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

SCIENTIFIC NAME: *Hypolimnas octucula mariannensis*

COMMON NAME: Mariana eight spot butterfly

LEAD REGION: Region 1

INFORMATION CURRENT AS OF: March 2010

STATUS/ACTION

___ Species assessment - determined we do not have sufficient information on file to support a proposal to list the species and, therefore, it was not elevated to Candidate status
___ New candidate
_X__ Continuing candidate
___ Non-petitioned
_X__ Petitioned - Date petition received: __May 11, 2004
_ 90-day positive - FR date:
_X_ 12-month warranted but precluded - FR date: _May 11, 2005
_N_ Did the petition request a reclassification of a listed species?

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

N_ Listing priority change
Former LP: ___
New LP: ___

Date when the species first became a Candidate (as currently defined): September 19,1997

___ Candidate removal: Former LPN: ___

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

ANIMAL/PLANT GROUP AND FAMILY: Insects; Family Nymphalidae (butterfly)

HISTORICAL STATES/TERRITORIES/COUNTRIES OF OCCURRENCE: Guam; Commonwealth of the Northern Mariana Islands (CNMI), island of Saipan.

CURRENT STATES/COUNTIES/TERRITORIES/COUNTRIES OF OCCURRENCE: Guam

LAND OWNERSHIP The lands that support populations of this butterfly are privately owned (three populations), the Government of Guam (one population), and the U.S. Department of Defense (DOD)(six populations).

LEAD REGION CONTACT: Linda Belluomini, (503) 231-6283, linda_belluomini@fws.gov

LEAD FIELD OFFICE CONTACT: Pacific Islands Fish & Wildlife Office, Christa Russell (808) 792-9400, christa_russell@fws.gov

BIOLOGICAL INFORMATION

Species Description

The Mariana eight spot butterfly (*Hypolimnas octucula mariannensis*) is endemic to the islands of Guam and Saipan in the Mariana archipelago. Like most nymphalid butterflies, orange and black are the two primary colors exhibited by this subspecies. The males are smaller than the females by at least a third or more in size. Males are predominantly black with an orange stripe running vertically on each wing. The stripe on the hindwings exhibits small black dots in a vertical row. Overall, the females appear more orange in color than the males, and black bands across the apical (top) margins of both pair of wings are exhibited. Along the inner margin of these black bands, large white spots are exhibited across the entire length of the wings (Swezey 1942).

Taxonomy

This subspecies was originally described by Butler and is recognized as a distinct taxon (Swezey 1942). Swezey (1942) is the most recent and accepted taxonomy for this species.

Habitat/Life History
The larvae of this butterfly feed on two native plants, *Procris pedunculata* and *Elatostema calcareum*. Both of these forest herbs (Family Urticaceae) grow only on karst limestone (Schreiner and Nafus 1996).

Historical Range/Distribution
The Mariana eight spot butterfly is historically known from limestone forests on Saipan and Guam.

Current Range/Distribution
The last known surveys for the Mariana eight spot butterfly was in 1995 (Schreiner and Nafus 1996. On Saipan, several areas were found that supported good populations of the host plants, but no individuals of the Mariana eight spot butterfly were seen and it may be extirpated on Saipan (Schreiner and Nafus 1996; Schreiner and Nafus 1997). Surveys on the island of Guam located 10 populations (Fadian Cove, Hilaan (2 populations), Mangilao golf course (2 populations), Orote, Pagat (2 populations), and Tweeds Cove (2 populations) of the Mariana eight spot butterfly (Schreiner and Nafus 1996).

Population Estimates/Status
No quantitative estimates are given for the subspecies as a whole, however, Schreiner and Nafus (1996) noted on their surveys that the most butterflies seen in one day numbered six. In July of 2009 a survey of the Pagat Route 15 in Guam found one adult, likely a male (Campora and Lee 2009, p. 5).

THREATS

A. The present or threatened destruction, modification, or curtailment of its habitat or range.
None known.

B. Overutilization for commercial, recreational, scientific, or educational purposes.
We are currently unaware if this species is being collected for commercial, recreational, scientific, or educational purposes. However, rare butterflies and moths are highly prized by collectors (Morris *et al*. 1991), who often take all individuals obtainable (59 FR 18350; United States Department of Justice (DOJ), *in litt*. 1993). The listing of butterflies as federally endangered may increase their attractiveness to collectors of rare species (DOJ, *in litt*. 1993). Unrestricted collecting and handling are known to impact populations of other species of rare Lepidoptera (Murphy 1988).

C. Disease or predation.
Numerous alien predators and parasitoids of Lepidoptera have become established, purposefully or adventitiously, in the Mariana Islands, including Guam and Saipan, and these have been documented to attack and significantly impact other species of native butterflies (Peterson 1957; Schreiner and Nafus 1986; Nafus 1989, 1992, 1993a, b, c). Schreiner and Nafus (1996) found

that egg predation by ants and egg parasitism killed the majority of Mariana eight spot butterflies studied for a year on Guam.

In the one year study, Schreiner and Nafus (1996) documented parasitism of eggs of the Mariana eight spot butterfly by two native parasitoids *Telenomus* sp.(NCN) and *Ooencyrtus* sp.(NCN) on Guam.

Nafus (1993a) found ants to be major predators of both eggs and larvae of the common eggfly (*Hypolimnas bolina*), a closely related butterfly. The most commonly observed ants were dwarf pecdicel ants (*Tapinoma minutum*), tropical fire ants (*Solenopsis geminate*), white-footed ants (*Technomyrmex albipes*), and bi-colored trailing ants (*Monomorium floricola*). Ants prey on all immature stages of Lepidoptera and can completely exterminate populations (Zimmerman 1958). In the one year study, Schreiner and Nafus (1996) found predation by alien ants to be one of the primary causes of mortality (>90 percent) in the Mariana eight spot butterfly.

D. The inadequacy of existing regulatory mechanisms.
The Mariana eight spot butterfly currently receives no protection under the federal Endangered Species Act (16 U.S.C. §1531-1544). It also does not receive protection under the Guam Endangered Species Act (5GCA Ch. 63) or the CNMI Endangered Species List (Public Law 2-51 CMC 5108b)

E. Other natural or manmade factors affecting its continued existence.
The Mariana eight spot butterfly persists in extremely low numbers on Guam. This circumstance makes it vulnerable to extinction due to a variety of natural processes. Small populations are particularly vulnerable to reduced reproductive vigor caused by inbreeding depression, and they may suffer a loss of genetic variability over time due to random genetic drift, resulting in decreased evolutionary potential and ability to cope with environmental change (Lande 1988; Pimm *et al*. 1988; Center for Conservation Biology 1994; Mangel and Tier 1994). Small populations are also demographically vulnerable to extinction caused by random fluctuations in population size and sex ratio, and to catastrophes such as typhoons (Lande 1988).

CONSERVATION MEASURES PLANNED OR IMPLEMENTED
In 2009, we provided field information sheets with color pictures and descriptions of the Mariana eight spot butterfly and its host plants to over 20 professional staff currently working in the field on the islands of Rota, Tinian, and Saipan. The sheets request that pictures, GPS points and field notes be provided to the U.S. Fish and Wildlife Service (Service) in an effort to obtain information on this species (Nate Hawley, formerly with the Service, *in litt.* 2009).

A survey led by the Service was conducted on the island of Tinian, CNMI from June through October, 2008, to determine the presence or absence of two butterfly species, Mariana wandering butterfly (*Vagrans egistina*) and the Mariana eight spot butterfly . While Tinian is not known to be part of either species' historical range the likelihood of introduced pests arriving on Tinian due to an increase in sea and air transports to this island is a concern for a suite of native butterfly species, including the Mariana eight spot butterfly. Additionally, any reduction of host plant sites

for these two species may be of conservation concern if translocation to Tinian is considered in future recovery or enhancement plans. While four host plant areas were identified and monitored on Tinian, no life stages of either butterfly were found (Hawley 2009).

Surveys on Guam insect biodiversity are currently underway (C. Aguon, Guam Division of Aquatic and Wildlife Resources, *in litt.* 2009). In addition, a survey for the butterfly in Pagat was conducted between July 15 and July 24, 2009. While the survey was only able to confirm the presence of one adult male, they did fine eggs, larvae, one viable chrysalis, and three empty chrysalides of *Hypolimnas.* Unfortunately, immature life stages are difficult to distinguish and therefore unless reared to adult form cannot be confirmed (Campora and Lee 2009, pp. 3-5).

SUMMARY OF THREATS

Based on our evaluation of predation and parasitism we conclude there is sufficient information to develop a proposed rule for this species due to the threat of predation by ants and parasitism by small wasps. The likely extirpation of this species from Saipan and its reduction to low numbers on Guam makes it vulnerable to random demographic and environmental events. We find that this species is warranted for listing throughout all of its range, and, therefore, find that it is unnecessary to analyze whether it is threatened or endangered in a significant portion of its range.

For species that are being removed from candidate status:

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

RECOMMENDED CONSERVATION MEASURES

- Develop and implement monitoring surveys for the Mariana eight spot butterfly
- Conduct parasite control
- Conduct ant control

LISTING PRIORITY

THREAT			
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	Monotypic genus	7
		Species	8
		Subspecies/population	9
	Non-imminent	Monotypic genus	10
		Species	11
		Subspecies/population	12

Rationale for listing priority number:

Magnitude:
The threat to the Mariana eight spot butterfly from predation by nonnative ants and parasitism by small wasps are of high magnitude. Nonnative ants and parasitic wasps occur rangewide. The small number of individuals also make this species very susceptible to the negative effects of randomly occurring natural events such as typhoons and storms.

Immediacy of Threats:
The primary threat of predation by nonnative ants and parasitism by small wasps is imminent because it is ongoing.

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

Is Emergency Listing Warranted? No. The species is not considered for emergency listing at this time because the immediacy of the threats is not so great as to imperil the species within the time frame of the routine listing process. If it becomes apparent that the routine listing process is not sufficient to prevent large losses that may result in this species' extinction, then the emergency rule process for this species will be initiated. We will continue to monitor the status of the Mariana eight spot butterfly as new information becomes available. This review will determine if a change in status is warranted, including the need to make prompt use of emergency listing procedures.

DESCRIPTION OF MONITORING

We conducted literature searches for recent articles on this species and attempted to contact relevant species experts regarding the current status of this species. No new information on this species was found, and there is no new information on the numbers of individuals or populations, or on threats to the species.

This level of monitoring is appropriate to update the status of the species because a thorough literature search was conducted as well as relevant experts contacted Information contained in this assessment form was verified and any updated information incorporated.

List of Experts Contacted:

Name	Date	Affiliation
Sylvan O. Igisomar	January 29, 2010	CNMI Division of Fish and Wildlife, Saipan
Celestino Aguon	January 29, 2010	Guam Division of Aquatic Wildlife and Resources

The Mariana eight spot butterfly is included in the list of species in the Guam Comprehensive Wildlife Conservation Strategy (Guam Division of Aquatic Wildlife and Resources 2005).

COORDINATION WITH STATES

On January 29, 2010, we sent a letter to the Guam Division of Aquatic Wildlife and Resources (DAWR) and to the CNMI Division of Fish and Wildlife (DFW) requesting their review and comments on our most recent candidate assessment of this species. No response was received from either the CNMI DFW or the Guam DAWR.

LITERATURE CITED

Campora, C. and S. Lee. 2009. Survey for the Mariana eight spot butterfly, *Hypolimnas octocula marianensis* (Lepidoptera:Nymphalidae), in the Pagat Route 15 area of Yigo Village, Guam. A report. August 2009.

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Personal Communications and *in litt*.

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Hawley, N. U.S. Fish and Wildlife Service. Email dated February 2, 2009.

Igisomar, S.O. CNMI Division of Fish and Wildlife, Letter regarding CNMI's response to request for information on candidate assessment forms. February 27, 2008.

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:

Acting Carolyn A. Bohan
Regional Director, Region 1, Fish and Wildlife Service — 5/18/10 Date

Rowan W. Gould
ACTING
Director, Fish and Wildlife Service — October 22, 2010

Concur:

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

Director's Remarks:

Date of annual review: April 16, 2010
Conducted by: Lorena Wada, Pacific Islands FWO
Biologist, Prelisting and Listing Program

Comments:
PIFWO Review

Reviewed by: Christa Russell — Date: April 19, 2010
Prelisting and Listing Program Coordinator

Marilet Zablan — Date: April 26, 2010
Assistant Field Supervisor, Endangered Species Division

Gina Shultz — Date: April 30, 2010
Acting Field Supervisor