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

SCIENTIFIC NAME: *Dendroica angelae*

COMMON NAME: Elfin-woods warbler

LEAD REGION: 4

INFORMATION CURRENT AS OF: April 2010

STATUS/ACTION:

___ Species assessment- determined species did not meet the definition of endangered or threatened under the Act and, therefore, was not elevated to Candidate status
___ New candidate
_X_ Continuing candidate
___ Non-petitioned
_X_ Petitioned - Date petition received: May 11, 2004
___ 90-day positive - FR date: ___
___ 12-month warranted but precluded - FR date: ___
_ Did the petition request a reclassification of a listed species?

FOR PETITIONED CANDIDATE SPECIES:

a. Is listing warranted (if yes, see summary of threats below)? yes
b. To date, has publication of a proposal to list been precluded by other higher priority listing actions? yes
c. If the answer to a. and b. is "yes", provide an explanation of why the action is precluded. Higher priority listing actions, including court-approved settlements, court-ordered and statutory deadlines for petition findings and listing determinations, emergency listing determinations, and responses to litigation, continue to preclude the proposed and final listing rules for the species. We continue to monitor populations and will change its status or implement an emergency listing if necessary. The "Progress on Revising the Lists" section of the current CNOR (*http://endangered.fws.gov/*) provides information on listing actions taken during the last 12 months.

_____ Listing priority change
Former LPN:
New LPN:

Date when the species first became a Candidate (as currently defined): October 25, 1999
___ 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.

ANIMAL/PLANT GROUP AND FAMILY: Bird - Parulidae

HISTORICAL STATES/TERRITORIES/COUNTRIES OF OCCURRENCE: Puerto Rico

CURRENT STATES/TERRITORIES/COUNTRIES OF OCCURRENCE: Puerto Rico

LAND OWNERSHIP:

The species has been found in Federal and Commonwealth forests and private lands. The Puerto Rico Department of Natural and Environmental Resources (DNER) manages the Maricao Commonwealth Forest, Toro Negro Commonwealth Forest, and Carite Commonwealth Forest. The U.S. Forest Service manages the El Yunque National Forest. *Dendroica angelae* has also been found in areas of suitable habitat adjacent to these forests under private ownership.

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LEAD FIELD OFFICE CONTACT: Dr. Jorge E. Saliva, Caribbean Field Office, 787/851-7297

BIOLOGICAL INFORMATION:

Species Description
Dendroica angelae (elfin-woods warbler) is about 12.5 centimeters (cm) (4.9 inches (in)) in length, and entirely black and white. Adults have a thin, white eyebrow stripe, white patches on ear-covers and neck, incomplete eye ring, and black crown. Immature birds are similar to the adult, but black is replaced by grayish-green on the back, and yellowish-green on the head and underparts (Raffaele *et al*. 1998, p. 168).

Taxonomy
Dendroica angelae was discovered in 1971 by Angela and Cameron Kepler from the Elfin, or Dwarf, forest type of the El Yunque National Forest in the Luquillo Mountains. Kepler and Parkes (1972, pp. 3-5) described it as a valid taxon.

Habitat/Life History

Kepler and Parkes (1972 p.5-6) described the elfin-woods warbler from the high elevation Elfin Woodland forests (640 to 1,030 meters (m)) (2,099 to 3,378 feet (ft)) and occasionally Palo

Colorado forests in El Yunque National Forest. Wiley and Bauer later (1985 p.12) reported the species from the Elfin forests and lower elevation forests (370 to 600 m (1,213 to 1,968 ft)) such as Palo Colorado and Sierra Palm forests in the El Yunque National Forest. Based on surveys conducted in 1989 and 1990, Arroyo-Vázquez (1991, p. 56) suggested that the species migrates vertically in elevation. In addition, the species seems to move towards the north facing valleys during the months of heaviest rainfall.

El Yunque National Forest is managed by the U.S. Forest Service. It covers approximately 11,300 hectares (ha) (27,911 acres (ac)), with elevations ranging from 100 to 1,075 m (328 to 3,526 ft). The Elfin forest is found on the summits of mountains, and it is composed of dense stands of short, small diameter, twisted trees and shrubs. Mosses and epiphytes cover the plants and forest floor. The area is characterized by high rainfall (annual average of 453.3 cm or 178.5 in), high humidity, low solar insulations, low temperatures, and constant winds.

The species was reported from the Maricao Commonwealth Forest, which is located in western Puerto Rico in the Cordillera Central, and described as a mixture of mature native trees and shade coffee plantations. It covers approximately 4,150 ha (10,250 ac) and overlies serpentine derived soils, low in water holding capacity, and low in fertility, resulting in more xeric vegetation than might be expected given the amount of annual rainfall (235 cm (92.5 in)). Vegetation types are described as dry slope forest, slope forest, mixed hardwood, exposed ridge woodland (Elfin forest), and *Podocarpus* mixed woodland (DNER 1976, p. 185). In the Maricao Forest, the species is found in a variety of habitats, including disturbed sites, and was reported from elevations ranging from 650 to 900 m (2,132 to 2,952 ft) (Cruz and Delannoy 1984a, p. 90). The authors described the species from the Los Viveros area with a *Podocarpus*-mixed hardwood forest with a continuous canopy at 15 to 20 m (49.2 to 65.6 ft). Rosario Alto and Campamento Santana sites have a mixture of plantation (*Eucalyptus robusta* and *Calophyllum calaba*) and Elfin forest (i.e. *Podocarpus*) on the ridges.

Delannoy (2007, p. 9) sampled four forest types within the Maricao Commonwealth Forest: *Podocarpus* forest (80 ha), exposed woodlands (2,711 ha), plantation (1,111 ha), and dry slope forest (1,367 ha). The structure among forest types was very similar with extensive canopy cover and similar canopy heights, although plantation forest averaged significantly lower canopy height. The highest canopy was found in the dry-slope forest. Stem density was relatively high among forest types, but significantly higher in the dry-slope forest. All DBH classes (diameter at breast height; the outside bark diameter at breast height), with the exception of DBH class of 6.4-12.0 (cm), were larger in the dry slope forest.

Although the structure among forest types was very similar, Delannoy (2007, pp. 14-18) reported statistically-significant differences in elfin-woods warbler abundance among the four primary forest types sampled. The highest abundance of elfin-woods warbler was found in the *Podocarpus* forest within the Maricao Commonwealth Forest and in the shade coffee plantations located on lands adjacent to the public forest. The author did not provide reasons for these differences, but recommended additional studies on habitat selection and food resources for the implementation of effective management strategies (Delannoy 2007, p.26).

The species forages in the middle part of trees, gleaning insects from leaves in the outer portion of the tree crown (Cruz and Delannoy 1984b, p. 155). Information related to the breeding biology of this species is limited. The breeding season extends from March to June (Raffaele 1998, p. 406). Elfin-woods warblers build a compact cup nest, usually close to the trunk and well hidden among the epiphytes of a small tree. This species' nest is associated with aerial leaf litter, which is unique among wood warblers, and is placed at moderate heights (1.3-7.6 m (4.3-24.9 ft)) above ground (Wood 1992, p. 3). Rodríguez-Mojica (2004, p. 21) found one elfin-woods warbler nest with four hatchlings in a tree cavity of Palo Colorado (*Cyrilla racemiflora*) in the Maricao Forest.

Historical Range/Distribution

The elfin-woods warbler is endemic to Puerto Rico and has been reported in humid montane forest habitats. Initially thought to occur only in the Luquillo Mountains (El Yunque National Forest), this species was later discovered in the Maricao, Toro Negro, and Carite Commonwealth forests (Gochfeld *et al*. 1973, p. 231; Cruz and Delannoy 1984a, p. 92; Raffaele 1998, p. 406).

Current Range/Distribution

Once found in four sites, it is now restricted to two populations; one in the Maricao Commonwealth Forest (in southwestern Puerto Rico) and one in the El Yunque National Forest (in northeastern Puerto Rico) located about 145 km apart. Arroyo-Vázquez (1991, p. 55) did not find the elfin-woods warbler in the Toro Negro Forest during surveys conducted following Hurricane Hugo in 1989. In 2003 and 2004, Anadón-Irizarry (2006, p. 34) conducted surveys for the elfin-woods warbler in the Carite, Toro Negro, Guilarte , Bosque del Pueblo, and Maricao Commonwealth forests and the El Yunque National Forest, but only detected the species in the latter two. Delannoy (2007, p. 5) surveyed the Susúa Forest and visited the Toro Negro Forest for more than 30 years but did not detect the species.

The elfin-woods warbler is not evenly distributed within the Maricao Commonwealth Forest and El Yunque National Forest (Anadón-Irizarry 2006, p. 23). In Maricao, even though the species is found in several habitat types, the species is most abundant in *Podocarpus* Forest type at elevations from 601-900 m (1,972- 2, 953 ft). The *Podocarpus* forest type comprises about 80 ha (198 ac) or 1.9% of the forest area. Although the range of this species extends outside the Maricao Forest boundaries into adjacent private lands, Delannoy (2007) and Anadón-Irizarry (2006) both describe a trend in reduction in abundance with decrease of elevation. The species distribution in El Yunque National Forest revealed that it is concentrated more in the Palo Colorado (0.48 per point count station) and Elfin (0.42 per point count station) forests than Tabonuco (0.01) and Sierra Palm forests (0) (Anadón-Irizarry 2006, p. 24).

Population Estimates/Status

Kepler and Parkes (1972, p. 15) estimated the El Yunque elfin-woods warbler population at fewer than 300 pairs. Cruz and Delannoy (1984a, p. 92) reported the highest densities in the Maricao Forest at Los Viveros (20.9 individuals/ha (51.6/61.7 ac)) and significantly lower densities at Rosario Alto (3.0/25 ha (7.4/61.7 ac)) and Campamento Santana (1.2/25 ha (2.9/61.7

ac). Waide (1995, p. 9) estimated 138 pairs of elfin-woods warbler in the El Yunque National Forest using an area of Elfin woodland (329 ha) and the measured maximum density in the Maricao Forest (20.9 individuals/ha). Anadón-Irizarry (2006, p. 27) surveyed 155.2 ha of upland woods habitat in the El Yunque Forest, and recorded 196 elfin-woods warblers in seven counts for an average of 0.18 warblers /ha/count. Palo Colorado had the highest density with 0.30 warblers ha/count.

Anadón-Irizarry (2006, p. 27) surveyed 102.4 ha of habitat in the Maricao Forest and recorded 778 elfin-woods warblers in 18 counts for an average of 0.42 warblers/ha/count with *Podocarpus* having the highest density (0.94/ha/count) and dry slopes with the lowest. Delannoy (2007, p. 13) did not estimate the overall number of individuals in the Maricao Forest and adjacent properties, but provided an average elfin-woods warbler abundance per point-count station. Of the 127 point count stations located within the Maricao Commonwealth Forest, 106 (83.5%) yielded positive results for presence of elfin-woods warbler. Of the 234 point count stations located in lands adjacent to the Maricao Commonwealth Forest, only 58 (24.8%) yielded positive results for elfin-woods warbler presence. González (2008, p. 16-18) determined the abundance of the elfin-woods warbler in habitats of the Maricao Forest and adjacent areas. As with previous studies, species abundance was highest in *Podocarpus* forest (1.41 individuals per point count station) and lowest in dry adjacent forest (0.01 individuals per point count station). The species was not recorded in un-shaded coffee plantations. Within the Maricao Forest, González (2008, p. 18) estimated 97.67 elfin-woods warblers in a 203.2 ha/count sampling area; whereas in areas adjacent to the Maricao Forest, he estimated 43.02 elfin-woods warblers in a 374.4 ha/count sampling area.

Based on the above studies, the Maricao Forest sustains a higher number of elfin woods warbler per hectare that the El Yunque National Forest. Delannoy (2007, p. 24) states that these two populations are currently thriving well, and there is no indication that these population are declining in numbers; suggesting that the known elfin-woods warbler populations are stable. Birdlife International (Birdlife Caribbean 2004, pp. 12-13; 2009) estimates the total population at 1,800 individuals.

THREATS:

A. <u>The present or threatened destruction, modification, or curtailment of its habitat or range</u>.

Prime habitats for the elfin-woods warbler within Elfin forest and *Podocarpus* forest are essential hot spots of high warbler abundance and are very important for maintaining "healthy" populations (Delannoy 2007, p. 24). Delannoy (2007, p. 21) stated that within the Maricao Commonwealth Forest there are strong and continuous pressures to cut and replace *Podocarpus* forest for the development of infrastructure for the communications industry and for the expansion of recreational facilities and trails. The Maricao Forest has several private and government inholdings with communication towers and recreational facilities. Approximately 5 years ago, about 4 ha of *Podocarpus* forest habitat were cleared to create a picnic area; this area was equivalent to the loss of about four to five elfin-woods warbler territories. Recently, about 12 ha of *Podocarpus* forest were cleared to expand a camping ground possibly eliminating 10-12 elfin-woods

warbler territories (C. Delannoy 2009, pers. comm.). Waide (1995, p.17) suggested that areas of high pedestrian use have fewer birds. Therefore, the expansion of trail or road systems in either forest, or the increased use of those presently existing, may pose a threat to the species. However, Commonwealth and Federal regulations exist to minimize or prevent impacts from construction of infrastructure on elfin-woods warbler habitat within the Maricao Forest (See Factor D below).

Within the El Yunque National Forest, habitat has been protected and management activities are evaluated for impacts to wildlife species. Congress designated part of the El Yunque Forest as a Wilderness Area, which includes some of the Elfin, Tabonuco and Palo Colorado forest types. This brings an extra level of protection to activities impacting the elfin-woods warbler. However, the protection of lands adjacent to the El Yunque forest is still a concern. A study of a disturbed site in the Luquillo Mountains found that although 23 woody species were present after 18 years of recovery, the site would take approximately 200 years to fully recover to habitat suitable for the species (Weaver 1990, p. 83). Although Puerto Rico's Planning Board designated a buffer zone surrounding this forest as a Special Planning Area to protect the forest from direct impacts due to development, habitat within the buffer zone and in adjacent areas has experienced modification from the construction of residential projects. In the last decade we have provided technical assistance to the Puerto Rico Planning Board on at least three large-scale residential projects in the area. If residential development continues, the transitional habitat found on lands adjacent to El Yunque National Forest, used by the species for altitudinal migration, may become scarce.

Elfin-woods warbler is also known to migrate vertically, utilizing lower elevation areas where shade coffee plantations are found. However, areas adjacent to the Maricao Forest, described as potential habitat for the species and previously planted in shade coffee, were converted to sun coffee plantations. This resulted in the elimination of this over story and reduction in the value to wildlife, including the elfin-woods warbler. During his study of privately owned lands adjacent to the Maricao forest, Delannoy (2007 p. 15) did not detect the presence of the elfin-woods warbler in the sun coffee plantation in any of the survey points, while the shade coffee plantations exhibited the highest abundance of the species (0.35 average of elfin-woods warbler per point count) on lands outside the forest. Commonwealth and Federal incentive programs promote the cultivation of shade coffee, instead of sun coffee, for better, higher longevity coffee plants, the control of sedimentation and erosion, and pest control. However, incentive programs are completely voluntary and farmers may produce sun coffee and expand cultivation into potential elfin habitat adjacent to the Maricao Forest. Several sun coffee plantations are currently being converted to shade coffee plantations, which provide a better habitat for wildlife and the elfin-woods warbler; however, this conversion will take a few decades before full restoration to shade coffee plantation is complete. The Service has implemented a pilot conservation project for the species under the Partner's for Fish and Wildlife (PFW) Program to conserve and enhance suitable habitat for the species adjacent to the Maricao Commonwealth Forest. However, the project has limited resources and a similar conservation project may need to be implemented adjacent to El Yunque National Forest for the protection of private lands in the area.

Based on the above, the present or threatened destruction, modification, or curtailment of habitat or range is a threat to the species.

B. Overutilization for commercial, recreational, scientific, or educational purposes.

These factors have not been documented as threats to elfin-woods warbler.

C. Disease or predation.

Arroyo-Vázquez (1991, p. 78) and Waide (1995, p. 17) suggested that native bird species such as the pearly-eyed thrasher (*Margarops fuscatus*) and the sharp-shinned hawk (*Accipiter striatus*) may prey upon the species. However, no data are available documenting these threats. Based on the above information, predation is not a current threat to the species.

D. The inadequacy of existing regulatory mechanisms.

The elfin-woods warbler is currently protected by the Law # 241 known as the "Nueva Ley de Vida Silvestre de Puerto Rico" (New Wildlife Law of Puerto Rico) approved in 1999 by the Commonwealth of Puerto Rico. The purpose of this law is to protect, conserve and enhance both native and migratory wildlife species; declare all wildlife species within its jurisdiction property of Puerto Rico; regulate permits, regulate hunting activities, and regulate exotic species among others. Article 5 of the Law prohibits collection and hunting of wildlife species within the jurisdiction of Puerto Rico without a permit from the Secretary of the DNER. Law #241 also requires authorization from the Secretary of DNER for any action that may affect the habitat for the species.

In 2004, the Commonwealth of Puerto Rico adopted Regulation #6766 ("Reglamento para Regir las Especies Vulnerables y en Peligro de Extinción en el Estado Libre Asociado de Puerto Rico") which regulates the management of threatened and endangered species in Puerto Rico. Under Regulation #6766, the Commonwealth of Puerto Rico listed the elfin-woods warbler as a Vulnerable (VU) species, which is a species that, although not critically endangered, faces a high risk of extinction in the wild in the immediate future; a "vulnerable" status is equivalent to a "threatened" status. Regulation #6766 prohibits collecting, killing, or harming listed species, as well as possessing, transporting, or selling items derived from listed species. Regulation #6766 also requires authorization from the Secretary of DNER for any action that may affect the habitat for the species.

The Maricao Commonwealth Forest is protected by Law #133 ("Ley de Bosques de Puerto Rico" or The Puerto Rico Forest Law), as amended in 2000, which prohibits damage and collection of flora and fauna in public forests. The management plan for the Maricao Forest provides for the protection and conservation of species classified under DNER regulations as critical, threatened (vulnerable), or endangered (DNER 1976, p.3); elfin-woods warbler is classified as vulnerable by DNER.

Additionally, the species co-exists with other federally-listed species such as the Puerto Rican sharp-shinned hawk (*Accipiter striatus venator*), the Puerto Rican boa (*Epicrates inornatus*), and several listed plant species which are subject to the protections under sections 7 and 10 of the Endangered Species Act; therefore the elfin-woods warbler may benefit from indirect protection. The elfin-woods warbler was included in the State Wildlife Action Plan (DNER 2005a, p. 26). In addition, all Commonwealth forests are also designated as Critical Wildlife Areas (CWA) by the Commonwealth of Puerto Rico. The CWA designation constitutes a special recognition by the Commonwealth with the purpose of providing information to Commonwealth and Federal agencies about the conservation needs of these areas and assisting permitting agencies in precluding negative impacts as a result of permit approvals or endorsements (DNER 2005b, p. 6).

El Yunque National Forest is managed by the U.S. Forest Service. The Caribbean National Forest Act of 2005 designated 10,000 acres within the El Yunque National Forest as a component of the National Wilderness Preservation System to protect habitat for the elfin-woods warbler and the Puerto Rican parrot (*Amazona vittata vittata*). The designation of the area as a wilderness area means that the habitat is protected, development is not permitted, and actions in this area require approval from the U.S. Forest Service. Additionally, the Puerto Rico's Planning Board designated a buffer zone surrounding this forest as a Special Planning Area to protect the forest from direct impacts due to development.

As indicated under Factor A, there are strong and continuous pressures to cut and replace *Podocarpus* forest for the development of infrastructure for the communications industry and for the expansion of recreational facilities and trails (Delannoy 2007, p. 21); expansion of these facilities would have a direct impact to the elfin-woods warbler since they are mostly located within the *Podocarpus* forest type. The Maricao Forest has several existing private and government inholdings with communication towers and recreational facilities. Expansion of these facilities would have a direct impact to the elfin-woods warbler since they are mostly located within the *Podocarpus* forest type. However, there is a special regulatory process for the establishment of communication facilities within Commonwealth forests (Regulation 4745 of 1992) which requires considering critical elements, including species designated as vulnerable by the Commonwealth, and federally listed endangered species in the process.

There are existing Federal and Commonwealth regulatory mechanisms that provide protection to this species and its habitat. Although the elfin-woods warbler is not federally-listed, the species co-exists with federally-listed species that are protected under both Federal and Commonwealth regulations in the Maricao Commonwealth Forest and El Yunque National Forest. Therefore, the inadequacy of existing regulatory mechanisms is not considered a threat to the species.

E. <u>Other natural or manmade factors affecting its continued existence</u>.

In previous reviews, we stated that catastrophic events such as hurricanes may affect the abundance and distribution of the elfin-woods warbler. Arroyo-Vazquez (1991, p. 55) surveyed the Toro Negro and Carite forests after Hurricane Hugo in 1989 and did not detect the species. However, Tossas (2006, p. 84) found that the elfin woods warbler was one of two species that, after Hurricane Georges in 1998, recovered within a year to pre-hurricane population levels; suggesting that the warblers abandoned defoliated sites immediately after the hurricane and shifted to protected patches with adequate foraging substrate and prey, until the defoliated sites recovered. It is possible that small populations may experience local extinction with these catastrophic events. However, more surveys are necessary to assess the impact of these events on habitat use patterns of the species.

In the past, human-induced fires occurred at the Maricao Forest, particularly during the dry season. Reported fires have mostly occurred on the timber plantations of the lower slopes. At present time, DNER has a fire prevention program to prevent and respond to fires in public forests, so fire is not a threat to the forests where the elfin-woods warblers are found.

Based on the above, other natural or manmade factors are not affecting the species continued existence in Puerto Rico.

CONSERVATION MEASURES PLANNED OR IMPLEMENTED:

Scientists from the University of Puerto Rico, Mayagüez Campus, and the U.S. Forest Service have conducted studies on the abundance and distribution of elfin-woods warbler at various forests, and have reported observations on several aspects of the biology of the species. We received the final report for these studies in April 2007 and incorporated information into this assessment. The Caribbean National Forest Act of 2005 designated 10,000 acres within the El Yunque National Forest as a Wilderness Area to protect the elfin woods warbler and the federally listed Puerto Rican parrot. The Service continues to provide technical assistance to local agencies and private citizens on non-federal projects to curtail impacts to this species and its habitat. ESA section 7 consultation process for the Puerto Rican parrot furthers the recovery of this species through the review of communication towers sitting permits and federally sponsored projects.

It is essential to protect shade coffee habitats and restore sun coffee plantations to shade coffee plantations adjacent to elfin-woods warbler habitat in the Maricao Commonwealth Forest. The Caribbean Field Office's PFW program initiated a conservation initiative with private landowners in 2007 to conserve and enhance habitat, particularly shade coffee plantations through the Candidate Conservation Pilot Project Plan for the Southeast Region. According to this Plan, approximately 200 ac of elfin woods warbler habitat would be restored between 2007 and 2011. In 2008, the PFW program, in cooperation with Envirosurvey, Inc. restored 183 ac of tropical upland forest and 1.46 miles of riparian buffers for the elfin-woods warbler. Most of the conservation agreements are located within five miles of the Maricao Commonwealth Forest

where the elfin-woods warbler has recently been documented nesting in shaded coffee plantations and other abandoned agricultural lands.

SUMMARY OF THREATS (including reasons for addition or removal from candidacy, if appropriate):

The elfin woods warbler is a species with a limited distribution and threatened by habitat modification. Although there are laws and regulations protecting the species and habitat within the Maricao and El Yunque forests, habitat modification is a concern on adjacent lands. While there is an effort to restore sun-coffee plantations to shade-coffee habitat, there are still sun-coffee plantations adjacent to the Maricao Forest with the potential to expand into elfin-woods warbler quality habitat. Conversion of elfin-woods warbler habitat of better quality (*e.g*., mature secondary forests, young secondary forests, and shade-coffee plantations) along the periphery of the Maricao Commonwealth Forest to marginal habitat (*e.g*., pastures, dry slope forests, residential rural forests, gallery forests, and un-shaded coffee plantations) may result in ineffective corridors for dispersal and expansion of the elfin-woods warbler. In addition, although Puerto Rico's Planning Board designated a buffer zone surrounding this forest as a Special Planning Area to protect the forest from direct impacts due to development, habitat within the buffer zone and in adjacent areas has experienced modification from the construction of residential projects.

We have sufficient information on biological vulnerability to maintain the elfin-woods warbler as a candidate species. We find that this species is warranted for listing throughout all its range, and, therefore, find that it is unnecessary to analyze whether it is threatened or endangered in a significant portion of its range.

For species that are being removed from candidate status:

___Is the removal based in whole or in part on one or more individual conservation efforts that you determined met the standards in the Policy for Evaluation of Conservation Efforts When Making Listing Decisions (PECE)?

RECOMMENDED CONSERVATION MEASURES:

In addition to the currently implemented conservation measures, the potential for a Candidate Conservation Agreement with the US Forest Service and the DNER for additional benefit to the species should be examined.

Delannoy (2007, pp. 24-25) recommended a number of conservation measures to help conserve elfin-woods warbler and its habitat. The conservation of the *Podocarpus* forest type in the Maricao Commonwealth Forest is critical and essential for the survival of the species. Degraded lands should be restored with species like María (*Calophyllum calaba*) because it was among the plantation types within the Maricao Forest with higher elfin-woods warbler abundance. To address these recommendations, the Service's Partners for Fish and Wildlife Program has initiated a project to conserve and enhance private farms adjacent to the Maricao Forest to provide suitable habitat for the species. Additional habitat restoration projects are needed to provide effective corridors for elfin-woods warbler dispersal throughout the central mountains of

Puerto Rico. A greater effort should be made in outreach and education activities for elfin-woods warbler to increase awareness of the species and need for its conservation especially in municipalities located adjacent to its known habitats.

LISTING PRIORITY

THREAT			
Magnitude	Immediacy	Taxonomy	Priority
High	Imminent	Monotypic genus	1
		Species	2
		Subspecies/population	3
	Nonimminent	Monotypic genus	4
		Species	5
		Subspecies/population	6
Moderate to Low	Imminent	Monotypic genus	7
		Species	8
		Subspecies/population	9
	Nonimminent	Monotypic genus	10
		Species	**11***
		Subspecies/population	12

Magnitude:

The distribution of elfin-woods warbler is limited to two populations on opposite ends of Puerto Rico. The most recent surveys in other high elevation forests along the central mountain chain (Commonwealth Forests of Toro Negro, Guilarte, Bosque del Pueblo, and Carite) have failed to detect this species. Habitat modification still occurs, but it is only in limited areas and there is no indication that the two populations of elfin-woods warbler are declining in numbers. Therefore, the magnitude of threats is moderate to low.

Imminence:

The immediacy of threats to elfin-woods warbler is nonimminent because most of the known range of this species is within forests administered and managed by the DNER or the U.S. Forest Service. Both agencies have regulatory mechanism to address maintenance activities at the telecommunication tower areas and current trails. However, some activities within inholdings by other agencies and on current permitted areas may still impact the species habitat.

Rational for Change in Listing Priority Number: N/A

Yes Have you promptly reviewed all of the information received regarding the species for the purpose of determining whether emergency listing is needed?

Is Emergency Listing warranted?

No. At the time of this review, there was no indication that threats to the elfin-woods warbler have increased, or that population numbers have been reduced from previous numbers.

DESCRIPTION OF MONITORING:

The Service has funded several studies to investigate the status and nesting habitat requirements of the elfin-woods warbler at the Maricao Commonwealth Forest, in cooperation with the University of Puerto Rico, Mayagüez Campus that started in the fall of 2004 and was concluded in December 2006. The report was submitted to the Service in April 2007 and included in our 2008 Candidate Assessment of this species.

COORDINATION WITH STATES (indicate which State(s) (within the range of the species) provided information or comments on the species or latest species assessment):

The DNER manages the Maricao Commonwealth Forest and sporadically provides assistance and information on recent sightings and trail access. Additionally, the Service works closely with the DNER in the coordination of research on elfin-woods warbler at the Maricao Forest funded by the Service. The elfin-woods warbler is protected by the DNER and was included in the Comprehensive State Wildlife Action Plan (DNER 2005a, p. 26).

Indicate which State(s) did not provide any information or comments: N/A

LITERATURED CITED

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Arroyo-Vázquez, B. 1991. Comparative study of foraging behavior and habitat selection of resident wood warblers (*Dendroica*) in southwestern Puerto Rico. M.S. thesis, University of Arkansas. 83 pp.

BirdLife International. 2009. Species factsheet: *Dendroica angelae*. Downloaded from http://www.birdlife.org on 9/16/2009.

Birdlife Caribbean. 2004. Newsletter. October (1): pp. 12-13.

Cruz, A. and C. A. Delannoy. 1984a. Ecology of the elfin-woods warbler (*Dendroica angelae*). I. Distribution, habitat usage, and population densities. Carib. J. Sci. 20 (1-2): 89-96.

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Delannoy, C.A. 2007. Distribution, abundance and description of habitats of the elfin-woods warbler *Dendroica angelae*, in southwestern Puerto Rico. Final Report submitted to the U.S. Fish and Wildlife Service under Grant Agreement No. 401814G078. University of Puerto Rico, Mayaguez Campus. 77pp.

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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: _____ June 14, 2010
for Regional Director, Fish and Wildlife Service Date

Concur: _____ Date: October 22, 2010
ACTING
Director, Fish and Wildlife Service

Do Not Concur:

_____ _____
Director, Fish and Wildlife Service Date

Director's Remarks

Date of annual review: March 2010

Conducted by: Caribbean Field Office, Boquerón, Puerto Rico