DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

[4500090022]

Endangered and Threatened Wildlife and Plants; 12-Month Findings on Petitions To List 25 Species as Endangered or Threatened Species

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Notice of 12-month petition findings.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), announce 12-month findings on petitions to list 25 species as endangered or threatened species under the Endangered Species Act of 1973, as amended (Act). After a thorough review of the best available scientific and commercial information, we find that listing 14 Nevada springsnail species, Barbour's map turtle, Bicknell's thrush, Big Blue Springs cave crayfish, the Oregon Cascades—California population and Black Hills population of the black-backed woodpecker, the eastern population of the boreal toad, the Northern Rocky Mountains population of the fisher, Florida Keys mole skink, Great Sand Dunes tiger beetle, Kirtland's snake, Pacific walrus, and San Felipe gambusia is not warranted at this time. However, we ask the public to submit to us at any time any new information that becomes available concerning the stressors to any of the species listed above or their habitats.

DATES: The finding announced in this document was made on October 5, 2017.

ADDRESSES: Detailed descriptions of the basis for each of these findings are available on the Internet at *http://www.regulations.gov* under the following docket numbers:

Species	Docket No.
14 Nevada springsnails	FWS–R8–ES–2011–0001
Barbour's map turtle	FWS–R4–ES–2017–0065
Bicknell's thrush	FWS–R5–ES–2012–0056
Big Blue Springs cave crayfish	FWS–R4–ES–2017–0066
Black-backed woodpecker	FWS–R8–ES–2013–0034
Boreal toad	FWS–R6–ES–2012–0003
Fisher	FWS–R6–ES–2015–0104
Florida Keys mole skink	FWS–R4–ES–2017–0067
Great Sand Dunes tiger beetle	FWS–R6–ES–2017–0068
Kirtland's snake	FWS–R3–ES–2017–0039
Pacific walrus	FWS–R7–ES–2017–0069
San Felipe gambusia	FWS–R2–ES–2017–0024

Supporting information used to prepare these findings is available for public inspection, by appointment, during normal business hours, by contacting the appropriate person, as specified under **FOR FURTHER INFORMATION CONTACT.** Please submit any new information, materials, comments, or questions concerning these findings to the appropriate person, as specified under **FOR FURTHER INFORMATION CONTACT.**

FOR FURTHER INFORMATION CONTACT:

Species	Contact information
14 Nevada springsnails	For bifid duct pyrg: Carolyn Swed, Field Supervisor, Northern Nevada (Reno) Fish and Wildlife Office, 775–861–6337 For all other species: Glen Knowles, Field Supervisor, Southern Nevada Fish and Wildlife Office, 702–515–5230.
Barbour's map turtle	Catherine Phillips, Field Supervisor, Panama City Ecological Services Field Office, 850–769–0552.
Bicknell's thrush	Krishna Gifford, Listing Coordinator, Region 5 Regional Office, 413–253–8619.
Big Blue Springs cave crayfish	Catherine Phillips, Field Supervisor, Panama City Ecological Services Field Office, 850–769–0552.
Black-backed woodpeckers	Oregon Cascades—California population: Jenn Norris, Field Supervisor, Sacramento Fish and Wildlife Office, 916–414–6600 Black Hills population: Scott Larson, Field Supervisor, South Dakota Ecological Services Office, 605–224–8693.
Boreal toad	Drue DeBerry, Field Supervisor, Colorado and Nebraska Field Office, 303–236–4774.
Fisher	Jodi Bush, Field Supervisor, Montana Ecological Services Field Office, 406–449–5225, ext. 205.
Florida Keys mole skink	Roxanna Hinzman, Field Supervisor, South Florida Ecological Services Field Office, 772–469–4309.
Great Sand Dunes tiger beetle	Drue DeBerry, Field Supervisor, Colorado and Nebraska Field Office, 303–236–4774.
Kirtland's snake	Dan Everson, Field Supervisor, Ohio Ecological Services Field Office, 614–416–8993.
Pacific walrus	Patrick Lemons, Chief Marine Mammals Management, Region 7, 907–786–3668.
San Felipe gambusia	Adam Zerrenner, Field Supervisor, Austin Ecological Services Field Office, 512–490–0057, ext. 248.

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SUPPLEMENTARY INFORMATION:

Background

Within 12 months after receiving any petition to revise the Federal Lists of Endangered and Threatened Wildlife and Plants, we are required to make a finding whether or not the petitioned action is warranted (''12-month finding''), unless we determined that the petition did not contain substantial scientific or commercial information indicating that the petitioned action may be warranted (section 4(b)(3)(B) of the Act (16 U.S.C. 1531 *et seq.*)). We must make a finding that the petitioned action is: (1) Not warranted; (2) warranted; or (3) warranted but precluded. ''Warranted but precluded'' means that (a) the immediate proposal of a regulation implementing the petitioned action is precluded by other pending proposals to determine whether species are endangered or threatened species, and (b) expeditious progress is being made to add qualified species to the Federal Lists of Endangered and Threatened Wildlife and Plants (Lists) and to remove from the Lists species for which the protections of the Act are no longer necessary. Section 4(b)(3)(C) of the Act requires that we treat a petition for which the requested action is found to be warranted but precluded as though resubmitted on the date of such finding, that is, requiring that a subsequent finding be made within 12 months of that date. We must publish these 12-month findings in the **Federal Register**.

Summary of Information Pertaining to the Five Factors

Section 4 of the Act (16 U.S.C. 1533) and the implementing regulations at part 424 of title 50 of the Code of Federal Regulations (50 CFR part 424) set forth procedures for adding species to, removing species from, or reclassifying species on the Federal Lists of Endangered and Threatened Wildlife and Plants. The Act defines ''endangered species'' as any species that is in danger of extinction throughout all or a significant portion of its range (16 U.S.C. 1532(6)), and ''threatened species'' as any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range (16 U.S.C. 1532(20)). Under section 4(a)(1) of the Act, a species may be determined to be an endangered species or a threatened species because of any of the following five factors:

(A) The present or threatened destruction, modification, or curtailment of its habitat or range;

(B) Overutilization for commercial, recreational, scientific, or educational purposes;

(C) Disease or predation;

(D) The inadequacy of existing regulatory mechanisms; or

(E) Other natural or manmade factors affecting its continued existence.

We summarize below the information on which we based our evaluation of the five factors provided in section 4(a)(1) of the Act to determine whether the 14 Nevada springsnail species, Barbour's map turtle, Bicknell's thrush, Big Blue Springs cave crayfish, Oregon Cascades-California and Black Hills populations of the black-backed woodpecker, eastern population of the boreal toad, Northern Rocky Mountains population of the fisher, Florida Keys mole skink, Great Sand Dunes tiger beetle, Kirtland's snake, Pacific walrus, and San Felipe gambusia meet the definition of ''endangered species'' or ''threatened species.'' More-detailed information about these species is presented in the species-specific assessment forms found on *http://www.regulations.gov* under the appropriate docket number (see **ADDRESSES** above).

In considering what stressors under the Act's five factors might indicate that the species may meet the definition of a threatened or endangered species, we must look beyond the mere exposure of the species to the stressor to determine whether the species responds to the stressor in a way that causes actual impacts to the species. If there is exposure to a stressor, but no response, or only a positive response, that stressor does not cause a species to meet the definition of a threatened or endangered species. If there is exposure and the species responds negatively, the stressor may be significant. In that case, we determine whether that stressor drives or contributes to the risk of extinction of the species such that the species warrants listing as an endangered or threatened species as those terms are defined by the Act. This does not necessarily require empirical proof of impacts to a species. The combination of exposure and some corroborating evidence of how the species is likely affected could suffice. The mere identification of stressors that could affect a species negatively is not sufficient to compel a finding that listing is appropriate; similarly, the mere identification of stressors that do not affect a listed species negatively is insufficient to compel a finding that delisting is appropriate. For a species to be listed or remain listed, we require evidence that these stressors are operative threats to the species and its habitat, either singly or in combination, to the point that the species meets the definition of an endangered or a threatened species under the Act.

In making these 12-month findings, we considered and thoroughly evaluated the best scientific and commercial information available regarding the past, present, and future stressors and threats. We reviewed the petitions, information available in our files, and other available published and unpublished information. These evaluations may include information from recognized experts; Federal, State, and tribal governments; academic institutions; foreign governments; private entities; and other members of the public.

14 Nevada Springsnails: Spring Mountains Pyrg (*Pyrgulopsis deaconi*), Corn Creek Pyrg (*Pyrgulopsis fausta*), Moapa Pebblesnail (*Pyrgulopsis avernalis*), Moapa Valley Pyrg (*Pyrgulopsis carinifera*), Grated Tryonia (*Tryonia clathrata*), Blue Point Pyrg (*Pyrgulopsis coloradensis*), Hubbs Pyrg (*Pyrgulopsis hubbsi*), Pahranagat Pebblesnail (*Pyrgulopsis merriami*), White River Valley Pyrg (*Pyrgulopsis sathos*), Butterfield Pyrg (*Pyrgulopsis lata*), Hardy Pyrg (*Pyrgulopsis marcida*), Flag Pyrg (*Pyrgulopsis breviloba*), Lake Valley Pyrg (*Pyrgulopsis sublata*), Bifid Duct Pyrg (*Pyrgulopsis peculiaris*).

Previous Federal Actions

On February 17, 2009, we received a petition from the Center for Biological Diversity (the Center), the Freshwater Mollusk Conservation Society, Dr. James Deacon, and Don Duff requesting that 42 species of Great Basin springsnails from Nevada, Utah, and California be listed as endangered or threatened species under the Act. Three of those springsnail species were addressed in an August 18, 2009, 90-day finding (74 FR 41649). The remaining 39 springsnail species, which includes the 14 springsnails addressed in this 12-month finding, were addressed in a September 13, 2011, ''substantial'' 90-day finding (76 FR 56608).

On April 25, 2012, we received from the Center a notice of intent to file suit to compel us to issue 12-month findings for four of the 2009-petitioned species (*i.e.,* Hardy pyrg, flag pyrg, Lake Valley pyrg, and bifid duct pyrg). Subsequently, on September 13, 2012, the Center filed a complaint to compel us to issue findings for the four springsnails. On April 29, 2013, we reached a stipulated settlement agreement with the Center, agreeing to publish 12-month findings for the four species by September 30, 2017. This 12-month finding satisfies the requirements of that stipulated settlement agreement for Hardy pyrg, flag pyrg, Lake Valley pyrg, and bifid duct pyrg. A detailed discussion of the basis for these findings can be found in the Species Assessment Form and the SSA Report that we used in preparing this finding (see **ADDRESSES** above).

Background

All 14 of the species that this finding addresses fall within either the genus *Pyrgulopsis* or the genus *Tryonia.* To inexperienced and unaided eyes, species within each genus *Pyrgulopsis* and *Tryonia* appear relatively similar to one another, but have been collected, described, and differentiated based on subtle morphological characteristics using methods described by Hershler and Sada (1987, pp. 780–785) and Hershler (1989, pp. 176–179; 1994, pp. 2–4; 1998, pp. 3–11; 2001, p. 2). In general, species of *Pyrgulopsis* and *Tryonia* are similarly sized. The shell heights of adult *Pyrgulopsis* may range between approximately 1 and 5 mm

(0.04 and 0.2 in) and have 3 to 5 whorls (Hershler 1998, pp. 4–9), whereas shell heights of adult grated tryonia may be approximately 3 to 7 mm (0.1 to 0.3 in) and have between 5 to 9 whorls (Hershler 2001, p. 7).

The 14 springsnail species occur in a portion of the Great Basin, which is a contiguous watershed area of closed drainage basins that retain water and allow no outflow to other external bodies of water, such as rivers or oceans. The range and distribution of the 14 springsnail species within the Great Basin overlap 11 hydrographic basins (*i.e.,* drainage areas of streams) in Clark, Lincoln, Nye, and White Pine Counties, Nevada, and three hydrographic basins in Millard County, Utah.

Springsnails occur in springs, which are relatively small aquatic and riparian systems that flow onto the land surface through natural processes and are maintained by groundwater. They range widely in size, water chemistry, morphology, landscape setting, and persistence. They occur from mountain tops to valley floors, some of which occur in clusters known as spring provinces, and are predominantly isolated from other aquatic and riparian systems. Springs occur where subterranean water under pressure reaches the earth's surface through fault zones, rock cracks, or orifices that occur when water creates a passage by dissolving rock. Most springs are considered unique based on the province influences of aquifer geology, morphology, discharge rates, and regional precipitation (Sada and Pohlmann 2002, pp. 3–5). Details regarding the subject springs' size, water transport or flow system, and environmental characteristics (such as temperature, dissolved oxygen, and other water chemistry conditions) are described in the supporting SSA Report for these species (Service 2017, pp. 40–42).

The genetic diversity of springsnails is not well understood, particularly as it relates to their ability to adapt to short- and long-term environmental changes. Based on their restricted distributions within a springbrook (water outflow from a spring source), they seem to be limited to a range of physical and biological parameters that exist within that occupied area (Sada 2017, p. 13), one known parameter being their dependency on perennial water (Hershler and Liu 2008, p. 92). Overall, the best available information indicates that the 14 Nevada springsnails' physical and ecological needs include sufficient water quality, adequate substrate and vegetation, free-flowing water, and adequate spring discharge (Service 2017, pp. 42–45).

Summary of Status Review

These findings constitute our completion of our review of the petitioned action. However, we intend that any listing determination for the 14 Nevada springsnails be as accurate as possible. Therefore, we will continue to accept additional information and comments from all concerned governmental agencies, the scientific community, industry, or any other interested party concerning these findings.

A species status assessment (SSA) was completed for these species and summarized in an SSA Report (Service 2017). Below are summary discussions for each species, primarily focusing on impacts to species' needs within and among populations both currently and in the future. We focused on the overall condition of the species' needs here as they relate to a species' ability to withstand disturbances and stochastic events (resiliency), the distribution of populations across the landscape to withstand disturbances and stochastic events (redundancy), and the ability for each species to adapt to changing environmental conditions (representation). For detailed scientific information on current and potential future conditions of these species, including full discussions of resiliency, redundancy, and representation for each species, please see the SSA Report. As explained further in the SSA Report, for all of these springsnails we considered the foreseeable future to be 50 years because: (1) It is within the range of the available hydrological and climate change model forecasts; and (2) because of the short generation time of these springsnails (approximately 1 year), 50 years encompassed approximately 30 to 40 generations, which is a relatively high number of generations over which to observe effects to the species.

Spring Mountains Pyrg—The Spring Mountains pyrg has been reported to occur historically at a total of nine springs in the Spring Mountains area of Clark and Nye Counties, Nevada; however, subsequently its presence has been confirmed at only eight of the nine springs. Surveys at six of these locations indicate that the downstream extent and abundance of this species fluctuates during and between years. Populations of Spring Mountains pyrg have typically been abundant or common during surveys in recent years. A variety of stressors have been negatively affecting the springs both historically and currently, and individuals continue to occupy those seven springs at similar abundance levels (*i.e.,* scarce, common, or abundant) across its range as compared to past survey results. Stressors present include vegetation and soil disturbance from ungulate activity (all three springs at Horse Springs Province; Factor A) and recreation (Red Spring and Willow Spring; Factor A), potential crushing of individuals from ungulates and recreationists (all springs except Crystal Spring; Factor E), and residual impacts associated with historical spring modification (surface water diversion) (Kiup Spring and Horse Springs Province; Factor A). Although these stressors are present, they are not resulting in significant adverse effects to the Spring Mountains pyrg or its habitat. Projected future conditions include a possible decrease in spring discharge and insignificant impacts to substrate and vegetation. However, the populations of Spring Mountains pyrg continue to persist with an appropriate population size, growth rate, and occupied habitat, and the best available information does not indicate any reason why the expected condition of the springs and spring provinces within the species' range would not continue to meet the species' needs in the foreseeable future. We also looked for significant portions of the Spring Mountain pyrg's range that might be endangered or threatened, and we determined that there are no geographic concentration of stressors (see our Species Assessment Form, Section 15.1.3 available on the Internet at *http://www.regulations.gov* under Docket No. FWS–R8–ES–2011–0001).

Corn Creek Pyrg—There are three populations of the Corn Creek pyrg that continue to occupy the entirety of its known historical range, including five spring source locations in Clark County, Nevada, which are within the Desert National Wildlife Refuge managed by the Service (Sada 2017, pp. 76–79). The relative abundance of Corn Creek pyrg has varied between sites and surveys. Residual impacts associated with historical spring modification (surface water diversion, channel modification, and impoundment) occur at Corn Creek Springs Province (Factor A). Additionally, there are insignificant residual impacts from beneficial habitat restoration (Factor A) at four of the five springs. Projected future conditions include a possible decrease in spring discharge, which is a result of future changing climate conditions in conjunction with a possible increase in groundwater withdrawal (although, if it occurs, this is not expected to be significant across the species' range). We project that, at a minimum, four springs total (two populations) are likely to remain viable in the foreseeable future even with the potential stressor of ground water withdrawal effects, particularly given the significant protections and management afforded the springs due to their presence within the Desert National Wildlife Refuge both currently and into the future (the Species Assessment form describes in more detail our analysis of these protections). We also looked for significant portions of the Corn Creek pyrg's range that might be endangered or threatened, and we determined that there was a geographic concentration of stressors but that portion was not significant, and thus did not meet the criteria of an SPR (see our Species Assessment Form, Section 15.1.3 available on the Internet at *http://www.regulations.gov* under Docket No. FWS–R8–ES–2011–0001).

Moapa Pebblesnail and Moapa Valley Pyrg—The Moapa pebblesnail and Moapa Valley pyrg are endemic springsnails that co-occur at 6 locations (springs and spring provinces, totaling 16 springs) in Clark County, Nevada, which is the entirety of their historical ranges. Their abundance and distribution vary temporally and in response to restoration (documented to be scarce to abundant over survey periods), and the best available data indicate that the populations for both species are stable. Moapa Valley pyrg typically appears more abundant than Moapa pebblesnail. The primary impacts are at one spring that is currently low-flow—Cardy Lamb Spring—which represents residual impacts from historical spring modifications (surface diversion, channel modification, and impoundment) (Factor A), as well as presence of invasive species (mosquitofish (*Gambusia affinis*) and red-rimmed melania (*Melanoides tuberculate*)) that may predate upon the species (Factor C) or compete with resource needs (Factor E) of the Moapa pebblesnail. Baldwin Spring also harbors invasive species (Factors C and E) and experiences residual impacts from historical spring modifications (surface diversion and channel modification) (Factor A). Additionally, residual historical impacts are evident to an insignificant degree from spring modifications and restoration (Factor A) at Apcar Springs Province, Pederson Springs Province, and Plummer Springs Province. The species' needs (adequate water quality and discharge, substrate and vegetation, and free-flowing water) are being met throughout its range, although water flow is low at one spring (Cardy Lamb). The best available data indicate that various stressors have been negatively affecting the springs both historically and currently, although it appears not to the degree that the entire populations have been affected over time. Overall, the likelihood that 5 of the 6 populations (15 springs) for each species will continue to persist with appropriate population sizes and growth rates appears high based on both species' demonstrated ability to persist with disturbances in the past, as well as the future expected conditions, and the best available information does not indicate any reason why the expected condition of the springs and spring provinces within the species' range would not continue to meet the species' needs in the foreseeable future. We also looked for significant portions of the Moapa pebblesnail and Moapa Valley pyrg ranges that might be endangered or threatened, and we determined that there was a geographic concentration of stressors but that portion was not significant, and thus did not meet the criteria of an SPR (see our Species Assessment Form, Section 15.1.3 available on the Internet at *http://www.regulations.gov* under Docket No. FWS–R8–ES–2011–0001).

Grated Tryonia—The grated tryonia is an endemic springsnail that occurs in 5 springs and 6 spring provinces, totaling greater than 31 springs in Clark, Lincoln, and Nye Counties, Nevada: 3 springs exhibit common relative abundance, 6 exhibit scarce abundance (which historically is the most-frequent relative abundance value recorded across its range, suggesting the species' abundance is inherently scarce), and for 3 springs the presence of the species must be presumed because there was no access to the springs during the most-recent surveys in 2016. This occupied area is the entirety of its known historical range (multiple springs at multiple locations). The primary stressors are invasive species (Factors C and E) and residual impacts from spring modification and habitat restoration activities (Factor A), which have been negatively affecting the springs historically and currently to varying degrees. Invasive species occur at a greater abundance at Baldwin Spring and Ash Spring Province as compared to Cardy Lamb Spring, Moorman Spring, and Hot Creek Springs Province; however, invasive species do not occur in high numbers or densities such that population- or rangewide-level effects are evident. Residual impacts from historical spring modifications (surface diversions, channel modifications, or impoundments) or from past restoration activities are evident throughout the species' range, although surveys do not indicate that the activities have had significant impacts on the species across its range. Projected future conditions include a possible decrease in spring discharge that, if manifested, could result in the loss of the Cardy Lamb Spring population. However, the best available information indicates that there is a high likelihood that 10 of the 11 populations of grated tryonia will continue to persist in the foreseeable future with an appropriate population size and growth rate. We also looked for significant portions of the grated tryonia's range that might be endangered or threatened, and we determined that there are no geographic concentration of stressors (see our Species Assessment Form, Section 15.1.3 available on the Internet at *http://www.regulations.gov* under Docket No. FWS–R8–ES–2011–0001).

Blue Point Pyrg—The Blue Point pyrg's range has always been limited to Blue Point Spring (Hershler 1998, p. 29), which is owned and managed by the National Park Service (Lake Mead National Recreation Area) in Clark County, Nevada. The species' abundance is known to vary over time: Scarce in the early 1990s, potentially extinct prior to 2001, rediscovered in 2006, common or abundant in 2012, scarce in 2014, common or abundant in 2015, and again common in 2017 (Service 2017, p. 137). The primary stressor for this species is aquatic invasive predation (Factor C), although other stressors that may negatively affect the species to a lesser degree are vegetation and substrate damage from ungulate use and roads (Factor A), as well as residual impacts from historical spring modification (Factor A). Although invasive species are the primary stressors for Blue Point pyrg, they do not occur in high numbers or densities such that population- or rangewide-level effects are evident. Overall, although stressors are present at Blue Point Spring, they do not appear to be resulting in significant adverse effects to Blue Point pyrg or its habitat (*i.e.,* the species' needs continue to be met, and there is no information to indicate declining population trends). Given the continued disturbance from some of these stressors, and the continued presence of the species at this spring, Blue Point pyrg appears resilient over the long term in the face of these impacts. The spring modification that occurred historically is not expected to be restored to its natural condition, although springsnails continue to persist now and are expected to persist into the future, despite this surface modification. Additionally, the spring is expected to continue to experience an insignificant level of impacts from soil and vegetation disturbances. Even with both these residual, historical impacts and the potential addition of ground water withdrawal if it occurs, there is no evidence to suggest that these stressors are likely to increase in magnitude to such a degree that the population of Blue Point pyrg would be lost, or decline to a significant degree as a result in the foreseeable future. We also looked for significant portions of the Blue Point pyrg's range that might be endangered or threatened, and we determined that there are no geographic concentration of stressors (see our Species Assessment Form, Section 15.1.3 available on the Internet at *http://www.regulations.gov* under Docket No. FWS–R8–ES–2011–0001).

Hubbs Pyrg—Hubbs pyrg has been reported from two spring areas on private land in Lincoln County, Nevada: Hiko Spring and Crystal Springs Province (two springs) (Service 2017, Figure 5.5; Hershler 1998, pp. 35–37; Sada 2017, pp. 80–81). The species is likely extirpated from Hiko Spring; in 2000, Sada (2017, p. 80) observed that the spring box was significantly modified, and the pyrg has not been observed since. Hubb's pyrg is presumed extant at Crystal Springs Province where it has been found to be common or abundant from surveys conducted between 1992 and 2015 (see Table 5.35 in the SSA Report (Service 2017, p. 140)). The best available information indicates that the primary stressor for this species is residual impacts associated with historical spring modifications (surface diversion, channel modification, and impoundment) (Factor A). It is reasonable to assume that some residual temporary negative impacts associated with historical spring modifications currently exist. However, there is no evidence to suggest that the Hubbs pyrg is not continuing to occupy Crystal Springs Province at similar abundance levels (*i.e.,* common or abundant) as recorded previously. Thus, although spring modifications still exist at Crystal Springs Province, the best available information indicates there are no significant adverse effects to Hubbs pyrg or its habitat (*i.e.,* the species' needs continue to be met, and there is no information to indicate declining population trends). Potential future changes in climate conditions (increases in temperature or decreases in precipitation) are not likely to cause significant impacts to the regional carbonate aquifer that Crystal Springs Province relies on. Although the species is now found in only one spring, we concluded in the Species Assessment Form that the resiliency of the species within that spring is sufficiently high that the species is not in danger of extinction or likely to become so in the foreseeable future. Therefore, at this time, there is no evidence to suggest that the stressors discussed herein are likely to increase in magnitude into the future to such a degree that the population of Hubbs pyrg would be lost, or decline to a significant degree as a result in the foreseeable future. We also looked for significant portions of the Hubbs pyrg's range that might be endangered or threatened, and we determined that there are no geographic concentrations of stressors (see our Species Assessment Form, Section 15.1.3 available on the Internet at *http://www.regulations.gov* under Docket No. FWS–R8–ES–2011–0001).

Pahranagat Pebblesnail—This springsnail is consistently found to be common or abundant within four springs and spring provinces (greater than nine springs) in Lincoln and Nye Counties, Nevada. This area is the entirety of its known historical range. Although none of its springs are in natural condition or resemble natural characteristics, physical alteration of these habitats has all been historical, and the springs have naturalized to a stable condition. Relative abundance and springbrook data have varied by spring and year, although the most-recent survey information indicates it is currently abundant to common throughout its range. There are no stressors that are significantly affecting the species, although some presence of invasive species (Factor C) and residual impacts from historical spring modifications (Factor A) are likely resulting in insignificant effects. Although these stressors are present, they do not appear to be resulting in significant adverse effects to Pahranagat pebblesnail or its habitat (*i.e.,* the species' needs continue to be met at affected springs, and there is no information to indicate declining population trends across the species' range). Future conditions are projected to include the continued presence of invasive species. There is also potential for future decreased flow or ground water withdrawals across this species' range if climate change or pressures from oil or gas development occur; however, if any such reduction in flow or reduced substrate and vegetation conditions occur, impacts are predicted to be insignificant; thus, even if springsnail individuals may be impacted, the species' needs would still be met in the foreseeable future. We also looked for significant portions of the Pahranagat pebblesnail's range that might be endangered or threatened, and we determined that there are no geographic concentration of stressors (see our Species Assessment Form, Section 15.1.3 available on the Internet at *http://www.regulations.gov* under Docket No. FWS–R8–ES–2011–0001).

White River Valley pyrg—The White River Valley pyrg occurs in seven populations at nine springs or provinces in Nye and White Pine Counties, Nevada. Although some historical habitat was lost for this species, it currently occupies multiple springs at multiple locations throughout its known historical range. Two additional springs that could possibly contain the species have not been accessed since 1999 and 2007; there is no evidence to suggest that the species no longer occurs at those locations. The White River Valley pyrg in Flag Springs, Camp Spring, Lund Spring, and Preston Big Spring appears to be thriving. The primary stressor affecting the species is residual impacts from historical spring modifications (Factor A), primarily at Cold Spring and Nicholas Spring, although these residual impacts are also evident to a lesser degree at three other springs and one spring province. Although no significant effects were noted, invasive species (Factor C) occur at Preston Big Spring, and vegetation and substrate impacts (Factor A) from roads, ungulate use, and recreation were also evident at four springs.

The best available information indicates that the current stressors (spring modification, vegetation and soil disturbance from ungulates, invasive aquatic species) have existed historically across the species' range, resulting in a likelihood of some continued residual impacts to individuals or populations, but on a limited scale that does not affect the entire range of the species; no current impacts appear to exist at the Flag Springs Province (three springs). Thus, the best available information indicates that White River Valley pyrg continues to occupy multiple springs at abundance levels (common or abundant) similar to historical levels (albeit presumed occupancy for three of the populations). At this time, although stressors are present, they do not appear to be resulting in any significant adverse effects to White River Valley pyrg or its habitat (*i.e.,* the species' needs continue to be met at affected springs, and there is no information to indicate declining population trends across the species' range). Four populations—Flag Springs Province, Camp Spring, Lund Spring, and Preston Big Spring—consisting of five to eight springs are likely to continue to provide for the species' needs into the foreseeable future. Existing stressors (*i.e.,* presumed invasive species (nonnative fish), vegetation and soil disturbance from roads, and historical spring modifications) are likely to continue but only to affect individuals of the species or to result in insignificant effects to populations. Additionally, abundance levels are expected to continue at this same status (abundant or common), having persisted over time regardless of the historical surface water diversions. We also looked for significant portions of the White River Valley pyrg's range that might be endangered or threatened, and we determined that there are no geographic concentrations of stressors (see our Species Assessment Form, Section 15.1.3 available on the Internet at *http://www.regulations.gov* under Docket No. FWS–R8–ES–2011–0001).

Butterfield Pyrg—Butterfield pyrg occurs as two populations (likely five springs) at the Butterfield Springs Province in Nye County, Nevada, which is the likely historical range. Although two of the five springs could not be located during recent survey efforts, there is no evidence to suggest that the springs no longer exist. We determined that the species' needs are being met (or presumed to be met, noting additional surveys are necessary to locate two of the five spring sources). The primary stressors, although insignificant where they occur, are vegetation and soil disturbance from ungulate use (Factor A), invasive species (Factor C), and residual impacts from historical spring modifications (Factor A). The best available data indicate that residual impacts occur at the springs from past surface water diversions and disturbance of substrate and vegetation from ungulate activity, in addition to invasive plants present at two of the springs. Regardless of these historical and current impacts, the species was found to be both scarce and abundant (the latter at the largest spring in the province) at the three springs surveyed in 2016.

We are also unaware of any projects or activities occurring that would result in significant negative effects to the species' needs. Although there are stressors present, they are not resulting in significant adverse effects to Butterfield pyrg or its habitat (*i.e.,* the species' needs continue to be met at affected springs, and there is no information to indicate declining population trends across the species' range). It is likely that all populations will continue to persist into the future. The most probable impacts to the species' needs are potential reduced aquifer levels if climate change predictions (minimal increase in temperature and decrease in precipitation) come to fruition. If flow does decrease, it is not expected to affect the species' needs negatively to such a degree that springsnail abundance would decrease or springs would be lost in the foreseeable future. We also looked for significant portions of the Butterfield pyrg's range that might be endangered or threatened, and we determined that there was a geographic concentration of stressors; however, we found those stressors were not likely to cause the species in that portion to be in danger of extinction now or in the foreseeable future. Therefore, no portion of the Butterfield pyrg's range meets the criteria of an SPR (see our Species Assessment Form, Section 15.1.3 available on the Internet at *http://www.regulations.gov* under Docket No. FWS–R8–ES–2011–0001).

Hardy Pyrg—The Hardy pyrg occurs in White River Valley, Nye County, Nevada. Although some historical habitat was lost for this species, it currently occupies multiple springs at multiple locations (8 populations within 24 springs) throughout its known historical range. The species' abundance in some springs varies, including recent surveys showing the species' abundance to range from none to common or abundant. The most common stressors across the range of the species include vegetation and soil disturbance from ungulate use (Factor A), as well as potential for crushed springsnails (seven populations; Factor E), and residual impacts from historical spring modifications (surface diversions, channel modifications, or impoundments at six populations; Factor A). Additionally, three populations are subject to vegetation and soil disturbance from roads (Factor A), and two also contain invasive species (Factor C). Although these stressors are present, they are not resulting in significant adverse effects to Hardy pyrg or its habitat (*i.e.,* the species' needs continue to be met at affected springs, and there is no information to indicate declining population trends across the species' range). A decrease in spring discharge in the future, if it occurs, may result in reduced Hardy pyrg population resiliency (possibly loss of the Ruppes Boghole Springs). Based on the current spring characteristics, stressors, and habitat conditions, we believe at least 6 populations (11 springs) would be able to withstand future stochastic events, regardless of the lowered resiliency. Overall, we expect habitat conditions may be reduced to some extent, but overall conditions will remain suitable for the Hardy pyrg in the foreseeable future. We also looked for significant portions of the Hardy pyrg's range that might be endangered or threatened, and we determined that there are no geographic concentrations of stressors (see our Species Assessment Form, Section 15.1.3 available on the Internet at *http://www.regulations.gov* under Docket No. FWS–R8–ES–2011–0001).

Flag Pyrg—Flag pyrg occurs in two populations (four springs) in Nye County, Nevada: Meloy Spring and Flag Springs Province. Both of these areas represent the entirety of the species' known historical range. They both contain large populations that have historically and currently been classified as common or abundant (with the exception of Flag Spring C where none were found in 2016 (Service 2017, p. 190). Although this pyrg may be present in low numbers or absent at Flag Spring C, all remaining populations appear to be thriving. The overall condition of these four springs is high, with the only stressor known to affect these populations being residual impacts from historical spring modifications (surface diversions at both locations, and an impoundment at Meloy Spring) (Factor A). Although residual effects from this stressor are present, the spring modifications are not resulting in significant adverse effects to the Flag pyrg or its habitat (*i.e.,* the species' needs continue to be met at affected springs, and there is no information to indicate declining population trends across the species' range). There is potential for future reduced flow and possibly reduced substrate and vegetation conditions at both locations if climate change projections are realized; however, if any such reduction in flow or reduced substrate and vegetation conditions occur, impacts to this species are expected to be insignificant; even if springsnail individuals may be impacted, the species' needs would still be met. Because the springs have substantially high rates of free-flowing water, we expect habitat conditions may be reduced, but overall conditions are likely to remain suitable for the Flag pyrg in the foreseeable future. We also looked for significant portions of the Flag pyrg's range that might be endangered or threatened, and we determined that there are no geographic concentrations of stressors (see our

Species Assessment Form, Section 15.1.3 available on the Internet at *http://www.regulations.gov* under Docket No. FWS–R8–ES–2011–0001).

Lake Valley Pyrg—Although some historical habitat was lost for this species, Lake Valley pyrg currently occupies multiple springs at multiple locations throughout its known historical range. Specifically, Lake Valley pyrg is known from four springs at Wambolt Springs Province (Lake Valley, Lincoln County, Nevada), where it occurs as two populations. Surveys in 2009 found Lake Valley pyrg in three of the four springs surveyed—Wambolt Springs A, C, and D—which closely align in a meadow, whereas surveys in 2016 found the species in Wambolt Springs B, C, and D where Sada (2017, pp. 112–113) considered them abundant. With regards to stressors, spring modification (surface diversion; Factor A) and cattle disturbance to vegetation and substrate (Factor A) are evident. The Wambolt Springs Province has historically experienced some spring modifications and ungulate use that disturbs substrate and vegetation; ungulate use continues currently, although Lake Valley pyrg's relative abundance numbers do not appear significantly affected. At this time, although these stressors are present, they are not resulting in significant adverse effects to Lake Valley pyrg or its habitat (*i.e.,* the species' needs continue to be met at affected springs, and there is no information to indicate declining population trends across the species' range).

With regard to our future conditions analysis, the most probable impacts to the species' needs are associated with reduced aquifer levels if climate change predictions (minimal increase in temperature and decrease in precipitation) come to fruition, as well as with vegetation and soil disturbance from ungulate activity. Additionally, there are no proposed projects that are likely to impact the species or its habitat in the future. The greatest potential future impacts—ground water withdrawal or changes in climate conditions—may result in future reductions in spring discharge and free-flowing water; however, the best available information suggests that any realized negative effects would not result in significant population- or rangewide-level effects. In other words, Lake Valley pyrg's resiliency, redundancy, or representation is not likely to be reduced to a significant degree in the foreseeable future. We also looked for significant portions of the Lake Valley pyrg's range that might be endangered or threatened, and we determined that there are no geographic concentrations of stressors (see our Species Assessment Form, Section 15.1.3 available on the Internet at *http://www.regulations.gov* under Docket No. FWS–R8–ES–2011–0001).

Bifid Duct Pyrg—The bifid duct pyrg occurs in White Pine County, Nevada, and Millard County, Utah. Although some historical habitat was lost for this species, it currently occupies a wide distribution within multiple springs at multiple locations throughout its known historical range (11 extant bifid duct pyrg populations in 18 springs), which can help protect the species against potential catastrophic events. Abundance varies across the species' range. During 2016 surveys, it was common or abundant in the majority of springs where it was found. It also appears that it consistently demonstrates relatively high abundance numbers in all but one of the 18 springs, and that the species has been both historically and currently scarce in the remaining spring. The most significant stressors across the species' range include residual impacts associated with historical spring modification (eight populations; Factor A), damaged substrate and vegetation from ungulate use (Factor A), the potential for crushed springsnails from ungulate use (Factor E), and, to a significantly lesser extent, potential vegetation and substrate impacts (Factor A) from roads (three springs) and recreation (three springs). Additionally, one spring (Maple Grove Springs) has invasive species (Factor C) present, although at insignificant abundance levels. The best available data indicate that there are no projects or activities occurring or proposed that would result in significant negative effects to the species' needs.

At this time, although these stressors are present, they are not resulting in significant adverse effects to bifid duct pyrg or its habitat (*i.e.,* the species' needs continue to be met at affected springs, and there is no information to indicate declining population trends across the species' range). A decrease in spring discharge, if it occurs in the future, may result in a reduction in resiliency for all populations of bifid duct pyrg. The degree to which reduction in discharge would affect resiliency would vary among populations, based on the current size of the population, the amount of flow at each spring site, the extent of habitat, and uncertainties associated with management on private land and proposed groundwater development projects. The best available information indicates that the bifid duct pyrg's resiliency, redundancy, or representation is not likely to be reduced to a significant degree in the foreseeable future. This conclusion is based on: (1) There are no proposed projects or negative changes in management practices expected in the foreseeable future, and (2) any future reduction in discharge or other species needs is not likely to be significant given the overall adequacy of current conditions (particularly spring discharge; see Service 2017, Table 6.13, p. 268) throughout the majority of the species' range such that springs or populations would be lost. We also looked for significant portions of the bifid duct pyrg's range that might be endangered or threatened, and we determined that there was a geographic concentration of stressors but that portion was not significant, and thus did not meet the criteria of an SPR (see our Species Assessment Form, Section 15.1.3 available on the Internet at *http://www.regulations.gov* under Docket No. FWS–R8–ES–2011–0001).

Finding

Based on our review of the best available scientific and commercial information pertaining to the five factors, as well as the number and distribution of springs and spring provinces for each of the 14 springsnail species, the continued presence of adequate resources to meet the species' needs, and our consideration of the species' continued redundancy, resiliency, and representation, we conclude that the impacts on the 14 species and their habitat are not of such imminence, intensity, or magnitude to indicate that any of the 14 springsnail species are in danger of extinction (an endangered species), or likely to become so within the foreseeable future (a threatened species), throughout all or a significant portion of their ranges. We conclude there is no evidence of any significant impacts to the species such that there is or would be in the foreseeable future a loss of the resources needed to meet the species' physical and ecological needs across all 14 of the species' ranges. Nor is there any evidence that there are any significant portions of the species' ranges where the species could be in danger of extinction or likely to become so in the foreseeable future. Thus, our future analysis reveals a low risk of extirpation in the foreseeable future for all 14 species.

Barbour's Map Turtle (*Graptemys barbouri*)

Previous Federal Actions

On April 20, 2010, we received a petition from the Center to list 404 aquatic, riparian, and wetland species from the southeastern United States as endangered or threatened species under the Act, including Barbour's map turtle. On September 27, 2011, we published a 90-day finding in the **Federal Register** (76 FR 59836) concluding that the petition presented substantial information indicating that listing the Barbour's map turtle may be warranted. As a result of the Service's 2012 settlement agreement with the Center, the Service is required to submit a proposed listing rule or not-warranted 12-month finding for the Barbour's map turtle to the **Federal Register** by September 30, 2017. This notice satisfies the requirements of that settlement agreement for the Barbour's map turtle, and constitutes the Service's 12-month finding on the April 20, 2010, petition to list the Barbour's map turtle as an endangered or threatened species.

Background

The Barbour's map turtle is a freshwater riverine turtle found in the Apalachicola–Chattahoochee–Flint (ACF) Rivers and their major tributaries—Choctawhatchee, Pea, Ochlockonee, and Wacissa Rivers in southeastern Alabama, southwestern Georgia, and the Florida panhandle. Barbour's map turtles are mostly found in riverine habitats, although they may also be found in creeks, streams, and impoundments. These map turtles are historically known from the ACF River drainage (to include Chattahoochee, Flint, and Chipola Rivers) of southeastern Alabama, southwestern Georgia, and the Florida panhandle and some of their tributaries. Stream geomorphology in the ACF River basin is characterized by steep, sandy banks and Ocala limerock outcrops with alternating shallow, rocky shoals and deep, sandy pools. The abundance of Barbour's map turtles in the ACF River basin has led researchers to believe the limestone substrate and water depth are important elements of the species' habitat. Barbour's map turtles have recently been found outside the known historical range in the Wacissa and Ochlockonee Rivers in the Florida panhandle and the Choctawhatchee and Pea Rivers in Alabama and Florida panhandle.

Map turtles are avid baskers, basking up to 6 or more hours a day from March through October. In Florida and southern Alabama, map turtles will bask during every month of the year as long as the ambient temperature is above water temperature. In the northern portion of their range in Georgia and during cold spells throughout the region, turtles become lethargic in the cooler water temperatures but do not hibernate. Basking is required for thermoregulation, prevention and destruction of parasites and fungi that may grow on the carapace or skin, and exposure to ultraviolet radiation for absorption of vitamin D. Map turtles are easily startled and will dive into the water for protection.

River sinuosity, meaning the amount and type of curves and bends, plays an important part in providing habitat, shelter, and food for this species. The more bends and curves a river or creek has, the more riparian area that could be present to provide woody vegetation and snags for basking and sheltering, increased diversity of water depth and flow, more exposed open sandbars to provide advantageous nesting areas, and habitat for food sources consumed by all life stages of Barbour's map turtle.

Summary of Status Review

In completing the status review for the Barbour's map turtle, we considered and evaluated the best scientific and commercial information available, and evaluated the potential stressors that could be affecting the Barbour's map turtle, including the Act's five threat factors. This evaluation includes information from all sources, including Federal, State, tribal, academic, and private entities and the public. The Species Status Assessment Report (Service 2017b, entire) for the Barbour's map turtle summarizes and documents the biological information we assembled, reviewed, and analyzed as the basis for our finding. While the petition stated concerns regarding impacts to the species from stressors within the five factors, we concluded that the species is resilient to the stressors and current impacts to the species do not rise to a level that would warrant listing under the Act.

Our review of the best available science indicates that the Barbour's map turtle continues to occupy most of its historical range in the ACF River basin and additional locations beyond the historical range. Although the Barbour's map turtle faces a variety of impacts from reduced water flow from dams, fluctuating levels of water quality and habitat availability, dredging, and deadhead logging, the species has continued to persist and the magnitude of these threats is not expected to significantly change in the near future. Furthermore, the impacts from any of the stressors—either individually or cumulatively—are not likely to affect the species at a population- or range-wide level in the near term.

To evaluate the current and future viability of the Barbour's map turtle, we assessed a range of future conditions to allow us to consider the species' resiliency, redundancy, and representation. Resiliency describes the ability of a population to withstand stochastic disturbance effects. Redundancy describes the ability of the species to withstand catastrophic disturbance events. Representation characterizes a species' adaptive potential by assessing geographic, genetic, ecological, and niche variability. Together, resiliency, redundancy, and representation comprise the key characteristics that contribute to a species' ability to sustain populations in the wild over time.

A species with multiple resilient populations distributed across its range is more likely to persist into the future and avoid extinction than a species with fewer, less-resilient populations. For the purposes of this assessment, populations were delineated using HUC8 watersheds that Barbour's map turtles have historically occupied or currently occupy. The Barbour's map turtle currently occupies 16 HUC8 watersheds within the ACF River basin and the Choctawhatchee, Ochlockonee, and Wacissa River basins. Overall, estimates of current resiliency, representation, and redundancy for Barbour's map turtle are considered to be moderate to high, with the exception of the Upper Choctawhatchee River, and we did not find any evidence that these conditions may change in the future. Our estimation of the species' moderate to high resiliency, redundancy, and representation throughout the majority of its range suggest that it has the ability to sustain its populations into a 30-year time horizon. This timeframe captures the time period of 2–3 generations of Barbour's map turtles, as well as our best professional judgment of the projected future conditions related to either environmental stressors (*e.g.,* water management, deadhead logging, dredging or channel maintenance for commerce and public use of the waterways) or systematic changes (*e.g.,* climate change, riparian management or regulatory mechanisms, human consumption, and pet trade collection). We evaluated the current range of the Barbour's map turtle to determine if there are any apparent geographic concentrations of potential threats to the species. The risk factors that occur throughout the Barbour's map turtle's range include reduction of water flow from dams (Factor A), climate change (Factor A), deadhead logging (Factor A), dredging (Factor A), and human exploitation (Factor B). There was no concentration of threats identified across its range. Therefore, there is no portion of the species' range where the species could be in danger of extinction or likely to become so in the foreseeable future, and the Barbour's map turtle is not in danger of extinction currently, nor is it likely to become so in the foreseeable future, in a significant portion of its range.

Finding

Based on our review of the best available scientific and commercial information pertaining to the five factors, as well as the number and distribution of populations, the continued presence of adequate resources to meet the species' needs, and our consideration of the species' continued redundancy, resiliency, and representation, we conclude that the impacts on the species and its habitat are not of such imminence, intensity, or magnitude to indicate that the Barbour's map turtle is in danger of extinction (an endangered species), or likely to become so within the foreseeable future (a threatened species), throughout all or a significant portion of its range.

We conclude there is no evidence of any significant loss of the resources needed to meet the species' physical and ecological needs across the species' range, nor is there any evidence of declining numbers of turtles at any of the locations. Rather, recent surveys (1990s–2000s) have resulted in a larger species range than that which was previously known.

Therefore, we find that listing the Barbour's map turtle as a threatened or an endangered species or maintaining the species as a candidate is not warranted throughout all or a significant portion of its range. A detailed discussion of the basis for this finding can be found in the Barbour's map turtle species-specific assessment form and other supporting documents available on the Internet at *http://www.regulations.gov* under Docket No. FWS–R4–ES–2017–0065.

Bicknell's Thrush (*Catharus bicknelli*)

Previous Federal Actions

In 1994, the Bicknell's thrush was determined to be a category 2 species of concern and we announced that finding in the Animal Candidate Review for Listing as Endangered or Threatened Species (59 FR 58982, November 15, 1994). Category 2 was defined as including taxa for which the Service had information indicating that proposing to list as endangered or threatened was possibly appropriate, but for which persuasive data on biological vulnerability and threats were not currently available to support proposed rules. In 1996, the Service discontinued the list of category 2 candidate species, resulting in the removal of the Bicknell's thrush from candidate status (61 FR 64481, December 5, 1996).

On August 26, 2010, we received a petition dated August 24, 2010, from the Center, requesting that the Bicknell's thrush be listed as an endangered or threatened species under the Act and that critical habitat be designated. Included in the petition was supporting information regarding the species' natural history and ecology, population status, and threats to the species, including: Habitat loss and climate change (Factor A); disease and predation (Factor C); the inadequacy of existing regulatory mechanisms (Factor D); and exposure to mercury, acid deposition, interspecific competition, and disturbance by recreationists (Factor E).

On September 9, 2011, the U.S. District Court for the District of Columbia approved two settlement agreements: One agreement between the Service and the Center and a second agreement between the Service and WildEarth Guardians (Guardians). The agreements enabled the Service to systematically, over a period of 6 years, review and address the needs of more than 250 species listed on the 2010 Candidate Notice of Review (75 FR 69222, November 10, 2010). The agreements also included additional scheduling commitments for a small subset of the actions in the 6-year work plan that were consistent with the Service's objectives and biological priorities. For the Bicknell's thrush, the settlement agreement with Guardians specified that we would complete a 90-day petition finding by the end of fiscal year 2012. On August 15, 2012, we published a 90-day finding for the Bicknell's thrush (77 FR 48934) indicating that the petition provided substantial information indicating that listing the species because of Factors A, D, and E may be warranted, and initiated a status review.

In 2013, the Center filed a complaint against the Service for failure to complete a 12-month finding for the Bicknell's thrush within the statutory timeframe. The Service entered into a settlement agreement with the Center to address the complaint; the court-approved settlement agreement specified a 12-month finding for the Bicknell's thrush would be delivered to the **Federal Register** by September 30, 2017. This notice constitutes the 12-month finding on the August 26, 2010, petition to list the Bicknell's thrush as an endangered or threatened species.

Background

This information is summarized from the Service's Bicknell's Thrush Biological Species Report (Species Report) (Service 2017c, entire); for more detail, please see the Bicknell's Thrush Species Report available on the Internet at *http://www.regulations.gov* under Docket No. FWS–R5–ES–2012–0056. The Bicknell's thrush is a migratory bird: The smallest of North American *Catharus* thrushes in the family Turdidae, which includes all birds related to the robins. Due to similar morphometric (related to size and shape) characteristics, positively identifying a Bicknell's thrush from other North American *Catharus* thrushes, especially the gray-cheeked thrush (*C. minimus*), requires close scrutiny. However, trained biologists can tell similar species apart. We have carefully reviewed the available taxonomic information and conclude that the Bicknell's thrush (*Catharus bicknelli*) is a valid taxonomic species.

The Bicknell's thrush breeds during the summer (May to August) in areas of the northeastern United States and southeastern Canada. Individuals start migrating in late September or early October by following a coastal route south to Virginia, where most birds depart, flying across the ocean to the Bahamas and Cuba, before finally arriving in the Greater Antilles (*i.e.,* the grouping of larger islands in the Caribbean, including but not limited to the Bicknell's thrush's wintering areas in Cuba, Haiti, the Dominican Republic, Jamaica, and Puerto Rico) sometime during mid-October through early November. Wintering occurs in the Greater Antilles (October to March), and migration occurs back overland through the Southeast United States in spring (April to May) to reach its breeding grounds.

Breeding habitat for the Bicknell's thrush consists of dense tangles of both living and dead "stunted" trees that are predominately balsam fir (*Abies balsamea*) with lesser amounts of red spruce (*Picea rubens*) and white birch (*Betula papyrifera var. cordifolia*) (Wallace 1939, p. 285; Ouellet 1993, p. 561; Rimmer *et al.* 2001, p. 7; McKinnon *et al.* 2014, p. 2). Except in the case of the Canadian provinces, where the species has been found at lower elevations along the coast and in regenerating industrial forests at higher elevations, the species breeds mostly in stunted high-elevation or montane spruce-fir forests located close to, but below, timberline (*i.e.,* at elevations above 700 m (2,300 ft)) (Wallace 1939, pp. 248, 286; Ouellet 1993, pp. 560, 561; Atwood *et al.* 1996, p. 652; Nixon *et al.* 2001, p. 38; Rimmer *et al.* 2001, p. 7; Glennon and Seewagen 2016, p. 134; Aubry *et al.* 2016, p. 304). Although the Bicknell's thrush exhibits some flexibility in the elevation of its breeding habitats, the species demonstrates a strong preference for a specific, dense vegetation structure.

While there is more suitable breeding habitat in Canada than in the United States, the species is not evenly distributed throughout the habitat. Based on breeding density information, the best available data indicate that the current Bicknell's thrush global population is approximately 97,358 to 139,477, with approximately 66 percent of the population breeding in the United States and 33 percent breeding in Canada.

During migration, the Bicknell's thrush appears to be a habitat generalist and can be found in dense woodlots composed of variable tree species, or along well-vegetated beaches, orchards, and gardens (Wallace 1939, p. 259; Wilson and Watts 1997, pp. 520–521). Wintering occurs exclusively in the Greater Antilles, with the majority of Bicknell's thrushes on the island of Hispaniola, in Haiti and the Dominican Republic; however, the species can also be found on the islands of Cuba, Jamaica, and Puerto Rico (Rimmer *et al.* 2001, pp. 3–4). In Jamaica, the Bicknell's thrush is considered ''extremely rare'' and observed in old growth forests (Strong in litt. 2016). The species' information for Puerto Rico is scant (Rivera in litt. 2017), with surveys conducted in the winter of 2015 and 2016 finding a total of 10 birds (Rimmer 2016, entire). In the Dominican Republic, where the majority of wintering information about the species is derived, the Bicknell's thrush can be found from sea level to 2,200 m (7,200 ft), although most occur in moderately wet to wet broadleaf montane forests above 1,000 m (3,300 ft) elevation (*i.e.,* cloud forest) (Rimmer *et al.* 2001, p. 8). The Bicknell's thrush can also be found in dry pine-dominated forests at lower elevations (Rimmer *et al.* 2001, p. 6). The species prefers wintering in dense thicket vegetation (Townsend *et al.* 2010, p. 520), similar to the habitat structure selected during the breeding season.

Summary of Status Review

This information is summarized from the Species Report (Service 2017c, entire); for more detail, please see the report. Due to the lack of specific data regarding survival rates by life stage or fecundity rates, we evaluated existing stressor-related data and qualitatively assessed the individual and cumulative effects of those stressors on individual Bicknell's thrush, aggregates of Bicknell's thrush in the breeding or wintering grounds, and at the species level. From this assessment, we conclude that habitat loss in the wintering range has most likely been a significant driver of the species' decreased viability, particularly when combined with low productivity in some years due to nest predation from red squirrels (*Sciurus vulgaris*), which also contributes to annual variation in the abundance of the Bicknell's thrush.

Activities that contribute to loss of the species' habitat include some forestry practices such as precommercial thinning and clearcutting in the Canadian portion of the species' range, which may result in the loss and fragmentation of important breeding habitat. However, the regeneration of young dense stands of conifers that follows cutting can provide breeding habitat for the species for approximately 5 to 12 years after clearcutting (International Bicknell's Thrush Conservation Group 2010, p. 12; McKinnon et al 2014, pp. 264, 268). The development of ski areas, wind turbines, telecommunication facilities, and their associated infrastructure (*i.e.,* roads and transmission lines) has also resulted in the loss and fragmentation of Bicknell's thrush habitat (International Bicknell's Thrush Conservation Group 2010, p. 12), but these activities have affected a relatively small proportion of the available Bicknell's thrush breeding habitat and associated individuals.

Looking forward, the best available information suggests that, as a result of climate change, the spruce-fir habitat that supports breeding Bicknell's thrushes may be substantially reduced, with the potential to be nearly eliminated, from the species' current range in the northeastern United States and may decline in Canada by the end of this century, depending on the amount of greenhouse gases emitted to the atmosphere, habitat type (*i.e.,* low vs. high elevation), and forest harvest management strategies. The effects of climate change may also result in an increase in competition between the Bicknell's and Swainson's thrushes (*Catharus ustulatus*), at the expense of the Bicknell's thrush, and an increase in predation from red squirrels.

On the wintering grounds, the consequences of climate change will likely include a drying of the Caribbean region and an associated decline in the wet montane and cloud forest habitats where most Bicknell's thrushes are found. It is also likely that socioeconomic and development pressures, especially in the Dominican Republic and Haiti, will result in further losses of the species' preferred habitat, as forests are converted to other land uses.

The stressors we evaluated in detail in our Bicknell's Thrush Report (Service 2017c, entire) that fall under Factors A, C, and E of section 4(a)(1) of the Act are habitat loss and degradation due to incompatible forestry practices (*e.g.,* precommercial thinning), conversion to agriculture, atmospheric acid and nitrogen deposition, recreational and wind energy development, and the effects of climate change (Factor A); predation from red squirrels and Norway rats (*Rattus norvegicus*) (Factor C); and effects of mercury, effects of acid deposition, collision and disturbance by stationary and moving structures, disturbance by recreationalists, and competition with Swainson's thrush (Factor E). An examination of existing regulatory mechanisms (Factor D) for both the Bicknell's thrush and its habitat in general reveals that some mechanisms exist that may provide a conservation benefit to the species. Where relevant, the adequacy of those mechanisms is discussed in context in the relevant sections of the Species Report.

We have no information indicating that habitat degradation due to atmospheric acid and nitrogen deposition (Factor A), disease (Factor C), or the effects of mercury and acid deposition (Factor E) are currently affecting the Bicknell's thrush or its habitat. In addition, we concluded that recreational and wind energy development (Factor A), as well as collision and disturbance by stationary/moving structures and disturbance by recreationalists (Factor E) may be affecting individual Bicknell's thrush but were not significant stressors to aggregates of individuals or at the species level.

Our review of the best available information indicates that the Bicknell's thrush continues to occupy most of its historical breeding, migration, and wintering range. Although there are some stressors that are expected to result in the loss of suitable breeding and wintering habitat for the Bicknell's thrush, as well as directly affect the species through reduced reproduction and overwintering mortality, we have no evidence to suggest that the species is currently at risk of extinction; in other words, the risk of the Bicknell's thrush significantly declining in the near term is very low given that it has persisted despite historical levels of habitat loss and predation throughout its range. Furthermore, neither the loss of wintering habitat nor predation levels nor any other stressors, either individually or cumulatively, are likely to cause species-level effects such that the species is currently at risk of extinction; thus the Bicknell's thrush does not meet the definition of an endangered species.

The stressors likely to have the greatest influence on the Bicknell's thrush's viability over time include: (1) For the breeding range, changes in habitat suitability (*e.g.,* changes in tree species composition, forest pests, and fire regime), increased red squirrel predation, and increased interspecific competition due to the effects of climate change; and (2) for the wintering range, direct habitat loss due to agriculture conversion and the effects of climate change. We considered whether we could reliably predict the extent to which these stressors might affect the status of the species in the future. Our ability to make reliable predictions into the future for the Bicknell's thrush is limited by the variability in not only the quantity and quality of available data across the species' range regarding the species' occurrence and the potential impacts to the species from ongoing and predicted stressors, but also by the high amount of uncertainty in how the Bicknell's thrush may respond to those effects.

The future timeframe for this analysis is approximately 30 years, which is a reasonably long time to consider as the foreseeable future given the Bicknell's thrush's life history and the temporal scale associated with the patterns of the past and current stressors outlined in the best available information. For example, the foreseeable future is twice as long as the 15-year data set (from 2001 to 2014) showing the extent of decline in tree cover on four Caribbean islands occupied by wintering Bicknell's thrushes (Hansen *et al.* 2017, entire). This timeframe also captures the range of time periods for continued habitat loss in the wintering range as a result of incompatible forestry practices and conversion to agricultural lands (*i.e.,* using the previous 15 years of data to project the same rate of the decline over the next 15 to 30 years), climate models, as well as our best professional judgment of the reliability of data on, and the projected range of future conditions related to the effects, including cumulative effects, of climate change (*i.e.,* the period in which there is reliable data upon which to base a prediction of the species' response to the potential effects of climate change).

Since the analysis of potential effects from climate change was an important consideration in our status assessment and the effects of climate change take place over a period of time, we sought to consider a timeframe that was long enough to evaluate those potential effects adequately. However, in evaluating the status of the species, we did not extend our forecast out as far as all existing climate change models discussed in the Bicknell's Thrush Report. Those models extend to approximately 100 years, and we concluded that such an extended forecast was not sufficiently reliable for the listing determination due to the: (1) Increased uncertainty in the model results (*i.e.,* the confidence intervals associated with temperature and precipitation projections); (2) increasing uncertainty in the magnitude and imminence of the predicted changes; (3) higher level of uncertainty of how the species may respond to any potential changes in its habitat that may result from changes in temperature and precipitation patterns; and (4) uncertainty associated with how society will respond to the predicted change in climate (*e.g.,* take actions that will mediate or accelerate global emissions) that far into the future. As an example of biological uncertainty, there are significant questions regarding the point at which the predicted shifts (*i.e.,* tree species composition, interspecific competition with Swainson's thrush) make the habitat unsuitable for the Bicknell's thrush, as well as the extent to which the Bicknell's thrush has the adaptive capacity to use any changes in what we now understand to be suitable habitat or to find other habitat to be suitable. These uncertainties are additive and undermine the Service's confidence in making a risk assessment projection beyond 30 years into the future. Therefore, the Service concluded that an approximate 30-year projection of threats and effects to the species represents the timeframe in which a reliable prediction is possible.

Based on the species' abundance and distribution in its breeding and wintering locations, the continued presence of adequate habitat quality and quantity to meet the species' breeding and overwintering needs, and our consideration of the species' future distribution, abundance, and diversity, we conclude that the Bicknell's thrush is likely to remain at a sufficiently low risk of extinction that it will not become in danger of extinction in the foreseeable future (*i.e.,* approximately 30 years) and thus does not meet the definition of a threatened species under the Act.

We evaluated the current range of the Bicknell's thrush to determine if there are any apparent geographic concentrations of potential threats to the species. The risk factors that occur throughout the Bicknell's thrush's range include the loss of habitat due to the effects of climate change. The loss of habitat due to illegal logging, conversion to subsistence farming, and slash and burn agriculture, however, is occurring both currently and in the foreseeable future, at a rate of approximately 5 percent reduction in tree cover over 15 years (based on Hansen *et al.*'s (2017, entire) analysis), solely in the Dominican Republic and Haiti. Thus, this one area of the species' wintering range is subject to a type of habitat loss that is not affecting the species uniformly throughout its range. While the human-mediated loss of suitable habitat in the wintering grounds appears to be concentrated in areas within the Dominican Republic and Haiti, the risk is low that the current rate of loss that we project to continue, is sufficient to cause the Bicknell's thrush to be in danger of extinction (*i.e.,* be an endangered species) or likely to cause the species to become endangered within the foreseeable future period of approximately 30 years (*i.e.,* be a threatened species) in a portion of its range.

Finding

Based on our review of the best available scientific and commercial information pertaining to the five factors, we find that the stressors acting on the species and its habitat, either singly or in combination, are not of sufficient imminence, intensity, or magnitude to indicate that the Bicknell's thrush is in danger of extinction (an endangered species), or likely to become endangered within the foreseeable future (a threatened species), throughout all of its range. We request that you submit any new information concerning the status of, or threats to, the Bicknell's thrush to our New England Fish and Wildlife Office (see **ADDRESSES**) whenever it becomes available.

Big Blue Springs Cave Crayfish (*Procambarus horsti*)

Previous Federal Actions

On April 20, 2010, we received a petition from the Center to list 404 aquatic, riparian, and wetland species from the southeastern United States as threatened or endangered species under the Act, including the Big Blue Springs cave crayfish. The 90-day finding was published on September 27, 2011; it determined that the petition contained substantial information indicating the species may warrant listing, and initiated a status review (76 FR 59836). As a result of the Service's 2012, settlement agreement with the Center, the Service is required to submit a 12-month finding to the **Federal Register** by September 30, 2017. This notice satisfies the requirements of that settlement agreement for the Big Blue Springs cave crayfish, and constitutes the Service's 12-month finding on the April 20, 2010, petition to list the Big Blue Springs cave crayfish as an endangered or threatened species.

Background

The Big Blue Springs cave crayfish is a subterranean species of crayfish endemic to several freshwater springs and sink caves within the panhandle of Florida. It has been collected from aquatic caves and limestone springs associated with the Woodville Karst Plain near and south of a geomorphological feature of karst limestone known as the Cody Scarp, paralleling riverine karst areas of the Wakulla, St. Marks, and Wacissa Rivers in Jefferson, Leon, and Wakulla Counties, Florida. It has been found in the boil area of springs, depths of 21–26 m (70–80 ft), and a sinkhole near the surface. The principal habitat feature supporting this species appears to be a flowing, freshwater, subterranean environment; however, specific water-quality requirements for the species are currently unknown.

The Big Blue Springs cave crayfish was historically found in three locations: A well in Leon County, Big Blue Spring in Jefferson County, and Shepherd Spring on St. Marks National Wildlife Refuge in Wakulla County, Florida. In 2017, the species was found in three aquatic cave sites within 12 mi (19 km) of each other—Big Blue Spring and nearby Garner Spring on the east side of the Wacissa River (Jefferson County) and Horsehead Spring on the west side of the Wacissa River (Jefferson County)—which included locations where the species had not previously been found.

Summary of Status Review

In completing our status review for the Big Blue Springs cave crayfish, we reviewed the best available scientific and commercial information and compiled the information in the Species Status Assessment Report (Service 2017d, entire) for the Big Blue Springs cave crayfish. We evaluated all known potential impacts to the Big Blue Springs cave crayfish, including the Act's five threat factors. As explained further below, we also used a time period of 35–50 years for the foreseeable future. This evaluation included information from all sources, including Federal, State, tribal, academic, and private entities and the public.

The Big Blue Springs cave crayfish were recently (March 2017) observed in two of three historical locations. No population estimates exist for the species; however, at least 90 individuals were observed across three locations during the 2017 surveys. The primary stressors to the Big Blue Springs cave crayfish currently and into the future are loss of freshwater within the karst system and saltwater intrusion.

The petition stated that the species is at risk from present or future destruction, modification, or curtailment of its range by extensive degradation of aquatic and riparian habitats due to land-use activities and the direct alterations of waterways. In addition, populations are prone to potential pollution and detrital change, and there is concern that the aquifer system may be receiving pollutants from the Tallahassee area. We also evaluated the extent to which overutilization and climate change (including saltwater intrusion resulting from sea-level rise) may be affecting the species negatively.

Land Use Activities and Direct Alteration of Waterways: In general, crayfish species experience degradation of aquatic and riparian habitats in the Southeast due to land-use activities—such as development, agriculture, logging, and mining—and direct alterations of waterways—such as impoundment, diversion, dredging and channelization, and draining of wetlands (Benz and Collins 1997, p. 273; Shute *et al.* 1997, pp. 445–446). However, information on whether these activities represent actual or active threats to the Big Blue Springs cave crayfish is inconclusive.

Population Increases and Water Pollution: According to the U.S. Census Bureau, the human population in the southeastern United States has grown at an average annual rate of 37.9 percent since 2000 (U.S. Census Bureau 2017, pp. 1–4), by far the most rapidly growing region in the country. This rapid growth has resulted in expanding urbanization, sometimes referred to as ''urban sprawl.'' Urban sprawl increases the connectivity of urban habitats while simultaneously fragmenting non-urban habitats such as forests and grasslands (Terando *et al.* 2014, p. 1). In turn, species and ecosystems are negatively affected by the increased sprawl because of water pollution, local climate conditions, and disturbance dynamics (Terando *et al.* 2014, p. 1).

Population projections for Leon County, Florida, are expected to increase, leading to potential ground water impacts associated with greater water demands for the city of Tallahassee. However, the Northwest Florida Water Management District indicated that ground water pumping was not an issue in the watershed; more freshwater is staying in the system due to improvements in storm water and stream flow management. This is based on observed increases in discharge that could be related to the release of water from underground stream openings and sinks connected to the regional karst system (Coates 2017, pers. comm.). With more freshwater staying in the system due to improvements in storm water and stream flow management, we concluded that the best available scientific and commercial information does not indicate that ground water changes are having a negative impact on the species at a population level.

Overutilization: The petition also discussed the potential threat of overutilization of crayfish from collection for bait or food; however, the freshwater cave habitat for this species is difficult to access, which offers the crayfish some protection from collection. This threat is not causing population- or species-level impacts; therefore, the best available information does not indicate overutilization is an operative threat to this species.

Climate Change: Our analyses under the Act include consideration of ongoing and projected changes in climate. Various types of changes in climate can have direct or indirect effects on the species. These effects may be positive, neutral, or negative and they may change over time. In our analyses, we use the best available scientific and commercial data and modeling available and our expert judgment to weigh relevant information, including uncertainty, in our consideration of various aspects of climate change.

One impact from climate change that may be a factor for the Big Blue Springs cave crayfish is sea-level rise due to its proximity to the Gulf coast of Florida. Annual rates of sea-level rise at Apalachicola, Florida (southwest of areas inhabited by Big Blue Springs cave crayfish) have averaged approximately 1.96 mm (0.08 in) since the 1970s (National Oceanic and Atmospheric Administration 2017). The projected sea-level rise for coastal Wakulla County in 2080 is 0.32 m (1.05 ft) (Harrington and Walton 2008, p. 12). Sea-level rise may result in an increase in saltwater intrusion into the karst freshwater aquifer system as a result of associated increases in hydraulic pressure on the aquifer; however, the mechanics of the coastal aquifer system are complex and dynamic. Generally, seawater is kept out of the conduit system by freshwater hydraulic pressure resisting against seawater intrusion (Werner and Simmons 2009, pp. 197–198). However, Xu *et al.* (2016, p. 2) documented seawater intrusion into the Woodville Karst Plain conduit network during periods of low precipitation. Their analysis of precipitation and electrical conductivity data indicates that seawater intrusion into the karst system does occur, traveling 11 mi (18 km) against the prevailing regional hydraulic gradient to Wakulla Spring (Xu *et al.* 2016, p. 2).

This increase in seawater intrusion into the karst conduit system may be contributing to the increased freshwater discharge rates periodically observed in some springs (*e.g.,* Wakulla Springs) in recent years. Sea-level rise would result in increased hydraulic pressure and, therefore, the potential for increased saltwater intrusion into the conduit system. However, we are unable to conclude that the current predicted rates of sea-level rise will significantly affect the cave crayfish's habitat within the foreseeable future. First, the species is able to move vertically within spring systems and can quickly adapt to changes in the availability of freshwater within the conduit system (Moler 2016, pers. comm.). Saltwater is also denser than freshwater and, therefore, descends as it intrudes inland through the aquifer, reducing the likelihood that it will affect the availability of freshwater in the conduit system as distance from the ocean increases. The flow of seawater from the Gulf of Mexico interacts with the force of a seaward hydraulic pressure of freshwater creating a diffusion zone at the freshwater–saltwater interface (Zhang *et al.* 2002, p. 233). This interface is a dynamic zone that is dictated by the flow of the water in each direction; further inland, there is less pressure from the introduced seawater and more pressure from the freshwater system flowing into the ocean.

Finally, habitats occupied by the Big Blue Springs cave crayfish are located 3 to 43 km (2 to 27 mi) from the coast, at elevations of 1.5 to 15 m (5 to 50 ft) above sea level, though occupied habitats within the conduit system are below sea level. Although seawater intrusion and transport in karst aquifers can occur over extremely long distances, increases in conductivity noted at the vent of Wakulla Spring are small in an absolute sense. An increase in conductivity is indicative of saltwater intrusion inland (Xu *et al.* 2016, p. 9). Conductivity would likely be similar or less at the two furthest sites occupied by Big Blue Springs cave crayfish (Big Blue Spring and Garner Spring). Seawater intrusion could be a more important issue at Shepherd Spring, which is located within 3 km (2 mi) of the Gulf of Mexico.

Overall, based on historical data along with current and future conditions of the species and habitat, we anticipate that Big Blue Springs cave crayfish populations will remain resilient. The locations where the crayfish have been observed at the surface can be thought of as ''windows'' into the karst system. The species has the ability to move throughout the system in response to environmental conditions in order to relocate to suitable habitat or areas of refugia. The species is expected to continue to be resilient in response to stochastic events. A survey from March 2017 detected the species in areas where they hadn't previously been detected, and many individuals were found in Garner Springs, indicating that the species is persisting there. Management actions on public lands can provide protection and improvement for springs. Portions of the Aucilla Wildlife Management Area are designated as Outstanding Florida Waters by the Florida Department of Environmental Protection; such a designation restricts degradation of water quality and water withdrawal (Florida Fish and Wildlife Conservation Commission 2016, p. 57). As explained further in the Species Assessment Form, we evaluated ongoing management of the springs within the range of the Big Blue Springs cave crayfish will reduce impacts to the species by maintaining water flow to the springs thus allowing the persistence of suitable habitat.

Foreseeable future for this species was determined to be a 35–50-year timeframe based on the biology of the species, the threats identified, and ongoing water management practices that include actions that are beneficial to the species, with the 50-year outer limit as the conservative amount of time to apply when evaluating its status as threatened. The lifespan of cave crayfish is typically around 20 years, so the range of 35–50 years encompasses 2–3 generations, allowing sufficient time for population response to stressors to be detected, with the major stressor to the species being a decline or loss of freshwater availability. The climate model used included projections beyond 50 years; however, a longer timeframe would lead to too much uncertainty in evaluating the response of the species to habitat changes or the impacts from sea-level rise, drought, or overall water availability.

We evaluated the current range of the Big Blue Springs cave crayfish to determine if there are any apparent geographic concentrations of potential threats to the species. There was no concentration of threats identified across its range. Therefore, we find there could be no significant portion of the species' range where the species is in danger of extinction or likely to become so in the foreseeable future. Therefore, we find that the Big Blue Springs cave crayfish is not endangered or threatened throughout a significant portion of its range.

Finding

Based on our review of the best available scientific and commercial information pertaining to the five factors, we evaluated relevant stressors, including land-use activities and direct alterations of waterways (Factor A), water withdrawal (Factor A), sea-level rise (Factor A), and overutilization (Factor B), and concluded that the stressors acting on the species and its habitat, either singly or in combination, are not of sufficient imminence, intensity, or magnitude to indicate that the Big Blue Springs cave crayfish is in danger of extinction (an endangered species), or likely to become endangered within the foreseeable future (a threatened species), throughout all or a significant portion of its range.

The most important factor that may affect Big Blue Springs cave crayfish resiliency is ground water decline. We expect that ground water levels may decline over time, but there is significant uncertainty over how that will affect freshwater availability. If freshwater availability is reduced due to lower aquifer levels caused by ground water pumping or prolonged drought, we expect populations would likely be minimally affected, since the species has been found at significant spring and sink depths and can move as ground water levels decrease (Moler 2016, pers. comm.).

A detailed discussion of the basis for this finding can be found in the Big Blue Springs cave crayfish species-specific assessment form and other supporting documents available on the Internet at *http://www.regulations.gov* under Docket No. FWS–R4–ES–2017–0066.

Black-Backed Woodpecker (*Picoides arcticus*)

Previous Federal Actions

On May 8, 2012, we received a petition dated May 2, 2012, from the John Muir Project of the Earth Island Institute, the Center for Biological Diversity, the Blue Mountains Biodiversity Project, and the Biodiversity Conservation Alliance (Earth Island Institute *et al.* 2012, pp. 1–16) (petitioners), requesting that the Oregon-Cascades/California population and the Black Hills population of the black-backed woodpecker each be listed as an endangered or threatened subspecies, and that critical habitat be designated concurrent with listing under the Act. The petition also requested that, should we not recognize either population as a subspecies, we consider listing each population as an endangered or threatened distinct population segment (DPS) under our policy published in the **Federal Register** for determining distinct vertebrate population segments under the Act (61 FR 4721; February 7, 1996). Included in the petition was information regarding the species' ecology, genetic sampling information, distribution, present status, and suggested actual and potential causes of decline. Our positive 90-day finding for the petition was published in the **Federal Register** on April 9, 2013 (78 FR 21086).

On September 24, 2014, the United States District Court for the District of Columbia issued a court order for a stipulated settlement agreement in the case of *Center for Biological Diversity* v. *S.M.R. Jewell,* No.1: 14–cv–0 1021–EGS. The order and stipulated settlement agreement required the Service to complete a 12-month finding for the ''California-Oregon and South Dakota populations'' of the black-backed woodpecker by September 30, 2017. This notice constitutes the 12-month finding on the May 2, 2012, petition to list the Oregon-Cascades/California population and Black Hills population as endangered or threatened species under the Act.

Background

The black-backed woodpecker is similar in size to the more-common American robin (*Turdus migratorius*) and is heavily barred with black and white sides (Dawson 1923, pp. 1007–1008). Males and young have a yellow crown patch, while the female crown is entirely black. Its sooty-black dorsal plumage camouflages it against the black, charred bark of the burned trees upon which it preferentially forages (Murphy and Lehnhausen 1998, p. 1366; Tremblay *et al.* 2016, p. 1). The black-backed woodpecker has only three toes on each foot instead of the usual four. Black-backed woodpeckers have a narrow diet, consisting mainly of larvae of wood-boring beetles and bark beetles (Cerambycidae, Buprestidae, Tenebrionidae, and Scolytidae) (Goggans *et al.* 1989, pp. 20, 34; Villard and Beninger 1993, p. 73; Murphy and Lehnhausen 1998, pp. 1366–1367; Powell 2000, p. 31; Dudley and Saab 2007, p. 593), which are available following large-scale disturbances, especially high-severity fire (Nappi and Drapeau 2009, p. 1382). The black-backed woodpecker is a cavity-nesting bird. It nests in late spring, with nest excavation generally occurring from April to June, depending on location and year.

The black-backed woodpecker occurs across dense, closed-canopy boreal and montane coniferous forests of North America from Alaska, Canada, Washington, Oregon, California, Northern Rockies, South Dakota, Minnesota and east to New England (Winkler *et al.* 1995, p. 296; Tremblay *et al.* 2016, pp. 10–11). This includes the Black Hills of western South Dakota (Drilling *et al.* 2016, pp. 251–252) and adjacent counties of northeastern Wyoming (Orabona *et al.* 2012, p. 76). It also includes the area of eastern Washington and Oregon where the species is found in the Cascade Range, south through throughout the Blue Mountains and Wallowa Mountains and into the Siskiyou Mountains in southwestern Oregon. From Oregon, the range continues south into California along the higher elevation slopes of the Siskiyou, Cascades, Klamath, and Sierra Nevada Mountains to eastern Tulare County, California (Dawson 1923, p. 1007; Grinnell and Miller 1944, p. 248; Tremblay *et al.* 2016, pp. 10–11). The black-backed woodpecker's breeding range generally corresponds with the location of boreal and montane coniferous forests throughout its range.

At the landscape scale, while not tied to any particular tree species, the black-backed woodpecker generally is found in older conifer forests that comprise high densities of larger snags (Bock and Bock 1973, p. 400; Russell *et al.* 2007, p. 2604; Nappi and Drapeau 2009, p. 1388; Siegel *et al.* 2012, pp. 34–42). The species is closely associated with standing dead timber that contains an abundance of snags (Tremblay *et al.* 2016, pp. 13–16). Black-backed woodpeckers appear to be most abundant in stands of trees recently killed by fire (Hutto 1995, pp. 1047, 1050; Smucker *et al.* 2005, pp. 1540–1543) and in areas where beetle infestations have resulted in high tree mortality (Bonnot *et al.* 2009, p. 220).

The black-backed woodpecker was first described in 1831 (Swainson and Richardson 1831, p. 313; American Ornithologists' Union (AOU) 1983, p. 392). The scientific community recognizes the black-backed woodpecker as a valid species (AOU 1983, pp. 392–393), and no subspecies of the black-backed woodpecker were included at the time that AOU, the scientific authority responsible for bird classification, last published subspecies classifications in 1957 (AOU 1957, p. 330). In addition, no other taxonomic authority has recognized any subspecies for the black-backed woodpecker (Tremblay *et al.* 2016, p. 9).

Summary of Status Review

A recent genetic study identified some genetic differences between individuals found in three areas within the black-backed woodpecker's range. The three areas include: (1) The boreal forest of Canada, Washington, Northern Rockies, and northeastern United States, (2) the Oregon-Cascades/California (Sierra Nevada Mountains), and (3) the area around the Black Hills (southwestern South Dakota and northeastern Wyoming) (Pierson *et al.* 2010, entire; Pierson *et al.* 2013, entire). The petitioners have relied on the Pierson *et al.* (2010) study results to propose that this new genetic information may warrant a revised interpretation of the taxonomic description of the species into three subspecies (EII *et al.* 2012, pp. 13–16). However, based on our review of the best available scientific and commercial information, as well as the expert opinion of the scientific community, we find that the Oregon-Cascades/California and Black Hills populations are not subspecies. Also in our analysis, we could not find significant differences in behavior, morphology, or habitat use for the species across its range, or that any genetic differences have yet manifested themselves into differences that can be pointed at that would support separation of the populations into subspecies.

We also reviewed whether the Black Hills population or the Oregon-Cascades/California population were distinct vertebrate population segments (DPSs) under our 1996 DPS policy (61 FR 4721, February 7, 1996). Based on a review of the best available information, we have determined that the Black Hills population and the Oregon-Cascades/California population are not significant in relation to the remainder of the taxon because they do not exist in an ecological setting unique or unusual to the taxon; the loss of the populations would not result in a significant gap in the range of the taxon; they are not the only surviving natural occurrences of the taxon; and the genetic makeup of neither population contains unique genetic characteristics not found elsewhere in the larger boreal population. Therefore, we have determined that neither the Black Hills population nor the Oregon-Cascades/California population qualifies as a DPS under our 1996 DPS policy, and neither is a listable entity under the Act. Because the Black Hills and Oregon-Cascades/California populations of the black-backed woodpecker are not listable entities, we did not perform a status assessment under the five factors found in section 4(a) of the Act.

Finding

Based on our thorough review of the best available scientific and commercial information as summarized in our Species Assessment (Service 2017f, entire), we find that the petitioned entities identified as the Oregon-Cascades/California population and the Black Hills population of the black-backed woodpecker are not subspecies and neither meets our criteria for being a DPS under our February 7, 1996, DPS policy (61 FR 4722). Therefore the Oregon-Cascades/California and Black Hills populations of the black-backed woodpecker do not meet the definition of listable entities under the Act and, as a result, cannot warrant listing under the Act. Our complete rationale and supporting information for our subspecies and DPS determinations are outlined in our Species Assessment document (Service 2017f, entire; available on the Internet at *http://www.regulations.gov* under Docket No. FWS–R8–ES–2013–0034).

Boreal Toad (*Anaxyrus boreas boreas*)

Previous Federal Actions

On September 30, 1993, the Service received a petition from the Biodiversity Legal Foundation and Dr. Peter Hovingh. The petitioners requested that the Service list the Southern Rocky Mountains population of the ''western boreal toad'' (an alternate common name sometimes used in the past for *Anaxyrus boreas boreas*) as endangered. The petitioners also requested that the Service designate critical habitat. On July 22, 1994, we published a notice of a 90-day finding on the petition in the **Federal Register** (59 FR 37439), indicating that the petition and other readily available scientific and commercial information presented substantial information indicating that the petitioned action may be warranted.

On March 23, 1995, the Service announced a 12-month finding that listing the Southern Rocky Mountains population of the boreal toad as an endangered DPS was warranted but precluded by other higher priority actions (60 FR 15281). At that time, a listing priority number of 3 was assigned. When we find that listing a species is warranted but precluded, we refer to it as a candidate species. Section 4(b)(3)(B) of the Act directs that, when we make a ''warranted but precluded'' finding on a petition, we are to treat the petition as being one that is resubmitted annually on the date of the finding; thus, the Act requires us to reassess the petitioned actions and to publish a finding on the resubmitted petition on an annual basis. Several resubmitted candidate assessments for the boreal toad were completed. The most recent of these was published in the **Federal Register** on May 11, 2005 (70 FR 24870).

On September 29, 2005, we determined that the Southern Rocky Mountains population of the boreal toad did not warrant listing because it was not a listable entity according to the DPS criteria and, therefore, should be withdrawn from the candidate list (70 FR 56880). When the boreal toad was put on the candidate list in 1995, the DPS Policy did not yet exist, so the determination that the toad was a listable entity was not based on the current criteria. The combination of using the DPS criteria developed in 1996 and incorporating genetic and other information available during development of the 2005 finding led to determinations that the Southern Rocky Mountains population of the boreal toad was discrete, but not significant. Therefore, we determined in the 2005 finding that it was not a listable entity.

On May 25, 2011, we received a petition from the Center, the Center for Native Ecosystems, and the Biodiversity Conservation Alliance, requesting that either the Eastern or Southern Rocky Mountains population of the boreal toad be listed as an endangered or threatened DPS, and that critical habitat be designated under the Act. Please note that the Southern Rocky Mountains population is a subset of what we now call the Eastern Population of the boreal toad. We published a notice of a 90-day finding for the petition in the **Federal Register** on April 12, 2012 (77 FR 21920). In that finding we concluded that the petition presented substantial scientific or commercial information indicating that listing the Eastern Population of the boreal toad as a DPS may be warranted. The finding announced that we were initiating a review of the status of the Eastern Population to determine if listing it as a DPS is warranted. The 90-day finding further announced that we did not find substantial information that listing the Southern Rocky Mountains population of the boreal toad as a DPS may be warranted. Although the Southern Rocky Mountains population appears geographically discrete, we did not find substantial information to suggest that it may be significant according to the criteria in our DPS Policy. We concluded that there is not substantial information in the petition and in our files to suggest that the Southern Rocky Mountains population of boreal toads may be a valid listable entity (*i.e.,* a DPS) (77 FR 21920, April 12, 2012).

On June 27, 2013, the Center filed a complaint (1:13–cv–00975–EGS) to compel the Service to issue 12-month findings as to whether listing under the Act was warranted for nine species, including the Eastern Population of the boreal toad. On September 23, 2013, the Service and the Center filed a stipulated settlement agreement, agreeing that the Service would submit to the **Federal Register** a 12-month finding for the Eastern DPS of the boreal toad by September 30, 2017 (*Center for Biological Diversity* v. *Jewell* 2013, case 1:13–cv–00975–EGS). This notice constitutes the Service's 12-month finding on the 2011 petition to list the Eastern DPS of boreal toad as an endangered or threatened species.

Background

The boreal toad is a subspecies of the Western toad (*Anaxyrus boreas,* formerly *Bufo boreas*), which occurs throughout much of the western United States. Current and ongoing genetic analyses suggest the occurrence of an eastern group of boreal toads that are distinct from the rest of the subspecies. Genetic studies have helped clarify the boundaries of this group, which we now understand to include boreal toads in southeastern Idaho, western and south-central Wyoming, most of Utah (except western Box Elder County), Colorado, and north-central New Mexico. This group, which we refer to as the ''Eastern Population,'' is the focus of this finding.

The boreal toad occurs between 2,000 m (6,550 ft) and 3,670 m (12,232 ft) in areas with suitable breeding habitat within a landscape containing a variety of vegetation types, including pinon-juniper, lodgepole pine, spruce-fir forests, mountain shrubs, and alpine meadows (Service 2017f, p. 13). Breeding takes place in shallow, quiet water in lakes, marshes, bogs, ponds, and wet meadows (Service 2017f, p. 13).

We are not aware of any total population size estimates for the Eastern Population of the boreal toad. We lack information to define or precisely map all individual breeding populations of boreal toads, because some recent location data are limited to incidental sightings of individual toads. Therefore, for the purposes of our analysis, the range of the species was depicted by watershed, at the 12-digit hydrologic unit code (HUC–12) level, where a HUC–12 may include one or more current or historical breeding sites (Service 2017f, pp. 11–13). We considered these HUC–12s to be proxies for ''populations'' within the larger Eastern Population, because the 12-digit HUC is the finest grained sub-watershed delineated in the National Watershed Boundary Dataset, representing areas of 10,000–40,000 ac (4,000–16,000 ha) (USGS 2009). This approach allowed us to rely upon consistent units for analysis across the range of the boreal toad. We do not believe that the current range has changed substantially from the historical range, although some HUC–12s with documented presence of toads are now considered extirpated (Service 2017f, pp. 11–13).

We evaluated the Eastern Population of boreal toads under the Service's Policy Regarding the Recognition of Distinct Vertebrate Population Segments Under the Endangered Species Act (61 FR 4722; February 7, 1996). Our complete DPS evaluation can be found in the Species Assessment and Listing Priority Assignment Form for the boreal toad (available on the Internet at *http://www.regulations.gov* under Docket No. FWS–R6–ES–2012–0003) and is summarized here. The Eastern Population of the boreal toad is markedly separated from the rest of the boreal toad subspecies, based on the collective results of genetic studies that provide evidence of this discontinuity, and in particular the nuclear DNA evidence clarifying the boundaries of the Eastern Population. As a result, the Eastern Population of the boreal toad is considered a discrete population according to the DPS policy. In addition, the extirpation of this group would mean the loss of the genetic variation in this distinct group, and the loss of the future evolutionary potential (*i.e.,* representation) that goes with it. Thus, the genetic data support the conclusion that the Eastern Population of the boreal toad represents a unique and irreplaceable biological resource of the type the Act was intended to preserve. Thus, we conclude that the Eastern Population of the boreal toad differs markedly in its genetic characteristics relative to the rest of the taxon. Therefore, we consider the Eastern Population of the boreal toad significant to the taxon to which it belongs under the DPS policy. Because the Eastern Population of the boreal toad is both discrete and significant, it qualifies as a DPS under the Act. From here on in this document, we refer to this entity as the Eastern DPS of the boreal toad.

Summary of Status Review

We completed a Species Status Assessment (SSA) Report for the Eastern DPS of the boreal toad (Service 2017f, entire), which reports the results of the comprehensive biological status review by the Service for the Eastern DPS of the boreal toad, and provides a thorough account of the species' overall viability and, therefore, extinction risk. To evaluate the biological status of the boreal toad both currently and into the future, we assessed a range of conditions to allow us to consider the population's resiliency, redundancy, and representation as proxies for evaluating overall viability. The boreal toad needs multiple resilient populations (redundancy) widely distributed (representation) across its range to maintain its persistence into the future and to avoid extinction. A number of factors may increase a boreal toad population's resilience to stochastic events. These factors include (1) sufficient population size (abundance), (2) recruitment of toads into the population, as evidenced by the presence of all life stages at some point during the year, and (3) connectivity between breeding populations. As explained further in the SSA Report (Service 2017f), we used a time period of up to 50 years for the foreseeable future.

We evaluated a number of potential stressors that could influence the health and resilience of boreal toad populations (Service 2017f, p. 22), corresponding to the five factors under section 4(a)(1) of the Act. We found that the main factor influencing the status of populations is the presence of chytrid fungus, *Batrachochytrium dendrobatidis* (Bd); however, the response of boreal toads to Bd varies across the species' range (Service 2017f, p. 24). Toads in the Southern Rocky Mountains subpopulation area appear to respond most negatively when exposed to Bd, resulting in drastic declines in toad numbers at breeding sites, or the extirpation of toads at some sites. Toads in Utah do not appear to be significantly affected by Bd, and toads in western Wyoming display slow population declines through time. We consider occupied sites where Bd infection is absent to be the most resilient; some populations exist where Bd is present and are highly resistant to Bd infection, and we also consider these populations highly resilient (Service 2017f, p. 29). Other areas display moderate resistance to Bd and are, therefore, moderately resilient; low-resiliency populations are those that have little or no resistance to Bd and suffer severe population declines or extirpation (Service 2017f, p. 33).

The historical range of the Eastern DPS of boreal toad includes 439 known HUC–12s across the range of this subspecies. Currently, approximately 194 HUC–12s are considered occupied. Of these, approximately 83 HUC–12s are positive for Bd infection (Service 2017f, pp. 31–32). Occupancy within the remaining approximately 245 HUC–12s is currently unknown due primarily to the lack of recent survey effort. However, this number includes approximately 62 HUC–12s within the Southern Rocky Mountains subpopulation area that are considered unoccupied and may have been extirpated by Bd (Service 2017f, pp. 31–32). We recognize that the 439 known HUC–12s within the range of the species likely represents a minimum number of possible breeding sites, since surveys done to date have not included every area that could possibly support boreal toads (Service 2017f, p. 11).

The variability in the toads' response to Bd infection informs our understanding of the future of the boreal toad. As part of the Southern Rocky Mountains Recovery Team's update of its conservation plan, Converse *et al.* (2016, entire) and Gerber *et al.* (in review) as cited in Crockett (2017a, p. 2) developed a population persistence model, which provides a statistically rigorous assessment of viability of boreal toads in the Southern Rocky Mountains (Crockett 2017a, p. 2). The model, based on data on the occupancy of sites by toads and the presence of Bd, is described in greater detail in our SSA Report (Service 2017f, pp. 24, 34–35). This model predicts a greater-than-95 percent probability of persistence of toads within the Southern Rocky Mountains over the next 50 years, but with lower population levels, fewer breeding sites, and reduced geographic distribution. Given that boreal toads in other geographic areas display higher levels of resistance to Bd infection (and there is no information to suggest that situation will change), we believe this model represents a worst-case scenario when considering the future condition of the Eastern DPS as a whole (Service 2017f, pp. 35–36). If we anticipate that this high level of persistence will occur within an area most susceptible to Bd infection (with possible reductions in resilience, representation, or redundancy), toads in other population areas are likely to fare even better, maintaining robust breeding populations into the future, although there is uncertainty regarding how climate change may factor into the future condition of the Eastern DPS (Service 2017f, p. 36).

In summary, boreal toad populations are currently experiencing variability in their response to Bd infection, which we consider to be the primary stressor on boreal toad population resilience. The most-susceptible population to Bd infection experiences high population losses and localized extirpations, but some breeding sites continue to persist despite significant population declines. Some populations within the range show little or no evidence of impacts caused by Bd infection and remain robust despite the presence of Bd. Other areas show some population decline, but at much lower severity than observed in the Southern Rocky Mountains. This analysis is described in greater detail in our SSA Report (Service 2017f, entire). Therefore, we have concluded that the Eastern DPS of boreal toad is not in danger of extinction because it will likely continue to maintain self-sustaining populations distributed across its range over the next 50 years.

Having determined that the Eastern DPS of boreal toad is not currently in danger of extinction or likely to become so in the foreseeable future throughout all of its range, we next considered whether there are any significant portions of the range where the species is in danger of extinction or is likely to become endangered in the foreseeable future. Given the apparent greater vulnerability to Bd of boreal toads in the Southern Rocky Mountains (Service 2017f, p. 24), we evaluated whether the population could be considered endangered or threatened in this portion of its range. We found that in this portion of the range, 51 percent of HUC–12s are in the high or moderate resilience category, and these are spread throughout the Southern Rocky Mountains, providing adaptive capacity (representation) and redundancy in the face of catastrophic events (Service 2017f, p. 30). Looking into the foreseeable future, we considered the best data available—the only existing model of population persistence focused on the Southern Rocky Mountains. That model predicted a 95-percent probability of persistence for toads in this geographic area in 50 years (Service 2017f, p. 35). Despite the possible reductions in breeding sites and occupied mountain ranges in the foreseeable future, the current and projected future conditions indicate a low risk of extinction for boreal toads in the Southern Rocky Mountains. Therefore, Eastern boreal toads are not in danger of extinction or likely to become so in the foreseeable future in the Southern Rocky Mountains portion of its range.

Finding

We reviewed the best available scientific and commercial information pertaining to the Eastern DPS of the boreal toad, corresponding to the Act's five threat factors. Because boreal toads in the Eastern DPS are distributed across the majority of their historical range, with a large percentage of populations in a moderate or high resiliency category in the face of Bd, which is the primary stressor influencing the species (Service 2017f, pp. 11–12, 33–34), we find that the species retains adaptive capacity and has a very low risk of extirpation due to stochastic or catastrophic events that could plausibly occur in the future. Therefore, we conclude that the current risk of extinction is low, such that the Eastern DPS of boreal toads is not in danger of extinction throughout all of its range.

In addition, because we project a high probability of persistence in the face of Bd across the majority of the range of the Eastern DPS in 50 years, even under a worst-case scenario (Service 2017f, pp. 35–36), we find that the species has a low future risk of extirpation due to plausible stochastic or catastrophic events in the foreseeable future and that, due to the high probability of persistence and the low risk of extirpation, the species is expected to retain most of its adaptive capacity. Therefore, we conclude that the risk of extinction in the foreseeable future is low, and the Eastern DPS of boreal toad is not likely to become an endangered species within the foreseeable future throughout all of its range.

Finally, we considered whether there are any significant portions of the range where the population is in danger of extinction or is likely to become so in the foreseeable future. We evaluated the Southern Rocky Mountains portion of the range, where the population has evidenced the least ability to resist Bd, the primary stressor, and found a low risk of extirpation of the Eastern boreal toad even in that portion of its range. Based on this analysis, we concluded that there is not a significant portion of the DPS's range where the species is in danger of extinction or likely to become so in the foreseeable future.

We have carefully assessed the best scientific and commercial information available regarding the past, present, and future threats to the Eastern DPS of the boreal toad. Because the species is neither in danger of extinction now nor likely to become so in the foreseeable future throughout all or any significant portion of its range, the species does not meet the definition of an endangered species or threatened species. Therefore, we find that listing the Eastern DPS of boreal toad as an endangered or threatened species under the Act is not warranted at this time. This document constitutes the Service's 12-month finding on the 2011 petition to list the Eastern DPS of boreal toad as an endangered or threatened species. A detailed discussion of the basis for this finding can be found in the Eastern DPS of boreal toad's species-specific Species Assessment and Listing Priority Assignment Form, SSA Report, and other supporting documents (available on the Internet at *http://www.regulations.gov* under Docket No. FWS–R6–ES–2012–0003).

Fisher (*Pekania pennanti*)

Previous Federal Actions

On December 29, 1994, we received a petition dated December 22, 1994, from the Biodiversity Legal Foundation requesting that two fisher populations in the western United States, including the States of Washington, Oregon, California, Idaho, Montana, and Wyoming, be listed as threatened under the Act. Based on our review, we found that the petition did not present substantial information indicating that listing the two western United States fisher populations as DPSs was warranted (61 FR 8016; March 1, 1996).

On March 6, 2009, we received a petition dated February 24, 2009, from the Defenders of Wildlife, Center, Friends of the Bitterroot, and Friends of the Clearwater requesting that the fisher population in the Northern Rocky Mountains (NRM) of the United States be considered a DPS and listed as endangered or threatened, and critical habitat be designated under the Act. We published a 90-day finding on April 16, 2010, stating that the petition presented substantial information that listing a DPS of fisher in the NRMs may be warranted, and initiated a status review of the species (75 FR 19925). The next annual Candidate Notice of Review (CNOR), published on November 10, 2010, also included a notice of the 90-day finding and commencement of a 12-month status review for the fisher NRM

DPS (75 FR 69222). In our June 30, 2011, 12-month finding, we concluded that the fisher in the U.S. Northern Rocky Mountains of western Montana and north-central to northern Idaho constitutes a DPS (hereafter referred to as NRM fisher). However, we concluded that listing the NRM fisher as an endangered or threatened species was not warranted.

On September 23, 2013, the Center, Defenders of Wildlife, Friends of the Bitterroot, Friends of the Clearwater, Western Watersheds Project, and Friends of the Wild Swan petitioned the Service to list the NRM fisher as threatened or endangered under the Act. We published a positive 90-day finding on the petition on January 12, 2016 (81 FR 1368). We published a notice of commencement of a status review for the NRM fisher on January 13, 2017 (82 FR 4404). In August 2016, the Service entered into a settlement agreement with the Center, requiring the Service to submit a proposed listing rule or not-warranted 12-month finding for the NRM fisher to the **Federal Register** by September 30, 2017. This notice satisfies the requirements of that settlement agreement for the NRM fisher and constitutes the Service's 12-month finding on the 2013 petition to list the NRM fisher as an endangered or threatened species.

Background

The fisher is a forest-dwelling, medium-sized mammal, light brown to dark blackish-brown in color, found throughout many forested areas in Canada and the United States. The fisher has a long body with short legs and a long bushy tail. The fisher is classified in the order Carnivora, family Mustelidae, a family that also includes weasels, mink, martens, and otters (Anderson 1994, p. 14). The distribution of NRM fishers includes forested areas of western Montana and north-central to northern Idaho, and potentially northeastern Washington (Service 2017g, p. 15). Genetic analyses confirm the presence of a remnant native population of fishers in the NRM that escaped presumed extirpation early in the 20th century (Vinkey *et al.* 2006 p. 269; Schwartz 2007, p. 924; Knaus *et al.* 2011, p. 7). The population was supplemented with reintroductions of fisher from the Midwest and Canada in the mid to late 1900's (Service 2017g, p. 12). Some fishers in the NRM still reflect the genetic legacy of the remnant native population, with unique genetic identity found nowhere else in the range of fishers (Service 2017g, p. 14).

Fisher habitat includes low- to mid-elevation environments of mesic (moderately moist), coniferous and mixed conifer and hardwood forests (reviewed by Hagmeier 1956, entire; Arthur *et al.* 1989a, pp. 683–684; Banci 1989, p. v; Aubry and Houston 1992, p. 75; Jones and Garton 1994, pp. 377–378; Powell 1994, p. 354; Powell *et al.* 2003, p. 641; Weir and Harestad 2003, p. 74). Fishers are associated more commonly with mature forest cover and late-seral forests with greater physical complexity than other habitats (reviewed by Powell and Zielinski 1994, p. 52). In the NRM, fishers select for landscapes with abundant large trees (Schwartz *et al.* 2013, p. 109; Olsen *et al.* 2014, p. 93) and greater than 50 percent mature forest (Sauder and Rachlow 2014, pp. 79–80) arranged in a contiguous, complex mosaic (Sauder and Rachlow 2014, p. 79). These features occur in regions of the NRM receiving greater mean annual precipitation (Olson *et al.* 2104, p. 93) and having mid-range values for mean temperature in the coldest month (Olson *et al.* 2104, p. 93). Within areas of low- and mid-elevation forests, the most-consistent predictor of fisher occurrence at larger spatial scales is moderate to high levels of contiguous canopy cover rather than any particular forest plant community (Buck 1982, p. 30; Arthur *et al.* 1989b, pp. 681–682; Powell 1993, p. 88; Jones and Garton 1994, p. 41; Weir and Corbould 2010, p. 408).

NRM fishers select heterogeneous areas with intermediate abundance of habitat edge and high canopy cover within home ranges, not necessarily areas containing more-mature forest (Sauder and Rachlow 2015, pp. 52–53). In general, composition of individual fisher home ranges is usually a mosaic of different forested environments and successional stages (Sauder and Rachlow 2015, pp. 52–53; reviewed by Lofroth *et al.* 2010, p. 94). Cavities and branches in trees, snags, stumps, rock piles, and downed timber are used as resting sites, while cavities in large-diameter live or dead trees are selected more often for natal and maternal dens (Powell and Zielinski 1994, pp. 47, 56). A unique aspect of the landscapes that fishers use in the NRM is the presence of an ash layer in the soil profile—which is linked to increased forest productivity and potential resilience to drought (McDaniel and Wilson 2007, p. 32).

Summary of Status Review

We completed a Species Status Assessment (SSA) Report for the NRM fisher, which reports the results of the comprehensive biological status review and provides a thorough account of the species' overall viability and, therefore, extinction risk. To assess the NRM fisher's current and future statuses, we used the three conservation biology principles of resiliency, redundancy, and representation. Specifically, we identified the species' ecological requirements at the individual, population, and species levels and described the stressors influencing the species' viability. The NRM fisher needs multiple, resilient populations distributed across its range in a variety of ecological settings to persist into the future and to avoid extinction.

The biological information we reviewed and analyzed as the basis for our findings and projections for the future condition of the species is documented in the SSA Report (Service 2017g, entire). The potential stressors we evaluated in detail in the SSA Report (Service 2017g, entire) include climate change (Factor A), development/roads (Factor A), forestry (Factor A), fire (Factor A), trapping (Factor B), poisoning (Factor E), and predation (Factor C) (Service 2017g, chapter 3.5). For the reasons described in the SSA Report, there is no evidence to suggest that climate change, development, forestry, fire, trapping, poisoning, or predation are having population-level impacts to the NRM fisher, either individually or cumulatively with any other potential threats (Service 2017g, chapter 3.5 and chapter 4.9).

The NRM fisher currently exhibits a level of viability (characterized using resiliency, redundancy, and representation) that allows them to occur across their historical range (Service 2017h, chapter 3.6). A species distribution model estimates about 30,000 sq km (78,000 sq mi) of potential habitat for fisher in the NRM (Service 2017g, p. 25). Fisher habitat is inherently resistant to stochastic events (resilient) such as localized fire and drought (Service 2017g, p. 51) because the effects of such events on fisher habitat are mediated by the wetter, maritime climate and diverse topography across much of the NRM, as evidenced by the longer fire-return intervals that characterize most of the modeled fisher habitat (Service 2017g, p. 51). In order to characterize spatial distribution of potential fisher habitat, we divided the area of the NRM into three spatial units. In addition, since population size of the NRM fisher has not been estimated, we rely on describing the amount and distribution of modeled habitat patches at two scales to make inferences about the NRM fisher. The smaller scale habitat patch is 100 km^2—the approximate size of a male fisher home range and area needed to sustain individual fishers. The larger scale habitat patch is 2,500 km^2—a minimum critical area (MCA) needed to sustain 50 breeding fisher and avoid the effects of inbreeding depression.

Within the NRM, there is redundancy of modeled habitat patches at the home-range scale (100 km^2) (Service 2017g, p. 52). In addition, two of the three fisher spatial units have three or more MCAs (2,500 km^2), thereby lowering the risk that even a large, catastrophic event could eliminate all larger, contiguous habitat patches (Service 2017g, p. 52). Representation of suitable fisher habitat across the NRM appears high, and fisher have been able to adapt to shifting habitat in the past as glacial ice sheets melted and habitat distribution changed (Service 2017g, p. 52). A native genotype is still present in the NRM, along with individuals with genetic signatures presumably from past reintroductions (Service 2017g, p. 14). Fishers can utilize a wide variety of prey, thereby minimizing the influence of changing environmental conditions on prey abundance and distribution (Service 2017g, p. 52).

We assessed the future condition of the NRM fisher by analyzing the number and distribution of potential habitat patches at the home-range scale (100 sq km) and MCA scale (2500 sq km) among fisher spatial units in the NRM at three future time points (years 2030, 2060, and 2090) and under two future scenarios incorporating stressor trajectories derived from the scientific literature (Service 2017g, chapter 4.8). In both future scenarios, modeled fisher habitat is expected to be widely distributed across its range and, in some cases, increase (Service 2017g, pp. 57–58). Under these modeled future scenarios, we expect resiliency to remain stable or increase in the future (Service 2017g, pp. 65–67). Redundancy of habitat patches capable of supporting multiple fisher (100 sq km) and the number of MCAs (2500 sq km) are expected to increase under Scenario 1 and be widely distributed among all fisher spatial units (Service 2017g, p. 68). Fewer habitat patches capable of supporting multiple fishers (100 sq km) and slightly fewer MCAs (2500 sq km) are expected in the future under Scenario 2 than Scenario 1; however, habitat patches are expected to remain well distributed among fisher spatial units (Service 2017g, p. 68). Regarding representation, the full genetic diversity of fisher in the NRM is unknown; however, four different genetic haplotypes exist in the NRM (Service 2017g, p. 68). The native haplotype, along with three other haplotypes presumed to be from historical fisher reintroductions, indicate some level of genetic variability within the fisher population in the NRM; this variability is expected to persist into the future (Service 2017g, p. 68). Both modeled future scenarios predict that adequate distribution of patches among fisher spatial units will remain into the future (Service 2017g, p. 68). Thus, representation is expected to remain high in the future (Service 2017g, p. 68). This analysis is described in greater detail in our SSA Report (Service 2017g, entire).

Finding

We evaluated the NRM fisher under the Service's Policy Regarding the Recognition of Distinct Vertebrate Population Segments (DPS) Under the Endangered Species Act (61 FR 4722; February 7, 1996). Based on the best scientific and commercial information available, we find that the fisher in the NRM is both discrete and significant to the taxon to which it belongs. Fishers in the NRM are markedly separated from other populations of the same taxon as a result of physical factors, further supported by quantitative differences in genetic identity. The loss of the fisher in the NRM would result in the loss of markedly different genetic characteristics relative to the rest of the taxon and a significant gap in the range of the taxon; therefore, we consider the NRM fisher to be significant to the taxon to which it belongs (Service 2017h, pp. 12–14). Because the fisher in the NRM is both discrete and significant, it qualifies as a DPS under the Act.

We reviewed the best available scientific and commercial information pertaining to the status of the NRM fisher, corresponding to the Act's five threat factors. Currently, based on modeled habitat, there is a high-level (in both quantity and distribution) condition of individual home ranges (100 sq km) and a moderate-level condition of MCAs (2,500 sq km) across the NRM (Service 2017g, chapter 3.6). Habitat patches are widespread in distribution and occupy a part of the NRM that has a distinct ash cap in the soil left from the eruption of Mount Mazama, thereby increasing the soils' water retention properties and making NRM fisher habitat relatively resilient to future environmental change stemming from climate change (Service 2017g, p. 4). Modeled habitat patches that are currently present throughout the NRM indicate that they are likely to sustain fisher in the short and long term and to persist throughout the NRM through at least 2090 (Service 2017g, chapter 3.6). Modeled habitat patches are redundant among the three fisher spatial units, and this redundancy is expected to remain into the future (Service 2017g, p. 68). Representation, both currently and in the future, is predicted to remain high among all three fisher spatial units because of connectivity across the NRM, the mobile nature of dispersing fisher, and the continued existence of the native genotype (Service 2017g, p. 68). Although there is inherently some level of uncertainty to any model, we conclude that the potential stressors that the NRM fisher is facing do not place the species in danger of extinction. Therefore, we conclude that the current risk of extinction is low, such that the NRM fisher is not in danger of extinction throughout all of its range, *i.e.,* not an endangered species throughout its range at this time.

To evaluate the status of the species in the future, we considered two overall future scenarios out to 2030, 2060, and 2090. We used these timeframes because the best available science (Olsen et al. 2014, p. 92), used these timeframes to synthesize and project the effects of potential stressors on viability of NRM fisher (Service 2017g, chapter 4.8) in the future. We expect fisher habitat to shift north and east, with widely distributed habitat across its range under both future scenarios (Service 2017g, pp. 65–68). Fishers have good overall dispersal capability and, given that canopy cover is expected to be adequate across much of the NRM, are expected to adapt to habitat shifts in the future (Service 2017g, p. 65). NRM fisher resiliency is expected to be maintained or increase in future scenarios (Service 2017g, pp. 65–67). In terms of redundancy, under both modeled future scenarios, we predict that the NRM fisher modeled habitat will remain or increase in distribution and amount across its range and that redundancy will be in a moderate to high condition (Service 2017g, p. 68). We expect fisher in the NRM to retain their ability to withstand catastrophic events (Service 2017g, p. 68). In terms of representation, in both future scenarios, we predict the NRM fisher will continue to occupy the full extent of its range and ecological settings and will maintain its current level (high) of representation (Service 2017g, p. 68) through 2090.

We conclude that, despite the uncertainties inherent in any modeling of future scenarios, the risk of extinction of the NRM fisher in the foreseeable future is low, such that the NRM fisher is not likely to become an endangered species within the foreseeable future throughout all of its range. Overall, resiliency, redundancy, and representation are expected to be stable or increasing into the future at both scales (100 sq km and 2500 sq km) (Service 2017g, chapters 3.6 and 4.9). Under both future scenarios, and based on our modeled habitats, we expect adequate available habitat distributed across the NRM to support multiple individual home ranges (100 sq km) and MCAs (2500 sq km) to provide resiliency (to tolerate environmental and demographic stochasticity), redundancy (to withstand catastrophic events), and representation (to allow for future adaptive capacity) (Service 2017g, chapter 4.9). Thus, after assessing the best available information, we conclude that the NRM fisher is not in danger of extinction throughout all of its range nor is it likely to become so in the foreseeable future, *i.e.,* not a threatened species throughout its range.

Having determined that the NRM fisher does not meet the definition of a threatened or endangered species throughout all of its range, we next considered whether there are any significant portions of the range where the species is in danger of extinction or is likely to become endangered in the foreseeable future. The SSA Report did not identify any areas of the species' range where stressors are currently having any population-level negative impacts to the NRM fisher (Service 2017g, chapter 3.5). There is no evidence to suggest that climate change, development, forestry, fire, trapping, poisoning, or predation are having population-level impacts to the species either individually or cumulatively with any other potential threats (Service 2017g, chapter 3.5). We conclude there are no concentrations of threats in any portion of the range such that the species could be in danger of extinction now or likely to become so in the foreseeable future in a particular portion (Service 2017h, pp. 26–27). Therefore, no portion warrants further consideration to determine whether the species may be in danger of extinction or likely to become so in the foreseeable future in a significant portion of its range (Service 2017h, pp. 26–27).

We have carefully assessed the best scientific and commercial information available regarding the past, present, and future threats to the NRM fisher. Because the species is neither in danger of extinction now nor likely to become so in the foreseeable future throughout all or any significant portion of its range, the species does not meet the definition of an endangered species or threatened species. Therefore, we find that listing the NRM fisher as an endangered or threatened species under the Act is not warranted at this time. This notice constitutes the Service's 12-month finding on the petition to list the NRM fisher as an endangered or threatened species. A detailed discussion of the basis for this finding can be found in the NRM fisher's Species Assessment and Listing Priority Assignment Form, SSA Report, and other supporting documents (available on the Internet at *http://www.regulations.gov* under Docket No. FWS–R6–ES–2015–0104).

Florida Keys Mole Skink *(Plestiodon egregius egregius)*

Previous Federal Actions

On April 20, 2010, we received a petition from the Center to list 404 aquatic, riparian, and wetland species from the southeastern United States—including the Florida Keys mole skink—as endangered or threatened species under the Act. On September 27, 2011, we published a 90-day finding, which determined that the petition contained substantial information indicating the Florida Keys mole skink may warrant listing, and initiated a status review for the subspecies (76 FR 59836). As a result of the Service's 2013 settlement agreement with the Center, the Service is required to submit a 12-month finding to the **Federal Register** by September 30, 2017. This notice satisfies the requirements of that settlement agreement for the Florida Keys mole skink and constitutes the Service's 12-month finding on the April 20, 2010, petition to list the Florida Keys mole skink as an endangered or threatened species.

Background

The Florida Keys mole skink is one of five distinct subspecies of mole skinks, all in the genus *Plestiodon* (previously referred to as *Eumeces*) (Brandley *et al.* 2005, pp. 387–388). The Florida Keys mole skink is isolated from the mainland and limited to islands of the Florida Keys. This subspecies is a slender, small, brownish lizard with smooth scales, two to four pairs of light stripes, and a brilliantly colored tail. This subspecies is semi-fossorial (adapted to digging and living underground) and cryptic in nature, but has also been seen running along the substrate surface when exposed. Adults reach a total length of approximately 13 cm (5 in) (Florida Natural Areas Inventory 2001, p. 1).

Historically, the Florida Keys mole skink has been found in low numbers across the range from Key Largo to Dry Tortugas (north to south). Current surveys documented the subspecies from Long Key southwest to the Marquesas Keys, but no current records have been documented as far west as the Dry Tortugas or in the Upper Keys in the Key Largo area. The Florida Keys mole skink occurs in the beach berm (50 to 80 cm [20 to 31 in] above sea level) and coastal hammock habitats and relies on dry, unconsolidated soils for movement, cover, and nesting. The dry, unconsolidated soils allow for the Florida Keys mole skink to dig nest cavities. Because of the predominantly limestone, prehistoric coral reef, and rocky composition of the Florida Keys, only a few areas [137 to 191 ha (340 to 472 ac)] provide the suitable soils needed for Florida Keys mole skink nesting. This subspecies needs detritus, leaves, wrack, and other ground cover over loose substrate as cover and to locate the insects that serve as a food source. These ground cover and substrate conditions also provide reproductive and thermoregulatory refugia.

The Florida Keys mole skink subspecies was listed as a threatened species by the State of Florida in 1974 under the Florida Endangered and Threatened Species Act but was changed to a species of concern in 1978. In 2010, after a subspecies status review, the Florida Fish and Wildlife Conservation Commission (FWC) determined the Florida Keys mole skink warranted listing as a State-designated threatened species. Under the Florida Endangered and Threatened Species Act, "threatened species" means "any species of fish and wildlife naturally occurring in Florida which may not be in immediate danger of extinction, but which exists in such small populations as to become endangered if it is subjected to increased stress as a result of further modification of its environment." The FWC uses a system to rank and evaluate species and subspecies according to biological vulnerability. If the species or subspecies meets at least one of the criteria for listing as a State-designated Threatened species based on International Union for Conservation of Nature (IUCN) guidelines and criteria in Rule 68A–27.001, F.A.C., then the FWC makes a determination whether listing a species or subspecies is warranted. The criteria in the *Guidelines for Using the IUCN Red List Categories and Criteria (Version 13)* are (A) population size reduction, (B) geographic range size, (C) population size and trend, (D) population very small or restricted, and (E) quantitative analysis of extinction risk (IUCN 2017, p. 15). The FWC justified the listing as a State-designated Threatened species for the Florida Keys mole skink based on criterion D, which is met when a population has a very restricted area of occupancy (estimated at 20.3 sq km) (7.8 sq mi) of potential habitat) such that it is prone to the effects of human activities or stochastic events within a short time period in an uncertain future (FWC 2011, pp. 10, 14). In 2013, a Florida Keys mole skink State Action Plan was developed with the goal of improving the conservation status of the Florida Keys mole skink to the point at which the subspecies is secure within its historical range (FWC 2013).

Summary of Status Review

In completing our status review for the Florida Keys mole skink, we reviewed the best available scientific and commercial information and compiled the information in the Species Status Assessment Report (SSA Report) (Service 2017i) for the Florida Keys mole skink. We evaluated all known potential impacts to the Florida Keys mole skink, including the Act's five threat factors. This evaluation included information from all sources, including Federal, State, academic, and private entities, and the public.

Historical observations documented the Florida Keys mole skink from Key Largo, Plantation Key, Upper Matecumbe Key, Indian Key, Long Key, Grassy Key, Boot Key, Key Vaca, Saddlebunch, West Summerland Key, Sawyer Key, Bahia Honda, Big Pine Key, Boca Chica, Middle Torch Key, East Rockland Key, Stock Island, Key West, Mooney Harbor (Marquesas), and Dry Tortugas (north to south) (Florida Museum of Natural History 2011; Florida Natural Areas Inventory 2011; Mays and Enge 2016, entire; Mount 1965, p. 208). Currently, no population estimates exist for the subspecies; however, recent (2014–present) targeted and opportunistic surveys for the Florida Keys mole skink have documented 127 records from Long Key to Marquesas (north to south) (Emerick and FWC 2017; Mays and Enge 2016, entire). Of these, 104 observations or captures have been documented during targeted surveys at one location, the Long Beach site on Big Pine Key. An approximate 1:1 ratio of male to female was observed although the sex was undeterminable for 40 percent of the Long Beach captures. A second location, Ohio Key, has existing suitable habitat; however, targeted searches by Service staff have yielded zero observations at this location. From November 2016 to January 2017, opportunistic searches at 10 locations yielded 8 skinks from 4 additional locations: Long Key, Content Key, Cook Island, and Big Munson Key.

Preliminary genetic research on the five *Plestiodon egregius* subspecies has recently identified at least four genetically distinct populations within the Florida Keys mole skink subspecies (Parkinson *et al.* 2016). These preliminary findings should be taken with caution as the study used small sample sizes from a limited number of locations, and additional samples collected from other Keys are still to be processed. We did not explore the possibility of these genetically distinct populations as qualifying as distinct population segments under the Act, because we were not petitioned to do so. The preliminary genetic evidence suggests that little to no breeding is taking place between the four genetically distinct populations, suggesting that the structure of the subspecies is that of discrete, minimally to non-interbreeding populations (Parkinson *et al.* 2016). It is likely that some level of stochastic passive dispersal of individuals, primarily via rafting (carried by floating debris and seaweed wrack), is occurring, but the degree of success for the Florida Keys mole skink in establishing new populations on unoccupied islands is uncertain (Branch *et al.* 2003, p. 207; Adler *et al.* 1995, pp. 535–537).

The Florida Keys mole skink has limited genetic and environmental variation (subspecies representation) within the Keys, and there is no behavioral or morphological variation within the subspecies. Despite the subspecies' occurrence across many Keys (subspecies redundancy), there are gaps in the data on the subspecies' actual range-wide distribution and abundance. Based on preliminary research, there are four genetically distinct populations and additional individuals (not yet identified into populations) occurring across separate Keys; however, little information exists on the abundance or growth rate of these populations (population resiliency).The largest and most consistently surveyed area, Long Beach on Big Pine Key, indicates that all life stages, including breeding and nesting, are occurring in this area.

The primary stressors affecting the current and future condition of the Florida Keys mole skink are sea-level rise; climate-change-associated shifts in rainfall, temperature, and storm intensities; and human development. These stressors account for indirect and direct effects at some level to all life stages and the habitat and soils across the subspecies' range. The beach berm and coastal hammock habitat upon which the subspecies relies for food, nesting, and shelter are susceptible to flooding, inundation, and saltwater intrusion from sea-level rise and climate-change-associated factors. We geospatially assessed potentially available suitable habitat (beach berm and coastal hammock) for the Florida Keys mole skink, and the current total acreage of available suitable habitat in the Florida Keys from Key Largo to the Dry Tortugas is approximately 3,700 ha (9,100 ac). In addition, we assessed potentially available suitable dry, unconsolidated soils (Bahia fine sand, beach, and unconsolidated soils) from Monroe County Soil maps for this same range with some overlap of the suitable habitat identified, and the current suitable soils total approximately 138 to 191 ha (340 to 472 ac) and mainly occur on six of the Keys in Monroe County: Lower Matecumbe, Long Key, Boot Key, Bahia Honda, Big Pine, and Key West (Monroe County 2016). There are small patches of unconsolidated soils that occur intermixed within other habitats across the islands, primarily in the coastal hammock. The long-term trend in sea-level rise at the National Oceanic and Atmospheric Administration (NOAA) Key West Station shows a 2.4 mm (0.09 in) increase of the mean high water line per year from 1913 to 2015, and the NOAA Vaca Key Station shows a 35 mm (0.14 in) increase per year from 1971 to 2015 (NOAA 2017a).

Our analyses include consideration of ongoing and projected changes in climate within the next 83 years. We analyzed suitable habitats (beach berm and coastal hammock) and soils (beach sand and Bahia fine sand) across the range of the Florida Keys mole skink to predict inundation from three regional climate-change sea-level rise projections at 2040, 2060, and 2100. However, foreseeable future for this subspecies was determined to be a 30–40-year timeframe. This determination considered the biology of the subspecies, the stressors identified, and the consistency in the sea-level rise projections to 2060. This includes the expectation that sea-level rise will increase over time, but there is also uncertainty about how the Florida Keys mole skink will respond and how suitable habitats may transition. The generation time of the Florida Keys mole skink is typically 3 to 4 years, so the foreseeable future range of 30–40 years encompasses 10–13 generations, which allows sufficient time for any population-level response to stressors to be detected. Although our analyses predicted inundation out to 2100, we did not extend our foreseeable future beyond 30–40 years due to too much uncertainty in the projections that far out and the divergence among the Low, Medium, and High sea-level rise projections beyond 2060.

Based on this range-wide geospatial analysis, we projected that by 2040 the subspecies could experience the loss of 2 to 17 percent of its suitable habitat rangewide (a loss of 81 to 631 ha (200 to 1,559 ac)) of the 3,669 ha (9,066 ac) of suitable habitat estimated to be available currently. By 2040, suitable soils are projected to decline by 19 to 37 percent (30 to 58 ha (74 to 143 ac)) of the 155 ha (383 ac) of suitable soils estimated to be available currently. Under 2060 projections, the amount of suitable habitat and soils loss is expected to be 4 to 44 percent and 25 to 50 percent, respectively. The sea-level-rise projections predict inundation only and do not model the complex set of shifts that are anticipated to be triggered over time as the effects of sea-level rise are experienced.

Overall, the Florida Keys mole skink may experience reductions in population resiliency, subspecies redundancy, and subspecies representation due to sea-level rise and climate-change-associated factors. However, although we expect some habitat loss and inundation across the range of the Florida Keys mole skink, the best scientific and commercial data available indicate that 56 to 98 percent of the suitable habitat and 50 to 81 percent of the suitable soils will remain into the foreseeable future.

Finding

Based on our review of the best available scientific and commercial information pertaining to the five factors, as well as the continued presence of adequate resources to meet the subspecies' needs, we find that the stressors acting on the subspecies and its habitat, either singly or in combination, are not of sufficient imminence, intensity, or magnitude to indicate that the Florida Keys mole skink is in danger of extinction (an endangered species), or likely to become endangered within the foreseeable future (a threatened species), throughout all of its range.

The main stressors that may affect Florida Keys mole skink resiliency are sea-level rise, climate-change-associated factors, and development (all under Factor A). The Florida Keys has experienced sea-level rise rates equivalent to the global rate (Service 2017i, p. 5), with no indication that these factors are currently acting on the subspecies. The persistence of occupied habitat (as well as potentially occupied suitable habitat) across the subspecies' range demonstrates resiliency, redundancy, and representation to sustain the subspecies beyond the near term. Continued occurrence of the Florida Keys mole skink across most of the historical range indicates a level of resiliency to the stressors that have been acting upon it in the past and are currently acting on it. Strong rainstorms, tropical storms, and hurricanes are all natural parts of the tropical Florida Keys ecosystem and may be a contributing factor to the low historical and current observation data for the subspecies. Since the subspecies has persisted on multiple Keys with human development and activities over time, it is likely that development will not be a driving stressor on the future viability of the Florida Keys mole skink. Over time, the subspecies has persisted on different Keys providing a level of redundancy, which may help the Florida Keys mole skink withstand the increased potential for catastrophic events into the future. Finally, the subspecies should continue to exhibit a level of representation with suitable habitat and soils continuing to occur in multiple Keys across the range of the subspecies.

As mentioned above, the FWC determined the Florida Keys mole skink met the criterion D as a very restricted population and, therefore, listed the Florida Keys mole skink as a State-designated Threatened species in 2010. While the Florida Keys mole skink meets at least one criterion of a State-designated Threatened species under the Florida Endangered and Threatened Species Act, in our analysis under the Federal Endangered Species Act, we find that the continued presence of occupied habitat (as well as potentially occupied suitable habitat) across most of the subspecies' range continues to provide a level of resiliency, redundancy, and representation to the subspecies in the near term and within the foreseeable future. Therefore, we conclude the Florida Keys mole skink is likely to remain at a sufficiently low risk of extinction and will not become in danger of extinction in the foreseeable future and, thus, does not meet the definition of an endangered species or threatened species under the Act.

We evaluated the current range of the Florida Keys mole skink to determine if there are any apparent geographic concentrations of potential threats to the subspecies. The risk factors that occur throughout the Florida Keys mole skink's range include sea-level rise; climate-change-associated shifts in rainfall, temperature, and storm intensities; and human development. We did not find that there was a concentration of threats in a particular area that would cause the subspecies to be in danger of extinction or likely to become so in the foreseeable future throughout any portion of its range. Therefore, we find that listing the Florida Keys mole skink as a threatened or an endangered species is not warranted in a significant portion of its range. A detailed discussion of the basis for this finding can be found in the Florida Keys mole skink species-specific assessment form and other supporting documents (available on the Internet at *http://www.regulations.gov* under Docket No. FWS–R4–ES–2017–0067).

Great Sand Dunes Tiger Beetle (*Cicindela theatina*)

Previous Federal Actions

As part of a multispecies petition in 2007, Guardians (which at the time was called ''Forest Guardians'') petitioned the Service to list the Great Sand Dunes tiger beetle (referred to in the petition as the ''Colorado tiger beetle,'' an older common name for the species). The petition requested that we evaluate all full species in our Southwest Region (where the Great Sand Dunes tiger beetle was erroneously thought to occur) ranked as G1 or G2 by the organization NatureServe, and list each species under the Act as either endangered or threatened with critical habitat. In 2009, we published a 90-day finding, in which we concluded that the petition presented substantial information that listing the Great Sand Dunes tiger beetle may be warranted (74 FR 66866, December 16, 2009).

Background

The Great Sand Dunes tiger beetle is a medium-sized tiger beetle in the family Cicindelidae. The species occurs only in the Great Sand Dunes geological feature in southern Colorado. The life history of the Great Sand Dunes tiger beetle is closely tied to the sand dunes for all stages of the species' life cycle, including feeding, sheltering, and reproducing (Service 2017j, p. 13). Suitable habitat is considered to include active dunes, which may include sandy blowouts and shifting sands, with a vegetative cover between 0.20 to 15 percent cover (Service 2017j, p. 13).

Three types of dune provinces, or areas, are present within the Great Sand Dunes complex—the main sand dune mass, sand sheet dunes, and playa lakes dunes. All three types provide suitable habitat for the Great Sand Dunes tiger beetle (Service 2017j, p. 8). The current estimated area of suitable habitat is approximately 12,770 ac (5,168 ha), which consists of a combination of areas of verified occupied habitat and areas of likely suitable habitat, based on sand and vegetation conditions (Service

2017j, p. 8). There is neither a precise population estimate nor population monitoring data for the species.

Summary of Status Review

We completed a Species Status Assessment (SSA) Report for the Great Sand Dunes tiger beetle (Service 2017j, entire), which provides the results of the Service's comprehensive biological status review for the Great Sand Dunes tiger beetle, and provides a thorough account of the species' overall viability and, therefore, risk of extinction. To evaluate the biological status of the Great Sand Dunes tiger beetle, the SSA Report assesses a range of conditions, both current and into the future, to allow us to consider the species' resiliency, redundancy, and representation as proxies for evaluating overall viability. The Great Sand Dunes tiger beetle needs multiple self-sustaining subpopulations (redundancy) that are both widely distributed (representation) and connected across its range to maintain its viability into the future and to avoid extinction (Service 2017j, p. 22). A number of factors influence whether the Great Sand Dunes tiger beetle will maintain large and stable subpopulations, which increases the resiliency of a population to stochastic events. These factors include (1) a relatively stable dune system maintained by a complex combination of hydrologic and wind conditions, (2) relatively undisturbed dunes, (3) the presence of suitable vegetation cover on the dunes (0.2 to 15 percent cover), and (4) connectivity between the sub-populations (Service 2017j, p. 19).

The SSA Report evaluates the Great Sand Dunes tiger beetle's subpopulations, and what is negatively and positively affecting those subpopulations, within the three dune provinces present at the Great Sand Dunes complex. The species is currently distributed across most of the known geographic extent of its range, including all three dune areas (Service 2017j, p. 27). The most significant potential stressor to the Great Sand Dunes tiger beetle would be the potential future loss of dune habitats that individuals need to complete their life cycle. Surface disturbances within areas of suitable habitat can result in loss of habitat and injury or mortality of individuals. Historical and current surface disturbances in areas of suitable habitat are estimated to be low, representing less than 5 percent of the suitable habitat (Service 2017j, pp. 29–32). Field observation data from 2000 to 2016 indicate a continued occupancy of the dunes by the Great Sand Dunes tiger beetle (Service 2017j, p. 28).

The SSA found that the Great Sand Dunes tiger beetle population is currently experiencing relatively stable dunes and minimal surface disturbances due to land management under the National Park System, The Nature Conservancy, and the Service's National Wildlife Refuge Program. Relative stability of the dune system is maintained by the existing hydrologic and wind conditions within the San Luis Valley. Hydrologic conditions in this area are further protected by the Great Sand Dunes Act of 2000 that maintains the surface and ground water rights at the Park.

To assess the status of the species in the foreseeable future, the SSA Report forecasted future conditions for the Great Sand Dunes tiger beetle in terms of resiliency, redundancy, and representation under five plausible future scenarios for the years 2050 and 2100. We chose these years because they correspond to time periods that have been evaluated by the National Park Service and are within the range of the available hydrological and climate change model forecasts by the National Park Service (see Service 2017j, Appendix B). Additionally, because of the short generation time (3 years) of the Great Sand Dunes tiger beetle (Pineda 2002, p. 57), the year 2050 (33 years from now) and the year 2100 (83 years from now) encompass approximately 10 and 30 generations, which is a relatively long time in which to observe effects to the species. Climate change models forecast warmer temperatures, but there is uncertainty regarding whether precipitation will increase or decrease within the range of the Great Sand Dunes tiger beetle, although the overall trend is expected to be increased aridity due to warming temperatures. Our scenarios accounted for the uncertainty regarding future precipitation by including both possible precipitation conditions, as well as a range of levels of future surface disturbances of tiger beetle habitat (Service 2017j, pp. 36–49). Under all five scenarios we expect the subpopulations of Great Sand Dunes tiger beetle to continue to occupy at least the two largest, if not all three, of the dune areas. We anticipate that the future persistence of the Great Sand Dunes tiger beetle will be provided by the continued maintenance of the relatively undisturbed and relatively stable dune system at the Great Sand Dunes.

Finding

In making this finding, we reviewed the best available scientific and commercial information pertaining to the Great Sand Dunes tiger beetle, as summarized in the SSA Report, corresponding to the Act's five threat factors, and we applied the standards within the Act, its implementing regulations, and Service policies.

Because this species occupies the majority of its historical range, with evidence of continued occupancy and very limited impact from stressors across all three dune provinces, we find that the species has a very low risk of extirpation due to stochastic or catastrophic events that could plausibly occur in the future and that, due to these conditions, the species retains adaptive capacity. Therefore, we conclude that the current risk of extinction is low, such that the Great Sand Dunes tiger beetle is not in danger of extinction throughout all of its range.

In addition, because we project continued occupancy and very limited impact from stressors across nearly all of the species' suitable habitat under all five future scenarios, we find that the species has a low future risk of extinction due to stochastic or catastrophic events that could plausibly occur in the future and that, due to these conditions, the species is expected to retain most of its adaptive capacity. Therefore, we conclude that the risk of extinction in the foreseeable future is low, such that the Great Sand Dunes tiger beetle is not likely to become an endangered species within the foreseeable future throughout all of its range.

Having determined that the Great Sand Dunes tiger beetle does not meet the definition of a threatened species or an endangered species, we next considered whether there are any significant portions of the range where the species is in danger of extinction or is likely to become endangered in the foreseeable future. The best available information indicates that the Great Sand Dunes tiger beetle habitat in the playa lakes dunes may have greater vulnerability to potential future stressors. We therefore evaluated whether the playa lakes dunes could be considered ''significant.'' The playa lake dunes provide only 0.67 percent of the total Great Sand Dunes tiger beetle habitat. If all of the Great Sand Dunes tiger beetles within the playa lake dunes were to hypothetically be extirpated, the species would lose a very small amount of representation and redundancy. However, the loss of this portion of the species' range would still leave sufficient resiliency, redundancy, and representation in the remainder of the species' range such that it would not be expected to increase the vulnerability of the entire species to extinction.

We have carefully assessed the best scientific and commercial information available regarding the past, present, and future threats to the Great Sand Dunes tiger beetle. Because the species is neither in danger of extinction now nor likely to become so in the foreseeable future throughout all or any significant portion of its range, the species does not meet the definition of an endangered species or threatened species. Therefore, we find that listing the Great Sand Dunes tiger beetle as an endangered or threatened species under the Act is not warranted at this time. A detailed discussion of the basis for this finding on the 2007 petition to list the Great Sand Dunes tiger beetle as an endangered or threatened species can be found in the Great Sand Dunes tiger beetle's Species Assessment and Listing Priority Assignment Form, SSA Report, and other supporting documents (available on the Internet at *http://www.regulations.gov* under Docket No. FWS–R6–ES–2017–0068).

Kirtland's Snake (*Clonophis kirtlandii*)

Previous Federal Actions

We first identified the Kirtland's snake as a candidate for listing under the Act in 1982 (47 FR 58454; December 30, 1982) as a category 2 species. At that time, a category 2 candidate species was any species for which information in the possession of the Service indicated that proposing to list as endangered or threatened was possibly appropriate, but for which persuasive data on biological vulnerability and threat were not currently available to support a proposed rule to list as an endangered or threatened species. The species remained a category 2 candidate in subsequent Candidate Notices of Review (50 FR 37958, September 18, 1985; 54 FR 554, January 6, 1989; 56 FR 58804, November 21, 1991; 59 FR 58982, November 15, 1994). In 1996 (61 FR 7596, February 28, 1996), we discontinued recognition of category 2 candidates in favor of maintaining a list that represented only those species for which we have on file sufficient information on biological vulnerability and threats to support a proposal to list as an endangered or threatened species, but for which preparation and publication of a proposal is precluded by higher priority listing actions.

On April 20, 2010, we received a petition, dated April 20, 2010, from the Center, Alabama Rivers Alliance, Clinch Coalition, Dogwood Alliance, Gulf Restoration Network, Tennessee Forests Council, and West Virginia Highlands Conservancy (the Petitioners), requesting that we list 404 aquatic, riparian, and wetland species as threatened or endangered species under the Act, including Kirtland's snake. On September 27, 2011, we published a 90-day finding in the **Federal Register** (76 FR 59836), concluding that the petition presented substantial scientific information indicating that listing the Kirtland's snake may be warranted.

On June 17, 2014, the Center filed a complaint against the Service (1:14–CV–01021) for failure to complete a 12-month finding for the Kirtland's snake in accordance with statutory deadlines. On September 22, 2014, the Service and the Center filed stipulated settlements in the District of Columbia, agreeing that the Service would submit to the **Federal Register** a 12-month finding for the Kirtland's snake no later than September 30, 2017 (*Ctr. for Biological Diversity* v. *Jewell,* case 1:14–CV–01021–EGS).

Background

The Kirtland's snake is a small, non-venomous snake in the water snake subfamily of the constrictor family. The species occurs close to permanent or seasonal water sources, including wetlands, streams, reservoirs, lakes, and ponds. The Kirtland's snake requires moist-soil environments and spends much of its time underground in or near crayfish burrows. When Kirtland's snake is above ground, it is almost always found under natural or artificial cover objects instead of basking or moving through open areas.

The core of the Kirtland's snake's range includes Illinois, Indiana, Michigan, and Ohio. The species has also been found in three counties in Kentucky, three counties in eastern Missouri, and one county in Tennessee. The status of some Kirtland's snake sites in western Pennsylvania is unknown. The species historically occurred in southern Wisconsin.

We currently consider the species to be extant in 60 counties rangewide, with 43 percent of the historical counties having Kirtland's snake documented within the last 15 years. The species may be experiencing some range contraction in the east and northwest, but recent county records in the north and south have extended the range slightly in those directions.

The Kirtland's snake is notoriously difficult to detect, even with focused survey effort, because they are primarily underground. Negative survey data available for most sites are not rigorous enough to document whether the species is extirpated. Of a total of 415 records of the Kirtland's snake, we determined 194 (47 percent) to be extant and 204 (49 percent) are unknown, primarily due to detection difficulties, lack of survey effort, and uncertainty regarding habitat requirements. We determined 17 records (4 percent) are extirpated.

Summary of Status Review

In making this 12-month finding on the petition, we considered and evaluated the best scientific and commercial information available, and evaluated the potential stressors that could be affecting Kirtland's snake populations. This evaluation includes information from all sources, including Federal, State, tribal, academic, and private entities and the public. The Species Status Assessment (SSA) Report (service 2017k, entire) for the Kirtland's snake summarizes and documents the biological information we assembled, reviewed, and analyzed as the basis for our finding.

We evaluated habitat loss and degradation from urbanization and development (Factor A) as a potential threat to the Kirtland's snake. However, we found that the Kirtland's snake occurs at a number of urban and suburban sites in vacant lots, parks, cemeteries, remnant wetlands, neighborhood yards, railroad rights-of-way, and trash dumps. The Kirtland's snake has persisted in these degraded habitats in seemingly high densities for decades and presumably is capable of reproducing in these otherwise marginal areas.

Collection for the pet trade (Factor B) was also cited by the Petitioners as a potential threat. Six States list the Kirtland's snake as threatened or endangered under State laws, most of which regulate possession of listed species. We do not know to what extent illegal collection may still occur, but there are no data indicating that collection is affecting the species.

We also considered road mortality (Factor E) and snake fungal disease (Factor C) as potential threats. Road-killed Kirtland's snakes have been documented at a number of sites, and three Kirtland's snakes have tested positive for snake fungal disease. However, such incidents are scattered and there are no data indicating that road mortality or snake fungal disease affects the species at a population level.

Additionally, we investigated climate change as a potential threat. One modeling effort found that the Kirtland's snake will see greater changes to the climatic suitability in its range relative to other reptiles in the Great Lakes region. However, this study did not address how the Kirtland's snake would respond to any changes in climate (for example, changes in temperature or precipitation patterns). There are no data to indicate how the Kirtland's snake is likely to respond to these changes, and we do not understand the habitat needs of the species or why it occurs or persists where it does so there is no basis on which to conclude that the species will decline as a result of changes to climatic suitability.

Finding

We acknowledge that data regarding actual impacts of these stressors on the species is limited; however, the best available scientific and commercial information does not indicate that any of these stressors is occurring to a degree or magnitude that would result in population- or species-level impacts. While information regarding population abundance is limited, the species continues to be found over a wide area, suggesting that the species has at least some redundancy to guard against catastrophic events. Additionally, the species appears to tolerate a variety of habitat conditions and has persisted in degraded areas for decades and, thus, presumably is capable of reproducing in otherwise marginal areas, indicating the species is at least somewhat resilient. The information available regarding future trends of the stressors or the species' response does not allow us to reliably predict changes to the species' status; however, the best available scientific and commercial information does not indicate that these stressors are likely to result in population- or species-level impacts in the foreseeable future.

Further, we found no portions of the Kirtland's snake's range where these stressors are concentrated or substantially greater than in other portions of its range. Therefore, there would not be any significant portions of the species' range where the species could have a higher level of risk than its status throughout all of its range (*i.e.,* be in danger of extinction or likely to become so in the foreseeable future).

Based on this information about resiliency and redundancy, as articulated in more detail in the underlying SSA Report, combined with a lack of operative threats now or in the future, we conclude that the Kirtland's snake is not in danger of extinction nor is it likely to become so in the foreseeable future throughout all or a significant portion of its range. Therefore, we find that listing the Kirtland's snake as an endangered or threatened species under the Act is not warranted at this time. The Kirtland's Snake SSA Report and other supporting documents provide a detailed discussion supporting the basis for this finding (available on the Internet at *http://www.regulations.gov* under Docket No. FWS–R3–ES–2017–0039).

Pacific Walrus (*Odobenus rosmarus ssp. divergens*)

Previous Federal Actions

On February 8, 2008, we received a petition dated February 7, 2008, from the Center, requesting that the Pacific walrus be listed as endangered or threatened under the Act and that critical habitat be designated. The petition included supporting information regarding the species' ecology and habitat use patterns and predicted changes in sea ice habitats and ocean conditions that may impact the Pacific walrus. We acknowledged receipt of the petition in a letter to the Center, dated April 9, 2008. In that letter, we stated that an emergency listing was not warranted and that all remaining available funds in the listing program for Fiscal Year (FY) 2008 had already been allocated to the Service's highest priority listing actions and that no listing funds were available to evaluate the Pacific walrus petition further in FY 2008.

On December 3, 2008, the Center filed a complaint in U.S. District Court for the District of Alaska for declaratory judgment and injunctive relief, challenging the failure of the Service to make a 90-day finding on their petition to list the Pacific walrus, pursuant to section 4(b)(3) of the Endangered Species Act and the Administrative Procedure Act (5 U.S.C. 706(1)). On May 18, 2009, a settlement agreement was approved in the case of *Center for Biological Diversity* v. *U.S. Fish and Wildlife Service, et al.* (3:08–cv–00265–JWS), requiring us to submit our 90-day finding on the petition to the **Federal Register** by September 10, 2009. On September 10, 2009, we made our 90-day finding that the petition presented substantial scientific information indicating that listing the Pacific walrus may be warranted (74 FR 46548). On August 30, 2010, the Court approved an amended settlement agreement requiring us to submit our 12-month finding to the **Federal Register** by January 31, 2011. On February 10, 2011, we published a 12-month petition finding that listing the Pacific walrus as an endangered or threatened species was warranted; however, listing the Pacific walrus was precluded by higher priority actions to amend the Lists of Endangered and Threatened Wildlife and Plants (76 FR 7634). We added the Pacific walrus to the candidate list and assigned it a Listing Priority Number LPN of 9, based on the moderate magnitude and imminence of threats. The Pacific walrus was included in all of our subsequent annual candidate notices of review (76 FR 66370, October 26, 2011; 77 FR 69994, November 21, 2012; 78 FR 70104; November 22, 2013; 79 FR 72450, December 5, 2014; 80 FR 80584, December 24, 2015; 81 FR 87246, December 2, 2016).

On September 9, 2011, the Service entered into two settlement agreements with Guardians and the Center regarding species on the candidate list at that time (Endangered Species Act Section 4 Deadline Litigation, No. 10–377 (EGS), MDL Docket No. 2165 (D.D.C. May 10, 2011)). The settlement agreement with the Center included a deadline to submit a proposed rule or not-warranted finding to the **Federal Register** for the Pacific walrus by September 30, 2017. This publication fulfills the requirement of the settlement agreement for the Pacific walrus.

Background

The Pacific walrus is one of the largest extant pinnipeds (fin or flipper-footed marine mammals) in the world. The Pacific walrus is identified and managed as a single panmictic population (a population with random mating). The subspecies ranges across the shallow continental shelf waters of the Bering and Chukchi Seas, occasionally moving into the East Siberian Sea and Beaufort Sea. Pacific walruses are highly mobile, and their distribution varies markedly in response to seasonal and interannual variations in sea-ice cover. Pacific walruses undertake seasonal migrations between the Bering and Chukchi Seas and primarily rely on broken pack ice habitat to access offshore breeding and feeding areas.

Most Pacific walruses spend the winter in the Bering Sea. As the Bering Sea ice deteriorates in the spring, adult females, juveniles, and some adult males migrate northward to summer feeding areas over the continental shelf in the Chukchi Sea, where sea ice has historically remained throughout the year. Calves are born each spring during the northward migration. Thousands of adult male Pacific walruses remain in the Bering Sea year round, where they forage from coastal haulouts during ice-free periods. In late September and October, walruses that summered in the Chukchi Sea typically begin moving south in advance of the developing sea ice.

The size of the Pacific walrus population is uncertain. Preliminary survey results from a mark-recapture survey undertaken by the Service estimate a total population size of 283,213 Pacific walruses with a 95 percent credible interval of 93,000 to 478,975 individuals (Beatty 2017). However, this abundance estimate should be interpreted with extreme caution due to the preliminary nature of the estimate and the low precision estimates in the model.

Summary of Status Review

In making this 12-month finding, we considered and evaluated the best scientific and commercial information available, and evaluated the potential stressors that could be affecting the Pacific walrus. This evaluation includes information from all available sources, including Federal and State entities, Alaska natives, academics, private entities, and the public. The Species Status Assessment Report (SSA Report) (Service 2017l) for the Pacific walrus summarizes and documents the biological information we assembled, reviewed, and analyzed to inform our finding.

We reviewed the potential stressors that could be affecting the Pacific walrus and assessed the viability of the Pacific walrus through an assessment of the resiliency, representation, and redundancy of the Pacific walrus population. Owing to the relatively wide geographic range of the subspecies, individual walruses may be impacted by a variety of stressors; however, concerns about the walrus' status as a whole revolve primarily around the following stressors associated with the effects of climate change: (1) Loss of sea ice; (2) ocean warming; and (3) ocean acidification. We reviewed the following additional stressors in the SSA Report (Service 2017l): Harvest; disease and parasites; predation; contaminants and biotoxins; oil and gas exploration, development, and production; commercial fisheries; and ship and air traffic. Although we acknowledge that these additional stressors may be affecting individual Pacific walruses, the best available information does not show that these activities or stressors are having an impact at the population level; further discussion can be found in the SSA Report (Service 2017l, entire).

We found that the Pacific walrus population appears to possess degrees of resiliency, representation, and redundancy that have allowed it to cope with the changing environments of the last decade. Although changes in resiliency, representation, and redundancy of the subspecies during this time would be difficult to detect for a species with a 15-year generational timeframe, few malnourished or diseased animals are observed, and reproduction is higher than in the 1970s–1980s, when the population was thought to have reached carrying capacity and subsequently declined. Consequently, the current prey base of Pacific walruses appears adequate to meet the energetic and physiological demands of the population. Survival rates are higher than in the 1970s–1980s, and harvest levels have also decreased. These observations mirror those of Alaskan Native hunters, who assert that the population is large and stable; that Pacific walruses are intelligent, adaptable, and able to make the necessary adjustments needed to persist; and that Pacific walruses are not being negatively impacted in a significant way at this time.

In considering the future as it relates to the status of the Pacific walrus, we considered the stressors acting on the species and looked to see if reliable predictions about the status of the species in response to those stressors could be drawn. We considered how far into the future we could reliably predict the extent to which threats might affect the status of the species, recognizing that our ability to make reliable predictions into the future is limited by the variable quantity and quality of the available data about impacts to the Pacific walrus and the response of the Pacific walrus to those impacts.

For the Pacific walrus, the most significant risk factor looking into the future is the effects of climate change (sea-ice loss). While we have high certainty that sea-ice availability will decline as a result of climate change, we have less certainty, particularly further into the future, about the magnitude of effect that climate change will have on the full suite of environmental conditions (*e.g.,* benthic productivity) or how the species will respond to those changes. We find that beyond 2060 the conclusions concerning the impacts of the effects of climate change on the Pacific walrus population are based on speculation, rather than reliable prediction.

Our habitat analysis predicts that shifts in both seasonal distribution and availability of sea-ice habitat will occur across the range of the Pacific walrus. For example, we found that, across seasons and time, ice-accessible habitat will shift northward with the loss of pack ice in the northern areas of the subspecies' range, exposing more land-accessible habitat, especially in the Bering Sea. In winter, we project that ice-accessible habitat will shift from the central Bering Sea in 2015 to the Bering Strait, straddling the southern Chukchi and northern Bering Seas, in 2060. We detected large variations in the trajectories of potential habitat for the Pacific walrus across the Bering Sea and Chukchi Sea area. For example, our results demonstrate increases in potential habitat in spring and winter for both the U.S. and Russia Chukchi Sea areas, yet potential habitat declined dramatically in these areas in summer. Conversely, we predicted notable declines in potential habitat in spring and winter and a stable trajectory in summer. In all seasons, potential habitat in the Russia Bering Sea area varied little.

We relied on monthly projections of sea-ice extent from a 13-model ensemble of the most-recent Global Circulation Models and three Representative Concentration Pathways (RCP) to assess the response of Pacific walruses to changes in the number of ice-free months over time. Pacific walruses currently use sea ice for courtship and breeding from December to March with a core period occurring from January to February. In addition, Pacific walruses currently use sea ice for birthing in the spring from April to June with a core birthing period occurring in May. Furthermore, calves nurse on the sea ice exclusively for 2–4 weeks after birth, and this critical period in post-natal care occurs in May and June. Given our prediction that the areas where the Pacific walruses' occur will, in combination, provide sufficient sea ice to meet the species' breeding, birthing, and denning needs, we found that Pacific walruses habitat needs will be met during the core breeding and birthing portions of the annual cycle under all RCP scenarios out to 2060.

Although Pacific walruses prefer sea ice habitat, they also use land habitat during the summer and fall, but likely not without tradeoffs related to energetic costs and other risks of using coastal haulouts (*e.g.,* trampling events, predation, and disease). Nonetheless, if land habitat proves to be comparable in quality to ice habitat, including access to foraging sites, then it is likely that their habitat needs will be met. If land habitat is inferior to ice habitat for Pacific walruses in summer and fall, then survival and recruitment of Pacific walruses will likely decline and population-level effects would occur. However, while it is likely that the increased use of land habitat will have some negative effects on the population, the magnitude of effect is uncertain given the demonstrated ability of Pacific walruses to change their behavior or adapt to greater use of land.

In our assessment of the Pacific walrus, we considered the future impacts of stressors such as shipping and oil and gas development, along with changes in potential suitable habitat, on the viability of the Pacific walrus population. As previously discussed, we find that beyond 2060 the conclusions concerning the impacts of the effects of climate change and other stressors on the Pacific walrus population are based on speculation, rather than reliable prediction. Therefore, while we included projections out to 2100 in our analysis, we considered 2060 as the foreseeable future timeframe for this analysis. Due to future changes in suitable habitat, coupled with the impacts of the other stressors, we expect that the Pacific walrus's viability will be characterized by lower levels of resiliency and redundancy in the future, but we do not have reliable information showing that the magnitude of this change could be sufficient to put the subspecies in danger of extinction in the foreseeable future. In addition, we expect that representation will remain relatively unchanged.

We evaluated the current range of the Pacific walrus to determine if there is any apparent geographic concentration of potential threats to the taxon. We examined potential threats from loss of sea ice, ocean warming, ocean acidification, energetics, change in habitat use patterns, harvest, disease and parasites, predation, contaminants and biotoxins, oil and gas exploration, development and production, commercial fisheries, and ship and air traffic. We found no portions of its range where potential threats are significantly concentrated or substantially greater than in other portions of its range, and that there was no higher concentration of threats in the Chukchi or the Bering Seas. We did not identify any portions where the species may be in danger of extinction or likely to become so in the foreseeable future. Therefore, no portions warrant further consideration to determine whether the species may be in danger of extinction or likely to become so in the foreseeable future in a significant portion of its range.

Finding

Our review of the best scientific and commercial information available indicates that the threats affecting the Pacific walrus are not, singly or in combination, of sufficient imminence, intensity, or magnitude that the species is in danger of extinction or is likely to become endangered in the foreseeable future throughout all or a significant portion of its range. We conclude that, while the Pacific walrus will experience a future reduction in availability of sea ice, resulting in reduced resiliency and redundancy, we are unable to reliably predict the magnitude of the effect and the behavioral response of the Pacific walrus to this change, and we therefore do not have reliable information showing that the magnitude of this change could be sufficient to put the subspecies in danger of extinction now or in the foreseeable future. At this time, sufficient resources remain to meet the subspecies' physical and ecological needs now and into the future. Therefore, we find that listing the Pacific walrus as an endangered or threatened species under the Act is not warranted at this time. A detailed discussion of the basis for this finding can be found in the Pacific walrus species-specific assessment form and other supporting documents (available on the Internet at *http://www.regulations.gov* under Docket No. FWS–R7–ES–2017–0069).

San Felipe Gambusia (*Gambusia clarkhubbsi*)

Previous Federal Actions

On June 13, 2005, we received a petition, dated June 10, 2005, from Save Our Springs Alliance requesting that the San Felipe gambusia be listed as an endangered species under the Act. The West Texas Springs Alliance was also listed as a petitioner. On February 13, 2007, we published a 90-day finding (72 FR 6703) in the **Federal Register** that the 2005 petition from Save Our Springs Alliance did not present substantial information indicating that listing may be warranted.

On June 18, 2007, Guardians (which at the time was called ''Forest Guardians'') petitioned the Service to list 475 species in the southwestern United States as endangered or threatened under the Act, including the San Felipe gambusia. On December 16, 2009, the Service published in the **Federal Register** a partial 90-day finding (74 FR 66866) for 192 of the 475 species raised in Guardians' 2007 petition, including the San Felipe gambusia. In that finding, the Service found the 2007 petition presented substantial scientific or commercial information indicating that listing the San Felipe gambusia may be warranted. This 12-month finding satisfies the statutory requirement of section 4(b)(3)(B) of the Act that the Service determine whether or not the San Felipe gambusia warrants listing.

Background

The San Felipe gambusia is a small fish in the family Poeciliidae (order Cyprinodontiformes). It was first discovered in 1997 and described by Dr. Gary Garrett and Dr. Robert Edwards (2003, pp. 783–788) as a species distinct from other gambusia species, including its closest believed relative, the spotfin gambusia (*Gambusia krumholzi*). Garrett and Edwards identified the San Felipe gambusia as a new species only known to occur from San Felipe Creek in Val Verde County, Texas. This distinction between the San Felipe gambusia and spotfin gambusia was based on morphological characteristics, primarily body pigmentation and aspects of the male gonopodium (modified anal fin that allows male fish of the families Anablepidae and Poeciliidae to briefly hook into the vent of a female fish to deposit sperm; Garrett and Edwards 2003, p. 783).

Summary of Status Review

We have evaluated the best scientific and commercial information available, and based on that information we find that the San Felipe gambusia is not a distinct species, but rather the same species as the spotfin gambusia (*Gambusia krumholzi*). This section summarizes the information upon which we base this finding. The best available and most current scientific information indicates that the San Felipe gambusia is a junior synonym of the spotfin gambusia. In this context, a ''junior synonym'' refers to different scientific names for the same species, where the later name given is considered junior. The Service is not considering the spotfin gambusia for listing action at this time.

Echelle *et al.* (2013, p. 72), including as co-authors Dr. Gary Garrett and Dr. Robert Edwards, who first identified San Felipe gambusia as a new species, described the genetic structure and species-level taxonomy of three gambusia species: San Felipe gambusia, spotfin gambusia, and Tex-Mex gambusia (*Gambusia speciosa*). Echelle also reevaluated the morphological characteristics of the San Felipe gambusia and the spotfin gambusia. Echelle's work was published in *Copeia,* a peer-reviewed scientific journal published by The American Society of Ichthyologists and Herpetologists. The American Society of Ichthyologists and Herpetologists, in conjunction with the American Fisheries Society, is recognized as an authority in establishing the taxonomic status of fish.

Echelle *et al.*'s, (2013, p. 77) study assessed variation in mitochondrial DNA and six nuclear microsatellite loci of the San Felipe gambusia and the spotfin gambusia. None of the six microsatellite loci showed fixed differences between the populations of San Felipe gambusia and spotfin gambusia (Echelle *et al.* 2013, p. 77). In other words, this genetic analysis did not find statistically significant differences between San Felipe gambusia and spotfin gambusia to indicate that they were separate species. Additionally, morphological characteristics that Garrett and Edwards (2003, pp. 738–786) had originally used to describe the San Felipe gambusia were generally subtle, and reevaluation of these characteristics showed no statistically significant variance associated with species-level taxonomy (Echelle *et al.* 2013, p. 77). In other words, in the more recent peer-reviewed evaluation, the body characteristics that had been identified as potentially distinguishing between the San Felipe gambusia and the spotfin gambusia revealed no statistically significant differences to indicate that they were separate species. The only exception to this was degree of body crosshatching in males, which differed in direction, as noted by Garrett and Edwards (2003, p. 785). However, there was broad overlap in crosshatching pattern between the San Felipe gambusia and spotfin gambusia, and the difference was not detected in females (Echelle *et al.* 2013, p. 77). Based on the results of the genetics work and morphological reassessment, Echelle *et al.* (2013, entire) found that the San Felipe gambusia is not a new species, but is a junior synonym of (*i.e.,* the same species as) the more widespread spotfin gambusia, endemic to river systems in Coahuila, Mexico (Echelle *et al.* 2013, p. 77).

Based on our review of the best available scientific and commercial information, the taxonomic entity that is known as the San Felipe gambusia is not a distinct species or subspecies, but rather the same species (a junior synonym) as the spotfin gambusia (Echelle *et al.* 2013, p. 72).

Finding

Under the Act, the term ''species'' includes ''any subspecies of fish or wildlife or plants, and any distinct population segment of any species of vertebrate fish or wildlife which interbreeds when mature'' (16 U.S.C. 1532(16)). Based on the best scientific and commercial information available, the San Felipe gambusia is not itself a species, subspecies, or distinct population segment, as those terms are defined in the Act. Therefore, the San Felipe gambusia is not a listable entity under the Act. We find the San Felipe gambusia is not a valid taxonomic entity, does not meet the definition of a species or subspecies under the Act, and, as a result, cannot warrant listing under the Act.

New Information

We request that you submit any new information concerning the taxonomy, biology, ecology, status of, or stressors to, the 14 Nevada springsnail species, Barbour's map turtle, Bicknell's thrush, Big Blue Springs cave crayfish, Oregon Cascades-California population and Black Hills population of the black-backed woodpecker, eastern DPS of the boreal toad, Northern Rocky Mountains DPS of the fisher, Florida Keys mole skink, Great Sand Dunes tiger beetle, Kirtland's snake, Pacific walrus, and San Felipe gambusia to the appropriate person, as specified under **FOR FURTHER INFORMATION CONTACT**, whenever it becomes available. New information will help us monitor these species and encourage their conservation. We encourage local agencies and stakeholders to continue cooperative monitoring and conservation efforts for these species. If an emergency situation develops for any of these species, we will act to provide immediate protection.

References Cited

Lists of the references cited in the petition findings are available on the Internet at *http://www.regulations.gov* in the dockets listed above in **ADDRESSES** and upon request from the appropriate person, as specified under **FOR FURTHER INFORMATION CONTACT**.

Authors

The primary authors of this document are the staff members of the Unified Listing Team, Ecological Services Program.

Authority

The authority for this action is section 4 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*).

Dated: September 15, 2017.

James W. Kurth,

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

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