

ADDRESSES and reference Docket No. NHTSA-2009-0108.

II. Submission of Comments

How Do I Prepare and Submit Comments?

Your comments must be written and in English. To ensure that your comments are correctly filed in the Docket, please include the Docket number of this document in your comments. Please submit two copies of your comments, including attachments, to Docket Management at the address given above under **ADDRESSES**. Comments may also be submitted to the docket electronically by logging onto <http://www.regulations.gov>. Click on "How to Use This Site" and then "User Tips" to obtain instructions for filing the document electronically.

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Will the Agency Consider Late Comments?

We will consider all comments that Docket Management receives before the close of business on the comment closing date indicated above under **DATES**. To the extent possible, we will also consider comments that Docket Management receives after that date. If a comment is received too late for us to consider it in developing a final plan, we will consider that comment as an informal suggestion for future revisions of the plan.

How Can I Read the Comments Submitted by Other People?

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1. Go to <http://www.regulations.gov>.
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3. The next page will contain results for that docket number; it may help you to sort by "Date Posted: Oldest to Recent."
4. On the results page, click on the desired comments. You may download the comments. However, since the comments are imaged documents, instead of word processing documents, the downloaded comments may not be word searchable.

Please note that even after the comment closing date, we will continue to file relevant information in the Docket as it becomes available. Accordingly, we recommend that you periodically check the Docket for new material.

Anyone is able to search the electronic form of all comments received into any of our dockets by the name of the individual submitting the comment (or signing the comment, if submitted on behalf of an association, business, labor union, etc.). You may review DOT's complete Privacy Act Statement in the **Federal Register** published on April 11, 2000 (Volume 65, Number 70; Pages 19477-78) or you may visit <http://www.dot.gov/privacy.html>.

Authority: 49 U.S.C. 30111, 30117, 30168; delegation of authority at 49 CFR 1.50 and 501.8.

Issued on: June 25, 2009.

Ronald L. Medford,

Senior Associate Administrator for Vehicle Safety.

[FR Doc. E9-15523 Filed 6-30-09; 8:45 am]

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DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

[FWS-R2-ES-2009-0030; 92210-1111-FY08-B2]

Endangered and Threatened Wildlife and Plants; 90-Day Finding on a Petition to List the Northern Leopard Frog (*Lithobates [=Rana] pipiens*) in the Western United States as Threatened

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Notice of a 90-day petition finding and initiation of status review.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), announce a 90-day finding on a petition to list the western U.S. population of the northern leopard frog (*Lithobates [=Rana] pipiens*) as threatened under the Endangered Species Act of 1973, as amended (Act). Following a review of the petition, we find that the petition presents substantial scientific or commercial information indicating that listing the western U.S. population of northern leopard frog may be warranted. Therefore, with the publication of this notice, we are initiating a status review of the species, and we will issue a 12-month finding to determine if listing the species throughout all or a significant portion of its range is warranted. To ensure that the status review of the northern leopard frog is comprehensive, we are soliciting scientific and commercial information and other information regarding this species.

DATES: We made the finding announced in this document on July 1, 2009. To allow us adequate time to conduct a status review, we request that information be submitted on or before August 31, 2009.

ADDRESSES: You may submit comments by one of the following methods:

- *Federal eRulemaking Portal:* <http://www.regulations.gov>. Follow the instructions for submitting comments.
- *U.S. mail or hand-delivery:* Public Comments Processing, Attn: FWS-R2-ES-2009-0030; 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 Information Solicited section below for more details).

FOR FURTHER INFORMATION CONTACT: Steven L. Spangle, Field Supervisor,

Arizona Ecological Services Office, U.S. Fish and Wildlife Service, 2321 West Royal Palm Drive, Suite 103, Phoenix, AZ 85021; telephone 602-242-0210; facsimile 602-242-2513. If you use a telecommunications device for the deaf (TDD), please call the Federal Information Relay Service (FIRS) at 800-877-8339.

SUPPLEMENTARY INFORMATION:

Information Solicited

When we make a finding that a petition presents substantial information indicating that listing a species may be warranted, we are required to promptly commence a review of the status of that species. To ensure that the status review is complete and based on the best available scientific and commercial information, we are soliciting information concerning the status of the northern leopard frog. We request information from the public, other concerned governmental agencies, Native American Tribes, the scientific community, industry, or any other interested parties concerning the status of the northern leopard frog. We are seeking information regarding:

(1) The historical and current status and distribution of the northern leopard frog, its biology and ecology, and ongoing conservation measures for the species and its habitat, and threats to the species and its habitat;

(2) information relevant to the factors that are the basis for making a listing determination for a species under section 4(a) of the Endangered Species Act of 1973, as amended (Act) (16 U.S.C. 1531 *et seq.*), which are:

(a) The present or threatened destruction, modification, or curtailment of the species' 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 and threats to the species or its habitat; and

(3) its taxonomy (particularly genetics of the western U.S. population and of the convergence zone of the eastern and western haplotypes in Wisconsin and Ontario, Canada).

If we determine that listing the northern leopard frog is warranted, it is our intent to propose critical habitat to the maximum extent prudent and determinable at the time we would propose to list the species. Therefore, with regard to areas within the geographical range currently occupied

by the northern leopard frog, we also request data and information on what may constitute physical or biological features essential to the conservation of the species, where these features are currently found, and whether any of these features may require special management considerations or protection. In addition, we request data and information regarding whether there are areas outside the geographical area occupied by the species which are essential to the conservation of the species. Provide specific information as to what, if any, critical habitat should be proposed for designation if the species is proposed for listing, and why the suggested critical habitat meets the requirements of the Endangered Species Act of 1973, as amended (Act; 16 U.S.C. 1531 *et seq.*).

Please note that submissions merely stating support or opposition to the action under consideration without providing supporting information, although noted, will not be considered in making a determination, as section 4(b)(1)(A) of the Act directs that determinations as to whether any species is a threatened or endangered species shall be made "solely on the basis of the best scientific and commercial data available." At the conclusion of the status review, we will issue the 12-month finding on the petition, as provided in section 4(b)(3)(B) of the Act.

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 your submission is made via 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>. Please include sufficient information with your comments to allow us to verify any scientific or commercial information you include.

Information and materials we receive, as well as supporting documentation we used in preparing this finding, will be available for public inspection on <http://www.regulations.gov>, or by appointment, during normal business hours, at the U.S. Fish and Wildlife Service, Arizona 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 the petitioned action may be warranted. We are to base this finding on information contained in the petition, supporting information submitted with the petition, and information otherwise available in our files. To the maximum extent practicable, we are to make this finding within 90 days of receipt of the petition, and publish our notice of this finding promptly in the **Federal Register**.

Our standard for substantial scientific or commercial 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.

We received a petition dated June 5, 2006, from the Center for Native Ecosystems, Biodiversity Conservation Alliance, Defenders of Black Hills, Forest Guardians, Center for Biological Diversity, The Ark Initiative, Native Ecosystems Council, Rocky Mountain Clean Air Action, and Jeremy Nichols requesting that the northern leopard frog (*Lithobates* (=Rana) *pipiens*) occurring in the western United States (Arizona, California, Colorado, Idaho, Iowa, Minnesota, Missouri, Montana, Nebraska, Nevada, New Mexico, North Dakota, Oregon, South Dakota, Texas, Utah, Washington, and Wyoming) be listed as a threatened distinct population segment (DPS) under the Act. The petition clearly identified itself as such and included the requisite identification information for the petitioners, as required in 50 CFR 424.14(a). In response to the petitioners' request, we sent a letter to the petitioners dated August 7, 2006, explaining that we would not be able to address their petition at that time. The reason for this delay was that responding to court orders and settlement agreements for other listing actions required nearly all of our listing funding. Delays in responding to the petition have continued due to higher priority actions, until funding recently became available to respond to this petition.

In reviewing the petition, there were two issues for which the Service requested clarification from the

petitioners. We were petitioned to list the population west of the Mississippi River and the Great Lakes region in the United States and south of the international boundary between the United States and Canada. However, the petition map does not show Wisconsin as a part of the petition, and the status of the species is not mentioned in that State. However, Wisconsin is located west of the Great Lakes region. Therefore, we requested that the petitioners clarify whether they intended to include or exclude Wisconsin from the petitioned DPS. The Service also sought clarification as to whether the petitioners were requesting we review only the western U.S. population of the northern leopard frog as a DPS or if they were also requesting us to consider listing the entire species or a significant portion of the range of the species. The petitioners responded to our clarification request in a letter dated February 8, 2008, requesting we review whether Wisconsin should be included in the western U.S. population of the northern leopard frog. In addition, the petitioners clarified that, if we find that listing the western U.S. population of northern leopard frogs as a DPS is not warranted, we review whether listing the entire species is warranted because of threats in a significant portion of its range.

Previous Federal Action

No previous Federal action has been taken on the northern leopard frog. The northern leopard frog has no Federal regulatory status under the Act.

Species Information

The northern leopard frog is in the family Ranidae (Frost *et al.* 2008, pp. 7–8), the true frogs, and is 1 of about 29 species within the genus *Lithobates* that occur in North America (Lannoo 2005, p. 371). The northern leopard frog is a smooth-skinned green, brown, or sometimes yellow-green frog covered with large, oval dark spots, each of which is surrounded by a lighter halo or border (Stebbins 2003, pp. 234–235). Adult snout-vent lengths range from 2 to 4.5 inches (5 to 11 centimeters) (Stebbins 2003, p. 234). Citations within the petition provide a more detailed description of the northern leopard frog (Baxter and Stone 1985, pp. 41–42; Hammerson 1999, pp. 145–146; Patla and Keinath 2005, p. 13).

The northern leopard frog requires a mosaic of habitats, which includes overwintering, breeding, and upland post-breeding habitats, as well as habitat linkages, to meet the requirements of all of its life stages (Pope *et al.* 2000, p. 2505; Smith 2003, pp. 6–15). Northern

leopard frogs breed in a variety of aquatic habitats that include slow-moving or still water along streams and rivers, wetlands, permanent or temporary pools, beaver ponds, and human-constructed habitats such as earthen stock tanks and borrow pits (Rorabaugh 2005, p. 572). Breeding areas typically do not contain predaceous fish or other predators (Merrell 1968, p. 275; Smith 2003, pp. 19–21), and emergent vegetation such as sedges and rushes are thought to be important features of breeding and tadpole habitats (Smith 2003, pp. 8–9).

Sub adult northern leopard frogs typically migrate to feeding sites along the borders of larger, more permanent bodies of water (Merrell 1970, p. 49). Recently metamorphosed frogs will move up and down drainages and across land in an effort to disperse from breeding areas (Seburn *et al.* 1997, p. 69); however, in some areas of the western United States, subadults may remain in the breeding habitat within which they metamorphosed (Smith 2003, p. 10). In addition to the breeding habitats, adult northern leopard frogs require stream, pond, lake, and river habitats for overwintering and upland habitats adjacent to these areas for summer feeding. In summer, adults and juveniles commonly feed in open or semi-open wet meadows and fields with shorter vegetation, usually near the margins of water bodies, and seek escape cover underwater. During winter, northern leopard frogs are found inactive underwater on the bottom of deeper streams or waters that do not freeze to the bottom and are well-oxygenated (Stewart *et al.* 2004, p. 72).

As soon as males leave overwintering sites, they travel to breeding ponds and call in shallow water (Smith 2003, p. 13). Male frogs attract females by calling from specific locations within a breeding pond, with several males typically calling together to form a chorus (Merrell 1977, p. 7). Eggs are typically laid within breeding habitats, two to three days following the onset of chorusing (Corn and Livo 1989, p. 5). Eggs are laid and larvae typically develop in shallow, still water that is exposed to sunlight. Eggs are usually attached to vegetation, just below the water surface. Egg masses may include several hundred to several thousand eggs (Lannoo 2005, p. 371) and are deposited in a tight, oval mass (Rorabaugh 2005, p. 572). Time to hatching is correlated with temperature and ranges from 2 days at 81 degrees Fahrenheit (27 degrees Centigrade) to 17 days at approximately 53 degrees Fahrenheit (12 degrees Centigrade) (Nussbaum *et al.* 1983, p. 182).

Northern leopard frog tadpoles are predominantly generalist herbivores, typically eating attached and free-floating algae (Hoff *et al.* 1999, p. 215), however they may feed on animal material (Hendricks 1973, p. 100). Adult and subadult frogs are generalist insectivores (Merrell 1977, p. 15; Smith 2003, p. 12). Prey includes insects, spiders, mollusks, and crustaceans.

A genetic study published in 2004 using mitochondrial DNA (mtDNA) reports that the northern leopard frog is split into two populations containing discrete eastern and western mtDNA markers (haplotypes), with the Mississippi River and Great Lakes region dividing the geographic ranges (Hoffman and Blouin 2004, p. 152). Results of the study indicate that the two populations have been isolated for approximately 2 million years, except for a small zone of likely secondary contact in Ontario, Canada.

The northern leopard frog historically ranged from Newfoundland and southern Quebec, south through New England to West Virginia, west across the Canadian provinces and northern and central portions of the United States to British Columbia, Oregon, Washington, and northern California, and south to Arizona, New Mexico, and extreme western Texas (Rorabaugh 2005, p. 570). However, since the 1970s the northern leopard frog has experienced significant declines throughout its range, particularly in the western United States and Canada (Corn and Fogelman 1984, p. 147; Hayes and Jennings 1986, p. 491; Clarkson and Rorabaugh 1989, p. 534; Weller and Green 1997, p. 323; Casper 1998, p. 199; Leonard *et al.* 1999, p. 51; Smith 2003, pp. 4–6). The species tends to become less abundant the further west one proceeds. The northern leopard frog is now considered uncommon in a large portion of its range in the western United States, and declines of the species have been documented in most western States (Rorabaugh 2005, pp. 570–571; Smith 2003, pp. 4–6; Stebbins 2003, p. 235).

Distinct Population Segment

We consider a species for listing under the Act if available information indicates such an action might be warranted. “Species” is defined in section 3 of the Act to include any subspecies of fish or wildlife or plants, and any distinct vertebrate population segment of fish or wildlife that interbreeds when mature (16 U.S.C. 1532 (16)). We, along with the National Marine Fisheries Service (now the National Oceanic and Atmospheric Administration—Fisheries), developed

the Policy Regarding the Recognition of Distinct Vertebrate Population Segments (DPS Policy) (February 7, 1996; 61 FR 4722) to help us in determining what constitutes a DPS. The policy identifies three elements that we are to consider in making a DPS determination. These elements include: (1) The discreteness of the population segment in relation to the remainder of the species to which it belongs; (2) the significance of the population segment to the species to which it belongs; and (3) the population segment's conservation status in relation to the Act's standards for listing. If we determine that a population segment meets the discreteness and significance standards, then the level of threat to that population segment is evaluated, based on the five listing factors established by the Act, to determine whether listing the DPS as either threatened or endangered is warranted.

Discreteness

Citing the Services' DPS policy (61 FR 4722), the petition asserts that the western U.S. population of the northern leopard frog may qualify as a DPS based on discreteness. The DPS policy states that a population may be considered discrete if it satisfies either one of the following conditions:

(1) It is markedly separated from other populations of the same taxon as a consequence of physical, physiological, ecological, or behavioral factors. Quantitative measures of genetic or morphological discontinuity may provide evidence of this separation; or

(2) It is delimited by international governmental boundaries within which differences in control of exploitation, management of habitat, conservation status, or regulatory mechanisms exist that are significant in light of section 4(a)(1)(D) of the Act.

The petitioners assert that the western U.S. population of the northern leopard frog is markedly separated and geographically isolated from the eastern population, based on genetic differences and analyses of haplotypes (Hoffman and Blouin 2004, pp. 145–159). A haplotype is a set of closely linked genetic markers that are present on one chromosome and tend to be inherited together. The petitioners cited Hoffman and Blouin (2004) to support their assertion that the western U.S. population of the northern leopard frog is discrete. The petition states that there is a marked separation of western populations from eastern populations based on the following measures from Hoffman and Blouin (2004, pp. 145–159): (1) Eastern and western haplotypes have been differentiated for approximately 2 million years; (2)

eastern and western haplotypes are divided by the Mississippi River and Great Lakes; and (3) there is an average sequence divergence of 3 percent between eastern and western haplotypes.

The only area of potential overlap between the eastern and western population of northern leopard frog occurs north of the Great Lakes region in Ontario (Hoffman and Blouin 2004). Only one population (located near Attawapiskat, Ontario) appears to be in an area of geographic convergence of eastern and western haplotypes. This population is located north of the Great Lakes region, and contains both eastern and western haplotypes, likely due to secondary contact during the current interglacial period. Thus, it represents the maximum extent of postglacial eastward expansion of the western haplotypes and westward expansion of the eastern haplotypes (Hoffman and Blouin 2004, p. 152). Several studies on both plants and animals have documented a genetic discontinuity associated with the Mississippi River region (Fontanella *et al.* 2007, p. 1063).

Thus, based on the Hoffman and Blouin (2004) genetic analyses, the petitioners believe that the western population is not only markedly separated from the eastern population in relation to its genetics, but clearly geographically isolated and discrete in relation to the eastern northern leopard frog population. The petition asserts that the genetic differentiation between the haplotypes of eastern and western northern leopard frogs, which was found to average 3 percent, is considered to be relatively high for an intraspecific comparison (Hoffman and Blouin 2004, p. 152). Hoffman and Blouin (2004, p. 152) explain that this amount of genetic variation is comparable to that found between some recognized species of frogs in the family Ranidae (ranid frogs) such as *R. pretiosa*-*R. luteiventris*, about 3 percent (K. Monsen and M.S. Blouin, unpubl. data). In addition, Jaeger *et al.* (2001, pp. 339–354) found that there was about 4.7 percent genetic variation between *R. yavapaiensis* and *R. onca*, and approximately 4.9 percent genetic variation between *R. blairi* and *R. berlanderi*. However, the purpose of the Hoffman and Blouin (2004) study was not to undertake taxonomic revisions, but to better understand the evolutionary history of the northern leopard frog; as such, the authors do not recommend splitting the northern leopard frog into two distinct species based upon their analyses. The authors do recommend that further work be conducted on the taxonomic status of

the two northern leopard frog populations to further understand their initial findings.

As stated above, a population may be considered discrete if it satisfies either one of the discreteness conditions listed in the policy. The second condition is that the petitioned population be delimited by international governmental boundaries within which differences in control of exploitation, management of habitat, conservation status, or regulatory mechanisms exist that are significant in light of section 4(a)(1)(D) of the Act. Section 4(a)(1)(D) of the Act discusses the adequacy of existing regulatory mechanisms in the Act's "5-factor" analysis for determining whether a species is threatened or endangered. In assessing a population for discreteness based on delimitation by international governmental boundaries, we focus specifically on whether the factors named above are significantly different between the two countries because of the inadequacy of existing regulatory mechanisms.

The petitioners state that the western U.S. population of the northern leopard frog is delimited by international government boundaries, namely between Canada and the United States (Smith 2003, p. 5). The petitioners reference Seburn and Seburn (1998, pp. 4–11) in providing information documenting significant declines in northern leopard frog populations in British Columbia, Alberta, Manitoba, southern Northwest Territories, Saskatchewan, and western Ontario. In British Columbia, only one northern leopard frog population is known to remain (Seburn and Seburn 1998, p. 10). The species has also disappeared from much of its range in Alberta since 1979 (Seburn and Seburn 1998, p. 10). In Manitoba and Saskatchewan, the northern leopard frog experienced significant declines in the 1970s and many dead and dying frogs were found (Seburn and Seburn 1998, p. 9). Less is known about the status of the frog in the Northwest Territories, but the species is reported from only nine sites, all of which are fragmented and isolated from populations further south in Alberta and Manitoba (Seburn and Seburn 1998, pp. 6, 8). Declines have also occurred in northern and southwestern Ontario (Seburn and Seburn 1998, p. 10; Hecnar 1997, p. 9).

The petition claims that habitat declines throughout the Canadian range of the northern leopard frog have also been significant (Seburn and Seburn 1998, p. 13). The decline is thought to be related to the loss of wetland habitat throughout Canada. Approximately 65 to 80 percent of historical wetlands in

Canada have been drained, mostly for agriculture and urban development (Natural Resources Canada 2004, p. 1), and are considered to be an endangered habitat (Findlay and Houlihan 1997, p. 1001). Seburn and Seburn (1998, p. 13) describe this loss of habitat as occurring throughout all of the provinces, with southern Saskatchewan having 59 percent of its wetland basins and 78 percent of its wetland margins affected by agriculture.

The Committee on the Status of Endangered Wildlife in Canada determines the national status of wild species, subspecies, varieties, and nationally significant populations that are considered to be at risk in Canada (Seburn and Seburn 1998, p. vi). The British Columbia population (Southern Mountain Region) is listed as Endangered under the Species at Risk Act, which provides protection similar to that of the Endangered Species Act in the United States. The northern leopard frog is also on the provincial Red List and is listed as "Endangered" under British Columbia's Wildlife Act, and as "Threatened" under Alberta's Wildlife Act (Alberta Northern Leopard Frog Recovery Team 2005, p. 1). However, the provincial Wildlife Acts do not prohibit take of listed species or provide a means by which agencies must ensure their actions are not jeopardizing the species. Neither Saskatchewan nor Ontario affords the northern leopard frog any specific protection (Seburn and Seburn 1998, p. 7). In the United States, northern leopard frog protection and collection policies are implemented by a wide variety of Federal and State agencies. States predominately control the management, collection, and importation of the species throughout its range, while Federal land management agencies manage habitat for the species, particularly throughout the western portion of its range. Therefore, because of differences in regulatory mechanisms between the United States and Canada, we find there is evidence to suggest that the international boundary with Canada may be significant in terms of section 4(a)(1)(D) of the Act.

The Service's DPS policy requires that only one of the discreteness criteria be satisfied in order for a population of a vertebrate species to be considered discrete. After reviewing the information provided in the petition, we believe that the petition presents substantial information that the northern leopard frog western U.S. population may be physically isolated from northern leopard frogs in the eastern United States and may be genetically distinct. In addition, it

presents substantial information that differences in regulatory mechanisms between the United States and Canada may be significant in terms of section 4(a)(1)(D) of the Act. Therefore, we find that the petition presents substantial information indicating that the northern leopard frog in the western United States may satisfy the discreteness element of the DPS policy.

Significance

If we determine that a population meets the DPS discreteness element, we then consider if it also meets the DPS significance element. The DPS policy (61 FR 4722) states that if a population segment is considered discrete under one or more of the discreteness criteria, its biological and ecological significance will be considered in light of Congressional guidance that the authority to list DPSs be used "sparingly" while encouraging the conservation of genetic diversity. In making this determination, we consider available scientific evidence of the discrete population's importance to the taxon to which it belongs. Since precise circumstances are likely to vary considerably from case to case, the DPS policy does not describe all of the classes of information that might be used in determining the biological and ecological importance of a discrete population. However, the DPS policy does provide four possible reasons why a discrete population may be significant. As specified in the DPS policy (61 FR 4722), this consideration of significance may include, but is not limited to, the following:

- (1) Persistence of the discrete population segment in an ecological setting unusual or unique to the taxon;
- (2) Evidence that loss of the discrete population segment would result in a significant gap in the range of a taxon;
- (3) Evidence that the discrete population segment represents the only surviving natural occurrence of a taxon that may be more abundant elsewhere as an introduced population outside its historic range; or
- (4) Evidence that the discrete population segment differs markedly from other populations of the species in its genetic characteristics.

The petition asserts that the western U.S. population of the northern leopard frog, being discrete from other populations, also meets the significance element of the DPS policy for two of the four reasons above: (1) Loss of the population would create a significant gap in the range of the taxon and (2) the population differs markedly from the eastern population based on genetic characteristics.

The petitioners present three reasons why the loss of the western U.S. population would represent a significant gap in the range of the species. First, it would represent an approximately 50 percent loss in the historical range of the species. Second, the loss of the western U.S. population would leave only frogs in western Canada to represent the western population of northern leopard frog, thereby creating a significant gap in the range. Third, loss of the western U.S. population would create an irreversible gap in the range of the species because the Mississippi River and Great Lakes are barriers to dispersal by the eastern population into the western United States.

According to the petition, the western U.S. portion of the range in 19 western and Midwestern States west of the Mississippi River and the Great Lakes region constitutes approximately 50 percent of the historical overall range and nearly 70 percent of the western population in the United States and Canada (Rorabaugh 2005, p. 571). The petition states that the species' range has declined in almost every State that it inhabits in the western United States.

The most recent summary of distributional and abundance patterns of the northern leopard frog is from Rorabaugh (2005, pp. 570–577), which documents a substantial contraction of the species' range, especially in the western two-thirds of the United States, where widespread extinctions have occurred. Information provided in the petition indicates that the species is declining, considered rare, or locally extinct from historical locations in Arizona, California, Colorado, Idaho, Iowa, Minnesota, Missouri, Montana, Nebraska, Nevada, New Mexico, North Dakota, Oregon, Texas, Utah, Washington, Wisconsin, and Wyoming (Hayes and Jennings 1986, p. 491; Stebbins and Cohen 1995, p. 220; Johnson and Batie 1996; Bowers *et al.* 1998, p. 372; Casper 1998, p. 199; Lannoo 1998, p. xvi; Mossman *et al.* 1998, p. 198; Smith 2003, pp. 4–6; McCleod 2005, pp. 292–294; Rorabaugh 2005, p. 571; Smith and Keinath 2004, pp. 57–60). The species is possibly extirpated from almost 100 percent of its historical range in Texas, California, Oregon, and Washington (Stebbins and Cohen 1995, p. 220; McAllister *et al.* 1999, p. 15; Stebbins 2003, p. 235). The status of the frog is not clear in South Dakota. Smith (2003, p. 39) states that, although northern leopard frogs may still be common in the Black Hills, surveys are incomplete, monitoring does not occur, and no habitat delineation has been completed for the species. The

petitioners estimate a decline of at least 35 percent based on estimates of wetland loss in the State. In summary, the petition presents substantial information that the northern leopard frog is declining in the western United States, that such a large geographic area may represent a significant part of the range, and that loss of the western U.S. population may create a significant gap in the range of the species.

The petition also argues that the western U.S. population is isolated, peripheral and genetically different, and that it is important to the survival, evolution, and conservation of the species. The petitioners argue that the western U.S. population of the northern leopard frog is significant because it is markedly different from the eastern population based on genetic characteristics and because its loss would represent a significant gap in the range of the species. Citing Hoffman and Blouin (2004, p. 152), the petition presents information that the level of mtDNA genetic variation between the eastern and western populations of 3 percent is relatively high for an intraspecific comparison of ranid frogs, akin to the genetic difference between the Columbia spotted frog (*Rana luteiventris*) and the Oregon spotted frog (*R. pretiosa*). The western population also differs from the eastern population in having significantly lower diversity of genetic materials (nucleotides) (Hoffman and Blouin 2004, p. 151).

Based on the significant gap in the species' range that potentially would be created by the loss of the western U.S. population and the potential genetic differences, we find that the petition presents substantial information that the western U.S. population of the northern leopard frog may satisfy the significance element of the DPS policy.

DPS Conclusion

We have reviewed the information presented in the petition, and have evaluated the information in accordance with 50 CFR 424.14(b). In a 90-day finding, the question is whether a petition presents substantial information that the petitioned action may be warranted. Based on our review, we find that the petition, supported by information in our files, presents substantial scientific or commercial information to indicate that the western U.S. population of the northern leopard frog may be a DPS based on genetic evidence. The information presented in the petition presents substantial scientific or commercial information to demonstrate that the western U.S. population of the northern leopard frog may be discrete from the eastern U.S.

population. Further, the petition also presents substantial information that the western U.S. population of the northern leopard frog may be significant to the taxon as a whole. Thus, the western U.S. population of the northern leopard frog may be a listable entity under the Act as a DPS. To meet the third element of the DPS policy, we evaluate the level of threat to the DPS based on the five listing factors established by the Act. We thus proceeded with an evaluation of information presented in the petition, as well as information in our files, to determine whether there is substantial scientific or commercial information indicating that listing this population may be warranted. Our threats analysis and conclusion follow.

Threats Evaluation

Section 4 of the Act (16 U.S.C. 1533) and its implementing regulations (50 CFR 424) set forth the procedures for adding species to the Federal Lists of Endangered and Threatened Wildlife and Plants. A species, subspecies, or distinct population segment of vertebrate taxa may be determined to be endangered or threatened 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 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 the northern leopard frog as presented in the petition and other information available in our files is substantial, thereby indicating that the petitioned action may be warranted. Our evaluation of this information is presented below.

A. Present or Threatened Destruction, Modification, or Curtailment of the Species' Habitat or Range

The petitioners assert that loss and degradation of habitat has been widespread and has affected the species in every State in the western United States in which the northern leopard frog is historically known to have occurred (Maxell 2000, p. 15; Hitchcock 2001, pp. 64–66; Rorabaugh 2005, p. 576; Clarkson and Rorabaugh 1989, p. 535; Smith 2003, p. 26–31). Habitat loss and degradation is reported to be the primary threat to all ranid frogs in the western United States (Bradford 2005, p. 923) and a principal threat to northern leopard frogs in the western United

States (Smith 2003, p. 4; Rorabaugh 2005, p. 571). The petition asserts that the northern leopard frog is threatened with loss and degradation of habitat due to livestock grazing, agricultural development, urban development, oil and gas development, road development, poor forestry practices, groundwater pumping, mining, and invasive species.

The petitioners claim that western U.S. northern leopard frog populations are vulnerable to local extirpation from the effects of livestock grazing (Maxell 2000, pp. 15–16; Smith 2003, p. 30). Specifically, the petition states that livestock grazing may result in the trampling of individual frogs (Maxell 2000, p. 15; Smith 2003, p. 30) and may trample soils around aquatic habitats, thereby decreasing infiltration of water into the soil, increasing soil erosion, and contributing to stream channel down cutting (Kauffman and Kreuger 1984, pp. 432–434; Belskey *et al.* 1999, pp. 419–431). These impacts could hinder or prevent movements of northern leopard frogs by reducing and eliminating riparian vegetation that provides cover. Impacts to water quality through increased sedimentation (Belskey *et al.* 1999, pp. 420–424) may reduce the depth of breeding ponds or overwintering habitats, increase water temperatures, and create favorable environments for diseases and parasites known to contribute to mortality in northern leopard frogs (Maxell 2000, pp. 15–16; Johnson and Lunde 2005, pp. 133–136; Ouellet *et al.* 2005, p. 1435).

The petitioners note that livestock grazing and associated actions are specifically identified as being responsible for habitat loss and degradation and negatively affecting northern leopard frog populations at some sites in Arizona (Clarkson and Rorabaugh 1989, p. 535; Sredl 1998, pp. 573–574), California (California Department of Fish and Game 2008), Idaho (Idaho Department of Fish and Game 2005, Appendix F), Montana (Maxell 2000, p. 15), Nevada (Hitchcock 2001, p. 66), North Dakota (Euliss, Jr. and Mushet 2004, p. 82), and South Dakota (Smith 2003, p. 27). In addition, the petition lists approximately 281 grazing allotments on Forest Service National System Lands in Colorado, Nebraska, New Mexico, South Dakota, and Wyoming that the U.S. Forest Service (Forest Service) determined would adversely impact northern leopard frogs. We did not verify each of these allotment determinations, but the Forest Service Region 2 website (accessed April 24, 2008) does contain documents noting adverse effect determinations for the northern leopard

frog resulting from livestock grazing (for instance, see Forest Service 2005a and Forest Service 2003 as cited in the petition). Information in our files also indicates that leopard frogs may be able to persist with well-managed livestock grazing (Hitchcock 2001, p. 62; Service 2007, pp. 32–34).

The petitioners state that agricultural development may directly destroy northern leopard frog habitat due to dewatering or indirectly through the introduction of contaminants and invasive species into habitats (Leonard *et al.* 1999, p. 58; Leja 1998, pp. 345–353; Rorabaugh 2005, p. 576). The petitioners provide information indicating that agricultural development has occurred throughout the range of the northern leopard frog, but particularly in the Midwestern States (Leja 1998, p. 349). The petition presents 1990 data that indicate that greater than 90 percent of the total land area in Iowa, Nebraska, North Dakota, and South Dakota is used for agricultural purposes (*Demographia* 2000). Agricultural development can result in modification of river valley habitat, including draining of wetlands, channelization and damming of rivers, and the development of irrigation systems (Wang *et al.* 1997, p. 11; Findlay and Houlahan 1997, p. 1001), all of which may modify breeding, overwintering, and dispersal habitat for northern leopard frogs.

The petition presents information on urbanization of the western United States and the resulting loss of northern leopard frog habitat throughout the western States (Hitchcock 2001, pp. 64–66). The petitioners provide information from the U.S. Census Bureau (2006) that the only State within the range of the northern leopard frog in the western United States that is not gaining human population is North Dakota. Projected population growth is expected to result in increased needs for water (surface diversions and groundwater pumping) to support growth (Deacon *et al.* 2007, p. 688). This could decrease water availability for northern leopard frogs and thereby impact the amount and extent of habitat for northern leopard frogs.

The petitioners also discuss how oil and gas development threatens the northern leopard frog and its habitat in the western United States. The petition states that the Bureau of Land Management (BLM) and Forest Service have determined that the drilling and maintenance of wells, related construction of roads, and disposal of wastes resulting from oil and gas development will negatively affect the northern leopard frog. The petitioners argue that oil and gas development in

the Black Hills of South Dakota, northern Idaho, Wyoming, and the Arkansas River drainage in Colorado are reported to have disturbed habitat, altered hydrology, introduced contaminants into water, and reduced the availability of water for the frog. Coal-bed methane development is currently occurring primarily in Wyoming, but the petitioners note that other western States may be impacted in the future. Impacts associated with coal-bed methane development include road-related mortality, discharge of contaminated water into breeding ponds, loss of spring flows related to groundwater withdrawals, discharge of extremely cold water into breeding habitats, and discharge of water containing nonnative predatory fish in these same areas (Allan 2002, pp. 5–8; Gore 2002, pp. 1–14; Noss and Wuethner 2002, pp. 1–20). Mining and oil and gas development may also lead to contamination of habitats (Smith 2003, pp. 26, 31; Spengler 2002, pp. 7–26).

The petition presents information and cites references indicating that roads may pose barriers to dispersal and contribute nonpoint source pollution (Smith 2003, pp. 27, 38; Maxell 2000, p. 25; Fahrig *et al.* 1995, pp. 177–182). Road building is often tied to other activities such as oil and gas, urban, and agricultural development, so the indirect effects of road construction, maintenance, and use could negatively affect northern leopard frog populations.

The petition also claims that timber harvest activities may be a threat to northern leopard frog populations (Maxell 2000, pp. 12–14; Smith 2003, p. 29). The petitioners state that the Forest Service has determined that logging activities planned on the Arapaho-Roosevelt, Routt, Medicine Bow, Bighorn, and Black Hills National Forests (Colorado, South Dakota, and Wyoming) would adversely affect the northern leopard frog, and cite several project planning and land use plan documents prepared by the Forest Service (Center for Native Ecosystems *et al.* 2006, pp. 186–191). Smith (2003, p. 29) found that the northern leopard frog may be especially affected by logging on the Black Hills National Forest of western South Dakota and northeastern Wyoming more than 80 percent of the 1.2 million-acre (485,623 hectare) National Forest is forested, most areas were harvested three or four times in the last century, and logging projects may include cutting within approximately 500 feet (152.4 meters) of breeding ponds. However, it may be difficult to predict the extent of the potential negative impact to northern leopard

frogs due to our poor understanding of their use of upland habitat.

The petition lists 11 harvesting projects where the Forest Service authorized cutting within 100 feet of breeding habitats. Information cited in the petition indicates that this practice may result in increased sedimentation, increased temperature, and reduced dispersal corridors for leopard frogs (Smith 2003, pp. 29–38). The petition focuses on the effects to northern leopard frogs on the Black Hills National Forest and does not show how this threat may be affecting northern leopard frogs across the western United States. However, information in our files indicated that fuels reduction and logging occur throughout the western range of the northern leopard frog and that logging operations in riparian areas should maintain buffers near riparian habitats or only conduct partial harvests of trees to mitigate the effects of timber harvest to amphibians (Perkins and Hunter 2006, pp. 664–668; McComb *et al.* 1993, pp. 7–15).

The petitioners provide limited information regarding the effects of groundwater depletion, but information in our files indicates that pumping groundwater can decrease spring output and recharge in many areas (Wirt *et al.* 2005, pp. G1–11; Alley *et al.* 1999, pp. 33–44). The petition does note that groundwater depletion may have reduced the availability of surface water in areas across the range of the western portion of the northern leopard frog. In addition, the petition gives two examples from Nevada and New Mexico to describe how groundwater pumping may impact leopard frog habitat. Brussard *et al.* (1998, pp. 505–542) found that pumping of groundwater from gold mines threatened spring communities in the north-central region of Nevada. Groundwater pumping by the city of Albuquerque, New Mexico, has contributed to the loss of wetland habitat in the Rio Grande valley as well (Bogan 1998, pp. 562–563).

The petition also identifies the introduction of nonnative aquatic animal and plant species as a threat to the northern leopard frog. Nonnative animals (e.g., crayfish, bullfrogs, and fish) may displace northern leopard frogs by degrading habitat (e.g., destroying emergent vegetation, increasing turbidity, and reducing algal or invertebrate populations) or through direct predation on eggs, tadpoles, and even adult leopard frogs. The petitioners state that nonnative, invasive plants may also threaten northern leopard frog habitat in the western United States (Maxell 2000, pp. 21–22; Hitchcock 2001, pp. 5–6). Tamarisk and other

nonindigenous aquatic and terrestrial plants may alter riparian habitats by forming dense stands that exclude native amphibians (Maxell 2000, p. 21) and enhance the survival of other introduced species, such as bullfrogs (*Lithobates catesbeiana*), which compete with and predate northern leopard frogs (Adams *et al.* 2003, pp. 343–351; Maxell 2000, p. 21; Hitchcock 2001, pp. 5–6, 62–66).

Citing Jezouit 2004 (pp. 423–445), the petitioners state that the emissions of certain gases into the air may lead to acid precipitation and the acidification of aquatic habitats, which then leads to the direct destruction of vegetation needed for habitat (EPA 2000, pp. 48699–48701). Additionally, as discussed under Factor D, the petitioners state that the National Ambient Air Quality Standards (NAAQS) for sulfur dioxide, which contributes to the formation of acid precipitation, are not adequate and do not protect aquatic ecosystems from the adverse impacts of acid precipitation and acidification impacts. They cite literature indicating that continued acid precipitation may cause vegetation damage under the current sulfur dioxide NAAQS. The petitioners state this information indicates that the current NAAQS allow for the emission of sulfur dioxide that may harm northern leopard frog habitat. We were unable to locate the documents cited by the petitioners for this claim.

The petitioners make the same claim for nitrogen dioxide, which also contributes to the formation of acid rain (Baron *et al.* 2000, p. 352; Fenn *et al.* 2003, p. 404; Jezouit 2004, pp. 423–445; EPA 2005, p. 59594); nitrogen dioxide can increase the acidity of soils and aquatic ecosystems, may contribute to eutrophication (a process whereby increased nutrients leads to decreased dissolved oxygen), and may possibly change plant community composition (*e.g.*, enhanced growth of invasive species and shifts in phytoplankton productivity) (Baron *et al.* 2000, p. 358; Fenn *et al.* 2003, pp. 404–418). The petitioners contend that scientific studies document continued acid precipitation and adverse habitat effects from nitrogen deposition under the current NAAQS (Baron *et al.* 2000, p. 365; Fenn *et al.* 2003, pp. 417–418).

The petition also considers water pollution to be a significant threat to the northern leopard frog (Leja 1998, pp. 345–348; Smith and Keinath 2004 pp. 46–53; Bradford 2005, p. 917). The petition claims that agriculture is the primary source of water pollution throughout the western range of the northern leopard frog and that this

water pollution occurs primarily through sedimentation, nutrient pollution, pesticide pollution, and mineral pollution (Ribauda 2000, pp. 5–11). Bradford (2005, p. 919) indicates that chemical contamination of water (defined as pollution; acid precipitation; acid mine drainage; mine water pollution; sewage; and, heavy metals) was the third most implicated adverse factor for frog population decline in the United States.

Based on our evaluation of the information presented in the petition and available in our files regarding the livestock grazing, agricultural development, urban development, oil and gas development, road development, forestry practices, groundwater pumping, mining, invasive species, air emissions, and water pollution within the range of the northern leopard frog, we find that the petition presents substantial information. Therefore, listing the western U.S. population of the northern leopard frog may be warranted due to the present or threatened destruction, modification, or curtailment of habitat or range.

B. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

The petitioners state that overutilization of the northern leopard frog is not reported to be a threat to the species in the western United States except in Minnesota and Nebraska, where large numbers of leopard frogs are used for commercial purposes, and collection has likely contributed to population declines (Moriarty 1998, p. 168; Smith 2003, p. 21). From 1995–1999, approximately 174,772 northern leopard frogs were collected in Nebraska to supply only two biological supply houses (Smith 2003, p. 21). In addition, northern leopard frogs in Minnesota have been heavily collected for fish bait and for the biological supply trade (Moriarty 1998, p. 168).

In 1971, Gibbs *et al.* (p. 1027) published a paper describing the frog trade and the decline of northern leopard frogs throughout most of their range. However, due to the declines noted by Gibbs *et al.* (1971), many States began establishing laws to prevent uncontrolled collecting. Today, State wildlife agencies, including those in the western United States, use commercialization and collection regulations to control human actions that may harm wildlife populations, such as collection of amphibians (Adams *et al.* 1995, p. 394). Although these regulations may be somewhat inconsistent among States, information

in our files indicates that, except for the isolated instances cited by the petition, overutilization does not appear to threaten the western U.S. population of the species. Therefore, we find that the petition and information in our files do not provide substantial information to support the claim that the western U.S. population of the northern leopard frog may be threatened by overutilization for commercial, recreational, scientific, or educational purposes.

C. Disease or Predation

The petition states that the western U.S. northern leopard frog is threatened by fungal, viral, and bacterial diseases, all of which may cause mass mortality and/or contribute to population decline (Rorabaugh 2005, pp. 575–577). The petition provides information from the U.S. Geological Survey in 2006 (Table 16 in petition, pp. 96–97) indicating that disease has caused mass mortality in ranid frogs in almost every western State in the United States. There are several fungal diseases that affect the northern leopard frog (Faeh *et al.* 1998, p. 263); of those, amphibian chytridiomycosis caused by the fungus *Batrachochytrium dendrobatidis* (Bd) has likely had a large impact on northern leopard frogs in the western United States. Mortality from Bd is reported for several leopard frog species, including the northern leopard frog, in Arizona, California, and Colorado (Bradley *et al.* 2002, pp. 206–212; Muths *et al.* 2003, p. 361; Briggs *et al.* 2005, p. 3149). Information in Muths *et al.* (2003, p. 364) notes a northern leopard frog museum specimen from Colorado preserved in 1974 was examined histologically and tested positive for Bd, which means the presence of Bd in Colorado can be traced back to the 1970s.

The petition also cites information from recent studies that indicates that factors such as habitat degradation, habitat fragmentation, and climate change may exacerbate the lethal effects of Bd on amphibian populations (Carey *et al.* 1999, pp. 459–472; Ouellet *et al.* 2005, p. 1437). Habitat fragmentation may prevent populations from recovering after lethal outbreaks of Bd (Ouellet *et al.* 2005, p. 1437), and other stressors such as water pollution may make northern leopard frogs more susceptible to Bd (Carey *et al.* 1999, pp. 459–472; Kiesecker *et al.* 2004, p. 138). The petition provides information indicating that saprolegniasis, a water-borne fungal disease, may also threaten populations of northern leopard frogs (Faeh *et al.* 1998, p. 263). However, this fungal disease is usually secondary to other stressors such as bacterial

infections or trauma (Faeh *et al.* 1998, p. 263). The petition asserts that saprolegnia has been associated with embryonic die-offs of ranid frogs in Oregon, and is found in Columbia spotted frog eggs in Idaho and Montana (Patla and Keinath 2005, p. 43), but there is no other information provided to indicate that this disease is a threat to northern leopard frogs.

Faeh *et al.* (1998, pp. 260–261) are also cited as a source of information regarding five viral diseases that have and could potentially affect the northern leopard frog. These include the iridoviruses, which include ranavirus, polyhedral cytoplasmic amphibian virus, tadpole edema virus, and frog erythrocytic virus. Ranavirus may be extremely lethal, and all life stages of frogs may acquire the disease, although tadpoles are the most susceptible to the disease (Daszak *et al.* 1999, p. 744). The loss of 80 to 90 percent of tadpoles in a population from ranavirus may result in an 80 percent loss of adult recruitment (survival of individuals to sexual maturity and joining the reproductive population), which may negatively affect population viability (Daszak *et al.* 1999, pp. 742–745). The petition provides information indicating that the introduction of bullfrogs and spread of tiger salamanders throughout the western U.S. range of the northern leopard frog may increase the threat of ranavirus infection (Daszak *et al.* 1999, p. 745; Lannoo and Phillips 2005, pp. 636–639).

The petition also states that bacterial diseases are resulting in loss of populations of northern leopard frogs. Septicemia or “red leg” may have contributed to northern leopard frog declines in the Midwestern United States in the early 1970s (Koonz 1992, p. 20) and caused declines in Colorado between 1974 and 1982 (Carey 1993, pp. 356–358). However, “red leg” may be triggered by a variety of environmental factors, and it is unclear how it may be influencing northern leopard frog declines in the western United States (McAllister *et al.* 1999, p. 19).

One of the widespread and pervasive threats to the northern leopard frog in the western United States is predation by nonnative fishes and other introduced aquatic invasive species. The petition asserts that predation, particularly by nonnative fish and bullfrogs, has likely contributed to population declines and extirpation of northern leopard frogs across their western range (Hayes and Jennings 1986, pp. 490–509; Hecnar and M'Closkey 1997, pp. 125–127; Hammerson 1999, pp. 140–141; Maxell 2000, pp. 19–20; Hitchcock 2001, pp. 6,

63; Smith 2003, pp. 20–21; Smith and Keinath 2004, pp. 57–59). Information from Bradford (2005, pp. 922–923) indicates that ranid frogs in the western United States may be adversely affected more so than ranid frogs in the eastern United States due to their greater exposure to exotic, introduced species. Because northern leopard frogs in the West evolved in permanent or semi-permanent waters without large aquatic predators (Merrell 1968, p. 275), they may be more vulnerable to predation by introduced sport fish, bullfrogs, and crayfish (Bradford 2005, p. 923).

Information in our files (Rorabaugh 2005, p. 575) supports the conclusion that predation by nonnative species may be severely impacting northern leopard frogs in the western United States. Nonnative fishes and other invasive species such as crayfish and bullfrogs that prey upon, compete with, or otherwise impact native aquatic species are now implicated as the single most important deterrent to conservation and recovery of the native fish in the West (Minckley 1991, pp. 124–177; Marsh and Pacey 2005, pp. 59–63; Mueller 2005, pp. 10–19) as well as many amphibians and aquatic reptiles (Rosen and Schwalbe 2002, pp. 220–240). Nonnative, predacious fish, crayfish, and bullfrogs are currently impacting watersheds and riparian habitat across the west and likely are responsible for some declines of northern leopard frogs (Rorabaugh 2005, p. 575).

The data presented in the petition, as well as information in our files, relating to threats to the western U.S. population of the northern leopard frog indicate both disease, in particular, Bd fungal infections, and predation by introduced predators are credible and substantial. We find that the petition presents substantial information that the western U.S. population of the northern leopard frog may be threatened by the predation and disease.

D. Inadequacy of Existing Regulatory Mechanisms

The petitioners contend that existing regulatory mechanisms, at both State and Federal levels, have failed to cease or reverse the decline of the northern leopard frog. The petitioners identified the Service, U.S. Environmental Protection Agency (EPA), BLM, Forest Service, and State wildlife agencies as governmental entities who share a responsibility to protect the northern leopard frog either via jurisdictional directive or through land-management decisions.

The petition states that air pollution is reported to be a threat to the northern leopard frog (Rorabaugh 2005, pp. 575–

576) and that the emissions of certain gases into the air may lead to acid precipitation and the acidification of aquatic habitats (Jezouit 2004, pp. 423–445). The petitioners assert that this situation then leads to the direct destruction of vegetation needed for habitat (EPA 2000, pp. 48699–48701). Additionally, as stated earlier, the petitioners state that the NAAQS for sulfur dioxide, which contributes to the formation of acid precipitation (Baron *et al.* 2000, p. 352; Fenn *et al.* 2003, p. 404; Jezouit 2004, pp. 423–445; EPA 2005, pp. 59582–59600), are not adequate and do not protect aquatic ecosystems from the adverse impacts of acid precipitation and acidification impacts. The primary NAAQS for sulfur dioxide are limited to concentrations of no more than an arithmetic mean of 0.03 parts per million (ppm) on an annual basis or 0.14 ppm on a 24-hour basis (see 40 CFR § 50.4), and the secondary NAAQS for sulfur dioxide are limited to 0.5 ppm over a 3-hour averaging period (see 40 CFR 50.5). The petitioners, citing literature we were unable to locate, state that continued acid precipitation causes vegetation damage under the current sulfur dioxide NAAQS and thus, the emission of sulfur dioxide that may harm the northern leopard frog and its habitat. The petitioners make the same claim for nitrogen dioxide, which also contributes to the formation of acid rain (Baron *et al.* 2000, p. 352; Fenn *et al.* 2003, p. 404; Jezouit 2004, pp. 423–445; EPA 2005, pp. 59582–59600). As discussed under Factor A, increased acidity may destroy, modify, or curtail northern leopard frog habitat (Baron *et al.* 2000, p. 358; Fenn *et al.* 2003, pp. 404–418).

The primary and secondary NAAQS for nitrogen dioxide are limited to concentrations of no more than an annual arithmetic mean of 0.053 ppm (see 61 FR 52853, October 8, 1996). The petitioners contend that although scientific studies document continued acid precipitation and adverse habitat effects from nitrogen deposition under the current NAAQS (Baron *et al.* 2000, p. 365; Fenn *et al.* 2003, pp. 417–418), the standards have also remained unchanged since 1971. Therefore, the petitioners contend that the Clean Air Act is currently allowing for harmful emissions of nitrogen dioxide. Finally, the petition concludes that, because the Clean Air Act does not regulate the potential impacts of hydrofluorocarbons and perfluorocarbons to climate, the current laws may not protect the northern leopard frog from alleged adverse impacts of climate change. The potential effects of climate change on

the northern leopard frog in the western United States as described in the petition are discussed under Factor E.

The petitioners contend that implementation of the Clean Water Act (CWA) is allowing waters to be polluted and, as such, is not protecting northern leopard frog habitats. The petitioners state that although the CWA regulates point source pollution through the National Pollutant Discharge Elimination System (NPDES), and is required to protect aquatic life through the protection of designated uses (petition cites 40 CFR § 131.2), in most cases the northern leopard frog is not considered in the determination of whether NPDES permits meet this criterion. The petitioners cite examples from Wyoming where dozens of NPDES permits have recently been issued by the Wyoming Department of Environmental Quality authorizing the discharge of wastewater from coalbed methane development. The petition asserts that none of these permits considered or mitigated impacts to the northern leopard frog (Wyoming Department of Environmental Quality 2005a, 2005b, 2005c, 2006a). We reviewed the permit for Wyoming Department of Environmental Quality 2005a and although there are no specific mitigation measures for northern leopard frogs, the permit prohibits deposition of substances in quantities that could result in significant aesthetic degradation or degradation of habitat for aquatic life, plant life, or wildlife (Wyoming Department of Environmental Quality 2005a, p. 3). However, it is unclear how this would or would not provide for protection of northern leopard frogs and their habitat.

The petition further states that, despite the existence of the NPDES program, water quality throughout the western U.S. range of the northern leopard frog continues to decline. The petition supports this claim with data from the EPA (2002) that lists the percent of impaired rivers, streams, lakes, and ponds in each western State. The data do indicate that a vast majority of rivers, streams, lakes, ponds, and reservoirs may have some degree of impaired water quality. In addition, the petition asserts that the CWA does not adequately regulate nonpoint source pollution, and in most cases, it is nonpoint source pollution that is a threat to the northern leopard frog in the western United States (Leja 1998, p. 353; Smith 2003, pp. 23–27; Rorabaugh 2005, p. 576). Pesticides and herbicide runoff from agricultural activities, runoff from mining operations, runoff from roads, erosion and sedimentation from domestic livestock grazing, and

acid rain are nonpoint sources of water pollution that the petitioners indicate have resulted in adverse effects to the northern leopard frog and its habitat throughout the western United States (Rorabaugh 2005, p. 576). Bradford (2005, p. 919) indicates that chemical contamination (defined as pollution; acid precipitation; acid mine drainage; mine water pollution; sewage; and, heavy metals) was the third most implicated adverse factor for frog population declines in the United States.

The EPA is responsible for administering the CWA and Clean Air Act, as well as for managing the use of pesticides. As discussed above, the petitioners assert that neither the CWA nor the Clean Air Act currently provide adequate protection for the northern leopard frog in the western United States. In addition, the petitioners allege that, in relation to pesticide regulation, the EPA is not adequately protecting the northern leopard frog and its habitat. The petition contends that pesticide contamination of surface waters in the United States is extensive and concentrations of pesticides were frequently greater than water-quality benchmarks for aquatic life and fish-eating wildlife (Gilliom *et al.* 2006, p. 8). Of the streams analyzed as part of the National Water Quality Assessment Program, 57 percent contained one or more pesticides that exceeded at least one aquatic life protection benchmark (Gilliom *et al.* 2006, p. 8). The petitioners are particularly concerned with the use of atrazine, a commonly used herbicide in the United States. Even when used at very low concentrations of 0.1 parts per billion (ppb), atrazine may cause gonadal abnormalities such as retarded development and hermaphroditism in male northern leopard frogs (Hayes *et al.* 2002, p. 895). Atrazine contamination levels are reported to exceed aquatic life protection benchmarks in a majority of streams in the United States, especially streams dominated by urban runoff (Gilliom *et al.* 2006, pp. 6–11), and can be present in excess of 1 ppb in precipitation, even in areas where it is not used (Hayes *et al.* 2002, p. 895; Rorabaugh 2005, p. 576). The petitioners also state that other commonly used pesticides, such as glyphosate, malathion, and carbaryl may result in tadpole mortality, reduced foraging success, and decreased ability to avoid predators (Diana and Beasley 1998, p. 274; Smith and Keinath 2004, pp. 46–50; Relyea 2005, pp. 351–357).

The petitioners contend that the BLM has provided inadequate protection to the northern leopard frog, although the

species occurs on BLM lands in Colorado, Idaho, Montana, New Mexico, Nevada, and Wyoming, and may also inhabit BLM lands in North and South Dakota. The petitioners note that the frog has declined or is absent from BLM lands in Arizona (Clarkson and Rorabaugh 1989, p. 534), Idaho (Makela 1998, pp. 8–9), Montana (Maxell 2000, p. 144), Nevada (Hitchcock 2001, p. 9), Washington (McAllister *et al.* 1999, pp. 1–4), and Wyoming (Smith and Keinath 2004, p. 57), based upon historical ranges. BLM lists the northern leopard frog as a sensitive species in Colorado, Idaho, Wyoming, Montana, and North and South Dakota; the species is not listed as sensitive on BLM lands elsewhere. The petitioners cite National Environmental Policy Act documents and sensitive species lists from several of these States. The petitioners also cite relevant sections of BLM manual section 6840, which guides management of sensitive species. However, petitioners provided an example from Colorado that shows the BLM manual is not a mandatory requirement.

Of the 14 BLM field offices in Colorado, the northern leopard frog occurs on lands managed by 8 of the field offices. According to the petition, no documentation was provided that indicated the eight field offices had considered the northern leopard frog at all in relation to the BLM Special Status Species Policy at BLM Manual 6840. The petitioners assert that information provided by the BLM under the Freedom of Information Act indicated the following: (1) None of the eight field offices had evaluated the significance of lands administered by the BLM or action undertaken by BLM in conserving, maintaining, or restoring the northern leopard frog; (2) only two field offices generated documentation concerning the occurrence of the species, and none of the field offices had information pertaining to the distribution or abundance of the species; and (3) none of the field offices had developed or implemented any conservation programs for the species or its habitat.

The Service manages national wildlife refuges within the northern leopard frog's western U.S. range, and the petitioners believe that predation by introduced species and water contamination are both factors affecting the persistence of northern leopard frogs and quality of their habitat on refuges. As the petition asserted in Factors A and C, the introduction of nonnative fish and bullfrogs has caused declines in the northern leopard frog and threatens the species throughout its western range. The petition states that the

presence of predatory brown trout and bullfrogs on refuges where northern leopard frogs are or potentially exist (Ruby Lake, Las Vegas, Deer Flat, Alamosa, Monte Vista, and Tule Lake National Wildlife Refuges), is contributing to the decline of the species. Additionally, water contamination is stated as a threat on several additional national wildlife refuges (Dickerson and Ramirez 1993, pp. 1–2). Therefore, the petitioners contend that the Service is not ensuring the protection of the northern leopard frog in the western United States.

The Forest Service manages populations of northern leopard frogs in the western United States on National Forests and National Grasslands in several States, including Arizona, Colorado, Idaho, Minnesota, Montana, New Mexico, North Dakota, South Dakota, Utah, and Wyoming. As described under Factor A, populations of northern leopard frogs have declined across most of these States. The petition states that the Forest Service's proposed and current planning regulations are insufficient to protect the northern leopard frog. The northern leopard frog is designated a "sensitive species" in Forest Service Regions 1 (Northern Region—northern Idaho, Montana, North Dakota, northwest South Dakota), 2 (Rocky Mountain Region—Colorado, Nebraska, most of South Dakota, Wyoming), 3 (Southwest Region—Arizona, New Mexico), 5 (Pacific Southwest Region—California), and 6 (Pacific Northwest—Oregon and Washington), but not in Regions 4 (Intermountain Region—southern Idaho, Nevada, Utah, western Wyoming) and 9 (Eastern Region—includes all eastern States and Minnesota and Missouri). However, the petitioners allege that the sensitive species status does not provide any special protection and cite relevant portions of the Forest Service's Manual at 2672.1 that requires "an analysis of the significance of adverse effects on the population, its habitat, and on the viability of the species as a whole." The petitioners contend that in practice this manual direction allows for sensitive species to be impacted as long as there is an analysis of the impacts; however, no protection is guaranteed as part of the analysis.

The petition provides examples of nine Land and Resource Management Plans for national forests in the western United States (see Table 19, p. 116 of petition) that concluded that implementation of these Land and Resource Management Plans "may adversely impact individuals but are not likely to result in a loss of viability over the planning area nor cause a trend

toward listing of the northern leopard frog range wide." It is unclear without further analysis regarding these Land and Resource Management Plans what the effects of plan implementation have been or are likely to be on northern leopard frogs. The petition also contends that Region 2 of the Forest Service reduced protection for northern leopard frog habitats in 2005 by making the Watershed and Conservation Practices Handbook voluntary. The Watershed and Conservation Practices Handbook served to ensure implementation of "proven watershed conservation practices to protect soil, aquatic, and riparian systems" (Forest Service Handbook 2509.25) and was required for all actions on National Forest system lands. The revised Watershed and Conservation Practices Handbook now states that "alternative practices" may be used in place of the Watershed and Conservation Practices Handbook, although these alternative practices are not explained or defined (Forest Service 2005b, Forest Service Handbook 2509.25).

The petition also contends that State regulatory mechanisms are inadequate to protect the northern leopard frog and its habitat. To the extent that the States do provide some level of protection, the States may lack jurisdiction to address many of the threats facing the northern leopard frog, particularly the ability to protect the species' habitat on Federal lands. The northern leopard frog is designated a "species of special concern" or "sensitive species" (the terminology may differ by State) in Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, and Oregon. This designation primarily ensures that a permit must be obtained to collect the species, but otherwise does not provide any legal protection to the species or its habitat. In 1999, the species was listed as "endangered" in Washington, but according to the petition, this designation does not provide substantive protection to the frog or its habitat on State, private, or Federal land. The designation does require that a recovery plan be developed within 5 years of listing; however, to date the plan has not been completed.

Per the petition, according to Washington law, recovery plans call for regulation, mitigation, acquisition, incentive, and compensation to meet recovery objectives, but these measures "must be sensitive to landowner needs and property rights" and there is no guaranteed funding for implementation of the recovery plan. The northern leopard frog has no protection in Iowa, Minnesota, Missouri, Nebraska, North

Dakota (although a license is required to take the species in North Dakota), South Dakota, Texas, Utah, or Wyoming. In Nebraska, the northern leopard frog is classified as a bait species. Our records indicate that several States identified habitats important to the northern leopard frog as needing special management in their Wildlife Action Plans and some States, such as Arizona, are actively promoting conservation of the species.

In summary, we acknowledge that the petitioners have presented substantial information that State and Federal regulatory mechanisms including implementation of the CWA and Clean Air Act and management of occupied lands by the States, BLM, Service, and Forest Service may be inadequate to conserve the northern leopard frog in the western United States. Therefore, we have determined that the petition presents substantial information that the western DPS of the northern leopard frog may be threatened due to the inadequacy of existing regulatory mechanisms.

E. Other Natural or Manmade Factors Affecting the Species' Continued Existence

The petitioners cite several other factors that are contributing to declines of the western U.S. population of the northern leopard frog. The factors discussed in the petition include malformations, pesticides, water pollution, air pollution, ultraviolet radiation, road impacts, and effects due to climate change. Many of these factors interact with habitat degradation and loss, disease, and predation to impact the species. In our analysis of the information presented in the petition, the Service reviewed the effects of air and water pollution, acid precipitation, and roads as they relate to habitat destruction, modification or curtailment under Factor A. Under Factor D, the Service reviewed information regarding the effects of pesticides, water and air pollution, and ultraviolet radiation on the northern leopard frog, as well as the information included below.

Within the last 15 to 20 years, malformed northern leopard frogs have been reported with increasing frequency in the western United States, particularly in Minnesota, North Dakota, and South Dakota (Helgen *et al.* 1998, p. 288; Johnson and Lunde 2005, p. 124). However, malformations are reported from Arizona, Colorado, Iowa, and Montana as well (Johnson and Lunde 2005, pp. 124–128; North American Center for Reporting Amphibian Malformations 2006). Noted malformations have included limb

deformities, multiple and missing limbs, jaw deformities, stunted growth, multiple eyes, missing eyes, and various other growths (Helgen *et al.* 1998, pp. 288–297; Hoppe 2005, p. 104). The petitioners contend that the malformations are believed to be caused by a variety of factors, including trematode parasites, ultraviolet-B radiation, and water contamination (Blaustein and Johnson 2003, pp. 87–91; Johnson and Lunde 2005, pp. 124–138; Helgen *et al.* 1998, pp. 294–297), but are generally linked to human-induced changes in aquatic habitats (Johnson and Lunde 2005, pp. 130–136; Meteyer *et al.* 2000, pp. 151–171). These malformations typically lead to mortality as behavior is compromised to the point of affecting individual fitness (Helgen *et al.* 1998, p. 289; Hoppe 2005, pp. 105–108). Rorabaugh (2005, pp. 576–577) provides a concise and thorough review of this literature and other information to indicate that northern leopard frogs are likely negatively impacted by malformations, pesticides, water pollution, air pollution, and ultraviolet radiation throughout their range, and that these factors are likely affecting the persistence of the species.

The petition states that even at low levels, pesticides can lead to local declines or extinction of northern leopard frog populations, particularly in areas that are in close proximity to heavy or frequent pesticide use as tadpole and larval stages are sensitive to low-level pesticide contamination (Berrill *et al.* 1997, p. 244). The effects to northern leopard frogs from pesticides, including herbicides, piscicides (chemical substances poisonous to fish), and insecticides vary, but information in the petition indicates that the species is negatively affected both acutely and via sublethal symptoms by several pesticides and chemicals (rotenone, Roundup, atrazine, malathion, copper sulfate, and fenthion) commonly used in the western United States (Patla 2005, p. 275; Relyea 2005, p. 353; Hayes *et al.* 2002, pp. 895–896; Fordham 1999, p. 125; Beasley *et al.* 2005, p. 86; Stebbins and Cohen 1995, pp. 215–216; Rorabaugh 2005, p. 576). The petition contends that pesticide contamination of surface waters in the United States is extensive and concentrations of pesticides were frequently greater than water-quality benchmarks for aquatic life and fish-eating wildlife (Gilliom *et al.* 2006, p. 8). Of the streams analyzed as part of the National Water Quality Assessment Program, 57 percent contained one or more pesticides that exceeded at least

one aquatic life protection benchmark (Gilliom *et al.* 2006, p. 8).

The petitioners also assert that ultraviolet radiation (UV) may also be negatively impacting the northern leopard frog in the western United States through increased larval mortality and deformities, and slowed growth and development (Blaustein *et al.* 2003, p. 126). Studies of amphibians and UV radiation have focused on UV-B, which has been found to be the most damaging radiation at the earth's surface (Blaustein *et al.* 2003, p. 124). In the absence of shade, ambient UV-B radiation has been found to be lethal to northern leopard frog tadpoles (Blaustein *et al.* 2003, pp. 124–128). In addition, synergistic effects resulting from UV-B radiation in combination with low pH, pollutants, and pathogens may adversely affect the hatching success and development of northern leopard frogs (Kiesecker and Blaustein 1995, pp. 9900–9904; Long *et al.* 1995, p. 1303; Blaustein *et al.* 2003, pp. 124–128).

The petitioners contend that the northern leopard frog in the western United States meets all of the criteria for a species at risk due to human-induced climate change. Citing information in the Service's Determination of Threatened Status for the California Tiger Salamander (69 FR 47212; August 4, 2004), the petitioners assert that climate change has resulted in increased temperatures in the western United States, declining snowpack and snow water equivalents in western mountains, and earlier snow melt. These changes are expected to lead to large hydrological changes (69 FR 47212; Patla and Keineth 2005).

The petitioners claim that the northern leopard frog is at the upper limit of its physiological tolerance to temperature and dryness throughout the arid and semi-arid habitats in the western United States (Hammerson 1999, pp. 146–147; Hitchcock 2001, pp. 18–19; Rorabaugh 2005, p. 577). In addition, the petitioners note that the northern leopard frog frequently depends upon small, ephemeral wetlands for breeding habitats (Merrell 1968, p. 275) and due to habitat fragmentation, the presence of nonnative aquatic species, and other factors, the leopard frog is bounded by dispersal barriers throughout its western range (Rorabaugh 2005, p. 577). The petition provides a list of impacts in addition to habitat impacts that may occur from climate change, including earlier reproduction and more rapid development of larva, decreased mobility due to drier conditions, and shorter hibernation periods (Carey and

Alexander 2003, pp. 111–121; Patla and Keineth 2005, pp. 44–46). The petitioners contend that higher summer temperatures may result in increased evaporation rates with breeding habitats drying up prior to metamorphosis, and also due in part to earlier breeding times in response to warmer spring temperatures, with subsequent episodes of freezing temperatures that may result in high egg mortality (Smith 2003, p. 34). Finally, the petitioners assert that climate change may also cause frogs to experience increased physiological stress and decreased immune system function, possibly leading to disease outbreaks (Carey and Alexander 2003, pp. 111–121; Pounds *et al.* 2006, pp. 161–167).

On the basis of our review, we find the information on pesticides, water pollution, air pollution, ultraviolet radiation, road impacts, and effects due to changing environmental conditions possibly resulting from climate change presented in the petition provides substantial information to indicate that other natural or manmade factors (stochastic events) may be a threat to the species. The potential impacts of these factors may be exacerbating other threats to this population; however, additional analysis is needed to determine the effect of these impacts on the northern leopard frog. Based on the information submitted in the petition, we have determined that substantial information has been presented that the western U.S. population of the northern leopard frog may be threatened due to other natural or manmade factors (stochastic events) affecting its continued existence (Factor E). We will continue to evaluate the potential effects of these factors on the species and its habitat during our status review.

Finding

Section 4(b)(3)(A) of the Endangered Species Act of 1973, as amended (Act) (16 U.S.C. 1531 *et seq.*), 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 the 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 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 the finding promptly in the **Federal Register**.

We have reviewed the petition and the literature cited in the petition, and evaluated that information to determine

whether the sources cited support the claims made in the petition. We also reviewed reliable information that was readily available in our files to evaluate the petition.

Our process for making this 90-day finding under section 4(b)(3)(A) of the Act is limited to a determination of whether the information in the petition presents “substantial scientific and commercial information,” which is interpreted in our regulations as “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)). As described in our Threats Evaluation, above, the petition presents substantial information indicating that listing the western U.S. population of the northern leopard frog may be warranted based on Factors A, C, D, and E, summarized below. Based on our five-factor analysis (above), the petition does not present substantial information indicating that Factor B is a threat to this species.

We find that the petitioners have presented substantial information indicating that the northern leopard frogs in the western United States may be genetically discrete from northern leopard frogs in the eastern United States and that the western U.S. population may also be significant to the species as a whole as the loss of this potentially discrete population segment may result in a significant gap in the range of the species. We also find that the petition presents substantial scientific or commercial information that listing the DPS of the northern leopard frog in the western United States as threatened or endangered may be warranted as the result of current and

future threats under Factor A due to habitat destruction and modification, Factor C due to disease and predation, Factor D because it is not currently protected by existing regulatory mechanisms, and Factor E due to malformations, pesticides, and ultraviolet radiation. Therefore, we are initiating a status review to determine if listing the species under the Act is warranted. We will issue a 12-month finding as to whether the petitioned action is warranted, not warranted, or warranted but precluded.

The petition asserts that the northern leopard frog is a possible DPS, and requested that if we find that listing the western U.S. population of northern leopard frogs as a DPS is not warranted, that we review whether listing the entire species is warranted because of threats in a significant portion of its range. Because we find that the petition presents substantial information that listing the western DPS may be warranted, we have not evaluated the extent to which the northern leopard frog may be endangered or threatened throughout a significant portion of its range. Such an analysis would occur during the 12-month status review if we determine that listing the western DPS is not warranted.

We encourage interested parties to continue gathering data that will assist with the conservation and monitoring of the northern leopard frog throughout the western United States. You may submit information regarding the northern leopard frog by one of the methods listed in the **ADDRESSES** section, at any time.

The “substantial information” standard for a 90-day finding is not the

same as the Act’s “best scientific and commercial data” standard that applies to a 12-month finding to determine whether a petitioned action is warranted. A 90-day finding is not a status assessment of the species and does not constitute a status review under the Act. Our final determination of whether a petitioned action is warranted is not made until we have completed a thorough status review of the species as part of the 12-month finding on a petition, which is conducted following a positive 90-day finding. Because the Act’s standards for 90-day and 12-month findings are different, as described above, a positive 90-day finding does not mean that the 12-month finding also will be positive.

References Cited

A complete list of all references cited herein is available upon request from the Arizona Ecological Services Office (see **FOR FURTHER INFORMATION CONTACT** section).

Author

The primary author of this notice is the staff of the U.S. Fish and Wildlife Service, Arizona Ecological Services Office (see **FOR FURTHER INFORMATION CONTACT** section).

Authority

The authority for this action is the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*).

Dated: June 24, 2009.

Marvin E. Moriarty,

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

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