5-YEAR REVIEW

Short Form Summary

Species Reviewed: Micronesian Megapode or Sasangat (*Megapodius laperouse*)

Current Classification: Endangered

Federal Register Notice announcing initiation of this review:

[USFWS] U.S. Fish and Wildlife Service. 2018. Endangered and threatened wildlife and plants; initiation of 5-year status reviews of 156 species in Oregon, Washington, Hawaii, Palau, Guam, and the Northern Mariana Islands. Federal Register 83 FR: 20088-20092.

Lead Region/Field Office: Region 1/Pacific Islands Fish and Wildlife Office (PIFWO), Honolulu, Hawai`i

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Methodology used to complete this 5-year review:

This review was conducted by staff of the Pacific Islands Fish and Wildlife Office of the U.S. Fish and Wildlife Service (USFWS). This document is based on a review of current, available information since the last 5-year review for the Micronesian megapode (USFWS 2016). The evaluation by Tyler Willsey, Fish and Wildlife Biologist, was reviewed by the Mariana Islands Team Manager, the Animal Recovery Coordinator, and the Conservation and Restoration Team Manager.

Background:

For information regarding the species listing history and other facts, please refer to the U.S. Fish and Wildlife Service's Environmental Conservation On-line System (ECOS) database for threatened and endangered species (http://ecos.fws.gov/tess_public).

Review Analysis:

Please refer to the previous 5-year review for the Micronesian megapode published on October 28, 2016 (available at https://ecos.fws.gov/docs/five_year_review/doc4827.pdf), for a complete review of the species' status, threats, and management efforts.

The Micronesian megapode, known as *sasangat* in Chamorro and *sasangal* in Carolinian, is a pigeon-sized bird of the forest floor. This subspecies is endemic to the Mariana Islands and differs slightly from the Palauan subspecies (*Megapodius laperouse senex*) in color, vocalizations, and morphology (USFWS 1998). The Micronesian megapode once occurred throughout the Mariana archipelago, but was extirpated from Guam, Rota, and possibly Saipan in the 19th and early 20th centuries due primarily to exploitation by humans and loss of habitat (USFWS 1998). Remnant populations were believed to persist

on Aguiguan, Tinian, and Farallon de Medinilla (FDM), as well as a small reintroduced population on Saipan (USFWS 1998). Larger numbers were believed to remain on the mostly, uninhabited northern islands of Anatahan, Sarigan, Guguan, Alamagan, Pagan, Asuncion, Maug and possibly Agrihan (USFWS 1998). It is not known how many individuals existed at the time of listing (USFWS 1970). There were an estimated 1,440 to 1,975 individuals on 11 to 12 islands in the Mariana archipelago in 1998 (USFWS 1998).

In 2009 and 2010, the USFWS Pacific Islands Fish and Wildlife Office coordinated surveys in the Commonwealth of the Northern Mariana Islands (Amidon et al. 2011). These surveys used different methods from prior surveys and are described below. Analysis of the data resulted in a range-wide population estimate of approximately 10,727 individuals (95% Confidence Interval; 6,682-15,445) distributed across 12 islands, with the majority of birds on the islands of Sarigan, Guguan, and Asuncion (Amidon et al. 2011; Table 1). During the surveys, Micronesian megapodes were counted on Aguiguan, Saipan, Anatahan, Sarigan, Guguan, Alamagan, Pagan, Asuncion, and Maug. The FDM information is from a 2009 survey of FDM (Vogt 2009). It is believed that the increased population estimates are, in part, due to increased survey effort. However, other factors, such as the ungulate eradication on Sarigan and Anatahan and the volcanic eruptions on Anatahan also affected the population estimates during the Amidon et al. 2011 study. In addition, due to the remoteness of the northern islands and the difficulty accessing them, past survey efforts have largely consisted of short trips that included surveys of sub-sections of the island being surveyed. In the 2009-2010 survey effort, the use of repeated surveys, playbacks, and additional time to survey on each of the islands, allowed an increase in overall detections to allow for improved density estimates (Amidon et al. 2011). This study recommended developing an archipelago-wide management plan and continued monitoring of the Micronesian megapode to assess its status and to determine if restoration efforts are aiding recovery.

Population Dynamics

Information related to dispersal and population dynamics is lacking. We do have anecdotal information that supports some interisland movement and recolonization, but we cannot determine whether each island functions as a separate population. Megapodes are capable of dispersing by flying over water for considerable distances (Olson 1980). In Palau, *Megapodius laperouse senex* have been observed to fly several kilometers between islands (Pratt et al. 1980). The Mariana species may be able to fly the 4.6 kilometers (2.9 miles) between Saipan and Tinian, and the 8.9 kilometers (5.5 miles) between Tinian and Aguiguan, but they probably would not normally fly the 30 to 60 kilometers (18 to 37 miles) between adjacent northern islands. We do have some evidence of movements between northern islands seem to occur at least occasionally, because Falanruw (1975) observed a megapode on Uracus, an active volcano with no forest habitat, which is 41.8 miles (63.7 km) from the closest island (Maug) with megapodes present. In addition, a series of volcanic eruptions from 2003 to 2005 was thought to have extirpated the population of megapodes on Anatahan as none were detected during at least seven surveys from 2005 to 2009. Surprisingly, the 2010 surveys estimated at least 20 megapodes occur on Anatahan (Amidon et al. 2011), which is 25 mi (41 km) from the

nearest island with an extant megapode population. Although no observations of flights over open-ocean have been reported in the Marianas, the migration of megapodes between adjacent islands, would explain the apparent increase in numbers on Anatahan, the lone detection on Uracas.

The current status for the Micronesian megapode, as known, is provided in Table 2 below. Threats to the species (Table 3) continue including habitat loss and degradation, overgrazing by feral ungulates (goats, pigs, and cows), predation by introduced species (rats, feral dogs, cats, and pigs, and monitor lizards), the potential for the introduction of the brown treesnake (*Boiga irregularis*), human disturbance, possibly including poaching, stochastic events (volcanism, typhoons, and drought), and more recently, climate change (USFWS 1998, 2010).

New status information:

- There is no new information on the status of the species since the last five year review conducted in 2015 (USFWS 2016).

Threats:

There are no new potential threats to the megapode beyond those discussed in our previous 5-year status review (USFWS 2015) and recovery plan (USFWS 1998). The primary threats continue to involve habitat loss and depredation by nonnative predators. Appendix A summarizes the applicability of the threats listed below by island.

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

- The main threat to the megapode continues to be the loss and degradation of habitat due to feral ungulates and development (USFWS 1998). The conversion of forest habitat to non-native monocultures, such as sword grass or tangan tangan, affects the amount and diversity of food available (USFWS 1998). In the early 1900's, much of the native forest in the Marianas, particularly on Saipan, Tinian, and Aguiguan, was cleared for agriculture. During the Second World War, forests in Micronesia were further damaged by clearing for military operations, bombing and other fighting (Baker 1946). Although forest habitat continues to be impacted by development in the Southern Islands, a majority of this habitat loss occurred in the 19th and early 20th centuries while the islands were under Spanish, German, and Japanese rule and the species was considered extirpated from Guam, Rota, and Saipan. There is currently only a small population of megapodes on Saipan and a few individuals on Tinian, therefore civilian development is not currently considered a threat to existing populations, but does exclude these islands as recovery areas, thereby significantly reducing the population distribution and size.

- The Island of Farallon de Medinilla (FDM) has been used for live fire training by the U.S. Military since the 1970s and continues to be used. As part of the

Commonwealth Joint Military Training proposal, the islands of Tinian and Pagan are proposed for use by the U.S. Military for live fire training activities as well. Tinian (>10), FDM (28), and Pagan (147) contain populations of megapodes which are likely to be impacted by these activities.

- Forest habitat on the Southern Islands as well as Alamagan, Pagan, and Agrihan continue to be damaged by feral goats, pigs, and cattle. Megapodes are ground foragers (USFWS 1998) and understory browsing by ungulates may affect microclimate for ground insects, which may impact food availability for megapodes. Dense understories may also provide protective cover from predators, like feral cats and dogs, monitor lizards, and humans. Ungulates (goats and pigs) were removed from Sarigan in 1998 (Kessler 2002). The increase in megapodes shown by surveys on Sarigan pre- (5.25 birds per ha, Fancy et al. 1999) and post-ungulate removal in 2010 (11.93 birds per hectare, this study) could be related to increases forest and understory regeneration both of which provide habitat for the species (Amidon 2011). Therefore, ungulates are considered a threat to the megapode on the Southern islands as well as Alamagan, Pagan, and Agrihan.

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

- Megapode hunting and collection of their eggs has been documented in the past but current levels of collection are unknown (Oustalet 1896, Ludwig 1979, USFWS 1998). Megapodes were overexploited on the southern islands, and possibly on all inhabited islands. Human exploitation of nests was still a problem when Ludwig visited Agrihan in 1978. Megapodes are now protected by both Federal and local laws, and there have been no recent reports of exploitation. However, megapodes are fairly conspicuous and relatively tame, making them vulnerable to hunting with firearms or pellet guns. Also, concentrated nesting areas in the northern islands are vulnerable to the collection of eggs. Collection of eggs would reduce recruitment while hunting would lower the number of individuals available for breeding which would result in reduced populations.

- Human reoccupation of Anatahan, Alamagan, Pagan, and Agrihan is considered a long term goal by the Mayor of the Northern Islands, however the remoteness of these islands, the lack of infrastructure, and difficulty in establishing supply lines remains a significant obstacle. Furthermore, these islands contain relatively small populations of megapodes so an increase in overutilization is possible but not likely at this time.

Factor C: Disease or Predation

- Sources suggest that egg predation by introduced rats could be a direct threat to Micronesian Megapodes in the Mariana Islands, but none cite any direct, quantitative evidence to justify this assertion (USFWS 1998; Wiles & Conry 2001; Olsen et al. 2013). Four species of rat have become established in the

Marianas, two of which—the Polynesian rat (R. exulans) and black rat (R. rattus)—occur in forested areas (Wiles & Conry 1990)

- Monitor lizards have been observed raiding megapode incubation sites in both the Marianas and Palau and consuming an adult bird on Sarigan in the Marianas (pers. comm., T. Hall; Ludwig 1979). Although they are considered a likely threat to megapodes (USFWS 1998), and these observations confirm that; evidence also suggests that predation by monitor lizards is relatively rare (e.g., Olsen et al. 2013). In the Marianas, the lizard occurs on all islands except FDM, Guguan, Asuncion, Maug, and Uracas (Vogt 2010), and therefore will affect a minority (at most 28%) of megapodes in the archipelago (Amidon et al. 2011).

- Dogs, cats, and pigs also could potentially consume or result in the mortality of adult and juvenile megapodes and their eggs but this has not been documented in the Mariana Islands. Pigs may also root megapode nests and disturb or crush eggs. Cats are known to occur on Tinian and Saipan in large numbers and are thought to occur on Sarigan and Alamagan in relatively small numbers. Dogs occur on Saipan and Tinian and on Alamagan and Agrihan in small numbers. Pigs occur on Saipan and Tinian but remain largely domesticated but are considered feral on Alamagan, Pagan, and Agrihan in occur in large numbers.

- The IUCN (2016) proposes that a possible future introduction of the brown treesnake could affect Micronesian megapode populations in the CNMI and would produce a very rapid decline of its population. The brown treesnake quickly devastated Guam's bird life (Savidge 1987; Wiles et al. 2003) and is considered the greatest threat to the avifauna of the CNMI, where an incipient population of the brown treesnake is thought to occur (Colvin et al. 2005). In the Marianas the brown treesnake is primarily a threat to the avifauna of the human populated islands of Rota, Tinian, and Saipan (Colvin et al. 2005). Snakes could be introduced from Guam to the CNMI via interisland transportation and if established could predate on adult or juvenile megapodes on Saipan or Tinian. However, a vast majority of megapodes occur on the seldom visited islands north of Saipan, which are considered to be safe from the threat of the treesnake (MAC Working Group 2014), therefore these population would likely not be affected by the introduction snake (Radley et al 2018).

<u>Factor D: Inadequacy of Regulatory Mechanisms</u>

- The introduction of ungulates to the northern islands and the lack of legislation preventing this action is a concern for the survival and recovery of the megapode. Ungulates were introduced to Anatahan, Sarigan, Alamagan, Pagan, and Agrihan in the 20th century and remain abundant and uncontrolled on Alamagan, Pagan, and Agrihan. Ungulates were eradicated from Anatahan and Sarigan in the 1990's and megapode populations on Sarigan increased soon after and remain high since this joint effort by the USFWS and the CNMI Government. The

eruption of Anatahan in 2003 likely hindered any habitat regeneration and subsequent megapode population increases following the eradication.

- The introduction of nonnative Sambar deer to Pagan in 2020 is a major concern for the USFWS and for native species and ecosystem conservation in the CNMI. Despite the fact that the release of domesticated deer is against CNMI Public Law 17-23, Section 5, the action was funded and executed by the CNMI government. In addition, there was little to no communication or consultation with current or former residents of Pagan, the public, or subject matter experts to determine if the public supported the introduction or whether any unintended consequences could result from the action. Without stronger regulatory mechanisms and enforcement put in place to deter these actions, the introduction of habitat altering invasive species could potentially occur on any of the islands at any time.

Factor E: Other natural or human caused factors affecting its continued existence

- Volcanism, which facilitates breeding by a large portion of megapodes in the Mariana Islands (Glass & Aldan 1988; Jones et al. 1995), is also a potential threat to the megapodes in the Marianas. All of the islands north of Farallon de Medinilla (where the majority of the Micronesian Megapodes occur) are relatively young and are either active or dormant volcanos (Bloomer et al. 1989). As an example of this threat, the population of megapodes that once occurred on Anatahan is believed to have been driven or extirpated from the island as a result of a series of substantial and drastic habitat altering eruptions between 2003 and 2005 (Amidon et al. 2011). Cataclysmic volcanic eruptions on Sarigan, Guguan, Alamagan, Asuncion, or Maug could affect a significant portion of the Micronesian Megapode population. This, however, is a threat the species has faced since it established itself in the Marianas, and one to which it is very likely well adapted (Radley et al 2018).

- The IUCN (2016) suggests that the Micronesian Megapode in the Mariana is threatened by increased storm/typhoon intensity as a result of climate change. Megapodes in the Mariana Islands, however, are currently not known to breed at an elevation that is within close proximity to the ocean (Jones et al. 1995) and therefore would likely be little threatened by the tidal surges associated with large typhoons. However, the forested areas and habitat in which they occur and breed are frequently affected by the exceedingly damaging winds that are generated by such storms (Berger et al. 2005; Ha et al. 2012).

New management actions:

- Predator monitoring and control – Efforts continue on Guam to control the brown treesnake at ports of entry and on military lands. In recent years, acetaminophen has been used as a toxicant to control snakes within a 55-hectare (136-acre) fenced area on Anderson Air Force Base (AAFB), Guam. In addition, a brown treesnake strategic plan was finalized in 2015. The megapode was historically

found on Guam, so efforts to reduce predators could potentially allow for reintroduction of the species.

- Climate change degradation of habitat – Climate change may pose a threat to this species. However, current climate change analyses in the Pacific Islands lack sufficient spatial resolution to make predictions on impacts to this species. Typhoons may be the main threat to this species as a result of climate change. Climate models indicate that hurricanes in the northwestern Pacific are expected to increase in intensity (5.4%), frequency (2.8%) and duration (1.4%) by 2100, and continue to increase further into the future (Emanuel et al. 2008). Improved modeling of the impacts of climate change will help decision makers determine which populations of the megapode will be impacted the most and inform management decision.

- Invasive Plant Management- The Service has received funding from the U.S. Navy as mitigation for the bombing of FDM to conduct an invasive plant control and native habitat restoration project on Aguiguan. The project is expected to begin in 2020. The creation of additional native forest habitat on Aguiguan will increase breeding, feeding, and sheltering habitat on the island for the megapode.

- Ungulate Management- CNMI DFW is currently evaluating the feasibility of ungulate control on Alamagan. The removal of ungulates on Alamagan would decrease the threat of nest failure by trampling or rooting by pigs and other ungulates as well as reduce grazing pressure and aide in the regeneration of forest habitat.

Synthesis:

Downlisting and delisting objectives are provided in the recovery plan for Micronesian megapode (USFWS 1998). To be downlisted to threatened: 1) there must be a brown treesnake interdiction and control plan in place and implemented for all of the Mariana Islands; 2) current threats to all extant Micronesian megapode populations must be assessed and controlled; and 3) the comparatively large populations on Anatahan, Sarigan, Guguan, Pagan, and Maug must remain at their current levels or be increasing for a period of 5 years.

The downlisting goals for this species have not been met (Table 2) and not all threats are being managed (Table 3). In addition, the loss of distribution may not provide enough buffer against stochastic events given the evidence indicating dispersal between islands is possible but a relatively rare occurrence. Another consideration is that 4 to 5 of the populations are in direct contact with humans to some extent (Saipan, Pagan, Alamagan, Aguiguan, and Agrihan) and human presence may increase on Pagan. Survey results show higher megapode densities on islands with low human presence, which are also islands without ungulates (Maug, Asuncion, Guguan, and Sarigan) indicating these stressors, whether through habitat degradation or harassment, negatively impact megapode populations (Amidon et al. 2011). Therefore, the Mariana subspecies of the

Micronesian Megapode meets the definition of endangered as it remains in danger of extinction throughout its range.

In summary, the delisting goals have not been met, threats are not controlled, and while the recent population estimate is higher than previous surveys, methods differed from previous surveys and represent the status at just one point in time; additional archipelago-wide surveys are needed to determine the population trend. As long as ungulates are present on islands with megapodes, habitat loss and degradation will continue to negatively impact the species. Several of the islands have very low population numbers, and these are susceptible to effects from small population size and stochastic events.

Recommendations for Future Actions:

- Regularly survey and monitor the species using the methods described in Amidon et al. 2011 to asses population status and trends.

- Threats – predator control research – Continue efforts to develop and refine brown treesnake control techniques to support large-scale control and/or eradication efforts. Continue to implement large-scale brown treesnake control and/or eradication efforts on Guam. Continue to work on preventing the establishment of the brown treesnake on other Mariana Islands from Guam. Determine what additional actions or changes are needed to address brown treesnake interdiction/control.

- Threats – herbivore control research – remove ungulates from the islands with larger Micronesian megapode populations, including Aguiguan, Alamagan, and Pagan.

- Threats –predator control research – Prioritize islands most in need of predator control, implement predator control and utilize improved methods as they become available.

- Habitat and natural process management and restoration – Determine how to improve the management of the islands with the largest Micronesian megapode populations, especially those set aside as conservation areas. For example, consider rodent removal from Sarigan.
    - Develop and implement plans to monitor Micronesian megapode populations on all islands on a regular basis.
- Population biology research – Conduct essential research on the ecology and biology of the Micronesian megapode in the Mariana Islands. Determine if Micronesian megapodes can be supported and re-introduced to islands they have been extirpated from, for example, Rota and Tinian.
    - Conduct a population viability analysis (PVA) to determine the minimum viable population number by island needed for recovery, and
    - Conduct surveys every year for at least 10 years to determine actual status of the species.

- Invasive plant monitoring and control – Restore native forest and conduct forest restoration programs.

- Update the recovery plan (USFWS 1998). Use recent survey data to reevaluate and revise down- and delisting criteria as appropriate.

- There are past records of poaching, which may not be an issue currently, but may become a concern if people move permanently back to northern islands utilized by megapodes.

Table 1. Population size estimates of the Micronesian megapode or Sasangat by island.

Island	Individual Number Estimate	Year	Source
Aguiguan	112	2009	Amidon et al. 2010
Tinian	<10	2008	Kessler and Amidon 2009
Saipan	151	2010	Amidon et al. 2011
FDM	28	2008	Vogt 2009
Anatahan	>20	2010	Amidon et al. 2011
Sarigan	2,135	2010	Amidon et al. 2011
Guguan	1,507	2010	Amidon et al. 2011
Alamagan	529	2010	Amidon et al. 2011
Pagan	147	2010	Amidon et al. 2011
Agrihan	<10	2010	Amidon et al. 2011
Asuncion	5,714	2010	Amidon et al. 2011
Maug	544	2010	Amidon et al. 2011
Uracus	0	2010	Amidon et al. 2011

Table 2. Status and trends of the Micronesian megapode or Sasangat from time of listing (1970) through current 5-year review.

Date	Number of adult wild individuals	Downlisting Criteria identified in Recovery Plan	Downlisting Criteria Completed?
1970 (listing)	Unknown, but extirpated from Guam, Rota, Uracus (and probably Tinian).	No recovery plan developed yet.	N/A
1998 (Recovery plan, USFWS 1998)	1,440 to 1,975 on 11 to 12 islands in the Mariana Archipelago (USFWS 1998)	1. There must be a brown treesnake interdiction and control plan in place and implemented for all of the Mariana Islands.	No
		2. Current threats to all extant megapode populations must be assessed and controlled.	No
		3. The comparatively large populations on Anatahan, Sarigan, Guguan, Pagan, and Maug must remain at their current levels or be increasing for a period of 5 years.	No
2010 (5-year review)	Survey results undergoing analysis	1. There must be a brown treesnake interdiction and control plan in place and implemented for all of the Mariana Islands.	No
		2. Current threats to all extant Micronesian megapode populations must be assessed and controlled.	No
		3. The comparatively large populations on Anatahan, Sarigan, Guguan, Pagan, and Maug must remain at their current levels or be increasing for a period of 5 years.	No
2016 (5-yr review)	10,727 individuals (95% CI; 6,682-15,445) (Amidon et al. 2011)	1. There must be a brown treesnake interdiction and control plan in place and implemented for all of the Mariana Islands.	Partial – BTS strategic plan nearly finalized (BTTWG 2015). Barriers established at ports on Tinian and Saipan. Canine BTS detector dogs on Saipan, Tinian, and Guam. Rapid Response Team established and implemented for snake sightings. Testing large-scale toxicant use on Guam.

Date	Number of adult wild individuals	Downlisting Criteria identified in Recovery Plan	Downlisting Criteria Completed?
		2. Current threats to all extant Micronesian megapode populations must be assessed and controlled.	Partial – Recent survey work in the Marianas assessed threats (Amidon et al. 2010).
		3. The comparatively large populations on Anatahan, Sarigan, Guguan, Pagan, and Maug must remain at their current levels or be increasing for a period of 5 years.	Partial - Surveys (Amidon et al. 2011) need to be repeated to determine if numbers are stable or increasing.
2020 5 year review	10,727 individuals (95% CI; 6,682-15,445) (Amidon et al. 2011)	1. There must be a brown treesnake interdiction and control plan in place and implemented for all of the Mariana Islands.	Partial – BTS strategic plan finalized (BTTWG 2015). Barriers established at ports on Tinian and Saipan. Canine BTS detector dogs on Saipan, Tinian, Rota and Guam. Rapid Response Team established and implemented for snake sightings. Testing large-scale toxicant use on Guam.
		2. Current threats to all extant Micronesian megapode populations must be assessed and controlled.	Partial – Recent survey work in the Marianas assessed threats (Amidon et al. 2010).
		3. The comparatively large populations on Anatahan, Sarigan, Guguan, Pagan, and Maug must remain at their current levels or be increasing for a period of 5 years.	Partial - Surveys (Amidon et al. 2011) need to be repeated to determine if numbers are stable or increasing.

Table 3. Status of threats to the Micronesian megapode or Sasangat from time of listing (1970) through current 5-year review.

Threat	Listing factor	Current Status	Conservation/ Management Efforts
Habitat loss and degradation	A	Ongoing	Partial – establishment of Sarigan, Guguan, Asuncion, Maug and Uracus as wildlife sanctuaries by the CNMI. The Saipan Upland Mitigation Bank and the Micronesian megapode Conservation Areas set aside on Saipan also include habitat used by the Micronesian megapode. Removal of ungulates from Anatahan and Sarigan. However, goats continue to be a major issue on Aguiguan, Pagan, Agrihan, and Alamagan and there are pigs and/or cows on some of these islands as well.
Overgrazing by feral ungulates	A	Ongoing	Partial – removal of ungulates from Anatahan and Sarigan. CNMI DFW has plans for ungulate control on Alamagan as well.
Predation by introduced species	C	Ongoing	No –Predation by introduced species including rats, feral dogs, cats, pigs, and monitor lizards is not addressed in a strategic manner.
Potential for establishment of a brown treesnake population from Guam to other islands in the Mariana Archipelago	C	Ongoing	Partial – efforts to control the brown treesnake are ongoing.
Potential poaching by humans	D, E	Unknown	No
Stochastic events such as typhoons and volcanic activity	E	Ongoing	No
Climate change and increased storms	E	Increasing	No

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Appendix A:
Threats to the Micronesian Megapode by Island.

Island	Estimated Number of Megapodes (2010 Survey)	Percentage of Megapode Population	Last Volcanic Eruption (USGS 2020)	Volcanic Threat Potential (USGS 2020)	Ungulates and other introduced mammals	Human Population	Conservation Status	Development Pressure
Guam	0	0%	N/A	None	Yes,	Yes	None	Yes
Rota	0	0%	N/A	None	Yes,	Yes	None	Yes
Aguiguan	112	1.03%	N/A	None	Yes, G	No, but frequent visitors	None	No, but frequent visitors
Tinian	<10	~0%	N/A	None	Yes, G, P, C, D, Do, Ca	Yes	None	Yes, CJMT and Tourism
Saipan	151	1.40%	N/A	None	Yes, G, P, C, D, Do, Ca	Yes	Partially, SUMBA, MIME CA	Yes
FDM	28	~0%	N/A	None	No	No	None	No
Anatahan	>20	~0%	2008 CE	Moderate	No	No	None	No
Sarigan	2,135	19.65%	Holocene	Moderate	No	No	Locally protected	No
Guguan	1,507	13.87%	1883 CE	Moderate	No	No	Locally protected	No
Alamagan	529	4.87%	870 CE	Moderate	Yes, G, P, C, Do, Ca	Seasonal small	None	No
Pagan	147	1.35%	2012 CE	High	Yes, G, P, C, D	Seasonal small	None	Yes, CJMT
Agrihan	<10	~0%	1917 CE	High	Yes, P, G, Do	Seasonal small	None	No
Asuncion	5,714	52.58%	1906 CE	Moderate	No	No	Island is locally and federally protected	No
Maug	544	5.01%	Unrest in the Holocene	Low/Very Low	No	No	Island is locally and federally protected	No
Uracas	0	0%	1967 CE	Moderate	No	No	Island is locally and federally protected	No
	10867	100%						

G= Goats

P= Pigs

C= Cattle

D= Deer

Do= Dogs

Ca= Cats

U.S. FISH AND WILDLIFE SERVICE
SIGNATURE PAGE for 5-YEAR REVIEW of
Micronesian Megapode or Sasangat (*Megapodius laperouse laperouse*)

Pre-1996 DPS listing still considered a listable entity? N/A

Recommendation resulting from the 5-year review:

_____ Delisting
_____ Reclassify from Endangered to Threatened status
_____ Reclassify from Threatened to Endangered status
__X__ No Change in listing status

for **Field Supervisor, Pacific Islands Fish and Wildlife Office**

MEGAN LAUT

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