In the Office of Endangered Species
U.S. Fish and Wildlife Service
United States Department of Interior

A Petition to List 206 Critically Imperiled or Imperiled Species in the Mountain-Prairie Region of the United States as Threatened or Endangered Under the Endangered Species Act, 16 U.S.C. §§ 1531 et seq.

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I. Introduction

Forest Guardians hereby petitions the Secretary of the Interior, acting through the U.S. Fish and Wildlife Service (Service), to list and thereby protect under the Endangered Species Act (ESA) all full species in the Service's Mountain-Prairie Region[1] ranked as G1 (critically imperiled) or G1G2 (critically imperiled or imperiled) by NatureServe. This Petition requests the listing of all G1 and G1G2 species that the Service has previously failed to list or even identify as candidates for listing under the ESA. The petitioned species are named in Tables 1 & 2.

NatureServe ranks 271 full species found in the Service's Mountain-Prairie Region as G1 or G1G2. Of these 271 species, the Service has listed or identified as candidates for listing only 50. This represents only 18% of the species in the region that the scientific community believes are critically imperiled or imperiled (Table 3). 15 species have been previously petitioned. Our petition seeks protection for the remaining 206 species identified as critically imperiled or imperiled by NatureServe but ignored by the Service.

Across the short- and mixed-grass prairies, red rock mesas, mountain valleys, conifer forests, cottonwood-lined riparian streams, sagebrush steppe, and alpine meadows of the Rocky Mountains and Great Plains in the U.S., there exists a broad array of native flora and fauna. The diversity of habitats found in the region sustain a wide range of reptiles, birds, mammals, plants, butterflies, and other species, including many found nowhere else on Earth. This tapestry of life is unraveling, with the endangerment and extinction of individual species, and the consequent crumbling of native ecosystems of which they are parts. As John Muir put it, "When we try to pick out anything by itself, we find it hitched to everything else in the universe."[2] Aldo Leopold issued a similar warning: "The last word in ignorance is the man who says of an animal or plant, 'What good is it?'…[w]ho but a fool would discard seemingly useless parts? To keep every cog and wheel is the first precaution of intelligent tinkering."[3]

Contemporary scientists describe this concept as ecosystem collapse:

> If species composing a particular ecosystem begin to go extinct, at what point will the whole machine sputter and destabilize? We cannot be sure because the requisite natural history of most kinds of organisms does not exist, and experiments on ecosystem failure have been generally lacking. Yet think of how such an experiment *might* unfold. If we were to dismantle an ecosystem gradually, removing one species after another, the exact consequences at each step would be impossible to predict, but one

[1]FWS's Mountain-Prairie Region, Region 6, includes all of Colorado, Kansas, Montana, Nebraska, North Dakota, South Dakota, Utah, and Wyoming.
[2]Muir, John. 1911. "My First Summer in the Sierra" in *The Wilderness Journeys* (published in 1996 by Canongate Classics) at p. 91.
[3]Aldo Leopold. 1966. "The Round River," in *A Sand County Almanac* (published in 1988 by Ballantine Books) at p. 190.

> general result seems certain: at some point the ecosystem would suffer a collapse.[4]

This petition seeks to safeguard the Mountain-Prairie Region's diverse tapestry of life, by asking the Service to extend the ESA's safety net of legal protection to hundreds of vanishing beetles, caddisflies, mayflies, stoneflies, mountainsnails, pondsnails, fishes, milkvetches, buckwheats, daisies, penstemons, groundsels, cacti, mosses, and grasses. Many of these species are found nowhere else on earth but this region.

The Petitioner, Forest Guardians, is a non-profit conservation organization whose mission is to defend and restore the wildlands and wildlife of the greater American Southwest through fundamental reform of public policies and practices. Forest Guardians is committed to protecting flora, fauna, natural processes, and native habitats in the greater American Southwest. Forest Guardians is interested in the conservation of species that face high levels of imperilment, especially those who play important umbrella and keystone functions within their ranges. In addition, Forest Guardians strives for the restoration and preservation of *all* naturally occurring components and processes within native ecosystems.

II. ESA Listing Process

Through the ESA, Congress mandated that all threatened and endangered species and the ecosystems on which these species depend be granted federal protection.[5] Congress clearly intends the ESA to protect both species and the ecosystems of which they are a part.[6] The ESA reflects congressional recognition of the aesthetic, ecological, educational, historical, recreational, and scientific values of species,[7] and the fact that our nation's wildlife and plants are becoming increasingly imperiled due to "economic growth and development untempered by adequate concern and conservation."[8]

The Supreme Court has held that the ESA is "the most comprehensive legislation for the preservation of endangered species ever enacted by any nation." *Tennessee Valley Authority v. Hill*, 437 U.S. 153, 180 (1978). The Supreme Court further noted that "[t]he plain intent of Congress in enacting this statute was to halt and reverse the trend towards species extinction, whatever the cost. This is reflected not only in the stated policies of the Act, but in literally every section of the statute." 437 U.S. at 184.

[4]Edward O. Wilson. 1992. *The Diversity of Life*. Belknap Press of Harvard University Press at p. 309.
[5]The sole exception is pest insects, which are defined as those "species of the Class Insecta determined by the Secretary to constitute a pest whose protection under the provisions of this Act would present an overwhelming and overriding risk to man." 16 U.S.C.A. 1532(6).
[6]Congress has consistently supported ecosystem protection throughout the legislative history of the ESA. Rosmarino, Nicole J. 2002. "Endangered Species Act Under Fire: Controversies, Science, Values, and the Law." Ph.D. Dissertation, University of Colorado at Boulder.
[7]16 U.S.C.A. § 1531(a)(3).
[8]16 U.S.C.A. § 1531(a)(1).

A. The ESA's Listing Process Requires Use of the Best Available Science

However, despite all its vaunted strength as a biodiversity protection statute, the ESA does nothing to protect a species unless that species is first "listed" under the Act. "Listing" is a critical first step in the ESA's system of species protection.[9] No matter how imperiled a species might be it does not receive any substantial protection under the ESA unless it is officially listed as threatened or endangered. *See e.g.*, *Federation of Fly Fishers v. Daley*, 131 F.Supp.2d 1158, 1163 (N.D.Cal. 2000) ("[L]isting is critically important because it sets in motion the [ESA's] other provisions, including the protective regulation, consultation requirements, and recovery efforts."). As a result, Congress aptly described Section 4 of the ESA, 16 U.S.C. § 1533, the section setting forth the listing process, as "[t]he cornerstone of effective implementation of the [ESA]." S.Rep. No. 418, 97th Cong., 2d Sess. at 10; *see also* H.Rep. No. 567, 97th Cong., 2d Sess. at 10 ("The listing process under Section 4 is the keystone of the [ESA]").

The ESA defines the term "species" broadly to include full species and "any subspecies of fish or wildlife or plant and any distinct population segment of any species of vertebrate fish or wildlife which interbreeds when mature." 16 U.S.C. § 1532(16). A species is "endangered" if it "is in danger of extinction throughout all or a significant portion of its range." 16 U.S.C. § 1532(6). A species is "threatened" if it "is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range." 16 U.S.C. § 1532(20).

To determine whether a species warrants listing as a threatened or endangered species, the Service must consider whether the species is imperiled based on "any of the following factors: (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." 16 U.S.C. § 1533(a)(1). Most importantly, in its evaluation of each of these listing factors the Service must reach its determination "solely on the basis of the best scientific and commercial data available."[10] 16 U.S.C. § 1533(b)(1)(A).

[9]Once a species is listed under the ESA, significant arrays of statutory protections apply. For example, Section 7 of the ESA requires all federal agencies to "insure" that their actions neither "jeopardize the continued existence" of any listed species nor "result in the destruction or adverse modification" of its critical habitat. 16 U.S.C. § 1536(a)(2). Section 9 prohibits, among other things, "any person" (including federal or state agencies as well as individuals) from "taking" endangered species. 16 U.S.C. § 1538(a)(1)(B). "Taking" is broadly defined to include, in addition to actions that directly harm individuals of the species, habitat modification that adversely affects the species. 16 U.S.C. § 1532(19); 50 C.F.R. § 17.3. Other provisions require the Service to designate critical habitat for listed species, 16 U.S.C. § 1533(a)(3), require the Service to "develop and implement" recovery plans for listed species, 16 U.S.C. § 1533(f), authorize the Service to acquire land for the protection of listed species, 16 U.S.C. § 1534, and make federal funds available to states to assist in their efforts to preserve and protect threatened and endangered species, 16 U.S.C. § 1535(d).

[10]Any interested person can begin the listing process by filing a petition to list a species with the Service. 16 US.C. § 1533(b)(3)A); 50 C.F.R. § 424.14(a). Upon receipt of a petition to list a species, the Service has 90 days to the maximum extent practicable to make a finding as to whether the petition "presents substantial scientific or commercial information indicating that the petitioned action may be warranted." 16

B. NatureServe Represents the Best Available Science

NatureServe provides the "best scientific and commercial data available" in its analyses and designations of G1 and G1G2 status to native plant and animal species. Accordingly, rather than restate the obvious, we hereby incorporate all analysis, references, and documentation provided by NatureServe in its on-line database at: http://www.natureserve.org/explorer into this Petition by reference, including all data and analysis underlying its conservation status classification scheme.

As of 1999, The Nature Conservancy ranked 1,385 species in the United States as G1.[11] This ranking is the most imperiled designation a species can receive in NatureServe's system. In the NatureServe system, a G1 rank is defined as:

> **Critically Imperiled**-At very high risk of extinction due to extreme rarity (often 5 or fewer populations), very steep declines, or other factors.[12]

This definition is completely analogous to the ESA's definition of "endangered," or at a minimum "threatened" species, and the factors considered by NatureServe overlap with the ESA's recitation of the applicable listing factors as set forth above.

Some taxa are classified as G1G2 by NatureServe because there is uncertainty about their status. As NatureServe describes:

> **Range Rank**—A numeric range rank (e.g., G2G3) is used to indicate the range of uncertainty in the status of a species or community. A G2G3 rank would indicate that there is a roughly equal chance of G2 or G3 and other ranks are much less likely. Ranges cannot skip more than one rank (e.g., GU should be used rather than G1G4).[13]

U.S.C. § 1533(b)(3)(A); 50 C.F.R. § 424.14(b)(1). This threshold determination is commonly called a 90-day finding. If the Service makes a positive 90-day finding, it must promptly publish the finding in the Federal Register and commence a status review of the species. 16 U.S.C. § 1533(b)(3)(A). After issuing a positive 90-day finding, the Service has 12 months from the date it received the petition to make one of three findings: (1) the petitioned action is not warranted; (2) the petitioned action is warranted; or (3) the petitioned action is warranted but presently precluded by work on other pending proposals for listing species of higher priority. 16 U.S.C. § 1533(b)(3)(B); 50 C.F.R. § 424.14(b)(3). This second determination is commonly known as a 12-month finding. If the Service finds that listing the species is warranted, it must publish a proposed rule to list the species as endangered or threatened in the Federal Register. 16 U.S.C. § 1533(b)(5). Absent a "substantial disagreement regarding the sufficiency or accuracy of the available data," 16 U.S.C. § 1533(b)(6)(B)(i), the Service must either publish a final rule listing the species as threatened or endangered or withdraw the proposed rule. 16 U.S.C. § 1533(b)(6)(A). A "substantial disagreement" over the "sufficiency or accuracy of the available data" affords the Service only a single 6 month extension of this deadline. 16 U.S.C. § 1533(b)(6)(B)(i).

[11]The Nature Conservancy and Association for Biodiversity Information. 2000. *Precious Heritage: the Status of Biodiversity in the United States*. Eds. Bruce A. Stein, Lynn S. Kutner, and Jonathan S. Adams. Oxford University Press. See Table 4.4 at p. 104. An online NatureServe search (via natureserve.org/explorer) conducted on July 18, 2007, for G1 full species in the U.S. yielded 3,744 records.

[12]See http://www.natureserve.org/explorer/ranking.htm#globalstatus, visited May 29, 2007.

[13]*Id.*

G2 species are considered imperiled in the NatureServe system, which defines a G2 rank as:

> **Imperiled**—At high risk of extinction due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors.[14]

Again, NatureServe's definitions, while using different terms (e.g. "imperiled" rather than "endangered" or "threatened"), are functionally identical to the ESA's definitions.[15]

Importantly, the Service itself considers NatureServe to be an authoritative source for species information, representing the "best scientific and commercial data available." On the Service's websites for listed species, the agency includes a link to NatureServe Explorer Species Reports under "Other Resources" and states the following:

> NatureServe Explorer is a source for authoritative conservation information on more than 50,000 plants, animals and ecological communtities of the U.S and Canada. NatureServe Explorer provides in-depth information on rare and endangered species, but includes common plants and animals too. NatureServe Explorer is a product of NatureServe in collaboration with the Natural Heritage Network.[16]

By petitioning to list all G1 and G1G2 species in the Service's Mountain-Prairie Region, we are only asking the Service to act on the best available scientific information, information the Service itself already has knowledge of and endorses. Additionally, by restricting our Petition to only G1 and G1G2 species, we aim to confer timely ESA protection on those species that need it the most to avoid extinction. ESA protection is known to be effective in preventing species extinctions, yet there are only 1,352 total domestic listings.[17] Listing of G1 and G1G2 species can help meaningfully address the extinction crisis in the U.S. by ushering species in need onto the legal Ark the ESA provides.

[14] *Id.*

[15] We have included species with ranks of "G1?", "G1Q", and "G1G2Q" as a precautionary measure. Species ranked "G1?," according to NatureServe, may be ranked G2. Those with G1Q or G1G2Q rankings have questionable taxonomy. Only 16% (32) of the species were are petitioning are ranked G1?, G1Q, G1G2Q.

[16] This language is included on webpages for every listed U.S. species in the U.S. Fish and Wildlife Service's online Threatened and Endangered Species System (TESS).

[17] This figure is taken directly from the Service's "box score" posted on its website at: http://ecos.fws.gov/tess_public/Boxscore.do, visited July 18, 2007. The number of taxa listed is actually lower, as 16 U.S. species are counted more than once due to listings of distinct population segments.

III. A Petition of this Scope is Necessary

A. The Sixth Extinction

This 206-species petition is compelled by the mass extinction event rapidly unfolding on this planet. This new extinction epoch is the sixth in the history of the earth. The current "Sixth Extinction" is occurring primarily due to human actions, including habitat destruction, exploitation, pollution, proliferation of non-native species, introduced diseases, and a climate crisis caused by increased greenhouse gas emissions. Current extinction rates are occurring at up to 1,000 times the natural rate of extinction, and these rates are expected to continue rising.

As Harvard biologist E.O. Wilson[18] puts it, "…humanity has initiated the sixth great extinction spasm, rushing to eternity a large fraction of our fellow species in a single generation."[19] The first five (non-human caused) extinction "spasms" occurred in this order, according to geological period and represented in time before the present: end-Ordovician, 440 million years; late Devonian, 365 million years; end-Permian, 225-245 million years; end-Triassic, 210 million years; and end-Cretaceous, 65 million years.[20] During each prior extinction epoch at least 12% of the *families* of species went extinct.[21] In each of these extinction events, at least 65% of species went extinct. In the Permian extinction, more than 95% of marine species vanished.[22]

The comparison of the current mass extinction to these great geological extinction events is chilling. Humanity's current impact on species diversity is comparable to that of the asteroid that wiped out the dinosaurs 65 million years ago. Future intelligent beings, should there be any, will be able to date our passing by looking at little more than fossils preserved in rock layers. The best current estimate is that unless current trends are interrupted, by the year 2020 up to 20% of all extant species will no longer exist.[23] Given that the best scientific data indicates that approximately 13 to 30 million species now

[18]Edward O. Wilson is Pellegrino University Professor at Harvard and Curator in Entomology at Harvard's Museum of Comparative Zoology. In addition to two Pulitzer Prizes, Wilson has won many scientific awards, including the National Medal of Science and the Craford Prize of the Royal Swedish Academy of Sciences.
[19]*The Diversity of Life* at p. 32.
[20]*The Diversity of Life* at p. 29; and Leakey, Richard, and Roger Lewin. 1995. *The Sixth Extinction: Patterns of Life and the Future of Humankind*. NY, NY: Doubleday.
[21]*The Diversity of Life* at p. 30.
[22]*The Sixth Extinction* at p. 44.
[23]*The Diversity of Life* at p. 346. *See also* International Union for the Conservation of Nature, *Red List of Threatened Animals* at ii (1996) ("All known species of birds and mammals have been evaluated, with the result that 25% of mammal species and 11% of bird species are classified as being threatened with extinction. Not all reptile, amphibian, and fish species have been assessed, but of those that have been evaluated, rough estimates of the percent that are threatened are: 20% of reptiles, 25% of amphibians, and 34% of fishes…").

exist,[24] this means an average extinction rate of scores if not hundreds of species per day.[25] For comparison, the "normal" extinction rate, measured over geologic time, is estimated to be 10 to 1000 times less.[26] In amending the ESA in 1978, Congress relied upon Department of Interior reports, putting the global rate of extinction at approximately 30 species per year.[27] Today's scientists would call Interior's 1978 estimate of the yearly extinction total a low-ball estimate for even a single day.

According to the World Conservation Union, one in every four mammals is facing a high risk of extinction in the near future.[28] Almost half of all tortoises and freshwater turtles are threatened.[29] More than one-fifth (22%) of the world's birds face extinction.[30] One third of the world's amphibians face extinction.[31] Three out of five species face extinction from climate change if greenhouse gas emissions are not promptly curtailed.[32]

Moreover, scientists are estimating a trickle-down effect from extinctions, with the loss of one species leading to the loss of other species. For instance, researchers calculated that extinction of the 6,279 plants listed as threatened or endangered by the International Union for Conservation of Nature and Natural Resources would also result in the loss of 4,672 species of beetles and 136 types of butterflies.[33]

Indeed, whole ecosystems are increasingly imperiled. In the Mountain-Prairie Region, examples of ecosystem endangerment are rife:

- 48% of wetlands in Kansas, 35% of wetlands in Nebraska and South Dakota, 49% of wetlands in North Dakota, 38% of wetlands in Wyoming, 30% loss of wetlands in Utah, and 50% of wetlands in Colorado were lost between the 1780s and 1980s.
- 60-65% of prairie potholes in the upper Great Plains has been lost.
- 80-90% of low elevation old-growth forests and native grasslands has been lost in western Montana.

[24]United Nations Environment Program, *Global Biodiversity Assessment* at 111 (1995) (estimating 13-14 million); D.Chadwick and J.Sartore, *The Company We Keep: America's Endangered Species* at 17 (Nat'l Geo. Soc'y 1996) (estimating 30 million); *The Diversity of Life* at p. 346 (estimating 10-100 million).
[25]The current rate of extinction in the tropical rainforest alone is estimate to exceed several score per day. E. O. Wilson, *Biophilia and the Conservation Ethic*, in *The Biophilia Hypothesis*, 35, 36 (Stephen R. Kellert & E.O. Wilson, eds. 1993 (this estimate was limited to birds and mammals).
[26]National Academy of Sciences, National Research Council, *Science and the Endangered Species Act* at 26 (1995).
[27]Senate Comm. on Environment and Public Works, *A Legislative History of the Endangered Species Act of 1973, as Amended in 1976, 1977, 1978, 1979, and 1980*, 97th Cong., 2d Sess. 819.
[28]IUCN: http://www.iucn.org/en/news/archive/2001_2005/species_extinction_05_2007.pdf.
[29]*Id.*
[30]Birdlife International: http://www.birdlife.org/news/pr/2007/05/2007_red_list_update.html. Birdlife International is the Red List Authority for birds for the IUCN Red List.
[31]Stokstad, E. 2004. "Global Survey Documents Puzzling Decline of Amphibians." *Science* 306: 391.
[32]Flannery, Tim. 2005. *The Weather Makers*. Atlantic Monthly Press at p. 183.
[33]Lian Pin Koh, Robert R. Dunn, Navjot S. Sodhi, Robert K. Colwell, Heather C. Proctor, Vincent S. Smith. 2004. "Species Coextinctions and the Biodiversity Crisis." *Science* 305 (5690): 1632-1634. 10 September 2004.

- 95% of waters in Montana are degraded, have lost native species, or have been invaded by exotics.
- 82% loss of tallgrass prairie in Kansas, 97% loss of tallgrass prairie in the eastern third of Nebraska.
- 90% loss of native grassland in North Dakota, and more than 47% loss of native grassland in South Dakota.[34]

In sum, there should be no legitimate debate that our planet's biodiversity is rapidly diminishing.

There should also be little debate that the current biodiversity crisis is caused by human activities:

> Human demographic success has brought the world to this crisis of biodiversity. Human beings - mammals of the 50-kilogram weight class and members of a group, the primates, otherwise noted for scarcity - have become a hundred times more numerous than any other land animal of comparable size in the history of life. By every conceivable measure, humanity is ecologically abnormal. Our species appropriates between 20 and 40 percent of the solar energy captured in organic material by land plants. There is no way that we can draw upon the resources of the planet to such a degree without drastically reducing the state of most other species.[35]

The leading cause of imperilment of species in the U.S. is habitat destruction.[36] Habitat destruction and other threats to biodiversity can be curtailed by the ESA. Indeed, over 99% of the species listed under the ESA are still in existence today.[37] Researchers have estimated that at least 227 species would have gone extinct in the past thirty years were it not for this law.[38] In addition, species are twice as likely to be recovering if provided with critical habitat,[39] which cannot be conferred to unlisted species.

B. FWS Must Act to Remedy the Extinction Crisis

Meanwhile, as the global scientific community increasingly recognizes the need for expeditious and dramatic action to avert the Sixth Extinction, the Service has completely

[34]Reed Noss et al. at: http://biology.usgs.gov/pubs/ecosys.htm, including a bibliography of citations documenting all of these examples.
[35]*The Diversity of Life* at p. 272.
[36]Wilcove, David S., David Rothstein, Jason Dubow, Ali Phillips, and Elizabeth Losos. 1998. "Quantifying threats to imperiled species in the United States." *BioScience* 48(8):607-615.
[37]The Service itself reports this figure: see http://www.fws.gov/endangered//esb/96/chief.html, http://www.fws.gov/coloradoriverrecovery/Crrpesa1.htm.
[38]Scott, J. Michael, Dale D. Goble, Leona K. Svancara, and Anna Pidgorna. 2006. "By the Numbers" in *The Endangered Species Act at Thirty.* Eds. Dale D. Goble, J. Michael Scott, and Frank W. Davis. Washington: Island Press. See p. 31.
[39]Suckling, Kieran F., and Martin Taylor. 2006. "Critical Habitat and Recovery" in *The Endangered Species Act at Thirty*. See p. 86.

abandoned its obligation to list and protect endangered species. The listing of species under the Act, the keystone and threshold step to the ESA's protective scheme designed by Congress, has nearly ground to a halt. Not one species has been listed under Interior Secretary Dirk Kempthorne, who has been in office for over a year.[40] The door to the Ark is functionally closed. The current administration has listed only 8 species per year, in contrast to 62 per year under President Bill Clinton and 56 per year under President George H.W. Bush. Dozens of candidate species have gone extinct while awaiting ESA listing, and the Service has held others in limbo as candidates for over 25 years.[41] Nearly 300 species are currently awaiting listing on the candidate list.

Given the Service's intransigence and the formidable listing bottleneck, this Petition is necessary to prevent extinction of individual species, and to preserve the native ecosystems in which these species play highly interactive parts or serve in indicator, keystone, or umbrella roles.[42]

The glacial pace of the Service's listing program is startling not only because of the backlog of candidate and proposed species, but because of the thousands of at-risk species that are not even in the queue for federal protection. Approximately 6,000-9,000 U.S. species are likely imperiled,[43] roughly four to seven times more than the current ESA list.

While Forest Guardians has previously submitted lengthy listing petitions for individual species, primarily based on federal and state government data, the Service has demonstrated a consistent refusal to list species in need. The Service is now, in some cases, re-writing the findings of its own biologists in order to avoid listing species, in violation of the ESA's requirement that listing determinations be based solely on the best scientific data available. In particular, the Service has refused to list imperiled species whose protection could safeguard whole ecosystems. Examples include prairie dog and grouse species. The listing of these imperiled proxy species would help address the extinction crisis.[44]

While listing the species included in this Petition would increase the current total number of listed domestic species by approximately 15%, this Petition is nonetheless conservative. The Petitioners are requesting only the listing of full species and deliberately did not include subspecies to avoid taxonomic disputes. Petitioners did not

[40]Dirk Kempthorne was confirmed as Interior Secretary by the U.S. Senate on May 26, 2006. See Associated Press. 2006. "Senate Confirms Kempthorne for Interior," May 26, 2006.
[41]Greenwald, D. Noah. 2007 "Politicizing Extinction: the Bush Administration's Dangerous Approach to Endangered Wildlife." Report by the Center for Biological Diversity, issued May 2007.
[42]Miller, Brian, Richard Reading, Jim Strittholt, Carlos Carroll, Reed Noss, Michael Soule, Oscar Sanchez, John Terborgh, Donald Brightsmith, Ted Cheeseman, and Dave Foreman. 1998/99. "Using focal species in the design of nature reserve networks." *Wild Earth* Winter 1998/99. Pp. 81 – 92. Soulé, Michael E., James A. Estes, Brian Miller, and Douglas L. Honnold. 2005. "Strongly Interactive Species: Conservation, Policy, Management, and Ethics." *BioScience* 55(2): 168-176.
[43]Scott et al. 2006, *The Endangered Species Act at Thirty*, at p. 22.
[44]Rosmarino 2002. See also Rosmarino, Nicole J. 2007. "Political Interference in Endangered Species Act Findings for Prairie Dogs." Memo submitted to House Resources Committee Chairman Nick Rahall, January 24, 2007.

include G2 and G3 species, although NatureServe considers these species to be imperiled or vulnerable. Petitioners also did not include G4 and G5 species, although some of these species may merit ESA listing given population declines, significant range shrinkage, and low prospects for long-term persistence.

Additionally, this Petition requests the listing of only those species occurring in the Service's Mountain-Prairie Region, where many of Forest Guardians' members reside, because we believe each Region of the Service should conduct investigations into the status of at-risk species occurring in their Region.[45]

This petition seeks to regain lost ground. At several times in the past the Service has purged large numbers of species from the lists of species in the queue for ESA protection. In 1979, FWS withdrew proposals to list 1,876 species.[46] In 1996, FWS removed over 2,000 species from the candidate list.[47] The current domestic list of 1,352 species should therefore be regarded as stunted. Thousands more species are known to be imperiled and should be expeditiously listed under the ESA, given its proven efficacy in preventing extinction.

Finally, this petition is not unprecedented but is modeled on historical examples. In 1975, the Smithsonian Institution petitioned for the listing of 3,187 plants.[48] Yet, only 744 plants are currently listed under the ESA, and most of the Smithsonian nominees were dropped from the candidate list in 1996. In May 1984, FWS added 1,000 invertebrates to the candidate list.[49] Most of these were also dropped from the candidate list in 1996. In 2004, the Center for Biological Diversity, scientists, and others petitioned for the listing of 225 plant and animal species. On June 18, 2007, Forest Guardians petitioned for the listing of 475 southwestern species.

In addition to addressing the problem of the vast majority of critically imperiled species in the Mountain-Prairie Region lacking ESA protection, this Petition helps address the taxonomic disparities in the current ESA list. Invertebrates are underrepresented under the current list: they comprise 37% of the critically imperiled or imperiled species in the NatureServe system, yet make up only 16% of the ESA list.[50] Our analysis indicates that only 9% of G1 and G1G2 invertebrates and only 19% of G1 and G1G2 plants have ESA

[45]Greenwald et al. 2006 advocate that listing rules be prepared by an independent scientific body for all species ranked critically imperiled and imperiled species by NatureServe. See Greenwald, D. Noah, Kieran F. Suckling, and Martin Taylor. 2006. "The Listing Record" in *The Endangered Species Act at Thirty* at p. 67.

[46]Scott, J. Michael, Dale D. Goble, and Frank W. Davis. 2006. "Introduction" in *The Endangered Species Act at Thirty*. See p. 9.

[47]FWS deleted the C-2 and C-3 categories from the candidate list, which respectively comprised 2,001 and 424 taxa in 1994. The total number of candidates included in the 1994 Candidate Notice of Review was 2,563 taxa, in contrast to 420 in the 1996 Candidate Notice of Review. See 59 Fed. Reg. 58982 and 61 Fed. Reg. 7958.

[48]The Smithsonian report was submitted to Congress on January 9, 1975 (House Document No. 94-51, Serial No. 94-A, 94th Congress, 1st Session, Government Printing Office, 200 pages). It was treated by the Service as a listing petition.

[49]See http://www.fws.gov/news/historic/1984/19840424b.pdf.

[50]Greenwald et al. 2006 in *The Endangered Species Act at Thirty* at p. 66.

status (See Table 3). As we describe below, these socially undervalued species can often play inordinately important ecological roles.

C. Need to Increase the ESA Listing Budget

To truly address the Sixth Extinction we should use this nation's most effective species protection statute, the ESA. To effectively do so a substantial increase in the Service's budget for ESA implementation, especially the listing budget, is necessary. The listing budget (including critical habitat designation) has averaged approximately $15 million per year since 1992, yet a 1990 Inspector General report estimated $144 million was needed to address the listing backlog.[51] The Service recently increased the estimate of what is required to $153 million.[52] The Service must begin requesting from Congress adequate funds to address the listing backlog, as well as to meet statutory deadlines for this petition and future listing needs.

Indeed, a paradigm shift is required in the ESA's budget to stem the extinction crisis. President George W. Bush's proposed 2008 budget would fund the law at only $146.5 million,[53] despite calculations that $470 million is needed to adequately fund this law in 2008, and that the budget should increase to $693 million over the next five years.[54] Scientists have estimated that the ESA is being funding at 20% of what is required for endangered species protection. They compare it to "starving hospital patients…and then grilling the doctors about why more patients are not recovering."[55] In the case of listing, given the tremendous backlog of both unlisted candidates and G1 species not yet in the queue for listing, the listing budget needs to increase by at least one order of magnitude.

IV. The Value of Biodiversity

Native plants and wildlife, and the ecosystems they sustain and of which they are a part, hold incalculable worth to humans. Rep. Evans of Delaware captured this in 1982 on the House Floor:

> [I]t is important to understand that the contribution of wild species to the welfare of mankind in agriculture, medicine, industry, and science have been of incalculable value. These contributions will continue only if we protect our storehouse of biological diversity . . . [O]ur wild plants and

[51]U.S. Department of Interior Inspector General. 1990. Report no. 90-98. Washington, DC.
[52]The U.S. Fish and Wildlife Service estimated that approximately $153 million would be needed to address the current backlog of listing and critical habitat obligations. Secretary of Interior, Gale Norton and U.S. Fish and Wildlife Service Director, Steven Williams, defendants' responses to interrogatories in *Defenders of Wildlife et al. v. Gale Norton and Steven Williams* (CIV 02-00163-M DWM), page 4. See also Greenwald et al. 2006 at p. 64.
[53]See 2008 proposed U.S. Fish and Wildlife Service budget at: http://www.fws.gov/budget/2008/2008%20GB/08%20Greenbook.pdf.
[54]See National Wildlife Federation. 2007. Fair Funding for Wildlife. Online at: http://www.nwf.org/endangered/pdfs/FairFundingForWildlifeFullReport.pdf at p. 2.
[55]Miller, Julie K, J. Michael Scott, Craig R. Miller, and Lisette P. Waits. 2002. "The Endangered Species Act: Dollars and Sense?" *Bioscience* 52: 163-168.

> animals are not only uplifting to the human sprit, but they are absolutely essential -- as a practical matter -- to our continued healthy existence.[56]

The majority of species included in this petition are plants and invertebrates. While they may be socially undervalued, often their ecological and economic importance can be enormous.[57]

> So important are insects and other land-dwelling arthropods that if all were to disappear, humanity probably could not last more than a few months. Most of the amphibians, reptiles, birds, and mammals would crash to extinction about the same time. Next would go the bulk of the flowering plants and with them the physical structure of most forests and other terrestrial habitats of the word. The land surface would literally rot.[58]

The broad array of values possessed by native species includes utilitarian, ecological, aesthetic, symbolic, recreational, spiritual, ethical, and scientific. First, utilitarian values comprise foods, medicines, clothing, and other products that are derived from animals and plants.[59] On a global scale, 25 to 40% of pharmaceutical products come from wild plants and animals.[60] Moreover, 70% of pharmaceutical products are modeled on a native species, despite only 0.1% of plant species having been examined for their medicinal value. Of the top ten prescription drugs in the United States, nine are based on natural plants. The market value for drugs from tropical and temperate rainforest plants in the US alone is placed at $200 million dollars per year.[61] In addition, some wild plant species may be instrumental in thwarting blight in agricultural crops.[62] Conversely, the extinction of wild flora and the simplification of natural systems to monocultures can increase

[56]128 Cong. Rec. 26,189 (1982), statement of Rep. Evans.
[57]E.O. Wilson stated, "Why should we care? What difference does it make if some species are extinguished, if even half of all the species on earth disappear? Let me count the ways. New sources of scientific information will be lost. Vast potential biological wealth will be destroyed. Still undeveloped medicines, crops, pharmaceuticals, timber, fibers, pulp, soil-restoring vegetation, petoleum substitutes, and other products and amenities will never come to light. …In amnesiac revery it is also easy to overlook the services that ecosystems provide humanity. They enrich the soil and create the very air we breathe. Without these amenities, the remaining tenure of the human race would be nasty and brief. The life-sustaining matrix is built of green plants with legions of microorganisms and mostly small, obscure animals - in other words, weeds and bugs." *The Diversity of Life* at pp. 346-47.
[58]*The Diversity of Life* at p. 133.
[59]Dobson, Andrew P. 1996. *Conservation and biodiversity*. NY, NY: Scientific American Library; Kellert, Stephen R. 1996. *The Value of Life: Biological Diversity and Human Society*. Washington, DC: Island Press; Abramovitz, Janet N. "Valuing nature's services." In *State of the World 1997*. Worldwatch Institute Report on Progress Toward a Sustainable Society. New York: W.W. Norton & Co.; Costanza, R., R. d'Arge, R. de Groot, S. Farber, M. Grasso, B. Hannon, K. Limburg, S. Naeem, R. V. O'Neill, J. Paruelo, R.G. Gaskin, P. Sutton, and M. van den Belt. 1997. "The value of the world's ecosystem services and natural capital." *Nature* 387:253-260; and Pimentel, David, Christa Wilson, Christine McCullum, Rachel Huang, Paulette Dwen, Jessica Flack, Quynh Tran, Tamara Saltman, and Barbara Cliff. 1997. "Economic and environmental benefits of biodiversity." *BioScience* 47(11):747-757.
[60]Kellert 1996 (*The Value of Life*).
[61]Dobson 1996.
[62]*The Value of Life*.

susceptibility of crops to disease, pests, fires, and pollution.[63]

Second, the ecological value of species amplifies the utilitarian values discussed above because the extinction of one species may trigger the extinction of multiple species within an ecosystem.[64] The ecological value of flora and fauna is recognized in literature on the value of ecosystem services to human welfare.[65] Ecosystem services include maintenance of the atmosphere's gaseous composition by intact natural systems. Other benefits provided by healthy natural systems and their components include maintaining and generating soils; nourishing agricultural plants and trees by microorganisms; decomposing organic matter; waste disposal; nitrogren fixation and nutrient cycling; bioremediation of chemicals; biocontrol of species that attack crops, forests and domesticated animals; pollination by birds, bees, butterflies, bats and others; perennial cereal grains; and biotechnology.[66]

Benefits provided from biodiversity and ecosystem services in the US are estimated at $300 billion annually, and global ecosystem services are valued at $33 trillion annually.[67] These estimates are conservative, though, as the values of biodiversity are immeasurable, and intact ecosystems provide infinite value globally because without them humans could not survive.[68] Moreover, most of these services are so intricate and are provided on such a massive scale that it is not feasible to replicate them, even where scientists possess the knowledge to do so.[69] The tremendous value of ecosystem services will decline if the erosion of biodiversity continues.[70] Further, there may be a global explosion of pests and pathogens, as they are released by degraded natural controls.[71] The environmental and economic costs of exotic species in the U.S. are estimated at $137 billion per year.[72]

Invertebrate pollinators can play especially important ecological roles. Recent research indicates that many bee and butterfly pollinators are at risk in the United States.[73] The loss of pollinators threatens ecological and economic systems across the country.[74]

[63]Abramovitz 1997.
[64]Koh et al. 2004.
[65]Ehrlich, Paul R., and E.O. Wilson. 1991. "Biodiversity studies: science and policy." *Science* 253:758-62; and Pimentel et al. 1997.
[66]Ehrlich and Wilson 1991; and Pimentel et al. 1997.
[67]Pimentel et al. 1997; and Costanza et al. 1997.
[68]*The Sixth Extinction*; Bulte, Erwin, and G.C. Van Kooten. 2000. "Economic science, endangered species, and biodiversity loss." *Conservation Biology* 14(1):113-119; and Gatto, Marino and Giulio A. De Leo. 2000. "Pricing biodiversity and ecosystem services: the never-ending story." *BioScience* 50(4):347-355.
[69]Ehrlich and Wilson 1991.
[70]*Id*.
[71]Morris, D.W. and L. Heidinga. 1997. "Balancing the books on biodiversity." *Conservation Biology* 11:287-289.
[72]Pimentel, David, Lori Lach, Rodolfo Zuniga, and Doug Morrison. 2000. "Environmental and economic costs of nonindigenous species in the United States." *BioScience* 50(1):53-62.
[73]Xerces Society Red List of Pollinators of North America, http://www.xerces.org/Pollinator_Red_List/Table_Lepidoptera.htm, visited May 29, 2007.
[74]Committee on the Status of Pollinators in North America, National Research Council. 2006. *Status of Pollinators in North America*. Washington, DC: National Academies Press.

Third, the aesthetic and symbolic values of plants and wildlife also provide a rationale for protecting species. The beauty of unspoiled vistas, rugged terrain, wildflowers, butterflies, migrating birds, open spaces, charismatic megafauna, and other aspects of nature resonate with, and inform, human aesthetics. In fact, there is a consistent preference among humans for natural patterns and designs.[75] Symbolic values of wildlife are manifest in human language and cognition. Natural differentiations enable people to categorize disparate information and construct metaphors, thereby enhancing human cognition. Diversity in nature provides a greater range of categories that is especially pertinent for early childhood development.[76] The importance of this dynamic is underscored by the finding that upwards of 90% of characters in preschool books on counting and language are animals or natural objects. Animals and nature are ubiquitous in fairy tales and stories, which inform social codes of conduct. Continued destructiveness toward nature may consequently impact human cognition and social relations.[77] Aesthetic and symbolic values toward wildlife segue into their naturalistic value, as our enjoyment of the beauty and meaning of nature inspires us to experience it directly.

Fourth, the recreational value of wildlife involves a variety of activities, including bird- and wildlife-watching, fishing, hunting, eco-tourism, and hiking. These activities are very popular.[78] Non-tangible benefits deriving from the naturalistic value of the wild include decreased stress levels, physical exercise, and the intellectual value of direct experience with nature.[79] The economic value of wildlife-related recreation is significant: the Service has conducted surveys of wildlife-related recreation demonstrating extensive outdoor recreation in the U.S. The agency determined in its most recent report in 2006 that more than 87 million adult Americans, or 38% of the adult population, spent $120 billion in the course of wildlife-related recreation. Their expenditures supported hundreds of thousands of jobs.[80]

Fifth, ethical and moral values are a basis for endangered species protection. The inherent value of species and duty of existing humans to future generations of humans are ethical reasons to protect species from extinction. These ethics intersect with religious or

[75]*The Value of Life*; Kellert, Stephen R. and Edward O. Wilson, Eds. 1993. *The Biophilia Hypothesis*. Washington, DC: Island Press.
[76]*The Value of Life*; Bekoff, Marc. 1998b. "Deep ethology, animal rights, and the Great Ape/Animal Project: resisting speciesism and expanding the community of equals." *Journal of Agricultural and Environmental Ethics* 10: 269-296.
[77]*The Value of Life*. If this case seems overstated, one might consider the brevity of human experience with industrialization. Some 99% of human history took place in hunter-gatherer lifestyles where experience with nature was direct and inescapable (Kellert and Wilson 1993). In E.O. Wilson's words, "The more we know of other forms of life, the more we enjoy and respect ourselves. Humanity is exalted not because we are so far above other living creatures, but because knowing them well elevates the very concept of life." Wilson, Edward O. 1984. *Biophilia: The Human Bond with Other Species.* Cambridge: Harvard University Press at p. 115.
[78]Ehrlich and Wilson 1991; Dobson 1996; and *The Value of Life*.
[79]*The Value of Life*.
[80]U.S. Department of the Interior, Fish and Wildlife Service. 2007. "2006 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation." Issued May 2007. Online at: http://library.fws.gov/nat_survey2006.pdf.

spiritual reasons for preventing extinction. The kinship of all life – given similar cell structure, genetic makeup, and human existence as a byproduct of evolution – is also a basis for prescribing strong ethical duties toward nature.[81] Moralistic values toward wildlife therefore intersect with ecologistic values, as the web of life finds humans as a part of nature, just as the moralistic view on wild animals as kin derives from our common ancestry and human evolution within nature.

Sixth, flora and fauna possess scientific value. Scientific research on the natural processes and the behavior of individual species provides knowledge to humans on anatomy, biology, psychology, genetics, and other scientific disciplines.[82] Scientific findings serve both educational and applied functions. Recently, scientists have advocated a "conservation medicine" approach in conservation biology that examines the ways in which human, animal, and ecosystem health inter-relate.[83] Scientific knowledge gained from biodiversity studies provides a basis for improving human and animal health.

Finally, people may hold humanistic values toward wildlife.[84] Humans feel bonds of affection and love toward companion and wild animals, plants, and natural areas. This corresponds with notions of "biophilia" – or intrinsic emotional affiliation of humans to non-human beings.[85] While biophilia derives from and is manifest in the multiple values toward wildlife described above,[86] its expression is particularly apparent in humanistic expressions toward wildlife.

IV. Conclusion

We humans and the ecosystems that support us are in the midst of an extinction crisis unparalleled in the last 65 million years of geologic time. As more and more of us crowd this planet and convert its biological resources to our own ends, we impoverish the lives and the very existence of countless other species. Eventually, we will end up impoverishing ourselves. Irreplaceable species are being lost daily at alarming and increasing rates. Unquantifiable economic and other harm is occurring. We have a big problem. We need a big solution.

This is not an alarmist position. Congress recognized the scope of the extinction crisis and the incalculable damage we are doing to the very fabric of the natural world that supports our civilization over 30 years ago. Congress' solution to this problem was the ESA: a strong and precautionary law to prevent looming ecological disaster. It is time to

[81] *The Biophilia Hypothesis*; *The Sixth Extinction*; and *The Value of Life*.
[82] *The Value of Life*; Bekoff, Marc. 1998a. "Deep ethology." In *Kinship With the Animals*. Eds. Michael Tobias and Kate Solisti-Mattelon. Hilsboro, OR: Beyond Words Publishing; and Wilson, E.O. 1987. "The little things that run the world." *Conservation Biology* 1:344-346.
[83] Meffe, Gary K. 1999. "Conservation medicine." *Conservation Biology* 13: 953-954, Norris, Scott. 2001. "A new voice in conservation." *BioScience* 51(1): 7-12, and Spear, John R. 2000. "Conservation medicine: the changing view of biodiversity." *Conservation Biology* 14(6): 1913-1917.
[84] *The Value of Life*.
[85] *The Biophilia Hypothesis.*
[86] *The Value of Life*.

use this law as it was intended and extend a safety net to the species we have driven to the edge of extinction.

This Petition is only a modest proposal. Forest Guardians seeks to force the Service to act upon information the Service already recognizes and endorses. By using the citizen petition process of the ESA to protect 206 species in the Service's Mountain-Prairie Region, we are attempting to unlock the gates to the legal Ark, the ESA, that Congress designed to save these species from extinction. For reasons of its own, but anticipated by Congress when it included the citizen petition process in the ESA, the Service has kept the door to the Ark nearly shut. This is inappropriate and illegal. The ESA requires the Service to list, and thereby extend legal protection to, all species whenever the best scientific and commercial information available indicates that these species are likely to go extinct in the foreseeable future. In this case, there is a widespread scientific consensus documented in the NatureServe system, a system the Service itself recognizes as authoritative, that each of the 206 species included in this Petition faces extinction unless it is promptly protected. This Petition is intended to give the Service the opportunity to act on this scientific consensus and in accordance with the law as Congress intended when it set out to "halt and reverse the trend toward species extinction, whatever the cost." *TVA v. Hill*, 437 U.S. 153, 184 (1978).

Requested Designation

Forest Guardians hereby petitions the U.S. Fish and Wildlife Service under the Department of Interior to list the 206 species that are critically imperiled or imperiled in the Mountain-Prairie Region as Endangered or Threatened species pursuant to the Endangered Species Act. The petitioned species are named at Tables 1 & 2. This listing action is warranted, given the critically imperiled and imperiled biological status of these species. In addition to considering whether to list the petitioned species, we request that FWS consider emergency listing for those species among these 206 determined to be at imminent risk of extinction. We further request that listing rules for each of the petitioned species include critical habitat designations, given the efficacy of critical habitat in promoting species recovery,[87] and the fact that the leading threat to imperiled species is habitat destruction.[88]

[87]Suckling, Kieran F., and Martin Taylor. 2006. "Critical Habitat and Recovery" in *The Endangered Species Act at Thirty*. See p. 86.
[88]Wilcove et al. 1998.

Table 1. All G1 Species in MT, WY, UT, CO, ND, SD, NE, & KS not yet listed, candidates, proposed for listing, or previously petitioned under the Endangered Species Act (N=145). Source: NatureServe.

Scientific name	Common Name	NatureServe Rank	ESA Status	Range	NatureServe notes
Chaetarthria utahensis	Utah Chaetarthrian Water Scavenger Beetle	G1		UT	Incomplete Distribution Data: Distribution data for U.S. states and Canadian provinces is known to be incomplete or has not been reviewed for this taxon.
Microcylloepus browni	Brown's Microcylloepus Riffle Beetle	G1		CAN: MB USA: MT	Incomplete Distribution Data: Distribution data for U.S. states and Canadian provinces is known to be incomplete or has not been reviewed for this taxon.
Optioservus phaeus	Scott Optioservus Riffle Beetle	G1		KS	Incomplete Distribution Data: Distribution data for U.S. states and Canadian provinces is known to be incomplete or has not been reviewed for this taxon.
Arctia sp. 1		G1		CO	
Melanoplus missoulae	A Spur-throat Grasshopper	G1		MT	

Capnia arapahoe	A Stonefly	G1		CO	
Lednia tumana	Meltwater Lednian Stonefly	G1		CAN:MB USA:MT, ND, WA	
Suwallia salish	A Stonefly	G1		MT	
Amnicola sp. 2	Washington Duskysnail	G1		ID, MT, WA	
Physella spelunca	Cave Physa	G1		WY	
Physella zionis	Wet-rock Physa	G1		UT	
Planorbella oregonensis	Lamb Rams-horn	G1		OR, UT	
Pyrgulopsis anguina	Longitudinal Gland Pyrg	G1		NV, UT	
Pyrgulopsis bedfordensis	A Freshwater Snail	G1		MT	
Pyrgulopsis chamberlini	Smooth Glenwood Pyrg	G1		UT	
Pyrgulopsis fusca	Otter Creek Pyrg	G1		UT	
Pyrgulopsis hamlinensis	Hamlin Valley Pyrg	G1		UT	
Pyrgulopsis inopinata	Carinate Glenwood Pyrg	G1		UT	
Pyrgulopsis nonaria	Ninemile Pyrg	G1		UT	
Pyrgulopsis plicata	Black Canyon Pyrg	G1		UT	
Pyrgulopsis saxatilis	Sub-globose Snake Pyrg	G1		UT	

Stagnicola elrodi	Flathead Pondsnail	G1		MT	
Stagnicola elrodiana	Longmouth Pondsnail	G1		MT	
Catinella gelida	A Terrestrial Snail	G1		IA, IL, IN, KY(Extirpated), MI, MO, MS, OH, SD, WI	Extirpated: The species is extirpated in the subnation.
Cryptomastix sanburni	Kingston Oregonian	G1		ID, MT	
Discus brunsoni	Lake Disc	G1		MT	
Ogaridiscus subrupicola	Southern Tightcoil	G1		ID, OR, UT	
Oreohelix alpina	Alpine Mountainsnail	G1		MT	
Oreohelix carinifera	Keeled Mountainsnail	G1		CAN:MB USA:MT, WY	
Oreohelix elrodi	Carinate Mountainsnail	G1		CAN: MB USA: MT	
Oreohelix eurekensis	Eureka Mountainsnail	G1		UT	
Oreohelix hendersoni	Pallid Mountainsnail	G1		CO	
Oreohelix howardi	Mill Creek Mountainsnail	G1		UT	
Oreohelix parawanensis	Brian Head Mountainsnail	G1		UT	
Oreohelix pygmaea	Pygmy Mountainsnail	G1		WY	
Oreohelix sp. 11	Subcarinate Mountainsnail	G1		MT	

Oreohelix sp. 4	Drummond Mountainsnail	G1		MT	
Oreohelix sp. 6	Kintla Lake Mountainsnail	G1		MT	
Vertigo hannai	Hanna's Vertigo	G1		CAN: ON USA: IL, KS	
Prosopium abyssicola	Bear Lake Whitefish	G1		ID, UT	
Prosopium gemmifer	Bonneville Cisco	G1		ID, NV(Exotic), UT	Exotic: The species is present in the nation or subnation due to direct or indirect human intervention. Note: For plants these may include a small number of records where the native/exotic status is uncertain.
Prosopium spilonotus	Bonneville Whitefish	G1		ID, UT	
Cottus extensus	Bear Lake Sculpin	G1		ID, UT	
Xanthoparmelia idahoensis		G1		CAN:AB USA:CO, ID	Incomplete Distribution Data: Distribution data for U.S. states and Canadian provinces is known to be incomplete or has not been reviewed for this taxon.

Xanthoparmelia neowyomingica		G1		CO, WY	Incomplete Distribution Data: Distribution data for U.S. states and Canadian provinces is known to be incomplete or has not been reviewed for this taxon.
Chiloscyphus gemmiparus		G1		AK, CA, OR, UT	
Aschisma kansanum		G1		KS	Incomplete Distribution Data: Distribution data for U.S. states and Canadian provinces is known to be incomplete or has not been reviewed for this taxon.
Didymodon anserinocapitatus		G1		CO	Incomplete Distribution Data: Distribution data for U.S. states and Canadian provinces is known to be incomplete or has not been reviewed for this taxon.
Abronia ammophila	Yellowstone Sand Verbena	G1		WY	
Agrostis rossiae	Ross' Bentgrass	G1		WY	

Allium passeyi	Passey's Onion	G1		UT	
Aquilegia grahamii	Graham's Columbine	G1		UT	
Arabis pusilla	Fremont County Rockcress	G1		WY	
Astragalus avonensis		G1		UT	
Astragalus hamiltonii	Hamilton's Milk-vetch	G1		CO, UT	
Astragalus iselyi	Isely's Milk-vetch	G1		UT	
Astragalus loanus	Glenwood Milk-vetch	G1		UT	
Astragalus microcymbus	Skiff Milk-vetch	G1		CO	
Astragalus proimanthus	Precocious Milk-vetch	G1		WY	
Astragalus sabulosus	Cisco Milk-vetch	G1		UT	
Astragalus schmolliae	Schmoll's Milk-vetch	G1		CO	
Camissonia bairdii	Baird's Camissonia	G1		UT	
Camissonia exilis	Cottonwood Spring Suncup	G1		AZ, UT	
Cryptantha compacta	Compact Cat's-eye	G1		UT	
Cryptantha gypsophila	Gypsum Valley Cateye	G1		CO	

Cymopterus beckii	Pinnate Spring-parsley	G1		AZ,UT	
Descurainia torulosa	Wyoming Tansymustard	G1		WY	
Draba kassii	Kass's Rockcress	G1		UT	
Draba ramulosa	Tushar Mountain Whitlow-grass	G1		UT	
Draba weberi	Weber's Whitlow-grass	G1		CO	
Ericameria lignumviridis	Greenwood's Heath-goldenrod	G1		UT	
Erigeron wilkenii	Wilken's Fleabane	G1		CO	
Erigeron zothecinus	Alcove Daisy	G1		UT	
Eriogonum smithii	Smith's Wild Buckwheat	G1		UT	
Eriogonum soredium	Frisco Buckwheat	G1		UT	
Frasera gypsicola	Sunnyside Green-gentian	G1		NV, UT	
Gilia sedifolia	Stonecrop Gily-flower	G1		CO	
Hackelia gracilenta	Colorado Stickseed	G1		CO	
Hackelia ibapensis	Deep Creek Stickseed	G1		UT	

Hymenoxys lapidicola	Rock Hymenoxys	G1		UT	
Lepidium ostleri	Ostler's Pepper-grass	G1		UT	
Lesquerella humilis	Few-seeded Bladderpod	G1		MT	
Lesquerella lesicii	Pryor Mountains Bladderpod	G1		MT	
Lomatium latilobum	Canyonlands Lomatium	G1		CO, UT	
Mentzelia goodrichii	Goodrich's Blazingstar	G1		UT	
Mentzelia shultziorum	Shultz Stickleaf	G1		UT	
Mimulus gemmiparus	Weber's Monkeyflower	G1		CO	
Oreoxis humilis	Pikes Peak Spring-parsley	G1		CO	
Oreoxis trotteri	Trotter's Oreoxis	G1		UT	
Packera castoreus	Beaver Mountain Groundsel	G1		UT	
Packera malmstenii	Podunk Groundsel	G1		UT	
Penstemon flowersii	Flowers' Penstemon	G1		UT	
Penstemon franklinii	Ben Franklin's Beardtongue	G1		UT	

Penstemon gibbensii	Gibben's Beardtongue	G1		CO, UT, WY	
Penstemon navajoa	Navajo Beardtongue	G1		NN, UT	
Penstemon pinorum	Pinyon Penstemon	G1		UT	
Perityle specuicola	Alcove Rockdaisy	G1		NN, UT	
Phacelia indecora	Drab Phacelia	G1		NN, UT	
Physaria dornii	Dorn's Twinpod	G1		WY	
Physaria pulvinata		G1		CO	
Physaria stylosa	Duchesne River Twinpod	G1		UT	
Potentilla angelliae	Angell Cinquefoil	G1		UT	
Potentilla cottamii	Cottam's Potentilla	G1		NV, UT	
Primula domensis	House Range Primrose	G1		UT	
Senecio musiniensis	Musinea Ragwort	G1		UT	
Senecio spribillei		G1		MT	
Sphaeralcea gierischii		G1		AZ, UT	
Sphaeralcea janeae	Jane's Globemallow	G1		UT	
Talinum thompsonii	Thompson's Talinum	G1		UT	
Thelesperma caespitosum	Green River Greenthread	G1		UT, WY	

Thelesperma pubescens	Uinta Greenthread	G1		UT, WY	
Townsendia microcephala	Cedar Mountain Easter-daisy	G1		WY	
Trifolium barnebyi	Barneby's Clover	G1		WY	
Trifolium friscanum	Frisco Clover	G1		UT	
Viola clauseniana	Clausen's Violet	G1		UT	
Viola frank-smithii	Frank Smith's Violet	G1		UT	
Pheidole elecebra	An Ant	G1?		CO	Incomplete Distribution Data: Distribution data for U.S. states and Canadian provinces is known to be incomplete or has not been reviewed for this taxon.
Amblyderus werneri	Great Sand Dunes Anthicid Beetle	G1?		CO	Incomplete Distribution Data: Distribution data for U.S. states and Canadian provinces is known to be incomplete or has not been reviewed for this taxon.

Proctacanthus sp. 1	Robber Fly From Colorado	G1?		CO	Incomplete Distribution Data: Distribution data for U.S. states and Canadian provinces is known to be incomplete or has not been reviewed for this taxon.
Polydesmus cavicola	A Millipede	G1?		UT	Incomplete Distribution Data: Distribution data for U.S. states and Canadian provinces is known to be incomplete or has not been reviewed for this taxon.
Verrucaria kootenaica		G1?		MT	Incomplete Distribution Data: Distribution data for U.S. states and Canadian provinces is known to be incomplete or has not been reviewed for this taxon.
Ozobryum ogalalense		G1?		KS, NE	Incomplete Distribution Data: Distribution data for U.S. states and Canadian provinces is known to be incomplete or has not been reviewed for this taxon.

Camissonia gouldii	Diamond Valley Suncup	G1?		AZ, UT	
Corispermum navicula	Boat-shaped Bugseed	G1?		CO	
Cryptantha ochroleuca	Yellow-white Catseye	G1?		UT	
Cryptantha semiglabra	Pipe Springs Cryptantha	G1?		AZ, UT	
Lesquerella navajoensis		G1?		AZ, NM, NN, UT	
Phacelia argylensis	Argyle Canyon Phacelia	G1?		UT	
Potentilla macounii	Macoun's Cinquefoil	G1?		CAN: AB USA: MT	
Ranunculus coloradensis	Colorado Buttercup	G1?		CO	
Physaria repanda	Repand Twinpod	G1?Q		UT	
Sclerocactus contortus	Canyonland Fishhook Cactus	G1?Q		UT	
Helisoma newberryi	Great Basin Rams-horn	G1Q		CA, ID(Extirpated), NV, OR, UT(Extirpated), WY	Extirpated: The species is extirpated in the subnation.
Webbhelix chadwicki	Kaw Whitelip	G1Q		KS, NE	
Arabis falcatoria	Grouse Creek Rockcress	G1Q		NV, UT	
Cuscuta plattensis	Wyoming Dodder	G1Q		WY	

Erigeron awapensis	Awapa Daisy	G1Q		UT	
Eriogonum ammophilum	Ibex Wild Buckwheat	G1Q		UT	
Eriogonum cronquistii	Cronquist's Wild Buckwheat	G1Q		UT	
Eriogonum hylophilum	Gate Canyon Wild Buckwheat	G1Q		UT	
Eriogonum phoeniceum		G1Q		NV, UT	
Hymenoclea sandersonii	Sanderson's Cheesebush	G1Q		UT	
Lygodesmia entrada	Entrada Skeletonplant	G1Q		UT	
Physaria grahamii	Graham's Twinpod	G1Q		UT	
Xylorhiza cronquistii	Cronquist's Woody-aster	G1Q		UT	

Table 2. All G1G2 Species in MT, WY, UT, CO, ND, SD, NE, & KS not yet listed, candidates, proposed for listing, or previously petitioned under the Endangered Species Act (N=61). Source: NatureServe.

Scientific name	Common Name	NatureServe Rank	ESA Status	Range	NatureServe notes
Stygobromus coloradensis	A Cave Obligate Amphipod	G1G2		CO	
Stygobromus fontinalis	Spring Amphipod	G1G2		CO	
Stygobromus holsingeri	An Amphipod	G1G2		CO	

Stygobromus montanensis	A Cave Obligate Amphipod	G1G2		MT	
Stygobromus obscurus	A Cave Obligate Amphipod	G1G2		MT	
Stygobromus puteanus	A Cave Obligate Amphipod	G1G2		MT	
Stygobromus simplex	Simple Amphipod	G1G2		CO	
Stygobromus tritus	A Cave Obligate Amphipod	G1G2		MT	
Stygobromus utahensis	Utah Amphipod	G1G2		UT	
Stygobromus wardi	Ward's Amphipod	G1G2		CO	
Caecidotea metcalfi	A Cave Obligate Isopod	G1G2		KS	
Caecidotea tridentata		G1G2		IL,KS	
Oncopodura cruciata	A Springtail	G1G2		MT	
Sphalloplana kansensis	Kansas Planarian	G1G2		KS	

Hygrotus diversipes	Narrow-foot Hygrotus Diving Beetle	G1G2		WY	Incomplete Distribution Data: Distribution data for U.S. states and Canadian provinces is known to be incomplete or has not been reviewed for this taxon.
Heterocampa rufinans	A Notodontid Moth	G1G2		CO	
Allomyia hector	A Caddisfly	G1G2		CAN:AB USA:MT	Incomplete Distribution Data: Distribution data for U.S. states and Canadian provinces is known to be incomplete or has not been reviewed for this taxon.

Ironoquia plattensis	A Caddisfly	G1G2		NE	Incomplete Distribution Data: Distribution data for U.S. states and Canadian provinces is known to be incomplete or has not been reviewed for this taxon.
Neotrichia downsi	A Caddisfly	G1G2		CO	Incomplete Distribution Data: Distribution data for U.S. states and Canadian provinces is known to be incomplete or has not been reviewed for this taxon.
Melanoplus sp. 1		G1G2		MT	
Melanoplus sp. 40		G1G2		CO	
Melanoplus sp. 41		G1G2		CO	
Melanoplus sp. 42		G1G2		UT	
Melanoplus sp. 47		G1G2		UT	

Melanoplus sp. 49		G1G2		CO	
Sweltsa cristata	A Stonefly	G1G2		UT	
Ameletus edmundsi	A Mayfly	G1G2		UT	
Brachycercus tuberculatus	A Mayfly	G1G2		CO, UT	
Ephemerella apopsis	A Mayfly	G1G2		CO	
Leptophlebia konza	Konza Prairie Mayfly	G1G2		KS	
Paraleptophlebia calcarica	A Prongill Mayfly	G1G2		AR,KS	
Blancosoma scaturgo	A Cave Obligate Millipede	G1G2		CO	
Speodesmus aquiliensis	A Cave Obligate Millipede	G1G2		CO	
Oreohelix amariradix	Bitterroot Mountainsnail	G1G2		MT	
Oreohelix sp. 3	Bearmouth Mountainsnail	G1G2		MT	
Oreohelix sp. 31	Byrne Resort Mountainsnail	G1G2		MT	
Oreohelix sp. 5	Brunson Mountainsnail	G1G2		MT	
Oreohelix sp. 7	Kitchen Creek Mountainsnail	G1G2		MT	

Cryptobunus cavicolus	A Cave Obligate Harvestman	G1G2		MT	
Hesperonemastoma packardi	A Cave Obligate Harvestman	G1G2		UT	
Lepidomeda copei	Northern Leatherside Chub	G1G2		ID, NV, UT, WY	
Micarea ternaria		G1G2		MT	Incomplete Distribution Data: Distribution data for U.S. states and Canadian provinces is known to be incomplete or has not been reviewed for this taxon.
Riccia ozarkiana		G1G2		AK, KS, MO	

Campylium cardotii		G1G2		CAN:QC USA:MT	Incomplete Distribution Data: Distribution data for U.S. states and Canadian provinces is known to be incomplete or has not been reviewed for this taxon.
Aquilegia loriae		G1G2		UT	
Cryptantha johnstonii	Johnston Catseye	G1G2		UT	
Draba brachystylis	Wasatch Draba	G1G2		NV, UT	
Draba inexpectata	Uinta Mountains draba	G1G2		UT	
Erigeron abajoensis	Abajo Daisy	G1G2		UT	
Erigeron huberi		G1G2		UT	
Eriogonum brandegeei	Brandegee's Wild Buckwheat	G1G2		CO	
Eriogonum mitophyllum	Lost Creek wild buckwheat	G1G2		UT	
Lepidium huberi	Huber's Pepperwort	G1G2		UT	

Lepidium integrifolium	Thickleaf Pepperwort	G1G2		CO, UT, WY	
Lygodesmia doloresensis	Dolores River Skeleton-plant	G1G2		CO, UT	
Oenothera murdockii		G1G2		UT	
Sisyrinchium sarmentosum	Pale Blue-eyed-grass	G1G2		ND, OR, WA	
Viola lithion	Rock Violet	G1G2		NV, UT	
Cirsium scapanolepis	Mountain-slope Thistle	G1G2Q		CO	
Cymopterus minimus	Cedar Breaks Biscuitroot	G1G2Q		UT	
Sclerocactus blainei	Blaine's Pincushion	G1G2Q		NV, UT	

Table 3. Statistics on Endangered Species Act Status for G1 and G1G2 Species in the U.S. Mountain-Prairie Region. Source: NatureServe.

Taxonomy	G1 & G1G2	Listed or candidate	Already petitioned	Number Petitioned	Percent with ESA status	Percent already petitioned	Percent of Petition
Invertebrates	104	9	10	85	9%	10%	38%
Vertebrates	22	14	3	6	64%	14%	8%
Plants	145	27	2	117	19%	1%	54%
Totals	**271**	**50**	**15**	**206**	**18.45%**	**5.50%**	**100%**