**U.S. Air Force Academy Farish Memorial Recreation Area**	1	1
Air Force	CO	Region 6	**United States Air Force Academy**	1	30
Air Force	CA	Region 1	**Vandenberg Air Force Base**	18	176

Military Service	State	FWS Region	Installation Name	Total Number SAR	Square Miles
Air Force	UT	Region 6	**Wendover Range**	1	903
Air Force	MI	Region 3	**Wurtsmith Air Force Base (Closed)**	1	8
Army	HI	Region 1	**Aliamanu Military Reservation**	1	1
Army	AL	Region 4	**Anniston Army Depot**	2	32
Army	VA	Region 5	**Arlington National Cemetery**	1	1
Army	MT	Region 6	**Bearmouth National Guard Training Area**	3	4
Army	OR	Region 1	**Camp Adair Military Reservation**	1	1
Army	IN	Region 3	**Camp Atterbury Millaty Reservation**	1	64
Army	WA	Region 1	**Camp Bonneville Military Reservation (Closed)**	2	6
Army	TX	Region 2	**Camp Bullis**	3	63
Army	MI	Region 3	**Camp Grayling Military Reservation**	3	207
Army	NC	Region 4	**Camp MacKall Military Reservation**	6	12
Army	CA	Region 1	**Camp Parks Military Reservation**	2	2
Army	CA	Region 1	**Camp Roberts Military Reservation**	1	67
Army	UT	Region 6	**Dugway Proving Grounds**	2	618
Army	AK	Region 7	**Eklutna Army Mountain and Glacier Training Site**	1	29
Army	AZ	Region 2	**Florence Military Reservation**	1	8
Army	VA	Region 5	**Fort A. P. Hill Military Reservation**	1	117
Army	VA	Region 5	**Fort Belvoir Military Reservation**	1	15
Army	AL-GA	Region 4	**Fort Benning Military Reservation**	7	284
Army	TX-NM	Region 2	**Fort Bliss/McGregor Range***	12	1,048
Army	NC	Region 4	**Fort Bragg Military Reservation**	10	221
Army	KY-TN	Region 4	**Fort Campbell**	1	160
Army	CO	Region 6	**Fort Carson Military Reservation**	4	586
Army	NJ	Region 5	**Fort Dix Military Reservation**	8	48
Army	VA	Region 5	**Fort Eustis Military Reservation**	1	13
Army	GA	Region 4	**Fort Gordon**	4	87
Army	AK	Region 7	**Fort Greely (Scheduled to close)**	1	1,035
Army	TX	Region 2	**Fort Hood**	1	363
Army	AZ	Region 2	**Fort Huachuca**	12	129
Army	CA	Region 1	**Fort Irwin**	2	915
Army	SC	Region 4	**Fort Jackson**	5	77
Army	KY	Region 4	**Fort Knox**	2	172
Army	MO	Region 3	**Fort Leonard Wood Military Reservation**	3	100
Army	WA	Region 1	**Fort Lewis Military Reservation**	3	128
Army	AL	Region 4	**Fort McClellan Military Reservation (Closed)**	5	41
Army	WI	Region 3	**Fort McCoy**	2	93
Army	CA	Region 1	**Fort Ord Military Reservation (Closed)**	18	45
Army	VA	Region 5	**Fort Pickett Military Reservation (Closed)**	2	69
Army	LA	Region 4	**Fort Polk Military Reservation**	4	296
Army	AK	Region 7	**Fort Richardson Military Reservation**	1	111
Army	OK	Region 2	**Fort Sill Military Reservation**	2	149

Military Service	State	FWS Region	Installation Name	Total Number SAR	Square Miles
Army	GA	Region 4	**Fort Stewart**	9	437
Army	VA	Region 5	**Fort Story Military Reservation**	1	3
Army	AK	Region 7	**Fort Wainwright**	1	977
Army	NM	Region 2	**Fort Wingate Depot Activity (Closed)**	1	29
Army	GA	Region 4	**Hunter Army Airfield**	1	9
Army	CA	Region 1	**Hunter-Liggett Military Reservation**	18	277
Army	IN	Region 3	**Indiana Arsenal Army Ammuniton Plant (Closed)**	5	20
Army	IN	Region 3	**Jefferson Proving Ground (Closed)**	2	83
Army	IL	Region 3	**Joliet Army Ammunition Plant**	1	12
Army	HI	Region 1	**Kamehameha Military Reservation**	1	1
Army	HI	Region 1	**Makua Military Reservation**	36	6
Army	NC	Region 4	**Military Ocean Terminal Sunny Point**	8	22
Army	CA	Region 1	**Oakland Army Base (Closed)**	1	1
Army	HI	Region 1	**Pohakuloa Training Area**	1	1
Army	CA	Region 1	**Presidio of Monterey**	6	1
Army	VA	Region 5	**Radford Army Ammunition Plant**	1	11
Army	AL	Region 4	**Redstone Arsenal**	7	49
Army	IL	Region 3	**Rock Island Arsenal**	1	1
Army	CA	Region 1	**Sacramento Army Depot (Closed)**	1	1
Army	HI	Region 1	**Schofield Barracks Military Reservation**	46	21
Army	CA	Region 1	**Sierra Army Depot**	2	148
Army	HI	Region 1	**Tripler Military Hospital**	1	1
Army	NM	Region 2	**White Sands Missile Range***	16	3,470
Army	WA	Region 1	**Yakima Firing Center**	6	405
Army	AZ	Region 2	**Yuma Proving Ground**	1	1,316
Army Corps of Engineers	NC	Region 4	**B. Everett Jordan Lake**	2	47
Army Corps of Engineers	AR	Region 4	**Beaver Lake**	1	58
Army Corps of Engineers	LA	Region 4	**Bonnett Carre Spillway**	1	17
Army Corps of Engineers	OK	Region 2	**Broken Bow Lake**	1	40
Army Corps of Engineers	AR-MO	Region 3 / Region 4	**Bull Shoals Lake**	1	75
Army Corps of Engineers	OH	Region 3	**Burr Oak Lake**	1	1
Army Corps of Engineers	TX	Region 2	**Canyon Lake**	1	21
Army Corps of Engineers	IL	Region 3	**Carlyle Lake**	2	45
Army Corps of Engineers	KY	Region 4	**Cave Run Lake**	2	33
Army Corps of Engineers	TN	Region 4	**Center Hill Lake**	3	53
Army Corps of Engineers	TN	Region 4	**Cheatham Lake**	1	7
Army Corps of Engineers	OH	Region 3	**Clarence J. Brown Reservoir**	1	3

Military Service	State	FWS Region	Installation Name	Total Number SAR	Square Miles
Army Corps of Engineers	MO	Region 3	**Clearwater Lake**	1	7
Army Corps of Engineers	TN	Region 4	**Cordell Hull Lake**	1	11
Army Corps of Engineers	OR	Region 1	**Cottage Grove Lake**	1	2
Army Corps of Engineers	OR	Region 1	**Dorena Lake**	3	3
Army Corps of Engineers	ID	Region 1	**Dworshak Reservoir**	1	34
Army Corps of Engineers	OR	Region 1	**Fern Ridge Lake**	1	15
Army Corps of Engineers	OK	Region 2	**Fort Gibson Lake**	1	40
Army Corps of Engineers	OR	Region 1	**Foster Lake**	1	3
Army Corps of Engineers	KY	Region 4	**Grayson Lake**	1	4
Army Corps of Engineers	MO	Region 3	**Harry S. Truman Reservoir**	1	191
Army Corps of Engineers	GA-SC	Region 4	**Hartwell Lake**	3	99
Army Corps of Engineers	OK	Region 2	**Hugo Lake**	1	62
Army Corps of Engineers	IN	Region 3	**Huntington Lake**	2	5
Army Corps of Engineers	CA	Region 1	**Isabella Reservoir**	2	21
Army Corps of Engineers	TN	Region 4	**J. Percy Priest Lake**	5	36
Army Corps of Engineers	NC-VA	Region 5	**John H. Kerr Reservoir**	3	102
Army Corps of Engineers	MN	Region 3	**Lac qui Parle**	2	12
Army Corps of Engineers	KY	Region 4	**Lake Cumberland**	1	74
Army Corps of Engineers	AR	Region 4	**Lake Greeson**	2	14
Army Corps of Engineers	CA	Region 1	**Lake Kaweah**	4	4
Army Corps of Engineers	MT	Region 6	**Lake Koocanusa**	1	47
Army Corps of Engineers	VA	Region 5	**Lake Moomaw**	1	6
Army Corps of Engineers	FL	Region 4	**Lake Ocklawaha**	2	18
Army Corps of Engineers	AR	Region 4	**Lake Ouachita**	2	72
Army Corps of Engineers	ID	Region 1	**Lake Pend Oreille**	2	142
Army Corps of Engineers	FL-GA	Region 4	**Lake Seminole**	8	73

Military Service	State	FWS Region	Installation Name	Total Number SAR	Square Miles
Army Corps of Engineers	GA	Region 4	**Lake Sidney Lanier**	2	105
Army Corps of Engineers	MN	Region 3	**Lake Traverse**	2	20
Army Corps of Engineers	OR-WA	Region 1	**Lake Wallula**	1	37
Army Corps of Engineers	KY	Region 4	**Laurel River Lake**	1	15
Army Corps of Engineers	OR	Region 1	**Lookout Point Lake**	1	3
Army Corps of Engineers	MN	Region 3	**Mash Lake**	1	7
Army Corps of Engineers	OH	Region 3	**Mohawk Reservoir**	2	12
Army Corps of Engineers	NY	Region 5	**Mount Morris Lake**	1	7
Army Corps of Engineers	AR-MO	Region 4	**Norfork Lake**	1	39
Army Corps of Engineers	TN	Region 4	**Old Hickory Lake**	2	66
Army Corps of Engineers	CA	Region 1	**Pine Flat Reservoir**	1	15
Army Corps of Engineers	AL	Region 4	**R. B. Woodruff Lake**	5	4
Army Corps of Engineers	KY	Region 4	**Rough River Lake**	1	23
Army Corps of Engineers	TX	Region 2	**Sam Rayburn Reservoir**	2	207
Army Corps of Engineers	TX	Region 2	**Somerville Lake**	1	25
Army Corps of Engineers	CA	Region 1	**Success Lake**	2	6
Army Corps of Engineers	AR-MO	Region 3	**Table Rock Lake**	1	107
Army Corps of Engineers	OK	Region 2	**Tenkiller Ferry Lake**	1	72
Army Corps of Engineers	AL-GA	Region 4	**Walter F. George Lake**	3	80
Army Corps of Engineers	AL-GA	Region 4	**West Point Lake**	1	73
Army Corps of Engineers	AL	Region 4	**William Dannelly Reservoir**	3	41
Marine Corps	NC	Region 4	**Bogue Field**	1	1
Marine Corps	HI	Region 1	**Camp H. M. Smith Marine Corps Base**	1	0
Marine Corps	NC	Region 4	**Camp Lejeune Marine Corps Base**	8	153
Marine Corps	CA	Region 1	**Camp Pendleton Marine Corps Base**	11	191
Marine Corps	GA	Region 4	**Townsend Range**	1	13
Marine Corps	CA	Region 1	**Tustin Marine Corps Air Station (Closed)**	1	2
Navy	HI	Region 1	**Barbers Point Naval Air Station (Closed)**	2	6
Navy	HI	Region 1	**Barking Sands Pacific Missile Range Facility**	1	20

Military Service	State	FWS Region	Installation Name	Total Number SAR	Square Miles
Navy	OR	Region 1	**Boardman Naval Bombing Range**	1	98
Navy	VA	Region 5	**Camp Peary Naval Reservation**	1	14
Navy	FL	Region 4	**Cecil Field Naval Air Station (Closed)**	2	28
Navy	CA	Region 1	**China Lake Naval Weapons Center**	3	1,784
Navy	CA	Region 1	**Chocolate Mountain Naval Aerial Gunnery Range**	2	717
Navy	CA	Region 1	**Concord Naval Weapons Station**	5	13
Navy	CA	Region 1	**Coronado Naval Amphibious Base**	2	1
Navy	TX	Region 2	**Corpus Christi Naval Air Station**	2	6
Navy	CA	Region 1	**El Centro Naval Air Facility**	2	12
Navy	NV	Region 1	**Fallon Naval Target Range**	4	121
Navy	HI	Region 1	**Haiku Naval Reservation**	10	1
Navy	FL	Region 4	**Harold Outlying Landing Field**	2	1
Navy	NV	Region 1	**Hawthorne Army Ammunition Depot**	4	218
Navy	FL	Region 4	**Holley Field**	1	1
Navy	CA	Region 1	**Imperial Beach Naval Air Station**	3	1
Navy	FL	Region 4	**Jacksonville Naval Air Station**	2	9
Navy	FL	Region 4	**Key West Naval Air Station**	6	7
Navy	GA	Region 4	**Kings Bay Naval Submarine Support Base**	2	25
Navy	NJ	Region 5	**Lakehurst Naval Air Station**	3	15
Navy	HI	Region 1	**Lualualei Naval Radio Station**	2	3
Navy	HI	Region 1	**Lualualei Naval Reservation**	32	14
Navy	CA	Region 1	**Mare Island Naval Station (Closed)**	4	5
Navy	MS	Region 4	**Meridian Naval Air Station**	1	12
Navy	CA	Region 1	**Miramar Naval Air Station**	6	25
Navy	CA	Region 1	**Moffett Field Naval Air Station (Closed)**	1	3
Navy	CO	Region 6	**Naval Oil Shale Reserve**	2	91
Navy	CA	Region 1	**Naval Petroleum Reserve Number One**	9	67
Navy	CA	Region 1	**Naval Petroleum Reserve Number Two**	3	47
Navy	NY	Region 5	**Naval Weapons Industrial Reserve Plant**	1	11
Navy	CA	Region 1	**Naval Weapons Station (Fallbrook Annex)**	2	14
Navy	CA	Region 1	**North Island Naval Air Station**	3	4
Navy	FL	Region 4	**Panama City Naval Coastal Systems Center**	1	1
Navy	HI	Region 1	**Pearl Harbor Naval Station**	2	11
Navy	FL	Region 4	**Pensacola Naval Air Station**	2	8
Navy	CA	Region 1	**Point Mugu Pacific Missile Test Center**	5	7
Navy	WA	Region 1	**Puget Sound Naval Shipyard**	2	1
Navy	HI	Region 1	**Red Hill Naval Supply Center**	1	1
Navy	FL	Region 4	**Saddlebunch Keys Naval Communication Unit**	3	1
Navy	CA	Region 1	**San Clemente Island Naval Reservation**	26	57
Navy	CA	Region 1	**San Diego Naval Training Center (Closed)**	4	2
Navy	CA	Region 1	**San Nicolas Island Naval Reservation**	12	23
Navy	FL	Region 4	**Saufley Field**	1	1
Navy	CA	Region 1	**Seal Beach Naval Weapons Station**	1	6
Navy	CA	Region 1	**Skaggs Island Naval Security Group Activity**	3	8

Military Service	State	FWS Region	Installation Name	Total Number SAR	Square Miles
Navy	FL	Region 4	**Stevens Lake Bombing Range**	3	5
Navy	VA	Region 5	**U.S. Naval Supply Center**	2	1
Navy	VA	Region 5	**U.S. Naval Supply Center Cheatham Annex**	1	2
Navy	VA	Region 5	**U.S. Naval Weapons Station**	1	16

8.5 DOD Installations with Species at Risk: Comprehensive Information

List of DOD installations with species at risk, including comprehensive information about the species at risk that occur on them. See Appendix 8.3 (Species at Risk on DOD Installations – Comprehensive Information) for additional information about species biology and habitat requirements.

This list is not shown here because there is too much information to display on a letter-sized page. Data included in speadsheet format on CD-ROM (**DOD_SAR_Data: A5_install_comprehensive.xls**).

8.6 DOD Installations without Species at Risk

DOD Installations in the USGS Data Set "Federal Land Features of the United States" (National Atlas 2002) without species at risk. Note: The absence of species at risk on any particular Installation does not necessarily mean that no at-risk species are present. Many areas in the United States have not been adequately inventoried and new locations of species are continuously being discovered. Data is not available for installations in Pennsylvania and Massachusetts because specific locational data was not available for those states.

The information shown here is included in speadsheet format on CD-ROM (**DOD_SAR_Data: A6_install_without_SAR.xls**). A previous version of this information was presented in the 2002 NatureServe report as: **FINAL_USGS_install_no_data.xls**.

State	Military Service	Installation Name
AK	Air Force	Barter Island Long Range Radar Site
AK	Air Force	Beaver Creek Research Site
AK	Air Force	Blair Lake Air Force Range
AK	Air Force	Burnt Mountain Research Site
AK	Air Force	Campion Air Force Station
AK	Air Force	Cape Romanzof Long Range Radar Site
AK	Air Force	Chena River Research Site
AK	Air Force	Clear Air Force Station
AK	Air Force	Eielson Air Force Base
AK	Air Force	Elmendorf Air Force Base
AK	Air Force	Galena Air Force Base
AK	Air Force	Indian Mountain Long Range Radar Site
AK	Air Force	Indian Mountain Research Site
AK	Air Force	Lonely Distant Early Warning Station
AK	Air Force	Murphy Dome Air Force Station
AK	Air Force	Point Lay Distant Early Warning Station
AK	Air Force	Sparrevohn Long Range Radar Site (AF)
AK	Air Force	Tatalina Long Range Radar Site
AK	Air Force	Wainwright Dew Station
AL	Air Force	Maxwell Air Force Base
AR	Air Force	Eaker Air Force Base (Closed)
AR	Air Force	Little Rock Air Force Base
AZ	Air Force	Air Force Plant No. 44
AZ	Air Force	Davis-Monthan Air Force Base
AZ	Air Force	Luke Air Force Auxiliary Field
AZ	Air Force	Luke Air Force Base
AZ	Air Force	Rittenhouse Air Force Auxiliary Field
AZ	Air Force	Willcox Dry Lake Bombing Range
AZ	Air Force	Williams Air Force Base (Closed)
CA	Air Force	Castle Air Force Base (Closed)
CA	Air Force	Norton Air Force Base (Closed)
CO	Air Force	Lowry Air Force Base (Closed)
DC	Air Force	Bolling Air Force Base
DE	Air Force	Dover Air Force Base
FL	Air Force	MacDill Air Force Base
FL	Air Force	Patrick Air Force Base
GA	Air Force	Dobbins Air Force Base
GA	Air Force	Moody Air Force Base Annex
HI	Air Force	Wheeler Air Force Base

State	Military Service	Installation Name
ID	Air Force	Boise Air Terminal
ID	Air Force	Mountain Home Air Force Base
ID	Air Force	Mountain Home Small Arms Range Annex
IL	Air Force	Scott Air Force Base
IN	Air Force	Grissom Air Force Base (Closed)
KS	Air Force	Forbes Air Force Base
KS	Air Force	McConnell Air Force Base
KS	Air Force	Smoky Hill Air Force Range
LA	Air Force	Barksdale Air Force Base
MA	Air Force	Hanscom Air Force Base
MA	Air Force	Otis Air Force Base
MA	Air Force	Westover Air Force Base
MD	Air Force	Andrews Air Force Base
MD	Air Force	U.S. Air Force Transmitter Station
ME	Air Force	Loring Air Force Base (Closed)
MI	Air Force	K. I. Sawyer Air Force Base (Closed)
MI	Air Force	Selfridge Air Force Base
MO	Air Force	Richards-Gebaur Air Force Base (Closed)
MO	Air Force	Whiteman Air Force Base
MT	Air Force	Malmstrom Air Force Base
NC	Air Force	Seymour Johnson Air Force Base
ND	Air Force	Grand Forks Air Force Base
ND	Air Force	Minot Air Force Base
NE	Air Force	Offutt Air Force Base
NE	Air Force	Prototype Low Frequency Communications System
NM	Air Force	Cannon Air Force Base
NM	Air Force	Melrose Air Force Range
NM	Air Force	Sandia Military Reservation
NV	Air Force	Indian Springs Air Force Auxiliary Field
NV	Air Force	Wendover Air Force Auxiliary Field
NY	Air Force	Air Force Plant No. 38
NY	Air Force	Griffiss Air Force Base (Closed)
NY	Air Force	Hancock Field U.S. Air Force
NY	Air Force	Plattsburgh Air Force Base (Closed)
OH	Air Force	Wright-Patterson Air Force Base
OK	Air Force	Altus Air Force Base
OK	Air Force	Tinker Air Force Base
OK	Air Force	Vance Air Force Base
OR	Air Force	Kingsley Field Air National Guard Base
OR	Air Force	West Coast Over the Horizon Backscatter Radar System
SC	Air Force	Charleston Air Force Base
SC	Air Force	Shaw Air Force Base
SD	Air Force	Ellsworth Air Force Base
TX	Air Force	Bergstrom Air Force Base (Closed)
TX	Air Force	Brooks Air Force Base
TX	Air Force	Carswell Air Force Base (Closed)
TX	Air Force	Dyess Air Force Base
TX	Air Force	Fort Sam Houston
TX	Air Force	Goodfellow Air Force Base
TX	Air Force	Kelly Air Force Base (Scheduled to close)
TX	Air Force	Lackland Air Force Base
TX	Air Force	Randolph Air Force Base

State	Military Service	Installation Name
TX	Air Force	Reese Air Force Base (Closed)
TX	Air Force	Sheppard Air Force Base
UT	Air Force	Air Force Plant No. 78
UT	Air Force	Hill Air Force Base
UT	Air Force	Hill Air Force Range
UT	Air Force	Little Mountain Test Annex
WA	Air Force	Fairchild Air Force Base
WA	Air Force	McCord Training Annex
WY	Air Force	Francis E. Warren Air Force Base
WY	Air Force	Powell Air Force Station
AK	Army	Black Rapids Training Site
AK	Army	Fort Wainwright Maneuver Area
AK	Army	Gerstle River Test Site (Army)
AK	Army	Gulkana Glacier Training Site (Army)
AL	Army	Fort Rucker Military Reservation
AR	Army	Camp Joseph T. Robinson
AR	Army	Fort Chaffee (Closed)
AR	Army	Pine Bluff Arsenal
AZ	Army	Buckeye National Guard Target Range
AZ	Army	Navajo Army Depot (Closed)
CA	Army	Fort MacArthur
CA	Army	Los Alamitos Armed Forces Reserve Center
CA	Army	Sharpe General Depot (Field Annex)
CO	Army	Buckley Air National Guard AF Base
CO	Army	Fitzsimons Army Medical Center (Closed)
CO	Army	Pueblo Chemical Depot (Closed)
FL	Army	Malabar Transmitter Annex
GA	Army	Fort Gillem Heliport
GA	Army	Fort McPherson
HI	Army	Fort Shafter
HI	Army	Helemano Military Reservation
HI	Army	Sand Island Military Reservation
HI	Army	Tripler Military Hospital
HI	Army	Upper Kipapa Military Reservation
HI	Army	Waiawa Military Reservation
IA	Army	Camp Dodge Military Reservation
IA	Army	Iowa Army Ammunition Plant
IL	Army	Charles Melvin Price Support Center
IL	Army	Fort Sheridan (Closed)
IL	Army	Savanna Army Depot (Scheduled to close)
IN	Army	Fort Benjamin Harrison (Closed)
IN	Army	LaPorte Outdoor Training Facility
IN	Army	Newport Army Ammunition Plant
KS	Army	Fort Leavenworth Military Reservation
KS	Army	Fort Riley Military Reservation
KS	Army	Kansas Army Ammunition Plant
KS	Army	Sunflower Army Ammunition Plant
KY	Army	Lexington-Blue Grass Army Depot (Closed)
LA	Army	Louisiana Ordnance Plant
MA	Army	Fort Devens (Closed)
MA	Army	Natick Laboratories Military Reservation
MA	Army	U.S. Army Reserve Center

State	Military Service	Installation Name
MD	Army	Aberdeen Proving Ground Military Reservation
MD	Army	Army Chemical Center
MD	Army	Blossom Point Field Test Facility
MD	Army	Edgewood Arsenal
MD	Army	Fort George G. Meade
MD	Army	Fort Ritchie Military Reservation (Closed)
MD	Army	Globecom Radio Receiving Station
MD	Army	U.S. Army Aberdeen Proving Ground
MD	Army	U.S. Garrison, Fort Detrick
MI	Army	Custer Reserve Forces Training Area
MO	Army	Lake City Army Ammunition Plant
MT	Army	Fort William H. Harrison Military Reservation
NE	Army	Army Reserve Outdoor Training Area
NE	Army	Army Training Area
NE	Army	Cornhusker Army Ammunition Plant
NE	Army	Kearney Rifle Range
NE	Army	Mead Army National Guard Facility
NJ	Army	Belle Mead General Depot
NJ	Army	Fort Monmouth Military Reservation
NJ	Army	Picatinny Arsenal
NY	Army	Camden Test Annex
NY	Army	Fort Drum
NY	Army	Seneca Army Depot (Scheduled to close)
NY	Army	West Point U.S. Military Academy
OH	Army	Ravenna Arsenal
OK	Army	U.S. Army Ammunition Depot
OR	Army	Camp Riley Military Reservation
OR	Army	Umatilla Chemical Depot (Closed)
PA	Army	Fort Indiantown Gap Military Reservation (Closed)
PA	Army	Fort Ritchie Raven Rock Site
PA	Army	Greencastle Military Reservation
PA	Army	Letterkenny Army Depot
PA	Army	New Cumberland General Depot (U.S. Military Reservation)
TN	Army	Milan Arsenal And Wildlife Management Area
TX	Army	Camp Swift N. G. Facility
TX	Army	Fort Wolters
TX	Army	Longhorn Ordnance Army Ammo Plant
TX	Army	Red River Army Depot
UT	Army	Camp Williams
UT	Army	Defense Depot Ogden (Closed)
UT	Army	Tooele Army Depot
UT	Army	Utah Launch Complex White Sands Missle
VA	Army	Craney Island Disposal Area
VA	Army	Fort Lee Military Reservation
VA	Army	Fort Monroe Military Reservation
VA	Army	Vint Hill Farms Station Military Reservation (Closed)
VA	Army	Warrenton Training Center Military Reservation
VT	Army	Camp Johnson
VT	Army	Fort Ethan Allen Military Reservation
WA	Army	Mount Baker Helicopter Training Area
WA	Army	Nap of the Earth Army Helicopter Training Area
WI	Army	Badger Army Ammunition Plant

State	Military Service	Installation Name
AL	Army Corps of Engineers	Coffeeville Lake
AL	Army Corps of Engineers	Lake Tholocco
AL-MS	Army Corps of Engineers	Aliceville Lake
AR	Army Corps of Engineers	Blue Mountain Lake
AR	Army Corps of Engineers	Cache River Mitigation Project
AR	Army Corps of Engineers	Dardanelle Lake
AR	Army Corps of Engineers	DeGray Lake
AR	Army Corps of Engineers	DeQueen Reservoir
AR	Army Corps of Engineers	Dierks Reservoir
AR	Army Corps of Engineers	Gillham Lake
AR	Army Corps of Engineers	Greers Ferry Lake
AR	Army Corps of Engineers	Millwood Lake
AR	Army Corps of Engineers	Nimrod Lake
AR	Army Corps of Engineers	Ozark Lake
CA	Army Corps of Engineers	Black Butte Lake
CO	Army Corps of Engineers	Cherry Creek Reservoir
CO	Army Corps of Engineers	John Martin Reservoir
CT	Army Corps of Engineers	Mansfield Hollow Lake
CT-MA	Army Corps of Engineers	Colebrook River Lake
GA	Army Corps of Engineers	Allatoona Lake
GA	Army Corps of Engineers	Carters Lake
GA-SC	Army Corps of Engineers	J. Strom Thurmond Lake
GA-SC	Army Corps of Engineers	Richard B. Russell Lake
IA	Army Corps of Engineers	Coralville Reservoir
IA	Army Corps of Engineers	Lake Red Rock
IA	Army Corps of Engineers	Rathbun Lake
IA	Army Corps of Engineers	Saylorville Lake
ID	Army Corps of Engineers	Lucky Peak Lake
IL	Army Corps of Engineers	Lake Shelbyville
IL	Army Corps of Engineers	Rend Lake
IN	Army Corps of Engineers	Brookville Lake
IN	Army Corps of Engineers	Cagles Mill Lake
IN	Army Corps of Engineers	Cecil M. Hardin Lake
IN	Army Corps of Engineers	Mississinewa Lake
IN	Army Corps of Engineers	Monroe Lake
IN	Army Corps of Engineers	Patoka Lake
IN	Army Corps of Engineers	Salamonie Lake
KS	Army Corps of Engineers	Clinton Lake
KS	Army Corps of Engineers	Council Grove Lake
KS	Army Corps of Engineers	El Dorado Lake
KS	Army Corps of Engineers	Elk City Lake
KS	Army Corps of Engineers	Fall River Lake
KS	Army Corps of Engineers	John Redmond Reservoir
KS	Army Corps of Engineers	Kanopolis Lake
KS	Army Corps of Engineers	Marion Lake
KS	Army Corps of Engineers	Melvern Lake
KS	Army Corps of Engineers	Milford Lake
KS	Army Corps of Engineers	Perry Lake
KS	Army Corps of Engineers	Pomona Lake
KS	Army Corps of Engineers	Toronto Lake
KS	Army Corps of Engineers	Tuttle Creek Lake
KS	Army Corps of Engineers	Wilson Lake

State	Military Service	Installation Name
KS-OK	Army Corps of Engineers	Copan Lake
KS-OK	Army Corps of Engineers	Hulah Lake
KY	Army Corps of Engineers	Buckhorn Lake
KY	Army Corps of Engineers	Carr Fork Lake
KY	Army Corps of Engineers	Dewey Lake
KY	Army Corps of Engineers	Fishtrap Lake
KY-TN	Army Corps of Engineers	Dale Hollow Reservoir
KY-TN	Army Corps of Engineers	Lake Barkley
MD-PA	Army Corps of Engineers	Youghiogheny River Lake
MD-WV	Army Corps of Engineers	Jennings Randolph Lake
MN	Army Corps of Engineers	Big Sandy Lake
MN	Army Corps of Engineers	Cross Lake
MN	Army Corps of Engineers	Gull Lake
MN	Army Corps of Engineers	Lake Winnibigoshish
MN	Army Corps of Engineers	Leech Lake
MN	Army Corps of Engineers	Pokegama Lake
MN-SD	Army Corps of Engineers	Mud Lake
MO	Army Corps of Engineers	Mark Twain Lake
MO	Army Corps of Engineers	Pomme De Terre Lake
MO	Army Corps of Engineers	Stockton Lake
MO	Army Corps of Engineers	Wappapello Lake
MS	Army Corps of Engineers	Aberdeen Lake
MS	Army Corps of Engineers	Arkabutla Lake
MS	Army Corps of Engineers	Bay Springs Lake
MS	Army Corps of Engineers	Columbus Lake
MS	Army Corps of Engineers	Enid Lake
MS	Army Corps of Engineers	Grenada Lake
MS	Army Corps of Engineers	Okatibbee Lake
MS-OK	Army Corps of Engineers	Sardis Lake
MT	Army Corps of Engineers	Fort Peck Lake
NC	Army Corps of Engineers	Falls Lake Reservoir
NC	Army Corps of Engineers	W. Kerr Scott Reservoir
ND	Army Corps of Engineers	Bowman Haley Lake
ND	Army Corps of Engineers	Homme Lake
ND	Army Corps of Engineers	Lake Ashtabula
ND	Army Corps of Engineers	Lake Sakakawea
ND	Army Corps of Engineers	Pipestem Lake
ND-SD	Army Corps of Engineers	Lake Oahe
NE	Army Corps of Engineers	Harlan County Lake
NE-SD	Army Corps of Engineers	Lewis And Clark Lake
NH	Army Corps of Engineers	Hopkinton Lake
NM	Army Corps of Engineers	Abiquiu Reservoir
NM	Army Corps of Engineers	Conchas Lake
NM	Army Corps of Engineers	Conchiti Lake
NM	Army Corps of Engineers	Jemez Canyon Reservoir
NM	Army Corps of Engineers	Santa Rosa Lake
NY	Army Corps of Engineers	Whitney Point Lake
NY-PA	Army Corps of Engineers	Allegheny Reservoir
OH	Army Corps of Engineers	Alum Creek Lake
OH	Army Corps of Engineers	Atwood Lake
OH	Army Corps of Engineers	Beach City Lake
OH	Army Corps of Engineers	Berlin Lake

State	Military Service	Installation Name
OH	Army Corps of Engineers	Caesar Creek Lake
OH	Army Corps of Engineers	Charles Mill Lake
OH	Army Corps of Engineers	Clendening Lake
OH	Army Corps of Engineers	Deer Creek Lake
OH	Army Corps of Engineers	Dillon Lake
OH	Army Corps of Engineers	Leesville Lake
OH	Army Corps of Engineers	Michael J. Kirwan Reservoir
OH	Army Corps of Engineers	Mosquito Creek Lake
OH	Army Corps of Engineers	Paint Creek Lake
OH	Army Corps of Engineers	Piedmont Lake
OH	Army Corps of Engineers	Pleasant Hill Lake
OH	Army Corps of Engineers	Senecaville Lake
OH	Army Corps of Engineers	Tappan Lake
OH	Army Corps of Engineers	Willam H. Harsha Lake
OH	Army Corps of Engineers	Wills Creek Lake
OK	Army Corps of Engineers	Arcadia Lake
OK	Army Corps of Engineers	Birch Lake
OK	Army Corps of Engineers	Candy Lake
OK	Army Corps of Engineers	Canton Lake
OK	Army Corps of Engineers	Eufaula Lake
OK	Army Corps of Engineers	Fort Supply Lake
OK	Army Corps of Engineers	Heyburn Lake
OK	Army Corps of Engineers	Kaw Lake
OK	Army Corps of Engineers	Keystone Lake
OK	Army Corps of Engineers	Oologah Lake
OK	Army Corps of Engineers	Optima Lake
OK	Army Corps of Engineers	Pine Creek Lake
OK	Army Corps of Engineers	Robert S. Kerr Lake
OK	Army Corps of Engineers	Skiatook Lake
OK	Army Corps of Engineers	Waurika Lake
OK	Army Corps of Engineers	Webbers Falls Reservoir
OK	Army Corps of Engineers	Wister Lake
OK-TX	Army Corps of Engineers	Lake Texoma
OR	Army Corps of Engineers	Cougar Reservoir
OR	Army Corps of Engineers	Detroit Lake
OR	Army Corps of Engineers	Dexter Reservoir
OR	Army Corps of Engineers	Fall Creek Reservoir
OR	Army Corps of Engineers	Green Peter Lake
OR	Army Corps of Engineers	Hills Creek Lake
OR	Army Corps of Engineers	Lost Creek Lake
PA	Army Corps of Engineers	Beltzville Lake
PA	Army Corps of Engineers	Blanchard Lake
PA	Army Corps of Engineers	Blue Marsh Lake
PA	Army Corps of Engineers	Conemaugh River Lake
PA	Army Corps of Engineers	Crooked Creek Lake
PA	Army Corps of Engineers	Curwensville Lake
PA	Army Corps of Engineers	East Branch Clarion River Lake
PA	Army Corps of Engineers	Loyalhanna Lake
PA	Army Corps of Engineers	Mahoning Creek Lake
PA	Army Corps of Engineers	Prompton Lake
PA	Army Corps of Engineers	Raystown Lake
PA	Army Corps of Engineers	Shenango Lake

State	Military Service	Installation Name
PA	Army Corps of Engineers	Tionesta Lake
PA	Army Corps of Engineers	Woodcock Creek Lake
SD	Army Corps of Engineers	Lake Francis Case
SD	Army Corps of Engineers	Lake Sharpe
TX	Army Corps of Engineers	Aquilla Lake
TX	Army Corps of Engineers	Bardwell Lake
TX	Army Corps of Engineers	Belton Lake
TX	Army Corps of Engineers	Benbrook Lake
TX	Army Corps of Engineers	Caddo Lake
TX	Army Corps of Engineers	Grapevine Lake
TX	Army Corps of Engineers	Lake O' The Pines
TX	Army Corps of Engineers	Lake Ray Roberts
TX	Army Corps of Engineers	Lavon Lake
TX	Army Corps of Engineers	Lewisville Lake
TX	Army Corps of Engineers	Navarro Mills Lake
TX	Army Corps of Engineers	O. C. Fisher Lake
TX	Army Corps of Engineers	Pat Mayse Lake
TX	Army Corps of Engineers	Proctor Lake
TX	Army Corps of Engineers	Steinhagen Lake
TX	Army Corps of Engineers	Stillhouse Hollow Lake
TX	Army Corps of Engineers	Waco Lake
TX	Army Corps of Engineers	Whitney Lake
TX	Army Corps of Engineers	Wright Patman Lake
VA	Army Corps of Engineers	John W. Flanagan Reservoir
VA	Army Corps of Engineers	North Fork Pound Lake
VA	Army Corps of Engineers	Philpott Lake
VA-WV	Army Corps of Engineers	Bluestone Lake
VT	Army Corps of Engineers	North Springfield Lake
WA	Army Corps of Engineers	Howard Hanson Reservoir
WA	Army Corps of Engineers	Lake Sacajawea
WV	Army Corps of Engineers	Beech Fork Lake
WV	Army Corps of Engineers	Burnsville Lake
WV	Army Corps of Engineers	East Lynn Lake
WV	Army Corps of Engineers	R. D. Bailey Lake
WV	Army Corps of Engineers	Stonewall Jackson Lake
WV	Army Corps of Engineers	Summersville Lake
WV	Army Corps of Engineers	Sutton Lake
WV	Army Corps of Engineers	Tygart Lake
NC	Department of Defense	Harvey Point Defense Testing Activity
VA	Department of Defense	Pentagon
AZ	Marine Corps	Yuma Marine Corps Air Station
CA	Marine Corps	Barstow Marine Corps Logistics Base
CA	Marine Corps	El Toro Marine Corps Air Station (Closed)
CA	Marine Corps	Twentynine Palms Marine Corps Base
GA	Marine Corps	Marine Corps Logistics Support Base Atlantic
HI	Marine Corps	Kaneohe Marine Corps Air Station
NC	Marine Corps	Atlantic Field Marine Corps Air Station
NC	Marine Corps	Cherry Point Marine Corps Air Station
NC	Marine Corps	Cherry Point U.S. Military Range
NY	Marine Corps	U.S. Marine Corps Reserve Training Center
SC	Marine Corps	Beaufort Marine Corps Air Station
SC	Marine Corps	Laurel Bay Naval Area

State	Military Service	Installation Name
SC	Marine Corps	Parris Island U.S. Marine Corps
VA	Marine Corps	Quantico Marine Corps Base
AL	Navy	Barin Field
AL	Navy	Silverhill Outlying Landing Field
AL	Navy	Summerdale Outlying Landing Field
AZ	Navy	Naval Obervation Station
CA	Navy	Alameda Naval Air Station (Closed)
CA	Navy	El Centro Naval Auxiliary Air Station
CA	Navy	Lemoore Naval Air Station
CA	Navy	Long Beach Naval Station (Closed)
CA	Navy	Port Hueneme Naval Construction Batallion Center
CA	Navy	Salton Sea Naval Test Range (Closed)
CA	Navy	San Diego Naval Station
CA	Navy	San Diego Naval Submarine Base
CA	Navy	Stockton Naval Communications Station
CA	Navy	Treasure Island Naval Base (Closed)
CT	Navy	New London Submarine Base
DC	Navy	Naval Research Laboratory Washington
DC	Navy	Naval Station Anacostia
FL	Navy	Bronson Field
FL	Navy	Choctaw Outlying Landing Field
FL	Navy	Corry Field
FL	Navy	Homestead Naval Security Group Activity
FL	Navy	Kings Outlying Landing Field
FL	Navy	Mayport Naval Station
FL	Navy	McCoy Annex Naval Training Center
FL	Navy	Orlando Naval Training Center (Closed)
FL	Navy	Pinecastle Impact Range
FL	Navy	Rodman Bombing Range
FL	Navy	Santa Rosa Outlying Landing Field
FL	Navy	Spencer Outlying Landing Field
FL	Navy	Whiting Field Naval Air Station
HI	Navy	Ford Island Naval Station Annex
HI	Navy	Wahiawa Naval Reservation
IL	Navy	Glenview Naval Air Station (Closed)
IL	Navy	Great Lakes Naval Training Center
IN	Navy	Crane Naval Weapons Support Center
LA	Navy	New Orleans Naval Air Station
MA	Navy	South Weymouth Naval Air Station (Closed)
MD	Navy	Bloodsworth Island U.S. Naval Reservation
MD	Navy	Naval Academy Dairy Farm
MD	Navy	Naval Air Station, Patuxent River
MD	Navy	Naval Air Station, Patuxent River, Webster Field Annex
MD	Navy	Naval Station Washington, Solomons Complex
MD	Navy	Naval Surface Warfare Center, Indian Head Division
MD	Navy	U.S. Naval Academy and Naval Complex Annapolis
MD	Navy	U.S. Naval Radio Receiving Station
MD	Navy	U.S. Naval Surface Weapons Center
ME	Navy	Brunswick Naval Air Station
ME	Navy	U.S. Naval Radio Station
ME	Navy	U.S. Naval Survival Escape and Evasion Training Facility
MS	Navy	Alpha Naval Auxiliary Air Station

State	Military Service	Installation Name
MS	Navy	Bravo Naval Auxiliary Air Station
MS	Navy	Multipurpose Target Range
MS	Navy	Naval Construction Batallion Center
NC	Navy	Oak Grove Holt Navy Airfield
NC-VA	Navy	Naval Facility Engineering Command
NJ	Navy	Earle Naval Weapons Station
NV	Navy	Fallon Naval Air Station
OH	Navy	Defense Construction Supply Center
PA	Navy	Mechanicsburg Naval Ship Parts Control Center
PA	Navy	Philadelphia Naval Base (Closed)
PA	Navy	U.S. Naval Air Development Center
PA	Navy	Willow Grove Naval Air Station
RI	Navy	Davisville Naval Construction Battalion Center (Closed)
RI	Navy	Newport Naval Educational and Training Center
SC	Navy	Charleston Naval Shipyard (Closed)
SC	Navy	Charleston Naval Shipyard East Cooper Spoil Area (Closed)
SC	Navy	Charleston Naval Weapons Station
SC	Navy	Charleston Naval Weapons Station South Annex
TN	Navy	Memphis Naval Air Station (Closed)
TX	Navy	Chase Field Naval Air Station (Closed)
TX	Navy	Dallas Naval Air Station (Closed)
TX	Navy	Kingsville Naval Air Station
VA	Navy	Craney Island Fuel Depot
VA	Navy	Dam Neck Naval Training Area
VA	Navy	Driver Naval Radio Transmitting Facility (Closed)
VA	Navy	Fentress Auxiliary Landing Field
VA	Navy	Little Creek Amphibious Base
VA	Navy	Naval Base Norfolk
VA	Navy	Norfolk Naval Shipyard
VA	Navy	Oceana Naval Air Station
VA	Navy	Saint Julian Creek Annex
VA	Navy	U.S. Naval Surface Weapons Center Dahlgren Lab
WA	Navy	Bangor Naval Submarine Base
WA	Navy	Bangor Undersea Warfare Engineering Station Annex
WA	Navy	Camp Wesley Harris Naval Reservation
WA	Navy	Naval Reservation
WA	Navy	Puget Sound Naval Shipyard Bremerton Annex
WA	Navy	Whidbey Island Naval Air Station
WV	Navy	Sugar Grove U.S. Naval Radio Station
WY	Navy	Naval Petroleum Reserve Number 3

8.7 DOD Installations with INRMP and without Species at Risk

A comparison of installation lists with Integrated Natural Resource Management Plans (INRMP) and those installations found on the USGS reference layer. Appendix 8.7a lists the installations with INRMP, but not found in the USGS reference layer. Appendix 8.7b lists installations found on both sources, but with no species at risk.

The information shown here is included in speadsheet format on CD-ROM (**DOD_SAR_Data: A7_install_not_analyzed_partial.xls**). A previous version of this information was presented in 5/02 deliverable as: **FINAL_inrmp_soc_compare.xls**.

(A) DOD installations with INRMP, but not found in the USGS reference layer.

State	Military Service	Base Name (INRMP)	Does Base Have Completed INRMP?	Date(s) of Completed INRMP
AK	AF	Eareckson Air Force Station/611 CES	Yes	1999
AK	AF	King Salmon Airport/611 CES	Yes	1999
AK	AF	N. Coastal Sites: Tin City, Kotzebue, Cape Lisburne/611 CES		
CA	AF	Onizuka Air Force Station	Yes	1998
CA	AF	Pillar Point Air Force Station	Yes	2001
CO	AF	Cheyenne Mountain Air Force Base		
CO	AF	Farish Memorial Air Force Base	Yes	2001
CO	AF	Schreiver Air Force Base	Yes	1997
FL	AF	Hurlburt Field	Yes	1996
HI	AF	Maui Space Surveillance Site		
MA	AF	Cape Cod Air Force Station	Yes	2000
MS	AF	Columbus Air Force Base	Yes	1995
MS	AF	Keesler Air Force Base	Yes	1995
NH	AF	New Boston Air Force Station	Yes	2000
NJ	AF	Warren Grove Range	Yes	2001
NM	AF	Kirtland Air Force Base	Yes	2001-2006
SC	AF	McEntire Air National Guard		
TN	AF	Arnold Air Force Base	Yes	1999
WA	AF	McChord Air Force Base		
WI	AF	Volk Field/Hardwood Range	Yes	2001
HI	Army	Dillingham Military Reservation/ Army Training Range	Yes	2001
HI	Army	Kahuku Training Area/ Army Training Range	Yes	2001
HI	Army	Kawailoa Training Area/ Army Training Range	Yes	2001
IN	Army	Kingsbury Local Training Area	Yes	2001
MD	Army	Adelphi Laboratory Center	Yes	1996
MD	Army	Raven Rock Site		
MD/DC	Army	Walter Reed	Yes	2001
MS	Army	Mississippi Army Ammo Plant	Yes	1999
OK	Army	McAlester Army Ammunition Plant	Yes	2000 (?) or 1999-2003
PA	Army	Keystone/ Geneva Local Training Area		
TN	Army	Holston Army Ammunition Plant	Yes	2001
AK	Army/NG	Stewart River Training Site - National Guard	Yes	2001
AZ	Army/NG	Camp Navajo - National Guard		

State	Military Service	Base Name (INRMP)	Does Base Have Completed INRMP?	Date(s) of Completed INRMP
CA	Army/NG	Camp San Luis Obispo - National Guard		
CT	Army/NG	Camp Hartell - National Guard		
CT	Army/NG	Camp Rowland - National Guard		
CT	Army/NG	East Haven Rifle Range - National Guard		
CT	Army/NG	Stones Ranch Military Reservation - National Guard		
DE	Army/NG	Bethany Beach Training Site - National Guard	Yes	2000
DE	Army/NG	New Castle Rifle Range - National Guard	Yes	2000
FL	Army/NG	Camp Blanding - National Guard	Yes	2001
HI	Army/NG	Keaukaha Military Reservation - National Guard	Yes	2001
HI	Army/NG	Kekaha Rifle Range - National Guard	Yes	2001
HI	Army/NG	Ukumehame Firing Range - National Guard	Yes	2001
ID	Army/NG	Orchard Training Area - (Idaho) Nat. Guard	Yes	1997
IL	Army/NG	Marseilles Training Area - National Guard	Yes	2001
KS	Army/NG	Smokey Hill Training Area (Salina) - National Guard [aka Kasas Regional Training Center?]		
KY	Army/NG	Artemus Training Site - National Guard	Yes	1997
KY	Army/NG	Eastern Kentucky Training Site - National Guard	Yes	1997
KY	Army/NG	Wendell Ford Training Site - National Guard	Yes	1997
LA	Army/NG	Camp Beauregard Training Site - National Guard		
LA	Army/NG	Camp Minden LAAP - National Guard	Yes	2001
LA	Army/NG	Camp Villere Training Site - National Guard		
MA	Army/NG	Camp Edwards - National Guard	Yes	2001
MD	Army/NG	Lil Aaron Straus Training Site (Baker) - National Guard	Yes	2001
ME	Army/NG	Bog Brook/Riley Training Site -National Guard		
ME	Army/NG	Caswell Training Site - National Guard		
MN	Army/NG	Camp Ripley - National Guard	Yes	2000
MN	Army/NG	Twin Cities Army Ammunition Plant (Arden) - National Guard	Yes	2001
MO	Army/NG	Camp Clark - National Guard	Yes	1997
MO	Army/NG	Camp Crowder - National Guard	Yes	1997
MO	Army/NG	Macon Training Site - National Guard	Yes	1997
MO	Army/NG	Truman Training Site - National Guard	Yes	1998
MO	Army/NG	Wappapello Training Site - National Guard	Yes	1997
MS	Army/NG	Camp McCain Training Site - National Guard		
MS	Army/NG	Camp Shelby Training Site - National Guard		
MT	Army/NG	Limestone Hills Training Area - National Guard	Yes	2001
NC	Army/NG	Camp Butner - National Guard		
ND	Army/NG	Camp Grafton - National Guard	Yes	2001
ND	Army/NG	Garrison Training Area - National Guard	Yes	2001
NE	Army/NG	Camp Ashland - National Guard		
NE	Army/NG	Hastings Training Site (Greenlief) - National Guard		
NM	Army/Ng	National Guard Training Sites (Camel Tracks, Carlsbad, Deming, and Roswell)	Yes	2002-2006
NV	Army/NG	Stead Training Site - National Guard	Yes	2001
NY	Army/NG	Camp Smith - National Guard		
NY	Army/NG	Guilderland Weekend Training Site - National Guard		
NY	Army/NG	Youngstown Training Site - National Guard		

State	Military Service	Base Name (INRMP)	Does Base Have Completed INRMP?	Date(s) of Completed INRMP
OK	Army/NG	Camp Gruber - National Guard	Yes	1997 (?) and 1999-2003
OR	Army/NG	Central Oregon Training Site (Biak TC) - National Guard	Yes	2001
RI	Army/NG	Camp Fogarty Training Site - National Guard		
SC	Army/NG	Clarks Hill Training Site - National Guard		
SC	Army/NG	Leesburg Training Site (McCrady TC) - National Guard		
SD	Army/NG	West Camp Rapid - National Guard		
TN	Army/NG	Catoosa Training Site - National Guard		
TN	Army/NG	Grubbs/Kyle Training Site - National Guard		
TN	Army/NG	Tullahoma Training Site - National Guard		
TN	Army/NG	Volunteer Training Site		
TX	Army/NG	Camp Bowie - National Guard	Yes	2001-2005
TX	Army/NG	Camp Maxey - National Guard	Yes	2001-2005
WI	Army/NG	Camp Wismer Training Site - National Guard	Yes	2001
WV	Army/NG	Camp Dawson - National Guard		
WY	Army/NG	Camp Guernsey - National Guard	Yes	2001
WY	Army/NG	Lander Training Site - National Guard	Yes	2001
WY	Army/NG	Lovell Training Site - National Guard	Yes	2001
WY	Army/NG	Sheridan Training Area - National Guard	Yes	2001
CA	MC	MCRD San Diego	Yes	1995 and 2001
FL	MC	MC Reserve Training Ctr Jacksonville		
GA	MC	MCLB Albany	Yes	2001
HI	MC	Marine Corps Base Hawaii	Yes	1997 and 2001
AZ	Navy	Naval Observatory Flagstaff	Yes	2001-2006
AZ / NM	Navy	NSSS Gila River/NSSS Elephant Butte	Yes	1998-2003
CA	Navy	NAVBASE Point Loma Complex (Includes NCCOSC, FCTC, FASWTC, FISC, NAVSTA-MSF, SUBASE, and SPAWAR		
CA	Navy	NPS Monterey	Yes	2001
CA	Navy	NRTF Dixon		
CA	Navy	NSC Fuel Depot, San Pedro	Yes	2001
CA	Navy	NSSS Brown Field (Chula Vista)	Yes	2001
FL	Navy	FISC Jacksonville		
HI	Navy	NAVMAG HQ Pearl Harbor includes: NAVMAG Lualualei Branch, NAVMAG West Lock Branch, NAVMAG Waikele Branch	Yes	2001
MD	Navy	Naval Surface Warfare Ctr, Carderock W. Bethesda	Yes	2001
ME	Navy	NSERE Rangeley		
MS	Navy	NAVSTA Pascagoula	Yes	2001
MS	Navy	NCBC Gulfport	Yes	2001
TX	Navy	Naval Air Station Joint Reserve Base Forth Worth	Yes	2002-2011 (?)
TX	Navy	Naval Station Ingleside	Yes	2001-2010 (?)

State	Military Service	Base Name (INRMP)	Does Base Have Completed INRMP?	Date(s) of Completed INRMP
WA	Navy	Naval Radion Station Jim Creek (Naval Antenna Field)	Yes	2001
WA	Navy	Naval Undersea Warfare Center (NUWC) Keyport	Yes	2001
PA	who?	Defense Distribution Ctr, New Cumberland		

(B) DOD installations with INRMP and found on the USGS reference layer, but with no species at risk.

State	Military Service	Base Name (INRMP)	Base Name (USGS)	Completed INRMP	Date(s) of Completed INRMP
AK	AF	Eielson Air Force Base	Eielson Air Force Base	Yes	1998
AK	AF	Elmendorf Air Force Base	Elmendorf Air Force Base	Yes	1998
AK	AF	Galena Airport/611 CES	Galena Air Force Base	Yes	1999
AK	AF	N. Warning LRRS: Pt Lay, Pt Barrow, Oliktok, Barter Island/611 CES	Point Lay Distant Early Warning Station, Barter Island Long Range Radar Site	Yes	1999
AL	AF	Maxwell Air Force Base	Maxwell Air Force Base	Yes	1994 and 2000 Draft
AR	AF	Little Rock Air Force Base	Little Rock Air Force Base	Yes	1998 and 2001
AZ	AF	Davis-Monthan Air Force Base	Davis-Monthan Air Force Base	Yes	1998-2003
CO	AF	Buckley Air Force Base	Buckley Air National Guard AF Base	Yes	2001
DC	AF	Bolling Air Force Base	Bolling Air Force Base	Yes	1997 and 2001
DE	AF	Dover Air Force Base	Dover Air Force Base	Yes	1997 and 2001
FL	AF	MacDill Air Force Base	MacDill Air Force Base	Yes	2000
GA	AF	Dobbins Air Reserve Base	Dobbins Air Force Base	Yes	2001
ID	AF	Mountain Home (Juniper Butte)	Mountain Home Air Force Base	Yes	1998
IL	AF	Scott Air Force Base	Scott Air Force Base	Yes	1996
KS	AF	McConnell Air Force Base	McConnell Air Force Base	Yes	1997 and 2001
KS	AF	Smoky Hill Range	Smoky Hill Air Force Range	Yes	2001
LA	AF	Barksdale Air Force Base	Barksdale Air Force Base	Yes	1998
MA	AF	Hanscom Air Force Base	Hanscom Air Force Base	Yes	1997 and 2001
MA	AF	Otis Air National Guard Base	Otis Air Force Base	Yes	2001
MA	AF	Westover Air Force Base	Westover Air Force Base	Yes	1998
MD	AF	Andrews Air Force Base	Andrews Air Force Base	Yes	1997
MI	AF	Selfridge Air National Guard Base	Selfridge Air Force Base	Yes	2001

State	Military Service	Base Name (INRMP)	Base Name (USGS)	Completed INRMP	Date(s) of Completed INRMP
MO	AF	Whiteman Air Force Base	Whiteman Air Force Base	Yes	1997 and 2001
MT	AF	Malmstrom Air Force Base	Malmstrom Air Force Base	Yes	1996
NC	AF	Seymour Johnson Air Force Base	Seymour Johnson Air Force Base	Yes	1998
ND	AF	Grand Forks Air Force Base	Grand Forks Air Force Base	Yes	1997 and 2001
ND	AF	Minot Air Force Base	Minot Air Force Base	Yes	1999 and 2001
NE	AF	Offutt Air Force Base	Offutt Air Force Base	Yes	1998
NM	AF	Cannon Air Force Base	Cannon Air Force Base	Yes	1997-2002
OH	AF	Wright-Patterson Air Force Base	Wright-Patterson Air Force Base	Yes	1996 and 2001
OK	AF	Tinker Air Force Base	Tinker Air Force Base	Yes	1999 and 2002-2006
OK	AF	Vance Air Force Base/ Kegelman Auxiliary Airfield	Vance Air Force Base	Yes	1998 and 2002-2006
SC	AF	Charleston Air Force Base	Charleston Air Force Base	Yes	1996
SD	AF	Ellsworth Air Force Base	Ellsworth Air Force Base	Yes	1997 and 2001
TX	AF	Brooks Air Force Base	Brooks Air Force Base	Yes	2001-2005
TX	AF	Dyess Air Force Base	Dyess Air Force Base	Yes	1997
TX	AF	Goodfellow Air Force Base	Goodfellow Air Force Base	Yes	1995 and 2002-2006
TX	AF	Lackland Air Force Base	Lackland Air Force Base	Yes	1997-2001
TX	AF	Randolf Air Force Base	Randolph Air Force Base	Yes	1998
TX	AF	Sheppard Air Force Base	Sheppard Air Force Base	Yes	2000
UT	AF	Hill Air Force Base and Utah Test & Trn. Range	Hill Air Force Base	Yes	2001
WA	AF	Fairchild Air Force Base	Fairchild Air Force Base	Yes	2000
WY	AF	F.E. Warren Air Force Base	Francis E. Warren Air Force Base	Yes	
AR	Army	Pine Bluff Arsenal	Pine Bluff Arsenal	Yes	1999
CO	Army	Pueblo Depot	Pueblo Chemical Depot (Closed)	Yes	2001
HI	Army	Schofield Barracks East Range	Schofield Barracks Military Reservation	Yes	2001
IA	Army	Iowa Army Ammunition Plant	Iowa Army Ammunition Plant	Yes	2001
IN	Army	Newport Chemical Activity	Newport Army Ammunition Plant	Yes	2001
KS	Army	Fort Leavenworth	Fort Leavenworth Military Reservation	Yes	2000
KS	Army	Fort Riley	Fort Riley Military Reservation	Yes	2001
KS	Army	Kansas Army Ammunition Plant (Parsons)	Kansas Army Ammunition Plant	Yes	2001
KS	Army	Sunflower Army Ammunition Plant	Sunflower Army Ammunition Plant	Yes	2001

State	Military Service	Base Name (INRMP)	Base Name (USGS)	Completed INRMP	Date(s) of Completed INRMP
KY	Army	Blue Grass Army Depot	Lexington-Blue Grass Army Depot (Closed)	Yes	1999
MA	Army	Devens Reserve Forces Training Area	Fort Devens (Closed)	Yes	1997
MD	Army	Aberdeen Proving Ground	Aberdeen Proving Ground Military Reservation	Yes	2001
MD	Army	Fort Detrick	U.S. Garrison, Fort Detrick	Yes	2001
MD	Army	Fort George G. Meade	Fort George G. Meade	Yes	1999
MO	Army	Lake City Army Ammunition Plant	Lake City Army Ammunition Plant	Yes	1998
NE	Army	Cornhusker Army Ammunition Plant	Cornhusker Army Ammunition Plant	Yes	2000
NE	Army	Mead Local Training Area (89 RSC)	Mead Army National Guard Facility	Yes	2000
NJ	Army	Fort Monmouth	Fort Monmouth Military Reservation	Yes	2000
NJ	Army	Picatinny Arsenal (ARDEC)	Picatinny Arsenal	Yes	1996
NY	Army	Fort Drum	Fort Drum	Yes	2001
NY	Army	West Point Military Reservation	West Point U.S. Military Academy	Yes	1998
OR	Army	Umatilla Depot Activity	Umatilla Chemical Depot (Closed)	Yes	2000
PA	Army	Letterkenny Army Depot	Letterkenny Army Depot	Yes	2001
PR	Army	Fort Buchanan	Fort Buchanan Military Reservation	Yes	2000
TN	Army	Milan Army Ammunition Plant	Milan Arsenal And Wildlife Management Area	Yes	1998
TX	Army	Red River Army Depot/ Lonestar Army Ammo Plant	Red River Army Depot	Yes	2000-2004
UT	Army	Tooele Army Depot	Tooele Army Depot	Yes	2001
VA	Army	Fort Lee	Fort Lee Military Reservation	Yes	1999
VA	Army	Fort Monroe	Fort Monroe Military Reservation	Yes	2001
WI	Army	Badger Army Ammunition Plant	Badger Army Ammunition Plant	Yes	1999
AR	Army/NG	Fort Chaffee - National Guard	Fort Chaffee (Closed)	Yes	2001
HI	Army/NG	Waiawa Gulch Training Site - National Guard	Waiawa Military Reservation	Yes	2001
IA	Army/NG	Camp Dodge - National Guard	Camp Dodge Military Reservation	Yes	2001
MI	Army/NG	Fort Custer - National Guard	Custer Reserve Forces Training Area	Yes	2001
MT	Army/NG	Fort (William) Harrison - National Guard	Fort William H. Harrison Military Reservation	Yes	2001
OR	Army/NG	Camp Rilea - National Guard	Camp Riley Military Reservation	Yes	2001
TX	Army/NG	Camp Swift - National Guard	Camp Swift N. G. Facility	Yes	2001-2005
TX	Army/NG	Fort Wolters - National Guard	Fort Wolters	Yes	2001-2005

State	Military Service	Base Name (INRMP)	Base Name (USGS)	Completed INRMP	Date(s) of Completed INRMP
CA	MC	MCAGCC Twentynine Palms	Twentynine Palms Marine Corps Base	Yes	1995
CA	MC	MCLB Barstow	Barstow Marine Corps Logistics Base	Yes	1993 and 2001
NC	MC	MCAS Cherry Point	Cherry Point Marine Corps Air Station	Yes	1995
SC	MC	MCAS Beaufort	Beaufort Marine Corps Air Station	Yes	1997 and 2001
SC	MC	MCRD Parris Island	Parris Island U.S. Marine Corps	Yes	1996 and 2001
VA	MC	Marine Corps Base Quantico	Quantico Marine Corps Base	Yes	1997 and 2001
CA	Navy	NAVSTA San Diego or Mainside Complex (Includes Naval Station and Mission Gorge Recreational Facility (also referred to as Admiral Baker Field))	San Diego Naval Station	Yes	2001
DC	Navy	NAVDIST Washington (including NAVOBS Washington, NAVRECCEN Solomons Island, NAVSTA Anacostia, NAVSTA Annapolis)	Naval Station Anacostia	Yes	2001
HI	Navy	NCTAMSPAC Wahiawa (one INRMP with NCTAMSPACC Lualualei below) Formerly NCTAMS Eastern Pacific	Wahiawa Naval Reservation	Yes	2001
HI	Navy	NCTAMSPACC Lualualei (one INRMP with NCTAMSPAC Wahiawa above) Formerly NCTAMS Eastern Pacific	Lualualei Naval Reservation	Yes	2001
IL	Navy	NTC Great Lakes	Great Lakes Naval Training Center	Yes	2001
IN	Navy	NSWC Crane	Crane Naval Weapons Support Center	Yes	2001
LA	Navy	NAS-JRB New Orleans	New Orleans Naval Air Station	Yes	2001
MD	Navy	Naval Surface Warfare Ctr, Indian Head Div	Naval Surface Warfare Center, Indian Head Division	Yes	2001
MD	Navy	U.S. Naval Academy (includes U.S. Dairy Farm and Naval Station Annapolis)	U.S. Naval Academy and Naval Complex Annapolis	Yes	2001
ME	Navy	NAS Brunswick	Brunswick Naval Air Station	Yes	2001
ME	Navy	Survival Evasion, Resistance, & Escape School	U.S. Naval Survival Escape and Evasion Training Facility	Yes	2001

State	Military Service	Base Name (INRMP)	Base Name (USGS)	Completed INRMP	Date(s) of Completed INRMP
PR	Navy	Naval Security Group Activity (NSGA) Sabana Seca	Sabana Seca U.S. Naval Radio Station	Yes	2001
TN	Navy	NSA Mid-South (formerly Memphis)	Memphis Naval Air Station (Closed)	Yes	2001
TX	Navy	Naval Air Station Kingsville	Kingsville Naval Air Station	Yes	2002-2006
VA	Navy	Naval Air Station Oceana	Oceana Naval Air Station	Yes	2001
VA	Navy	NSWC Dahlgren	U.S. Naval Surface Weapons Center Dahlgren Lab	Yes	2001
WA	Navy	Submarine Base Bangor	Bangor Naval Submarine Base	Yes	2001

8.8 DOD Species at Risk on Installation Buffer Zones

DOD installations with all occurrences of species at risk residing in buffer zone. Analysis does not include species at risk on installations in Massachusetts, Pennsylvania. In addition, species at risk in Fort Bliss/McGregor Range and White Sands Missile Range in New Mexico and Texas are not considered because precise location of species in these installations is not available.

The information shown here is included in speadsheet format on CD-ROM (**DOD_SAR_Data: A8_install_SAR_in_buffer.xls, tab "buffer EOs"**).

Military Service	State	FWS Region	Installation Name	Total # SAR EOs	# SAR EOs on installation	# SAR EOs in buffer	% SAR EOs in buffer
Air Force	HI	Region 1	Bellows Air Force Station	3	0	3	100%
Air Force	UT	Region 6	Deseret Test Center	2	0	2	100%
Air Force	HI	Region 1	Dillinghan Air Force Base	9	0	9	100%
Air Force	TX	Region 2	Ellington Air Force Base	1	0	1	100%
Air Force	CA	Region 1	George Air Force Base (Closed)	3	0	3	100%
Air Force	HI	Region 1	Hickam Air Force Base	1	0	1	100%
Air Force	VA	Region 5	Langley Air Force Base	1	0	1	100%
Air Force	WA	Region 1	McCord Air Force Base	1	0	1	100%
Air Force	CO	Region 6	NORAD COC Center	1	0	1	100%
Air Force	CO	Region 6	Peterson Air Force Base	1	0	1	100%
Air Force	CA	Region 1	Travis Air Force Base	8	0	8	100%
Air Force	CO	Region 6	U.S. Air Force Academy Farish Memorial Recreation Area	1	0	1	100%
Army	VA	Region 5	Arlington National Cemetery	1	0	1	100%
Army	MT	Region 6	Bearmouth National Guard Training Area	3	0	3	100%
Army	OR	Region 1	Camp Adair Military Reservation	1	0	1	100%
Army	AZ	Region 2	Florence Military Reservation	1	0	1	100%
Army	KY-TN	Region 4	Fort Campbell	2	0	2	100%
Army	KY	Region 4	Fort Knox	2	0	2	100%
Army	OK	Region 2	Fort Sill Military Reservation	2	0	2	100%
Army	VA	Region 5	Fort Story Military Reservation	1	0	1	100%
Army	IL	Region 3	Joliet Army Ammunition Plant	1	0	1	100%
Army	HI	Region 1	Kamehameha Military Reservation	1	0	1	100%
Army	IL	Region 3	Rock Island Arsenal	1	0	1	100%

Military Service	State	FWS Region	Installation Name	Total # SAR EOs	# SAR EOs on installation	# SAR EOs in buffer	% SAR EOs in buffer
Army	CA	Region 1	Sacramento Army Depot (Closed)	6	0	6	100%
Army	CA	Region 1	Sierra Army Depot	2	0	2	100%
Army	AZ	Region 2	Yuma Proving Ground	1	0	1	100%
Army Corps of Engineers	LA	Region 4	Bonnett Carre Spillway	1	0	1	100%
Army Corps of Engineers	AR-MO	Region 3 / Region 4	Bull Shoals Lake	2	0	2	100%
Army Corps of Engineers	OH	Region 3	Burr Oak Lake	1	0	1	100%
Army Corps of Engineers	TX	Region 2	Canyon Lake	1	0	1	100%
Army Corps of Engineers	OH	Region 3	Clarence J. Brown Reservoir	1	0	1	100%
Army Corps of Engineers	MO	Region 3	Clearwater Lake	1	0	1	100%
Army Corps of Engineers	OR	Region 1	Cottage Grove Lake	1	0	1	100%
Army Corps of Engineers	OR	Region 1	Dorena Lake	6	0	6	100%
Army Corps of Engineers	ID	Region 1	Dworshak Reservoir	1	0	1	100%
Army Corps of Engineers	OK	Region 2	Fort Gibson Lake	1	0	1	100%
Army Corps of Engineers	KY	Region 4	Grayson Lake	1	0	1	100%
Army Corps of Engineers	MO	Region 3	Harry S. Truman Reservoir	1	0	1	100%
Army Corps of Engineers	IN	Region 3	Huntington Lake	2	0	2	100%
Army Corps of Engineers	MN	Region 3	Lac qui Parle	11	0	11	100%
Army Corps of Engineers	AR	Region 4	Lake Greeson	2	0	2	100%

Military Service	State	FWS Region	Installation Name	Total # SAR EOs	# SAR EOs on installation	# SAR EOs in buffer	% SAR EOs in buffer
Army Corps of Engineers	MT	Region 6	Lake Koocanusa	1	0	1	100%
Army Corps of Engineers	VA	Region 5	Lake Moomaw	1	0	1	100%
Army Corps of Engineers	FL	Region 4	Lake Ocklawaha	2	0	2	100%
Army Corps of Engineers	AR	Region 4	Lake Ouachita	2	0	2	100%
Army Corps of Engineers	ID	Region 1	Lake Pend Oreille	2	0	2	100%
Army Corps of Engineers	GA	Region 4	Lake Sidney Lanier	2	0	2	100%
Army Corps of Engineers	MN	Region 3	Lake Traverse	4	0	4	100%
Army Corps of Engineers	OR-WA	Region 1	Lake Wallula	1	0	1	100%
Army Corps of Engineers	KY	Region 4	Laurel River Lake	4	0	4	100%
Army Corps of Engineers	OR	Region 1	Lookout Point Lake	1	0	1	100%
Army Corps of Engineers	MN	Region 3	Mash Lake	2	0	2	100%
Army Corps of Engineers	AR-MO	Region 4	Norfork Lake	2	0	2	100%
Army Corps of Engineers	CA	Region 1	Pine Flat Reservoir	1	0	1	100%
Army Corps of Engineers	KY	Region 4	Rough River Lake	1	0	1	100%
Army Corps of Engineers	TX	Region 2	Sam Rayburn Reservoir	4	0	4	100%
Army Corps of Engineers	TX	Region 2	Somerville Lake	4	0	4	100%
Army Corps of Engineers	CA	Region 1	Success Lake	3	0	3	100%

Military Service	State	FWS Region	Installation Name	Total # SAR EOs	# SAR EOs on installation	# SAR EOs in buffer	% SAR EOs in buffer
Army Corps of Engineers	AR-MO	Region 3	Table Rock Lake	1	0	1	100%
Army Corps of Engineers	OK	Region 2	Tenkiller Ferry Lake	1	0	1	100%
Marine Corps	NC	Region 4	Bogue Field	1	0	1	100%
Marine Corps	GA	Region 4	Townsend Range	1	0	1	100%
Navy	HI	Region 1	Barbers Point Naval Air Station (Closed)	2	0	2	100%
Navy	FL	Region 4	Harold Outlying Landing Field	2	0	2	100%
Navy	CA	Region 1	Imperial Beach Naval Air Station	3	0	3	100%
Navy	MS	Region 4	Meridian Naval Air Station	1	0	1	100%
Navy	FL	Region 4	Panama City Naval Coastal Systems Center	2	0	2	100%
Navy	CA	Region 1	Seal Beach Naval Weapons Station	3	0	3	100%
Navy	FL	Region 4	Stevens Lake Bombing Range	5	0	5	100%
Navy	VA	Region 5	U.S. Naval Supply Center	2	0	2	100%
Navy	VA	Region 5	U.S. Naval Supply Center Cheatham Annex	1	0	1	100%
Navy	VA	Region 5	U.S. Naval Weapons Station	1	0	1	100%

8.9 Management Guidance Template for Species at Risk on DOD Installations

This outline serves as a sample format. Tailor it for the target species at risk.

1. Species Identifiers

Scientific name:_____

Common name:_____

DOD Installation(s) where species occurs:

2. Contacts

DOD Contact (name, title, installation, address, phone, fax, e-mail):

FWS Contact (name, title, office, address, phone, fax, e-mail):

Natural Heritage Program Contact (name, title, office, address, phone, fax, e-mail):

Indicate which of the contacts above is the primary contact and management guidance author:

3. Species Range, Status, and Life History

Summarize the species status and historic and current range (include range maps, if available):

Federal status (candidate): Yes or No

If a current candidate, list the candidate priority number:

State status (if any):

Heritage status rank:
Global Rank:
State Rank(s):

Current population levels rangewide:

Current population levels on DOD lands. Include percentage of total population that is found on DOD installations. Also describe planning level survey information (dates, intensity, frequency):

Species Description and Life History:

4. Habitat Requirements

Summarize the species general habitat requirements:

Describe the habitat conditions on DOD lands that sustain permanent or seasonal use by the species:

5. Threats to the Species

Describe the major threats to the species rangewide:

How well understood are the threats to the species?

What are the specific threats to the species on DOD installations where it occurs?

6. Regional Conservation Actions

Describe surrounding lands (ownership, management, etc.) where species occurs outside of DOD installations:

Briefly describe any previous or current conservation efforts for this species on these surrounding lands:

Describe the conservation objective of this management guidance on surrounding lands:

How can land managers/owners address the threats to the species on surrounding lands where it occurs? Describe the specific actions needed to meet the conservation objective.

What other conservation actions will land managers/owners undertake to benefit this species?

7. DOD Conservation Actions

Briefly describe any previous or current conservation efforts for this species on DOD lands:

Describe the conservation objective of this management guidance on DOD lands:

How can DOD address the threats to the species on DOD installations where it occurs? Describe the specific actions needed to meet the conservation objective.

What other conservation actions will DOD undertake to benefit this species on DOD lands or elsewhere? Will DOD work with any partners in this effort? If so, list and describe partners.
(Recommended regional partners include FWS field office and state Natural Heritage Programs, and The Nature Conservancy.)

8. Measuring Effectiveness of Conservation Actions

Describe the expected benefits of these conservation actions to the species (e.g., increase in population numbers, restoration of habitat, removal of threat):

How can DOD measure the effectiveness of the conservation actions?

- describe parameters to be used to demonstrate achievement of objectives
- describe standards for the parameters by which progress can be measured

9. Adaptive Management and Monitoring

Outline adaptive management principles to be included in management guidance, if any:

Describe how the conservation actions above can be monitored over time to determine their effectiveness:

Describe survey and monitoring methods, including any recommended or agreed upon standards for this species:

If conservation measures for this species are likely to affect listed species or modify critical habitat, demonstrate that these measures will have a neutral or positive benefit and will not adversely affect listed species or critical habitat.

10. Species Research

Describe any on-going research programs or needs for this species:

11. Information Management

Describe provisions for managing information related to this species management, monitoring, and research, and how this information will be tracked over time to measure effectiveness of the conservation actions:

12. Feasibility and Timetable

What is the estimated cost for achieving the objectives stated above?
On DOD installation(s):
On surrounding lands where species occurs, if any:

Describe the level of staffing, expertise, funding, and other resources that will be needed to implement this management guidance.

- Department of Defense:
- Regional partners (FWS, Natural Heritage Programs, others):

What is the legal authority of DOD to implement the above-stated conservation actions on the relevant DOD installations?

What is the timetable for implementing the conservation actions? List dates for when specific conservation objectives will be met.

13.Contacts

14.Literature Cited

SEND COMMENTS ON THIS DRAFT TO:
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