U.S. FISH AND WILDLIFE SERVICE
SPECIES ASSESSMENT AND LISTING PRIORITY ASSIGNMENT FORM

SCIENTIFIC NAME: *Catharus bicknelli*

COMMON NAME: Bicknell's Thrush

LEAD REGION: Region 5, Northeast Region

DATE INFORMATION CURRENT AS OF: June 15, 2017

STATUS/ACTION:

__x__ Species assessment - determined either we do not have sufficient information on threats or ***the information on the threats does not support a proposal to list the species*** and, therefore, it was not elevated to Candidate status

N/A Listed species petitioned for uplisting for which we have made a warranted-but-precluded finding for uplisting (this is part of the annual resubmitted petition finding)

N/A Candidate that received funding for a proposed listing determination; assessment not updated

N/A New candidate

N/A Continuing candidate

N/A Listing priority number change
Former LPN: ___
New LPN: ___

N/A Candidate removal: Former LPN: ___
___ A – Taxon is more abundant or widespread than previously believed or not subject to the degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status.
____U – Taxon not subject to the degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status due, in part or totally, to conservation efforts that remove or reduce the threats to the species.
___ F – Range is no longer a U.S. territory.
___ I – Insufficient information exists on biological vulnerability and threats to support listing.
___ M – Taxon mistakenly included in past notice of review.
___ N – Taxon does not meet the Act's definition of "species."

___ X – Taxon believed to be extinct.

Date when the species first became a Candidate (as currently defined):

Petition Information:
___ Non-petitioned
__**X**__ Petitioned;
Date petition received: 08/26/2010
90-day substantial finding FR publication date: 08/15/2012 (77 FR 48934)
12-month warranted but precluded finding FR publication date: N/A

FOR PETITIONED CANDIDATE SPECIES:
a. **Is listing warranted (if yes, see summary of threats below)? No**
b. To date, has publication of a proposal to list been precluded by other higher priority listing actions? N/A
c. Why is listing precluded? N/A

ANIMAL/PLANT GROUP AND FAMILY: Birds, Turdidae

HISTORICAL STATES/TERRITORIES/COUNTRIES OF OCCURRENCE: United States (Connecticut, Delaware, Georgia, Florida, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, North Carolina, Pennsylvania, Rhode Island, South Carolina, Tennessee, Vermont, Virginia, West Virginia), Bermuda, Canada (New Brunswick, Nova Scotia, Ontario, Prince Edward Island, Quebec), Cuba, Haiti, Jamaica, the Dominican Republic, the Bahamas.

CURRENT STATES/COUNTIES/TERRITORIES/COUNTRIES OF OCCURRENCE: United States (Connecticut, Delaware, Georgia, Florida, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, North Carolina, Pennsylvania, Rhode Island, South Carolina, Tennessee, Vermont, Virginia, West Virginia), Bermuda, Canada (New Brunswick, Nova Scotia, Ontario, Prince Edward Island, Quebec), Cuba, Haiti, Jamaica, the Dominican Republic, the Bahamas.

LAND OWNERSHIP: The species' current breeding, migration, and wintering range includes a mix of Federal, State, and private land. Known Federal land includes White Mountain National Forest (New Hampshire) and Green Mountain National Forest (Vermont). Known State land includes Baxter State Park (Maine), Catskill and Adirondack Parks (New York), Mount Mansfield State Forest (Vermont), and Guánica Biosphere Reserve and State Forest (Puerto Rico).

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LEAD FIELD OFFICE CONTACT: David Simmons, New England Field Office, 603–223–2541, *david_simmons@fws.gov*.

BIOLOGICAL INFORMATION: The Bicknell's Thrush Biological Species Report is a summary of the information assembled and reviewed by us and incorporates the best scientific and commercial information available for this species. Excerpts of the Biological Species Report are provided in the sections below. For more detailed information, please refer to the Biological Species Report (Service 2017, entire).

Species Description

The Bicknell's thrush is a migratory bird and is the smallest of North American *Catharus* thrushes in the family Turdidae, which includes all birds related to the robins (Townsend *et al.* 2015, unnumbered). Dorsal (back) coloration ranges from olive-brown to brown, while the belly is generally white with a light buffy wash and darker spots. Due to similar morphometric characteristics, positively identifying a Bicknell's thrush from other North American *Catharus*, especially the gray-cheeked thrush (*C. minimus*), requires close scrutiny. However, trained biologists can tell similar species apart.

Figure 1. Bicknell's thrush (Photo credit: Alan Schmierer)

Taxonomy

We have carefully reviewed the available taxonomic information and conclude that the Bicknell's thrush (*Catharus bicknelli*) is a valid taxonomic species.

General Life History and Habitat

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.

Figure 2. General range map for the Bicknell's thrush from Townsend *et al*. 2015, unnumbered.

The Bicknell's thrush's breeding range extends from the northern Saint Lawrence area of Quebec and the Canadian Maritime Provinces south through New England and New York to that State's Catskill Mountains (Wallace 1939, pp. 258–259; Ouellet 1993, pp. 563–564; Rimmer *et al.* 2001, p. 1). 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 high elevation regenerating industrial forests, 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 and 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. The best available estimates indicate there is a greater number of Bicknell's thrushes in the United States than in Canada (see the Current Population Estimate/Status section below).

Both males and females will mate with multiple partners, resulting in clutches from multiple paternities within the same nest (Goetz *et al*. 2003, p. 1044–1053). Some birds may return to their natal nesting areas, but there is also a high incidence of natal dispersal, which complicates the development of survival estimates for juvenile birds (Townsend *et al.* 2015, unnumbered; Studds *et al.* 2012, entire). On its breeding grounds, the Bicknell's thrush feeds predominantly on insects, but during migration and on its wintering grounds, the species may shift its diet to include several varieties of small fruits (Beal 1915 in Wallace 1939, p. 295; Rimmer *et al.* 2001, pp. 9–10; Townsend *et al.* 2010, p. 517).

Bicknell's thrushes begin departing the breeding grounds during the last few days of September, and by the end of the first week in October almost all birds will have departed on their fall migration (Wallace 1939, p. 259). The data demonstrate the mean duration of fall migration is 29 days, with individuals making temporary stops along a mostly coastal route to rest and feed, with the duration of those stops ranging from 6 to 33 days (McFarland *et al*. In prep., in Townsend *et al.* 2015, unnumbered). During migration, the Bicknell's thrush appears to be a habitat generalist and can be found in dense woodlots composed of variable tree species, 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 mesic 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. Both males and females defend and maintain individual territories against other Bicknell's thrushes (Townsend *et al.* 2010, p. 517).

In spring, the birds leave the Greater Antilles in late April through the first week in May (Rimmer *et al.* 2001, p. 5; McFarland *et al.* In prep., in Townsend *et al.* 2015, unnumbered). The spring migration period is shorter than the fall migration period, with most birds completing the journey in about 17 days (McFarland *et al.*, In prep.), using a primarily overland route through the Southeast United States, with birds passing northward through Florida, Georgia, and the Carolinas (Townsend *et al.* 2015, unnumbered).

Historical Range/Distribution

See information above and the Survey Efforts and Population Trends section of the Biological Species Report (Service 2017, pp. 17–22).

Current Range/Distribution

See information above and the Survey Efforts and Population Trends section of the Biological Species Report (Service 2017, pp. 17–22).

Current Population Estimates/Status

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. From the available estimates, the United States' breeding range supports approximately 66 percent of the global population of the Bicknell's thrush (COSEWIC 2009, p. 246; Hill and Lloyd *in litt.* 2016). Within the United States, approximately 26,449 birds (37 percent) breed in New Hampshire, 21,072 birds (29 percent) breed in New York, 18,802 birds (26 percent) breed in Maine, and 5,297 birds (7 percent) breed in Vermont (Hill and Lloyd *in litt.* 2016). There is no longer a breeding population in Massachusetts. The remainder of the global population of the Bicknell's thrush, 40,570 to 49,258 birds (approximately 33 percent), breeds in Canada (COSEWIC 2009, p. 24).

Notwithstanding the challenges associated with conducting population surveys within the Bicknell's thrush breeding range, the best available data suggest the species' abundance has been undergoing a slight, long-term declining trend. There is sparse information readily available about the species' wintering population. In contrast, multiple breeding range datasets spanning different time periods indicate a decline in overall abundance (COSEWIC 2009, p. 25; Campbell and Stewart 2012, pp. 7, 13; Tremblay *in litt*. 2017), contraction in range (COSEWIC 2009, p. 9; Rimmer *et al.* 2001, p. 4), decline in distribution and probability of observation (Aubry, unpubl. data in Campbell *et al.* 2007, p. 7; COSEWIC 2009, p. 9; Whittam *et al*. 2015, pp. 391), local

extirpations (Atwood *et al.* 1996, p. 657; Rimmer *et al.* 2001, p. 4; Petersen and Meservey 2003, p. 427; Rimmer and McFarland 2013, p. 9; Deluca and King 2014, p. 498), and natal dispersal ((Studds *et al.* 2012, p. 920). The observations documenting local declines and extirpations at sites across the species' breeding range in the United States is supported by an analysis of combined datasets collected from multiple standard single-observer point count surveys conducted in association with multiple monitoring programs (Ralston *et al.* 2015, p. 273). Since comparison of data collected under different protocols can bias estimates of detection and population trends, the researchers used modern analytical methods to control for the effects of varying methodologies in field sampling (Ralston *et al.* 2015, p. 272). The results of the analysis indicate the Bicknell's thrush has undergone a statistically significant decline since the early 1990s, as indicated by an overall trend estimate of 0.977 (value of 1.0 indicates stable populations) (Ralston *et al.* 2015, p. 272).

CURRENT THREATS

Below is the summary of current factors influencing the Bicknell's thrush. For more detailed information, please refer to the Existing Factors Influencing the Bicknell's Thrush section of the Biological Species Report (Service 2017, pp. 23–41).

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' viability, with the additive effects associated with low productivity in some years due to nest predation from red squirrels also contributing to annual variation in the abundance of the Bicknell's thrush. For example, loss of wintering habitat in the Caribbean due to forest conversion has been extensive and is ongoing, with no indication that it is likely to be abated, (Rimmer *et al.* 2001, p. 4; Rimmer *et al.* 2005b, p. 228; Townsend and Rimmer 2006, p. 454; COSEWIC 2009, p. 32; IBTCG In prep.; Butler 2006, entire; Latta *et al.* 2003, p. 180; IBTCG 2010, p. 12; Timyan *et al.* 2012, entire; León *et al.* 2013, entire; Pasachnik *et al.* 2016, entire). Contributing factors to the Bicknell's thrush's viability 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 can provide breeding habitat for the species for approximately 5 to 12 years post clearcutting (IBTCG 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 (IBTCG 2010, p. 12), but these activities have affected a relatively small proportion of the available Bicknell's thrush breeding habitat and associated individuals. The species does show some ability to adapt and persist in the vicinity of ski slopes and wind turbines (Rimmer *et al.* 2004, p. 1; McFarland *et al.* 2008, p. 56, Parrish

2013, p. 47).

The best available data indicate that the current level of predation of adult Bicknell's thrushes is not a significant source of mortality to the species (Townsend *et al.* 2009a, p. 568). However, nest predation by red squirrels can significantly influence nesting success in some years.

FUTURE THREATS

Below is the summary of future factors influencing the Bicknell's thrush. For more detailed information, please refer to the Future Factors Influencing the Bicknell's Thrush and Future Scenarios sections of the Biological Species Report (Service 2017, pp. 42–60).

The best available information suggests that, as a result of climate change, the spruce-fir habitat that support 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 amount of green-house gases emitted to the atmosphere, habitat type (i.e., low vs. high elevation) and forest harvest management strategies. The effect of climate change may also result in an increase in competition between the Bicknell's and Swainson's thrushes, 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 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 viability of the Bicknell's thrush depends on maintaining suitable breeding and wintering habitat that is capable of supporting multiple resilient populations over time. Given the uncertainty over the expected projections from the multiple best available climate models, as well as the potential climate policy mitigations that may occur in the future, we attempted to forecast the range of what habitat availability for the Bicknell's thrush could potentially look like over the next 50 to 83 years (i.e., to the end of the century (2100)). We've chosen four potential scenarios, three of which use a different climate projection, and made assumptions about effects to the species' habitat based on information published in the scientific literature and from Bicknell's thrush, avian ecology, phenology, and climate experts. These scenarios do not include all possible futures, but rather include several potential scenarios that represent examples from the continuous spectrum of possible futures. The Non-Climate Stressor scenario is used to evaluate the habitat loss, predation, and competition stressors separate from the effects of climate change. The Optimistic scenario is less plausible than the Low and High Warming scenarios due to the current rate of increase in global emissions and average surface temperatures.

Summary of Future Scenarios (Table 5 from the Biological Species Report (Service 2017, pp. 42–60)).

Scenario Name	Timeframe	Climate Future Model	Conservation Measures	Breeding Habitat	Wintering Habitat
Non-Climate Stressors Scenario	50-83 years (i.e., 2100, end of the century)	Not applicable: scenario addresses only non-climate influences.	Developing and implementing best management practices (BMP's) for timber companies and establishing the Memorandum of Agreement (MOA) between Canada, the U.S., and the Dominican Republic (DR) remain desired goals.	Canada: No change in suitable habitat which continues to support approx. 33% of breeding population. United States: No change in suitable habitat which continues to support approx. 66% of breeding population. Both: Periodicity of red squirrel predation and competition with Swainson's thrush remains at current levels.	Deforestation in the Caribbean continues at the current rate; the Dominican Republic will continue to lose its tree cover at the rate of approximately 5 percent every 15 years due to land use, economics, and lack of enforcement of protected areas.
Optimistic Scenario	50-83 years (i.e., 2100, end of the century)	Most closely resembles the RCP 2.6 scenario with regional variation. Limit increase in global average surface temperatures to below 2 °C (3.6 °F) above pre-industrial levels, but in the Caribbean, the average surface temperature will increase by 2.9 °C (5.2 °F).	Significant curtailment of global emissions plus implementation and effectiveness of negative emissions technologies (as assumed under RCP 2.6). Developing and implementing BMP's for timber companies; MOA between Canada, the U.S., and the DR is finalized & implemented; logging within DR parks is eliminated.	Canada: In low elevation habitat (<900 m), forest harvest strategies could help maintain most habitat such that approx. 82% remains. In higher elevations (>900 m), regardless of forest harvest strategies, habitat may increase by approx. 43%. United States: An eventual shift in tree species composition projecting to result in a decrease in the extent of spruce and balsam fir. Both: The periodicity of red squirrel predation and competition with Swainson's thrush likely increases.	Approximately 18% of wintering habitat remains.
Low Warming Scenario	50-83 years (i.e., 2100, end of the century)	SRES B1 and RCP 4.5 with regional variations. Mean annual global surface temperatures increase by 1.8 °C (3.2 °F), the average regional surface temperature in the Northeast will increase by increase by 3 °C to 5 oC (5.4 °F to 9 °F), and the average regional surface temperature in the Caribbean will increase by 5.3 °C (9.5 °F).	Some curtailment of global emissions, as assumed under SRES B1 and RCP 4.5. Developing and implementing BMP's for timber companies; MOA between Canada, the U.S., and the DR is established; logging within DR parks is curtailed to the extent practicable.	Canada: In low elevation habitat (<900 m), regardless of forest harvest strategies, suitable habitat could decrease, leaving approx. 49% remaining. In higher elevations (>900 m), regardless of forest harvest strategies, habitat may increase by approx. 22%. United States: There is the potential for most Bicknell's thrush habitat to be eliminated, with small isolated patches likely to persist in the highest elevations of NH and ME. Both: Periodicity of red squirrel predation and competition with Swainson's thrush likely increases in any remaining habitat.	Projected complete loss of wintering habitat.
High Warming Scenario	50-83 years (i.e., 2100, end of the century)	SRES A1F1 and RCP 8.5 scenarios with regional variations. Mean annual global surface temperatures increase by 3.7 °C (6.7 °F), the average regional surface temperature in the Northeast will increase by increase by 5.3 °C to 6 °C (9.5 °F to 10.8 °F), and the average regional surface temperature in the Caribbean will increase by 3.7 °C (6.7 °F)	Very limited curtailment of global emissions, as assumed under SRES A1F1 and RCP 8.5. Developing and implementing BMP's for timber companies; MOA between Canada, the U.S., and the DR is established; logging within DR parks is curtailed to the extent practicable.	Canada: In low elevation habitat (<900 m), regardless of forest harvest strategies, suitable habitat could decrease, leaving approx. 20% remaining. In higher elevations (>900 m), forest harvest strategies could help mediate anticipated decreases in suitable habitat such that approx. 87% remains. United States: Possibility of complete elimination of breeding habitat, with the possibility of small isolated patches remaining in the highest elevations of NH and ME. Both: Periodicity of red squirrel predation and competition with Swainson's thrush likely increases in any remaining habitat.	Projected complete loss of wintering habitat.

In all but the Non-Climate Stressor scenario, some amount of Bicknell's thrush habitat loss in the breeding range is expected. The amount and distribution of breeding habitat that may remain through the end of the century varies depending on climate change projection, location (United State vs. Canada), and potential for forest harvest strategies to maintain spruce-fir habitat. In Canada, potential habitat loss may be partially mitigated by management strategies or elevation in the Optimistic and Low Warming Scenarios, but habitat loss is expected under the High Warming Scenario. In the United States, the eventual shift in tree species composition is projected to result in a decrease in spruce-fir habitat under the Optimistic Scenario; there is the potential for most habitat to be eliminated, although small isolated patches may persist in the highest elevations of New Hampshire and Maine, under the Low Warming Scenario; and the possibility that a complete elimination of habitat could occur, with a possibility that small isolated patches may persist in the highest elevations of New Hampshire and Maine, under the High Warming Scenario. The results of these projections are inclusive of potential conservation measures intended to address habitat-related stressors. Any remaining breeding habitat, it is predicted, will likely have limited suitability due to the presence of competing Swainson's thrushes and nest-predating red squirrels.

In all scenarios, including the Non-Climate Stressor scenario, loss and degradation of the species' habitat across the wintering range is expected to continue. The amount of wintering habitat that likely remains through the end of the century varies from the current amount and distribution (Non-Climate Stressor) to approximately 18 percent (Optimistic) to potentially zero (Low and High Warming). The results of these projections are inclusive of potential conservation measures intended to address habitat-related stressors.

We recognize that the level of uncertainty about the likely effects of climate change increases the further into the future we attempt to project. We also recognize that we do not know how the Bicknell's thrush will respond or if it has the potential to adapt to the potential habitat changes.

CONSERVATION MEASURES PLANNED OR IMPLEMENTED

The Migratory Bird Conservation Act, the Neotropical Migratory Bird Conservation Act, and the identification of birds of management concern through the Birds of Conservation Concern apply to the Bicknell's thrush. These regulatory and nonregulatory actions are intended to foster conservation of migratory birds. As such, the Service is working with the U.S. Department of State, Canada, and the Dominican Republic Ministry of Environment and Natural Resources (Ministry) to implement a Memorandum of Agreement (MOA) that would provide the structure for formal assistance in addressing the challenges facing the Dominican Republic's ability to conserve its natural resources. A Letter of Intent approved by the USFWS' International Affairs program and the State Department was sent to Canada and the Ministry in early 2016. However, full development of the MOA may still take some time. When completed, it will be a nonregulatory agreement if and when it is negotiated (USFWS *in litt*. 2016; Dettmers *in litt*. 2016; Gifford *in litt* 2016).

The Ministry is working on a management plan (Plan) for the Sierra de Bahoruco National Park using an "open standard" conservation process for developing the Plan. The open standard is a structured approach to ranking threats with results chains, conservation targets, and strategies to reduce the threats. Development of the Plan includes participation from surrounding stakeholders and, as a result, should account for some of the socioeconomic factors driving some of the threats to Bicknell's thrush wintering habitat on the island. The Plan will also include areas for restoration potential. The habitat can regrow if it is not subject to the same deforestation that initially made it unsuitable (Gifford *in litt*. 2016). The Ministry had hoped to have a Draft Plan completed by the end of calendar year 2016 (Gifford *in litt*. 2016), but the plan is approximately one-third complete (Dettmers *in litt*. 2016). In addition, other parks are working on pilot projects to establish sustainable forestry practices adjacent to protected area boundaries. These projects are meant to relieve deforestation pressure on currently protected areas (Gifford *in litt*. 2016).

FINDING

Standard for Review

Section 4 of the Act (16 U.S.C. 1533), and its implementing regulations at 50 CFR part 424, set forth the procedures for determining whether a species is an endangered species or threatened species and should be included on the Federal Lists of Endangered and Threatened Wildlife and Plants (listed). The Act defines an endangered species as any species that is "in danger of extinction throughout all or a significant portion of its range" and a threatened species as any species "that is likely to become endangered throughout all or a significant portion of its range within the foreseeable future." The phrase "significant portion of its range" (SPR) is not defined by the Act, and, since the Service's policy interpreting the phrase was vacated by the court in *Center for Biological Diversity* v. *Jewel*, No. 14-cv-02506-RM (D. Ariz. Mar. 29, 2017), we currently do not have a binding interpretation that addresses: (1) The outcome of a determination that a species is either in danger of extinction or likely to become so in the foreseeable future throughout a significant portion of its range; or (2) what qualifies a portion of a range as "significant." We have examined the plain language of the Act and court decisions addressing the Service's application of the SPR phrase in various listing decisions, and for purposes of this rulemaking we are applying the following interpretation for the phrase "significant portion of its range" and its context in determining whether or not a species is an endangered species or a threatened species.

Two district court decisions have evaluated whether the outcomes of the Service's determinations that a species is in danger of extinction or likely to become so in the foreseeable future in a significant portion of its range were reasonable. *Defenders of Wildlife* v. *Salazar*, 729 F. Supp. 2d 1207 (D. Mont. 2010) (appeal dismissed as moot because of public law vacating the listing, 2012 U.S. App. LEXIS 26769 (9th Cir. Nov. 7, 2012)); *WildEarth Guardians* v. *Salazar*,

No. 09-00574-PHX-FJM, 2010 U.S. Dist. LEXIS 105253 (D. Ariz. Sept. 30, 2010). Both courts found that, once the Service determines that a "species"—which can include a species, subspecies, or DPS under ESA Section 3(16)—meets the definition of an "endangered species" or a "threatened species," the species must be listed in its entirety and the Act's protections applied consistently to all members of that species (subject to modification of protections through rules under sections 4(d) and 10(j) of the Act). See *Defenders*, 729 F. Supp. 2d at 1222 (delisting the Northern Rocky Mountain DPS of gray wolf except in the Wyoming portion of its range (74 FR 15123 (Apr. 2, 2009)) was unreasonable because the ESA unambiguously prohibits listing or protecting part of a DPS); *WildEarth Guardians*, 2010 U.S. Dist. LEXIS 105253, at 15-16 (the Service's finding that listing the Gunnison's prairie dog in the "montane portion" of its range was warranted (73 FR 6660 (Feb. 5, 2008)) was unreasonable because the Service "cannot determine that anything other than a species, as defined by the ESA, is an endangered or threatened species"). The issue has not been addressed by a Federal Court of Appeals.

For the purposes of this rule, we interpret the phrase "significant portion of its range" (SPR) in the Act's definitions of "endangered species" and "threatened species" to provide an independent basis for listing a species in its entirety; thus two situations (or factual bases) would qualify a species for listing: A species may be in danger of extinction or likely to become so in the foreseeable future throughout all of its range; or a species may be in danger of extinction or likely to become so throughout a significant portion of its range. If a species is in danger of extinction throughout an SPR, it, the species, is an "endangered species." The same analysis applies to "threatened species." Therefore, the consequence of finding that a species is in danger of extinction or likely to become so throughout a significant portion of its range is that the entire species will be listed as an endangered species or threatened species, respectively, and the Act's protections will be applied to all individuals of the species wherever found.

Although there are potentially many ways to determine whether a portion of a species' range is "significant," we conclude, for the purposes of this rule, that the significance of the portion of the range should be determined based on its biological contribution to the conservation of the species. For this reason, we describe the threshold for "significant" in terms of an increase in the risk of extinction for the species. We conclude that such a biologically based definition of "significant" best conforms to the purposes of the Act, is consistent with judicial interpretations, and best ensures species' conservation.

For the purposes of this rule, we determine if a portion's biological contribution is so important that the portion qualifies as "significant" by asking whether, *without that portion*, the species in the remainder of its range warrants listing. Conversely, we would not consider the portion of the range at issue to be "significant" if the species would not warrant listing even if the population in that portion of the range in question became extirpated (extinct locally).

We interpret the term "range" to be the general geographical area within which the species is

currently found, including those areas used throughout all or part of the species' life cycle, even if not used on a regular basis. We consider the "current" range of the species to be the range occupied by the species at the time the Service makes a determination under section 4 of the Act. The phrase "is in danger" in the definition of "endangered species" denotes a present-tense condition of being at risk of a current or future undesired event. Hence, to say a species "is in danger" in an area where it no longer exists—*i.e.,* in its historical range where it has been extirpated—is inconsistent with common usage. Thus, "range" must mean "current range," not "historical range." A corollary of this logic is that lost historical range cannot constitute a significant portion of a species' range where a species is in danger of extinction or likely to become so within the foreseeable (i.e., it cannot be currently in danger of extinction in a portion of its range where it is already extirpated). While we conclude that a species cannot be in danger of extinction in its lost historical range, taking into account the effects of loss of historical range on a species is an important component of determining a species' current and future status.

In implementing these independent bases for listing a species, as discussed above, we list any species in its entirety either because it is in danger of extinction now or likely to become so in the foreseeable future throughout all of its range or because it is in danger of extinction or likely to become so in the foreseeable future throughout a significant portion of its range. With regard to the text of the Act, we note that Congress placed the "all" language before the SPR phrase in the definitions of "endangered species" and "threatened species." This suggests that Congress intended that an analysis based on consideration of the entire range should receive primary focus. Thus, the first step in our assessment of the status of a species is to determine its status throughout all of its range. Depending on the status throughout all of its range, we will subsequently examine whether it is necessary to determine its status throughout a significant portion of its range.

We recognize the definition of "species" allows, for vertebrates, consideration of the status of a taxonomic species or subspecies over less than its entire range (*i.e.,* distinct population segment). The Act's definition of "species" includes "any subspecies of fish or wildlife or plants, and any distinct population segment of any species of vertebrate fish and wildlife which interbreeds when mature (16 U.S.C. 1532(16))." Under the DPS authority, the Service can evaluate and list members of a species in less than the entire range of the species if the segment is determined to be both discrete and significant (61 FR 4722, February 7, 1996). Because the DPS authority and the SPR language both allow the Service to evaluate the status of a taxonomic species or subspecies over less than its entire range, we must explain their relationship.

The definition of "significant" for the purpose of SPR analysis differs from the definition of "significant" as defined in our DPS policy and used for DPS analysis. We expect—based on our experience and knowledge of already listed DPSs, the differences between the two standards, the specific circumstance described by the definition of "significant portion of its range," and the high bar it sets—that there will seldom be situations in which the population within a SPR for a

taxonomic species or subspecies might also constitute a DPS. The DPS authority affords the Service flexibility to apply differing statuses (and thus differing management) across the range of vertebrate species and allows to us to consider and recognize efforts made by States or foreign nations in our application of protections of the Act. Therefore, in the rare circumstance when there is an SPR that also meets the definition of a DPS, we would consider the DPS to be the proper entity for listing.

Under section 4(a)(1) of the Act, we determine whether a species is an endangered species or threatened species because of any of the following: (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. These five factors apply whether we are analyzing the species' status throughout all of its range or throughout a significant portion of its range.

Summary of Analysis

The biological information for the Bicknell's thrush that we reviewed and analyzed as the basis for our finding is documented in the Biological Species Report (Service 2017, entire), a summary of which is provided in the BIOLOGICAL INFORMATION section of this Species Assessment Form. The projection for future conditions is based on our expectations of the potential risk factors (in other words, the stressors' potential effects on the species or its habitats) that may result in population- or rangewide-level effects currently or in the future. The stressors we evaluated in detail in our Biological Species Report (Service 2017, 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 (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, those mechanisms are discussed in context in the relevant sections of the Biological 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.

To make the determination whether the Bicknell's thrush warrants protection as an endangered or threatened species under the Act, we evaluated the current factors and the species' potential future viability given projections of future factors (taking into account the risk factors and their effects on individuals and aggregates of individuals). As described below, we first evaluate whether the Bicknell's thrush is in danger of extinction throughout its range now (an endangered species). Second, we evaluate whether the species is likely to become in danger of extinction throughout its range in the foreseeable future (a threatened species). Third and finally, we consider whether the Bicknell's thrush is an endangered or threatened species in a significant portion of its range.

Bicknell's Thrush Determination of Status Throughout All of its Range

Under the Act, an endangered species is any species that is "in danger of extinction throughout all or a significant portion of its range." Because of the fact-specific nature of listing determinations, there is no single metric for determining if a species is currently in danger of extinction. We used the best available scientific and commercial data to evaluate the current viability (and thus risk of extinction) of the Bicknell's thrush to determine if it meets the definition of an endangered species.

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. While there appears to be local extirpations of previously occupied breeding sites in some areas of Massachusetts, Vermont, New Hampshire, and Canada, Bicknell's thrushes continue to breed in New York, Vermont, New Hampshire, Maine, and Canada (Service 2017, pp. 19–22). The current distribution of the Bicknell's thrush during the breeding season is approximately 66 percent in the United States and 33 percent in Canada, despite Canada having more suitable habitat (Service 2017, pp. 14, 19–22). Any ongoing and anticipated habitat loss and degradation of breeding habitat due to incompatible forestry practices and recreational and wind energy development has been localized and we have no evidence that these instances have had or will have a species-level effect on the Bicknell's thrush. In addition, the current rate of red squirrel predation and competition with Swainson's thrush are part of the natural cyclical processes with which the Bicknell's thrush has become adapted. Those processes may be changing as a result of the effects of climate change, but there is considerable uncertainty about how much, to what extent, and when those changes may occur. Because the Bicknell's thrush is a habitat generalist during spring and fall migration, we have no reason to conclude that the species is limited in abundance or habitat at that point in its life cycle. Loss of wintering habitat in the Caribbean due to forest conversion has been extensive and is ongoing, with no indication that it is likely to be abated. However, suitable habitat for the Bicknell's thrush still exists in all areas of its known wintering range, and the species is known to occupy some areas within that suitable habitat in the Dominican Republic, Haiti, Jamaica, Cuba, and Puerto Rico.

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 would not persist 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 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 persistence of occupied habitat across the species' range provides distribution, abundance, and diversity to sustain the species beyond the near term. ***Therefore, we conclude that the current risk of extinction of the Bicknell's thrush is sufficiently low that it does not meet the definition of an endangered species under the Act.***

Under the Act, a threatened species is any species that is "likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range." The foreseeable future refers to the extent to which the Secretary can reasonably rely on predictions about the future in making determinations about the future conservation status of the species (U.S. Department of the Interior, Solicitor's Memorandum, M–37021, January 16, 2009). A key statutory difference between a threatened species and an endangered species is the timing of when the relevant threats would begin acting upon a species such that it may be in danger of extinction, either now (endangered species) or in the foreseeable future (threatened species).

As described in **Future Threats**, above, in considering the foreseeable future as it relates to the status of the Bicknell's thrush, we considered the relevant risk factors acting on the species, existing regulatory measures, and whether we could draw reliable predictions about the status of the species in response to these factors. The U.S. Department of the Interior's Solicitor's 2009 Foreseeable Future Memorandum (M–37021, January 16, 2009) specifies that the Secretary must look not only at the foreseeability of threats, but also at the foreseeability of the impact of the threats on the species.

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 the data on, and the projected potential 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 quite as far as all existing climate change models discussed in the Biological Species 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.

As we concluded in the Biological Species Report (Service 2017, pp. 42–60), 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. Given the risk factors affecting the species currently and/or potentially in the future, we determined the following:

- There are few to no existing regulatory mechanisms to address the potential effects of climate change on the quality and quantity of Bicknell's thrush habitat. However, the best available information indicates that the risk is low that changes in habitat quantity due to projected changes in tree species composition in the breeding or wintering range resulting from changes in temperature, precipitation, wind speed, or relative humidity will result in aggregate or species-level effects in the foreseeable future. This conclusion is supported by the fact that the interaction between a species' habitat and a species' distribution is a complex ecological process and to date there have been studies that show initial shifts in species' distribution that are counterintuitive to forecasted shifts (DeLuca and King 2016, unnumbered). In addition, preliminary results from Tremblay *et al*. (In Prep. 2017) indicate some projected shifts in Bicknell's thrush habitat, depending on the elevation and climate model, may be mediated to some extent by forest management strategies.
- There is significant uncertainty regarding the timeframe in which the predicted climate induced changes to rates of red squirrel predation and interspecific competition from Swainson's thrush will manifest (i.e., whether those changes will occur within the foreseeable future). While rates of red squirrel predation can currently be sufficient to have aggregate level, if not species-level, effects in some years in some areas, the Bicknell's thrush has persisted through these cyclical events. The potential for increased levels of red squirrel predation, are predicated on warming temperatures resulting in more cone (red squirrel food) production which results in more red squirrels, which further results in an overabundance of red squirrels in relation to the available cones in the following year, which then results in red squirrels turning to bird egg and nestlings for an alternative food source. For the Swainson's thrush, warmer temperatures are predicted to cause a shift and increase in suitable conditions upslope of where the Swainson's thrush currently occurs, which would result in increased competition for nesting and food resources between the two thrush species.
- The current level (approximately 5 percent over 15 years) of direct habitat loss in the Dominican Republic is expected to continue within the foreseeable future (i.e., approximately 30 years) due to the lack of enforcement of protected areas and the country's socioeconomic projections. However, the risk is low that the amount of suitable habitat remaining within the Dominican Republic, as well as elsewhere in the species' wintering range, would not be sufficient to support the species within the foreseeable future (i.e., approximately 30 years). As explained above, the habitat loss summarized in Table 5 of the Biological Species Report (Service 2017, p. 55) is based on projections out to 2100, which is beyond our definition of foreseeable future for the Bicknell's thrush. We conclude that the potential for an additional 10 percent loss of wintering habitat over the next 30 years will not affect the Bicknell's thrush to the extent that the species is likely to become endangered within the foreseeable future.

Taking into account the effects of the most likely stressors and the potential for cumulative effects to the species, our projections for foreseeable future conditions are that the risk is low that the Bicknell's thrush will not continue to be distributed across multiple areas within the species' current breeding and wintering range. These multiple areas would help the Bicknell's thrush withstand catastrophic events; meaning no one significant weather or other event would affect the entire species. The species would continue to be present in multiple areas in adequate abundance to withstand stochastics events; meaning a high red squirrel predation event would be unlikely to affect all of that year's breeding productivity. Finally, the species would continue to occupy the diversity of coastal, high elevation, and managed forest breeding and mid to high elevation wet montane wintering habitats; meaning if there are ecological or genetic advantages to these areas, the species could retain that adaptability. Additionally, although the best available information from the breeding range surveys indicates that there is a low level decline in the species' population, our analysis of the future projections indicates a low risk of extirpation in the foreseeable future.

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.***

Summary of the Bicknell's Thrush Determination of Status Throughout All of Its Range: Thus, after assessing the best available information, we conclude that the Bicknell's thrush is not in danger of extinction throughout all of its range nor is it likely to become so in the foreseeable future.

Determination of Status Throughout a Significant Portion of its Range

Consistent with our interpretation that there are two independent bases for listing species as described above, after examining the species' status throughout all of its range, we now examine whether it is necessary to determine its status throughout a significant portion of its range. We must give operational effect to both the "throughout all" of its range language and the SPR phrase in the definitions of "endangered species" and "threatened species." The Act, however, does not specify the relationship between the two bases for listing. As discussed above, to give operational effect to the "throughout all" language and that it is referenced first in the definition, consideration of the species' status throughout the entire range should receive primary focus and we should undertake that analysis first. In order to give operational effect to the SPR language, the Service should undertake an SPR analysis if the species is neither in danger of extinction nor likely to become so in the foreseeable future throughout all of its range, to determine if the species should nonetheless be listed because of its status in an SPR. Thus, we conclude that to

give operational effect to both the "throughout all" language and the SPR phrase, the Service should conduct an SPR analysis if (and only if) a species does not warrant listing according to the "throughout all" language.

Because we determined that the Bicknell's thrush is not in danger of extinction or likely to become so in the foreseeable future throughout all of its range, we will consider whether there are any significant portions of its range in which the Bicknell's thrush is in danger of extinction or likely to become so.

Although there are potentially many ways to determine whether a portion of a species' range is "significant," we conclude, as noted above, for the purposes of this rule, that the significance of the portion of the range should be determined based on its biological contribution to the conservation of the species. For this reason, we describe the threshold for "significant" in terms of an increase in the risk of extinction for the species. We conclude that such a biologically based definition of "significant" best conforms to the purposes of the Act, is consistent with judicial interpretations, and best ensures species' conservation.

We evaluate biological significance based on the principles of conservation biology using the concepts of redundancy, resiliency, and representation because decreases in the redundancy, resiliency, and representation of a species lead to increases in the risk of extinction for the species. *Redundancy* (having multiple resilient populations considering genetic and environmental diversity) may be needed to provide a margin of safety for the species to withstand catastrophic events. *Resiliency* describes the characteristics of a species that allow it to recover from stochastic events or periodic disturbance. *Representation* (the range of variation found in a species) ensures that the species' ability to adapt to changing environments is conserved. Redundancy, resiliency, and representation are not independent of each other, and some characteristics of a species or area may contribute to all three. For example, distribution across a wide variety of habitats is an indicator of representation, but it may also indicate a broad geographic distribution contributing to redundancy (decreasing the chance that any one event affects the entire species), and the likelihood that some habitat types are less susceptible to certain threats, contributing to resiliency (the ability of the species to recover from disturbance). None of these concepts is intended to be mutually exclusive, and a portion of a species' range may be determined to be "significant" due to its contributions under any one of these concepts.

For the purposes of this rule, we determine if a portion's biological contribution qualifies as "significant" by asking whether, *without that portion*, the representation, redundancy, or resiliency of the species would be so impaired that the species would be in danger of extinction or likely to become so in the foreseeable future (*i.e.*, would be an "endangered species" or a "threatened species"). Conversely, we would not consider a portion to be "significant" if there is sufficient resiliency, redundancy, and representation elsewhere in the species' range that the species would not be in danger of extinction or likely to become so throughout its range even if

the population in that portion of the range in question became extirpated.

We recognize that this definition of "significant" establishes a threshold that is relatively high. Given that the outcome of finding a species to be in danger of extinction or likely to become so in an SPR would be to list the species and apply protections of the Act to all individuals of the species wherever found, we concluded it is important to use a threshold for "significant" that is robust. It would not be meaningful or appropriate to establish a low threshold whereby a portion of the range can be considered "significant" even if only a negligible increase in extinction risk would result from its loss. Because nearly any portion of a species' range can be said to contribute some increment to a species' viability, use of such a low threshold would require us to impose restrictions and expend conservation resources disproportionately to conservation benefit: Listing would be rangewide, even if only a portion of the range with minor conservation importance to the species is imperiled. On the other hand, it would be inappropriate to establish a threshold for "significant" that is too high. This would be the case if the standard were, for example, that a portion of the range can be considered "significant" only if threats in that portion result in the entire species' being currently in danger of extinction or likely to become so. Such a high bar would not give the SPR phrase independent meaning, as the Ninth Circuit held in *Defenders of Wildlife* v. *Norton*, 258 F.3d 1136 (9th Cir. 2001).

The definition of "significant" used in this rule carefully balances these concerns. By setting a relatively high threshold, we minimize the degree to which restrictions would be imposed or resources expended that do not contribute substantially to species conservation. But we have not set the threshold so high that the phrase "throughout a significant portion of its range" loses independent meaning. Specifically, we have not set the threshold as high as it was under the interpretation presented by the Service in the *Defenders* litigation. Under that interpretation, the portion of the range would have to be so important that the species' current level of imperilment in the portion results in the species currently being in danger of extinction or likely to becomes throughout all of its range. Under the definition of "significant" used in this rule, the portion of the range need not rise to such an exceptionally high level of biological significance.

We are aware that the court in *Center for Biological Diversity* v. *Jewel* found that this definition of "significant" does not give sufficient independent meaning to the SPR phrase. However, that decision was based on two misunderstandings about the interpretation of "significant." First, the court's decision was based on its finding that, as with the interpretation that the court rejected in *Defenders*, the definition of "significant" does not allow for an independent basis for listing. However, this definition of "significant" is not the same as the definition applied in *Defenders*, which looked at the current status within the portion and asked what the current effect on the entire range of the species is. By contrast, this definition of "significant" looks at a future hypothetical loss of all members within the portion and evaluates the effect on the remainder of the species. The current status of the species in that portion is relevant *only* for determining the listing status if the portion has been determined to be significant. This definition of "significant"

establishes a lower threshold than requiring that the species' current status in that portion of its range is already causing the species to be in danger of extinction throughout all of its range or likely to become so in the foreseeable future. In other words, this definition of "significant" captures circumstances that would not be captured by the definition used in *Defenders*, or by analyzing whether a species is in danger of extinction or likely to become so throughout all of its range: a species that is *not* currently even likely to become an endangered species in the foreseeable future, but would be if a particular important portion of its range is completely lost, can nonetheless be listed now if the species in that portion is threatened or endangered (as opposed to only after the portion is in fact lost, as would be the case if the SPR language did not exist).

The second misunderstanding was the court's characterization of the listing determination for the African coelacanth as an indication of our difficulty applying this definition of "significant." However, in that listing determination, the conclusion was that the species was not in danger of extinction throughout all of its range or likely to become so in the foreseeable future but it did warrant listing because of its status in a significant portion of its range. The only reason for not listing the entire species was that the population in that portion of the range met the definition of a distinct population segment (DPS). Therefore, the agency listed the DPS instead of the entire species. The population in an SPR is not automatically a DPS so, contrary to the court's reasoning, the definition of "significant" can be applied and result in listing a species that would not otherwise be listed. We also note another instance in which this definition has resulted in a finding that an entity did was not in danger of extinction in the foreseeable future through all of its range, but was in a significant portion. In a proposed rule (82 FR 3694; January 12, 2017), NMFS found that the giant manta ray was not currently in danger of extinction or likely to become so in the foreseeable future throughout all of its range because the Atlantic populations were not experiencing the same risks as the Pacific populations. However, they did find that the Pacific populations constituted an SPR, because without that portion, the smaller and more sparsely distributed populations in the Atlantic would become vulnerable to demographic risks and would be likely to become in danger of extinction in the foreseeable future. Accordingly, the giant manta ray is proposed to be listed as a threatened species. In light of these two misunderstandings, we are currently seeking reconsideration of the district court's decision.

To undertake this analysis, we first identify any portions of the species' range that warrant further consideration. The range of a species can theoretically be divided into portions in an infinite number of ways. To identify only those portions that warrant further consideration, we determine whether there is substantial information indicating that there are any portions of the species' range: (1) that may be "significant," and (2) where the species may be in danger of extinction or likely to become so in the foreseeable future. We emphasize that answering these questions in the affirmative is not equivalent to a determination that the species should be listed—rather, it is a step in determining whether a more-detailed analysis of the issue is required.

A key part of identifying portions appropriate for further analysis is whether the threats are geographically concentrated. If a species is not in danger of extinction or likely to become so in the foreseeable future throughout all of its range and the threats to the species are essentially uniform throughout its range, then the species is not likely to be in danger of extinction or likely to become so in the foreseeable future in any portion of its range. Moreover, if any concentration of threats applies only to portions of the species' range that are not "significant," such portions will not warrant further consideration.

If we identify any portions (1) that may be significant and (2) where the species may be in danger of extinction or likely to become so in the foreseeable future, we conduct a more thorough analysis to determine whether both of these standards are indeed met. The identification of a geographic area that meets our definition of significant does not create a presumption, prejudgment, or other determination as to whether the species is in danger of extinction or likely to become so in the foreseeable future in that identified SPR. We must then analyze whether the species is in danger of extinction or likely to become so in the SPR. To make that determination, we use the same standards and methodology that we use to determine if a species is in danger of extinction or likely to become so in the foreseeable future throughout all of its range.

Depending on the biology of the species, its range, and the threats it faces, it might be more efficient for us to address the significance question first or the status question first. If we address significance first and determine that a portion of the range is not "significant," we do not need to determine whether the species is in danger of extinction or likely to become so in the foreseeable future there; if we address the status of the species in portions of its range first and determine that the species is not in danger of extinction or likely to become so in a portion of its range, we do not need to determine if that portion is "significant."

Bicknell's Thrush Determination of Significant Portion of its Range

Applying the process described above, to identify whether any portions warrant further consideration, we determine whether there is substantial information indicating that (1) particular portions may be significant and (2) the species may be in danger of extinction in those portions or likely to become so within the foreseeable future.

To identify portions that may be significant, we consider whether any natural divisions within the range might be of biological or conservation importance. As described above, the Bicknell's thrush winters in the areas in Cuba, Haiti, the Dominican Republic, Jamaica, and Puerto Rico, with the majority of Bicknell's thrush 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). The majority of the information about the species in its

wintering range is derived from the Dominican Republic (Service 2017, pp. 15, 34–37, 38, 52).

We have identified some portion (specifically the Dominican Republic and Haiti in the wintering ground) that may be significant. We next consider whether the species may be in danger of extinction or likely to become so in the foreseeable future in that portion. We can accomplish this by considering whether there is substantial information indicating that there are any threats to or effects of threats on the species that are concentrated in that portion.

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) 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, will be 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.

We have identified a portion that may be significant. However, we concluded that the species is not in danger of extinction or likely to become so in the foreseeable future in the portion. 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.

We have carefully assessed the best scientific and commercial information available regarding the past, present, and future threats to the Bicknell's thrush. Because the species is neither in danger of extinction now (endangered) nor likely to become so in the foreseeable future (threatened) throughout all or any significant portion of its range, the species does not meet the definition of an endangered species or threatened species.

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** section the Federal Register Notice for the 12-month finding) whenever it becomes available. New information will help us monitor the Bicknell's thrush and encourage its conservation. If an emergency situation develops for the Bicknell's thrush, we will act to provide immediate protection.

RECOMMENDED CONSERVATION MEASURES

The following are examples of high priority conservation measures for the species. For additional conservation measures, see the May 2017 International Bicknell's Thrush Conservation Group Report (Lloyd and MacFarland, editors, 2017). Additional conservation measures may be developed at a later time.

- Finalize and implement the Memorandum of Agreement between the U.S, Department of State, Canada, and the Dominican Republic Ministry of Environment and Natural Resources to address the Dominican Republic's ability to conserve its natural resources. In addition, support the Ministry's efforts to develop and implement a management plan for the Sierra de Bahoruco National Park.
- Stronger enforcement of protected area boundaries in the Dominican Republic and Haiti.
- Implement best management forestry practices in the breeding grounds that reduce or eliminate precommercial thinning within Bicknell's thrush habitat.
- Continue survey efforts and population monitoring in the species' breeding and wintering grounds.
- Monitor changes in habitat quality and quantity to assess population trends resulting from forest conversion and climatic responses.

We request that you submit any new information concerning the status of, or threats to, the Bicknell's thrush to our New England Field Office (see **ADDRESSES** section of the Federal Register Notice for the 12-month finding) whenever it becomes available. New information will help us monitor this species and encourage its conservation. If an emergency situation develops for the species, we will act to provide immediate protection.

DESCRIPTION OF MONITORING

To date, multiple survey efforts have been and continue to be ongoing throughout the Bicknell's thrush breeding range (Service 2017, p. 18). In addition, there is limited monitoring occurring in the species migration and wintering range (Service 2017, pp. 18–19).

COORDINATION WITH STATES

Indicate which State(s) (within the range of the species) provided information or comments on the species or latest species assessment: In preparing the Bicknell's Thrush Biological Species Report, we requested information from all of the States/Territory within the species breeding, migration, and wintering range. We received information from States within the breeding range (Maine, New Hampshire, New York, and Vermont) and the wintering range (Puerto Rico).

A draft of the Biological Species Report was sent to States/Territory within the species' breeding and wintering range for review. We received comments from New Hampshire, New York, and Puerto Rico.

Indicate which State(s) did not provide any information or comments: We did not receive comments on the draft Biological Species Report from Maine or Vermont.

LITERATURE CITED

A complete list of references cited in this Species Assessment Form and in our full Biological Species Report is provided in the Biological Species Report for the Bicknell's Thrush (Service 2017, pp. 1–80).

APPROVAL/CONCURRENCE: Lead Regions must obtain written concurrence from all other Regions within the range of the species before recommending changes, including elevations or removals from candidate status and listing priority changes; the Regional Director must approve all such recommendations. The Director must concur on all resubmitted 12-month petition findings, additions or removal of species from candidate status, and listing priority changes.

Approve: _____ 25 July 2017
Acting Regional Director, Fish and Wildlife Service — Date

Concur: James W. Kurth SEP 15 2017
Director, Fish and Wildlife Service — Date
Acting

Do not concur: _____ _____
Director, Fish and Wildlife Service — Date

Director's Remarks: