Pacific Bird Conservation

Mariana Avifauna Conservation

Program 2022 Progress Report

The Mariana Avifauna Conservation Program 2022
Field Collection of Mariana Fruit Dove (*Ptilinopus roseicapilla*) and Rufous Fantail (*Rhipidura rufifrons saipanensis*) from Saipan for Translocation to Guguan, CNMI

Rufous Fantail Credit: Geoff Jones 2013

Trip Report

The Mariana Avifauna Conservation Program 2022 Field Collection of Mariana Fruit Dove (*Ptilinopus roseicapilla*) and Rufous Fantail (*Rhipidura rufifrons saipanensis*) from Saipan for Translocation to Guguan, CNMI

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Program Objectives

1. Collect twenty Mariana Fruit Dove and fifty Rufous Fantails on Saipan and prepare them for translocation to Gugan, with a target date for departure to Guguan of 3 May 2022.
2. Assist Commonwealth of the Northern Marianas (CNMI) Division of Fish and Wildlife (DFW) with transport and release of birds to Guguan.
3. Collect fecal samples from Mariana fruit dove and rufous fantails for long-term study of stress hormones during translocation process.
4. Host high school student interns and teachers from Tinian for research and professional development opportunities
5. Conduct high school classroom and field trip experiences.
6. Provide public presentations of MAC Program activities.

Itinerary

16 April:	MAC core team arrives on Saipan – begin scouting and clearing trap line lanes for site A and B
17 April:	Opening crew arrives – pick up field equipment and begin set-up of bird holding
18 April:	Begin trapping at site B (MAFD)
19 April:	Set up trap site A – primary capture of RUFA
20 April:	Place nets and camp at site A
21 April:	Begin trapping at site A (RUFA)
22 April:	Closing crew arrives on Saipan
26 April:	Trapping completed at site B
27 April:	Trapping completed at site A
29 April:	Trap sites A/B closed, field gear inventoried and transferred to storage
1 May:	Opening crew departs Saipan. Birds color banded for translocation.
3 May:	Birds loaded into crates for translocation. Birds translocated to Guguan. Holding room closed, final supply inventory, all supplies transferred to container.

4 May: Closing crew departs Saipan

12 May: DFW and PBC (John) arrive back to Saipan from Guguan

Background

Guam's avifauna rapidly disappeared with the introduction of the brown tree snake (*Boiga irregularis*) in the last half of the twentieth century via cargo ships. The snake is believed to be solely responsible for the extirpation or severe reduction of Guam's endemic bird community. Based on roadside surveys conducted on Guam over a 20-year period, most species experienced a 90% decline within nine years. Ten of the twelve native bird species were driven to local extinction. Two of these species, the Guam kingfisher (*Todiramphus cinnamominus*) and the Guam rail (*Gallirallus owstoni*), were found only on Guam and now only exist in captive and managed populations. The Guam flycatcher or broadbill (*Myiagra freycineti*) was unable to be successfully trapped and is now extinct.

The populated islands of Saipan, Tinian, and Rota, part of the Commonwealth of the Northern Mariana Islands (CNMI), are all close neighbors to Guam and are recognized as having the greatest risk from introduction of the brown tree snake. Recovery Plans published by the U. S. Fish and Wildlife Service for the currently listed species all cite the establishment of the brown tree snake as a major threat. To date there have been over 90 sightings of brown tree snakes on Saipan.

The CNMI has avifauna with limited distribution, with most forest bird species found only on these islands. Several species have extremely limited distribution such as the Tinian monarch (*Monarcha takatsukasae*), found only on Tinian; the Golden white-eye (*Cleptornis marchei*), found only on Saipan and Aguiguan; the Saipan Reed-warbler (*Acrocephalus luscinia*), found only on Saipan and Alamagan; and the Mariana fruit dove (*Ptilinopus roseicapilla*), found only on four CNMI islands and numbering less than 10 on some.

The CNMI government has requested long-term assistance of Pacific Bird Conservation and zoological institutions to aid with the following objectives:

- Develop techniques to capture, acclimate to captive conditions, hold, transport, and breed in captivity selected bird species found in CNMI
- Establish captive populations of select species that can be used as a source population for possible reintroduction back to Guam or islands in the CNMI which can control the brown tree snake
- Translocate birds to islands where the brown tree snake is not present to seed satellite populations
- Develop public education programs that will assist the conservation of their avifauna
- Develop fund-raising programs to assist *in situ* conservation efforts
- Provide education and training to local biologists and community members

Building on successive conservation programs in the CNMI, the Mariana Avifauna Conservation

(MAC) Program is a partnership between the CNMI Division of Fish and Wildlife (DFW), U.S. Fish and Wildlife Service, Pacific Bird Conservation, and annually over a dozen accredited zoos from the Association of Zoos and Aquariums (AZA). The MAC Program began in 2004, with the first avian translocations taking place in 2006. T

For more information, please visit the Pacific Bird Conservation home page at www.pacificbirdconservation.org, or our social media page at www.facebook.com/PacificBirdConservation.

Trip Overview

A total of 20 individuals from 7 zoos along with PBC and CNMI DFW participated in this year's translocation. MAC team members were in the CNMI from 16 April 2022 through 4 May 2022. Peter Luscomb, John Bender, and Hannah Bailey were the MAC management team. The majority of the field team came for two-week periods and made up two crews; the opening crew and closing crew. Additional team members arrived as they could to assist with the overall program. A specialized education team handled all education and community events in addition to hosting off island (Tinian) interns and teachers for research and professional development opportunities.

The Startup crew arrived between 16-17 April and was responsible for set-up of the holding room (rented room at hotel where birds are held prior to translocation) and the field collection site. Collection of Mariana fruit doves began on 18 April and Rufous Fantails began 21 April. The closing crew arrived 21 April and began assisting the startup crew with collection of birds. Once all birds were collected, the combined crew prepared the birds for translocation. All birds received a physical exam to ensure that they were healthy and appropriate for translocation. Each bird also received a metal band and a unique combination of color bands on their legs for future identification in the field. One MAC team member (John Bender) assisted in the transport and release on Guguan. The MAC staff that remained on Saipan broke down the collection site and bird room and prepared and stored all field equipment in the MAC storage container located at the CNMI DFW base yard.

During our time on Saipan we stayed at the Beach Garden Hotel in Garapan. The Beach Garden Hotel provides the MAC team rooms for all team members in addition to a large apartment to house the birds while in our care. This space met all of our needs to provide optimum husbandry and veterinary care. Field protocols developed previously were used to guide all activities with the capture, care, and transport of the birds.

Methods and Results

Trapping

All trapping activities were done at two sites in the Marpi region of Saipan. Trapping activities were conducted from 18 April – 27 April 2022. All trapping was done on private land. Site A (fig. 1) consisted of a mixture of patchy native secondary forest and tangan-tangan (*Leucaena*

leucocephala) with a few areas of pasture shrub and open grass. Site A was the primary site for capturing the Rufous Fantails. Site B (fig. 2) was a large open cattle field that was vegetated primarily with a species of lantana (*verbenaceae*) and a species of Solanum (a shrub that produces small green fruits that are consumed by the fruit doves). We used a total of 23 net locations between the two sites over the nine-day trapping period. We trapped for a total of 938.5 net hours.

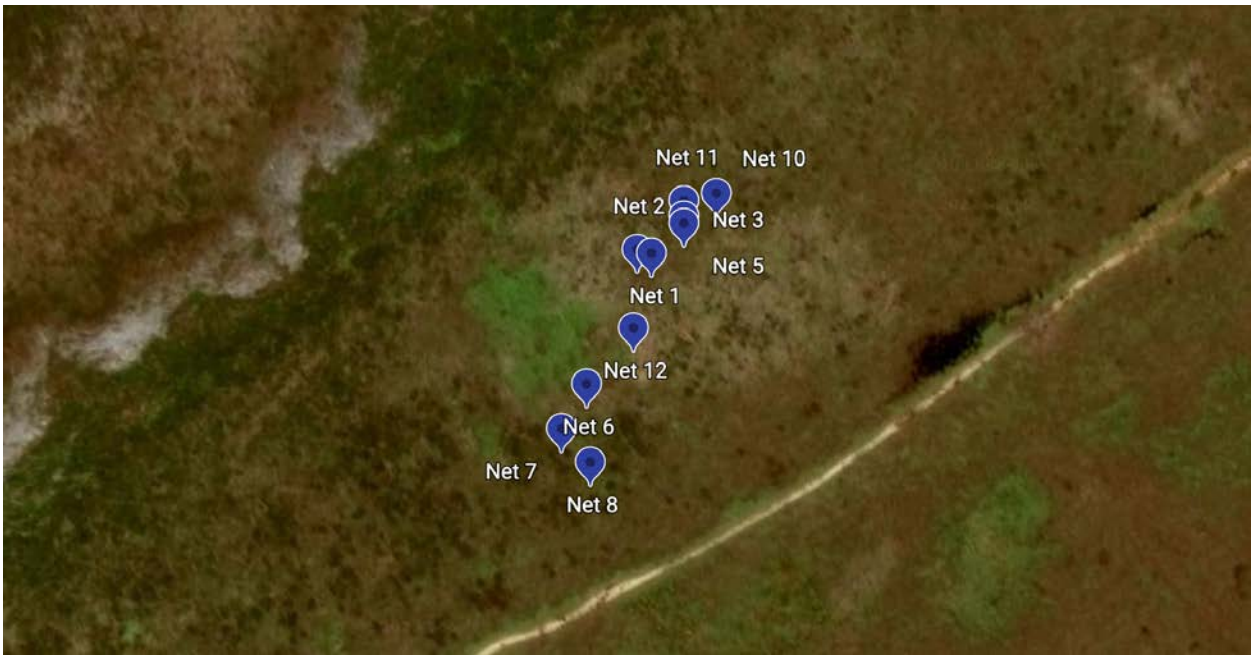

Figure 1: Site A, showing GPS locations of various net lanes used for fantails

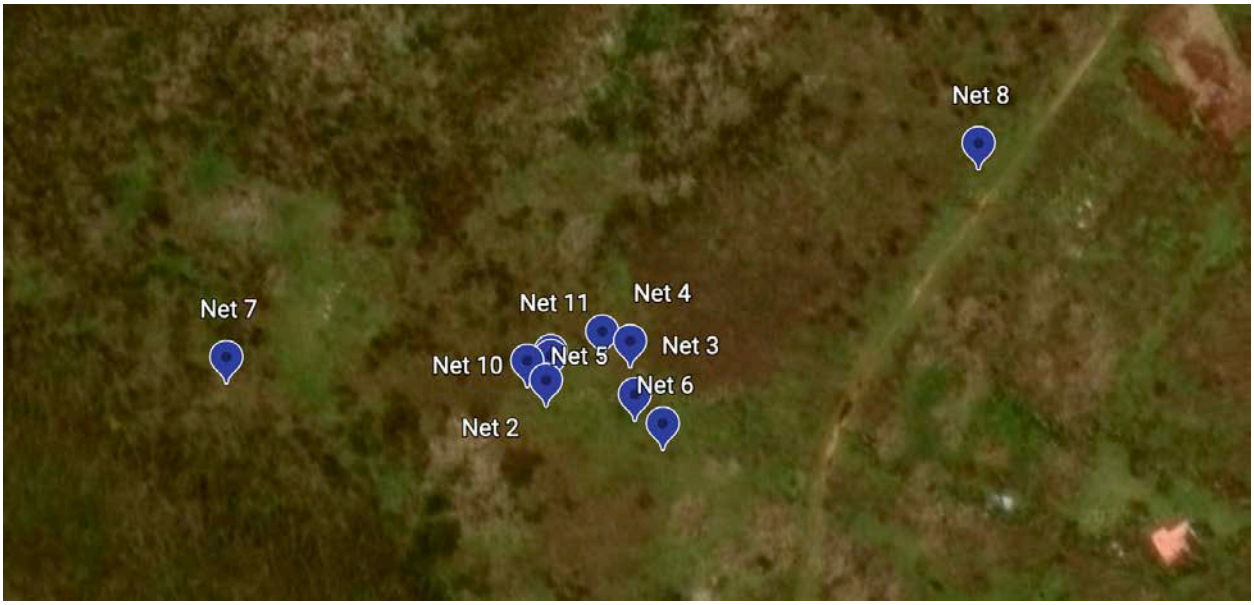

Figure 2: Site B, showing GPS locations of various net lanes used for fruit doves

All trapping was performed with the use of mist nets. Fruit doves were collected using double high mist nets with a 60mm mesh size and a length of 12 meters. This allowed for minimal incidental capture of smaller, non-target species. The Rufous fantails were collected with single high 24mm mesh size and a length of 12 meters. Previous field experience demonstrated that 24mm mesh size is the optimal size for collecting Rufous fantails, as the birds become less tangled.

At both trap sites, the field teams monitored the nets on a 30-minute schedule in the morning hours. As temperatures rose, the time was shortened to 15-mintue intervals. If nets were in direct sunlight, team members were stationed at the nets for immediate extraction of captured birds. All target species were removed from the nets and placed into a cloth bag. Birds were then transferred to our field bird holding areas. Birds were visually inspected, and then placed into a field holding box with food and water. In most cases, birds were transferred back to the hotel bird room within 2 hours of capture.

Our trapping activities focused on collecting fruit doves first, as they need more time to be prepared for translocation and are often more difficult to catch in large numbers. Team members scouted the field at Site B and monitored activity of the birds to determine the best locations for the 60mm double high nets. As these nets are time and labor intensive, it is best practice to get a true sense of bird movements throughout the trap site, and then place the net sets in the obvious flight paths of the fruit doves. Of the twelve net sets erected at Site B, eleven were outfitted with the 60mm nets for capturing doves (Table 1). Trapping of doves at Site B began on April 18th, and concluded on April 26th.

Trapping activities for rufous fantails began at Site A on 21 April. As the fantails can be territorial, team members spent time observing the movement of birds, and needed to close and relocate net sets frequently to meet our collection goals. A total of fifteen individual net locations were used at Site A (Table 1) to collect fantails.

Net	N	E	Description
A1	15° 14.836'	145° 48.874'	12m X 24mm SNGL
A2	15° 14.837'	145° 48.07o'	12m X 24mm SNGL
A3	15° 14.846'	145° 48.083'	12m X 24mm SNGL
A4	15° 14.479'	145° 48.737'	12m X 24mm SNGL
A5	15° 14.844'	145° 48.083'	12m X 24mm SNGL
A6	15° 14.801'	145° 48.056'	12m X 24mm SNGL
A7	15° 14.789'	145° 48.049'	12m X 24mm SNGL
A8	15° 14.780'	145° 48.057'	12m X 24mm SNGL
A9	15° 14.850'	145° 48.083'	12m X 24mm SNGL
A10	15° 14.852'	145° 48.092'	12m X 24mm SNGL
A11	15° 14.849'	145° 48.053'	12m X 24mm SNGL
A12	15° 14.816'	145° 48.069'	12m X 24mm SNGL
A14	15° 14.829'	145° 48.062'	12m X 24mm SNGL
A15	15° 14.813'	145° 48.079'	12m X 24mm SNGL
B1	15° 14.438'	145° 48.080'	12m X 60mm DBL
B2	15° 14.431'	145° 47.643'	12m X 60mm DBL
B3	15° 14.439'	145° 47.661'	12m X 60mm DBL
B4	15° 14.441'	145° 47.665'	12m X 60mm DBL
B5	15° 14.428'	145° 47.662'	12m X 60mm DBL
B6	15° 14.422'	145° 47.668'	12m X 60mm DBL
B7	15° 14.436'	145° 47.576'	12m X 60mm DBL
B8	15° 14.480'	145° 47.736'	12m X 60mm DBL
B9	15° 14.436'	145° 47.644'	12m X 60mm DBL
B10	15° 14.435'	145° 47.639'	12m X 60mm DBL
B11	15° 14.437'	145° 47.644'	9m X 24mm SNGL
B12	15° 14.438'	145° 47.642'	12m X 60mm DBL

Table 1: Inventory and GPS locations of all nets used at Site A and B for 2022 field season

Site A

At site A, a total of 159 birds from 7 species were collected. The following birds were collected: 59 Bridled white-eye, 30 Golden white-eye, 52 Rufous fantails, 1 Micronesian honeyeater, 4 Micronesian starling, 12 Collared kingfisher, and 1 Saipan reed warbler (*Acrocephalus hiwae)* (Table 2). The Saipan reed warbler is a critically endangered USFWS listed species, in accordance with our permit we notified the DFW biologists immediately and provided GPS data on the location caught. The bird was removed without issue and released at capture site. The 52 fantails were collected using 15 net sets across 434.25 net hours (Table 3). This resulted in a rate of 8.3 net hours to collect each fantail.

Site B

At site B, a total of 55 birds from 9 species were collected. The following birds were collected: 6 Bridled white-eye, 4 Golden white-eye, 1 Rufous fantails, 1 Micronesian honeyeater, 7 Micronesian starling, 12 Collared kingfisher, 20 Mariana fruit dove, 10 Philippine collared dove (*Streptopelia dusumieri),* and 1 White-throated ground dove (*Pampusana xanthonura*). The 20 fruit doves were collected using 12 net sets across 446.75 net hours (Table 3). This resulted in a rate of 22.33 net hours to collect each dove.

	Species											
Net	BRWE	GOWE	RUFA	MIHO	MIST	COKI	MAFD	PHDO	YEBI	WTGD	NGRW	Net Total
A1	3	1	2	0	0	0	0	0	0	0	0	6
A2	15	6	8	0	0	1	0	0	0	0	0	30
A3	11	5	6	0	2	0	0	0	0	0	0	24
A4	3	5	2	0	0	0	0	0	0	0	0	10
A5	3	3	7	0	0	0	0	0	0	0	0	13
A6	5	2	2	0	0	1	0	0	0	0	0	10
A7	4	2	6	0	0	2	0	0	0	0	0	14
A8	3	0	2	0	0	1	0	0	0	0	0	6
A9	2	3	1	0	1	4	0	0	0	0	0	11
A10	5	2	5	0	1	1	0	0	0	0	1	15
A11	4	0	1	1	0	1	0	0	0	0	0	7
A12	1	0	4	0	0	1	0	0	0	0	0	6
A14	0	0	0	0	0	0	0	0	0	0	0	0
A15	0	1	6	0	0	0	0	0	0	0	0	7
B1	0	0	0	0	0	0	2	2	0	0	0	4
B2	1	1	0	0	0	2	0	0	0	0	0	4
B3	4	0	0	0	6	5	7	2	0	0	0	24
B4	0	1	1	1	0	0	0	2	0	0	0	5
B5	0	0	0	0	0	0	0	1	0	0	0	1
B6	0	2	0	0	0	0	3	1	0	0	0	6
B7	0	0	0	0	0	2	0	0	0	0	0	2
B8	0	0	0	0	0	0	2	0	0	0	0	2
B9	1	0	0	0	0	1	2	2	0	1	0	7
B10	0	0	0	0	1	1	1	0	0	0	0	3
B11	0	0	0	0	0	0	2	0	0	0	0	2
B12	0	0	0	0	0	1	1	0	0	0	0	2
Species Total	65	34	53	2	11	24	20	10	0	1	1	221

Table 2: Complete species inventory of number of birds caught in each net at both sites. Totals of nets, species, and overall birds caught listed in last row.

MAC 2022		18-Apr	19-Apr	20-Apr	21-Apr	22-Apr	23-Apr	24-Apr	26-Apr	27-Apr	1-May
Net	Size	Net Hours	Net Hours	Net Hours	Net Hours	Net Hours	Net Hours	Net Hours	Net Hours	Net Hours	Net Hours
A1	12m X 24mm SNGL				9	3.25	8.75	11	6		
A2	12m X 24mm SNGL				9	3.25	8.75	11	10.75	7.5	3.5
A3	12m X 24mm SNGL				9	3.25	8.75	11	10.75	7.5	3.5
A4	12m X 24mm SNGL				9	3.25	8.75	11			
A5	12m X 24mm SNGL				9	3.25	8.75	11	10.75	7.5	
A6	12m X 24mm SNGL				9	3.25	8.75	11			
A7	12m X 24mm SNGL				9	3.25	8.75	11	10.75	7.5	
A8	12m X 24mm SNGL				9	3.25	8.75	11	6		
A9	12m X 24mm SNGL						8.75	11	10.75	7.5	3.5
A10	12m X 24mm SNGL						8.75	11	10.75	7.5	3.5
A11	12m X 24mm SNGL							4	10.75	7.5	
A12	12m X 24mm SNGL							4	10.75	7.5	3.5
A14	12m X 24mm SNGL								3.75	7.5	3.5
A15	12m X 24mm SNGL								1.5	7.5	3.5
B1	12m X 60mm DBL	8	9	9.25	9.25	4.5	9	13.5	10.5		
B2	12m X 60mm DBL	8	6.75								
B3	12m X 60mm DBL	8	9	9.25	9.25	4.5	9	13.5	10.5		
B4	12m X 60mm DBL	7.75	9	7.75							
B5	12m X 60mm DBL	4	9	8.25							
B6	12m X 60mm DBL	4.25	7	9.25	9.25	4.5					
B7	12m X 60mm DBL		1.5	9.25	6.5	4.5					
B8	12m X 60mm DBL		0	9.25							
B9	12m X 60mm DBL			1.5	9.25	4.5	9	13.5	10.5		
B10	12m X 60mm DBL			1	9.25	4.5	9	13.5	10.5		
B11	9m X 60mm SNGL			0.5	9.25	4.5	9	13.5	10.5		
B12	12m X 60mm DBL						7.75	13.5	10.5		
	Total Net Hours	40	51.25	65.25	134	57.5	140.25	185.5	155.75	75	24.5
	Grand Total	929									

Table 3: Complete net hours inventory of all nets at both sites. Total net hours per day at both sites listed in last row.

Image 1: Double high mist net set at Site B for Mariana fruit dove collection

Image 2: Single high mist net set at Site A for rufous fantail collection

Image 3: Marija Elden (Saint Louis Zoo) extracting a Mariana fruit dove from net, John Bender (Pacific Bird Conservation) at left

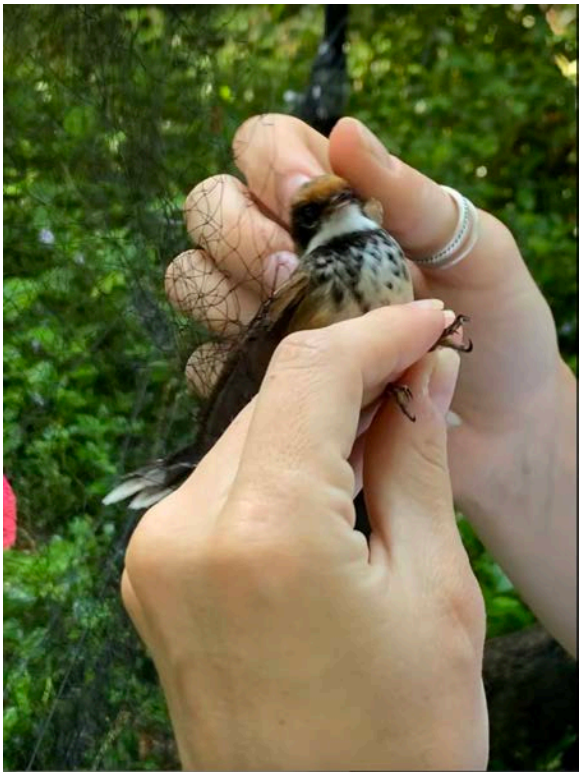

Image 4: Amanda Bender (Saint Louis Zoo) extracting a rufous fantail from net

Husbandry

A total of 20 Mariana Fruit Doves and 48 Rufous Fantails were transported to the holding room at the Beach Garden hotel for acclimatization and potential translocation. Once birds were collected in the field, they were transported back to the climate-controlled holding room. All birds were housed singly in individual holding boxes. Basic biological data were taken on each bird: capture weight, body condition index, fat stores, wing cord, tail length, and tarsus length. Weights were taken each day on all birds to monitor health status. Fecal samples were taken on all birds to determine potential parasite loads. Blood samples were collected for smears for complete blood count and blood parasite checks as well as future DNA analysis work. All birds were banded with a numbered aluminum leg band and a unique combination of color bands to allow for identification in the field during future CNMI DFW surveys.

Rufous Fantails

We experienced an unusual mortality event in the Rufous fantails (RUFA), which led to the early release of all remaining captive RUFA. RUFA: Initially, health exam results appeared to be consistent with results we have experienced in previous years working with this species. All birds had some level of ectoparasites on primary and secondary plumage, varying from few to very large numbers observed. The previously described "fainting" syndrome was not observed by the veterinary staff this year. Mortality event: 8 deaths in captive RUFA (one euthanasia) and two ill birds were released back into the wild. The time of death most commonly occurred 2-3 days post-capture. RUFA 19 was euthanized 6 days post capture. The 2-3 post-capture time frame may reflect the time period when corticosterone levels have been at their highest historically, which may be connected to a stress dysbiosis and enterotoxin risk. 5/8 deceased birds had a fly (in one case, a mealworm) lodged in the glottis at necropsy (mechanical obstruction vs. dehydration and secondary adherence to tissue). On gross necropsy exams, most were in poor body condition and appeared dehydrated. Other observations about the 2022 season that may have played a role:

- The environment of the field capture site was very wet (much more rain in Saipan than in previous collection years).
- The "bird room" holding the captive birds was at a different location than usual (Beach Garden Hotel) and the indoor environment appeared to be kept at a lower than ideal humidity (from room air conditioning and dehumidifier units) for RUFA.
- Observation that there were fewer flies found in water dishes this year, making fly and water consumption an unknown.
- Size of the flies may have been different than the usual fly population fed to the captive RUFA (different bait types were used this year due to low availability of fish on Saipan).

- RUFA pathology: Tissues were submitted to IDEXX for pathology and tissues were reviewed by a board certified pathologist. Histopathology summary:
  - Poor body condition (8/8), which is consistently seen in this species
  - Enteritis and/or large intestinal parasite load (5/8)
  - Hepatic inflammatory lesions (4/8)

- Lung congestion (2/8)
- Brain edema (2/8)

Mariana Fruit Dove

Mariana fruit doves (MAFD) do not easily transition to a captive diet, and as such, to ensure that the birds were healthy prior to translocation we provided the birds a hand-fed formula via tube-feeding. The MAFD were weighed daily at the AM feeding. Each dove was started on 6mL of formula per feeding, and gradually increased to a maximum of 12mL per feeding based on weight gains and feeding behaviors. The MAFD were fed three times a day, aiming for a goal of only two feedings per day as amounts increased. Birds were originally fed 2-3 cc of formula per feeding and this increased daily until birds were taking up to 12cc per feeding. Birds were fed three times a day and some birds were tapered off to two feeding per day.

The formula was a mix of Kaytee Exact Handfeeding supplement and finely mushed papaya, both mixed with warm water. 12cc syringes were filled with a 12 gauge feeding needle on the end. Birds were caught and wrapped in a towel for full body restraint with the head free. Personnel would extend the head slightly stretching the neck opening the mouth and placing the tube down the right side of the birds throat avoid the glottis. Once the tube was properly in the crop the bird was fed at a steady and consistent rate. Once complete the personnel slowly lowered the birds heads back down to avoid regurgitation. The birds were then released back into their enclosures. Syringes were always swapped out and new one was used for each bird. Needles and tubes were disinfected with Chlorohexiderm solution.

All twenty of the fruit doves in our care maintained weights (Figure 3) and passed all health and diagnostic examinations by the veterinary staff. By May 1 all birds were cleared and slated for translocation to Guguan on the afternoon of May 3.

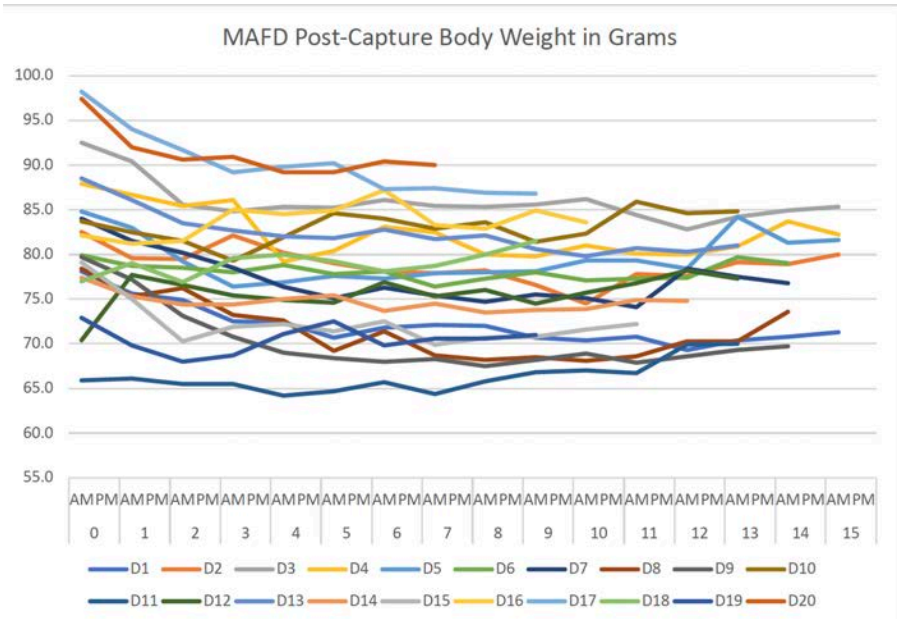

Figure 3: Post-capture weights (g) of Mariana fruit doves

Image 5: Rufous fantail holding boxes on secure racks in bird holding room


Image 6: Mariana fruit dove holding boxes on secure racks in bird holding room


Image 7: A Mariana fruit is examined by Dr. Kami Fox (DVM) and Sarah Sloan (CVT) both Fort Wayne Children's Zoo

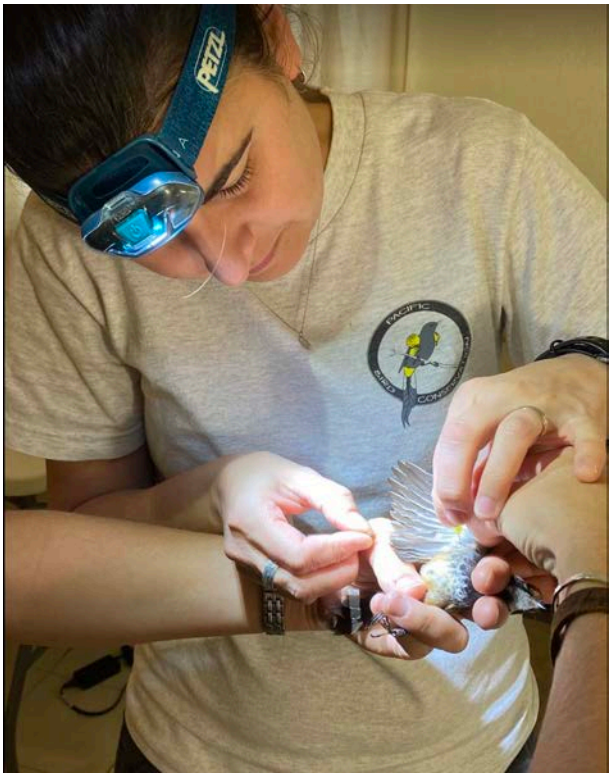

Image 8: A rufous fantail is examined by Dr. Emma Kaiser (DVM) Honolulu Zoo and Heather Scott (CVT) North Carolina Zoo

Image 9: Anne Heitman (Sedgwick County Zoo) prepares to tube feed a fruit dove

Image 10: A fruit dove is weighed prior to tube feeding

Translocation

The CNMI Division of Fish and Wildlife was able to contract the Super Emerald, a 64ft Coast Guard approved vessel, to transport birds and staff out the island of Guguan for this year's translocation effort. Once again, DFW and PBC staff were able to inspect the Super Emerald prior to translocation to identify how best to manage the birds during the trip to Guguan. The owners of the Super Emerald had maintained the palletized storage area constructed from previous translocations, so only a few preparations were needed to make the area ready for our bird crates. On 3 May 2022, 5 crates of birds (20 MAFD) were transported to Guguan along with members of DFW staff and 1 MAC team member (John Bender). The overnight trip to Guguan took approximately 14 hours. Upon arrival at Guguan, the birds were offloaded from the Super Emerald, and onto a skiff to be transported to shore. John Bender oversaw the loading of the bird crates onto the skiff, and Steve Mullin (DFW) organized the crates on shore. The birds were secured onto cargo backpacks and carried by DFW porters approximately 100m up the slope to the release point. Once all birds were positioned at the release point, John Bender visually inspected all the birds, to ensure they were suitable for release. A total of 20 MAFD were successfully released onto Guguan.

Image 11: John Bender (Pacific Bird Conservation) and Heather Scott (North Carolina Zoo) load a crate of fruit doves onto the Super Emerald for translocation to Guguan

Image 12: The Super Emerald departing the Port of Saipan on May 3 for Guguan

Image 13: Steve Mullin (DFW) and Ning Li (DFW) preparing to ascend Guguan with crates of fruit doves moments before release and completion of translocation

Image 14: John Bender (Pacific Bird Conservation) opens a crate door to release a fruit dove on Guguan

Image 15: A Mariana fruit dove exiting crate and being released on Guguan

Image 16: The island of Guguan as seen from the Super Emerald upon arrival from Saipan

Image 17: The island of Guguan as seen from the Super Emerald upon returning to Saipan

MAC 2022 Project Support and Funding

Major Contributors
CNMI Department of Land and Natural Resources
Disney Conservation Fund: 2-year award for 2022-23 totaling $49,900
The Unaka Foundation

Contributing/Participating AZA institutions ($2500.00 plus travel expenses for participating staff)
Fort Wayne Children's Zoo
Honolulu Zoo
North Carolina Zoo
Saint Louis Zoo
Sedgwick County Zoo

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Doug Pratt: Donation of artwork for staff shirts and educational materials