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

Scientific Name:

Atlantea tulita

Common Name:

Puerto Rico harlequin Butterfly

Lead region:

Region 4 (Southeast Region)

Information current as of:

04/16/2015

Status/Action

___ Funding provided for a proposed rule. Assessment not updated.

___ Species Assessment - determined species did not meet the definition of the endangered or threatened under the Act and, therefore, was not elevated to the Candidate status.

___ New Candidate

_X_ Continuing Candidate

___ Candidate Removal

- ___ 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
- ___ 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
- ___ Range is no longer a U.S. territory
- ___ Insufficient information exists on biological vulnerability and threats to support listing

___ Taxon mistakenly included in past notice of review

___ Taxon does not meet the definition of "species"

___ Taxon believed to be extinct

___ Conservation efforts have removed or reduced threats

___ More abundant than believed, diminished threats, or threats eliminated.

Petition Information

___ Non-Petitioned

_X_ Petitioned - Date petition received: 02/25/2009

90-Day Positive:04/26/2010

12 Month Positive:05/31/2011

Did the Petition request a reclassification? **No**

For Petitioned Candidate species:

Is the listing warranted(if yes, see summary threats below) **Yes**

To Date, has publication of the proposal to list been precluded by other higher priority listing? **Yes**

Explanation of why 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 this 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.

Historical States/Territories/Countries of Occurrence:

- **States/US Territories**: Puerto Rico
- **US Counties**:County information not available
- **Countries**:Country information not available

Current States/Counties/Territories/Countries of Occurrence:

- **States/US Territories**: Puerto Rico
- **US Counties**:County information not available
- **Countries**:Country information not available

Land Ownership:

Private and Public

Lead Region Contact:

ARD-ECOL SVCS, Victoria Davis, 404-679-4176, victoria_davis@fws.gov

Lead Field Office Contact:

CARIBBEAN ESFO, Carlos Pacheco, 787-851-7297, carlos_pacheco@fws.gov

Biological Information

Species Description:

The Puerto Rican harlequin butterfly is endemic to Puerto Rico, and is one of the four species endemic to the Greater Antilles within the genus Atlantea (Biaggi-Caballero 2009). The Puerto Rican harlequin butterfly has a wing span of about 2 to 2.5 in (6 cm) wide. Female and male harlequin butterflies are similar in color patterns and size. This butterfly is brownish black at the dorsal area with deep orange markings and confused black markings at the half basal anterior wing. The posterior wing has a wide black border enclosing a set of reddish-bronze sub-marginal points. The ventral side of the anterior wing is similar to the dorsal anterior wing, and the posterior is black with orange basal spots and a complete postdiscal beige band with a band of reddish spots distally and sub-marginal white half-moons. The costa, the most anterior (leading) edge of a wing, in males is gray and wide. Females are multivoltine ovipositors (they produce several broods in a single season) (Biaggi-Caballero 2009).

Taxonomy:

The species was described in 1877 by the German lepidopterist, Dr.Herman Dewitz , from specimens collected by Dr. Leopold Krug in the Municipality of Quebradillas, Puerto Rico.

Kingdom: Animalia
Phylum: Arthropoda
Class: Insecta
Order: Lepidoptera
Family: Nymphalidae
Genus: Atlantea
Scientific name: Atlantea tulita

Habitat/Life History:

The Puerto Rican harlequin butterfly occurs within the subtropical moist forest life zone on limestone-derived soil in the Northern karst Region (Ewel and Whitmore 1973, p. 25) and in the subtropical wet forest on serpentine derived soil in the Maricao Commonwealth Forest (Ewel and Whitmore 1973, p. 32). The subtropical moist forest life zone on limestone derived soil covers about 1.15 percent (10,338 ha (25,545.75 ac)) of the total area of Puerto Rico (USDA 2008, p. 21), however, the subtropical wet forest on serpentine-derived soil cover about 0.04 percent (358 ha (884.63 ac)) of the total area of Puerto Rico (USDA 2008, p. 20).

The species has been observed on a forest associated with coastal cliffs in Quebradillas and on sclerophullous forest (type of vegetation characterized by hard, leathery, evergreen foliage that is specially adapted to prevent moisture loss) in the Maricao Commonwealth Forest. The vegetation in the Puerto Rican harlequin butterfly's habitat in Quebradillas consists of *Oplonia spinosa* (prickly bush), *Cocoloba uvifera* (sea grape), *Boureria suculenta* (palo de vaca), *Lantana camara* (cariaquillo), *Lantana involucrata* (cariaquillo), *Randia aculeate* (tintillo), *Vernonia albicaulis* (no common name), *Poitea paucifolia* (no common name), *Leucaena leucocephala* (leucaena), *Eupatorium odoratum* (no common name), *Erithalis fructicosa* (no common name), *Distictis lactifolia* (no common name), *Bidens pilosa* (no common name), *Croton rigidus* (adormidera), *Staehytarpeta jamaicensis* (no common name), *Stigmaphyllon emargiuatum* (bull reed), and *Tabebuia heterophylla* (roble). The Puerto Rican harlequin butterfly has only been observed utilizing the *Oplonia spinosa* (prickly bush) as its host plant (plant used for laying the eggs and serves as a food source for the development of the larvae). *Oplonia spinosa* is a common tropical coastal shrub and is widely distributed in Puerto Rico. The Puerto Rican harlequin butterfly only lays eggs in the vegetative (green) stems on the apical zone (the tenderest zone on Oplonia spinosa new growth) (Biaggi-Caballero 2010, p. 2). No other stage of host plant is used for ovoposition (action of laying eggs). The chrysalis is also attached to dried twigs of the host plant (Biaggi-Caballero 2009, p. 3).

Adult butterflies feed from the nectar of the flowers available at the site but have not been observed feeding from the prickly bush. Most individuals have been found feeding on flowers of sea grape, palo de vaca, and cariaquillo. Carrión-Cabrera (2003, p. 40) stated that the species dispersion is limited by the monophagus habit of the larvae, only utilizing the prickly bush to feed. Carrión-Cabrera (2003, p. 51) further suggests that this butterfly flies slowly and is weak and it is considered relatively sedentary (not able to move or disperse in a given environment).

Historical Range/Distribution:

The historic range of the Puerto Rican harlequin butterfly includes the northern and southern karst, and the central western volcanic, regions of Puerto Rico. Within these three regions, the species has been historically reported from five municipalities: (1) In the northern karst region, the harlequin butterfly was reported from the municipalities of Quebradillas and Arecibo; (2) in the central-western volcanic region, the species was reported from the municipalities of Maricao and

Sabana Grande; and (3) in the southern karst region, it was reported from the municipality of Peñuelas (Carrión-Cabrera 2003, p. 32).

Current Range Distribution:

The Puerto Rican harlequin butterfly has been currently reported from two regions: (1) the northern karst region, and (2) the central-western volcanic-serpentine region (Pérez-Asso et al. 2009). At the northern karst region, the species is known to occur in an approximately 144 ha (356 ac) strip of forested habitat located on the northern coastal cliff between the municipalities of Isabela, Quebradillas, and Camuy (Biaggi- Caballero 2009). Here, the species' habitat is limited to the east by the Bellacas Creek, to the west by the Royal Isabela Gulf Court, to the north by the Atlantic Ocean, and to the south by Puerto Rico (PR) Highway No. 2 (a state road that runs parallel to the north coast from Aguadilla to San Juan) and deforested areas utilized for agricultural practices such as cattle grazing.

Within this area, the Puerto Rican harlequin butterfly occurs in:
• 10 scattered patches in the Terranova and San José wards in the municipality of Quebradillas, occupying an area of 1.05 ha (2.6 ac) (Monzón- Carmona 2007);
• One patch occupying an area of 0.26 ha (0.65 ac) on the forested cliff on western side of the mouth of the Guajataca River mouth in Coto ward in the municipality of Isabela (Monzón-Carmona 2007);
• One patch (no acreage reported) on the forested cliff along the Pastillo beach at Coto ward in the municipality of Isabela (H. Torres, UPRM, 2012, pers. comm.); and
• One small patch (no acreage reported) at Puerto Hermina in the municipality of Camuy (Biaggi-Caballero, pers. comm., 2010).

The Quebradillas' population occurs in both private and public lands. Five of the 10 patches known in the Municipality of Quebradillas fall within El Merendero, a public land managed for recreation by the Puerto Rico Department of Sports and Recreation (Monzón-Carmona 2007). The population at El Pastillo beach occurs on a forested cliff in a private land managed for conservation since 2012 by El Pastillo Conservation Trust (J. Chabert, Executive Director - El Pastillo Conservation Trust, 2013, pers. comm.). The other 7 patches, including the patch in the municipality of Isabela and the patch in the municipality of Camuy, are located on private lands.

On December 19, 2012, Service biologist Jesús Ríos, documented a male imago of the Puerto Rican harlequin butterfly in the Río Abajo Commonwealth Forest (J. Ríos, Service, 2012, unpublished data). This new sighting falls in an area located approximately 29.9 kilometers (20 miles) southeast of the Quebradillas' population, and outside of the historical range of the species in the northern karst. The Rio Abajo Commonwealth Forest is a public land managed for conservation and passive recreation by the Commonwealth of Puerto Rico since 1935 (DNR 1976).

In the central-western volcanic serpentine region, the Puerto Rican harlequin butterfly occurs in the Maricao Commonwealth Forest, a public forest managed for conservation by the Puerto Rico Department of Natural and Environmental Resources (PRDNER). The Maricao Commonwealth

Forest is located between the municipalities of Maricao and Sabana Grande in west-central Puerto Rico to the west of the municipality of Mayagüez, and approximately 108.88 km (67.66 mi)) from San Juan (Pérez-Asso et al. 2009). This discrete population of Puerto Rican harlequin butterflies occurs near PR Road 120, a state road that provides access from the municipality of Maricao to the municipality of Sabana Grande.

Population Estimates/Status:

Carrión-Cabrera (2003, p. 60) observed only 235 Puerto Rican harlequin butterfly imagoes (mature adult stage) during 12 months of surveys (2 sample days per month) on 0.82 acre in Quebradillas. However, more recently, Biaggi-Caballero (2009, p. 4) estimated the population to be 45 or fewer adults on any given day in the municipality of Quebradillas. Larva counts were reported to be between 10 and 100 per census day (2 man-hours of search efforts), and the presence of more than one generation confirms the species' multivoltine (producing several broods in a season) nature. From July to December, the larva population is lower than during the rest of the year. Since 2002, only 3 imagoes (Biaggi- Caballero 2010, p. 5) and 12 larvae (H. Torres 2010, pers. comm.) of the Puerto Rican harlequin butterfly have been reported in the Maricao Commonwealth Forest between the km 16.0 (mi 9.94) and km 16.8 (mi 10.44) points of PR Road 120.

The Puerto Rican harlequin butterfly population has been estimated at around 50 imagoes in the northern karst region (Biaggi-Caballero 2009, p. 4) and fewer than 20 imagoes in the volcanic serpentine central mountains of the island (Carrión-Cabrera 2003, p. 48).

Distinct Population Segment(DPS):

N/A

Threats

A. The present or threatened destruction, modification, or curtailment of its habitat or range:

Habitat modification and fragmentation have been identified as the main threat to the Puerto Rican harlequin butterfly (Carrión-Cabrera 2003; Monzón- Carmona 2007; Biaggi-Caballero 2009; Pérez-Asso et al. 2009; DNER, 2010, unpublished data). The consequences of the loss and fragmentation of natural habitat for the species is detrimental because: (a) it seems to have low dispersal capabilities, (b) has limited distribution, (c) has highly specialized ecological requirements (discussed in more detail under Factor E), and (d) is considered a specialist species because of the larvae's monophagous habit of feeding only on the plant *Oplonia spinosa* (Carrión-Cabrera 2003). The Puerto Rican harlequin butterfly faces significant threats from the existing and imminent destruction, modification, and curtailment of its habitat and geographic range in the municipalities of Isabela, Quebradillas, and Camuy. Most of the suitable habitat for the species, especially in the municipality of Quebradillas, is currently fragmented by residential and tourist development. Dr.

Stuart Ramos (University of Puerto Rico, Mayagüez Campus) reported that in 1997 one of the healthiest populations of the species showed a drastic decrease after the use of heavy equipment to clear vegetation in the Puente Blanco area in Quebradillas (Carrión-Cabrera 2003). In areas where undeveloped land remains, the species' larval food plant is likely to be affected by existing agricultural practices that result in deforestation to increase grass lands for cattle grazing.

Currently, the Puerto Rican harlequin butterfly is threatened by large-scale residential and touristic projects, which are planned within and around its habitat in northern Puerto Rico. For instance, in the municipalities of Isabela and Quebradillas, occupied suitable habitat is within an area classified by both municipalities and the Puerto Rico Planning Board (PRPB) as a ''Zone of Tourist Interest'' (PRPB, online data 2009, at http://www.jp.gobierno.pr). A Zone of Tourist Interest is an area that has the potential to be developed to promote tourism due to its natural features and historic value. In 2010, the PRPB website announced 11 residential development projects that were under evaluation around the species' habitat, possibly affecting 74.8 cuerdas (29.4 ha [72.6 ac]) in Quebradillas (PRPB, online data 2010). Reports from Esrnesto Estremera (Ecological Alliance of Quebradilla, 2013, pers. comm.) indicate that over 20 residential and tourist development projects are proposed within the Puerto Rican harlequin butterfly's habitat. However, by 2014, only one new house had been constructed at the Puente Blanco area and another house is under construction (C. Pacheco, Service, 2014, pers.obs.). We believe that most of these proposed projects will not be constructed in near future due to to the reduction in the economic activity in Puerto Rico. Nevertheless, land owners have removed the vegetation from the proposed projects sites, affecting the suitability of the habitat for the butterfly (C. Pacheco, Service, 2014, pers. obs.).

Urban development in or around the Puerto Rican harlequin butterfly's habitat would directly and indirectly fragment and impact its habitat and would limit its population expansion in the area. Additionally, the establishment of residential and tourist development projects are expected to increase traffic, and therefore, are likely to require road improvements in proximity to the Puerto Rican harlequin butterfly habitat. The biological effects of the existing roads on the species have not been studied and are not understood. However, increasing vehicle traffic on the roads within the essential habitat of a species with difficulties to move or disperse can result in mortality due to collisions and, in some instances, can be catastrophic to the population and should not be underestimated (Glista 2007). The combination of habitat fragmentation and high road density may negatively impact the species and its habitat.

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

An unknown number of Puerto Rican harlequin butterflies have been collected for scientific purposes and deposited in universities and private collections (J. Biaggi-Caballero 2011, pers. comm.). However, at present, only a few researchers are working with the Puerto Rican harlequin butterfly, and collection of the species is regulated by the PRDNER. The Service is not aware of any information that indicates the butterflies are being sought by collectors or collected for other purposes. Therefore, we do not find that overutilization for commercial, recreational, scientific, or educational purposes threaten the Puerto Rican harlequin butterfly.

C. Disease or predation:

Biaggi-Caballero (2010, p. 8) suggests the abundance of spiders (*Misumenus bubulcus*, *Peucetia viridians*, *Argiope argentata* and *Nephila clavipes*) are a possible source of predation to the Puerto Rican harlequin butterfly. He also mentions lizards (*Anolis cristatellus* and *A. striatus*), and birds (*Tyrannus dominguensis*, *Dendroinca adelaida adelaida*, and *Quiscalus brachypterus*) as possible predators. Although no predator has been documented attacking and eating imagoes, larvae, or eggs, the sudden disappearance of larvae under observation suggests depredation (Biaggi-Caballero 2010, p. 8). Although the Puerto Rican harlequin butterfly may face predation by spiders, lizards, and birds, we are not aware of any data that indicate that predation is a significant threat to the species. We are not aware of any information regarding any impacts from disease on the Puerto Rican harlequin butterfly. Therefore, we do not find that disease or predation threatens the Puerto Rican harlequin butterfly.

D. The inadequacy of existing regulatory mechanisms:

The PRDNER designated the Puerto Rican harlequin butterfly as Critically Endangered under Commonwealth Law No. 241 and Regulation 6766 on February 11, 2004 (DNER 2004, p. 42; DNER 2010, unpublished data, p. 1). Article 2 of Regulation 6766 includes all prohibitions and states that the designation as “critically endangered” prohibits any person from taking the species; including to harm, possess, transport, destroy, import or export individuals, eggs, or juveniles without previous authorization from the Secretary of DNER (DNER 2004, p. 28). Although, the PRDNER has not designated critical habitat for the species under Regulation 6766, Law No. 241 prohibits modification of any natural habitat without a permit from the PRDNER Secretary. The Service believes that Law No. 241 and Regulation 6766 provide adequate protection for the species. However, the lack of effectiveness of enforcement makes these policies inadequate for the protection of the habitat of the Puerto Rican harlequin butterfly, and particularly its host plant (Biaggi-Caballero 2010, p. 9). Biaggi-Caballero (2010, p. 9) states that constant violation of the law occurs when the species’ habitat is modified, destroyed, or fragmented by urban development and vegetation-clearing activities. The host plant is considered a common species associated with edges of forested lands and is not directly protected by Law No. 241 or Regulation 6766. Under Factors A and E, we discuss in more detail certain cases of lack of enforcement that have led to threats to the species and its habitat. For these reasons, we conclude that existing regulatory mechanisms may be inadequate to protect the habitat of the Puerto Rican harlequin butterfly.

E. Other natural or manmade factors affecting its continued existence:

Based on a review of the best available information, we have determined that the Puerto Rican harlequin butterfly may also be threatened by: limited distribution; low reproductive capacity, and ecological requirements; human induced fire; use of herbicides and pesticides; vegetation management; and climate change.

Limited Distribution

The Puerto Rican harlequin butterfly is vulnerable to extinction due to low population numbers and restricted distribution (only two isolated colonies), coupled with loss or alteration of habitat, and the monophagus habit of its larvae (Carrión-Cabrera 2003). The Quebradillas population occupies about 0.9 percent of the total area of the forested habitat located on the northern cliff along the municipalities of Isabela, Quebradillas, and Camuy. For instance, in Quebradillas where the most significant population occurs, the species occupies only 2.6 ac [1.05 ha]) distributed in 10 scattered patches that fluctuate from 0.02 ac (0.007 ha) to 0.81 ac (0.387 ha) (Monzón-Carmona 2007). Its small range may reflect a remnant population of a once widely distributed butterfly whose habitat has been altered or lost due to previous land uses. Although the host plant *Oplonia spinosa* has been found widely distributed throughout Puerto Rico, the harlequin butterfly has been only detected in two localities (Carrión- Cabreara 2003). Dr. Hernan Torres, (University of Puerto Rico, Mayagüez Campus; UPRM) suggested that the limited distribution of the species may be an effect of deforestation for agricultural practices and of pesticides use for pests and mosquito control (H. Torres, UPRM, 2010, pers. comm.). Additionally, Monzón-Carmona (2007) suggested that although the species can disperse several hundred meters (approximately 800 meters [2,625 ft]), and has the capacity to colonize adjacent patches of *Oplonia spinosa*, it also shows the smallest geographic range of any butterfly in Puerto Rico. This information suggests that the current limited distribution of the Puerto Rican harlequin butterfly may be as a result of an undetermined ecological requirement of the species.

Low Reproductive Rate and Highly Specialized Ecological Requirements

The low reproductive rate (average lifetime number of offspring produced by a member of a population) of the Puerto Rican harlequin butterfly and its highly specific ecological requirements for completing its life cycle, are a threat to the species. These characteristics make the species less resilient and resistant to stressors that may impact existing populations. Carrión-Cabrera (2003) conducted a species survey and only observed 235 adult individuals in 12 months. Eggs and larvae have been found only on *Oplonia spinosa* (Biaggi-Caballero 2010). Its broods generally contain 50 to 150 eggs, with an average of 102 eggs per brood (Carrión-Cabrera 2003). However, the author also found that the number of larvae decreased as the number of adult individuals increased, suggesting that the population dynamic of the species may be synchronized with an undetermined environmental factor (Carrión-Cabrera 2003).

Fire

Human-induced fire is a current threat for the species in Quebradillas and Maricao (Biaggi-Caballero 2009; Biaggi-Caballero 2010). Fire may kill adults, young, and larvae, and eliminates or modifies the habitat of the species either temporarily or permanently. The Maricao Commonwealth Forest has been subjected to human induced fires, potentially affecting the habitat used by the Puerto Rican harlequin butterfly. At the Maricao Commonwealth Forest, the species occurs in the driest section near road PR 120. On February 25, 2005, arson burned more than 400 acres with unknown effects to the harlequin butterfly population (Biaggi-Caballero 2010). This fire likely had at least temporary effects on the butterfly’s habitat, but we have no information regarding

these effects and whether or not they were permanent. In Quebradillas, the species' habitat in the Puente Blanco area, where the most significant population occurs, is threatened by fires associated with clandestine garbage dumps on PR 4485 (DNER, 2010, unpublished data).

Use of Herbicides, Pesticides, and other Mechanisms to control vegetation

The use of herbicides is a current threat to the species and its host plant, *Oplonia spinosa*, which is found at the edges of roads and open areas. The use of herbicides is a current practice implemented to eliminate vegetation along the access road to Puente Blanco (road PR 4485) and private properties, and affects an undetermined number of *Oplonia spinosa* plants in Quebradillas (C. Pacheco, USFWS, 2009, pers. obs.). Further, fumigation programs are being implemented by the Commonwealth of Puerto Rico and local health officials at Terranova and San José wards to control dengue fever (a virus-based disease spread by mosquitoes) (Biaggi-Caballero 2010). The area where this population occurs in Quebradillas is surrounded by residential development. No pesticide use guidelines have been developed where the species occurs (Biaggi- Caballero 2010). Vegetation management at El Merendero in Quebradillas (public land managed as a recreational area and where the species currently occurs) may adversely affect the Puerto Rican harlequin butterfly and its host plant. *Oplonia spinosa* grows on both sides of the existing hiking trails and around the picnic areas at El Merendero. Maintenance personnel frequently trim the new growth of this plant to remove vegetation from the trails and picnic areas. The Puerto Rican harlequin butterfly uses the tenderest vegetative branches of new growth of the host plant for bearing its eggs and feeding during the larval stages (Biaggi-Caballero 2010). On April 12, 2012, maintenance staff of the municipality of Quebradillas cleared approximately 1 acre (0.4 ha) of vegetative cover within the species habitat at El Merendero. Trimming the host plant and clearing the vegetation in these areas may result in mortality of the Puerto Rican harlequin butterfly eggs and larvae. Further, the coastline of Isabela and Quebradillas is under pressure for urban and tourist development, only small remnants of coastal vegetation conserved in the steeper areas of the northern cliff still exist. In this area, landowners clear vegetative cover to the edge of the cliff so that potential buyers have a better view of the property and its landscape (Biaggi-Caballero 2010; C. Pacheco, Service 2014, pers. obs.). Currently, no guidelines about vegetation management and clearing have been developed to avoid or minimize effects to the species and its host plant.

Climate Change

The Intergovernmental Panel on Climate Change (IPCC) concluded that evidence of warming of the climate system is unequivocal (IPCC 2007a). Numerous long-term climate changes have been observed, including changes in arctic temperatures and ice, and widespread changes in precipitation amounts, ocean salinity, wind patterns, and aspects of extreme weather, including droughts, heavy precipitation, heat waves, and the intensity of tropical cyclones (IPCC 2007b). While continued change is certain, the magnitude and rate of change is unknown in many cases. Species that are dependent on specialized habitat types, that are limited in distribution or that have become restricted to the extreme periphery of their range will be most susceptible to the impacts of climate change. As previously mentioned, the Puerto Rican harlequin butterfly is currently only known from the northern karst region and the west-central volcanic-serpentine region of Puerto

Rico, and requires a very unique habitat type, which makes the species susceptible to the effects of climate change. However, we did not find any site-specific climate change information related to the Puerto Rican harlequin butterfly or its habitat. Thus, potential effects of climate change on the species and its habitat are currently unknown. Therefore, at this time, we do not consider climate change to be a threat to the species and its habitat.

Conservation Measures Planned or Implemented :

The Commonwealth of Puerto Rico currently considers the harlequin butterfly to be “critically endangered” under Commonwealth Law No. 241 and Regulation 6766. In 2013, the Service has propagated approximately 40 individuals of *Oplonia spinosa* (the host plant) to be planted in protected areas where the species can be introduced. In 2014, the Service and Ciudadanos del Karso (CDK; a local NGO) planted 20 of those individuals at El Tallonal's Farm, a private property managed by CDK for conservation. El Tallonal's Farm is located in the municipality of Arecibo at 21.9 km (13.5 mi) southeast from El Merendero in Quebradillas and 8.05 km (5.0 mi) north from the Río Abajo Commonwealth Forest. The Service will also explore with the Natural Resources Conservation Service (NRCS) the possibility to implementing conservation and restoration practices in private lands to benefit the Puerto Rican harlequin butterfly through NRCS' incentive programs. Also, the Service has conducted meetings with the Puerto Rico Department of Sports and Recreation to diminish impacts on the vegetation along the trails of El Merendero. The Service will continue monitoring the status of the species.

Summary of Threats :

This status review identified threats to the species attributable to Factors A, D, and E. For Factor A, we believe that the Puerto Rican harlequin butterfly is currently threatened by residential and tourist development, and habitat fragmentation. Modification of suitable habitat would substantially affect the distribution and abundance of the species. The scope and timing of this factor are considered by the Service to be high and imminent because known populations occur in areas that are subject to development, increased traffic, and increased road maintenance and construction. For Factor D, although there are current laws protecting the species, the lack of effective enforcement makes these policies inadequate for the protection of the species and its habitat. For this reason we concluded that the Puerto Rican harlequin butterfly is threatened by the inadequacy of existing regulatory mechanisms. With regard to Factor E, the Puerto Rican harlequin butterfly has limited distribution and highly specialized ecological requirements. Thus, we consider that other natural or manmade factors affecting the Puerto Rican harlequin butterfly are high and imminent. These threats may promote susceptibility to declines and affect the species’ populations directly during all life stages. In combination or by themselves, the primary natural or manmade threats explained above may exacerbate the intensity, duration, and exposure level of any other threats acting upon the species, including the use of herbicides and pesticides, vegetation management, and human induced fires. Based on this information, we conclude that factor E affects the continued existence of the species and that this threat is expected to continue and potentially increase in the foreseeable future.

Factor B (overutilization for commercial, recreational, scientific or educational purposes) and Factor C (disease and predation) do not present current threats to the species.

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 :

• Continue to conduct surveys to update species status and distribution.

• Introduce Puerto Rican harliquin butterfly individuals in protected areas (e.g. Maricao Commonwealth Forest) in coordination with the Puerto Rico Department of Natural and Environmental Resources.

• Continue propagation of the host plant (*Oplonia spinosa*) to plant in protected areas where the Puerto Rican harlequin butterfly will eventually be introduced.

• Initiate efforts to protect Puerto Rican harlequin butterfly populations on private land.

• Recommend measures to protect and minimize effects on the species and the host plant during technical assistance and in consultations (informal or formal).

• Continue public education and outreach

Priority Table

Magnitude	Immediacy	Taxonomy	Priority
High	**Imminent**	Monotypic genus	1
		Species	**2**
		Subspecies/Population	3
	Non-imminent	Monotypic genus	4
		Species	5
		Subspecies/Population	6
Moderate to Low	Imminent	Monotype genus	7
		Species	8
		Subspecies/Population	9
	Non-Imminent	Monotype genus	10
		Species	11
		Subspecies/Population	12

Rationale for Change in Listing Priority Number:

n/a

Magnitude:

We consider the threats to the Puerto Rican harlequin butterfly to be high in magnitude because many of the threats analyzed are present throughout its range and are likely to result in adverse impacts to the status of the species because of its small population size and limited distribution.

Imminence :

Threats are imminent because the known populations occur in areas subject to development, increased traffic, and increased road maintenance and construction as well as low distribution, low reproductive capacity and highly specialized ecological requirements. The threats are currently occurring throughout the range of the species. These impacts directly affect the species' ability to reproduce and expand to larger areas, and may promote susceptibility to population declines. Moreover, the threats are current and expected to continue in the future.

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

Emergency Listing Review

__No__ Is Emergency Listing Warranted?

Description of Monitoring:

The Service conducted surveys for the 12 month finding at Quebradillas, Maricao and Peñuelas to help document the status and distribution of the species. Surveys also helped identify the effects of the threats towards individuals and/or populations of the harlequin butterfly. In addition, Dr. Hernán Torres has conducted other surveys and has gathered valuable information that may help conservation agencies in the recovery of the species.

Indicate which State(s) (within the range of the species) provided information or comments on the species or latest species assessment:

none

Indicate which State(s) did not provide any information or comment:

Puerto Rico

State Coordination:

We requested information from the Department of Natural and Environmental Resources; however, they did not provide any information.

Literature Cited:

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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:  05/28/2015
Date

Concur:  12/15/2015
Date

Did not concur: _____ _____
Date

Director's Remarks: