

**BEFORE THE SECRETARY OF THE INTERIOR**



**Tinian Monarch (*Monarcha takatsukasae*)  
Photo by Eric VanderWerf, USFWS**

**PETITION TO LIST THE  
TINIAN MONARCH  
(*Monarcha takatsukasae*)  
AS THREATENED OR ENDANGERED  
UNDER THE ENDANGERED SPECIES ACT**

**December 11, 2013  
CENTER FOR BIOLOGICAL DIVERSITY**

## **Notice of Petition**

---

Sally Jewell, Secretary  
U.S. Department of the Interior  
1849 C Street NW  
Washington, D.C. 20240  
[exsec@ios.doi.gov](mailto:exsec@ios.doi.gov)

Dan Ashe, Director  
U.S. Fish and Wildlife Service  
1849 C Street NW  
Washington, D.C. 20240  
[Dan\\_Ashe@fws.gov](mailto:Dan_Ashe@fws.gov)

Douglas Krofta, Chief  
Branch of Listing, Endangered Species Program  
U.S. Fish and Wildlife Service  
4401 North Fairfax Drive, Room 420  
Arlington, VA 22203  
[Douglas\\_Krofta@fws.gov](mailto:Douglas_Krofta@fws.gov)

## **PETITIONER**

The Center for Biological Diversity (“Center”) is a non-profit, public interest environmental organization dedicated to the protection of native species and their habitats through science, policy, and environmental law. The Center is supported by more than 625,000 members and activists. The Center and its members are concerned with the conservation of endangered species and the effective implementation of the Endangered Species Act.



Submitted this 11th day of December, 2013

Pursuant to Section 4(b) of the Endangered Species Act (“ESA”), 16 U.S.C. § 1533(b); Section 553(e) of the Administrative Procedure Act, 5 U.S.C. § 553(e); and 50 C.F.R. § 424.14(a), the Center for Biological Diversity, Tara Easter, Tierra Curry, and Randy Harper hereby petition the Secretary of the Interior, through the United States Fish and Wildlife Service (“FWS,” “Service”), to list the Tinian monarch (*Monarcha takatsukasae*) as a threatened or endangered species.

FWS has jurisdiction over this petition. This petition sets in motion a specific process, placing definite response requirements on the Service. Specifically, the Service must issue an initial finding as to whether the petition “presents substantial scientific or commercial information indicating that the petitioned action may be warranted.” 16 U.S.C. § 1533(b)(3)(A). FWS must make this initial finding “[t]o the maximum extent practicable, within 90 days after receiving the petition.” *Id.*

## EXECUTIVE SUMMARY

The Tinian monarch (*Monarcha takatsukasae*) is a small forest bird that only exists on Tinian Island, a small island in the Commonwealth of Northern Mariana Islands (CNMI) in the western Pacific Ocean, east of the Philippines and south of Japan. This flycatcher was originally protected as an endangered species in 1970 (35 FR 08491) due to habitat loss resulting from agriculture and military activities prior to and during the Second World War. It was reclassified from endangered to threatened in 1987 (52 FR 10890), and in 2004 was delisted due to presumed recovery (69 FR 56367). Unfortunately, the Tinian monarch is once more threatened with extinction. The species experienced a rangewide decline of 39 percent from 1996-2008 and its very limited habitat faces multiple threats.

The Tinian monarch is considered to be threatened by the International Union for Conservation of Nature (IUCN 2012). It warrants protection as threatened or endangered under the Endangered Species Act due to threats from four of the five listing factors under the ESA ((16 U.S.C. § 1533 (a)(1)):

### *Loss and Degradation of Habitat:*

The monarch's remaining habitat in its tiny range is threatened by multiple factors including an increase in U.S. military activities on Tinian, the Tinian Airport expansion and alterations to the Federal Aviation Administration Mitigation Area, clearing of forests for agriculture, human population growth and development, fire, and increased vine cover which may reduce suitable nesting habitat. When the monarch was delisted, an area was set aside to provide high quality habitat to ensure its persistence. Even this area, however, is now under threat from proposed military activities and other factors. The monarch's limited habitat is threatened by degradation from military training on the island including proposed firing ranges and combat training zones that will encroach into forested land and disturb surrounding areas. Only 549 acres of native limestone forests (five percent of the island) remain on Tinian, which is where the highest densities of monarchs exist. Monarchs have far greater nesting success in remnant native forest, probably due to the greater availability of insects and greater protection from fire and storms (Balis-Larsen and Sutterfield 1997, BirdLife International 2013). Camp et al. (2012, p. 292) identify habitat loss and degradation, such as the expansion of the Tinian airport, as one likely cause of the significant decline in monarch abundance since 1982. The monarch has declined in areas on Tinian where housing, roads, and services have expanded, and it is expected that the downward trend will continue with increasing development (Camp et al. 2012, p. 295). Protection for the monarch is urgent because forest clearing on Tinian for military activities is underway. For example, a news release dated December 6, 2013 states, "In four weeks, those Marines took a jungle and restored it into four runways" (Rubio 2013).

### *Disease and Predation*

The Tinian monarch is threatened by predation from and competition by introduced rodents on Tinian. Estimates of rat densities on Tinian are among the highest ever recorded on tropical Pacific islands (Wiewel et al. 2009, p. 214). The threat of invasion by the predaceous brown tree snake from Guam is also very high with increased cargo transport between islands, and there

have already been multiple, but unconfirmed, sightings on Tinian. Monarch population declines of 30 to 49 percent are projected in the likely event of the brown tree-snake becoming established on Tinian (BirdLife International 2013). The monarch is also threatened by predation from feral and domestic cats. Predation has been identified as a likely factor in the recent declines in monarch abundance (Camp et al. 2012).

The monarch is also threatened by disease including avian poxvirus. Thirty-nine percent of monarchs mist-netted in 2006 and 11 percent of monarchs mist-netted in 2007 displayed cutaneous lesions. Cutaneous lesions resulting from pox viruses interfere with normal behavior and can lead to weakness, emaciation, and difficulty seeing, breathing, feeding and perching (USGS 2013).

#### *Inadequacy of Existing Regulatory Mechanisms*

There are no regulatory mechanisms that adequately protect the Tinian monarch. It was delisted under the ESA in 2004, and was removed from CNMI's list of threatened and endangered species in 2009. The Post Delisting Monitoring Plan (PDMP) for the Tinian monarch expired in 2010. The final report summarizing the results of the monitoring effort has yet to be published. No further monitoring in accordance with the PDMP is known to be occurring.

#### *Other Factors*

The Tinian monarch is threatened by the effects of climate change including rising sea levels, increased storm events, and increased risk from stochastic weather events such as fires and droughts. Inclement weather is one of the primary causes of monarch nestling mortality (Balis-Larsen and Sutterfield 1997).

The monarch is exceedingly vulnerable to extinction due to its highly restricted range on a single small island. Due to these threats, the Tinian monarch warrants protection under the Endangered Species Act.

## TABLE OF CONTENTS

Executive Summary	1
Introduction	4
Natural History	4
Taxonomy	4
Description	4
Breeding	4
Habitat Requirements	5
Current and Historic Distribution	5
Conservation Status	6
Population Status	6
Threats	7
Loss and Degradation of Habitat	8
Overutilization	18
Disease and Predation	18
Lack of Regulatory Mechanisms	21
Other Factors	21
Conclusion	24
References	25

## INTRODUCTION

The Tinian monarch is a small forest bird that only exists on Tinian Island. The flycatcher has undergone decline in both abundance and historical range and needs Endangered Species Act protection in light of ongoing and future threats to its survival. This petition summarizes the information available on the natural history of the Tinian monarch, the conservation and population status of the species, and the threats to the monarch and its habitat. The petition shows that, in the context of the ESA's five statutory listing factors, the Tinian monarch warrants protection as endangered or threatened under the Act due to loss or curtailment of habitat or range, disease and predation, the inadequacy of existing regulatory mechanisms, and other factors including noise pollution and global climate change.

## NATURAL HISTORY

### Taxonomy and Nomenclature

The Tinian monarch was first recognized as an individual species by Yamashina in 1931 (cited in USFWS 1999). Its complete classification can be found in Table 1. The Tinian monarch is known as the Chuchurican Tinian in the Chamorro language on Tinian Island (USFWS 2005 p. 1).

**Table 1:** Taxonomic Classification of the Tinian Monarch (BirdLife International 2012).

<b>Kingdom</b>	<b>Phylum</b>	<b>Class</b>	<b>Order</b>	<b>Family</b>	<b>Genus</b>	<b>Species</b>
Animalia	Chordata	Aves	Passeriformes	Monarchidae	Monarcha	Takatsukasae

### Description:

The Tinian monarch is a member of the monarch flycatcher family of forest birds. Adults stand at about 15 cm (6 in) tall and have light rufous under parts, olive-brown upper parts, and dark brown wings and tail (Baker 1951, cited in USFWS 1999 p. 8533). The sides of the face are buffy-tan and the crown and nape are grey. The monarch has a bold eye-ring, two narrow wing-bars and white-edged tertial feathers. The rump and under tail coverts are also white (BirdLife International 2013). The monarch has a short two-note call that sounds like a squeaky dog toy. Its song is a loudly whistled *tee-tee-wheeo*, and it also produces a loud, raspy scold (BirdLife International 2013).

### Breeding:

The Tinian monarch is thought to breed year round, and peak nesting periods may be associated with increased rainfall (USFWS 1998, p. 7). There appears to be distinct seasonality in nesting activity and success, with little nesting occurring during periods of low rainfall (Balis-Larsen and Sutterfield 1997). Nesting success is higher in areas of native forest than in other habitats (Ibid.).

### Habitat Requirements:

The Tinian monarch is a forest bird that lives mostly in native limestone forest dominated by figs (*Elaeocarpus joga*, *Mammea odorata*, *Guamia mariannae*, *Cynometra ramiflora*, *Aglaia mariannensis*, *Premna obtusifolia*, *Pisonia grandis*, *Ochrosia mariannensis*, *Neisosperma oppositifolia*, *Intsia bijuga*, *Melanolepis multiglandulosa*, *Eugenia* spp., *Pandanus* spp., *Artocarpus* spp., and *Hernandia* spp.). It can also be found in secondary vegetation consisting of *Casuarina equisetifolia*, as well as non-native species (*Acacia confusa*, *Albizia lebbbeck*, *Cocos nucifera*, *Delonix regia*) with some native species mixed in, and in nearly pure strands of introduced tangantangan, a shrubby legume (USFWS 2005 p. 1-2). The monarchs forage and nest within the native limestone forests, secondary vegetation, and introduced tangantangan habitats. Higher densities, higher rates of reproductive success and smaller home ranges within the native limestone forests indicate that the native forests provide higher quality habitat for the monarch than other habitat types (USFWS 2005 p. 2; Department of the Navy 2010 3:10-5).

Point transect sampling for Tinian monarch densities (birds/ha) based on habitat type were conducted in 2008 by USFWS. Table 2 summarizes the results showing the highest density estimates in limestone forest, followed by secondary forest.

**Table 2:** Tinian monarch density estimates (birds/ha), standard error (SE), and 95% confidence intervals (Lower and Upper 95% CI) by habitat in 2008 based on point transect sampling (USFWS 2009, p. 234, Table 3).

Habitat	Estimate	SE	L 95% CI	U 95% CI
Agriculture	1.75	1.75	*	*
Limestone Forest	6.41	0.74	5.09	8.05
Open Field	2.83	0.64	1.81	4.44
Secondary Forest	5.82	0.54	4.84	7.01
Tangantangan Thicket	4.36	0.47	3.52	5.39
Urban/Residential	1.50	1.04	0.32	6.94

\*Sample size was insufficient to estimate reliable confidence intervals.

### Current and Historic Distribution

The Tinian monarch lives only on Tinian Island which is a 101 km<sup>2</sup> (39 mi<sup>2</sup>) island in the Northern Marianas, three islands north of Guam (USFWS 1999). The monarch is endemic to Tinian, though a population may once have existed on Saipan (Peters 1996, cited in USFWS 2005, p.1). The Tinian monarch relies on forested habitats for its nesting and foraging behaviors. Tinian Island experienced a rapid change in vegetation as the human population grew, especially throughout the 20<sup>th</sup> century. The introduction of European-based agriculture and ranching practices, massive sugar cane production, and the development of military bases by the Japanese and then the United States has removed much of the native vegetation that formerly provided monarch habitat (reviewed in Camp et al. 2012, p. 283-284). Today, there are only 549 acres of native forests that remain, which make up about five percent of the island (Camp et al. 2012, p. 2).



## Conservation Status

The Tinian monarch is ranked by the International Union for Conservation of Nature (IUCN, 2012) as “Vulnerable,” one of the three levels in the “Threatened” category. As defined by the IUCN, a ranking of Vulnerable means that the best available evidence indicates that the taxon is considered to be facing a high risk of extinction in the wild (see: [http://www.iucnredlist.org/static/categories\\_criteria\\_3\\_1](http://www.iucnredlist.org/static/categories_criteria_3_1)). The justification for the Vulnerable (Threatened) ranking for the monarch includes its tiny range, the high risk of brown tree-snake invasion, and vulnerability to stochastic events such as typhoons because the monarch is confined to a single small island. The IUCN ranking states that due to suspected population decline, the monarch may warrant uplisting to Endangered if population declines are confirmed. Camp et al. (2012) report a statistically significant decline in monarch abundance, with both temporal and spatial declines in monarch density (p. 288), indicating that the monarch’s status warrants uplisting.

## Population Status

In 1970, when the monarch was listed as endangered by the U.S. Fish and Wildlife Service, it was presumed that population numbers had declined from historical levels due to widespread destruction of habitat by agriculture and military activities, especially after WWII. No surveys had been conducted to assess the bird’s status, and loss of habitat was used as a proxy for population decline (USFWS 1999, p. 8534). In the 1980s, Reichel and Glass (1991) noted that the Tinian monarch was “abundant” meaning that the monarch was almost certain to be found within representative habitats and in relatively large numbers (Camp et al. 2012, p. 284). In 1982, the first range-wide survey for the Tinian monarch was conducted by the U.S. Fish and Wildlife Service. A point transect count/variable circular plot survey yielded a population estimate of 39,338 (this estimate was later adjusted, see Table 3, below) (USFWS 2009, p. 228). The results of this survey led to downlisting of the monarch from endangered to threatened status in 1987 (52 FR 108900). In 1996, another survey was conducted using the same methods as the 1982 survey, and the estimated population was 55,721, though this estimate too was later re-adjusted (Lusk et al. 2000, p. 186, USFWS 2009, see Table 3, below). Following this apparent increase in numbers, the Service proposed to delist the monarch in 1999 (64 FR 8533), and it was delisted in 2004 (69 FR 56367).

The USFWS designed a 5 -Year Post-Delisting Monitoring Plan (PDMP) for the Tinian monarch in 2005 and published a progress report in 2009. The PDMP’s objectives were to monitor the population status of the Tinian monarch and the use and abundance of the forested habitat it relies on, and to establish protocols for early detection of possible brown tree snake introductions to the island (USFWS 2005, p. 4). The monitoring was to be conducted regularly from 2006-2010 using road-side point counts, small scale study plots, and an island-wide VCP survey at the end of the 5-year monitoring plan (USFWS 2005, p. 6). However, the Commonwealth of the Northern Mariana Islands’ Division of Fish and Wildlife (CNMI DFW) has not continued counts of the Tinian monarch since the initiation of the plan in 2005 (Marshall and Amidon 2009, p. 3).

The U.S. Navy has conducted quarterly point counts on seven transects in native limestone forest since 1999, but because these only account for a small portion of the monarch’s range, they do not provide an accurate estimate of overall population status (Marshall and Amidon 2009, p. 3).

The Navy’s early warning detection plots were designed for the monitoring and prevention of brown tree snake invasion and have been used to measure the density, territory sizes, and survival rates of the Tinian monarch (Marshall and Amidon 2009, p. 3). Within these native forest plots, territory sizes have appeared to remain relatively stable, suggesting that the densities of monarchs in these preferred habitats may not have changed much from 1995-2009 (Marshall and Amidon 2009, p. 6). In terms of survival, the survival rate from 2006-2009 was measured at 82 percent for males and 64 percent for females. Though some banded birds may have just relocated rather than succumbed to mortality, the low female survival rates are a cause for concern (Marshall and Amidon 2009, p. 4).

In 2008 the Pacific Islands Fish and Wildlife Office conducted an island-wide survey for the Tinian monarch using the same point transect/variable circular plot methods used for the 1982 and 1996 surveys, and re-analyzed the data from 1982 and 1996 to account for improvements made in the model used and the program DISTANCE (USFWS 2009, p. 228, 235). Improved estimates from 1982 and 1996 as well as the most recent estimate from 2008 are shown in Table 3.

**Table 3:** Population density (birds/km<sup>2</sup> ± SE, with 95% CI) and abundance (density times the area of Tinian; 101.01 km<sup>2</sup>; with 95% CI) estimates for Tinian monarchs from three point transect surveys (taken from USFWS 2009, p. 233).

<b>Year</b>	<b>Density</b>	<b>Abundance</b>
1982	634.5 ± 37.88 (564.3–713.4)	60,898 (49,484–75,398) <sup>1</sup>
1996	705.7 ± 43.96 (624.3–797.6)	62,863 (50,476–78,758) <sup>2</sup>
2008	431.3 ± 30.75 (374.9–496.2)	38,449 (29,992–49,849)

<sup>1</sup> 39,338 (35,161–43,515), Engbring et al. (1986) – Estimate from original report

<sup>2</sup> 55,721 (48,345–63,495), Lusk et al. (1986) – Estimate from original report

Using standardized methodology, the 2008 data show a 37 to 39 percent decline in the Tinian monarch population from 1982 and 1996 to 2008 (USFWS 2009, p. 233).

## **THREATS**

The Tinian monarch warrants protection as an endangered or threatened species under the Endangered Species Act. In the 2005 PDMP, the USFWS states that “if data from this monitoring effort or from some other source indicate that the Tinian monarch is experiencing significant declines in abundance or distribution, that its survival or territory occupancy are declining significantly, or that it requires protective status under the Act for some other reason, the Service can initiate procedures to re-list the monarch, including, if appropriate, emergency listing” (USFWS 2005, p. 4-5). The bird’s population has undergone decline (Camp et al. 2012), and in addition, new factors threaten the survival of the monarch.

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

The Tinian monarch is threatened by habitat loss and degradation due to military activities, the Tinian airport expansion, waste facilities, human population growth, agriculture, fire, and increased vine cover.

I. Military Land Use

In 1944, the United States took control of Tinian from the Japanese and converted the island into a major airbase for the war on Japan (Camp et al. 2012, p. 284). When WWII ended, the military mostly abandoned the island, but the Department of Defense (“DoD”) maintains leased land on Tinian for training purposes (Camp et al. p. 284). Current military training on the island occurs on the Tinian Military Lease Area, which encompasses 15,353 acres - with 7,574 acres in the northern third of Tinian in the Exclusive Military Use Area (“EMUA”), and 7,779 acres in the middle third of Tinian in the Leaseback Area (“LBA”) (Department of the Navy 2010, 3: 2-4). Activities in these two areas consist of airfield training in the EMUA and small scale ground element training in the LBA (Department of the Navy 2010, 3: 2-4). Now, a proposal to move military training activities from Okinawa to Guam and Tinian presents a significant threat to the Tinian monarch’s habitat by dramatically increasing the amount of activity and land use by the military.

Proposed activities for military training on Tinian include Rifle Known Distance Range (KD), Automated Combat Pistol/Military Police (MP) Firearms Qualification course, platoon battle course, and a field firing range (Department of the Navy 2010, 3: 2-1). The Tinian monarch inhabits 62 percent of the total land area on Tinian. Ninety-three percent of that area is made up of secondary vegetation and introduced tangantangan forest, and seven percent of it is native limestone forest. The Military Lease Area includes about 75 percent of current monarch habitat, which supports about 70 percent of the monarch population (Department of the Navy 2010, 3: 10-4).

In the Environmental Impact Statement for the Guam and CNMI Military Relocation, three alternatives were analyzed. The Record of Decision for the Guam and CNMI Military Relocation was signed in September 2010 and Alternative 1 was chosen as the Preferred Alternative. Based on density estimates made in 2009 by the USFWS, at least 204 monarch territories will likely be lost through construction (Department of the Navy 2010, 3: 4-35). Tables 4 and 5 summarize the potential impacts that military construction will have on the vegetation communities and Tinian monarch habitats with the implementation of Alternative 1. Though Alternative 1 is only estimated to directly impact one percent of the monarch population, the overall impact will be greater due to indirect effects of noise and disturbance and edge effects. The threat posed to the monarch’s long-term survival is also heightened by the loss of additional forest when so little forested habitat is available on Tinian for the monarch.

Vegetation clearing and training activities are currently underway on Tinian (eg., see Defense Video and Imagery Distribution System 2013, Rubio 2013). In addition to outright habitat loss and degradation, training activities in the forest threaten to disrupt normal monarch feeding and reproductive behavior.

**Table 4:** Vegetation Removed (ac [ha]) within the Tinian MLA with Implementation of Alternative 1 (Department of the Navy 2010, 3: 10-14, Table 10.2-1.)

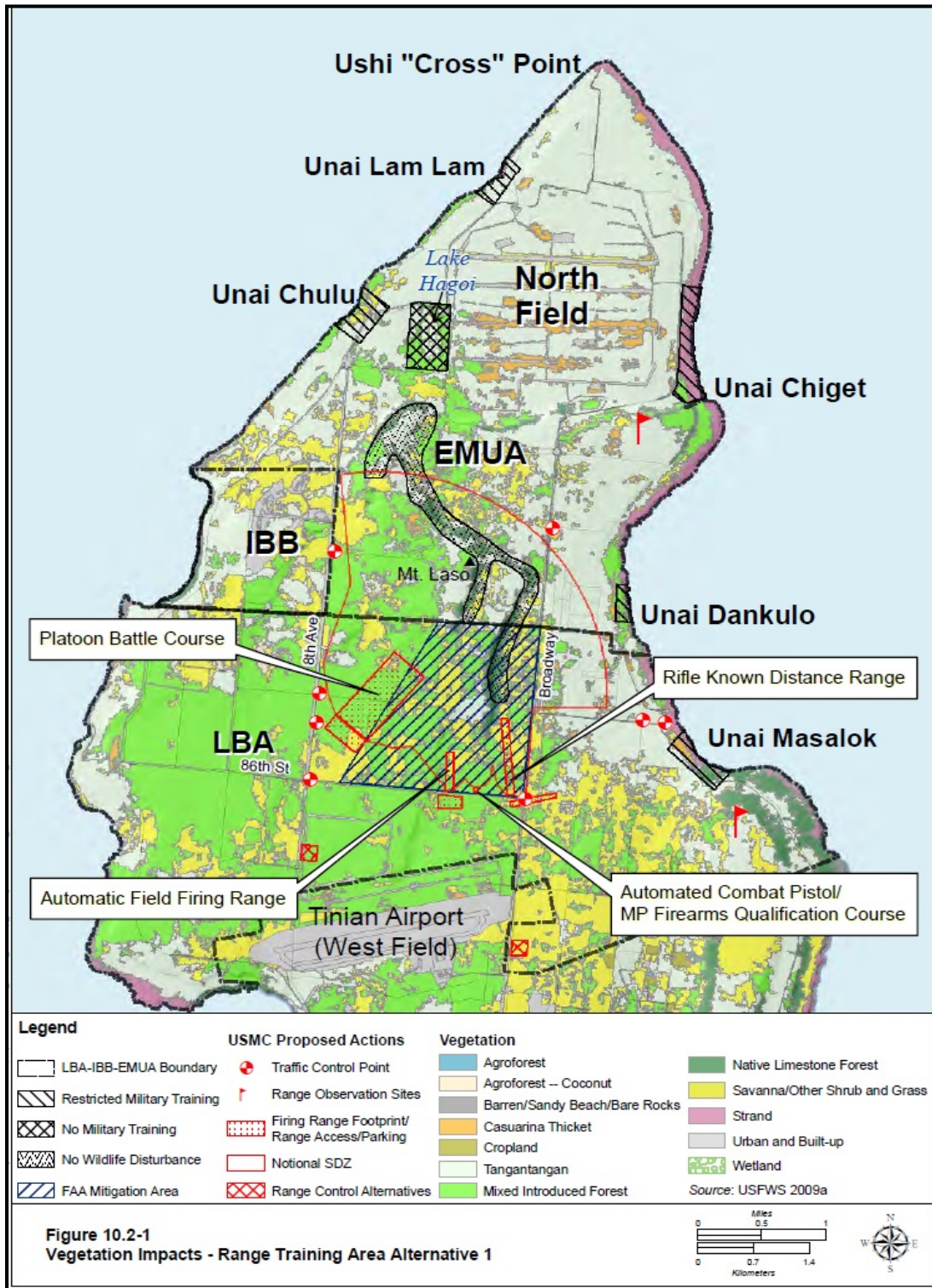
<i>Parcel and Activity</i>	<i>Mixed Introduced Forest</i>	<i>Tangantangan</i>	<i>Shrub and Grass</i>	<i>Developed</i>
Platoon Battle Course	123 (50)	0	13 (5.3)	0
Ranges	13 (5.3)	0	25 (10)	0
Range Control	9.0 (3.6)	0	9.8 (4.0)	1.0 (0.4)
Range Support Areas	28 (11)	0.8 (0.3)	19 (7.7)	0.4 (0.2)
<b>Total area removed</b>	<b>173 (70)</b>	<b>0.8 (0.3)</b>	<b>67 (27)</b>	<b>1.4 (0.6)</b>

**Table 5:** Direct Impacts to the Tinian Monarch with Implementation of Alternative 1 (Department of the Navy 2010, 3: 10-16, Table 10.2-2.)

<i>Habitat Type</i>	<i>Habitat Removed (ac [ha])</i>	<i>Monarch Density (#/ha)</i>	<i>Total Potential Birds in Removed Habitat</i>	<i>Max. Territories (#/ha)*</i>	<i>Total Potential Territories in Removed Habitat</i>
Mixed Introduced Forest	173 (70)	5.82	407	2.9	203
Tangantangan	0.8 (0.3)	4.36	1	2.5	1
<b>Totals</b>	<b>174 (70)</b>	NA	<b>408</b>	NA	<b>204</b>

Legend: NA = Not Applicable.  
Source: \*USFWS 2009.

**Figure 1:** Vegetation Impacts – Range Training Area Alternative 1 (Department of the Navy 2010, 3:10-17, Figure 10-21)



Outside of the proposed ranges and battle course, ongoing and proposed field training of military personnel will occur in areas with limestone, secondary, and tangantangan forests where Tinian monarchs commonly nest (USFWS 1999b, p.28). Large scale training, lasting up to nine weeks a year, and small scale daily training is a threat to monarchs because of the potential to knock midlevel nests out of trees as soldiers move through forests (USFWS 1999b, p. 28). In 1999, the Service's Biological Opinion on the effects of the military proposals on the monarch determined that they were not likely to jeopardize the continued existence of the species. This opinion, however, was given before new information was published on the significant population decline of the bird (Camp et al. 2012; discussed in Population Status above). Due to new information on declines in the monarch's abundance, and due to the range of other threats facing the flycatcher including other causes of habitat loss, predation, disease, and global climate change, the Service should reconsider the impacts that these military training proposals will have on this endemic bird. Without Endangered Species Act protection, there is no regulatory mechanism in place to protect the monarch from military expansion and other threats which are cumulatively degrading its habitat.

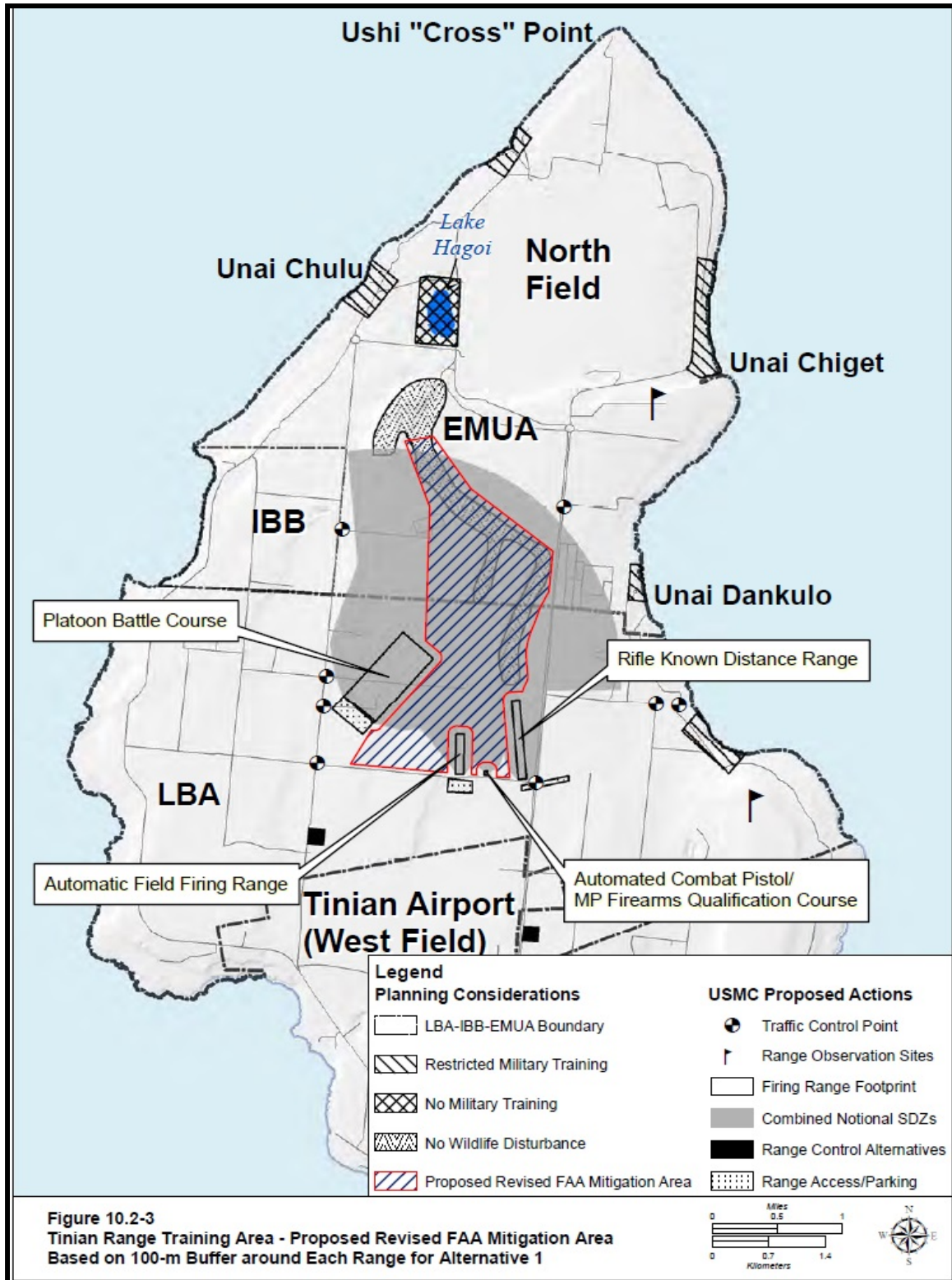
## II. Tinian Airport Expansion and the Federal Aviation Administration Mitigation Area

In 1998, the CNMI and the Federal Aviation Administration (FAA) proposed an expansion to the West Tinian Airport to accommodate larger aircraft and an expected increase in foreign travelers due to the passing of the Tinian Casino Gaming Control Act of 1989 (USFWS 1998, p. 3). The expansion required construction on an additional 605 acres of land which involved clearing 405 acres of tangantangan and secondary forest (USFWS 1998, p. 3, 5). At the time of this proposal, the Tinian monarch was listed as threatened under the ESA, and the USFWS recommended that its status be reassessed in 1996 based on their current knowledge of the bird's population (USFWS 1998, p. 7). The project was estimated to adversely impact 1,103 monarchs, but based on the assumed increase in the monarch's population and increase in vegetation, the USFWS did not consider this project to be a serious threat to the monarch population (USFWS 1998, p. 9). The project began construction in 1999.

To compensate for the forest lost in the expansion of the West Tinian Airport, the FAA designated 936 acres of forest within the LBA (Military Leaseback Area) as the Airport Mitigation Conservation Area. This area is made up of 311 acres of medium value habitat and 625 acres of low value habitat (USFWS 1998, p. 5). The implementation of Alternative 1 of the military relocation will remove 70 acres of the FAA Mitigation Area that was set aside to protect the monarch. The destruction of this land does not comply with the requirements laid out in the "Dedication of Tinian Military Retention Area Land for Wildlife Conservation" which was established for the protection of "endangered and threatened wildlife, particularly the Tinian monarch" with the provision that it is the right of the U.S. military to "use the premises for low-impact military training and for other purposes that do not disrupt the habitat and living conditions of the Tinian monarch" (Department of the Navy 2010, 3:10-16). Without Endangered Species Act protection, projects such as this one will continue to degrade the limited habitat the monarch depends on for survival, including habitats that had previously been set aside for the species.

To compensate for the designated mitigation habitat that will be lost, a different area will be added to the mitigation area, but this land is already protected, therefore it's substitution for the forested acres that will be degraded provides little actual benefit for the monarch. The proposed revised FAA Mitigation Area includes forested lands further north in the Mt. Lasso area which largely includes an area that is already designated as a "No Wildlife Disturbance" zone by CNMI (See Figure 2) (Department of the Navy 2010, 3:10-24, 10-25). Although this revision would add a significant amount of acreage to the mitigation area, the land proposed to be protected in the expansion is not under current threat of development and likely would not be in the future due to the steep nature of the limestone forest. Further, nearly the entire Mitigation Area would still be within the Surface Danger Zone (SDZ) of military training activities.

**Figure 2:** Tinian Range Training Area – Proposed Revised FAA Mitigation Area Based on 100-m Buffer around Each Range for Alternative 1 (Department of the Navy 2010, 3:10-25, Figure 10.2-3)





Given that the population of monarchs has already fallen below the estimated minimum number of 41,791 individuals that could be supported by the remaining available habitat as of 1999 (USFWS 1999, p. 8536; CNMI SWARS Council 2010, p. 13), it is reasonable to assume that even if the land disturbed in the Mitigation Area was replaced by formally protecting land elsewhere, there would not be enough remaining habitat to sustain a healthy population of Tinian monarchs in the long-term.

Because space on Tinian is so limited, pressures on the monarch's habitat will continue to build. The permitted destruction of part of the Airport Mitigation Conservation Area exemplifies why ESA protection for the monarch is necessary and warranted.

### III. Agriculture

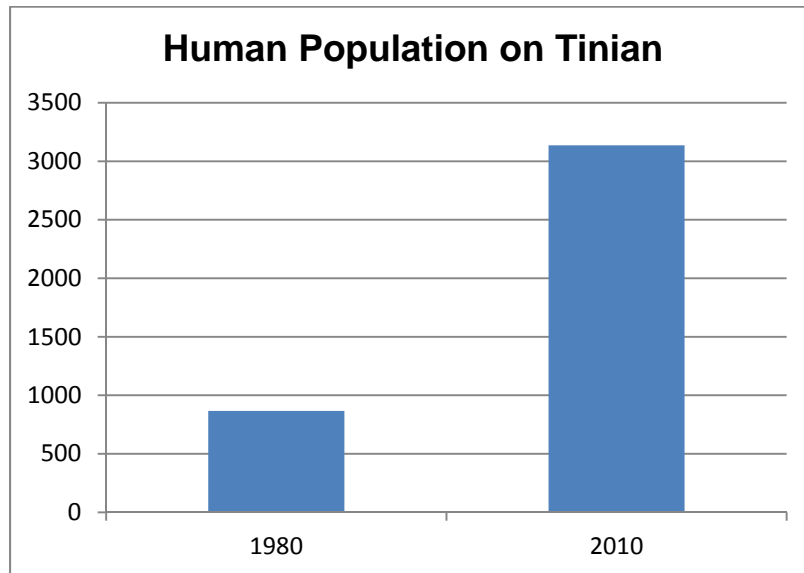
Loss of forested habitat due to clearing for agriculture contributed to the decline of the monarch historically. Different forms of agriculture swept through Tinian under Spanish, German, and Japanese control, converting the vast majority of the island to cropland before WWII (Camp et al. 2012, p. 283-284). Ranching of cattle, pigs, and goats began on the island in the 1500s, and over time dominant agricultural crops have included coconut plantations and sugarcane. After WWII, the United States took control of the island from Japan and the military occupied almost all of it. Now, most of the island (71 percent) that is leased to the U.S. military has had less agricultural use, but 30-50 percent of the island is still used for grazing, which partly shares space with military leased lands. Ten percent of the island is used for other forms of agriculture (USFWS 1999, p. 8534).

Ongoing forest clearance for cattle farming poses a threat to the monarch's remaining habitat (IUCN 2013). Cattle ranchers on Tinian have raised concerns about decreased grazing availability on military lands which could result from increased military activity on the island (Franklin 2013). Decreased availability of military lands could push ranchers to other parts of the island and further degrade remaining or potential monarch habitat. Trails created by cattle and goat grazing disturb natural habitat by accelerating erosion and impacting native vegetation (Department of the Navy 2010, 3:10-6). Feral ungulate populations have also grown on the island as a result of ranching practices, and they are damaging native forests by preventing regeneration and changing species composition (Sherley 2001, p. 44).

### IV. Human Population Growth and Development

The human population on Tinian has rapidly increased since the 1980s (Figure 3), magnifying the development pressure on the monarch's limited habitat.

**Figure 3:** Human Population on Tinian from 1980 to 2010.



Data taken from: Camp et al. 2012, p. 295; U.S. Census Bureau 2010; USFWS 1999, p. 8534.

Population growth is mostly concentrated in the Carolinas region of the island, which includes San Jose. From 2000 to 2010, the total number of housing units on Tinian increased from 790 to 1,118 (USDI 2013). An influx of military personnel is expected to add an additional 5,600 people to Tinian’s population from 2015-2035 (USDI 2013). The Tinian monarch has declined in these areas where houses, roads, and services have extended (Camp et al. 2012, p. 295). It is expected that the human population on Tinian will continue to expand as tourism and job opportunities increase under the provisions of the Tinian Casino Gaming Control Act of 1989 (see below) which will lead to development of additional facilities (see below).

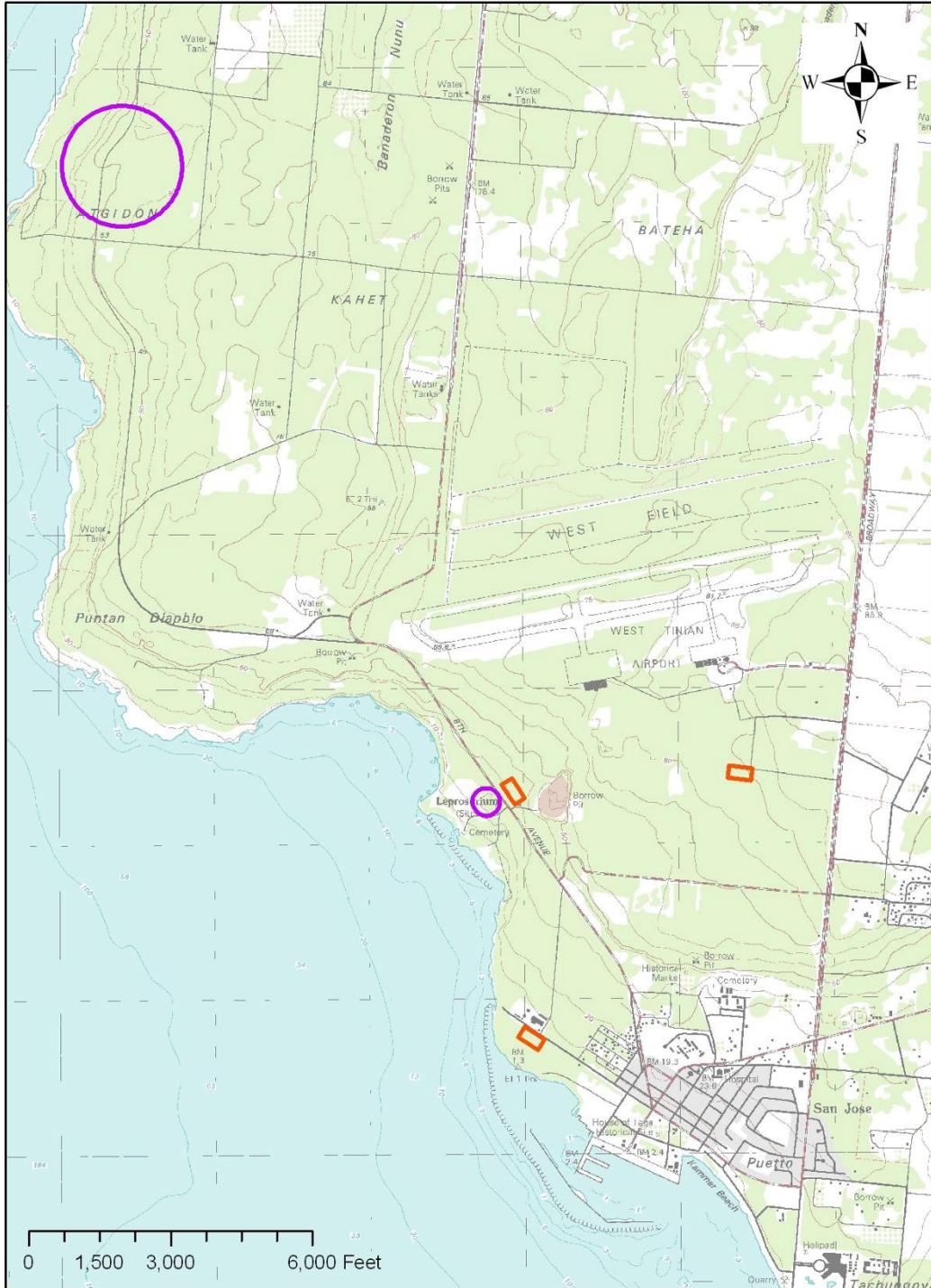
#### 1. The Tinian Casino Gaming Control Act of 1989

The Tinian Casino Gaming Control Act of 1989, also known as the “Casino Initiative” was a push to increase foreign tourism and investment on the island (USFWS 1998, p. 3). Under this act, up to five casino licenses can be issued with the requirements of constructing a 300 room, 20,000 ft<sup>2</sup> gaming floor space casino/hotel facility per license. Four have already been issued, and one facility, the Tinian Dynasty Hotel and Casino, has been built and is fully operating (USFWS 1998, p. 3).

#### 2. Waste Facilities

Proposed waste facilities, including a new landfill to replace the current dump and a solid waste transfer site, will remove mixed introduced forest and tangantangan habitat. The new landfill will be constructed on a 30-acre site at the Atgidon area (Tetra Tech 2013) which largely includes forested habitat that supports monarchs (see Figure 4).

**Figure 4:** Landfill site location and the three alternative transfer sites (Duenas, Camacho & Associates, Inc. 2012, p. 1-2; Figure 1-1)



The chosen site, Site C, will be a 3-acre property that requires clearing mixed introduced forest and tangantangan thicket where Tinian monarchs are known to reside (U.S. Department of the Interior 2013, p.3; Duenas, Camacho & Associates, Inc. 2012, p. 3-4, 3-8).

### 3. Wind Turbine Farm

The monarch is potentially threatened by the development of a wind turbine farm on Tinian. While increased wind energy production is desirable, especially given the threat posed to biodiversity globally from climate change, careful siting, use of best technology, and mitigation are critical in wind development to prevent harm to imperiled species such as the monarch.

A \$200 million wind turbine farm to produce up 40-60 Megawatts of energy has been proposed for Tinian (Eugenio2013). Two potential locations for turbine farms on Tinian have been identified by CNMI. The first is located two miles east and one mile south of the Tinian Airport runway on a 300 ft elevation bluff (Baring-Gould et al. 2011, p. 32). The second is located on a broad plateau at 500 ft of elevation, southeast of San Jose (Baring-Gould et al. 2011, p. 33). Both sites are surrounded by native limestone, tangantangan, and mixed introduced forest which could be occupied by Tinian monarchs.

Wind farms present a number of concerning factors to birds including collision mortality, displacement due to disturbance and barrier effects (the altering of flyways or migration patterns to avoid wind farms), nest mortality, and habitat change or loss (Dewitt et al. 2006, Loss et al. 2013, Zimmerling et al. 2013). Precise estimates of impacts that turbines have on bird populations are largely unknown due to the variability of each farm and study methodologies, but passerines are thought to suffer the most collision fatalities (Kuvlesky et al. 2007, p. 2488). More than 80 percent of avian fatalities at wind turbine farms are passerines, likely because they fly at lower altitudes than other bird species (Mabee et al. 2006, p. 682; Erickson et al. 2002 cited in Kuvlesky et al. 2007, p. 2488). In addition to collision fatalities, many bird species may avoid foraging, nesting, and roosting habitats near wind farms during construction to avoid disturbance and noise (Band et al. 2007, Higgins et al. 2007, cited in Zimmerling et al. 2013).

In the absence of federal protection, numerous projects like the examples discussed above can be developed without consideration for the monarch, allowing its very limited habitat to be chipped away without consideration of cumulative impact. The rapid loss of forested land and increase in the human population and activity on Tinian due to military land use and agriculture were the main causes for listing the Tinian monarch as endangered in 1970 (50 FR 45632, cited in USFWS 1999, p. 8534). Although gross changes in forest cover are unlikely to have been the cause for the recent decline of the Tinian monarch population from 1982 to 2008 (USFWS 2009, p. 237), current plans for land use on Tinian present significant threats to the habitat and range of the monarch, necessitating federal listing. Incremental habitat loss, in conjunction with other threats such as disease and predation, have risen to the level of threat under the criteria of the ESA.

## V. Fire

Both natural and intentional fires present a threat to the Tinian monarch's habitat (Balis-Larsen and Sutterfield 1997, BirdLife International 2013). Natural fires occur regularly during the dry season and have cleared up to 200 acres a year. Military weapons usage and other activities during dry seasons increase this risk (Department of the Navy 2010, 3:10-21). Additionally, many wildfires are caused by intentionally set fires going unattended and spreading. Hunters in particular burn grassland to induce new grass sprouts which attract deer, and sometimes unintentionally burn parts of forest. Many of these cases go unreported because the public is unaware of the damage that it causes (CNMI SWARS Council 2010, p. 20).

## VI. Increased Vine Cover

The Service noted that gross changes in the amount of available forest cover were unlikely to have been a cause for the decline in the Tinian monarch population from 1996 to 2008, but that the majority of the forest had an increase in vine cover, which may reduce the available areas for nests and territories (USFWS 2009, p. 237). Increasing vine cover is an emerging problem in tropical forests. Eight studies on the state of woody vines in tropical forests in the Americas showed that vines were increasing in abundance and biomass (Khan 2011). Vines are better adapted to survive in low water conditions, so they grow faster than trees during the dry season and out-compete them for light and water (Khan 2011). This lowers the survival rate of trees and presents a threat to the health of Tinian's forests.

The present and future threats to the Tinian monarch's habitat and range are causes for high concern for the survival of this rare island bird. Due to the magnitude and imminence of these threats, the monarch warrants protection under the Endangered Species Act.

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

There are no data which indicate that the Tinian monarch is currently threatened by overuse as it is not known to be sought after for any scientific, educational, recreational or scientific purpose (USFWS 1999, p. 8536).

### C. Disease or Predation.

The Tinian monarch is threatened by disease due to the spread of avian pox virus. When the USFWS proposed delisting the Tinian monarch in 1999, there were no indications that disease was a threat to the monarch or other avian species on Tinian (USFWS 1999, p. 8536). In 2006, while mist netting and banding monarchs within the three "early warning plots" created for the PDMP, 39 percent of monarchs caught were found to have lesions on their feet and toes, and in 2007, 11 percent of birds caught had them as well (Marshall and Amidon 2009, p. 6). Although the clinical tests on the lesions were inconclusive, the lesions are typical of those caused by the avian pox virus (*Poxvirus avium*), a viral infection of birds caused by one of the largest families of viruses of the pox virus group (Marshall and Amidon 2009, p. 6; Wilner 1969, cited in van Riper et al. 2002, p. 929-930).

Avian pox is found worldwide and is able to infect all bird families (van Riper et al. 2002, p. 930). Response to the virus varies among bird families and individual species. There are generally two forms of virus symptoms: skin and diphtheritic. In cutaneous pox, wart-like growths occur around the eyes, beak or any unfeathered skin. This leads to difficulty seeing, breathing, feeding, or perching. In diphtheritic pox, the growths form in the mouth, throat, trachea and lungs resulting in difficulty breathing or swallowing. Birds with either form of pox may appear weak and emaciated (USGS 2013). Avian pox can be fatal, depending on the species' response to the infection. The gravity of threat that avian pox poses to the Tinian monarch should not be discounted, as avian pox is considered to be one of the main threats to forest birds on other islands such as Hawaii (van Riper et al. 2002, p. 930, 939).

Avian poxvirus can be transmitted from mosquitoes, midges, flies, and through contact of infected birds or infected surfaces (van Riper et al., p. 930). An increase in urbanized areas leads to an increase in mosquitoes by creating more breeding grounds in reservoirs, standing water, and abandoned machinery (Marshall and Amidon 2009, p. 7). Domestic birds such as chickens and turkeys provide a source for the disease, and are thought to be the main source of the introduction of pox to Hawaiian forest birds (Marshall and Amidon 2009, p. 7; van Riper et al. 2002, p. 939). Avian pox, as well as predation from introduced rats to the island, was noted as a possible explanation for the recent decline in the Tinian monarch population (USFWS 2009, p. 237).

In addition to disease, predation currently poses a major threat to the Tinian monarch. The survival rate for the Tinian monarch from 2006-2009, based on early warning plot samples, measured an 82 percent survival rate for male monarchs, and a 64 percent survival rate for females (Marshall and Amidon 2009, p. 4). Females may have a lower survival rate because they are more subject to predation than males since the nests are about two meters off the ground in small trees and shrubs where small, predatory animals such as rats, monitor lizards, and feral cats can access them (USFWS pers. obs. 1996, cited in Marshall and Amidon 2009, p. 4). The low female survival rate is cause for concern.

Predation poses a dire threat to the long-term survival of the Tinian monarch. Alarming high population densities have been measured for some invasive predators on the island of Tinian. Invasive species are a threat to global biodiversity, but can be even more harmful to island species because of their small geographic range and population sizes, low fecundity, lack of coevolution with invading species, and extensively altered habitats (reviewed in Wiles et al. 2003).

Introduced *Rattus* species and other small mammals often have detrimental effects on native island species and ecology (Wiewel et al. 2009, p. 205). Surveys for the prevalence of these mammals on Tinian were conducted from 2005-2007 (Wiewel et al. 2009, p. 207). The roof rat (*R. rattus*) was found to occur at densities of 185/ac (75/ha) in native forest and the musk shrew (*S. murinus*) existed in densities of 183/ac (74/ha) in tangantangan habitat (Wiewel et al. 2009, cited in USFWS 2009, p. 245; Department of the Navy 2010, 3: 10-6). Estimates of rat densities were found to be higher than on any other tropical Pacific island, and 2-3 times higher than the densities ever found on Guam (Wiewel et al. 2009, p. 214). These high-density populations present a high threat to the Tinian monarch population not only through predation, but also

through dietary competition for similar prey that is needed for nestlings (Wiewel et al. 2009, p. 217).

The threat of the establishment of the brown tree snake (BTS) on Tinian presents another great concern for maintaining Tinian monarch populations. The BTS was accidentally introduced to the island of Guam after WWII when there was a heavy amount of air and ship traffic to support military activities (Fritts and Rodda 1998, p. 10; Wiles et al. 2003, p. 1351). The BTS spread from the south to the north of Guam at about 1.6 km/yr, and was well established on the island by between 1968 and 1970 (Wiles et al. 2003, p. 1352). By the 1980s, the BTS had extirpated 8 of Guam's 11 native bird species, and at the snake's peak eruption, they outnumbered birds four to one (Fritts and Rodda 1998, p. 11 Wiles et al. 2003, p. 1352).

In 1993 the U.S. Department of Agriculture and Wildlife Services created a program to reduce the spread of BTS through shipping (Engeman et al. 2002, p. 102). The plan includes buffer zones that have low snake populations to be used as shipping areas, cargo staging areas that have had snakes removed the night before, and trapping efforts to reduce the number of snakes on the island. Most cargo shipped from Guam, however, comes from areas without snake removal efforts, and all of the efforts are compromised after typhoons, which occur often (Engeman et al. 2002, p. 102). When there is a typhoon, the only way to reduce the risk of shipping BTS is to rely on detecting them in the cargo with dogs. In 1998 and 1999, the effectiveness of detector dogs was tested and the dogs had a 61 percent success rate in 1998 and a 64 percent success rate in 1999. The low rates of success were due to both handler and dog errors (Engeman et al. 2002, p. 103).

From 1993 to 1996, 80 percent of the cargo from Guam found to have snakes in it was headed for other Pacific islands (Engeman et al. 2002, p. 102). BTS have been found in Kwajalei, Pohnpei, Oahu, Diego Garcia, Spain, Alaska, Texas, Oklahoma, Rota, Saipan, and Tinian despite all of the efforts to reduce the risk of spread. There have been eight unconfirmed sightings on Tinian, and there have been 75 confirmed reports of BTS throughout the CNMI (Department of the Navy 2010, 3: 10-6). The threat of BTS establishment is high, especially with recently escalated military activities on Tinian. Under the chosen alternative (Alternative 1, see "Military Land Use" discussed in habitat loss section above), there will be increased transport between Guam and Tinian including a proposed 200-400 marines coming to Tinian via air transport from Guam once a month, accompanied by military equipment shipments by barge from Guam once a week (Department of the Navy 2010, 3: 2-14). If the BTS were to become established on Tinian, the large populations of rats and other small invasive mammals would help the snakes spread faster by providing a prey base, even as native species decline or are extirpated. They would also be harder to trap because mice and rats are used as attractants to traps, but if they exist in abundance in the forest, it is less likely that a snake will be lured to a trap (Wiewel et al. 2009, p. 218).

Monarch population declines of at least 30 to 49 percent are projected in the likely event of the brown treesnake becoming established on Tinian (BirdLife International 2013).

The monarch is also threatened by predation from domestic and feral cats (CNMI Division of Fish and Wildlife undated, p. 1; FWS 2005, p. 21). The domestic cat is one of the most damaging

species introduced to islands, and is a primary extinction driver for at least 33 insular endemic vertebrates (Nogales et al. 2013, p. 804).

The monarch warrants protection under the Endangered Species Act due to threats from predation and disease.

#### D. The inadequacy of existing regulatory mechanisms.

Currently, there are no existing regulatory mechanisms that adequately protect the Tinian monarch and its habitat. The monarch was federally delisted in 2004 (69 FR 56367), and it was delisted from CNMI's list of threatened and endangered species in 2009 (Department of the Navy 2010, 3: 10-4).

The Post Delisting Monitoring Plan for the monarch has now expired. Although the final summary of the results of the monitoring was scheduled to be completed in 2010, a report has not been published.

Public Law 2-51 prohibits the direct take, killing, or harassment of forest birds, but offers no protection for the monarch's habitat (USFWS 1999, p. 8536). Conservation areas on Tinian have no "take" policies (CNMI SWARS Council 2010, p. 17).

The Tinian monarch warrants protection under the Endangered Species Act because existing regulatory mechanisms are inadequate to prevent the bird from becoming threatened in the foreseeable future due to numerous ongoing and proposed threats to its remaining habitat as well as unabated threats from other factors.

#### E. Other natural or manmade factors affecting the continued existence of the species.

##### I. Noise Pollution

Numerous projects threaten to harass monarchs with noise pollution, chief among them the proposed increase in military activities on the island (Department of the Navy 2010). In addition to the direct impacts on habitat that the proposed activities would have, the quality of remaining habitat will be degraded by noise pollution. Noise and activity from construction is assumed to impact a 328-ft (100-m) wide zone surrounding the perimeter of the range footprint areas for all alternatives (Department of the Navy 2010, 3: 10-16, 10-28, 10-34). The peak noise exceeded by 15 percent of firing events during combat training is 104 decibels (dB), which will reach and impact 577 ac. of forest, including at least 25 ac. of the limestone forest that is prime habitat for the monarch. Sixty-five dB of a-weighted day-night level of noise will be audible in 1,229 ac. which includes 41 ac. of limestone forest (Department of the Navy 2010, 3:10-19). The Tinian monarch's specific stress response to noise is unknown, but the surrounding forests of the proposed training areas are highly important habitats. The monarch uses vocalizations to communicate (BirdLife International 2013), and if they are unable to alter their calls to adjust to the additional noise interference, they might abandon the area, have lower reproductive success, or be unable to avoid predation. The negative effects of noise pollution on forest birds that rely



on acoustic signals for communication are well established in the scientific literature (e.g. Bayne et al. 2008, Francis et al. 2009).

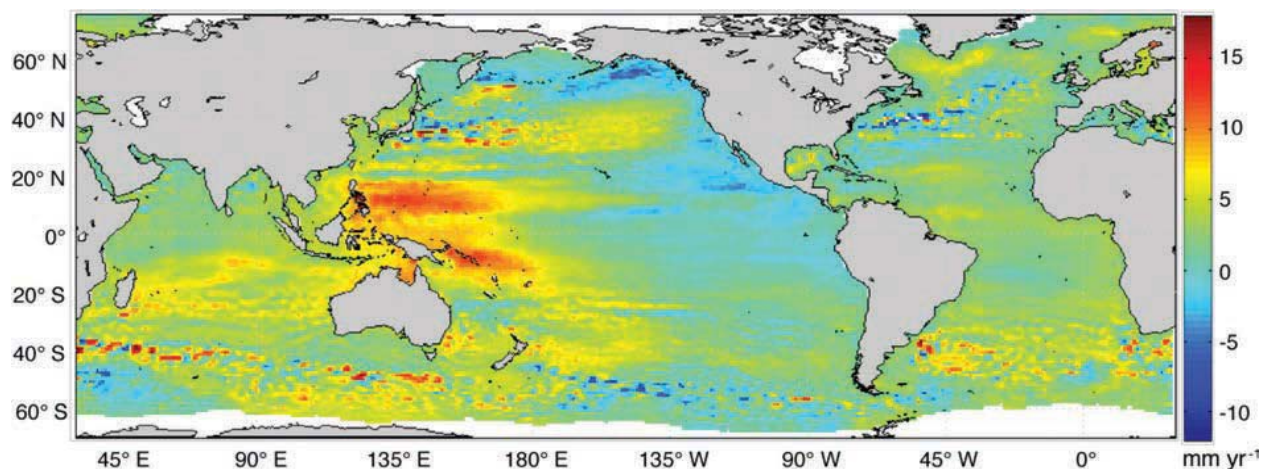
## II. Climate Change

Global climate change threatens the Tinian monarch via numerous mechanisms. The effects of global climate change will impact species worldwide and is predicted to cause rapid species-level extinctions (Thomas et al. 2004, cited in Maschinski et al. 2010, p. 148). Island species may be especially at risk due to the inability to relocate and the risks associated with already limited populations (Pimm 1991 cited in Manne et al. 1999, p. 258; Frankham 1997; Ross et al. 2009; Maschinski et al. 2010, p. 148, 153).

From 1993 to 2011, the global sea level rose at an average rate of  $3.2 \pm 0.5$  mm per year, with the highest rise occurring in Micronesia, at Mariana Islands, in Papua New Guinea Islands, and Solomon Islands (see Figure 7) (PIRCA 2012, p. 71; Becker et al. 2012, p. 91). This rate of rise was 60 percent faster than what was predicted by the Intergovernmental Panel for Climate Change (IPCC) (Rahmstorf et al. 2012).

Projections for global sea level rise by 2100 range from 0.5 to 2 m (Rahmstorf 2007, p. 368; Vermeer and Rahmstorf 2009, p. 4; Pfeffer et al. 2008, p. 1342; Grinsted et al. 2008) and are a concern for all island regions (PIRCA 2012, p. 66). Even under best case scenarios, 21 eco-regions, including and especially ones in Southeast Asia, are predicted to lose more than 50 percent of their land area (Menon et al. 2010, p. 8). The total sea level rise trend on Guam (the closest studied island to Tinian) is about 1.8 mm/year since 1950 (Becker et al. 2012, p. 97).

**Figure 7:** Sea-level trend for 1993–2010 from Aviso altimeter product, produced by Ssalto/Duacs with support from the Centre National d'Etudes Spatiales. (PIRCA 2012, p. 71)



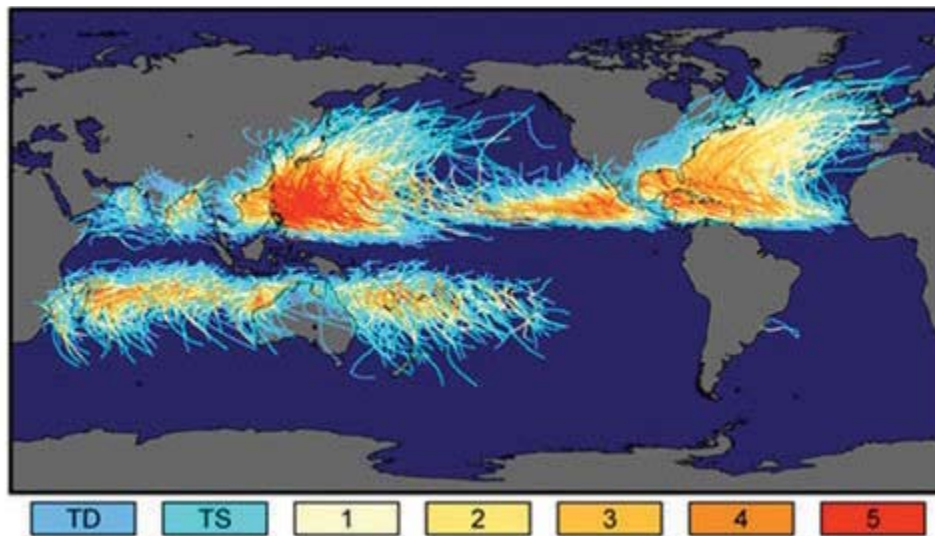
Tinian is threatened not only by rising sea levels but also by increased storm surges. Models show that an increase in sea surface temperature, like what has already been recorded and what is predicted to continue, will most likely lead to more intense storms that will exacerbate storm surge flooding on islands (reviewed in Maschinski et al. 2010, p. 148). Knutsen and Tuleya

(2004, 2008) estimated an average eight percent increase in hurricane intensity for every 1 degree Celsius of sea surface temperature rise (cited in Mousavi et al. 2009). Knutsen et al. (2010, p. 33) predicted an increase in average maximum wind speed of 2-11 percent and a 20 percent increase in global rainfall rates.

Wave runup, the process of waves surging against beaches and structures and causing or promoting erosion, also threatens Tinian. Wave runup represents the most dominant non-tidal sea-level deviation, and could be the largest cause for coastal inundation. Wave-driven inundation is a major concern for the Pacific Islands region (PIRCA 2012, p. 82).

Trends in extreme levels of surging tend to follow trends in mean sea level (PIRCA 2012, p. 82). Tinian is particularly vulnerable to increased surging because it is located in what is referred to as Typhoon Alley (Figure 8) which puts it at risk for frequent and energetic storms (DOI 2006; PIRCA 2012, p. 73). Typhoon Keith, for example, caused extensive damage when it swept through south of Tinian in 1997 and illustrates the swift and dramatic changes that can occur on islands (BirdLife International 2013).

**Figure 8:** Tracks and intensity of all tropical storms. Saffir-Simpson Hurricane Intensity Scale (PIRCA 2012, p. 74)



The monarch's habitat is threatened by damage from storms and sea level rise and also by displacement of people into the island's interior due to these factors (CNMI SWARS Council 2010, p. 31). San Jose, Tinian's most populated town, sits on the coast at approximately zero ft of elevation. Coastal inundation caused by more intense storm surges coupled with a higher sea level is already driving the re-location of many residents on some Pacific islands such as Fiji, Western Samoa, Tonga, etc. (Nunn and Mimura 1997, cited in Fitzgerald et al. 2008).

Climate change could also threaten the monarch and its habitat via other factors such as changes in forest composition and spread of invasive species (CNMI SWARS Council 2010, p. 31).

### III. Restricted Range

Populations restricted to small islands are naturally more vulnerable to threats such as invasive predators, diseases, and climate change because of their limited ability to leave and recolonize elsewhere and because of their naturally lower genetic variation (Pimm 1991 cited in Manne et al. 1999, p. 258; Frankham 1997). In a study done by Frankham (1997), island populations were found to have lower genetic variation than mainland populations, and island endemics were found to have even lower genetic variation than non-endemics (p. 320). Limited ability to adapt to environmental change, low genetic variation, inbreeding depression, accumulation of deleterious mutations, and genetic adaptations to island environments can all place island species at higher risk of extinction (Carlquist 1974; Myers 1979; Soulé 1983; Temple 1986; Vitousek 1988; Atkinson 1989; World Conservation Monitoring Centre 1992 cited in Frankham 1997, p. 321). Even island species with relatively large population sizes compared to their available habitat may need federal protection earlier in the stages of decline than what may be considered necessary for continental species. Since the 1600s, 97 out of 108 known bird extinctions have been on islands (Johnson and Stattersfield 1990, cited in Manne et al. 1991, p. 258). The Tinian monarch only exists on Tinian, which is a small 24,960 acre island with very little forested habitat remaining (Duenas, Camacho & Associates, Inc. 2012, p. 4-12). Given the monarch's limited range, declining status, and multiple habitat threats, the flycatcher needs federal protection to ensure its survival.

### CONCLUSION

The Endangered Species Act requires that the Service promptly issue an initial finding as to whether this petition "presents substantial scientific or commercial information indicating that the petitioned action may be warranted." 16 U.S.C. § 1533(b)(3)(A). According to the best available science, there is no question that under the five listing factors of the Act, protecting the Tinian monarch as threatened or endangered may be warranted. The monarch has experienced significant population decline since 1982, and is threatened by loss and curtailment of habitat or range, disease and predation, and various other factors including climate change. Protections made for the Tinian monarch could also provide other native species with benefits as well, especially those who also suffer from predation by rats, loss of forest habitat, and birds who are susceptible to avian poxvirus.

There are no existing regulatory mechanisms that are adequate to protect the monarch, and in order to stop its present decline, preserve its remaining habitat, and allow for recovery, it should be promptly protected under the Act.

On behalf of all parties,



Tierra R. Curry, M.Sc.  
Senior Scientist  
Center for Biological Diversity  
PO Box 11374  
Portland, OR 97211  
tcurry@biologicaldiversity.org

## REFERENCES

- Atkinson, I. 1989. Introduced animals and extinction. Conservation for the Twenty-First Century, pp. 54—75. Oxford University Press, New York.
- Baker, R. H. 1951. The avifauna of Micronesia, its origin, evolution, and distribution. University of Kansas Publications, Museum of Natural History 3:1-359.
- Balis-Larsen, M. and T. Sutterfield. 1997. Navy protects island monarch. *Endangered Species Bulletin* 22: 10-11.
- Bayne, E.M., L. Habib, and S. Boutin. 2008. Impacts of chronic anthropogenic noise from energy-sector activity on abundance of songbirds in the boreal forest. *Conservation Biology* 22(5): 1186–1193.
- BirdLife International. 2013. Species factsheet: *Monarcha takatsukasae*. Downloaded from <http://www.birdlife.org> on 08/08/2013.
- Camp, et al. 2012. Bird Populations on the Island of Tinian: Persistence despite Wholesale Loss of Native Forests. *Pacific Science*, vol. 66, no. 3:283-298.
- Carlquist, S. 1974. *Island Biology*. Columbia University Press, New York.
- Commonwealth of Northern Mariana Islands Division of Fish and Wildlife. Undated. Tinian monarch species handout. 1 pp. Available at: <http://www.dfw.gov.mp/Downloads/Species%20Handouts/TIMO.pdf> Accessed November 25, 2013.
- CNMI SWARS Council. 2010. Commonwealth of the Northern Mariana Islands (CNMI) Statewide Assessment and Resource Strategy 2010-2015+. CNMI Forestry.

Department of the Navy. 2010. Final Environmental Impact Statement: Guam and CNMI Military Relocation - Relocating Marines from Okinawa, Visiting Aircraft Carrier Berthing, and Army Air and Missile Defense Task Force. Volume 3: Marine Corps Relocation – Training on Tinian.

Department of the Navy and Department of the Army. 2010. Record of Decision for Guam and CNMI Military Relocation including Relocating Marines from Okinawa Transient Nuclear Aircraft Carrier Berth Air and Missile Defense Task Force.

Defense Video and Imagery Distribution System (DVIDS). 2013. News: Marines prepare for Forager Fury II. November 6, 2012. Available at:

<http://www.dvidshub.net/news/116434/marines-prepare-forager-fury-ii#.Un1J8uJh-2U>

Duenas, Camacho & Associates, Inc. 2012. Final Environmental Assessment for the Siting of a Solid Waste Transfer Station on Tinian, CNMI. Capital Improvement Projects Program Office, Saipan, MP.

Engeman, Richard M., et al. 2002. Sustained evaluation of the effectiveness of detector dogs for locating brown tree snakes in cargo outbound from Guam. USDA National Wildlife Research Center – Staff Publications. Digital Commons@University of Nebraska – Lincoln, 7-5-2002.

Eugenio, Haidee. 2013. Green Globe finds new partner for \$200m wind, solar proposal. Saipan Tribune. October 23, 2013.

<<http://www.saipantribune.com/newsstory.aspx?newsID=151038&cat=1>> Accessed October 23, 2013.

Francis, C. D., C. P. Ortega, and A. Cruz. 2009. Noise pollution changes avian communities and species interactions. *Current Biology* 19:1415–1419.

Frankham. 1997. Do island populations have less genetic variation than mainland populations? *Heredity*. 78: 311-327.

Franklin, Master Sgt. Pauline. 2013. Residents comment on live-fire ranges, training areas proposed for Tinian, Pagan. U.S. Marine Corps Forces, Pacific, In Any Clime and Place. Marine Corps Activity on Guam, April 18, 2013. <<http://www.marforpac.marines.mil/News/NewsArticleDisplay/tabid/919/Article/141615/residents-comment-on-live-fire-ranges-training-areas-proposed-for-tinian-pagan.aspx>> Accessed August 8, 2013.

Fritts, Thomas H. and Rodda, Gordon H. 1998. Alien Snake Threatens Pacific Islands. *Endangered Species Bulletin*. November/December 1998, Volume XXIII, No. 6.

International Union for Conservation of Nature (IUCN). 2012. IUCN Red List of Threatened Species. *Monarcha takatsukasae* Species Account. Available at:

<http://www.iucnredlist.org/details/full/106006119/0> Accessed October 18, 2013.

Johnson, T.H., Stattersfield, A.J. 1990. A global review of island endemic birds. International Council for Bird Preservation, 32 Cambridge Road, Girton, Cambridge CB3 OPJ.

Khan, Amina. 2011. Vines spreading at trees' expense in tropical forests, scientists say. Los Angeles Times. February 23, 2011. <<http://articles.latimes.com/2011/feb/23/science/la-sci-vines-trees-20110223>> Accessed August 8, 2013.

Loss, S.R., T. Will, and P.P. Marra. 2013. Estimates of bird collision mortality at wind facilities in the contiguous United States. *Biological Conservation* 168: 201–209.

Lusk, Michael, et al. 2000. Population status of the Tinian Monarch (*Monarcha takatsukasae*) on Tinian, Commonwealth of the Northern Mariana Islands. *Micronesica* 32(2):181-190.

Manne, Lisa L., Brooks, Thomas M., Pimm, Stuart L. 1999. Relative risk of extinction of passerine birds on continents and islands. *Nature*, Vol 399.

Marshall, Ann P. and Amidon, Fred A. 2009. Tinian Monarch Post-Delisting Monitoring Progress Report for March 11-22, 2009. U.S. Fish and Wildlife Service Pacific Islands Office, Honolulu, Hawaii.

Nogales, M., E. Vidal, F.M. Medina, E. Bonnaud, B.R. Tershy, K.J. Campbell, and E.S. Zavaleta. 2013. Feral cats and biodiversity conservation: the urgent prioritization of island management. *BioScience* 63(10): 804-810.

Myers, N. 1979. *The Sinking Ark A New Look at the Problem of Disappearing Species*. Pergamon Press, New York.

Peters, D. S. 1996. *Monarcha takatsukasae* (Yamashina 1931) - ein Nachweis von Saipan (Aves: Monarchidae). *Senckenbergiana Biologica* 76:15-17.

Pimm, S. L. 1991. *The Balance of Nature?* University of Chicago Press, Chicago.

Rubio, A. 2013. News: “Sumos” land on North Field during Exercise Forager Fury II, Defense Video and Imagery Distribution Service. Available at: <http://www.dvidshub.net/news/117838/sumos-land-north-field-during-exercise-forager-fury-ii#.UqiFfOIUYyd>

Soule, M.E. 1983. What do we really know about extinction? *Genetics and Conservation: A Reference for Managing Wild Animal and Plant Populations*, pp. 111—125.

Sherley, Greg. 2001. *Bird Conservation Priorities and a Draft Conservation Strategy for the Pacific Islands Region*. South Pacific Regional Environment Program (SPREP). Apia, Samoa.

Takatsukasa, S. and Y. Yamashina. 1931. Some new birds from the Palau and Mariana islands. *Dobutsu Zasshi* 43:484-487.

Temple, S. 1986. Why endemic island birds are so vulnerable to extinction. *Bird Conservation* 2, pp. 3—6. International Council for Bird Preservation, US Section: University of Wisconsin Press, Madison, WI.

Tetra Tech. 2013. A-E Services for Design of New Municipal Solid Waste Disposal Facility, Northern Mariana Islands. <[http://www.tetrattech.com/index.php?option=com\\_content&Itemid=304&catid=17&id=963&lang=en&view=article&tmpl=component](http://www.tetrattech.com/index.php?option=com_content&Itemid=304&catid=17&id=963&lang=en&view=article&tmpl=component)> Accessed August 8, 2013.

U.S. Department of the Interior (USDI). 2013. Finding No Significant Impact (FONSI) and Environmental Assessment for the Siting of a Solid Waste Transfer Station on Tinian, CNMI. Office of Insular Affairs.

U.S. Fish and Wildlife Service (USFWS). 1999. Proposed Rule to Remove the Tinian Monarch from the Federal List of Endangered and Threatened Wildlife. 64 FR 8533.

U.S. Fish and Wildlife Service (USFWS). 2004. Final Rule To Remove the Tinian Monarch From the Federal List of Endangered and Threatened Wildlife. 69 FR 56367.

U.S. Fish and Wildlife Service (USFWS). 2005. Post-delisting Monitoring Plan for the Tinian Monarch *Monarcha takatsukasae*. Endangered Species Division, Pacific Islands Fish and Wildlife Office, Honolulu, Hawaii. 22 pp.

U.S. Fish and Wildlife Service (USFWS). 2009. Final Report: Terrestrial Resource Surveys of Tinian and Aguiguan, Mariana Islands, 2008. Pacific Islands Fish and Wildlife Office, Honolulu, Hawaii.

U.S. Geological Survey (USGS). 2013. Avian Pox information sheet, National Wildlife Health Center. Available at: [http://www.nwhc.usgs.gov/disease\\_information/other\\_diseases/avian\\_pox.jsp](http://www.nwhc.usgs.gov/disease_information/other_diseases/avian_pox.jsp) Accessed October 18, 2013.

van Riper, Charles III., van Riper, Sandra G., Hansen, Wallace R. 2002. Epizootiology and Effect of Avian Pox on Hawaiian Forest Birds. *American Ornithologists Union. University of California Press*, vol. 119, no. 4: 929-942.

Vitousek, M. 1988. Diversity and biological invasions of oceanic islands. *Biodiversity*, pp. 181—189. National Academy Press, Washington, DC.

Wiewel, Andrew S., Yackel Adams, Amy A., Rodda, Gordon H. 2009. Distribution, Density, and Biomass of Introduced Small Mammals in the Southern Mariana Islands. *Pacific Science* (2009), vol. 63, no. 2:205-222.

Wiles, Gary J. et al. 2003. Impacts of the Brown Tree Snake: Patterns of Decline and Species Persistence in Guam's Avifauna. *Conservation Biology*, vol. 17, no. 5:1350-1360.

Wilner, B.I. 1969. A classification of the major groups of human and other animal viruses, 4<sup>th</sup> ed. Burgess Publishing Company, Minneapolis, Minnesota.

World Conservation Monitoring Centre. 1992, *Global Biodiversity: Status of the Earth's Living Resources*. Chapman and Hall, London.

Zimmerling, J. R., A.C. Pomeroy, M.V. d'Entremont, and C.M. Francis. 2013. Canadian estimate of bird mortality due to collisions and direct habitat loss associated with wind turbine developments. *Avian Conservation and Ecology* 8(2): 10.