

**DEPARTMENT OF THE INTERIOR****Fish and Wildlife Service****50 CFR Part 17**

[Docket No. FWS-R2-ES-2008-0130]  
[92210-1111-0000-B2]

**Endangered and Threatened Wildlife and Plants; Partial 90-Day Finding on a Petition to List 475 Species in the Southwestern United States as Threatened or Endangered with Critical Habitat**

**AGENCY:** Fish and Wildlife Service, Interior.

**ACTION:** Notice of 90-day petition finding.

**SUMMARY:** We, the U.S. Fish and Wildlife Service (Service), announce a 90-day finding on 192 species from a petition to list 475 species in the southwestern United States as threatened or endangered under the Endangered Species Act of 1973, as amended (Act). For 125 of the 192 species, we find that the petition did not present substantial information indicating that listing may be warranted. Based on our review, we find that the petition presents substantial scientific or commercial information indicating that listing may be warranted for 67 of the 192 species. Therefore, with the publication of this notice, we are initiating a status review of the 67 species to determine if listing is warranted. To ensure that the status review is comprehensive, we are requesting scientific and commercial data and other information regarding these 67 species. Based on the status review, we will issue a 12-month finding on the petition, which will address whether the petitioned action is warranted, as provided in the Act.

**DATES:** To allow us adequate time to conduct a status review, we request that we receive information on or before February 16, 2010. After this date, you must submit information directly to the Southwest Regional Ecological Services Office (see **FOR FURTHER INFORMATION CONTACT** section below). Please note that we may not be able to address or incorporate information that we receive after the above requested date.

**ADDRESSES:** You may submit information by one of the following methods:

- Federal rulemaking Portal: <http://www.regulations.gov>. Search for Docket no. FWS-R2-ES-2008-0130 and then follow the instructions for submitting comments.

- U.S. Mail or hand delivery: Public Comments Processing, Attn: FWS-R6-

ES-2008-0131; Division of Policy and Directives Management; U.S. Fish and Wildlife Service; 4401 N. Fairfax Drive, Suite 222; Arlington, VA 22203.

We will post all information received on <http://www.regulations.gov>. This generally means that we will post any personal information you provide us (see the **Request for Information** section below for more information).

**FOR FURTHER INFORMATION CONTACT:**

Nancy Gloman, Assistant Regional Director, Southwest Regional Ecological Services Office, 500 Gold Avenue SW, Albuquerque, NM 87102; telephone 505/248-6920; facsimile 505/248-6788.

If you use a telecommunications device for the deaf (TDD), please call the Federal Information Relay Service (FIRS) at 800-877-8339.

**SUPPLEMENTARY INFORMATION:****Request for Information**

When we make a finding that a petition presents substantial information indicating that listing a species may be warranted, we are required to promptly review the status of the species (status review). For the status review to be complete and based on the best available scientific and commercial information, we request information on each of the 67 species from governmental agencies, Native American Tribes, the scientific community, industry, and any other interested parties. For each of the 67 species, we seek information on:

- (1) The species' biology, range, and population trends, including:
  - (a) Habitat requirements for feeding, breeding, and sheltering;
  - (b) Genetics and taxonomy;
  - (c) Historical and current range including distribution patterns;
  - (d) Historical and current population levels, and current and projected trends; and
  - (e) Past and ongoing conservation measures for the species or its habitat.

- (2) The five factors that are the basis for making a listing determination for a species under section 4(a) of the Act (16 U.S.C. 1531 *et seq.*), which are:

- (a) The present or threatened destruction, modification, or curtailment of its habitat or range;
- (b) Overutilization for commercial, recreational, scientific, or educational purposes;
- (c) Disease or predation;
- (d) The inadequacy of existing regulatory mechanisms; or
- (e) Other natural or manmade factors affecting its continued existence.

Please include sufficient information with your submission (such as full references) to allow us to verify any

scientific or commercial information you include.

If, after the status review, we determine that listing any of the 67 species is warranted, we will propose critical habitat (see definition in section 3(5)(A) of the Act) to the maximum extent prudent and determinable at the time we propose to list the species. Therefore, within the geographical range currently occupied by each of these 67 species, we request data and information on:

- (1) what may constitute "physical or biological features essential to the conservation of the species";
- (2) where these features are currently found; and
- (3) whether any of these features may require special management considerations or protection.

In addition, we request data and information on "specific areas outside the geographical area occupied by the species" that are "essential to the conservation of the species." Please provide specific comments and information as to what, if any, critical habitat you think we should propose for designation if the species is proposed for listing, and why such habitat meets the requirements of section 3(5)(A) and section 4(b) of the Act.

Submissions merely stating support for or opposition to the action under consideration without providing supporting information, although noted, will not be considered in making a determination. Section 4(b)(1)(A) of the Act of 1973, as amended (Act) (16 U.S.C. 1533 (b)(1)(A)) directs that determinations as to whether any species is an endangered or threatened species must be made "solely on the basis of the best scientific and commercial data available."

You may submit your information concerning this status review by one of the methods listed in the **ADDRESSES** section. If you submit information via <http://www.regulations.gov>, your entire submission—including any personal identifying information—will be posted on the website. If you submit a hardcopy that includes personal identifying information, you may request at the top of your document that we withhold this information from public review. However, we cannot guarantee that we will be able to do so. We will post all hardcopy submissions on <http://www.regulations.gov>.

Information and supporting documentation that we received and used in preparing this finding will be available for you to review at <http://www.regulations.gov>, or you may make an appointment during normal business hours at the U.S. Fish and Wildlife

Service, Southwest Regional Ecological Services Office (see **FOR FURTHER INFORMATION CONTACT**).

### Background

Section 4(b)(3)(A) of the Act requires that we make a finding on whether a petition to list, delist, or reclassify a species presents substantial scientific or commercial information indicating that a petitioned action may be warranted. We are to base this finding on information provided in the petition, supporting information submitted with the petition, and information otherwise readily available in our files. To the maximum extent practicable, we are to make this finding within 90 days of our receipt of the petition and publish our notice of this finding promptly in the **Federal Register**.

Our standard for substantial information within the Code of Federal Regulations (CFR) with regard to a 90-day petition finding is “that amount of information that would lead a reasonable person to believe that the measure proposed in the petition may be warranted (50 CFR 424.14(b)).” If we find that substantial scientific or commercial information was presented, we are required to promptly commence a status review of the species, which is subsequently summarized in our 12-month finding.

### Petition History

On June 25, 2007, we received a formal petition dated June 18, 2007, from Forest Guardians (now WildEarth Guardians), requesting that we, the U.S. Fish and Wildlife Service (Service), do the following (1) Consider all full species in our Southwest Region ranked as G1 or G1G2 by the organization NatureServe, except those that are currently listed, as proposed for listing, or candidates for listing; and (2) list each species under the Act as either endangered or threatened with critical habitat. The petitioner incorporated all analyses, references, and documentation provided by NatureServe in its online database at <http://www.natureserve.org/> into the petition. The petition clearly identified itself as a petition and included the appropriate identification information, as required in 50 CFR 424.14(a). We sent a letter to the petitioner dated July 11, 2007, acknowledging receipt of the petition and stating that the petition was under review by staff in our Southwest Regional Office.

We received an additional petition on October 15, 2008, from WildEarth Guardians, dated October 9, 2008, requesting that we list *Pediomelum pentaphyllum* (Chihuahua scurfpea) as

threatened or endangered, and that we designate critical habitat concurrently with the listing. The petition clearly identified itself as a petition and included the information required in 50 CFR 424.14(a). We acknowledged receipt of the petition in a letter dated November 26, 2008. *Pediomelum pentaphyllum* was also included in the June 18, 2007, petition. This finding will evaluate information in both petitions concerning *P. pentaphyllum*.

On March 19, 2008, WildEarth Guardians filed a complaint indicating that the Service failed to comply with its mandatory duty to make a preliminary 90-day finding on the June 18, 2007, petition to list 475 southwest species. We subsequently published an initial 90-day finding for 270 of the 475 petitioned species on January 6, 2009, concluding that the petition did not present substantial information that listing of those species may be warranted (74 FR 419). On March 13, 2009, the Service and WildEarth Guardians filed a stipulated settlement agreement, agreeing that the Service would submit to the **Federal Register** a finding as to whether WildEarth Guardians' petition presents substantial information indicating that the petitioned action may be warranted for the remaining southwestern species by December 9, 2009. This finding, together with the 90-day finding on petitions to list nine Texas mussels (completed separately, and submitted to the **Federal Register** also on December 9, 2009), meets that portion of the settlement.

The 2007 petition included a list of 475 species. One species, Salina mucket (*Potamilus metnecktayi*), is also known by the scientific name *Disconaias salinasensis*; we were petitioned to list the species under both scientific names. The species files in NatureServe for these two names are identical. For the remainder of our review we used the name *P. metnecktayi*; therefore, we reviewed only 474 actual species files.

Because the petition requested that we consider all species from the list that were not currently listed, proposed for listing, or candidates for listing, an additional 5 of the 474 petitioned species were not included in the review because these species are either currently listed or are candidates for listing. Quitobaquito pupfish (*Cyprinodon eremus*) is currently listed as endangered under the name desert pupfish (*Cyprinodon macularius eremus*). In Arizona, this family was historically represented by two recognized subspecies, *C. m. macularius* and *C. m. eremus*, and an undescribed species, the Monkey Spring pupfish. Minckley *et al.* (2002, p. 701) raised *C.*

*m. eremus* to a full species, *C. eremus*. The species is listed as endangered throughout its range, so we did not consider it as part of this petition.

Ramsey Canyon leopard frog (*Rana subaquavocalis*) is no longer recognized as a distinct species (Crother 2008, p. 7). Rather, it is considered to be synonymous with the Chiricahua leopard frog (*Lithobates [=Rana] chiricahuensis*). The Chiricahua leopard frog is listed as threatened throughout its range, and any populations formerly known as Ramsey Canyon leopard frog are thus now listed as threatened.

On December 13, 2007, we made a 12-month finding that the Jollyville Plateau salamander (*Eurycea tonkawae*) warrants listing, but that listing is precluded by higher listing priorities (72 FR 71040), thus rendering the species to candidate status. Similarly, on December 6, 2007, we published our annual review of native species that are candidates for listing as endangered or threatened (72 FR 69034), in which we made the San Bernardino springsnail (*Pyrgulopsis bernardina*) a candidate species. Finally, on December 10, 2008, we made *Sphaeralcea gierischii* (Gierisch mallow) a candidate species in the annual review of candidate species (73 FR 75175). Because these five entities—Quitobaquito pupfish, Ramsey Canyon leopard frog, Jollyville Plateau salamander, San Bernardino springsnail, and *Sphaeralcea gierischii*—are currently listed or are candidates for listing, and we were petitioned to list species that are not listed or candidates, they were not evaluated as part of this petition.

*Agave arizonica* (Arizona agave) was recently delisted (71 FR 35195; June 19, 2006) because it was determined to be a product of hybridization and therefore not a listable entity. No new information was presented in the petition for *A. arizonica* beyond that reviewed in the June 19, 2006, delisting rule (71 FR 35195), thus *A. arizonica* was not evaluated as part of the petition. After eliminating review of Quitobaquito pupfish, Ramsey Canyon leopard frog, Jollyville Plateau salamander, San Bernardino springsnail, *Sphaeralcea gierischii*, and *A. arizonica*, there were 468 species files to continue with our review in the NatureServe database.

A total of 277 of the petitioned species were or will be addressed in other findings. As discussed above, 270 species were addressed in our January 6, 2009, finding (74 FR 419). Three additional species—*Camissoria exilis* (Cottonwood Spring suncup), *Cryptantha semiglabra* (Pipe Springs crypantha), and *Lesquerella navajoensis* (Navajo bladderpod)—were addressed

in a separate 90-day finding on a petition to list 206 species in the Midwest and western United States (August 18, 2009; 74 FR 41649). Four additional species which were not addressed in an earlier finding and are not included in this finding—golden orb (*Quadrula aurea*), Texas fatmucket (*Lampsilis bracteata*), Texas heelsplitter (*Potamilus amphichaenus*), and Salina mucket (*Potamilus metnecktayi*)—will be addressed in one or more additional 90-day findings in the future. Although we are not making a finding on the remaining four species at this time, the lack of inclusion of those species in this finding does not imply that we are making or will make a positive finding on any or all of the remaining species.

Finally, based on a review of our January 6, 2009, 90-day finding (74 FR 419), we are re-evaluating the information presented in the petition and readily available in our files regarding *Donrichardia macroneuron* in this finding. Thus, this finding addresses 192 of the 475 petitioned southwest species.

### Species Information

The petitioners presented two tables that collectively listed the 475 species for consideration and requested that the Service incorporate all analyses, references, and documentation provided by NatureServe in its online database into the petition. The information presented by NatureServe (<http://www.natureserve.org/explorer/>) is considered to be a reputable source of information on taxonomy and distribution. However, NatureServe indicates on its website that information in the database is not intended for determining whether species are warranted for listing under the Act, and we found that the information presented was limited in its usefulness for this process. The threat information presented by NatureServe in many cases is minimal. NatureServe was limited in usefulness when the information presented did not identify one or more threats, did not link the threats to the species or the habitats occupied by the species, or did not reasonably indicate how the threats may impact the species' status.

We accessed the NatureServe database on July 5, 2007. We saved electronic and hard-copies of each species file and used this information, including references cited within these files, during our review. Therefore, all information we used from the species files in NatureServe was current to that date. All of the petitioned species were ranked by NatureServe as G1 (critically

imperiled) or G1G2 (between critically imperiled and imperiled).

We followed regulations at 50 CFR 424.14(b) in evaluating the information presented in the petition. 50 CFR 424.14(b)(1) provides that the Service must consider whether the petition has presented substantial information indicating to a reasonable person that the petitioned action may be warranted. 50 CFR 424.14(b)(2) requires that the petition provide a narrative justification describing past and present numbers and distribution, and any threats faced by the species. The petition is also required to provide appropriate supporting documentation—references, publications, reports, or letters from authorities, and maps.

We reviewed all references cited in the NatureServe database species files that were available to us. For some species in NatureServe, there is a “Local Programs” link to the websites of the State programs that contribute information to NatureServe. Where information was available from these State programs specific to the species in question, we accepted the assertions and opinions of the State programs for the purposes of this 90-day finding, because these programs have primary management responsibility for non-federally listed species. These State programs' websites were accessed after 2007 when we downloaded the species files from NatureServe. We also reviewed information in references cited in NatureServe that were available on the Internet and in local libraries, and other information readily available in our files directly relevant to the information raised in the petition.

Following review of the available information, we separated the 192 remaining species reviewed in this finding into categories based on the level of information found. The first category, titled Category A in Table 1, has only minimal information about each species, and in some cases no more information than the name of the species. Category A contains 45 species. An example of a species in this category that had minimal information is a caddisfly with no common name, *Hydroptila protera*. The NatureServe file for this species names the species and states that it occurs in undetermined sites in Oklahoma and Texas. The file provides two references. The first, Blickle (1979), contains no information on threats to the species, but provides illustrations of various species within the same genus and in others. The second, Clemson University Department of Entomology (2002), provides only taxonomic information for the species. The magnitude and type of information

provided for other species in this category was similar in nature, or was largely taxonomic with little location information.

Occasionally, generic information was presented in the NatureServe species files for species we placed in Category A, such as for the class or family the species belongs to, but not specific information on the individual species. The references were taxonomic in nature or simply checklists (lists of species, for example Common and Scientific Names of Fishes from the United States and Canada (Robins *et al.* 1991)) or taxonomic keys (which provide anatomical characteristics for identification of species) and did not address threats to the species. An example that illustrates the type of generic information that was presented for such species in Category A is Guadalupe woodlandsnail (*Ashmunella carlsbadensis*). The NatureServe file for this species states the name of the species and lists two references. The first is an annotated checklist of New Mexico land snails (Metcalf and Smartt 1988). The second is a checklist of names of aquatic invertebrates from the United States and Canada (Turgeon *et al.* 1998). The file contains no other information specific to the Guadalupe woodlandsnail. The file does describe the basic biology of terrestrial snails (pulmonates) in general stating “terrestrial gastropods do not move much usually only to find food or reproduce” and “as a whole, pulmonates (previously Subclass Pulmonata) are better dispersers than prosobranchs (previously Subclass Prosobranchia) possibly due to their hermaphroditic reproduction increasing the chance of new colonization.” Identical language was used in other NatureServe files for terrestrial snail species, and no specific information was provided about the species or threats to the species or its habitat.

The information we reviewed for the species in Category B contained basic information on the range of the species based on some level of survey effort. Habitat type was frequently mentioned as well as other aspects of the species' biology, such as food habitats. Population size or abundance, if addressed, was rarely quantified, and NatureServe (2007) instead used descriptors such as large, small, or numerous. The available information we reviewed did not address specific threats to the species. Category B contains 29 species.

An example of the type of information we found for species in Category B is illustrated by *Opuntia aureispina* (golden-spined prickly-pear). The

NatureServe file for *O. aureispina* provides two references. The first describes the physical characteristics of cacti of Big Bend National Park (Heil and Brack 1988). The second is a checklist of the vascular flora of the United States, Canada, and Greenland

(Kartesz 1994). Neither article addresses threats to *O. aureispina*. The NatureServe file for this species states that the species is known from one small area of Big Bend National Park in Brewster County, Texas, and that it inhabits limestone slabs and fractured

limestone rocks in shrublands in low elevations near the Rio Grande. The NatureServe file for this species does not address threats or the global protection status for this species. This information is typical for the species in Category B.

TABLE 1. SPECIES FOR WHICH THREAT INFORMATION WAS NOT PROVIDED IN THE PETITION OR READILY AVAILABLE IN OUR FILES.

Category	Scientific Name	Common Name	Range	Group
A	<i>Ashmunella carlsbadensis</i>	Guadalupe Woodlandsnail	NM, TX	Snail
A	<i>Holospira yucatanensis</i>	Bartsch Holospira	TX	Snail
A	<i>Humboldtiana edithae</i>	Boulder Slide Threeband	TX	Snail
A	<i>Pseudosubulina cheatumi</i>	Chisos Foxsnail	TX	Snail
A	<i>Marstonia comalensis</i>	Comal Siltsnail	TX	Snail
A	<i>Radiocentrum ferrissi</i>	Fringed Mountainsnail	NM	Snail
A	<i>Euglandina texasiana</i>	Glossy Wolfsnail	TX	Snail
A	<i>Holospira hamiltoni</i>	Hamilton Holospira	TX	Snail
A	<i>Daedalochila hippocrepis</i>	Horseshoe Liptooth	TX	Snail
A	<i>Holospira oritis</i>	Mountain Holospira	TX	Snail
A	<i>Holospira pityis</i>	Pinecone Holospira	TX	Snail
A	<i>Holospira riograndensis</i>	Rio Grande Holospira	TX	Snail
A	<i>Holospira pasonis</i>	Robust Holospira	TX	Snail
A	<i>Helicodiscus nummus</i>	Wax Coil	AR, OK, TX	Snail
A	<i>Holospira mesolia</i>	Widemouth Holospira	TX	Snail
A	<i>Microdynerus arenicolus</i>	Antioch Potter Wasp	AZ,CA,NV	Insect
A	<i>Hydroptila protera</i>	Caddisfly	OK, TX	Insect
A	<i>Ptomaphagus cocytus</i>	Cave Obligate Beetle	AZ	Insect
A	<i>Oncopodura prietoi</i>	Cave Obligate Springtail	NM	Insect
A	<i>Pseudosinella vita</i>	Cave Obligate Springtail	NM	Insect
A	<i>Tomocerus grahami</i>	Cave Obligate Springtail	NM	Insect
A	<i>Afilia sp. 1</i>	Notodontid Moth	TX	Insect
A	<i>Hydroptila ouachita</i>	Purse Casemaker Caddisfly	LA, TX	Insect
A	<i>Melanoplus sp. 9</i>	Grasshopper	TX	Insect
A	<i>Melanoplus sp. 22</i>	Grasshopper	TX	Insect
A	<i>Melanoplus sp. 26</i>	Grasshopper	TX	Insect
A	<i>Melanoplus sp. 36</i>	Grasshopper	TX	Insect
A	<i>Melanoplus sp. 48</i>	Grasshopper	NM	Insect
A	<i>Melanoplus sp. 52</i>	Grasshopper	AZ	Insect
A	<i>Melanoplus sp. 62</i>	Grasshopper	TX	Insect
A	<i>Ceuthothrombium cavaticum</i>	Cave Obligate Mite	NM	Arachnid
A	<i>Albiorix anophthalmus</i>	Cave Obligate Pseudoscorpion	AZ	Arachnid

TABLE 1. SPECIES FOR WHICH THREAT INFORMATION WAS NOT PROVIDED IN THE PETITION OR READILY AVAILABLE IN OUR FILES.—Continued

Category	Scientific Name	Common Name	Range	Group
A	<i>Aphrastochthonius pachysetus</i>	Cave Obligate Pseudoscorpion	NM	Arachnid
A	<i>Chitrellina chiricahuae</i>	Cave Obligate Pseudoscorpion	AZ	Arachnid
A	<i>Neoleptoneta anopica</i>	Cave Obligate Spider	TX	Arachnid
A	<i>Procambarus texanus</i>	Bastrop Crayfish	TX	Crustacean
A	<i>Holsingerius samacos</i>	Cave Obligate Amphipod	TX	Crustacean
A	<i>Texiweckelia relictia</i>	Cave Obligate Amphipod	TX	Crustacean
A	<i>Palaemonetes holthuisi</i>	Cave Obligate Decapod	TX	Crustacean
A	<i>Amergoniscus centralis</i>	Cave Obligate Isopod	OK	Crustacean
A	<i>Amergoniscus gipsocolus</i>	Cave Obligate Isopod	TX	Crustacean
A	<i>Sphaeromicola moria</i>	Cave Obligate Shrimp	TX	Crustacean
A	<i>Fryxellia pygmaea</i>	Fryxell's Pygmy Mallow	TX	Flowering Plant
A	<i>Quercus acerifolia</i>	Mapleleaf Oak	AR, OK	Flowering Plant
A	<i>Xanthoparmelia planilobata</i>	Lichen (no common name)	NM	Lichen
B	<i>Eurycea sp. 6</i>	Pedernales River Springs Salamander	TX	Amphibian
B	<i>Sonorella papagorum</i>	Black Mountain Talussnail	AZ, NM	Snail
B	<i>Sonorella christenseni</i>	Clark Peak Talussnail	AZ, NM	Snail
B	<i>Sonorella huecoensis</i>	Hueco Mountains Talus Snail	TX	Snail
B	<i>Sonorella sp. 1</i>	Terrestrial Snail	NM	Snail
B	<i>Limnephilus adapus</i>	Caddisfly	TX	Insect
B	<i>Comaldessus stygius</i>	Comal Springs Diving Beetle	TX	Insect
B	<i>Protoptila arca</i>	San Marcos Saddle-case Caddisfly	TX	Insect
B	<i>Sphinx smithi</i>	Sphinx Moth (no common name)	AZ, Mexico	Insect
B	<i>Stygobromus limbus</i>	Border Cave Amphipod	TX	Crustacean
B	<i>Procambarus brazoriensis</i>	Brazoria Crayfish	TX	Crustacean
B	<i>Paramexiweckelia ruffoi</i>	Ruffo's Cave Amphipod	TX	Crustacean
B	<i>Adenophyllum wrightii</i>	Wright's Dogweed	AZ, NM	Flowering Plant
B	<i>Berberis harrisoniana</i>	Kofka Barberry	AZ, CA	Flowering Plant
B	<i>Carex mckittrickensis</i>	Guadalupe Mountain Sedge	TX	Flowering Plant
B	<i>Cooperia smallii</i>	Small's Rainlily	TX	Flowering Plant
B	<i>Hedyotis pooleana</i>	Jackie's Bluet	TX	Flowering Plant
B	<i>Echeandia texensis</i>	Craglily (no common name)	TX	Flowering Plant
B	<i>Opuntia aureispina</i>	Golden-spined Prickly-pear	TX	Flowering Plant
B	<i>Opuntia densispina</i>	Big Bend Prickly-pear	TX	Flowering Plant
B	<i>Perityle cochisensis</i>	Cochise Rockdaisy	AZ	Flowering Plant
B	<i>Quercus boytonii</i>	Boynton's Sand Post Oak	AL, TX	Flowering Plant
B	<i>Quercus tardifolia</i>	Chisos Mountains Oak	TX	Flowering Plant

TABLE 1. SPECIES FOR WHICH THREAT INFORMATION WAS NOT PROVIDED IN THE PETITION OR READILY AVAILABLE IN OUR FILES.—Continued

Category	Scientific Name	Common Name	Range	Group
B	<i>Quercus robusta</i>	Robust Oak	TX	Flowering Plant
B	<i>Selinocarpus maloneanus</i>	Malone Mountains Moonpod	TX	Flowering Plant
B	<i>Senna ripleyana</i>	Ripley's Senna	TX	Flowering Plant
B	<i>Solanum leptosepalum</i>	Tigna Potato	TX	Flowering Plant
B	<i>Stellaria porsildii</i>	Porsild's Starwort	AZ, NM	Flowering Plant
B	<i>Yucca necopina</i>	Brazos River Yucca	TX	Flowering Plant

The information we reviewed for the remaining 118 species included some discussion of one or more potential threats. Each of these species, which are listed in Tables 2 and 3 below, is discussed more thoroughly in the “**Five-Factor Evaluation**” section below.

TABLE 2. SPECIES FOR WHICH THREAT INFORMATION WAS PRESENTED, BUT FOR WHICH THE INFORMATION PRESENTED IN THE PETITION AND OTHERWISE READILY AVAILABLE WAS NOT SUBSTANTIAL.

Scientific Name	Common Name	Range	Group
<i>Geomys streckeri</i>	Strecker's Pocket Gopher	TX	Mammal
<i>Ashmunella mearnsii</i>	Big Hatchet Woodlandsnail	NM	Snail
<i>Pyrgulopsis simplex</i>	Fossil Springsnail	AZ	Snail
<i>Ashmunella hebardii</i>	Hacheta Grande Woodlandsnail	NM	Snail
<i>Sonorella pedregosensis</i>	Leslie Canyon Talussnail	AZ	Snail
<i>Pyrgulopsis davisii</i>	Limpia Creek Springsnail	TX	Snail
<i>Pyrgulopsis montezumensis</i>	Montezuma Well Springsnail	AZ	Snail
<i>Pyrgulopsis metcalfei</i>	Naegele Springsnail	TX	Snail
<i>Ashmunella kochi</i>	San Andreas Woodlandsnail	NM	Snail
<i>Adhemarius blanchardorum</i>	Blanchard's Sphinx Moth	TX	Insect
<i>Phylocentropus harrisi</i>	Caddisfly (no common name)	AL, FL, TX	Insect
<i>Apodemia chisosensis</i>	Chisos Metalmark	TX	Insect
<i>Stallingsia maculosus</i>	Manfreda Giant-skipper	TX, Mexico	Insect
<i>Lachlania dencyannae</i>	Mayfly (no common name)	NM	Insect
<i>Euhyparpax rosea</i>	Notodontid Moth (no common name)	CO, NM	Insect
<i>Ursia sp. 1</i>	Notodontid Moth (no common name)	TX	Insect
<i>Cylloepus parkeri</i>	Parker's Cylloepus Riffle Beetle	AZ	Insect
<i>Automeris patagoniensis</i>	Patagonia Eyed Silkmoth	AZ	Insect
<i>Sphingicampa raspa</i>	Royal Moth (no common name)	AZ, TX	Insect
<i>Sphinx eremitoides</i>	Sage Sphinx	CO, KA, NM, TX	Insect
<i>Thymoites minero</i>	Cave Obligate Spider (no common name)	AZ	Arachnid
<i>Procambarus nigrocinctus</i>	Blackbelted Crayfish	TX	Crustacean
<i>Procambarus nechesae</i>	Neches Crayfish	TX	Crustacean
<i>Streptocephalus moorei</i>	Spinythumb Fairy Shrimp	NM, Mexico	Crustacean

TABLE 2. SPECIES FOR WHICH THREAT INFORMATION WAS PRESENTED, BUT FOR WHICH THE INFORMATION PRESENTED IN THE PETITION AND OTHERWISE READILY AVAILABLE WAS NOT SUBSTANTIAL.—Continued

Scientific Name	Common Name	Range	Group
<i>Arenaria livermorensis</i>	Livermore Sandwort	TX	Flowering Plant
<i>Argemone arizonica</i>	Arizona Prickle-poppy	AZ	Flowering Plant
<i>Batesimalva violacea</i>	Purple Gay-mallow	TX, Mexico	Flowering Plant
<i>Bonamia ovalifolia</i>	Bigpod Bonamia	TX, Mexico	Flowering Plant
<i>Bouteloua kayi</i>	Kay Gramma	TX	Flowering Plant
<i>Cryptantha ganderi</i>	Gander's Cryptantha	AZ, CA, Mexico	Flowering Plant
<i>Dalea bartonii</i>	Cox's Dalea	TX	Flowering Plant
<i>Dalea tentaculoides</i>	Gentry's Indigobush	AZ	Flowering Plant
<i>Eleocharis cylindrica</i>	Cylinder Spikerush	NM, TX	Flowering Plant
<i>Erigeron acomanus</i>	Acoma Fleabane	NM	Flowering Plant
<i>Erigeron bistiensis</i>	Bisti Fleabane	NM	Flowering Plant
<i>Escobaria guadalupensis</i>	Guadalupe Pincushion Cactus	NM, TX	Flowering Plant
<i>Euphorbia aaron-rossii</i>	Marble Canyon Spurge	AZ	Flowering Plant
<i>Glossopetalon texense</i>	Texas Grease Bush	TX	Flowering Plant
<i>Kallstroemia perennans</i>	Perennial Caltrop	TX	Flowering Plant
<i>Pediomelum humile</i>	Rydberg's Scurfpea	TX, Mexico	Flowering Plant
<i>Perityle huecoensis</i>	Hueco Mountains Rockdaisy	TX, Mexico	Flowering Plant
<i>Perityle saxicola</i>	Fish Creek Rock Daisy	AZ	Flowering Plant
<i>Perityle warnockii</i>	River Rockdaisy	TX	Flowering Plant
<i>Quercus graciliformis</i>	Slender Oak	TX, Mexico	Flowering Plant
<i>Rhododon angulatus</i>	Lonestar Sand-mint	TX	Flowering Plant
<i>Sophora gypsophila</i>	Gypsum Necklace	NM, TX	Flowering Plant
<i>Valerianella nuttallii</i>	Nuttall's Corn-salad	AR, OK	Flowering Plant
<i>Grimmia americana</i>	Moss (no common name)	AZ, NV, TX	Fern Ally
<i>Riccia californica</i>	Moss (no common name)	CA, OR, TX	Fern Ally
<i>Acarospora clauzadeana</i>	Lichen (no common name)	NM, Mexico, Spain	Lichen
<i>Omphalora arizonica</i>	Lichen (no common name)	AZ, CO, NM	Lichen

TABLE 3. SPECIES FOR WHICH INFORMATION IN THE PETITION AND OTHERWISE READILY AVAILABLE IS SUBSTANTIAL AND INDICATES THAT LISTING AS THREATENED OR ENDANGERED MAY BE WARRANTED.

Scientific name	Common Name	Range	Group
<i>Aspidoscelis arizonae</i>	Arizona Striped Whiptail	AZ	Reptile
<i>Notophthalmus meridionalis</i>	Black-spotted Newt	TX, Mexico	Amphibian
<i>Eurycea robusta</i>	Blanco Blind Salamander	TX	Amphibian
<i>Eurycea tridentifera</i>	Comal Blind Salamander	TX	Amphibian
<i>Eurycea sp. 8</i>	Comal Springs Salamander	TX	Amphibian
<i>Eurycea neotenes</i>	Texas Salamander	TX	Amphibian

TABLE 3. SPECIES FOR WHICH INFORMATION IN THE PETITION AND OTHERWISE READILY AVAILABLE IS SUBSTANTIAL AND INDICATES THAT LISTING AS THREATENED OR ENDANGERED MAY BE WARRANTED.—Continued

Scientific name	Common Name	Range	Group
<i>Macrhybopsis tetranema</i>	Arkansas River Speckled Chub	CO, KA, NM, OK, TX	Fish
<i>Ictalurus sp. 1</i>	Chihuahua Catfish	TX	Fish
<i>Cyprinella sp. 2</i>	Nueces Shiner	TX	Fish
<i>Cyprinodon pecosensis</i>	Pecos pupfish	NM, TX	Fish
<i>Cyprinella lepida</i>	Plateau Shiner	TX	Fish
<i>Gambusia clarkhubbsi</i>	San Felipe Gambusia	TX	Fish
<i>Trogloglanis pattersoni</i>	Toothless Blindcat	TX	Fish
<i>Cyprinodon tularosa</i>	White Sands Pupfish	NM	Fish
<i>Satan eurystomus</i>	Widemouth Blindcat	TX	Fish
<i>Pleurobema riddellii</i>	Louisiana Pigtoe	LA, TX	Clam
<i>Pisidium sanguinichristi</i>	Sangre de Cristo Peaclam	NM	Clam
<i>Toxolasma corvunculus</i>	Southern Purple Lilliput	AL, FL, GA, OK	Clam
<i>Fusconaia lananensis</i>	Triangle Pigtoe	TX	Clam
<i>Pyrgulopsis arizonae</i>	Bylas Springsnail	AZ	Snail
<i>Ashmunella macromphala</i>	Cook's Peak Woodlandsnail	NM	Snail
<i>Sonorella todseni</i>	Dona Ana Talussnail	NM	Snail
<i>Tryonia gilae</i>	Gila Tryonia	AZ	Snail
<i>Pyrgulopsis bacchus</i>	Grand Wash Springsnail	AZ	Snail
<i>Ashmunella levettei</i>	Huachuca Woodlandsnail	AZ, NM	Snail
<i>Pyrgulopsis conica</i>	Kingman Springsnail	AZ	Snail
<i>Phreatodrobia imitata</i>	Mimic Cavesnail	TX	Snail
<i>Oreohelix pilsbryi</i>	Mineral Creek Mountainsnail	NM	Snail
<i>Pyrgulopsis pecosensis</i>	Pecos Springsnail	NM	Snail
<i>Sonorella grahamensis</i>	Pinaleno Talussnail	AZ	Snail
<i>Tryonia quitobaquitae</i>	Quitobaquito Tryonia	AZ	Snail
<i>Sonorella eremite</i>	San Xavier Talussnail	AZ	Snail
<i>Maricopella allynsmithi</i>	Squaw Park Talussnail	AZ	Snail
<i>Pyrgulopsis glandulosa</i>	Verde Rim Springsnail	AZ	Snail
<i>Sonorella macrophallus</i>	Wet Canyon Talussnail	AZ	Snail
<i>Cicindela theatina</i>	Colorado Tiger Beetle	CO	Insect
<i>Haideoporus texanus</i>	Edwards Aquifer Diving Beetle	TX	Insect
<i>Lycaena ferrisi</i>	Ferris's Copper	AZ	Insect
<i>Astylis sp. 1</i>	Notodontid Moth (no common name)	AZ	Insect
<i>Heterocampa sp. 1 nr. amanda</i>	Notodontid Moth (no common name)	AZ	Insect
<i>Litodonta sp. 1 nr. alpina</i>	Notodontid Moth (no common name)	AZ	Insect
<i>Ursia furtiva</i>	Notodontid Moth (no common name)	TX	Insect



TABLE 3. SPECIES FOR WHICH INFORMATION IN THE PETITION AND OTHERWISE READILY AVAILABLE IS SUBSTANTIAL AND INDICATES THAT LISTING AS THREATENED OR ENDANGERED MAY BE WARRANTED.—Continued

Scientific name	Common Name	Range	Group
<i>Papaipema eryngii</i>	Rattlesnake-master Borer Moth	AR, IL, IN, IA, KY, MO, NC, OK	Insect
<i>Sphingicampa blanchardi</i>	Royal Moth (no common name)	TX, Mexico	Insect
<i>Argia sabino</i>	Sabino Dancer	AZ	Insect
<i>Anacroneuria wipukupa</i>	Stonefly (no common name)	AZ, Mexico	Insect
<i>Agapema galbina</i>	Tamaulipan Agapema	AZ, TX, Mexico	Insect
<i>Archeolarca cavicola</i>	Grand Canyon Cave Scorpion	AZ	Arachnid
<i>Cambarus subterraneus</i>	Delaware County Cave Crayfish	OK	Crustacean
<i>Orconectes saxatilis</i>	Kiamichi Crayfish	OK	Crustacean
<i>Cambarus tartarus</i>	Oklahoma Cave Crayfish	OK	Crustacean
<i>Lirceolus smithii</i>	Texas Troglotic Water Slater	TX	Crustacean
<i>Agalinis navasotensis</i>	Navasota False Foxglove	TX	Flowering Plant
<i>Amoreuxia gonzalezii</i>	Santa Rita Yellowshow	AZ, Mexico	Flowering Plant
<i>Amsonia tharpia</i>	Tharp's Blue-star	NM, TX	Flowering Plant
<i>Asclepias prostrata</i>	Prostrate Milkweed	TX, Mexico	Flowering Plant
<i>Astragalus hypoxylus</i>	Huachuca Milk-vetch	AZ, Mexico	Flowering Plant
<i>Castilleja ornata</i>	Glowing Indian-paintbrush	NM, Mexico	Flowering Plant
<i>Erigeron piscaticus</i>	Fish Creek Fleabane	AZ	Flowering Plant
<i>Eriogonum mortonianum</i>	Morton's Wild Buckwheat	AZ	Flowering Plant
<i>Genistidium dumosum</i>	Brush-pea	TX, Mexico	Flowering Plant
<i>Hexalectris revolute</i>	Chisos Coralroot	AZ, TX, Mexico	Flowering Plant
<i>Lesquerella kaibabensis</i>	Kaibab Bladderpod	AZ	Flowering Plant
<i>Paronychia congesta</i>	Bushy Whitlow-wort	TX	Flowering Plant
<i>Pediomelum pentaphyllum</i>	Chihuahua Scurfpea	AZ, NM, TX, Mexico	Flowering Plant
<i>Salvia pentstemonoides</i>	Big Red Sage	TX	Flowering Plant
<i>Donrichardsonia macroneuron</i>	Moss (no common name)	TX	Fern Ally

### Evaluation of Information for this Finding

Section 4 of the Act (16 U.S.C. 1533) and its implementing regulations at 50 CFR 424 set forth the procedures for adding a species to, or removing a species from, the Federal Lists of Endangered and Threatened Wildlife and Plants. A species may be determined to be an endangered or threatened species due to one or more of the five factors described in section 4(a)(1) of the Act: (A) the present or threatened destruction, modification, or curtailment of its habitat or range; (B) overutilization for commercial, recreational, scientific, or educational purposes; (C) disease or predation; (D)

the inadequacy of existing regulatory mechanisms; or (E) other natural or manmade factors affecting its continued existence.

In making this 90-day finding, we evaluated whether information regarding threats to each of the 192 species, as presented in the petition and other information in our files, is substantial, thereby indicating that the petitioned action may be warranted. Our evaluation is presented below. For each species, we fully evaluated all information available to us through the NatureServe website, information cited in NatureServe available on the Internet or in local libraries, and other

information readily available in our files.

### Species Placed in Categories A and B for Which Substantial Information Was Not Presented

Factor A, The present or threatened destruction, modification, or curtailment of a species' habitat or range: For each of the species we placed in Categories A and B (Table 1 above), no information was presented on threats specific to the species or their habitats; therefore, we find the petition, including all available references and the NatureServe species files, does not present substantial information that the present or threatened destruction,

modification, or curtailment of habitat or range is a threat to any of the 74 species in Categories A and B (Table 1).

Factor B, Overutilization of species for commercial, recreational, scientific, or educational purposes: For each of the species we placed in Categories A and B (Table 1, above), no information was presented on threats to the species or their habitats; therefore we find the petition, including all available references and the NatureServe species files, does not present substantial information that overutilization for commercial, recreational, scientific, or educational purposes is a threat to any of the 74 species in Categories A and B (Table 1).

Factor C, Disease or predation: For those species we placed in Categories A and B (Table 1, above), no information was presented on threats specific to the species or their habitats; therefore we find the petition, including all available references and the NatureServe species files, does not present substantial information that disease or predation is a threat to any of the 74 species in Categories A and B (Table 1).

Factor D, Inadequacy of existing regulatory mechanisms: For those species we placed in Categories A and B (Table 1, above), no information was presented on threats specific to the species or their habitats; therefore we find the petition, including all available references and the NatureServe species files, does not present substantial information that the inadequacy of existing regulatory mechanisms is a threat to any of the 74 species in Categories A and B (Table 1).

Factor E, Other natural or manmade factors affecting species' continued existence: For those species we placed in Categories A and B (Table 1, above), no information was presented on threats specific to the species or their habitats; therefore we find the petition, including all available references and the NatureServe species files, does not present substantial information that other natural or manmade factors affecting the species' continued existence are threats to any of the 74 species in Categories A and B (Table 1).

Based on our evaluation of the information provided in the petition, we have determined that the petition does not present substantial information to indicate that listing the 74 species in Categories A and B may be warranted.

### Species for Which Threat Information Was Presented, But For Which Substantial Information Was Not Presented

#### Mammals

##### Strecker's Pocket Gopher (*Geomys streckeri*)

Strecker's pocket gopher is known from two localities in Dimmit and Zavala Counties, Texas (NatureServe 2007). No further information regarding the historical or current distribution or status of the species was presented.

Factors A, B, C, and D: No information was presented in the petition concerning threats to this species from these factors.

Factor E: NatureServe (2007) identifies rarity as a threat to Strecker's pocket gopher. In the absence of information identifying other threats to the species and linking those to the rarity of the species, we do not consider rarity to be a threat.

Based on our evaluation of the information provided in the petition, we have determined that the petition does not present substantial information to indicate that listing the Strecker's pocket gopher may be warranted.

#### Snails

##### Big Hatchet Woodlandsnail (*Ashmunella mearnsii*)

The Big Hatchet woodlandsnail is known to occur on talus slopes (rock piles formed at the base of cliffs) in the mountains of eastern Hidalgo County in southwestern New Mexico (Metcalf and Smartt 1997). Recently, the species was collected from isolated populations within the range of the Big Hatchet Mountains at Zeller Peak, Mescal Canyon, Chaney Canyon (also called Chainey Canyon), Big Hatchet Peak, and Thompson Canyon (Lang 2005). The species likely formerly occupied the Little Hatchet Mountains and Howells Ridge to the northwest of the Big Hatchet Mountains as indicated by the presence of fossils in those areas (Lang 2005).

Factor A: A prescribed burn of 4,856 hectares (ha) (12,000 acres (ac)) was planned for late spring to early summer of 2005 to control woody plant overgrowth in the north-central range of the Big Hatchet Mountains. Such a fire could threaten the persistence of isolated populations of the Big Hatchet woodlandsnail (Lang 2005). In addition, since the species inhabits talus slopes, which are sparsely vegetated and probably unlikely to have much fuel load, it is likely that the species and its habitat have withstood previous wildfires or prescribed burns in the

past. No information was provided on whether the burn occurred, or how the species may have responded to it. We have determined that this information does not meet the substantial information standard.

Factors B, C, and D: No information was presented in the petition concerning threats to this species from these factors.

Factor E: The Big Hatchet woodlandsnail and Hacheta Grande woodlandsnail (*Ashmunella hebardei*) co-occur and hybridize in a narrow and abrupt zone of contact of approximately 0.259 square kilometers (km) (0.1 square miles (mi)) in southwestern Chaney Canyon (Lang 2005). However, the area where hybrids occur is small relative to the size of the area occupied by the Big Hatchet woodlandsnail (Lang 2005). No information was presented indicating that this narrow zone of hybridization is resulting in impacts to the species. We have determined that this information does not meet the substantial information standard.

Based on our evaluation of the information provided in the petition, we have determined that the petition does not present substantial information to indicate that listing the Big Hatchet woodlandsnail may be warranted.

##### Fossil Springsnail (*Pyrgulopsis simplex*)

The fossil springsnail is found at a spring near Strawberry, Gila County, and Fossil Springs, Yavapai County, Arizona (AGFD 2003) in the lower Verde River watershed (NatureServe 2007). Individuals of the species are typically found in the headsprings and upper sections of the outflow. They are gill breathers and, therefore, require perennially flowing water (AGFD 2003). Springsnails in the genus *Pyrgulopsis* are generally found on rock or aquatic plants in moderate current. The occupied springs are on the Coconino and Tonto National Forests. The fossil springsnail was formerly a candidate 2 species, a taxon for which information in our possession indicated that proposing to list was possibly appropriate, but for which persuasive data on biological vulnerability and threat were not available to support a proposed listing rule. This species has had no Federal Endangered Species Act status since the practice of maintaining a list of candidate 2 species was discontinued in 1996.

Factor A: According to AGFD (2003), the fossil springsnail is threatened by water development activities and deterioration or disappearance of its habitat; however, they also note that the fossil springsnail has experienced no apparent reduction in range or

abundance as a result of activities in the Fossil Creek watershed during the past two decades. Further, AGFD (2003) does not describe the nature or cause of the deterioration or disappearance of fossil springsnail habitats. We have determined that this information does not meet the substantial information standard.

Factors B and C: No information was presented in the petition concerning threats to this species from these factors.

Factor D: According to AGFD (2003), Fossil Springs was designated a Botanical Area by the Coconino National Forest, an action designed to provide increased protection and restoration of the area. Public access to Fossil Springs is limited to foot travel; however, the other spring in the watershed containing the Fossil springsnail is provided no special protection.

Factor E: No information was presented in the petition concerning threats to this species from this factor.

Based on our evaluation of the information provided in the petition, we have determined that the petition does not present substantial information to indicate that listing the fossil springsnail may be warranted.

#### Hacheta Grande Woodlandsnail (*Ashmunella hebardii*)

The Hacheta Grande woodlandsnail is known from one population in Chaney Canyon (also referred to as Chainey Canyon) in the Big Hatchet Mountains, Hidalgo County, New Mexico (NatureServe 2007). The species has been collected from elevations of 1,935 to 2,234 meters (m) (6350 to 7330 feet (ft)) on the south side of Chaney Canyon west of Big Hatchet Peak (Metcalf and Smartt 1997; Lang 2005). Hacheta Grande woodlandsnails most commonly occur at the base of limestone outcrops beneath large rock fragments and rock rubble piles where mold grows on leaf litter mixed with soil (Lang 2005) in an area of tall pinyon pines (Metcalf and Smartt 1997). The historic range of the species is unknown; however, at all sites sampled by Lang (2005) where the species was found, live individuals or shells of recently dead individuals were found, suggesting that the historic and current range may be the same.

Factor A: According to NatureServe (2007), Chaney Canyon is remote and inaccessible, and does not appear to be valuable as a recreational site. The area has been explored for minerals, but the absence of mining in this mountain and those nearby suggests that mining is not a threat (NatureServe 2007). The mountain is grazed by livestock, but the snail inhabits rocky areas that lack

forage and are not generally accessed by livestock (NatureServe 2007). A prescribed burn of 4,856 ha (12,000 ac) was planned for late spring to early summer of 2005 to control woody plant overgrowth in that area of the Big Hatchet Mountains. Such a fire could threaten the persistence of isolated populations of the Hacheta Grande woodlandsnail (Lang 2005) or cause the extirpation of the species (NatureServe 2007); however, no information was provided on whether the burn occurred or how the species may have responded to it. In addition, since the species inhabits rock outcrops, which are sparsely vegetated and probably unlikely to have much fuel load, it is likely that the species and its habitat have withstood previous wildfires or prescribed burns in the past. We do not consider the assertions by Lang (2005) or NatureServe (2007) to meet the substantial information standard. NatureServe (2007) asserts that while range contraction due to climate change in the past ten thousand years has not been documented for this species, it has been documented for many similar species and may be a concern for the Hacheta Grande woodlandsnail. However, this is an assertion, and NatureServe (2007) did not provide references or discussion to support it, and there is no evidence of range contraction despite efforts of researchers to document it (Metcalf and Smartt 1997; Lang 2005). We have determined that this information does not meet the substantial information standard.

Factors B, C, and D: No information was presented in the petition concerning threats to this species from these factors.

Factor E: The Big Hatchet woodlandsnail and Hacheta Grande woodlandsnail co-occur and hybridize in a narrow and abrupt zone of contact of approximately 0.259 square km (0.1 square mi) in southwestern Chaney Canyon (Lang 2005). However, the area where hybrids occur is small relative to the size of the area occupied by the Hacheta Grande woodlandsnail (Lang 2005), and there is no evidence the area of hybridization has increased between the time of the Metcalf and Smartt surveys (1997) and those of Lang (2005). No information was presented indicating that this narrow zone of hybridization is resulting in impacts to the species. We have determined that this information does not meet the substantial information standard. NatureServe (2007) identifies restricted geographic range as a potential threat to the species. In the absence of additional information identifying other threats to the species and linking those threats to

the geographic range of the species, we do not consider restricted geographic range to be a threat.

Based on our evaluation of the information provided in the petition, we have determined that the petition does not present substantial information to indicate that listing the Hacheta Grande woodlandsnail may be warranted.

#### Leslie Canyon Talussnail (*Sonorella pedregosensis*)

The Leslie Canyon talussnail is known to occur in Leslie Canyon National Wildlife Refuge (a unit of the San Bernardino National Wildlife Refuge complex), north of Douglas in the Pedregosa Mountains, Cochise County, Arizona (Gilbertson and Radke 2006). No further information regarding the historical or current distribution or status of the species was presented.

Factors A and B: No information was presented in the petition concerning threats to this species from these factors.

Factor C: According to NatureServe (2007), at the time of initial collection of specimens of this species, Gilbertson and Radke (2006) observed a desert box turtle (*Terrapene ornate luteola*) actively preying on snails in the refuge following an overnight rainstorm when snails became most active. An examination of the box turtle's feces found shell fragments of the snail; however, there is no indication that this level of predation may constitute a species-level threat. We have determined that this information does not meet the substantial information standard.

Factors D and E: No information was presented in the petition concerning threats to this species from these factors.

Based on our evaluation of the information provided in the petition, we have determined that the petition does not present substantial information to indicate that listing of the Leslie Canyon talussnail may be warranted.

#### Limpia Creek Springsnail (*Pyrgulopsis davisii*)

The Limpia Creek springsnail is found in and on mud and rocks among patches of *Nasturtium officinale* (watercress) in spring-fed rivulets within a tributary of Limpia Creek, Pecos River drainage, Jeff Davis County, Texas (NatureServe 2007). The species is a gill breather and, therefore, requires perennially flowing water. Based on specimens collected in 1914, there may be an additional locality; however, the location of the possible second site is uncertain (NatureServe 2007). It is reported as abundant at the single known occurrence, but quantitative population estimates are not provided (NatureServe

2007). Since only one occurrence is known with certainty and the only known occurrence is small, occupying a very restricted habitat, abundance may be considered very low relative to most other organisms (NatureServe 2007).

Factor A: NatureServe (2007) indicates probable threats include trampling and other degradation of the aquatic site by livestock, and the potential for diversion or other flow alteration; however, no information is presented indicating that these activities are occurring or are likely to occur in the future in occupied habitats. We have determined that this information does not meet the substantial information standard.

Factor B, C, D, and E: No information was presented in the petition concerning threats to this species from these factors.

Based on our evaluation of the information provided in the petition, we have determined that the petition does not present substantial information to indicate that listing the Limpia Creek springsnail may be warranted.

#### Montezuma Well Springsnail (*Pyrgulopsis montezumensis*)

The Montezuma Well springsnail is known to occur in Montezuma Well, a unit of Montezuma Castle National Monument, in Yavapai County, Arizona (NatureServe 2007). No further information regarding the historical or current distribution or status of the species was presented.

Factors A, B, C, and D: No information was presented in the petition concerning threats to this species from these factors.

Factor E: The Arizona Game and Fish Department (AGFD 1998) identifies restricted geographic distribution as a threat to the Montezuma Well springsnail. In the absence of additional information identifying other threats to the species and linking one or more of those threats to the species, we do not consider a restricted geographic range to be a threat.

Based on our evaluation of the information provided in the petition, we have determined that the petition does not present substantial information to indicate that listing the Montezuma Well springsnail may be warranted.

#### Naegele Springsnail (*Pyrgulopsis metcalfi*)

The Naegele springsnail is found in the outflows of Naegele Springs (Rio Grande River basin), Presidio County, western Texas. Fossils from two localities in the Pecos River valley in New Mexico and Texas may also be Naegele springsnails (Taylor 1987). It is

reported to be common at the single known occurrence, but quantitative population estimates are not provided (NatureServe 2007). Since only one occurrence is known with certainty and the only known occurrence is small, occupying restricted habitat, abundance may be considered very low relative to most other organisms (NatureServe 2007).

Factor A: NatureServe (2007) indicates probable threats include trampling and other degradation of the aquatic site by livestock, and the potential for alteration of the sole aquatic site of occurrence; however, no information is presented indicating that these activities are occurring or are likely to occur in the future in occupied habitats. We have determined that this information does not meet the substantial information standard.

Factor B, C, D, and E: No information was presented in the petition concerning threats to this species from these factors.

Based on our evaluation of the information provided in the petition, we have determined that the petition does not present substantial information to indicate that listing the Naegele springsnail may be warranted.

#### San Andreas Woodlandsnail (*Ashmunella kochii*)

The San Andreas woodlandsnail is known to occur in the San Andres Mountains, Dona Ana County, New Mexico, and the Caballo Mountains to the west of the San Andres Mountains in Sierra County (Metcalf and Smartt 1997; Sullivan 1997). It primarily occurs in rock seams in steep canyons and cliffs associated with moderately moist vegetation and abundant shade (NatureServe 2007).

Factor A: According to Sullivan (1997), a road may be built to the peak of Quartzite Mountain in a portion of the San Andres Mountains, which would destroy some of the habitat of the species. No information was provided on whether the road has been constructed or if it may be constructed at some point in the future. The portion of the species' habitat that would be impacted by such a road appears small relative to the range of the species. We have determined that this information does not meet the substantial information standard.

Factors B, C, D, and E: No information was presented in the petition concerning threats to this species from these factors.

Based on our evaluation of the information provided in the petition, we have determined that the petition does not present substantial information to

indicate that listing the San Andreas woodlandsnail may be warranted.

#### Insects

##### Blanchard's Sphinx Moth (*Adhemarius blanchardorum*)

Blanchard's sphinx moth is known to occur in the Chisos Mountains in Brewster County, Texas (NatureServe 2007). Almost all known specimens are from Panther Pass and adjacent Green Gulch in Big Bend National Park. The species' range may extend south into the Sierra Madre Orientale of Mexico; however, no occurrences south of the U.S. border are documented (NatureServe 2007). No further information regarding the historical or current distribution or status of the species was presented.

Factors A, B, C, and D: No information was presented in the petition concerning threats to this species from these factors.

Factor E: NatureServe (2007) identifies rarity as a threat to Blanchard's sphinx moth. In the absence of information identifying other threats to the species and linking those threats to the rarity of the species, we do not consider rarity to be a threat.

Based on our evaluation of the information provided in the petition, we have determined that the petition does not present substantial information to indicate that listing Blanchard's sphinx moth may be warranted.

##### Caddisfly (no common name) (*Phylocentropus harrisi*)

NatureServe (2007) cites Morse *et al.* (1997) and personal communications with J. Morse in 2000 and 2004 in stating that the caddisfly is known to occur in the Southern Appalachian States and Texas. No further information regarding the historical or current distribution or status of the species was presented.

Factor A: Morse *et al.* (1997) identify multiple historical and potential current threats to the mayflies, dragonflies, damselflies, stoneflies, and caddisflies of the southeastern United States including agriculture, dams, deforestation, acid precipitation, sedimentation, and residential development. However, the discussions in Morse *et al.* (1997) are general in nature and do not identify which activities are currently impacting any species in particular nor do they identify which threats may be occurring in which habitats. We have determined that this information does not meet the substantial information standard.

Factors B, C, D, and E: No information was presented in the petition

concerning threats to this species from these factors.

Based on our evaluation of the information provided in the petition, we have determined that the petition does not present substantial information to indicate that listing the caddisfly may be warranted.

Chisos Metalmark (*Apodemia chisosensis*)

The Chisos metalmark is a butterfly known to occur in Texas (NatureServe 2007). No further information regarding the historical or current distribution or status of the species was presented.

Factors A, B, C, and D: No information was presented in the petition concerning threats to this species from these factors.

Factor E: NatureServe (2007) identifies rarity as a threat to the Chisos metalmark. In the absence of information identifying other threats to the species and linking those threats to the rarity of the species, we do not consider rarity to be a threat.

Based on our evaluation of the information provided in the petition, we have determined that the petition does not present substantial information to indicate that listing Chisos metalmark may be warranted.

Manfreda Giant-skipper (*Stallingsia maculosus*)

The Manfreda giant-skipper is a butterfly known to occur in San Patricio, Bexar, and Kinney Counties, Texas, and possibly in Nuevo Leon, Mexico (NatureServe 2007).

NatureServe (2007) states that the species is currently declining, and projects that the global long-term trend of the species will be one of large to substantial decline (50 percent to 90 percent).

Factor A: NatureServe (2007) identifies development as a threat to the Manfreda giant-skipper, and asserts that some of the few known sites have been destroyed. However, no specific information on where the development may be threatening the species now or in the future was provided. The three counties where it has been documented are not close to one another; therefore, we do not assume that if development is occurring at one occupied site, it also occurs at other sites. NatureServe (2004) also notes that the species' host plant may be in competition with invasive grasses such as Guinea grass (*Panicum maximum*), but does not indicate whether *P. maximum* occurs within the range of the Manfreda giant-skipper or is likely to in the future. We have determined that this information does not meet the substantial information

standard, particularly in light of the wide dispersion of the counties where the species has been documented.

Factors B, C, D, and E: No information was presented in the petition concerning threats to this species from these factors.

Based on our evaluation of the information provided in the petition, we have determined that the petition does not present substantial information to indicate that listing the Manfreda giant-skipper may be warranted.

Mayfly (no common name) (*Lachlania dencyanana*)

This mayfly is confined to the Gila River drainage system in New Mexico. According to NatureServe (2007), larvae have been found clinging to woody debris and vegetation caught in the crevices of rocks near the East Fork of the Gila River at its junction with the Gila River (McCafferty *et al.* 1997).

Factor A: According to NatureServe (2007), the Gila River drainage, the only known drainage inhabited by the species, is subjected to on-going degradation, primarily associated with grazing. However, NatureServe (2007) does not explain the type of grazing or its impact to the species or the portion of the Gila River occupied by the species where grazing threatens it. We have determined that this information does not meet the substantial information standard.

Factors B, C, and D: No information was presented in the petition concerning threats to this species from these factors.

Factor E: NatureServe (2007) cites McCafferty *et al.* (1997) indicating that the species appears to be truly rare and restricted to the Gila River drainage. In the absence of additional information identifying other threats to the species and linking one or more of those threats to the species, we do not consider rarity to be a threat.

Based on our evaluation of the information provided in the petition, we have determined that the petition does not present substantial information to indicate that listing the Mayfly may be warranted.

Notodontid Moth (no common name) (*Euhyparpax rosea*)

This notodontid moth is known to occur in Custer County in south-central Colorado, and several hundred miles (several hundred kilometers) away, near Silver City, Grant County in southwestern New Mexico, and in Arizona (AGFD 2005; NatureServe 2007). Described in the 1800s, the species has been found in one or two locations in the last 40 or 50 years

(NatureServe 2007). AGFD (2005) indicates that further study is needed to determine the moth's life history, population status, and population range.

Factors A, B, C, and D: No information was presented in the petition concerning threats to this species from these factors.

Factor E: NatureServe (2007) identifies its restricted range at each of the three known sites as a threat to this notodontid moth. Restricted geographic range may exacerbate the impacts to the species of potential threats through chance events such as fire, invasion of exotic weeds, or inadvertent management actions (NatureServe 2007). However, in the absence of information identifying chance events or other threats to the species and linking those threats to the restricted range of the species, or the potential for such chance events to occur in the occupied habitats, we do not consider chance events or restricted geographic range to be threats to the species. This is especially true in light of its apparent widely dispersed distribution, which suggests that a chance event occurring in one State is unlikely to be occurring in another State.

Based on our evaluation of the information provided in the petition, we have determined that the petition does not present substantial information to indicate that listing the notodontid moth may be warranted.

Notodontid Moth (no common name) (*Ursia* sp. 1)

This Notodontid moth is known to occur in Cameron and San Patricio Counties, along the coast of south Texas (NatureServe 2007).

Factors A, B, C, and D: No information was presented in the petition concerning threats to this species from these factors.

Factor E: NatureServe (2007) identifies its restricted geographic range as a threat to this notodontid moth. Restricted geographic range may exacerbate the impacts to the species of potential threats through chance events such as fire or inadvertent management actions (NatureServe 2007). However, in the absence of information identifying chance events or other threats to the species and linking those threats to the restricted range of the species, or the potential for such chance events to occur in the occupied habitats, we do not consider chance events or restricted geographic range to be threats to the species. Additionally, the two counties where this species is known to occur are widely spaced from one another, with four counties between them; thus, it is unlikely the same chance event would

occur at both sites in the same timeframe.

Based on our evaluation of the information provided in the petition, we have determined that the petition does not present substantial information to indicate that listing the Notodontid moth may be warranted.

#### Parker's Cylloepus Riffle Beetle (*Cylloepus parkeri*)

The Parker's cylloepus riffle beetle is known to occur in Roundtree Canyon in Bloody Basin within the Tonto National Forest, Yavapai County, Arizona (AGFD 2003). Johnson (1992) states that it also occurs in Tangle Creek, also located in Bloody Basin. The habitat is described as permanent, clean, slow-moving small streams, with loose gravelly substrate and very little sand. The species likely hides under rocks and may occur in spring brooks as well as creeks (AGFD 2003).

Factor A: According to AGFD (2003), the riffle beetle requires water that is high in oxygen content. This factor greatly restricts the species' distribution and results in high sensitivity to pollutants. AGFD (2003) indicates that activities such as mining, stream channelization, and heavy grazing would deplete the oxygen content of its habitat and almost certainly be detrimental to this beetle; however, they do not indicate whether these activities are occurring or are likely to occur in habitats occupied by the species.

Factor B, C, D, and E: No information was presented in the petition concerning threats to this species from these factors.

Based on our evaluation of the information provided in the petition, we have determined that the petition does not present substantial information to indicate that listing Parker's cylloepus riffle beetle may be warranted.

#### Patagonia Eyed Silkmoth (*Automeris patagoniensis*)

The Patagonia eyed silkmoth is known to occur at Harshaw Creek in the Patagonia Mountains in Santa Cruz County and in the Huachuca Mountains in Cochise County, Arizona (NatureServe 2007). No further information regarding the historical or current distribution or status of the species was presented.

Factor A: NatureServe (2007) identifies potential replacement of host plant grasses by invasive weeds to be a threat to the moth. However, NatureServe (2007) does not indicate whether invasive weeds currently occur or are likely to occur in known habitat of the moth. Additionally, the known moth sites are in two mountain ranges

several miles (several kilometers) apart and thus would not likely be impacted simultaneously by invasive weeds. We have determined that this information does not meet the substantial information standard.

Factors B, C, D, and E: No information was presented in the petition concerning threats to this species from these factors.

Based on our evaluation of the information provided in the petition, we have determined that the petition does not present substantial information to indicate that listing the Patagonia eyed silkmoth may be warranted.

#### Royal Moth (no common name) (*Sphingicampa raspa*)

This royal moth is known to occur in southeastern Arizona and Big Bend, Texas. On August 3, 2004, the species was photographed in Copper Canyon, Cochise County, Arizona, where 20 or more individuals were observed (AGFD 2005; NatureServe 2007). No further information regarding the historical or current distribution or status of the species was presented.

Factor A: The AGFD (2005) and NatureServe (2007) identify the lack of targeted management of habitat and fire as threats to the royal moth and its habitat. However, neither source identifies the extent to which these management activities may be occurring in the range of the species nor identifies the potential impacts of these activities on the species. We have determined that this information does not meet the substantial information standard.

Factors B, C, D, and E: No information was presented in the petition concerning threats to this species from these factors.

Based on our evaluation of the information provided in the petition, we have determined that the petition does not present substantial information to indicate that listing the royal moth may be warranted.

#### Sage Sphinx (*Sphinx eremitoides*)

The sage sphinx is a moth believed to occur in the Great Plains region from Kansas to Texas west into Colorado and New Mexico (NatureServe 2007), although there are no documented records for Colorado or New Mexico (NatureServe 2007). NatureServe (2007) indicates that the species occurs in two counties in Kansas and in four counties in Texas. No further information regarding the historical or current distribution or status of the species was presented.

Factor A: NatureServe (2007) identifies conversion of native habitats to cultivated agriculture or heavily

grazed lands as a threat to the sage sphinx. However, NatureServe (2007) provides no information or discussion to indicate that either of these activities is actually occurring or likely to occur in occupied habitats. We have determined that this information does not meet the substantial information standard.

Factors B, C, D, and E: No information was presented in the petition concerning threats to this species from these factors.

Based on our evaluation of the information provided in the petition, we have determined that the petition does not present substantial information to indicate that listing the sage sphinx may be warranted.

#### Arachnids

##### Cave Obligate Spider (no common name) (*Thymoites minero*)

This cave obligate spider can be found in tangled webs built under stones, against walls, and in cracks and crevices in caves within Cochise County, Arizona (AGFD 2005). AGFD (2005) indicates that further study is needed to determine distribution and population size, as well as life history traits of the spider.

Factor A: AGFD (2005) identifies development and vandalism as potential threats to cave invertebrates; however, no information specific to this cave-obligate species or its habitat was presented. We have determined that this information does not meet the substantial information standard.

Factors B, C, D, and E: No information was presented in the petition concerning threats to this species from these factors.

Based on our evaluation of the information provided in the petition, we have determined that the petition does not present substantial information to indicate that listing the cave obligate spider may be warranted.

#### Crustaceans

##### Blackbelted Crayfish (*Procambarus nigrocinctus*)

According to NatureServe (2007), the blackbelted crayfish is known to occur in five sites in the Neches River basin in Angelina and Jasper Counties, Texas. Blackbelted crayfish occur among rocks and accumulated debris in small, moderately flowing creeks (NatureServe 2007). No further information regarding the historical or current distribution or status of the species was presented.

Factor A: NatureServe (2007) indicates that several sites are near an airport and that development could eliminate populations; however, there is

no discussion or information provided which indicates any adverse impacts to the species as a result of its location near an airport nor an indication of whether development is occurring or is likely to occur in occupied habitats. We have determined that this information does not meet the substantial information standard.

Factors B, C, D, and E: No information was presented in the petition concerning threats to this species from these factors.

Based on our evaluation of the information provided in the petition, we have determined that the petition does not present substantial information to indicate that listing the blackbelted crayfish may be warranted.

#### Neches Crayfish (*Procambarus nechesae*)

The Neches crayfish is known to occur in five sites in the Neches River basin in Angelina and Trinity Counties, Texas (NatureServe 2007). According to NatureServe (2007), Neches crayfish form simple burrows in temporary or semipermanent pools in roadside ditches. No further information regarding the historical or current distribution or status of the species was presented.

Factor A: NatureServe (2007) identifies land alteration as a threat to the Neches crayfish, but does not indicate what type of land alteration may be occurring or the impacts such alteration could have on the species. We have determined that this information does not meet the substantial information standard.

Factors B, C, and D: No information was presented in the petition concerning threats to this species from these factors.

Factor E: NatureServe (2007) states that there are few known occurrences of the Neches crayfish and that it appears to be restricted to a small watershed. In the absence of information identifying other threats to the species and linking those threats to rarity or geographic distribution the species, we do not consider rarity or restricted geographic distribution to be a threat. We note that NatureServe (2007) also states that more and better surveys will probably at least double the number of occurrences.

Based on our evaluation of the information provided in the petition, we have determined that the petition does not present substantial information to indicate that listing the Neches crayfish may be warranted.

#### Spinythumb Fairy Shrimp (*Streptocephalus moorei*)

The spinythumb fairy shrimp is known from a site north of the town of Jimenez in northern Chihuahua, Mexico, and from two counties in southern New Mexico (Maeda-Martinez *et al.* 2005). In New Mexico, the species has been discovered recently in two pools in the town of Columbus in Luna County and in a stock tank in Sierra County (Maeda-Martinez *et al.* 2005). The area of occupancy is small, though three of the four sites are widely separated (NatureServe 2007). According to NatureServe (2007), the species was found at the northern Mexico site only in 1971 and has not been found there since, despite repeated visits. Maeda-Martinez *et al.* (2005) indicate that it may be extirpated there.

Factor A: According to NatureServe (2007), habitat destruction is the greatest threat to the species. Maeda-Martinez *et al.* (2005) indicates that extension of Federal Highway Number 45 is altering the habitat at the northern Mexico site. However, the highway construction threatens the site where the species has not been found since 1971, despite repeated visits. No specific information on habitat destruction was presented for the remaining three sites. We have determined that this information does not meet the substantial information standard.

Factors B, C, D, and E: No information was presented.

Based on our evaluation of the information provided in the petition, we have determined that the petition does not present substantial information to indicate that listing of the spinythumb fairy shrimp may be warranted.

#### Flowering Plants

##### *Arenaria livermorensis* (Livermore Sandwort)

*Arenaria livermorensis* is an herbaceous plant that inhabits crevices and cracks on cliffs and bare igneous rock walls at high elevations (NatureServe 2007). This species is known only from Mt. Livermore, Jeff Davis County, Texas (NatureServe 2007).

Factor A: NatureServe (2007) identifies habitat loss and degradation as a threat to *Arenaria livermorensis*; however, the cause of loss and degradation of habitat was not specified. NatureServe (2007) states that the possible development of an observatory on top of Mt. Livermore may constitute a threat to the species; however, there is no information indicating whether this development took place or may still take place. We have determined that this

information does not meet the substantial information standard.

Factors B, C, D, and E: No information was presented in the petition concerning threats to this species from these factors.

Based on our evaluation of the information provided in the petition and in our files, we have determined that the petition does not present substantial information to indicate that listing *Arenaria livermorensis* may be warranted due to the present or threatened destruction, modification, or curtailment of its habitat or range.

##### *Argemone arizonica* (Arizona Prickly-poppy)

*Argemone arizonica* is a plant known to occur on steep rocky slopes on the north wall of Grand Canyon National Park, Coconino County, Arizona (NatureServe 2007). No further information regarding the historical or current distribution or status of the species was presented.

Factor A: NatureServe (2007) identifies trampling from hiking as a possible threat to the species, but does not indicate whether trampling is occurring or is likely to occur in the future. Further, because *Argemone arizonica* is found on steep rocky slopes on canyon walls, it is not clear that recreationists would favor that type of habitat for hiking. We have determined that this information does not meet the substantial information standard.

Factors B, C, D, and E: No information was presented in the petition concerning threats to this species from these factors.

Based on our evaluation of the information provided in the petition, we have determined that the petition does not present substantial information to indicate that listing *Argemone arizonica* may be warranted.

##### *Batesimalva violacea* (Purple Gay-mallow)

*Batesimalva violacea* is a shrub known to occur in the Chisos Mountains of southern Brewster County, Texas, and is thought to occur in Coahuila and Nuevo Leon, Mexico (NatureServe 2007). No further information regarding the historical or current distribution or status of the species was presented.

Factors A and B: No information was presented in the petition concerning threats to this species from these factors.

Factor C: NatureServe (2007) identifies grazing as a threat to *Batesimalva violacea*, but does not indicate whether grazing is occurring or is likely to occur in the future in occupied habitats. Further, NatureServe (2007) does not indicate how grazing

may be impacting this species (e.g., trampling, habitat degradation, predation). We have determined that this information does not meet the substantial information standard.

Factors D and E: No information was presented in the petition concerning threats to this species from these factors.

Based on our evaluation of the information provided in the petition, we have determined that the petition does not present substantial information to indicate that listing *Batesimalva violacea* may be warranted.

#### *Bonamia ovalifolia* (Bigpod Bonamia)

*Bonamia ovalifolia* is a perennial herb known to occur in Brewster County, Texas, and in adjacent Coahuila, Mexico (NatureServe 2007). It is an inhabitant of deep alluvial sands overlying limestone ledges or outcrops along deep river canyons near desert grasslands and shrublands (NatureServe 2007). No further information regarding the historical or current distribution or status of the species was presented.

Factors A: NatureServe (2007) identifies overgrazing as a threat to *Bonamia ovalifolia*, but does not indicate whether grazing is occurring or is likely to occur in the future in occupied habitats. Further, NatureServe (2007) does not indicate how grazing may be impacting this species (e.g., trampling, habitat degradation, predation). We have determined that this information does not meet the substantial information standard.

Factors B, C, D, and E: No information was presented in the petition concerning threats to this species from these factors.

Based on our evaluation of the information provided in the petition, we have determined that the petition does not present substantial information to indicate that listing *Bonamia ovalifolia* may be warranted.

#### *Bouteloua kayi* (Kay Gramma)

*Bouteloua kayi* is a perennial grass known to occur in limestone crevices in Brewster County, Texas, where there are five known populations (NatureServe 2007). No further information regarding the historical or current distribution or status of the species was presented.

Factors A: NatureServe (2007) indicates that *Bouteloua kayi* is possibly threatened by overgrazing, but does not indicate whether grazing is occurring or is likely to occur in the future in occupied habitats. Further, NatureServe (2007) does not indicate how grazing may be impacting this species (e.g., trampling, habitat degradation, predation). We have determined that

this information does not meet the substantial information standard.

Factors B, C, D, and E: No information was presented in the petition concerning threats to this species from these factors.

Based on our evaluation of the information provided in the petition, we have determined that the petition does not present substantial information to indicate that listing *Bouteloua kayi* may be warranted.

#### *Cryptantha ganderi* (Gander's Cryptantha)

*Cryptantha ganderi* is an annual plant known to occur in southern California and Arizona in the United States, and Baja California and Sonora in Mexico (NatureServe 2007). It is found on sand dunes around the head of the Gulf of California, including the Gran Desierto de Altar in Sonora, Mexico; the Pinta Sands in Yuma County, Arizona; and the Borrego Valley in San Diego County, California (NatureServe 2007). According to the AGFD (2005), six occurrences are known in California and one in Arizona.

Factor A: NatureServe (2007) identifies development in California as a threat to the species, claiming that the expansion of the Borrego airport may impact the species' habitat; however, no supporting information was provided that allows us to determine if these activities are occurring or how they may be impacting the species. No information about development was presented for other portions of the range of the species. NatureServe (2007) indicates that sand dune habitats are vulnerable to OHV use; however, no information specific to *Cryptantha ganderi* or the specific areas where OHV use may be occurring was presented. We have determined that the information presented concerning development and OHV use does not meet the substantial information standard.

Factors B, C, D, and E: No information was presented in the petition concerning threats to this species from these factors.

Based on our evaluation of the information provided in the petition, we have determined that the petition does not present substantial information to indicate that listing *Cryptantha ganderi* may be warranted.

#### *Dalea bartonii* (Cox's Dalea)

*Dalea bartonii* is a perennial plant with one known occurrence in the drainage of the San Francisco Creek in Brewster County, Texas (NatureServe 2007). This population likely contains fewer than 1000 individuals (NatureServe 2007).

Factor A: NatureServe (2007) identifies overgrazing as a threat to *Dalea bartonii*, but does not indicate whether grazing is occurring or is likely to occur in the future in occupied habitats. Further, NatureServe (2007) does not indicate how grazing may be impacting this species (e.g., trampling, habitat degradation, predation). NatureServe (2007) further identifies the introduction of exotic species as a threat to *D. bartonii*, but does not identify which exotic species may be occurring within the range of *D. bartonii* or how those exotic species may be impacting *D. bartonii*. We have determined that the information presented concerning overgrazing and exotic species does not meet the substantial information standard.

Factors B, C, D, and E: No information was presented in the petition concerning threats to this species from these factors.

Based on our evaluation of the information provided in the petition, we have determined that the petition does not present substantial information to indicate that listing *Dalea bartonii* may be warranted.

#### *Dalea tentaculoides* (Gentry's Indigobush)

*Dalea tentaculoides* is a perennial shrub known historically in the United States from only three areas in southern Arizona: the western and northern slopes of the Baboquivari Mountains in the Tohono O'odham Nation, Mendoza Canyon in the Coyote Mountains, and Sycamore Canyon in the Atascosa Mountains on the Coronado National Forest (Service 2005). As of 2005, plants were only known to occur in Sycamore Canyon and on lands within the Tohono O'odham Nation (Schmalzel 2005). The plant has also been found at three locations in Mexico (Service 2005). The first location was found in 1995, northeast of Huásabas in the State of Sonora. In 2004, the species was documented in the Sierra El Humo, south-southwest of Sasabe, Arizona, in northwestern Sonora, Mexico (L. Hahn, pers. comm. 2004 cited in Service 2005). Surveys in 2005 documented the persistence of those two populations and discovered a third in the Sierra de La Madera (Van Devender 2005).

In 2005, the Service made a 12-month finding in response to a January 2, 2002, petition to list *Dalea tentaculoides* (September 27, 2005; 70 FR 56426). After reviewing the best scientific and commercial information available at that time, we determined the species did not warrant listing (Service 2005).

Factor A: NatureServe (2007) indicates that seasonal flooding,



watershed degradation due to overgrazing, and trampling by recreational users and livestock may be threats to *Dalea tentaculoides*, but does not indicate whether these activities are occurring or are likely to occur in occupied habitat. Further, these potential threats were examined in our 2005 12-month finding with the conclusion that the species did not warrant listing (Service 2005), and no newer information was provided by the petitioner than that used in the 2005 finding. We have determined that the information presented does not meet the substantial information standard.

Factor B: No information was presented in the petition concerning threats to this species from this factor.

Factor C: NatureServe (2007) indicates that consumption by livestock may be a threat to *Dalea tentaculoides*, but does not indicate whether consumption is occurring or is likely to occur in the future. Further, this potential threat was examined in our 2005 12-month finding with the conclusion that the species did not warrant listing (Service 2005), and no newer information was provided by the petitioner than that used in the 2005 finding. We have determined that the information presented does not meet the substantial information standard.

Factors D and E: No information was presented in the petition concerning threats to this species from these factors.

Based on our evaluation of the information provided in the petition, we have determined that the petition does not present substantial information to indicate that listing *Dalea tentaculoides* may be warranted.

*Eleocharis cylindrica* (Cylinder Spikerush)

*Eleocharis cylindrica* is a perennial sedge known to occur in New Mexico and Texas (NatureServe 2007). It is an inhabitant of shallow water or calcareous mud at desert springs and in streams (NatureServe 2007). No further information regarding the historical or current distribution or status of the species was presented.

Factor A: NatureServe (2007) states that wetlands in arid environments are often in jeopardy, but does not identify any specific activities or threats that may be impacting *Eleocharis cylindrica* now or in the future. We have determined that this information does not meet the substantial information standard.

Factors B, C, D, and E: No information was presented in the petition concerning threats to this species from these factors.

Based on our evaluation of the information provided in the petition, we

have determined that the petition does not present substantial information to indicate that listing *Eleocharis cylindrica* may be warranted.

*Erigeron acomanus* (Acoma Fleabane)

*Erigeron acomanus* is a perennial herb known to occur in McKinley and Cibola Counties, New Mexico (NatureServe 2007). It is an inhabitant of sandy arroyos beneath sandstone cliffs in the high plateau country of west-central New Mexico. It is presently known from four small, isolated populations, which are further divided into distinct geographic subpopulations (Reed 1996).

Factor A: NatureServe (2007) states that current land uses do not significantly threaten this species' habitats. NatureServe (2007) further notes that the species may occasionally be impacted by mining, but does not identify whether mining is actually occurring or is likely to occur in the future. We have determined that this information does not meet the substantial information standard.

Factors B, C, D, and E: No information was presented in the petition concerning threats to this species from these factors.

Based on our evaluation of the information provided in the petition, we have determined that the petition does not present substantial information to indicate that listing of *Erigeron acomanus* may be warranted.

*Erigeron bistiensis* (Bisti Fleabane)

*Erigeron bistiensis* is a perennial herb known from a small area primarily on Navajo Nation lands in San Juan County, New Mexico (NatureServe 2007). It is reported that there are fewer than 1,000 individuals, which are restricted to a particular type of sandstone-derived rock (NatureServe 2007). However, Tonne (2007) has questioned the validity of the species and believes it to be the common *Erigeron pulcherrimus* (basin fleabane).

Factor A: NatureServe (2007) identifies the species' placement in an area of high oil and gas development as a threat to the species, but does not identify how oil and gas activities may be impacting the species or its habitat. NatureServe (2007) also identifies urban development as a threat, but does not indicate whether urban development is occurring or is likely to occur in occupied habitats. We have determined that the information presented concerning oil and gas activities and urban development does not meet the substantial information standard.

Factor B: No information was presented in the petition concerning threats to this species from this factor.

Factor C: NatureServe (2007) identifies intense grazing as a threat to *Erigeron bistiensis*, but also states that plants seem free of signs of herbivory (consumption of plants). According to Tonne (2007), livestock grazing is intense in the area of the single described population, but individual plants showed no sign of herbivory; it appears to be relatively unpalatable to livestock. We have determined that this information does not meet the substantial information standard.

Factors D and E: No information was presented in the petition concerning threats to this species from these factors.

Based on our evaluation of the information provided in the petition, we have determined that the petition does not present substantial information to indicate that listing *Erigeron bistiensis* may be warranted.

*Escobaria guadalupensis* (Guadalupe Pincushion Cactus)

*Escobaria guadalupensis* is a cactus known to occur in New Mexico and in the Guadalupe Mountains National Park, Texas (NatureServe 2007). The species inhabits exposed slabs and fractured outcrops of limestone on steep slopes in open coniferous woodlands (NatureServe 2007). No further information regarding the historical or current distribution or status of the species was presented.

Factor A: No information was presented in the petition concerning threats to this species from this factor.

Factor B: NatureServe (2007) identifies collection of the cactus for cultivation as a possible threat to *Escobaria guadalupensis*, but indicates that specimens identified in trade were not collected from the wild. We have determined that this information does not meet the substantial information standard.

Factors C, D, and E: No information was presented in the petition concerning threats to this species from these factors.

Based on our evaluation of the information provided in the petition, we have determined that the petition does not present substantial information to indicate that listing *Escobaria guadalupensis* may be warranted.

*Euphorbia aaron-rossii* (Marble Canyon Spurge)

*Euphorbia aaron-rossii* is a plant known to occur on Navajo Nation lands and in the following areas in Grand Canyon National Park in Coconino County, Arizona: Marble Canyon, Grand

Canyon (along the Colorado River on the east side of the canyon), and the canyon of the Little Colorado River (AGFD 2005).

Factors A, B, C, and D: No information was presented in the petition concerning threats to this species from these factors.

Factor E: NatureServe (2007) identifies limited geographic range as a threat to *Euphorbia aaron-rossii*. In the absence of information identifying other threats to the species and linking those threats to the limited geographic range of the species, we do not consider limited geographic range to be a threat.

Based on our evaluation of the information provided in the petition, we have determined that the petition does not present substantial information to indicate that listing *Euphorbia aaron-rossii* may be warranted.

*Glossopetalon texense* (Texas Grease Bush)

*Glossopetalon texense* is a shrub known to occur in Uvalde and Val Verde Counties, Texas (NatureServe 2007). No further information regarding the historical or current distribution or status of the species was presented.

Factors A and B: No information was presented in the petition concerning threats to this species from these factors.

Factor C: NatureServe (2007) states that *Glossopetalon texense* may be susceptible to predation from browsing, but does not indicate whether grazing by livestock or other herbivores (animals which eat plants) is occurring or may occur in the future in occupied habitats. We have determined that this information does not meet the substantial information standard.

Factors D and E: No information was presented in the petition concerning threats to this species from these factors.

Based on our evaluation of the information provided in the petition, we have determined that the petition does not present substantial information to indicate that listing *Glossopetalon texense* may be warranted.

*Kallstroemia perennans* (Perennial Caltrop)

*Kallstroemia perennans* is a plant known to occur in Presidio, Val Verde and Brewster Counties, Texas (NatureServe 2007). No further information regarding the historical or current distribution or status of the species was presented.

Factor A: According to NatureServe (2007), *Kallstroemia perennans* occurs in an area subject to land abuse; however, these abuses are not specified. We have determined that this

information does not meet the substantial information standard.

Factors B, C, D, and E: No information was presented in the petition concerning threats to this species from these factors.

Based on our evaluation of the information provided in the petition, we have determined that the petition does not present substantial information to indicate that listing *Kallstroemia perennans* may be warranted.

*Pediomelum humile* (Rydberg's Scurfpea)

*Pediomelum humile* is a perennial herb known to occur in Val Verde County, Texas, and possibly in adjacent Coahuila, Mexico (NatureServe 2007). No further information regarding the historical or current distribution or status of the species was presented.

Factor A: NatureServe (2007) indicates that habitats are often heavily browsed by sheep or goats, but does not indicate how these activities may be impacting this species (e.g., trampling, habitat degradation, predation). NatureServe (2007) further indicates that urbanization could destroy some sites, but not does explain through what portion of the range these activities may occur nor how it would impact the species. We have determined that the information presented concerning browsing and urbanization does not meet the substantial information standard.

Factors B, C, D, and E: No information was presented in the petition concerning threats to this species from these factors.

Based on our evaluation of the information provided in the petition, we have determined that the petition does not present substantial information to indicate that listing *Pediomelum humile* may be warranted.

*Perityle huecoensis* (Hueco Mountains Rockdaisy)

*Perityle huecoensis* is a plant known to occur in the Hueco Mountains on Fort Bliss Military Reservation in El Paso County, Texas, and in the Sierra Juarez, Mexico (NatureServe 2007). According to NatureServe (2007), the Texas population consists of a total of 700 to 800 plants. No further information regarding the historical or current distribution or status of the species was presented.

Factor A: Worthington (1991) identifies human activity as a potential threat to the genus *Perityle* in an occupied canyon; however, he does not describe the nature of the human activity. Worthington (1991) also reports that *Perityle huecoensis* occurs on

vertical cliffs in the canyon, habitat not likely to be visited by humans. We have determined that this information does not meet the substantial information standard.

Factors B, C, D, and E: No information was presented in the petition concerning threats to this species from these factors.

Based on our evaluation of the information provided in the petition, we have determined that the petition does not present substantial information to indicate that listing *Perityle huecoensis* may be warranted.

*Perityle saxicola* (Fish Creek Rock Daisy)

*Perityle saxicola* is a perennial herb known to occur in Gila and Maricopa Counties, Arizona (NatureServe 2007). Its current distribution is found near Tonto National Monument, Roosevelt Lake, and above Horse Camp Creek in the Sierra Ancha Mountains (AGFD 2004). *Perityle saxicola* grows in moisture deficient habitat in cracks and crevices on cliff faces, on large boulders, and on rocky outcrops in canyons (AGFD 2004).

Factor A: AGFD (2004) indicates that threats to the species are restricted to activities requiring blasting, including dam, road, and trail construction, but does not indicate whether these activities are occurring or are likely to occur in occupied habitats in the future. AGFD (2004) further indicates that the species may have been impacted during the Roosevelt Dam re-construction in the 1990s; however, most of the plants occurred up-slope, above construction activities. We have determined that this information does not meet the substantial information standard.

Factors B, C, D, and E: No information was presented in the petition concerning threats to this species from these factors.

Based on our evaluation of the information provided in the petition, we have determined that the petition does not present substantial information to indicate that listing *Perityle saxicola* may be warranted.

*Perityle warnockii* (River Rockdaisy)

*Perityle warnockii* is a plant known to occur in the Pecos River in Val Verde County, Texas (NatureServe 2007). No further information regarding the historical or current distribution or status of the species was presented.

Factors A: NatureServe (2007) indicates that the area is heavily grazed by sheep and goats, but does not indicate how these activities may be impacting this species (e.g., trampling, habitat degradation, predation).

Factors B, C, D, and E: No information was presented in the petition concerning threats to this species from these factors.

Based on our evaluation of the information provided in the petition, we have determined that the petition does not present substantial information to indicate that listing *Perityle warnockii* may be warranted.

#### *Quercus graciliformis* (Slender Oak)

*Quercus graciliformis* is a plant known to occur in the Chisos Mountains in Big Bend National Park, Brewster County, Texas, and in adjacent northern Chihuahua, Mexico (NatureServe 2007). No further information regarding the historical or current distribution or status of the species was presented.

Factor A: NatureServe (2007) identifies the activities of tourists as a threat to this species, but does not identify the type of activities nor how they may be impacting this species. NatureServe (2007) further identifies occasional drought as a threat to the species, but provides no information concerning the frequency or intensity of these droughts or how the species is impacted by drought. We have determined that the information presented concerning tourist activities and drought does not meet the substantial information standard.

Factors B, C, D, and E: No information was presented in the petition concerning threats to this species from these factors.

Based on our evaluation of the information provided in the petition, we have determined that the petition does not present substantial information to indicate that listing *Quercus graciliformis* may be warranted.

#### *Rhododon angulatus* (Lonestar Sand-mint)

*Rhododon angulatus* is a plant known from two populations occurring in Aransas County, Texas (NatureServe 2007). It is also reported in Nueces and Refugio Counties; however, these reports remain unconfirmed (NatureServe 2007). No further information regarding the historical or current distribution or status of the species was presented.

Factor A: NatureServe (2007) notes that threats to *Rhododon angulatus* include suburban sprawl, industrial development, and road widening, but does not indicate whether these activities are occurring or are likely to occur in the future nor how these activities may impact *R. angulatus*. We have determined that this information does not meet the substantial information standard.

Factors B, C, D, and E: No information was presented in the petition concerning threats to this species from these factors.

Based on our evaluation of the information provided in the petition, we have determined that the petition does not present substantial information to indicate that listing *Rhododon angulatus* may be warranted.

#### *Sophora gypsophila* (Gypsum Necklace)

*Sophora gypsophila* is a shrub known to occur in Culberson County in western Texas and in adjacent Eddy and Otero Counties in southern New Mexico (NatureServe 2007). There is an additional occurrence 300 km (185 mi) to the south in Chihuahua, Mexico (NatureServe 2007). NatureServe (2007) estimates that there are approximately 2000 known individuals of the species.

Factors A, B, C, and D: No information was presented in the petition concerning threats to this species from these factors.

Factor E: NatureServe (2007) identifies the effects of climate change as a threat to *Sophora gypsophila*. NatureServe (2007) indicates that the distribution of the species is declining as its habitat becomes drier due to climate change. Information in our files indicates that warming of the climate is unequivocal and that drying trends in the southwestern United States are likely to persist (Intergovernmental Panel on Climate Change 2007a, p. 30; Intergovernmental Panel on Climate Change 2007b, p. 887); however, we find the information presented in the petition and readily available in our files to be insufficiently specific to *Sophora gypsophila* or its habitat.

Based on our evaluation of the information provided in the petition, we have determined that the petition does not present substantial information to indicate that listing *Sophora gypsophila* may be warranted.

#### *Valerianella nuttallii* (Nuttall's Corn-salad)

*Valerianella nuttallii* is an herbaceous plant that is limited to western Arkansas and eastern Oklahoma. The species is known from few remaining individuals (approximately 1,000-3,000) (NatureServe 2007). The species historically occurred in 11 counties in western Arkansas (NatureServe 2007) and in 13 counties in eastern Oklahoma (Oklahoma Biological Survey 2002), and is currently thought to occur in 7 counties in Arkansas and 3 in Oklahoma (NatureServe 2007). The species is found in areas with saturated soils associated with shale (NatureServe 2007).

Factor A: NatureServe (2007) indicates that *Valerianella nuttallii* occurs in hay meadows in which moderate grazing occurs; however, NatureServe (2007) does not identify moderate grazing as a threat to the species. We have determined that this information does not meet the substantial information standard.

Factors B, C, D, and E: No information was presented in the petition concerning threats to this species from these factors.

Based on our evaluation of the information provided in the petition, we have determined that the petition does not present substantial information to indicate that listing *Valerianella nuttallii* may be warranted.

#### Ferns and Allies

##### *Grimmia americana* (no common name)

*Grimmia americana* is a moss known to occur in western Texas, southern Nevada, and central Arizona (NatureServe 2007). No further information regarding the historical or current distribution or status of the species was presented.

Factor A: Stark (1999) states that the *Grimmia americana* population in Clark County, Nevada, occurs at an entry point to a canyon containing petroglyphs, and due to relatively high public access, is likely impacted by trampling by humans. Because this species is known to occur on cliffs and boulders (NatureServe 2007), it is likely somewhat protected from recreational users. No information is presented concerning recreational use at the Texas or Arizona site. We have determined that this information does not meet the substantial information standard.

Factors B, C, D, and E: No information was presented in the petition concerning threats to this species from these factors.

Based on our evaluation of the information provided in the petition, we have determined that the petition does not present substantial information to indicate that listing *Grimmia americana* may be warranted.

##### *Riccia californica* (no common name)

*Riccia californica* is a moss reported from west-central Oregon south to San Francisco and Santa Clara Counties in northern California, with a disjunct population reported from San Diego County in southern California (Stark and Whittemore 1992; NatureServe 2007). It has also been reported from Texas (Schuster 1992).

Factor A: NatureServe (2007) indicates the population in southern California may be threatened by

development, but the nature of the development and impact on the species were not discussed. Additionally, no information was presented concerning the present or threatened destruction, modification, or curtailment of its habitat in the rest of its range in northern California, Oregon, and Texas. We have determined that this information does not meet the substantial information standard.

Factors B, C, D, and E: No information was presented in the petition concerning threats to this species from these factors.

Based on our evaluation of the information provided in the petition, we have determined that the petition does not present substantial information to indicate that listing *Riccia californica* may be warranted.

### Lichens

*Acarospora clauzadeana* (no common name)

*Acarospora clauzadeana* is a lichen known to occur near Roswell in Chaves County, New Mexico; near Almeria in Andalusia, Spain; and near Cuatro Ciénegas in Coahuila, Mexico (NatureServe 2007). In New Mexico, it is very specific in where it colonizes as it is restricted to pure gypsum that has been eroded to knife-sharp edges (NatureServe 2007). The current size of the area occupied by this species is apparently small, even though it occurs in three distinct parts of the world (NatureServe 2007). The lichen is sparsely distributed throughout its local area in New Mexico. It is difficult to quantify abundance of this species because it deeply penetrates stony rocks. It is not clearly known how this species disperses and whether it has relatively recently colonized certain sites or it was once more common than it is now and surviving historic sites are being observed (NatureServe 2007). The status of the populations in Spain and Mexico are unknown (NatureServe 2007).

Factor A: NatureServe (2007) indicates that gypsum mining, off-road vehicle use, and other recreational activities are potential threats to *Acarospora clauzadeana*, but does not indicate whether any of these activities are occurring or are likely to occur in occupied habitats. Additionally, NatureServe (2007) indicates that its habitat is naturally subject to erosion such that any activity that accelerates erosion would threaten the species; however, NatureServe (2007) does not identify any specific erosion accelerating threats occurring or likely to occur in occupied habitats. We have

determined that this information does not meet the substantial information standard.

Factor B, C, D, and E: No information was presented in the petition concerning threats to this species from these factors.

Based on our evaluation of the information provided in the petition, we have determined that the petition does not present substantial information to indicate that listing *Acarospora clauzadeana* may be warranted.

*Omphalora arizonica* (no common name)

*Omphalora arizonica* is a lichen known to occur in the mountains in Santa Cruz and Apache Counties, Arizona; in Bernalillo, Lincoln, Otero, San Miguel, Union, and Doña Ana Counties, New Mexico; and in Larimer, Mineral, and Saguache Counties, Colorado (NatureServe 2007).

Factor A: NatureServe (2007) identifies mechanical disturbance such as rock climbing in the Sandia Mountains of New Mexico as a threat to *Omphalora arizonica*; however, this threat is not considered by NatureServe to be of significant concern. We have determined that this information does not meet the substantial information standard.

Factors B, C, and D: No information was presented in the petition concerning threats to this species from these factors.

Factor E: NatureServe (2007) identifies air pollution as a threat to *Omphalora arizonica*, but does not identify the nature of such pollution nor its impacts on this lichen. We have determined that this information does not meet the substantial information standard.

Based on our evaluation of the information provided in the petition, we have determined that the petition does not present substantial information to indicate that listing *Omphalora arizonica* may be warranted.

### Species For Which Substantial Information Was Presented

#### Reptiles

Arizona Striped Whiptail (*Aspidoscelis arizonae*)

The Arizona striped whiptail is a lizard which inhabits grasslands and shrublands and is reported to occur in a small range in southeastern Arizona, including in the vicinity of the towns of Willcox (Cochise County) and Fairbank (Cochise County), and the Hackberry Ranch in Whitlock Valley (Graham County) (Sullivan *et al.* 2005). Surveys from 2000 through 2003 found the

species near Willcox and near Bonita (where not previously recorded), but not in the Whitlock Valley (Sullivan *et al.* 2005). Sullivan *et al.* (2005) did not find appropriate habitat at the historical Fairbank site and believe it was a base camp rather than the actual collection site.

Factor A: NatureServe cited the AGFD (2006) in indicating that habitat degradation due to urban and agricultural development and improper livestock grazing may be threats to the species. Sullivan *et al.* (2005) noted that one historical collecting site is now a housing development where they found no whiptails during their surveys. While they found the species at seven of eight historical collecting sites, they found evidence of recent heavy grazing at most sites occupied by the species (Sullivan *et al.* 2005).

Factor B, C, D, and E: No information was presented in the petition concerning threats to this species from these factors.

Based on our evaluation of the information provided in the petition, we have determined that the petition presents substantial information to indicate that listing the Arizona striped whiptail may be warranted due to the present or threatened destruction, modification, or curtailment of its habitat or range resulting from development and improper livestock grazing.

#### Amphibians

Black-spotted Newt (*Notophthalmus meridionalis*)

The black-spotted newt is known to occur along the Gulf Coastal Plain, from south of the San Antonio River in Texas southward to Tamaulipas, northern Veracruz, and southeastern San Luis Potosi, Mexico (NatureServe 2007). Adults, juveniles, and larvae of the species inhabit permanent and temporary ponds, roadside ditches, and quiet stream pools. The species is usually found among submerged vegetation such as *Chara* spp. (muskgrass) and under rocks and other shelter when ponds dry up (NatureServe 2007). NatureServe (2007) reports results from a Service survey in the mid-1980's whereby the black-spotted newt was observed at 5 localities, 2 in Texas and 3 in Mexico, during 221 surveys conducted. Additionally, NatureServe (2007) reports that the species could be absent from two of the three known localities in Mexico, but still exists in Siberia in northern Veracruz. The black-spotted newt was formerly a candidate 2 species, a taxa for which information in our possession indicated that

proposing to list was possibly appropriate, but for which persuasive data on biological vulnerability and threat were not available to support a proposed listing rule. This species has had no Federal Endangered Species Act status since the practice of maintaining a list of candidate 2 species was discontinued in 1996.

Factor A: NatureServe (2007) identifies past habitat alteration within the historic range of the species in Texas and Mexico as a threat to the species; however, no information is provided concerning the potential for alteration of currently occupied habitats. We have determined that this information does not meet the substantial information standard.

Factors B and C: No information was presented in the petition concerning threats to this species from these factors.

Factor D: NatureServe (2007) states that it is unknown whether any occurrences are appropriately protected or managed. The species is listed as endangered by the Mexican government, but it is not known to occur in any protected areas in Mexico (NatureServe 2007). The species is listed as threatened by Texas Parks and Wildlife Department. Texas Parks and Wildlife Department regulations prohibit the taking, possession, transportation, or sale of any of the animal species designated by State law as endangered or threatened without the issuance of a permit.

Factor E: Dixon (1987) identifies the use of herbicide and pesticide as a threat to the species, indicating that the species "has become endangered in Texas because pesticides and herbicides have been used throughout its area of distribution in Texas."

Based on our evaluation of the information provided in the petition, we have determined that the petition presents substantial information to indicate that listing the black-spotted newt may be warranted due to the other natural or manmade factors affecting its continued existence resulting from herbicide and pesticide use.

#### Blanco Blind Salamander (*Eurycea robusta*)

The Blanco blind salamander is found in water-filled underground caverns known to occur in the San Marcos Pool of the Balcones Aquifer (part of the Edwards Aquifer), Hays County, Texas (NatureServe 2007). It is known from four specimens observed in 1951 where only one was collected and preserved (NatureServe 2007).

Factor A: NatureServe (2007) indicates that the Blanco blind salamander may be sensitive to changes

in water quality and thus vulnerable to groundwater pollutants. NatureServe (2007) further indicates the salamander is likely threatened by falling groundwater levels that have resulted from increased pumping to support residential and commercial development in the region. Campbell (2003) indicates that increased groundwater use coupled with drought in the region is a serious threat to aquatic species in the Edwards Aquifer.

Factor B, C, D, and E: No information was presented in the petition concerning threats to this species from these factors.

Based on our evaluation of the information provided in the petition, we have determined that the petition presents substantial information to indicate that listing Blanco blind salamander may be warranted due to the present or threatened destruction, modification, or curtailment of its habitat or range resulting from water pollutants and water withdrawal.

#### Comal Blind Salamander (*Eurycea tridentifera*)

The Comal blind salamander is known to occur in the southeastern margin of the Edwards Plateau and the Cibolo Sinkhole Plain region of Comal County, Bexar County, and possibly in Kendall County, Texas (NatureServe 2007). Its current distribution includes Badweather Pit, Honey Creek Cave, Ebert Cave, Comal Springs, Pedernales Spring 1 and Spring 2, and caves at Camp Bullis Army Base (Chippindale and Hills 1994, Hills and Chippindale 2000). Hills and Chippindale (2000) listed at least seven separate occurrences of the species in recent surveys.

Factor A: NatureServe (2007) cites Hills and Chippindale (2000), who note that several species that occur in the Comal Springs ecosystem are threatened by habitat loss and modification due to groundwater withdrawal and groundwater contamination within the Edwards Aquifer. Because the Comal blind salamander co-occurs with these species, it may be facing the same threats. NatureServe (2007) also indicates that the species may be threatened by land development; however, no information was provided indicating that development is occurring or is likely to occur in areas occupied by the species. We have determined that the information presented concerning land development does not meet the substantial information standard.

Factor B, C, D, and E: No information was presented in the petition

concerning threats to this species from these factors.

Based on our evaluation of the information provided in the petition, we have determined that the petition presents substantial information to indicate that listing the Comal blind Salamander may be warranted due to the present or threatened destruction, modification, or curtailment of its habitat or range resulting from groundwater withdrawal and contamination.

#### Comal Springs Salamander (*Eurycea* sp. 8)

The Comal Springs salamander is known to occur only in Comal Springs in Landa Park and Landa Lake, Texas.

Factor A: NatureServe (2007) cites Chippindale *et al.* (2000), who note that several species that occur in the Comal Springs ecosystem are threatened by habitat loss and modification due to groundwater withdrawal and groundwater contamination within the Edwards Aquifer. Because the Comal Springs salamander co-occurs with these species, it may be facing the same threats.

Factor B, C, D, and E: No information was presented in the petition concerning threats to this species from these factors.

Based on our evaluation of the information provided in the petition, we have determined that the petition presents substantial information to indicate that listing the Comal Springs salamander may be warranted due to the present or threatened destruction, modification, or curtailment of its habitat or range resulting from groundwater withdrawal and groundwater contamination.

#### Texas Salamander (*Eurycea neotenes*)

The Texas Salamander is known to occur in Bexar County in south-central Texas (NatureServe 2007). It was formerly thought to be a wide-ranging species (Sweet 1984), but recent genetic data indicates that it is restricted to Helotes Creek Spring, Leon Springs, and Mueller's Spring (Chippindale *et al.* 2000). No further information regarding the historical or current distribution or status of the species was presented.

Factor A: Bruce (1976) identifies frequent drought and occasional flooding, which would destroy or modify its habitat, as threats to the Texas salamander. Although those Texas salamanders in permanent springs or underground waters would be expected to survive droughts, it is likely that many would be trapped downstream in drying surface pools (Bruce 1976). Information readily

available in our files confirms that droughts occur in this region of south-central Texas (72 FR 71040, December 13, 2007).

Factor B: No information was presented in the petition concerning threats to this species from this factor.

Factor C: Bruce (1976) indicates that a high mortality rate in juvenile Texas salamanders may be due to high predation, but provides no information on the type of predation that may be occurring. We have determined that this information does not meet the substantial information standard.

Factors D and E: No information was presented in the petition concerning threats to this species from these factors.

Based on our evaluation of the information provided in the petition, we have determined that the petition presents substantial information to indicate that listing the Texas salamander may be warranted due to the present or threatened destruction, modification, or curtailment of its habitat or range resulting from drought.

## Fish

### Arkansas River Speckled Chub (*Macrhybopsis tetranema*)

The Arkansas River speckled chub is a fish known to occur in shallow channels of large, permanently flowing, sandy streams (NatureServe 2007). Historically, it occurred in the upper Arkansas River basin in Oklahoma, Kansas, Texas, New Mexico, and Colorado. It is currently known to be extant in two widely disjunct areas: the Ninescah River and an associated portion of the Arkansas River in Kansas, and the South Canadian River between Ute and Meredith reservoirs in New Mexico and Texas (Eisenhour 1999; Luttrell *et al.* 1999).

Factor A: According to NatureServe (2007) and Luttrell *et al.* (1999), the Arkansas River speckled chub may be threatened by continuing river impoundments, water diversion projects, drought, and depletions of groundwater.

Factors B, C, and D: No information was presented in the petition concerning threats to this species from these factors.

Factor E: Reservoirs and dewatered river stretches may pose further threats to the species by creating barriers to movement and recolonization (Luttrell *et al.* 1999). According to NatureServe (2007) and Luttrell *et al.* (1999), the species has declined in Kansas and Arkansas due to dewatering of streams, and low-water dams and other obstructions, which may have fragmented habitat and blocked

upstream recolonization. NatureServe (2007) claims that pollution from oil, feedlots, and pesticides is probably also preventing upstream recolonization.

Based on our evaluation of the information provided in the petition, we have determined that the petition presents substantial information to indicate that listing the Arkansas River speckled chub may be warranted due to the present or threatened destruction, modification, or curtailment of its habitat or range resulting from water impoundment and diversion projects, and due to other natural or manmade factors affecting its continued existence resulting from restricted recolonization.

### Chihuahua Catfish (*Ictalurus sp. 1*)

The Chihuahua catfish historically occurred in the Rio Grande basin in New Mexico, Texas, and Mexico, and possibly the Rio San Fernando basin in Nuevo Leon and Tamaulipas, Mexico (Service 1994). According to Service (1994), the species trend is declining and may be extirpated in the United States. Anderson *et al.* (1995) indicate that catfishes in general show a pattern of reduced relative abundance in most Texas rivers. The Chihuahua catfish was formerly a candidate 2 species, a taxa for which information in our possession indicated that proposing to list was possibly appropriate, but for which persuasive data on biological vulnerability and threat were not available to support a proposed listing rule. This species has had no Federal Endangered Species Act status since the practice of maintaining a list of candidate 2 species was discontinued in 1996.

Factor A: Anderson *et al.* (1995) identify causes for changes in diversity of fishes in Texas, including dam construction, proliferation of exotic species, and increasing water demands; however, no information specific to this species is included. Information in Service (1994) supports the information presented in Anderson *et al.* (1995) and notes that the aquatic habitats of this catfish are threatened with pollution and dewatering, and that nonnative species threaten native fish fauna.

Factors B, C, D, and E: No information was presented in the petition concerning threats to this species from these factors.

Based on our evaluation of the information provided in the petition, we have determined that the petition presents substantial information to indicate that listing the Chihuahua catfish may be warranted due to the present or threatened destruction, modification, or curtailment of its habitat or range, resulting from

pollution, dewatering, and nonnative species.

### Nueces Shiner (*Cyprinella sp. 2*)

The Nueces shiner is a small fish known to occur in clear, cool headwater creeks of the Nueces River in Texas (Richardson and Gold 1995).

Factor A: Groundwater levels for much of south-central Texas have decreased substantially over the past decade, resulting in significantly reduced water flow in spring-fed rivers, including the Nueces River (Richardson and Gold 1995; NatureServe 2007). In addition, much of the land in the Nueces River basin is used for agriculture, and both improper grazing by livestock and possible stream pollution from pesticides and other chemicals may pose serious problems for the Nueces shiner (Richardson and Gold 1995; NatureServe 2007).

Factors B, C, D, and E: No information was presented in the petition concerning threats to this species from these factors.

Based on our evaluation of the information provided in the petition, we have determined that the petition presents substantial information to indicate that listing the Nueces shiner may be warranted due to the present or threatened destruction, modification, or curtailment of its habitat or range resulting from reduced water flow, improper grazing by livestock and pollution.

### Pecos Pupfish (*Cyprinodon pecosensis*)

The Pecos pupfish is known from a small range in the Pecos River drainage of New Mexico and Texas (NatureServe 2007). The historical range of the species includes the Pecos River from Bitter Lake National Wildlife Refuge and Bottomless Lakes State Park near Roswell, New Mexico, downstream approximately 650 km (404 mi) to the mouth of Independence Creek, Texas (Service 2000). The species was also found in gypsum sinkholes and saline springs at Bitter Lake National Wildlife Refuge; sinkholes and springs at Bottomless Lakes State Park; and in Salt Creek, Reeves County, Texas. As of 2000, the species was known to occur only in the upper reach of Salt Creek in Texas, in the Pecos River from north of Malaga upstream to Bitter Lake National Wildlife Refuge, Bottomless Lakes State Park, and the Bureau of Land Management (BLM) Overflow Wetlands Wildlife Habitat Area/Area of Critical Environmental Concern (Service 2000).

Factor A: Information presented in NatureServe (2007) and verified by Service (2000) indicates Pecos pupfish habitat may be threatened by alterations

of habitat, such as dewatering, channelization, and nonnatural flow regime, due to excessive groundwater pumping and dams on the Pecos River. Lower water tables may also eliminate water flow between sinkholes, isolating small populations. Oil spills from pipelines into Salt Creek, Texas, have occurred and accidental spills or leaks may represent an ongoing threat to water quality throughout its range.

Factor B and C: No information was presented in the petition concerning threats to this species from these factors.

Factor D: In 1999, the Texas Parks and Wildlife Department; New Mexico Department of Game and Fish (NMDGF); New Mexico Energy, Minerals, and Natural Resources Department; New Mexico Department of Agriculture; New Mexico Environmental Department; New Mexico Office of the State Engineer; BLM; and Service signed a conservation agreement for the Pecos pupfish. The purpose of the agreement was to secure and protect the Pecos pupfish within its occupied and historical range (Texas Parks and Wildlife Department *et al.* 1999); however, the agreement expired in 2004 and has not been renewed.

Factor E: The Pecos pupfish may be threatened by hybridization with the sheepshead minnow (*Cyprinodon variegatus*) (NatureServe 2007; Service 2000). The sheepshead minnow was apparently introduced into the Pecos River in Texas in the 1980s (Echelle and Connor 1989). Interbreeding with the Pecos pupfish lead to hybridization and swamping of the genetic material of the Pecos pupfish with that of the sheepshead minnow and Pecos pupfish-sheepshead minnow hybrids. As of 1998, the sheepshead minnow had replaced the Pecos pupfish in about two-thirds of its former range.

Based on our evaluation of the information provided in the petition, we have determined that the petition presents substantial information to indicate that listing the Pecos pupfish may be warranted due to the present or threatened destruction, modification, or curtailment of its habitat or range as a result of water quality and quantity issues, and due to other natural or manmade factors affecting its continued existence as a result of hybridization with the sheepshead minnow.

#### Plateau Shiner (*Cyprinella lepida*)

The Plateau shiner is a small fish known to occur in a small range in the clear, cool spring-fed headwater creeks of the Frio and Sabinal Rivers in central Texas (Nueces River system). Survey efforts indicate that population sizes have decreased appreciably and suggest

that the decline in abundance is particularly evident in the Sabinal River (Richardson and Gold 1995).

Factor A: The species' decline is believed to be associated with habitat alteration resulting from dewatering, improper grazing by livestock, and possible stream pollution from pesticides and other agricultural chemicals (Richardson and Gold 1995; NatureServe 2007).

Factors B, C, D, and E: No information was presented in the petition concerning threats to this species from these factors.

Based on our evaluation of the information provided in the petition, we have determined that the petition presents substantial information to indicate that listing the Plateau shiner may be warranted due to the present or threatened destruction, modification, or curtailment of its habitat or range resulting from dewatering, improper grazing by livestock, and possible stream pollution.

#### San Felipe Gambusia (*Gambusia clarkhubbsi*)

The San Felipe gambusia is a fish known to occur in San Felipe Creek, Val Verde County, Texas. The species appears to prefer edge or quiet water habitat in close association to areas with significant spring flows (Garrett and Edwards 2003). On February 13, 2007, we published a 90-day finding in response to a petition to list the species as threatened or endangered under the Act. We found that the petition did not present substantial information that the species warranted listing at that time (72 FR 6703). However, we are re-evaluating the information we considered at that time and information presented in the current petition.

Factor A: San Felipe Creek is an urban stream that has been modified for bank stabilization, flood control, public access, road bridges, and diversion of irrigation water (Garrett and Edwards 2003). As a result, the San Felipe gambusia may be threatened by water quality problems including elevated nitrate, phosphate, and orthophosphate levels (Garrett and Edwards 2003).

Factors B, C, D, and E: No information was presented in the petition concerning threats to this species from these factors.

Based on our evaluation of the information provided in the petition, we have determined that the petition presents substantial information to indicate that listing the San Felipe gambusia may be warranted due to the present or threatened destruction, modification, or curtailment of its

habitat or range resulting from development and pollution.

#### Toothless Blindcat (*Trogloglanis pattersoni*)

The toothless blindcat is a catfish known to occur in five wells that penetrate the San Antonio Pool of the Edwards Aquifer in and near San Antonio, Bexar County, Texas (NatureServe 2007).

Factor A: Ono *et al.* (1983) identify decreasing water levels in the Edwards Aquifer and contamination from chemical pollution as threats to the toothless blindcat. The Edwards Aquifer supplies irrigation and drinking water to the area around San Antonio, Texas (Ono *et al.* 1983). Projected increases in the human population around San Antonio will likely result in an increase in water usage which would lower the water level in the aquifer to below the rainfall recharge zone (Ono *et al.* 1983). As such, the species may be vulnerable to pollution and depletion of the aquifer (Ono *et al.* 1983). In addition, Anderson *et al.* (1995) includes local habitat disturbances, such as the alteration of instream flow and eutrophication as threats to the species. Eutrophication is caused by an excess of nutrients, such as nitrogen and phosphorus, which stimulate excessive plant growth that results in the depletion of dissolved oxygen needed by the toothless blindcat.

Factor B, C, and D: No information was presented in the petition concerning threats to this species from these factors.

Factor E: Competition may be a threat due to the rapid increase of exotic species within the toothless blindcat's occupied habitat (Anderson *et al.* 1995).

Based on our evaluation of the information provided in the petition, we have determined that the petition presents substantial information to indicate that listing the toothless blindcat may be warranted due to the present or threatened destruction, modification, or curtailment of its habitat or range other natural or manmade factors affecting its continued existence resulting from water drawdown and pollution, or to other natural or manmade factors affecting its continued existence resulting from competition.

#### White Sands Pupfish (*Cyprinodon tularosa*)

The White Sands pupfish occurs in Lincoln, Otero, and Sierra Counties, New Mexico (NatureServe 2007). The species is abundant where its habitat occurs in the Tularosa Basin within the White Sands Missile Range and

Holloman Air Force Base, where the White Sands pupfish typically occurs in clear, shallow water over a variety of substrates, ranging from sand and gravel to silt and mud (NatureServe 2007, U.S. Army *et al.* 2006).

Factor A: NatureServe (2007) identifies habitat alteration as a threat to the White Sands pupfish. According to NatureServe (2007), feral horses degrade aquatic habitats; however, no further discussion was provided. We have no information that feral horses occur in that portion of the Tularosa Basin; however, information in our files indicates that oryx (*Oryx gazelle*), an exotic African ungulate, occurs and breeds year long in the area (Rowley 2001). NatureServe (2007) states that missile impact in pupfish habitat may affect or eliminate a population. We have information in our files that missile firing activity occurs in the area (U.S. Army *et al.* 2006). According to NatureServe (2007), surface water withdrawal is prohibited, but military activities, such as road construction, may require the use of groundwater, which may affect the quality of aquatic habitats. NatureServe (2007) states that introduced salt cedar (*Tamarix* spp.) has spread throughout the area occupied by the pupfish and may affect water levels or suitability of pupfish habitat. NatureServe (2007) states that the use of off-road vehicles by recreationalists or for military activities is a threat to the species; however, no further discussion is provided.

Factors B and C: No information was presented in the petition concerning threats to this species from these factors.

Factor D: The White Sands pupfish is managed under the implementation of a management plan jointly administered by NMDGF, the Service, the U.S. National Park Service, Holloman Air Force Base, and White Sands Missile Range (NatureServe 2007). We do not have information on the effectiveness of the implementation of this management plan; however, we will evaluate it more thoroughly during our status review for the species.

Factor E: No information was presented in the petition concerning threats to this species from this factor.

Based on our evaluation of the information provided in the petition, we have determined that the petition presents substantial information to indicate that listing the White Sands pupfish may be warranted, resulting from an exotic ungulate, missile-firing activity, water withdrawal, and the introduced plant salt cedar.

#### Widemouth Blindcat (*Satan eurystomus*)

The widemouth blindcat is a catfish known to occur in five artesian wells penetrating the San Antonio Pool of the Edwards Aquifer in and near San Antonio, Bexar County, Texas (NatureServe 2007).

Factor A: Ono *et al.* (1983) identify decreasing water levels in the Edwards Aquifer and contamination from chemical pollution as threats to the toothless blindcat. The Edwards Aquifer supplies irrigation and drinking water to the area around San Antonio, Texas (Ono *et al.* 1983). Projected increases in the human population around San Antonio will likely result in an increase in water usage which would lower the water level in the aquifer to below the rainfall recharge zone (Ono *et al.* 1983). In addition, Anderson *et al.* (1995) includes local habitat disturbances, such as the alteration of instream flow and eutrophication as threats to the species. Eutrophication is caused by an excess of nutrients, such as nitrogen and phosphorus, which stimulate excessive plant growth that results in the depletion of dissolved oxygen needed by the toothless blindcat.

As such, the species may be vulnerable to pollution and depletion of the aquifer (Ono *et al.* 1983). In addition, Anderson *et al.* (1995) includes local habitat disturbances, such as the alteration of instream flow and eutrophication, as being threats to the species.

Factors B, C, and D: No information was presented in the petition concerning threats to this species from these factors.

Factor E: Competition may be a threat due to the rapid increase of exotic species within the widemouth blindcat's occupied habitat (Anderson *et al.* 1995).

Based on our evaluation of the information provided in the petition, we have determined that the petition presents substantial information to indicate that listing the widemouth blindcat may be warranted due to the present or threatened destruction, modification, or curtailment of its habitat or range other natural or manmade factors affecting its continued existence resulting from water drawdown and pollution, or to other natural or manmade factors affecting its continued existence resulting from competition.

#### Clams

##### Louisiana Pigtoe (*Pleurobema riddellii*)

The Louisiana pigtoe is a freshwater mussel historically known to occur as

far west as the San Jacinto and Trinity Rivers, Texas, eastward through the Neches and Sabine systems into the Red River and Bayou Pierre of north central Louisiana (Howells *et al.* 1996, 1997). We have information in our files that in an extensive survey for mussels throughout Texas, Howells (2006) found the species at only two sites in eastern Texas and concluded that it has declined in Texas in recent decades.

Factor A: NatureServe (2007) indicates that general human modification of the area, including timber cutting, gravel and sand removal, is impacting mussel species within the region. The Louisiana Department of Wildlife and Fisheries (2007) identifies loss of habitat as a result of siltation and impoundments, and stream pollution as threats to the species in that state. Additional threats likely to affect the species in Texas are poor land and water management practices resulting in the loss of mussel habitat (Howells *et al.* 1997) and improper flow control from an upstream dam in the Neches River (Howells 2006).

Factor B: Turgeon *et al.* (1998) identify overharvesting as a threat to mussel species in general; however, no information specific to this species was presented.

Factors C and D: No information was presented in the petition concerning threats to this species from these factors.

Factor E: Turgeon *et al.* (1998) identify contamination by viruses, bacteria, harmful algal blooms, and toxic chemicals as threats to shellfish; however, no information specific to the Louisiana pigtoe was provided. Turgeon *et al.* (1998) also identify competition from introduced species as a threat to mollusk species in general; however, no information specific to the Louisiana pigtoe was provided.

Based on our evaluation of the information provided in the petition, we have determined that the petition presents substantial information to indicate that listing the Louisiana pigtoe may be warranted due to the present or threatened destruction, modification, or curtailment of its habitat or range resulting from general human modification of the water and adjacent land, siltation, impoundments, and water pollution.

##### Sangre de Cristo Peaclam (*Pisidium sanguinichristi*)

The Sangre de Cristo peaclam is a small freshwater clam known to occur in Middle Fork Lake, Taos County, New Mexico (NMDGF 2008). It is found in mud along emergent grasses in sheltered embankments and rocky substrates. NMDGF (2008) cites Taylor (1987), who



suggested the clam may occur in other portions of the southern Rocky Mountains, but his surveys and those initiated by NMDGF in the mid-1990s have failed to find additional occurrences of the clam. We were petitioned to list the Sangre de Cristo peaclam in 1985 by NMDGF. In 1987, we published a finding on the petition indicating that the petitioned action was warranted, but precluded by work on higher priority listings (July 1, 1987; 52 FR 24485). In 1991, we classified this species as a candidate 2, a taxon for which information in our possession indicated that proposing to list was possibly appropriate, but for which persuasive data on biological vulnerability and threat were not available to support a proposed listing rule. On December 5, 1996, we published a rule that discontinued the practice of keeping a list of category 2 candidate species (61 FR 64481), and the Sangre de Cristo peaclam was no longer considered a candidate species.

Factor A: NatureServe (2007) indicates that threats to the clam may include mining, water pollution from fish and forest fire management, and dewatering due to population growth. NMDGF (2008) supports the assertions of NatureServe (2007) in noting that runoff from placer mining and water pollution from fish and forest fire management may threaten the species, but does not speak to the threat of dewatering. NatureServe (2007) provides no discussion indicating whether dewatering due to population growth is occurring in occupied habitats. We do not consider the information presented concerning dewatering to meet the substantial information standard.

Factor B: Turgeon *et al.* (1998) identify overharvesting as a threat to mussel species in general; however, no information specific to this species was presented.

Factor C: No information was presented in the petition concerning threats to this species from this factor.

Factor D: NMDGF (2008) indicates that a conservation assessment plan for this species between the Service, U.S. Forest Service, and NMDGF was formalized in 1996. According to NMDGF (2008), the plan "calls for multi-agency research and management efforts direct at protection of the species." We do not have information on the effectiveness of the implementation of this plan; however, we will evaluate it more thoroughly during our status review for the species.

Factor E: Turgeon *et al.* (1998) identify contamination by viruses, bacteria, harmful algal blooms, and

toxic chemicals as threats to shellfish; however, no information specific to the Sangre de Cristo peaclam was provided. Turgeon *et al.* (1998) also identify competition from introduced species as a threat to mollusk species in general; however, no information specific to the Sangre de Cristo peaclam was provided.

Based on our evaluation of the information provided in the petition, we have determined that the petition presents substantial information to indicate that listing the Sangre de Cristo peaclam may be warranted due to the present or threatened destruction, modification, or curtailment of its habitat or range resulting from water pollution.

#### Southern Purple Lilliput (*Toxolasma corvunculus*)

The southern purple lilliput is a small freshwater mussel reported from Swamp Creek, Whitfield County, Georgia; Village Creek, Jefferson County, Alabama; the Sipsey Fork and Cahaba River in Alabama, and historically from Lake Ashby, Volusia County, Florida (NatureServe 2007). Current information in our files indicates that it may remain in four locations: the Sipsey Fork, Little Cahaba River, two tributaries to the Middle Coosa River, and a site in the Tallapoosa drainage, all within the Mobile River basin of Georgia and Alabama (J. Powell 2009, pers. comm.). According to NatureServe (2007), Isely reported it in 1924 from Cherokee County, Oklahoma, but records remain unconfirmed, and Branson (1982; 1983; 1984) does not include this species in the mussel fauna of Oklahoma. This species is known to inhabit the same tributaries of the Coosa River in which the Georgia pigtoe mussel, interrupted rocksnail, and rough hornsnail have recently been proposed as endangered with critical habitat (74 FR 31114, June 29, 2009).

Factor A: Hurd (1974) indicates that habitat degradation as a result of human activities, such as creation of hydroelectric and other impoundments, and contamination with sewerage, insecticides, and other chemicals, threatens the species. Dams eliminate or reduce river flow within impounded areas, cause sediment deposition, alter water temperature and dissolved oxygen levels, change downstream water flow and quality, affect normal flood patterns, and block upstream and downstream movement of species (74 FR 31114). McGregor *et al.* (2000) also indicates that poor water quality in the Cahaba River from high nutrient inputs may threaten the species there.

Factor B: Turgeon *et al.* (1998) identify overharvesting as a threat to

mussel species in general; however, no information specific to this species was presented.

Factors C and D: No information was presented in the petition concerning threats to this species from these factors.

Factor E: Turgeon *et al.* (1998) identify contamination by viruses, bacteria, harmful algal blooms, and toxic chemicals as threats to shellfish; however, no information specific to the southern purple lilliput was provided. Turgeon *et al.* (1998) also identify competition from introduced species as a threat to mollusk species in general; however, no information specific to the southern purple lilliput was provided.

Based on our evaluation of the information provided in the petition and our files, we have determined that the petition presents substantial information to indicate that listing the southern purple lilliput may be warranted due to the present or threatened destruction, modification, or curtailment of its habitat or range resulting from impoundments and poor water quality.

#### Triangle Pigtoe (*Fusconaia lananensis*)

The triangle pigtoe is a freshwater mussel known to occur in the Neches and San Jacinto Rivers and Village Creek in three counties in eastern Texas (Howells *et al.* 1996, NatureServe 2007). It is known from collections at 45 sites on the Neches River and 13 on the San Jacinto River (Howells *et al.* 1997). It is believed to be extirpated from all but one tributary to the Neches River and possibly extirpated from the San Jacinto River (Howells *et al.* 1997). This species' habitat primarily consists of mixed mud, sand, and fine gravel in small rivers (Howells *et al.* 1996).

Factor A: According to NatureServe (2007) and Howells *et al.* (1997), sand deposition from environmental disturbances to the San Jacinto River has caused either the depletion or extirpation of the species in that river. Howells *et al.* (1997) indicate that the population declines are likely due to poor land and water management practices that have resulted in the loss of mussel habitat.

Factor B: Turgeon *et al.* (1998) identify overharvesting as a threat to mussel species in general; however, no information specific to this species was presented.

Factors C and D: No information was presented in the petition concerning threats to this species from these factors.

Factor E: Turgeon *et al.* (1998) identify contamination by viruses, bacteria, harmful algal blooms, and toxic chemicals as threats to shellfish; however, no information specific to the

triangle pigtoe was provided. Turgeon *et al.* (1998) also identify competition from introduced species as a threat to mollusk species in general; however, no information specific to the triangle pigtoe was provided.

Based on our evaluation of the information provided in the petition, we have determined that the petition presents substantial information to indicate that listing the triangle pigtoe may be warranted due to the present or threatened destruction, modification, or curtailment of its habitat or range resulting from sand deposition, and poor land and water management practices.

### Snails

#### Bylas Springsnail (*Pyrgulopsis arizonae*)

The Bylas springsnail is a small freshwater snail known to occur in three springs on the north bank of the Gila River between Bylas and Pima Arizona (AGFD 2003). According to AGFD (2003), the Bylas springsnail occurs in springs that are mildly thermal, ranging from 26 to 32 degrees Celsius (79 to 90 degrees Fahrenheit). The most abundant submergent vegetation is *Chara* spp., and species of sedges and *Distichlis* (saltgrass) grow along the margins of the springs. The species is most abundant on dead wood, gravel, and pebbles (AGFD 2003). The Bylas springsnail was formerly a candidate 2 species, a taxon for which information in our possession indicated that proposing to list was possibly appropriate, but for which persuasive data on biological vulnerability and threat were not available to support a proposed listing rule. This species has had no Federal Endangered Species Act status since the practice of maintaining a list of candidate 2 species was discontinued in 1996.

Factor A: According to AGFD (2003), the snail is threatened by water development, including pond construction, and habitat degradation due to livestock grazing. AGFD (2003) recommends fencing of the springs to protect them from the effects of grazing.

Factor B, C, and D: No information was presented in the petition concerning threats to this species from these factors.

Factor E: According to AGFD (2003), the species is threatened by its restricted geographic distribution with associated potential for extinction due to chance events. In the absence of information identifying other threats to the species and linking those threats to the restricted geographic distribution of the

species, we do not consider restricted geographic distribution to be a threat.

Based on our evaluation of the information provided in the petition, we have determined that the petition presents substantial information to indicate that listing the Bylas springsnail may be warranted due to the present or threatened destruction, modification, or curtailment of its habitat or range resulting from water modification and livestock grazing.

#### Cook's Peak Woodlandsnail (*Ashmunella macromphala*)

The Cook's Peak woodlandsnail is known to occur on two rock slides, 400 m (1,312 ft) apart, on Cooke's Peak in Luna County, New Mexico, and in a single isolated population located in OK Canyon in Carson National Forest, northern New Mexico (Lang 2000). According to NMDGF (2008), the snails occupy the edges of the talus, where they occur under rocks, soil, and debris. The snail also uses the vegetation surrounding the talus such as oaks (*Quercus* sp.), which provide food and shelter for the species (NMDGF 2008). Fossil shells were found at the base of Cooke's Peak (Metcalf and Smartt 1997) indicating that the species likely occupied more of the mountain. The Cook's Peak woodlandsnail was formerly a candidate 2 species, a taxon for which information in our possession indicated that proposing to list was possibly appropriate, but for which persuasive data on biological vulnerability and threat were not available to support a proposed listing rule. This species has had no Federal Endangered Species Act status since the practice of maintaining a list of candidate 2 species was discontinued in 1996.

Factor A: NatureServe (2007) indicates this species may be threatened by mining activities and wildfire. According to NMDGF (2008), natural perturbations of its habitat such as fire and rockslides, and mining (surface and underground) represent the primary threats to the species. NatureServe (2007) further notes that the mountain occupied by the species is grazed by cattle, but that the rocky slopes occupied by the woodlandsnail are not favored by cattle. Lang (2000) documented grazing at the type locality for this species and notes that although cattle likely don't graze the rocky slopes, intense grazing of the woody vegetation surrounding the rocky slope can potentially decrease leaf litter available as food for snails. To this end, Lang (2000) recommends exclusion of grazing from these areas.

Factors B, C, and D: No information was presented in the petition concerning threats to this species from these factors.

Factor E: Climate change may be a threat, based on fossil evidence that the range has contracted to higher elevations of the mountain occupied by the species (Metcalf and Smartt 1997). Its declining trend is estimated to be 10 to 30 percent due to its range contraction attributed to drying of the climate in the past ten thousand or more years (Metcalf and Smartt 1997), which suggests that the range may continue to contract with continued warming of the climate.

Based on our evaluation of the information provided in the petition, we have determined that the petition presents substantial information to indicate that listing the Cook's Peak woodlandsnail may be warranted due to the present or threatened destruction, modification, or curtailment of its habitat or range, resulting from fire, rockslides, and mining, and to other natural manmade factors affecting its continued existence resulting from climate change.

#### Dona Ana Tallussnail (*Sonorella todseni*)

The Dona Ana tallussnail is known to be restricted to the Dona Ana Mountains, a small mountain range in Dona Ana County, New Mexico (Metcalf and Smartt 1997). According to NatureServe (2007), the known population size is small, estimated at less than 1,000 individuals. Although Sullivan (1997) estimated the occupied range to be 0.4 ha (1.0 ac), Lang (2000) found it at a few additional sites in the mountain range. The Dona Ana tallussnail was formerly a candidate 2 species, a taxon for which information in our possession indicated that proposing to list was possibly appropriate, but for which persuasive data on biological vulnerability and threat were not available to support a proposed listing rule. This species has had no Federal Endangered Species Act status since the practice of maintaining a list of candidate 2 species was discontinued in 1996.

Factors A: NatureServe (2007) stated that the mountain does not appear to have recreational values that would threaten the species. NatureServe (2007) further notes "whether mining is a threat needs to be determined." Lang (2000) indicates extant populations are highly vulnerable to any forms of soil disturbance, including foot traffic by human or cattle, or mining activities, but does not indicate whether these activities are occurring or are likely to

occur in tallusnail habitats. We do not consider the information provided in NatureServe (2007) and Lang (2000) to be meet the substantial information standard.

Factors B and C: No information was presented in the petition concerning threats to this species from these factors.

Factor D: NatureServe (2007) indicates this species is listed by the State of New Mexico as an endangered species, which prohibits collection without a permit; however, overcollection was not identified as a threat under Factor B above. Additionally, NatureServe (2007) notes that a portion of the range of the species occurs on BLM lands in an Area of Critical Concern, although they note that the adequacy of protection due to this designation needs to be reviewed further. We have determined that this information does not meet the substantial information standard.

Factor E: NatureServe (2007) claims that restricted range and low numbers of occurrences of this species are a threat. In the absence of information identifying other threats to the species and linking those threats to the restricted range and rarity of the species, we do not consider restricted range or rarity to be a threat. Old shells found at the base of the small occupied mountain beyond the currently occupied sites (NatureServe 2007) suggest that the range of the species has contracted over time. Sullivan (1997) indicates that range contraction is attributed to drying of the climate in the past 10 thousand years and suggests that the range will continue to contract with continued warming of the climate.

Based on our evaluation of the information provided in the petition, we have determined that the petition presents substantial information to indicate that listing the Dona Ana tallusnail may be warranted due to other natural or manmade factors affecting its continued existence resulting from climate change.

#### Gila Tryonia (*Tryonia gilae*)

The Gila tryonia is a freshwater snail known to occur in springs on the north side of the Gila River between Bylas and Pima in Graham County, Arizona (NatureServe 2007). The species can be found on dead wood, leaves, or stones in spring or springbrooks (Taylor 1987). Its habitat consists of spring sources that are all mildly thermal, ranging from 26 to 32 degrees Celsius (79 to 90 degrees Fahrenheit) (AGFD 2003). The most abundant submergent vegetation is *Chara* spp., and species of sedges and *Distichlis* (saltgrass) grow along the margins of the springs. The Gila tryonia

was formerly a candidate 2 species, a taxon for which information in our possession indicated that proposing to list was possibly appropriate, but for which persuasive data on biological vulnerability and threat were not available to support a proposed listing rule. This species has had no Federal Endangered Species Act status since the practice of maintaining a list of candidate 2 species was discontinued in 1996.

Factor A: According to AGFD (2003), the species is threatened by groundwater depletion and reduction of spring flows. AGFD (2003) further indicates that protection of spring sources is a needed management activity.

Factor B, C, and D: No information was presented in the petition concerning threats to this species from these factors.

Factor E: According to AGFD (2003), the species' restricted geographic distribution makes it vulnerable to extinction due to chance events. In the absence of information identifying other threats to the species and linking those threats to the restricted geographic distribution of the species, we do not consider restricted geographic distribution to be a threat.

Based on our evaluation of the information provided in the petition, we have determined that the petition presents substantial information to indicate that listing the Gila tryonia may be warranted due to the present or threatened destruction, modification, or curtailment of its habitat or range, resulting from groundwater depletion and reduction of spring flows.

#### Grand Wash Springsnail (*Pyrgulopsis bacchus*)

The Grand Wash springsnail is a small freshwater snail known to occur in Grapevine, Whisky, and Tassi springs within the Grand Wash trough, Mohave County, northwestern Arizona (AGFD 2001). Empty shells suspected to be the Grand Wash springsnail were collected from the southern end of the Virgin Mountains, Clark County, southeastern Nevada (AGFD 2001). Where they occur, the snail may be very abundant, in the tens of thousands, with as many as 30 to 50 snails being found on a single submerged cottonwood leaf (AGFD 2001). The Grand Wash springsnail was formerly a candidate 2 species, a taxon for which information in our possession indicated that proposing to list was possibly appropriate, but for which persuasive data on biological vulnerability and threat were not available to support a proposed listing rule. This species has had no Federal

Endangered Species Act status since the practice of maintaining a list of candidate 2 species was discontinued in 1996.

Factor A: According to the AGFD (2001), threats to the snail include groundwater depletion, subsequent loss of spring flows, and habitat degradation due to livestock use. Grapevine and Whiskey springs are fenced to prevent access by livestock, but Tassi Springs is not fenced, and livestock can access the spring complex. We also have information in our files that ungulate grazing causes degradation of spring habitats in Arizona (Service 2008c). AGFD (2001) further indicates that fencing of habitats is a needed management activity.

Factor B, C, D, and E: No information was presented in the petition concerning threats to this species from these factors.

Based on our evaluation of the information provided in the petition, we have determined that the petition presents substantial information to indicate that listing the Grand Wash springsnail may be warranted due to the present or threatened destruction, modification, or curtailment of its habitat or range, resulting from groundwater depletion, loss of spring flows, and livestock use.

#### Huachuca Woodlandsnail (*Ashmunella levettei*)

The Huachuca woodlandsnail is known to occur in Arizona and New Mexico (NatureServe 2007). No further information regarding the historical or current distribution or status of the species was presented.

Factors A, B, C, and D: No information was presented in the petition concerning threats to this species from these factors.

Factor E: Fairbanks and Miller (1983) documented inbreeding and the subsequent loss of heterozygosity (a measure of genetic diversity) in several populations of Huachuca woodlandsnail. We are aware that inbreeding can act as a stressor in small populations.

Based on our evaluation of the information provided in the petition, we have determined that the petition presents substantial information to indicate that listing the Huachuca woodlandsnail may be warranted due to other natural or manmade factors affecting its continued existence resulting from inbreeding.

#### Kingman Springsnail (*Pyrgulopsis conica*)

The Kingman springsnail is known to occur in the Burns, Dripping, and Cool

springs in the Black Mountains near Kingman, Mohave County, Arizona. The species is a gill breather and, therefore, requires perennially flowing water (AGFD 2003). Springsnails in the genus *Pyrgulopsis* are generally found on rock or aquatic plants in moderate current.

Factor A: According to AGFD (2003), the species is threatened by groundwater depletion and reduction of spring flows. AGFD (2003) also states that development is a threat to the species. AGFD (2003) further indicates that protection of the remaining known spring sources is a needed management activity.

Factor B, C, and D: No information was presented in the petition concerning threats to this species from these factors.

Factor E: According to AGFD (2003), the species' restricted geographic distribution makes it vulnerable to extinction due to chance events. In the absence of information identifying other threats to the species and linking those threats to the restricted geographic distribution of the species, we do not consider restricted geographic distribution to be a threat.

Based on our evaluation of the information provided in the petition and in our files, we have determined that the petition presents substantial information to indicate that listing the Kingman springsnail may be warranted due to the present or threatened destruction, modification, or curtailment of its habitat or range resulting from groundwater depletion with loss of spring flow and human development.

#### Mimic Cavesnail (*Phreatodrobia imitata*)

The mimic cavesnail is known from two wells penetrating the Edwards Aquifer, Texas (NatureServe 2007).

Factor A: Several species that occur in the Edwards Aquifer are known to be facing the threats of loss of habitat due to groundwater withdrawal and groundwater contamination (Service 1996). Because the mimic cavesnail co-occurs with these species, it may be facing the same threats.

Factors B, C, D, and E: No information was presented in the petition concerning threats to this species from these factors.

Based on our evaluation of the information provided in the petition, we have determined that the petition presents substantial information to indicate that listing the mimic cavesnail may be warranted due to the present or threatened destruction, modification, or curtailment of its habitat or range resulting from resulting from

groundwater withdrawal and groundwater contamination.

#### Mineral Creek Mountainsnail (*Oreohelix pilsbryi*)

The Mineral Creek mountainsnail is a snail known to occur in a small limestone outcrop in the Black Range mountains of Sierra County, New Mexico (NatureServe 2007; Metcalf and Smartt 1997; Lang 2000). The species can be found in moist limestone crevices and in soil and leaf litter beneath limestone rocks. The occupied patches within the outcrop may total less than 0.4 ha (1 ac). Fossil shells are common throughout much of the outcrop, indicating a larger historic range (NatureServe 2007). The site is on the Gila National Forest (NatureServe 2007).

Factor A: According to NatureServe (2007), threats may include natural disturbances, such as fire and rock slides. Lang (2000) indicates the species is highly vulnerable to any form of soil disturbance or mining activity. NatureServe (2007) further indicates that the area is grazed by livestock, but the snail inhabits rocky areas that are not favored by livestock.

Factor B: According to NatureServe (2007) the site is remote and not easily accessed and does not appear to have recreation values that would threaten the species with overutilization for recreational purposes.

Factor C: No information was presented in the petition concerning threats to this species from this factor.

Factor D: According to NatureServe (2007), the species is listed by the State as endangered, which protects individuals from collection without a permit, but does not protect its habitat. The site is in the Gila National Forest, which must issue permits for mining or other activities that could impact the species.

Factor E: According to NatureServe (2007), the species may be threatened by its narrow range and low number of occurrences. In the absence of information identifying other threats to the species and linking those threats to the limited range of the species, we do not consider limited range to be a threat. NatureServe (2007) also notes that climate change may be a threat, based on fossil evidence that the range has contracted within the limestone outcrop occupied by the species; however, no supporting information was presented that allows us to verify these claims. We have determined that this information does not meet the substantial information standard.

Based on our evaluation of the information provided in the petition, we

have determined that the petition presents substantial information to indicate that listing the Mineral Creek mountainsnail may be warranted due to the present or threatened destruction, modification, or curtailment of its habitat or range resulting from habitat disturbance.

#### Pecos Springsnail (*Pyrgulopsis pecosensis*)

The Pecos springsnail is known to occur in southeastern New Mexico (Taylor 1987). This snail is known only from Blue and Castle springs (Eddy County), which are key habitat areas in the State (NMDGF 2008). The historic range of the Pecos springsnail includes areas in New Mexico, but is not found beyond the State's borders (NMDGF 2008). The species is an aquatic, gilled species found along edges of streams in mud and pebble substrate (NMDGF 2008). At Blue Springs, the species is most common at the spring source. The stream supports dense masses of *Chara* spp. with an abundance of emergent and riparian plants including *Salix* spp. (willows), *Cladium jamaicense* (sawgrass), cattails, and watercress (NMDGF 2008). Flows in this spring are substantial, and the water quality is excellent (NMDGF 2008). At Castle Springs, habitat is smaller and lower in water quality due primarily to lower flows and more frequent flood-scouring of the arroyo into which the spring issues (NMDGF 2008).

Factor A: NMDGF (2008) indicates that a significant threat to the Pecos springsnail is dewatering, which results from diversion, drought, and underground pumping in the area. Additional threats may include loss or alteration of habitat due to pollution from oil and gas exploration and production in the vicinity. According to NMDGF (2008), the problem of flood-scouring is present at both Blue and Castle springs due to improper range-management and the disturbance of surface soils.

Factor B, C, D, and E: No information was presented in the petition concerning threats to this species from these factors.

Based on our evaluation of the information provided in the petition, we have determined that the petition presents substantial information to indicate that listing the Pecos springsnail may be warranted due to the present or threatened destruction, modification, or curtailment of its habitat or range resulting from dewatering, pollution, and flood scouring.

Pinaleno Talussnail (*Sonorella grahamensis*)

The Pinaleno talussnail is a land snail found in rockslides from the northeast slope of Mount Graham south to the vicinity of Arcadia Campground in the Pinaleno Mountains, Graham County, Arizona (AGFD 2003). The Pinaleno talussnail was formerly a candidate 2 species, a taxon for which information in our possession indicated that proposing to list was possibly appropriate, but for which persuasive data on biological vulnerability and threat were not available to support a proposed listing rule. This species has had no Federal Endangered Species Act status since the practice of maintaining a list of candidate 2 species was discontinued in 1996.

Factor A: The species is known to co-occur with the federally endangered Mount Graham squirrel in the Pinaleno Mountains and may be facing threats such as potential intense fires resulting from increased fuel loads (Service 1993, pp. 22). Because fires have been suppressed for a period of time, dead brush and decayed plant matter has built up on top of the talus slopes so that the heat of a large fire may be intense enough to kill the snails in the talus below (AGFD 2003).

Factor B: The snail inhabits land primarily used for recreation; however, the telescope complex on Mount Graham and an increase in camping and recreational sites are not expected to impact these snails to a great extent (AGFD 2003).

Factors C and D: No information was presented in the petition concerning threats to this species from these factors.

Factor E: AGFD (2003) indicates this snail faces restricted and declining distribution with associated potential for extinction due to chance events. In the absence of information identifying other threats to the species and linking those threats to the restricted distribution of the species, we do not consider restricted distribution to be a threat. AGFD (2003) further notes that since 1954, the mimic talussnail (*Sonorella imitator*) is becoming more common over the range previously inhabited by the Pinaleno talussnail, although the reason for and impact of this replacement is unknown.

Based on our evaluation of the information provided in the petition, we have determined that the petition presents substantial information to indicate that listing the Pinaleno talussnail may be warranted due to the present or threatened destruction, modification, or curtailment of its habitat or range resulting from fire.

Quitobaquito Tryonia (*Tryonia quitobaquiae*)

The Quitobaquito tryonia is a freshwater snail known to occur in Quitobaquito Springs, Pima County, Arizona (AGFD 2003). The species has been documented from three springs in the spring complex (NatureServe 2007). According to AGFD (2003), the species requires flowing water and has been extirpated from parts of the spring complex. The Quitobaquito tryonia was formerly a candidate 2 species, a taxon for which information in our possession indicated that proposing to list was possibly appropriate, but for which persuasive data on biological vulnerability and threat were not available to support a proposed listing rule. This species has had no Federal Endangered Species Act status since the practice of maintaining a list of candidate 2 species was discontinued in 1996.

Factor A: According to AGFD (2003), the Quitobaquito tryonia is threatened with habitat loss and degradation from groundwater pumping, water depletion, and growth of thick vegetation which inhibits free flowing water. AGFD (2003) further indicates that protection of spring source and restoration of previously occupied habitats are needed management actions.

Factor B, C, and D: No information was presented in the petition concerning threats to this species from these factors.

Factor E: According to AGFD (2003), the Quitobaquito tryonia is restricted in distribution with the associated potential for extinction due to chance events. In the absence of information identifying other threats to the species and linking those threats to the restricted distribution of the species, we do not consider restricted distribution to be a threat.

Based on our evaluation of the information provided in the petition, we have determined that the petition presents substantial information to indicate that listing the Quitobaquito tryonia may be warranted due to the present or threatened destruction, modification, or curtailment of its habitat or range, resulting from groundwater pumping and loss of free flowing water.

San Xavier Talussnail (*Sonorella eremita*)

The San Xavier talussnail is known from one location in the Mineral Hills of Pima County, Arizona (NatureServe 2007).

Factor A: NatureServe (2007) notes that potential threats include nearby

construction and mining. According to AGFD (2003), development of habitat, including mine expansion and prospecting, may be a threat to the species. AGFD (2003) further indicates that protection of habitat from direct and indirect effects of mining is a needed management activity. We have information readily available in our files indicating that the general area occupied by the talussnail is known for its mining potential (El Paso Natural Gas Company *et al.* 1998).

Factor B: NatureServe (2007) indicates overcollection may be a threat to this species, but provides no additional information indicating that over-collection may be occurring. We have determined that this information does not meet the substantial information standard.

Factor C: AGFD (2003) notes that predation by rodents may be a potential threat to the species, but provides no information indicating that predation is occurring or is likely to occur in the future. We have determined that this information does not meet the substantial information standard.

Factor D: The El Paso Natural Gas Company, Arizona Electric Power Cooperative, AGFD, and Service are parties to a conservation agreement for the San Xavier talussnail that was signed in 1998 (El Paso Natural Gas Company *et al.* 1998). We do not have information on the effectiveness of the implementation of this conservation agreement; however, we will evaluate it more thoroughly during our status review for the species.

Factor E: AGFD (2003) identifies restricted distribution as a threat to the San Xavier talussnail. In the absence of additional information identifying other threats to the species and linking one or more of those threats to the species, we do not consider rarity to be a threat.

Based on our evaluation of the information provided in the petition, we have determined that the petition presents substantial information to indicate that listing the San Xavier talussnail may be warranted due to the present or threatened destruction, modification, or curtailment of its habitat or range as a result of mining activities.

Squaw Park Talussnail (*Maricopella allynsmithi*)

The Squaw Park talussnail is known to occur at Squaw Peak Park and Mummy Mountain in Maricopa County, Arizona. The snail's habitat is north facing talus slopes; fourteen occur in Squaw Peak Park and two on Mummy Mountain (Hoffman 1994). These snails must inhabit very deep, open, talus

where they can seal their shell openings to solid rock while being protected from heat and dryness by rock layers and plants above (AGFD 2009). Some of the sites are within a park managed by the city of Phoenix. The Squaw Park talussnail was formerly a candidate 2 species, a taxon for which information in our possession indicated that proposing to list was possibly appropriate, but for which persuasive data on biological vulnerability and threat were not available to support a proposed listing rule. This species has had no Federal Endangered Species Act status since the practice of maintaining a list of candidate 2 species was discontinued in 1996.

Factor A: According to AGFD (2009), the Squaw Park talussnail is restricted in distribution and may be threatened by residential development, which may modify or destroy its occupied habitat. The city of Phoenix occurs in Maricopa County, and its population is predicted to continue to grow at a rapid rate (Gammage *et al.* 2008, p. 51), which supports the claim that development may threaten the species. AGFD (2009) also states that the species may be threatened by habitat modification or destruction due to human recreational activity such as hiking and climbing off trails.

Factors B, C, D, and E: No information was presented in the petition concerning threats to this species from these factors.

Based on our evaluation of the information provided in the petition and in our files, we have determined that the petition presents substantial information to indicate that listing of the Squaw Park talussnail may be warranted due to the present or threatened destruction, modification, or curtailment of its habitat or range resulting from residential development and recreational activities such as hiking and climbing off trails.

#### Verde Rim Springsnail (*Pyrgulopsis glandulosa*)

The Verde Rim springsnail is a small freshwater snail known to occur in the Nelson Place Spring complex in Yavapai County, Arizona (AGFD 2003). The spring complex has two springs 150 m (500 ft) apart (AGFD 2003). The Verde Rim springsnail was formerly a candidate 2 species, a taxon for which information in our possession indicated that proposing to list was possibly appropriate, but for which persuasive data on biological vulnerability and threat were not available to support a proposed listing rule. This species has had no Federal Endangered Species Act status since the practice of maintaining

a list of candidate 2 species was discontinued in 1996.

Factor A: According to the AGFD (2003), the species is threatened by water development and groundwater depletion. AGFD (2003) further indicates that protection of spring sources is a needed management action.

Factors B, C, and D: No information was presented in the petition concerning threats to this species from these factors.

Factor E: The AGFD (2003) identifies a restricted geographic range as a threat to the species. In the absence of additional information identifying other threats to the species and linking one or more of those threats to the species, we do not consider rarity to be a threat.

Based on our evaluation of the information provided in the petition, we have determined that the petition presents substantial information to indicate that listing the Verde Rim springsnail may be warranted due to the present or threatened destruction, modification, or curtailment of its habitat or range, resulting from water development and groundwater depletion.

#### Wet Canyon Talussnail (*Sonorella macrophallus*)

The Wet Canyon talussnail is a land snail found only in talus slopes above approximately a 1-mile length of Wet Canyon on the northeast slope of the Pinaleno Mountains in Graham County, Arizona (AGFD 2004). No other locations are known at this time. Recent surveys in 2001 and 2002 by the AGFD (2004) documented live talussnails further upstream and downstream in the Wet Canyon watershed than was previously reported, but the identity of the talussnails has not been confirmed. They also reported finding several live unidentified talussnails in the nearby Twilight Canyon drainage, upstream of Highway 366, and in an unnamed drainage uphill of Twilight Creek (AGFD 2004). This species requires a somewhat wetter and possibly a lower elevation habitat when compared to other talus-inhabiting snails (AGFD 2004).

Factor A: Human recreational activity from a nearby campground and hiking trail may negatively impact this species and its habitat by causing talus removal and infilling of the crevices in the talus that the snail occupies (AGFD 2004). Fire suppression in the area has increased fuel loads, which threatens the species with intense wildfires and post-fire ash flows (AGFD 2004). Information readily available in our files supports the assertions by AGFD (2004) that recreational activities and intense

fires represent threats to this species (U.S. Forest Service *et al.* 1999).

Factor B and C: No information was presented in the petition concerning threats to this species from these factors.

Factor D: The U.S. Forest Service, Service, and Arizona Game and Fish Commission are parties to a conservation agreement for the Wet Canyon talussnail that was signed in 1999 (U.S. Forest Service *et al.* 1999). We do not have information on the effectiveness of the implementation of this conservation agreement; however, we will evaluate it more thoroughly during our status review for the species.

Factor E: AGFD (2004) indicates that this species has a highly restricted distribution with associated potential for extinction due to chance events. In the absence of information identifying other threats to the species and linking those threats to the restricted distribution of the species, we do not consider restricted distribution to be a threat.

Based on our evaluation of the information provided in the petition, we have determined that the petition presents substantial information to indicate that listing the Wet Canyon talussnail may be warranted due to the present or threatened destruction, modification, or curtailment of its habitat or range resulting from recreation and fire.

#### Insects

##### Colorado Tiger Beetle (*Cicindela theatina*)

The Colorado tiger beetle, also known as the Great Sand Dunes tiger beetle, is a narrow endemic known only from the sand dunes of the Great Sand Dunes National Park and adjacent lands in the San Luis Valley, Colorado (NatureServe 2007). Adult Colorado tiger beetles prefer sandy slopes with sparse bunches of vegetation, generally less than 15-percent vegetative cover, but are not found on open sand (Pineda and Kondratief 2003, p. 1). Larvae are restricted to burrowing in the cooler, more moist, and leeward, especially northeast, sides of the dunes. Suitable habitat is restricted to 290 square kilometers (Pineda and Kondratief 2003, p. 1). No accurate population estimates are available, although Nature Serve (2007) provided an educated guess of 1000 to 10,000 individuals.

Factor A: (NatureServe 2007) identifies the off-site depletion of groundwater in the San Luis Valley as an imminent threat to the species; it could change the hydrology of the sand dunes, possibly altering moisture gradients in the sands and decreasing

the stability of the dunes. A reduced water table could also result in increased shrubby vegetation, which would reduce the quality of the habitat for the tiger beetle (P. Bovin 2009, pers. comm.). NatureServe (2007) states that visitor use at the park may cause trampling of tiger beetle burrows. Approximately three-quarters of the known tiger beetle locations occur within the Great Sand Dunes National Park, where tiger beetles are generally protected from ground-disturbance impacts, such as off-road vehicles (P. Bovin 2009, pers. comm.). At the remaining known locations of the tiger beetle on lands adjacent to the National Park, access is limited, offering some protection from ground-disturbance impacts (P. Bovin 2009, pers. comm.). It is unclear from the information reviewed the degree to which ground-disturbance may be at threat to the Colorado tiger beetle; however, we intend to investigate the ground-disturbance factor more thoroughly in our status review for the species.

Factors B, C, D, and E: No information was presented in the petition concerning threats to this species from these factors.

Based on our evaluation of the information provided in the petition and in NatureServe, we have determined that the petition presents substantial information to indicate that listing of the Colorado tiger beetle may be warranted due to the present or threatened destruction, modification, or curtailment of its habitat or range resulting from off-site depletion of groundwater.

#### Edwards Aquifer Diving Beetle (*Haideoporus texanus*)

The Edwards Aquifer diving beetle is known to occur in underground freshwater in the San Marcos pool of the Edwards Aquifer, Hays County, Texas. According to NatureServe (2007), it is uncommon in water samples taken from the aquifer.

Factor A: According to NatureServe (2007), the Edwards Aquifer diving beetle is threatened by aquifer drawdown and loss of water quality due to increasing human population growth in large cities using the water supply. We have information in our files that substantiates this claim (Service 1996, pp. 16-19).

Factors B, C, D, and E: No information was presented in the petition concerning threats to this species from these factors.

Based on our evaluation of the information provided in the petition, we have determined that the petition presents substantial information to

indicate that listing the Edwards Aquifer diving beetle may be warranted due to the present or threatened destruction, modification, or curtailment of its habitat or range resulting from water drawdown and loss of water quality due to development.

#### Ferris's Copper (*Lycaena ferrisi*)

Ferris's copper is a butterfly known to occur in the White Mountains of Apache County, near McNary and Maverick, and in Greer County, Arizona (NatureServe 2007). The species can be found in meadows and marshes near *Rumex hymeospalus* (wild rhubarb), the plant species on which the larvae feed (NatureServe 2007).

Factor A: AGFD (2002) indicates that fire suppression is a threat because it results in the invasion of meadow habitats by dense conifer forests and an understory of grasses. Eventual warm season fires could be intense and eliminate some populations or permanently alter previously suitable habitats. Although it is not explicitly stated by AGFD (2002), we interpret their claim that fire suppression is a threat to be because the larval food plant, *Rumex hymeospalus*, and possibly individual larvae, would be destroyed or reduced in abundance as a result of fire suppression.

Factors B, C, D, and E: No information was presented in the petition concerning threats to this species from these factors.

Based on our evaluation of the information provided in the petition, we have determined that the petition presents substantial information to indicate that listing the Ferris's copper may be warranted due to the present or threatened destruction, modification, or curtailment of its habitat or range resulting from fire suppression.

#### Notodontid Moth (no common name) (*Astylys* sp. 1)

This notodontid moth is known to occur in Ash Canyon of the Huachuca Mountains in Cochise County, Arizona. The AGFD (2005) indicates that further study is needed to determine the moth's population status and range, as well as its life history traits.

Factor A: According to AGFD (2005) and NatureServe (2007), this species is threatened by its limited range and that a single event, such as an extensive fire, could destroy or modify its habitat in all or a significant portion of the moth's small range. We have information in our files that fire suppression in southern Arizona forests has resulted in excessive fuel loads that encourage large, vegetation-destroying wildfires (DeBano and Neary 1996; Swetnam and Baisan

1996; Dahms and Geils 1997; Danzer *et al.* 1997).

Factors B, C, D, and E: No information was presented in the petition concerning threats to this species from these factors.

Based on our evaluation of the information provided in the petition and information in our files, we have determined that the petition presents substantial information to indicate that listing of this Notodontid moth species may be warranted due to the present or threatened destruction, modification, or curtailment of its habitat or range resulting from fire.

#### Notodontid Moth (no common name) (*Heterocampa* sp. 1 nr. *amanda*)

This Notodontid moth is known to occur in oak-juniper woodland in southern Arizona. It is known from Ash and Garden Canyons of the Huachuca Mountains, Cochise County, and at two localities in the Atascosa Mountains, Santa Cruz County (AGFD 2005).

Factor A: According to AGFD (2005) and NatureServe (2007), this species is threatened by its limited range and states that a single event, such as an extensive fire, could destroy or modify its habitat in significant portions of the moth's small range. We have information in our files that fire suppression in southern Arizona forests has resulted in excessive fuel loads that encourage large, vegetation-destroying wildfires (DeBano and Neary 1996; Swetnam and Baisan 1996; Dahms and Geils 1997; Danzer *et al.* 1997).

Factors B, C, D, and E: No information was presented in the petition concerning threats to this species from these factors.

Based on our evaluation of the information provided in the petition and information in our files, we have determined that the petition presents substantial information to indicate that listing of this Notodontid moth species may be warranted due to the present or threatened destruction, modification, or curtailment of its habitat or range resulting from fire.

#### Notodontid Moth (no common name) (*Litodonta* sp. 1 nr. *alpina*)

This Notodontid moth is known to occur only in upper Pinery Canyon on the west slope of the Chiricahua Mountains in Cochise County, in southeastern Arizona (AGFD 2005).

Factor A: AGFD (2005) indicates that this species is threatened by its limited range and that a single event, such as an extensive fire, could eliminate significant portions of the moth's small range. We have information in our files that fire suppression in southern

Arizona forests has resulted in excessive fuel loads that encourage large, vegetation-destroying wildfires (DeBano and Neary 1996; Swetnam and Baisan 1996; Dahms and Geils 1997).

Factors B, C, D, and E: No information was presented in the petition concerning threats to this species from these factors.

Based on our evaluation of the information provided in the petition and information in our files, we have determined that the petition presents substantial information to indicate that listing the Notodontid moth may be warranted due to the present or threatened destruction, modification, or curtailment of its habitat or range resulting from fire.

Notodontid Moth (no common name)  
(*Ursia furtiva*)

This Notodontid moth is known to occur from two widely separated locations in San Antonio, Bexar County, and Pine Canyon in the Chisos Mountains, Big Bend National Park, Texas (NatureServe 2007). The San Antonio habitat is on private property, while Big Bend National Park is part of the National Park Service system (NatureServe 2007).

Factor A: NatureServe (2007) indicates that the moth may be threatened by its limited range. A catastrophic fire in the Chisos Mountains and urban development in the San Antonio area could eliminate significant portions of its two known occurrences. Information in our files supports the claim that the City of San Antonio is growing at a rapid rate (Draft Bexar County Karst Invertebrates Recovery Plan, p. 1.5-1).

Factors B, C, D, and E: No information was presented in the petition concerning threats to this species from these factors.

Based on our evaluation of the information provided in the petition, we have determined that the petition presents substantial information to indicate that listing the Notodontid moth may be warranted due to the present or threatened destruction, modification, or curtailment of its habitat or range resulting from fire and development.

Rattlesnake-Master Borer Moth  
(*Papaipema eryngii*)

The rattlesnake-master borer moth is historically known to occur in portions of Illinois, Indiana, Iowa, Kentucky, North Carolina, Oklahoma, Arkansas, and maybe Missouri (NatureServe 2007). As of 2004, the species is believed to be extant in Illinois, Arkansas, Oklahoma, and Kentucky

(NatureServe 2007). The moth appears to have declined more than any of the other prairie moths in the same genus, at least in the northern part of its range (NatureServe 2007). It is apparently restricted to mesic prairies and associated wetlands in the midwest, often but not always with limestone (NatureServe 2007). The rattlesnake-master borer moth was formerly a candidate 2 species, a taxon for which information in our possession indicated that proposing to list was possibly appropriate, but for which persuasive data on biological vulnerability and threat were not available to support a proposed listing rule. This species has had no Federal Endangered Species Act status since the practice of maintaining a list of candidate 2 species was discontinued in 1996.

Factor A: NatureServe (2007) indicates that most or all sites for the moth could be vulnerable to catastrophic events, including wildfires that occur while the species is dormant. NatureServe (2007) also indicates that its prairie habitat has been reduced to remnants except possibly in eastern Oklahoma where it is documented to occur in one county.

Factor B: NatureServe (2007) cites a case in Illinois that documents a collector damaging the moth's needed food plants on a large scale while looking for larvae. It is likely that some of the moth's populations are small enough that overcollecting may be a threat. NatureServe (2007) also notes damage from collectors in Kentucky where the population is small. Specifically, collecting immatures is a potential problem (NatureServe 2007).

Factors C and D: No information was presented in the petition concerning threats to this species from these factors.

Factor E: Due to very low number of populations and the likelihood that most or all have survived major genetic bottlenecks during past fires, loss of genetic variability could be a concern (NatureServe 2007). NatureServe (2007) also indicates that colonization between habitat remnants must be very rare and only plausible today in Oklahoma.

Although the references cited in NatureServe were not readily available to us, the information in NatureServe for this species was provided by Dr. D. F. Schweitzer, who is a reputable lepidopterist. Based on our evaluation of the information provided in the petition, we have determined that the petition presents substantial information to indicate that listing the rattlesnake-master borer moth may be warranted due to the present or threatened destruction, modification, or curtailment of its habitat or range

resulting from fire, or to overutilization for commercial, recreational, scientific, or educational purposes resulting from collection, or to other natural or manmade factors affecting its continued existence resulting from loss of genetic variability and inability to colonize remnant habitat.

Royal Moth (no common name)  
(*Sphingicampa blanchardi*)

This royal moth is known to occur in a few isolated localities in Cameron and Hidalgo Counties, Texas (NatureServe 2007). The range of the moth likely extends into Mexico; however, no occurrences are documented there (NatureServe 2007). No further information regarding the historical or current distribution or status of the species was provided.

Factor A: NatureServe (2007) identifies conversion of habitat to agricultural lands and proposed construction in the area as threats to the royal moth and its habitat. Jahrsdoerfer and Leslie (1988) indicate that native brushland in the Lower Rio Grande Valley, which includes Cameron and Hidalgo Counties, has been converted to agriculture. They claim that agricultural clearing is the greatest threat to the vegetation communities and wildlife in that region. They further explain that habitat alterations likely have been detrimental to the invertebrate fauna as well.

Factors B, C, and D: No information was presented in the petition concerning threats to this species from these factors.

Factor E: NatureServe (2007) identifies pesticide drift from adjacent agricultural lands as a threat to the royal moth. This may be a reasonable assertion considering information in Jahrsdoerfer and Leslie (1988) that extensive agriculture occurs in the Lower Rio Grande Valley; however, no information is presented which indicates that pesticide drift is in fact occurring or how it may be impacting the royal moth. We have determined that this information does not meet the substantial information standard.

Based on our evaluation of the information provided in the petition, we have determined that the petition presents substantial information to indicate that listing this royal moth may be warranted due to the present or threatened destruction, modification, or curtailment of its habitat or range resulting from agricultural clearing.

Sabino Dancer (*Argia sabino*)

The Sabino dancer is a damselfly known to occur in Sabino Canyon in the Santa Catalina Mountains of Arizona. In



Sabino Creek, the species' range has constricted over the past 35 years, previously including Lower and Upper Sabino Creek but now restricted to the latter area (AGFD 2001). It is probable that additional populations of the Sabino dancer exist in other parts of southeastern Arizona or northern Mexico (AGFD 2001). Access to remote high-gradient streams is difficult, and many habitats have never been surveyed (AGFD 2002). The Sabino dancer was formerly a candidate 2 species, a taxon for which information in our possession indicated that proposing to list was possibly appropriate, but for which persuasive data on biological vulnerability and threat were not available to support a proposed listing rule. This species has had no Federal Endangered Species Act status since the practice of maintaining a list of candidate 2 species was discontinued in 1996.

Factor A: AGFD (2001) states that the decline of Sabino dancer's population size and geographic distribution is due to hydrological alteration resulting in reduced water flow. Recreational use of Upper Sabino Creek is controlled by preventing vehicle access and requiring recreationists to access it by a tram (AGFD 2001).

Factor B: No information was presented in the petition concerning threats to this species from this factor.

Factor C: AGFD (2001) indicates that the species' habitat is experiencing pool contraction that increases the likelihood that exotic green sunfish (*Lepomis cyanellus*) and crayfish (*Procambarus* sp.) have the potential to expand their ranges up Sabino Creek into the core of Sabino dancer's current range, increasing predation impacts on the Sabino dancer.

Factor D: No information was presented in the petition concerning threats to this species from this factor.

Factor E: AGFD (2001) indicates that the species' habitat is experiencing pool contraction that may have direct negative effects on the Sabino dancer larvae, reducing the time available for larval development.

Based on our evaluation of the information provided in the petition, we have determined that the petition presents substantial information to indicate that listing the Sabino dancer may be warranted due to the present or threatened destruction, modification, or curtailment of its habitat or range resulting from hydrological alteration resulting in reduced water flow, to disease and predation resulting from pool contraction that allows increased predation, or to other natural or manmade factors affecting its continued

existence resulting from decreased time for larval development.

#### Stonefly (no common name) (*Anacroneuria wipukupa*)

This stonefly is only known to occur in Oak Creek, Yavapai County, Arizona (NatureServe 2007). NatureServe (2007) notes that it may also occur in similar habitats in Sonora, Mexico.

Factor A: According to AGFD (2004), threats to the stonefly may include impacts to its aquatic habitats, especially pollution. Information in our files substantiates this claim. The site is in close proximity to a State fish hatchery, which appears to drain fish-rearing waste water into Oak Creek, and it is downstream from the town of Sedona (D. Smith 2009, pers. comm.). In the spring of 2008, David Smith, a Service biologist, visited the site and found most of the aquatic insects there were tolerant of higher nutrients in the water (D. Smith 2009, pers. comm.), which is indicative of pollution.

Factors B, C, D, and E: No information was presented in the petition concerning threats to this species from these factors.

Based on our evaluation of the information provided in the petition, we have determined that the petition presents substantial information to indicate that listing this stonefly may be warranted due to the present or threatened destruction, modification, or curtailment of its habitat or range as a result of pollution.

#### Tamaulipan Agapema (*Agapema galbina*)

The Tamaulipan agapema is a moth known to occur in the lower Rio Grande Valley of Texas, in southern Arizona, and in Tamaulipas and Baja California, Mexico (Struttman 1997). The species is thought to be extirpated from the United States portion of its range (Struttman 1997), but is currently known to occur in Tamaulipas, Mexico (Tuskes *et al.* 1996). In Tamaulipas and formerly in Texas, its habitat is Tamaulipan thornscrub, which is open, low vegetation characterized by thorny trees with short trunks and low, branching crowns that rarely meet to form a closed canopy.

Factor A: Jahrsdoerfer and Leslie (1988) indicate this species faces the loss and degradation of its habitat in the Lower Rio Grande Valley. With the conversion of its Tamaulipan thornscrub habitat there to agricultural field crops, such as cotton, only up to 5 percent of native vegetation remained in the 1980s and 1990s (Jahrsdoerfer and Leslie 1988; Tuskes *et al.* 1996).

Factors B, C, D, and E: No information was presented in the petition concerning threats to this species from these factors.

Based on our evaluation of the information provided in the petition, we have determined that the petition presents substantial information to indicate that listing of Tamaulipan agapema may be warranted due to the present or threatened destruction, modification, or curtailment of its habitat resulting from its conversion to agricultural field crops.

#### Arachnid

##### Grand Canyon Cave Scorpion (*Archeolarca cavicola*)

The Grand Canyon cave scorpion is a pseudoscorpion, lacking a stinger that true scorpions possess (AGFD 2003). It occurs on or very near the soil surface in Cave of the Domes, Grand Canyon National Park, Coconino County, Arizona. The subterranean cave habitat is also occupied by bats and rodents, which are thought to be necessary to support the arthropod food base for the Grand Canyon cave scorpion (AGFD 2003). This pseudoscorpion was formerly a candidate 2 species, a taxon for which information in our possession indicated that proposing to list was possibly appropriate, but for which persuasive data on biological vulnerability and threat were not available to support a proposed listing rule. This species has had no Federal Endangered Species Act status since the practice of maintaining a list of candidate 2 species was discontinued in 1996.

Factor A: According to AGFD (2003), threats to the scorpion include groundwater pollution and recreational impacts from cave visitation.

Factors B and C: No information was presented in the petition concerning threats to this species from these factors.

Factor D: AGFD (2003) indicates that Cave of the Domes is the only cave in Grand Canyon National Park for which visitation is not regulated, although the National Park Service has the authority to regulate recreational visitation.

Factor E: No information was presented in the petition concerning threats to this species from this factor.

Based on our evaluation of the information provided in the petition, we have determined that the petition presents substantial information to indicate that listing the Grand Canyon cave scorpion may be warranted due to the present or threatened destruction, modification, or curtailment of its habitat or range resulting from groundwater pollution and recreational

impacts, and to inadequacy of existing regulatory mechanisms resulting from unregulated visitation.

### Crustaceans

#### Delaware County Cave Crayfish (*Cambarus subterraneus*)

The Delaware County cave crayfish is thought to be restricted to three caves in Delaware County, Oklahoma (Hobbs 1993, NatureServe 2007) in the Neosho River watershed. No additional populations have been found despite recent surveys of over 50 caves that provide suitable habitat within the vicinity of the occupied caves (Graening and Fenolio 2005). The species is considered to have fewer than 50 individuals in the three different caves (NatureServe 2007).

Factor A: NatureServe (2007) identifies groundwater contamination, specifically the disposal of untreated animal waste from hog farms and poultry houses, as the greatest threat to this species. In a study of the recharge areas for groundwater impacting two of the three caves, Aley and Aley (1990) identified petroleum storage areas, including gas stations and sawmills; large storage tanks that might contain petroleum; confined hog and poultry buildings; dairies and livestock sale barns; and dumps, landfills, and auto salvage yards within the recharge areas of the caves. They identified six such sites in the recharge area for one cave and five in the recharge area of the other and concluded that these were potential sources of water pollution for those two caves. They also concluded that disposal of untreated animal wastes is probably the greatest single threat to aquatic life in those caves.

Factors B, C, D, and E: No information was presented in the petition concerning threats to this species from these factors.

Based on our evaluation of the information provided in the petition, we have determined that the petition presents substantial information to indicate that listing of Delaware County cave crayfish may be warranted due to the present or threatened destruction, modification, or curtailment of its habitat resulting from pollution.

#### Kiamichi Crayfish (*Orconectes saxatilis*)

The Kiamichi crayfish is known to occur in the upper Kiamichi River and its associated tributaries above Whitesboro, Oklahoma (NatureServe 2007). The species can be found in slowly to moderately flowing streams with rocky bottoms, and usually with emergent vegetation, such as *Typha* sp. (cattails), in shallower areas

(NatureServe 2007). Historically, the Kiamichi crayfish was known from fewer than 20 adults until a recent survey in which 696 individuals were found 7 rivers in the upper Kiamichi River watershed in Oklahoma. The Kiamichi crayfish is known to co-occur with Ouachita rock pocketbook (*Arkansia wheeleri*), a federally endangered mussel, which suggests the species faces the same threats listed in the Ouachita rock pocketbook recovery plan (Service 2004, pp. 20-30).

Factor A: Impoundment, channelization, and water quality degradation have been identified as principal factors causing the decline of the Ouachita rock pocketbook (Service 2004, p. 20), and since it co-occurs with the Kiamichi crayfish, we conclude these same factors may threaten that species as well. NatureServe (2007) identifies dewatering as a threat to the Kiamichi crayfish. Surface water in the Kiamichi River watershed is the primary source of drinking water and the proposed site of additional water resource development projects needed to meet the demands of the growing population in neighboring States. These proposed projects may cause stream drying and may play a role in the decline in Kiamichi crayfish. Siltation resulting from poor tree-harvesting techniques, road construction, or large-scale changes in land use is also identified as a threat to the species (NatureServe 2007).

Factors B, C, D, and E: No information was presented in the petition concerning threats to this species from these factors.

Based on our evaluation of the information provided in the petition, we have determined that the petition presents substantial information to indicate that listing the Kiamichi crayfish may be warranted due to the present or threatened destruction, modification, or curtailment of the species' habitat or range resulting from impoundment, channelization, water quality degradation, and dewatering.

#### Oklahoma Cave Crayfish (*Cambarus tartarus*)

The Oklahoma cave crayfish is known to occur at two caves in a single watershed of Spavinaw Creek, a small creek in Delaware County, Oklahoma, and potentially at three additional caves in that watershed (Graening *et al.* 2006). Graening *et al.* (2006) estimate the species' abundance to be 80 individuals. The Oklahoma cave crayfish was formerly a candidate 2 species, a taxon for which information in our possession indicated that proposing to list was possibly appropriate, but for which

persuasive data on biological vulnerability and threat were not available to support a proposed listing rule. This species has had no Federal Endangered Species Act status since the practice of maintaining a list of candidate 2 species was discontinued in 1996.

Factor A: Spavinaw Creek is designated an impaired waterbody by the State of Oklahoma under section 303(d) of the Clean Water Act due to excessive nutrient loading; many confined animal feeding operations occur upstream from the caves in which this species occurs, and the City of Colcord discharges sewage effluent into the Spavinaw Creek Watershed (Graening *et al.* 2006). Graening *et al.* (2006) noted that cave crayfish are likely susceptible to contaminants in cave water due to adaptations to otherwise stable conditions and as a result of the species' longevity which could allow toxins to accumulate to lethal levels. Graening *et al.* (2006) further indicate this species remains vulnerable to extirpation, primarily because of water quality degradation and recent habitat transformation.

Factor B, C, D, and E: No information was presented in the petition concerning threats to this species from these factors.

Based on our evaluation of the information provided in the petition, we have determined that the petition presents substantial information to indicate that listing the Oklahoma Cave crayfish may be warranted due to the present or threatened destruction, modification, or curtailment of its habitat or range resulting from water pollution and habitat transformation.

#### Texas Troglobitic Water Slater (*Lirceolus smithii*)

The Texas troglobitic water slater is an isopod known to occur in an aquifer under several counties in central Texas (NatureServe 2007), the Edwards Aquifer, which supports numerous species of underground aquatic species (Service 1996, pp. 16-19). Within its limited range, it is considered to be abundant (NatureServe 2007). Records of its occurrence represent different sampling sites rather than different populations within its occupied range (NatureServe 2007).

Factor A: NatureServe (2007) identified aquifer drawdown and declining water quality in the aquifer as threats to the species. Drawdown of the Edwards Aquifer's water level and decreasing water quality are the result of a rapid population increase (Service 1996, pp. 16-19) in that area of Texas.

Factors B, C, D, and E: No information was presented.

Based on our evaluation of the information provided in the petition and our files, we have determined that the petition presents substantial information to indicate that listing of the Texas troglitic water slater may be warranted due to the present or threatened destruction, modification, or curtailment of its habitat or range resulting from aquifer drawdowns and decreasing water quality.

### Flowering Plants

*Agalinis navasotensis* (Navasota False Foxglove)

*Agalinis navasotensis* is an herbaceous plant in the family scrophulariaceae that is known from Grimes County, Texas. One population of approximately 330 individuals is located on the shallow soil of a sandstone outcrop (Canne-Hilliker and Dubrule 1993; NatureServe 2007). There are two subpopulations, one with approximately 300 individuals and one with approximately 30 (Canne-Hilliker and Dubrule 1993). Canne-Hilliker and Dubrule (1993) describe the outcrop as a distinct island surrounded by a sea of post oak savannah, blackland prairie, and farmland. Similar outcrops may harbor additional populations (NatureServe 2007), although there are no other such outcrops in that county (Canne-Hilliker and Dubrule 1993).

Factor A: NatureServe (2007) states that the most likely foreseeable threat to the *Agalinis navasotensis* is habitat degradation and loss. Individual plants are reported to occur close to a road, making them and their habitat susceptible to destruction from road widening (Canne-Hilliker and Dubrule 1993; NatureServe 2007). Road widening would probably destroy the main subpopulation (Canne-Hilliker and Dubrule 1993; NatureServe 2007). There are no known plans to put the site into cultivation or to graze it (NatureServe 2007). Trampling by humans and off-road vehicle use are potential threats because the site is not fenced (Canne-Hilliker and Dubrule 1993; NatureServe 2007).

Factor B, C, D, and E: No information was presented in the petition concerning threats to this species from these factors.

Based on our evaluation of the information provided in the petition, we have determined that the petition presents substantial information to indicate that listing of *Agalinis navasotensis* may be warranted due to the present or threatened destruction, modification, or curtailment of its

habitat or range resulting from road widening, trampling, and off-road vehicle use.

*Amoreuxia gonzalezii* (Santa Rita Yellowshow)

*Amoreuxia gonzalezii* is an herbaceous plant known to occur from Santa Cruz and Pima Counties, Arizona, south to Sonora, Mexico, and probably Baja California (AGFD 2003; NatureServe 2007). It has been reported from two subpopulations in the Santa Rita Mountains, in Pima County and from four populations in northern Mexico (NatureServe 2007). In Arizona, *A. gonzalezii* grows on rocky limestone hillsides, but in Sonora, Mexico, it prefers decomposed granite on slopes (AGFD 2003). One of the Arizona populations of *A. gonzalezii* has fewer than 65 plants on a limestone outcrop (AGFD 2003).

Factor A: According to NatureServe (2007), *Amoreuxia gonzalezii* is threatened by degradation of habitat due to livestock grazing, urban development, and mining. AGFD (2003) concurs, but points out that the grazing threat is due to herbivory, not habitat degradation (see Factor C).

Factor B: No information was presented in the petition concerning threats to this species from these factors.

Factor C: Herbivory by cattle is a management problem because the species is very palatable to cattle (AGFD 2003; NatureServe (2007). Javelina (*Pecari tajacu*) dig up and consume the roots, which NatureServe (2007) and AGFD (2003) indicate is a threat.

Factor D: No information was presented in the petition concerning threats to this species from this factor.

Factor E: According to AGFD (2003), competition is likely occurring with the introduced *Cenchrus ciliaris* (buffelgrass), *Eragrostis lehmanniana* (Lehmans lovegrass), and other aggressive, exotic plants.

Based on our evaluation of the information provided in the petition, we have determined that the petition presents substantial information to indicate that listing of *Amoreuxia gonzalezii* may be warranted due to the present or threatened destruction, modification, or curtailment of its habitat or range resulting from development and mining, to predation by cattle and javelina, and to other natural or manmade factors affecting its continued existence resulting from competition.

*Amsonia tharpia* (Tharp's Blue-star)

*Amsonia tharpia* is an herbaceous plant found in open areas in shortgrass grasslands or shrublands in Eddy

County, New Mexico, and Pecos County, Texas. Soils are shallow, well-drained, and generally composed of sand, silt, and clay over limestone (NatureServe 2007). One population in New Mexico is small with less than 100 plants and the other two contain a few thousand individuals (NatureServe 2007).

Factor A: NatureServe (2007) indicates that habitat degradation and loss is a likely threat. In New Mexico, Desert Botanical Garden (2008) indicates that *Amsonia tharpia* is subject to extirpation due to environmental changes brought about by improper grazing, such as severe erosion resulting in loss of habitat. Regular monitoring of the New Mexico populations may also cause additional erosion (NatureServe 2007). There is active gas development in the vicinity of two of the New Mexico populations (New Mexico Rare Plant Technical Council 1999). In Texas, *Amsonia tharpia* may be threatened by mowing of the highway easement along which plants grow (NatureServe 2007).

Factor B, C, and D: No information was presented in the petition concerning threats to this species from these factors.

Factor E: According to the Desert Botanical Garden (2008), environmental changes brought about by past improper grazing such as change in species composition has resulted in increased competition with nonnative species.

Based on our evaluation of the information provided in the petition, we have determined that the petition presents substantial information to indicate that listing of *Amsonia tharpia* may be warranted due to the present or threatened destruction, modification, or curtailment of its habitat or range resulting from erosion, gas development and mowing, or other natural or manmade factors affecting its continued existence resulting from competition.

*Asclepias prostrata* (Prostrate Milkweed)

*Asclepias prostrata* is a perennial, low-growing plant found in areas of little or no vegetation in grasslands or shrub-invaded grasslands within Starr and Zapata Counties, Texas and Tamaulipas, Mexico (NatureServe 2007). It is reportedly known from fewer than 10 occurrences in southern Texas (NatureServe 2007), at least four of which are along roadsides (Damude and Poole 1990).

Factors A, B, C, and D: No information was presented in the petition concerning threats to this species from these factors.

Factor E: NatureServe (2007) indicates that roadside mowing is a threat to

*Asclepias prostrata*. Damude and Poole (1990) indicate that frequent roadside mowing can cut individuals of the species if the mowing blade is set low enough. NatureServe (2007) further indicates that *Asclepias prostrata* is threatened by competition from widely planted and escaped nonnative pasture grasses, such as *Cenchrus ciliaris* (buffelgrass) (NatureServe 2007). According to Damude and Poole (1990), seeding *Cenchrus ciliaris* for pasture improvement has introduced a competitor to *Asclepias prostrata* that may be the greatest threat to the species.

Based on our evaluation of the information provided in the petition, we have determined that the petition presents substantial information to indicate that listing of *Asclepias prostrata* may be warranted, resulting from roadside mowing and planting of an exotic grass.

*Astragalus hypoxylus* (Huachuca Milk-vetch)

*Astragalus hypoxylus* is an herbaceous plant found on hillsides with slopes of 25 to 30 percent in open, limestone rocky clearings in oak-juniper-pinyon woodland within the Huachuca and Patagonia Mountains of Arizona. Despite surveys for the species in Sonora, Mexico, it has not been found there (NatureServe 2007). *Astragalus hypoxylus* was described from a collection made in the Huachuca Mountains in 1882. The description of the location of where the specimen was found, "Mahoney's Ranch, near Ft. Huachuca", was not sufficient to relocate the site (NatureServe 2007). The species was not seen again in the field until a collection in 1986 in the Patagonia Mountains south of Harshaw (NatureServe 2007). Searches elsewhere in the Patagonia Mountains have not extended the known range in that area by more than 1 mile (NatureServe 2007). Since 1986, other populations of *A. hypoxylus* have been located in the Huachuca Mountains. One population was found on the southwest side of the Huachuca Mountains near lower Bear Canyon along Bear Creek (NatureServe 2007). Another population was located in Scotia Canyon in 1990, and as many as 600 to 700 individuals were found there in the spring of 1991. The majority of the Scotia Canyon population is located on private land, and the other sites are managed by the Coronado National Forest (AGFD 1999). According to AGFD (1999), the Bear Creek population is extirpated, but NatureServe (2007) cites a personal communication with T. Deecken and indicates that the population there

occurs in a collection of sub-populations.

Factor A: According to AGFD (1999) and NatureServe (2007), improper grazing has the greatest impact to the species and its habitat. Seedling survivorship was found to be lower in heavily trampled areas at that site (NatureServe 2007). Livestock grazing occurs at all of the known sites (NatureServe 2007). According to AGFD (1999), recreation at the Bear Creek site also results in destruction of *Astragalus hypoxylus* and its habitat, and NatureServe (2007, citing T. Deecken) considers recreation to be a greater threat to that population than livestock grazing. An informal dirt parking lot has already damaged one sub-population and its habitat, and increased use of the area may destroy other plants and habitat in the future (NatureServe 2007, citing T. Deecken).

Factor B, C, and D: No information was presented in the petition concerning threats to this species from these factors.

Factor E: NatureServe (2007) indicates that possible indirect threats to the species could come from threats to the bee population; bees are the main pollinators for *Astragalus hypoxylus*. Pesticide use and the trampling of occupied bee nests may be harmful to the bees and, ultimately, to the plants they pollinate (Karron 1991, NatureServe 2007).

Based on our evaluation of the information provided in the petition, we have determined that the petition presents substantial information to indicate that listing of *Astragalus hypoxylus* may be warranted due to the present or threatened destruction, modification, or curtailment of its habitat or range resulting from recreation and livestock grazing and other natural or manmade factors affecting its continued existence resulting from impacts to its pollinator.

*Castilleja ornata* (Glowing Indian-paintbrush)

*Castilleja ornata* is an herbaceous plant known to occur in western Chihuahua and west-central Durango, Mexico; and at a single site in Hidalgo County in southwestern New Mexico (NatureServe 2007). The plant is a predominantly Mexican species, but is possibly now extinct there (NatureServe 2007). NatureServe (2007) indicates that *Castilleja ornata* occurs in flat seasonally wet areas in arid grasslands. According to New Mexico Rare Plant Technical Council (1999), searches of historical collection sites in Chihuahua failed to locate a single population there.

Factor A: NatureServe (2007) and the New Mexico Rare Plant Technical Council (1999) indicate that the seasonally wet habitat of *Castilleja ornata* is often improperly grazed or converted to cultivated cropland. According to New Mexico Rare Plant Technical Council (1999), the sites in Chihuahua, Mexico, were fully converted to agriculture.

Factor B, C, D, and E: No information was presented in the petition concerning threats to this species from these factors.

Based on our evaluation of the information provided in the petition, we have determined that the petition presents substantial information to indicate that listing of *Castilleja ornata* may be warranted due to the present or threatened destruction, modification, or curtailment of its habitat or range resulting from improper grazing or conversion to cultivated cropland.

*Erigeron piscaticus* (Fish Creek Fleabane)

*Erigeron piscaticus* is an herbaceous plant found in moist, sandy canyon bottoms associated with continuously flowing streams. It is known historically from two sites in Fish Creek Canyon, Superstition Mountains, Maricopa County; and Turkey Creek and Oak Grove Canyon (Aravaipa Canyon tributaries), Galiuro Mountains, Graham County, Arizona (AGFD 2001). Currently, it is known only from the Oak Grove Canyon location, which has been annually monitored since 1992 (AGFD 2001). According to AGFD (2001), surveys conducted in 1993 and 1994 at the Oak Grove Canyon site found 79 plants in both years, which suggests that the population is small, but stable. Two surveys conducted in 1994 showed continued population stability, and greater germination after summer rains, evidence that plants can germinate and flower following summer rains (AGFD 2001). *Erigeron piscaticus* was formerly a candidate 2 species, a taxon for which information in our possession indicated that proposing to list was possibly appropriate, but for which persuasive data on biological vulnerability and threat were not available to support a proposed listing rule. This species has had no Federal Endangered Species Act status since the practice of maintaining a list of candidate 2 species was discontinued in 1996.

Factor A: According to AGFD (2001), the location at Turkey Creek was in area used as a casual camping site; the Oak Grove Canyon site, the only site where the species is known to be extant, is also used for camping. There is also hiking

traffic at the site, which can destroy or modify the habitat (AGFD 2001). AGFD (2001) indicates poor watershed conditions and flooding in Oak Grove Canyon also threaten the species with habitat loss or modification.

Factors B, C and D: No information was presented in the petition concerning threats to this species from these factors.

Factor E: According to AGFD (2001), the small range and population size of about 80 plants in Oak Grove Canyon make it vulnerable to natural and human-caused disturbances. In the absence of information identifying other threats to the species and linking those threats to the restricted range of the species, we do not consider restricted range to be a threat.

Based on our evaluation of the information provided in the petition and our files, we have determined that the petition presents substantial information to indicate that listing of *Erigeron piscaticus* may be warranted due to the present or threatened destruction, modification, or curtailment of its habitat or range resulting from recreational activities, poor watershed conditions, and flooding.

*Eriogonum mortonianum* (Morton's Wild Buckwheat)

*Eriogonum mortonianum* is a woody perennial plant known from a single site on the Kaibab-Paiute Indian Reservation in Mojave County, Arizona. The species is usually found along small drainages in red clay hills of very shallow soils containing gypsum within sandstone and shale uplands (AGFD 2001; NatureServe 2007). AGFD (2001) reports that in 1980 the population contained approximately 750 plants and at that time appeared stable with several size and age classes represented.

Factor A: NatureServe (2007) reports that in 1992, many plants were destroyed by highway maintenance. According to AGFD (2001), *Eriogonum mortonianum* is threatened by highway right-of-way maintenance along State Highway 389 which would modify the habitat. AGFD (2001) also identifies livestock use and developments associated with livestock use as threats to the species.

Factors B, C, and D: No information was presented in the petition concerning threats to this species from these factors.

Factor E: According to AGFD (2001), the highly restricted geographic distribution is a management issue for the species. In the absence of information identifying other threats to the species and linking those threats to

the restricted geographic distribution of the species, we do not consider restricted geographic distribution to be a threat.

Based on our evaluation of the information provided in the petition, we have determined that the petition presents substantial information to indicate that listing of *Eriogonum mortonianum* may be warranted due to the present or threatened destruction, modification, or curtailment of its habitat or range resulting from road maintenance and livestock use.

*Genistidium dumosum* (Brush-pea)

*Genistidium dumosum* is a woody shrub known to occur in Brewster County, Texas, and Coahuila, Mexico (NatureServe 2007). The genus is monotypic (contains only one species) (Poole 1992, NatureServe 2007). There are three Texas occurrences within a few km of one another, and three in Mexico. The Texas occurrences consist of fewer than 50 plants (Poole 1992; NatureServe 2007). The status of the Mexican occurrences is unknown, although they are disjunct from the Texas occurrences and may differ genetically from them (Poole 1992). *Genistidium dumosum* was formerly a candidate 2 species, a taxon for which information in our possession indicated that proposing to list was possibly appropriate, but for which persuasive data on biological vulnerability and threat were not available to support a proposed listing rule. This species has had no Federal Endangered Species Act status since the practice of maintaining a list of candidate 2 species was discontinued in 1996.

Factor A: According to Poole (1992), highway construction at one of the Texas occurrences probably initially destroyed a few plants, and erosion of roadcuts probably threatens a few more. Any future highway widening could destroy additional plants and their habitat at that site (Poole 1992). Poole (1992) also reports that a tract of private land was developed for an annual recreational event, which may threaten the species and its habitat with destruction or modification from trampling, erosion and wildfire.

Factor B: According to Poole (1992), individuals at the highway site in Texas are threatened by collection pressure due to easy access to the site and the rarity and uniqueness (being in a monotypic genus) of the species.

Factors C and D: No information was presented in the petition concerning threats to this species from these factors.

Factor E: Although individuals of *Genistidium dumosum* occasionally produce numerous fruits, no seedlings

or juveniles have been observed (Poole 1992). Poole (1992) concluded that the major threat to the species is its low population numbers and lack of recruitment (survival of individuals to sexual maturity and joining the reproductive population).

Based on our evaluation of the information provided in the petition, we have determined that the petition presents substantial information to indicate that listing *Genistidium dumosum* may be warranted due to the present or threatened destruction, modification, or curtailment of its habitat or range resulting from highway construction and recreation, or to overutilization resulting from collection, or to other natural or manmade factors affecting its continued existence resulting from lack of recruitment.

*Hexalectris revoluta* (Chisos Coralroot)

*Hexalectris revoluta* is an orchid known from widely separated mountain ranges in Texas, Arizona, and Mexico (NatureServe 2007). Few total individuals of this species have been located throughout its range; however, surveys may be difficult because above ground portions of this plant are not produced in dry years (NatureServe 2007). *Hexalectris revoluta* was formerly a candidate 2 species, a taxon for which information in our possession indicated that proposing to list was possibly appropriate, but for which persuasive data on biological vulnerability and threat were not available to support a proposed listing rule. This species has had no Federal Endangered Species Act status since the practice of maintaining a list of candidate 2 species was discontinued in 1996.

Factor A: Louie (1996) indicates this species is subject to inadvertent destruction through maintenance activities, but does not identify the types of maintenance activities likely to occur in occupied habitats. We have determined that this information does not meet the substantial information standard. AGFD (2004) identifies mining as a threat to this species. Citing Coleman (2002), AGFD (2004) notes "some of its habitat in Arizona is at extreme risk from mining development. One of its major locations was briefly part of a planned land exchange between the U.S. Forest Service and a mining company until falling copper prices forced postponement of the deal."

Factor B: NatureServe (2007) and Louie (1996) indicate that collection may be a threat to this species, but provide no additional information concerning the likelihood of overcollection or the impacts to the

species of these activities. We have determined that this information does not meet the substantial information standard.

Factors C, D, and E: No information was presented in the petition concerning threats to this species from these factors.

Based on our evaluation of the information provided in the petition, we have determined that the petition presents substantial information to indicate that listing *Hexalectris revoluta* may be warranted due to the present or threatened destruction, modification, or curtailment of its habitat or range as a result of mining development.

*Lesquerella kaibabensis* (Kaibab Bladderpod)

*Lesquerella kaibabensis* is a perennial herb known to occur in the Kaibab Plateau in the Kaibab National Forest in Coconino County, Arizona (NatureServe 2007). It occurs on limestone-clay knolls with a high percentage of exposed rock on the surface, within open windswept meadows and along the sides of a State highway (AGFD 2001).

Factor A: NatureServe (2007) identifies road widening and maintenance as a threat to *Lesquerella kaibabensis*. According to AGFD (2001), the Forest Service Regional Botanist at the time made specific recommendations for widening of the State highway intended to minimize the impact to *Lesquerella kaibabensis*. However, those recommendations were not followed (AGFD 2001). NatureServe (2007) also identifies OHV use in occupied meadows as a threat to the species. AGFD (2001) and NatureServe (2007) acknowledge that the Kaibab National Forest has prohibited all OHV in the meadows adjacent to the State highway, but neither addresses whether the prohibition is effectively enforced.

Factor B: No information was presented in the petition concerning threats to this species from this factor.

Factor C: NatureServe (2007) identifies grazing as a threat to *Lesquerella kaibabensis*. According to AGFD (2001) the Kaibab National Forest Plan establishes that livestock utilization in these meadows should not exceed 30 percent, but utilization probably exceeds this level in most years.

Factors D and E: No information was presented in the petition concerning threats to this species from these factors.

Based on our evaluation of the information provided in the petition, we have determined that the petition presents substantial information to indicate that listing *Lesquerella kaibabensis* may be warranted due to

the present or threatened destruction, modification, or curtailment of its habitat or range resulting from highway widening and maintenance and OHV use or to disease or predation resulting from grazing.

*Paronychia congesta* (Bushy Whitlow-wort)

*Paronychia congesta* is a woody perennial shrub known to occur in openings in shrublands on calcareous outcrops of a particular geologic formation, the Bordas Escarpment in Jim Hogg County, Texas (NatureServe 2007). This species was removed from the Service's list of candidate species for listing under the Act on September 12, 2006 (71 FR 53755). The two known populations occur within two miles of each other. The species was first collected in 1963 at a site where the population was estimated to have 2,000 plants; a second locality was found nearby in 1987 was estimated then to have 100 plants (Service 2006). In 1987, five additional sites were searched, but the species was not found at them (Service 2006). The known occupied sites are on private land, which has not been accessed since the early 1990s (Service 2006).

Factor A: NatureServe (2007) states that *Paronychia congesta* may be threatened by right-of-way construction and maintenance, pipeline installation, oil and gas exploration, and well pad construction. Both populations occur on private rangeland that overlays oil fields, and are bisected by rights-of-way (NatureServe 2007), one by a road and the other by a pipeline (Service 2006). *Paronychia congesta* may also be threatened by brush clearing, herbicide use, and replanting to nonnative forage grasses, such as *Pennisetum ciliare* (Service 2006). However, the practice of replanting to nonnative forage grasses may be declining (NatureServe 2007).

Factor B, C, and D: No information was presented in the petition concerning threats to this species from this factor.

Factor E: NatureServe (2007) identifies rarity as a threat to *Paronychia congesta*. Restricted geographic range may exacerbate the impacts to the species of potential threats, such as chance events like fire and flood. For instance, the Service (2006) noted that in 1990, the number of individuals, and the apparent vigor of the plants in the second, smaller population, was reduced due to two consecutive years of drought and freezes.

Based on our evaluation of the information provided in the petition, we have determined that the petition

presents substantial information to indicate that listing *Paronychia congesta* may be warranted due to the present or threatened destruction, modification, or curtailment of its habitat or range resulting from right-of-way construction and maintenance, pipeline installation, oil and gas exploration, and well pad construction, or to other natural or manmade factors affecting its continued existence resulting from drought or freezes.

*Pediomelum pentaphyllum* (Chihuahua Scurfpea)

*Pediomelum pentaphyllum* is a perennial plant that grows up to 25 centimeters (9.8 inches) tall and has a long, swollen taproot (Tonne 2000; Sivinski 1993). The taproot apparently allows the plant to remain dormant or restrict growth in dry years (BLM 2004). As such, *P. pentaphyllum* may not send up an aerial portion (stem, leaves, and flowers) in dry years, making ground surveys more difficult (Tonne 2000).

*Pediomelum pentaphyllum* historically occurred in Texas, New Mexico, Arizona, and Chihuahua, Mexico (NatureServe 2007). It is currently only known from two disjunct sites in New Mexico and Arizona, despite multiple survey attempts across its range (WildEarth Guardians 2008). The New Mexico site occurs on BLM and New Mexico State Trust lands in Hidalgo County, and consists of 396 plants in an approximately 1,214 ha (3,000 ac) area (Tonne 2008). The Arizona site occurs on private land and includes a documented 32 plants in a 13 ha (32 ac) area (Tonne 2008).

Factor A: The petitioner asserts that livestock grazing may be a threat to *Pediomelum pentaphyllum*; however, information in NatureServe (2007) indicates that the impacts of livestock grazing on this species are unknown. The petitioner further asserts that oil development may be a potential threat, but provides no information indicating whether oil development is occurring or is likely to occur in occupied habitats nor does the petitioner provide information indicating how this species may be impacted by oil development. We have determined that the information provided concerning grazing and oil development does not meet the substantial information standard.

Factor B: The petitioner notes that *Pediomelum pentaphyllum* may have historically been threatened by overcollection. Tarahumara Indians used *P. pentaphyllum* to reduce fever (Sivinski 1993; Tonne 2000). According to Robert Bye, an ethnobotanist who has worked in Mexico, this species was

regularly available in the Chihuahua market in 1908, but has not been available in recent years (R. Bye, pers. comm. cited in Sivinski 1993). The reasons for the plant's disappearance from the market are unclear but may have been due to overcollection (Tonne 2000). However, historic overcollection is not considered a threat to current populations and no information was presented in the petition concerning current overutilization pressures.

Factor C: No information was presented in the petition concerning threats to this species from this factor.

Factor D: The petitioner asserts that existing regulatory mechanisms are not adequate to protect *Pediomelum pentaphyllum* from the threats it faces. The petition reports that *P. pentaphyllum* is listed as endangered by the State of New Mexico. As such, *P. pentaphyllum* is protected from unauthorized collection, transport, or sale by the New Mexico Endangered Plant Species Act, 9-10-10 NMSA. This law prohibits the taking, possession, transportation and exportation, selling or offering for sale any listed plant species. Listed species can only be collected under permit from the State of New Mexico for scientific studies and impact mitigation; however, this law does not provide any protection for *P. pentaphyllum* habitat.

The petition reports that *Pediomelum pentaphyllum* is considered a sensitive species by the BLM. According to BLM (2008), actions authorized by the BLM shall further the conservation of BLM-sensitive species. However, as noted by the petitioner, BLM-sensitive species status does not confer any requirement to protect populations or their habitats.

The petitioner further notes that the Service has identified *Pediomelum pentaphyllum* as a species of concern. While not a formal legal designation under Service regulations, a species of concern is defined as a taxon for which further biological research and field study are needed to resolve its conservation status or which is considered sensitive, rare, or declining on lists maintained by Natural Heritage Programs, State wildlife agencies, other Federal agencies, or professional/academic scientific societies (Service 2009). Species of concern are identified for planning purposes only and the title confers no regulatory protection.

Factor E: The petitioner asserts that *Pediomelum pentaphyllum* is threatened by herbicide use. Information cited in the petition indicates that the herbicide Tebuthiuron is being used to control shrub encroachment and improve rangelands in the area occupied by *P. pentaphyllum*

in New Mexico (BLM 2004). Howard (2005) notes that *P. pentaphyllum* is negatively impacted by Tebuthiuron use as evidenced by a greater proportion of absent plants, a greater proportion of non-normal looking plants, and a greater proportion of non-flowering plants in areas treated with Tebuthiuron as compared to control areas not treated with Tebuthiuron.

Based on our evaluation of the information provided in the petition, we have determined that the petition presents substantial information to indicate that listing *Pediomelum pentaphyllum* may be warranted due to other natural or manmade factors affecting the species' continued existence resulting from herbicide use.

*Salvia pentstemonoides* (Big Red Sage)

*Salvia pentstemonoides* is a plant found in moist or seasonally wet areas, especially creekbeds within the Edwards Plateau of Texas. *Salvia pentstemonoides* was thought to be extinct until one large and several small populations were found in the late 1980s. In 1997, an early and long summer flood killed a large portion of the largest population, leaving only a few hundred total individuals left in the wild (NatureServe 2007). NatureServe (2007) states that the plant consists of six small extant populations and about a dozen historical occurrences, some of which are of uncertain location or occur on private land and haven't been searched for in recent years. *Salvia pentstemonoides* was formerly a candidate 2 species, a taxon for which information in our possession indicated that proposing to list was possibly appropriate, but for which persuasive data on biological vulnerability and threat were not available to support a proposed listing rule. This species has had no Federal Endangered Species Act status since the practice of maintaining a list of candidate 2 species was discontinued in 1996.

Factor A: According to NatureServe (2007) the species is threatened with lowering of the water table due to development, drought, grazing, and erosion. We have information in our files that aquifer drawdown due to increasing human population growth in this area is occurring (Service 1996, pp. 16-19). No additional discussion was presented for the claims that drought, grazing, and erosion threaten the species, and thus we have determined that the information presented concerning drought, grazing, and erosion does not meet the substantial information standard.

Factor B: According to NatureServe (2007) Austin area nurseries extensively

cultivate *Salvia pentstemonoides*. NatureServe (2007) further notes that wild populations are potentially threatened by loss of genetic integrity due to hybridization as well as horticultural collecting.

Factors C and D: No information was presented in the petition concerning threats to this species from these factors.

Factor E: *Salvia pentstemonoides* may be threatened by potential extinction from chance events due to its restricted geographic distribution and small remaining number of individuals. In 1997, an early and long summer flood killed the largest part of the largest population, leaving only a few hundred total individuals left in the wild (NatureServe 2007, citing Texas Parks and Wildlife Department 1999), indicating that natural chance events may threaten the species.

Based on our evaluation of the information provided in the petition, we have determined that the petition presents substantial information to indicate that listing *Salvia pentstemonoides* may be warranted due to the present or threatened destruction, modification, or curtailment of its habitat or range resulting from aquifer drawdown; overutilization for commercial, recreational, scientific, or educational purposes as a result of commercial uses; or to other natural or manmade factors affecting its continued existence resulting from flooding.

#### Fern Ally

*Donrichardsia macroneuron* (no common name)

*Donrichardsia macroneuron* is an aquatic moss known to occur at Seven Hundred Springs on the South Llano River, Edwards County, Texas (Crum and Anderson 1981, Wyatt and Stoneburner 1980). It grows partially submerged in shaded areas in rapidly flowing water (Wyatt and Stoneburner 1980). Following an unsuccessful search of 11 similar spring sites in the Llano River watershed by Wyatt and Stoneburner (1980), they concluded that there are no longer sites downstream suitable for the species, although they believe such sites were historically occupied by the species.

Factor A: According to NatureServe (2007) and Wyatt and Stoneburner (1980), the one occurrence at Seven Hundred Springs is threatened by drying due to drought. A prolonged drought in 1950-1958 dried the 11 springs that were later searched for the species by Wyatt and Stoneburner (1980). NatureServe (2007) also claims the species is threatened by changes in hydrology, such as a rise in water level.

Wyatt and Stoneburner (1980) indicate that flooding is a potential threat to the species.

Factors B, C, D, and E: No information was presented in the petition concerning threats to this species from these factors.

Based on our evaluation of the information provided in the petition, we have determined that the petition presents substantial information to indicate that listing of *Donrichardsia macroneuron* may be warranted due to the present or threatened destruction, modification, or curtailment of its habitat or range resulting from drought or changes in hydrology.

### Finding

We reviewed and evaluated 192 of the 475 petitioned species, based on the information in the petition and the literature cited in the petition, and we have evaluated the information to determine whether the sources cited support the claims made in the petition relating to the five listing factors. We also reviewed reliable information readily available in our files.

On the basis of our determination under section 4(b)(3)(A) of the Act, we have determined that the petition does not present substantial scientific or commercial information indicating that listing may be warranted for 125 species.

We find that the petition presents substantial scientific or commercial

information that listing the remaining 67 of the 192 species that we evaluated as threatened or endangered under the Act may be warranted. Because we have found that the petition presents substantial information that listing these 67 species may be warranted, we are initiating a status review to determine whether listing any of these 67 species under the Act is warranted. We will issue a 12-month finding as to whether any of the petitioned actions are warranted.

We previously determined that emergency listing of any of the 192 species is not warranted. However, if at any time we determine that emergency listing of any of the species is warranted, we will initiate an emergency listing.

The petitioners also request that critical habitat be designated for the species concurrent with final listing under the Act. If we determine in our 12-month finding, following the status review of the species, that listing is warranted, we will address the designation of critical habitat in the subsequent proposed rule.

The "substantial information" standard for a 90-day finding differs from the Act's "best scientific and commercial data" standard that applies to a status review to determine whether a petitioned action is warranted. A 90-day finding does not constitute a status review under the Act. In a 12-month finding, we will determine whether a

petitioned action is warranted after we have completed a thorough status review of the species, which is conducted following a substantial 90-day finding. Because the Act's standards for 90-day and 12-month findings are different, as described above, a substantial 90-day finding does not mean that the 12-month finding will result in a warranted finding.

### References Cited

A complete list of references cited is available on the Internet at Docket No. FWS-R2-ES-2008-0130 at <http://www.regulations.gov> and upon request from the Southwestern Regional Ecological Services Office (see **FOR FURTHER INFORMATION CONTACT**).

### Author

The primary authors of this document are the staff members of the Southwestern Regional Ecological Services Offices (see **FOR FURTHER INFORMATION CONTACT**).

### Authority

The authority for this action is the Endangered Species Act of 1973, as amended (U.S.C. 1531 *et seq.*).

Dated: December 4, 2009

### Rowan W. Gould,

*Acting Director, U.S. Fish and Wildlife Service*  
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