



Pacific Bird Conservation  
Mariana Avifauna Conservation Program  
2019 Progress Report

**The Mariana Avifauna Conservation Program 2019**

Field Collection of Golden White-eye (*Cleptornis marchei*) and Rufous Fantail (*Rhipidura rufifrons saipanensis*) from Saipan for Translocation to Alamagan, CNMI



Rufous Fantail (*Rhipidura rufifrons saipanensis*)

Photo Credit: Megan Dalton

## Trip Report

**The Mariana Avifauna Conservation Program 2019 Field Collection of Golden White-eye (*Cleptornis marchei*) and Rufous Fantail (*Rhipidura rufifrons saipanensis*) from Saipan for Translocation to Alamagan, CNMI**

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### **Objectives of MAC Program 2019**

1. Collect fifty Golden White-eyes and fifty Rufous Fantails on Saipan and prepare them for translocation to Alamagan, with a target date for departure to Alamagan of 7 May 2019.
2. Assist Commonwealth of the Northern Marianas (CNMI) Department of Fish and Wildlife (DFW) with transport and release of birds on to Alamagan.
3. Collect fecal samples from collected Golden White-eyes and Rufous Fantails for long-term study of stress hormones during translocation process.
4. Conduct Library Programs for Tinian, Rota and Saipan.
5. Conduct High School Classroom and Field Trip Experiences.
6. Provide public presentations of MAC Program activities.
7. Host local, High School student interns.

### **Itinerary**

<b>22 April:</b>	MAC Opening Field and Education Teams arrive on Saipan, bird room set-up
<b>23 April:</b>	Education Team conduct High School programs at Marianas HS and Southern HS Field Team prepared net lanes and set up field camp, set-up of fly collection stations
<b>24 April:</b>	Education Team conduct High School programs at Kagman HS and Da'ok Academy
<b>25 April:</b>	Education Team traveled to Rota for Library program
<b>26 April:</b>	Education Team traveled to Tinian for Library program Presentation at American Memorial Park Museum Start of GOWE/RUFA collection at Site A
<b>27 April:</b>	Education Team hosts Library program at Saipan Library
<b>29 April:</b>	MAC Closing Field Team arrives Education Team conducts High School Tours of Field Site and Bird Room
<b>30 April:</b>	Education Team conducts High School Tours of Field Site and Bird Room
<b>1 May:</b>	Field team closes Site A, moves equipment and camp to Site B
<b>4 May:</b>	GOWE/RUFA collection complete MAC Opening Field Team Departs
<b>5 May:</b>	Tear down of Site B, net repair, start of inventory

- 7 May:** GOWE/RUFA crated for translocation  
Birds depart Saipan for Alamagan with Translocation Team (DFW staff and 6 MAC participants)
- 8 May:** Birds Released on Alamagan
- 9 May:** Bird Room closed, supplies inventoried and transferred to storage container  
Translocation Team returns from Alamagan
- 11 May:** Remaining Team members depart Saipan

### **Background**

Guam's avifauna rapidly disappeared with the introduction of the brown tree snake 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 25 bird species. 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 Guam 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 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 Mariana Islands all have avifauna with limited distribution, with most forest bird species found only in the CNMI. 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 Nightingale Reed-warbler (*Acrocephalus luscini*a), 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 islands.

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 all 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, and
- Provide training to local biologists upon request.

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. The translocation program is forecast to be complete by 2032.

For more information, please visit the Pacific Bird Conservation home page at [www.pacificbirdconservation.org](http://www.pacificbirdconservation.org), or our social media page at [www.facebook.com/PacificBirdConservation](https://www.facebook.com/PacificBirdConservation).

### **Trip Overview**

A total of 27 individuals from 12 zoos along with PBC and CNMI DFW participated in this year's translocation. MAC team members were in the CNMI from 22 April 2019 through 11 May 2019. Peter Luscomb, Herb Roberts, Hannah Bailey, and Scott Newland were the MAC management team. The majority of the field team came for two-week periods and made up two crews; the Startup team and Closing team. Additional team members arrived as they could to assist with the overall program. A specialized Education team handled all the education events.

The Startup crew arrived between 21-22 April and was responsible for set-up of the bird room (rented room at hotel where birds are held prior to translocation) and the field collection site. Collection of Golden White-eyes and Rufous Fantails began 26 April. The Closing crew arrived 29 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. Six MAC team members assisted in the transport and release on Alamagan. 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 and provided by DFW.

During our time on Saipan we once again stayed at the Summer Holiday Hotel in Garapan. The Summer Holiday rents the MAC team rooms for all team members in addition to a large room to house the birds while in our care. This bird room this year met all of our needs to provide optimum husbandry and veterinary care.

Peter Luscomb and Herb Roberts were the overall project leaders for MAC 2019, with Hannah Bailey from the Houston Zoo overseeing activities associated with the management of birds in our care prior to translocation, and Scott Newland from the Sedgwick County Zoo managing collection activities. John Bender (Lincoln Park Zoo) and Ken Reininger (North Carolina Zoo) also actively participate in the oversight of collection activities.

Field and husbandry protocols refined by Luscomb and Roberts and used successfully in 14 previous years of MAC translocations guided all activities with the capture, care, and transport of the birds.

## **Collection, Translocation, and Research: Objectives 1-3**

### **Methods and Results**

#### **Collection Methods**

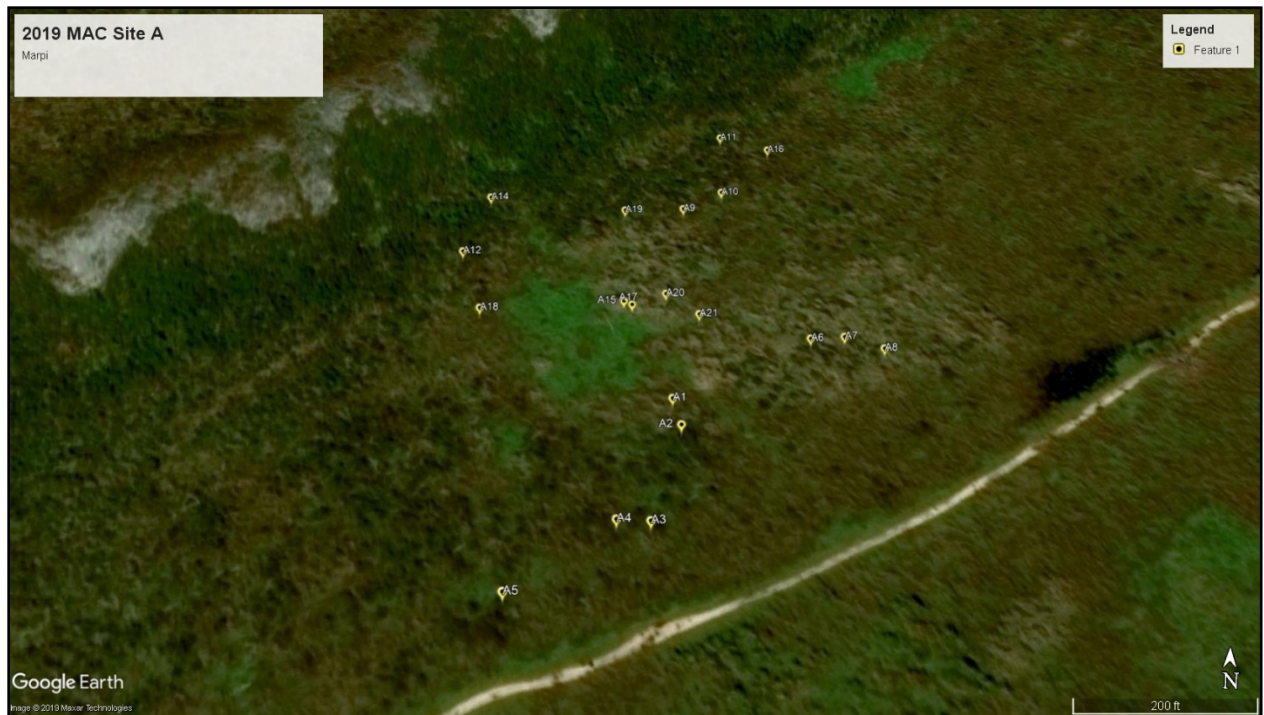
All collection activities were conducted at two on Saipan. Collection activities were conducted from 26 April – 4 May 2019. All collection was done on public land with permission through our DFW partners. Site A (Figure 1) was the initial collection site for both target species. Site A is located in the Marpi region of Saipan. Site A was an area of primarily forest with a few areas of open grass. A total of 20 net locations were utilized at Site A over a six-day collection period. Nets were in use for a total of 481.00 net hours at Site A. (Table 1). Due to the reduction of forest canopy and fruiting trees at Site A, Golden-white Eyes were not observed or collected at rates that would have allowed the team to meet the target numbers of birds for translocation. In response, the field team investigated a potential second site, the Laderan Tangke trail. A quick site survey on 30 April 2019 revealed that both target species were abundant along the Laderan Tangke trail. During the afternoon on 1 May 2019, collection efforts were concluded at Site A. The MAC team relocated to the Laderan Tangke area and collection on Site B began on 2 May 2019. A total of 9 net locations were utilized at Site B over a three-day span. Nets were in use for a total of 248.25 net hours at Site B (Table 1). Between Site A and Site B, nets were in use for a total of 729.25 net hours (Table 1).

All collection was performed with the use of mist nets. Golden White-eyes and Rufous Fantails were collected using mist nets with a 24mm mesh size. Previous field experience demonstrated that 24mm mesh size is the optimal size for collecting both the Golden White-eye and Rufous Fantail – these smaller species become less tangled with this size mesh, and net extractions can occur more quickly and with less stress on individual birds. MAC team members scouted the field at Site A and Site B monitoring activity of the target species to determine the best locations for the nets. Once a net lane was identified and a net array erected, the net site was marked using a GPS unit. Table 1 describes each net lane used and depicts the operating hours for each individual net. Table 2 contains the GPS coordinates for each net.

At the trap site (Figures 1 and 2), the field team monitored the nets on a 30-minute schedule in the morning hours. As air temperatures rose, the time was shortened to 15-minute 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 specifically designed for short-term songbird holding. Birds were then transferred to our field bird holding stations. Birds were visually inspected and placed into a field holding box with food and water. Birds were transferred back to the hotel bird room within approximately 2.5 hours of capture. Non-target “bycatch” species were recorded and immediately released at the net site.

Collection activities initially focused on collecting Golden White-eyes so the team would have time to trap an adequate supply of flies to feed the Rufous Fantails. Fantails typically eat aerial prey (e.g. flies) in the lower canopy but can be successfully transitioned to sedentary prey in captivity (e.g. mealworms). Fantail collection began on 23 April 2018 when all fly traps were producing large amounts of flies. Fantails tend to be territorial; therefore, team members spent time observing the movement of birds and relocated net sets frequently to meet the collection goal of 50 individuals.





**Figure 1: Site A, Marpi region, Saipan, CNMI**



**Figure 2: Site B, Laderan Tangki trail, Marpi region, Saipan, CNMI**

Site A MAC 2019			Site A												Site B								Net Sub-total	
Net	Net hr	value	26-Apr		27-Apr		28-Apr		29-Apr		30-Apr		1-May		2-May		3-May		4-May					
			Hours Open	Net Hours	Hours Open	Net Hours	Hours Open	Net Hours	Hours Open	Net Hours	Hours Open	Net Hours	Hours Open	Net Hours	Hours Open	Net Hours	Hours Open	Net Hours	Hours Open	Net Hours				
A1 12m X 24mm SINGL	1		1.5	1.5	5	5	6.5	6.5	7.75	7.75	7.50	7.50	5.75	5.75							34.00	Total Site A		
A2 12m X 24mm SINGL	1		1.5	1.5	3.75	3.75	6.25	6.25	7.75	7.75	7.50	7.50	5.25	5.25							32.00			
A3 12m X 24mm SINGL	1		1.5	1.5	4	4	5.5	5.5	5.50	5.50	4.50	4.50									21.00			
A4 12m X 24mm SINGL	1		1.5	1.5	5	5	6.5	6.5	7.75	7.75	7.50	7.50	5.25	5.25							33.50			
A5 12m X 24mm SINGL	1		1.5	1.5	5	5	6.5	6.5	5.50	5.50											18.50			
A6 12m X 24mm SINGL	1				5	5	7.75	7.75	7.75	7.75	7.00	7.00	5.25	5.25							32.75			
A7 12m X 24mm SINGL	1				5	5	7.75	7.75	7.75	7.75	7.00	7.00	5.25	5.25							32.75			
A8 12m X 24mm SINGL	1				3.75	3.75	5.75	5.75	5.00	5.00	7.75	7.75	3.00	3.00							25.25			
A9 12m X 24mm SINGL	1		1.5	1.5	5	5	6.75	6.75	7.50	7.50	8.00	8.00	5.25	5.25							34.00			
A10 12m X 24mm SINGL	1		1.5	1.5	5	5	6.75	6.75	7.50	7.50	8.00	8.00	5.25	5.25							34.00			
A11 6m X 30mm SINGL	0.5		1.5	0.75	5	2.5															3.25			
A12 12m X 24mm SINGL	1		1.5	1.5	3.75	3.75	5.5	5.5	7.50	7.50	5.50	5.50									23.75			
A14 12m X 24mm SINGL	1		1.5	1.5	4	4	5.5	5.5	7.50	7.50	7.00	7.00									25.50			
A15 12m X 24mm DBL	2				4	8	5	10	7.75	15.50	8.00	16.00	5.25	10.50							60.00			
A16 12m X 24mm SINGL	1								7.50	7.50	8.00	8.00	5.25	5.25							20.75			
A17 12m X 24mm SINGL	1								2.25	2.25	8.00	8.00	5.25	5.25							15.50			
A18 12m X 24mm SINGL	1										8.00	8.00	5.25	5.25							13.25			
A19 12m X 24mm SINGL	1										2.50	2.50	5.25	5.25							7.75			
A20 12m X 24mm SINGL	2										1.00	2.00	5.25	5.25							7.25			
A21 12m X 24mm SINGL	1										1.00	1.00	5.25	5.25							6.25			
B1 12m X 24mm SINGL	1														11.50	11.50	11.75	11.75	6.25	6.25	29.50	Total Site B		
B2 12m X 24mm SINGL	1														11.50	11.50	11.75	11.75	6.25	6.25	29.50			
B3 12m X 24mm SINGL	1														11.50	11.50	11.75	11.75	6.25	6.25	29.50			
B4 12m X 24mm SINGL	1														11.50	11.50	11.75	11.75	6.25	6.25	29.50			
B5 12m X 24mm SINGL	1														11.50	11.50	11.75	11.75	6.25	6.25	29.50			
B6 12m X 24mm SINGL	1														11.50	11.50	11.75	11.75	6.25	6.25	29.50			
B7 12m X 24mm SINGL	1														5.00	5.00	11.75	11.75	6.25	6.25	23.00			
B8 12m X 24mm DBL	2														0.50	0.50	11.75	23.50	6.25	12.50	36.50			
B9 12m X 24mm SINGL	1															5.50	5.50	6.25	6.25	11.75	11.75	248.25		
Total Net hours				14.25		64.75		87.00		110.00		122.75		82.25		74.50		111.25		62.50		729.25		

**Table 1: Net hour**

Net	N	E	Description
A1	15°14.804'	145°48.063'	24mm X 12m Single
A2	15°14.797'	145°48.065'	24mm X 12m Single
A3	15°14.773'	145°48.059'	24mm X 12m Single
A4	15°14.773'	145°48.052'	24mm X 12m Single
A5	15°14.756'	145°48.031'	24mm X 12m Single
A6	15°14.823'	145°48.095'	24mm X 12m Single
A7	15°14.824'	145°48.103'	24mm X 12m Single
A8	15°14.821'	145°48.112'	24mm X 12m Single
A9	15°14.865'	145°48.065'	24mm X 12m Single
A10	15°14.872'	145°48.075'	24mm X 12m Single
A11	15°14.893'	145°48.075'	30mm X 6m Single
A12	15°14.844'	145°48.011'	24mm X 12m Single
A14	15°14.861'	145°48.016'	24mm X 12m Single
A15	15°14.832'	145°48.051'	24mm X 12m Double
A16	15°14.890'	145°48.088'	24mm X 12m Single
A17	15°14.831'	145°48.053'	24mm X 12m Single
A18	15°14.828'	145°48.017'	24mm X 12m Single
A19	15°14.863'	145°48.050'	24mm X 12m Single
A20	15°14.835'	145°48.061'	24mm X 12m Single
A21	15°14.829'	145°48.069'	24mm X 12m Single
B1	15°15.141'	145°47.813'	24mm X 12m Single
B2	15°15.124'	145°47.820'	24mm X 12m Single
B3	15°15.115'	145°47.826'	24mm X 12m Single
B4	15°15.100'	145°47.833'	24mm X 12m Single
B5	15°15.097'	145°47.836'	24mm X 12m Single
B6	15°15.092'	145°47.839'	24mm X 12m Single
B7	15°15.163'	145°47.804'	24mm X 12m Single
B8	15°15.151'	145°47.810'	24mm X 12m Double
B9	15°15.085'	145°47.854'	24mm X 12m Single

**Table 2: GPS data and Descriptions of net locations**



## Collection Results

A total of 211 birds from 9 species were collected between Site A and Site B (Figure 3). The following birds were collected: 86 Bridled White-eyes, 49 Golden White-eyes, 60 Rufous Fantails, 3 Micronesian Honeyeaters, 3 Micronesian Starlings, 6 Collared Kingfishers, 1 Mariana Fruit Dove, 1 Philippine Collared Doves, and 1 Yellow Bittern (Table 3). The 49 GOWE were collected using 29 net sets across 729.25 net hours. This resulted in a rate of 14.88 net hours to collect each GOWE. Using all 29 nets over the same 729.25 net hours, 60 RUFA were collected. This resulted in a collection rate of one RUFA every 12.15 net hours (Table 1).

Net Number	Species										Total
	BRWE	GOWE	RUFA	MIHO	MIST	COKI	MAFD	PHDO	YEBI	WTGD	
A1	3	1	3	0	0	0	0	0	1	0	8
A2	4	1	3	0	0	0	0	0	0	0	8
A3	4	1	0	0	0	1	0	0	0	0	6
A4	2	2	4	1	0	1	0	1	0	0	11
A5	1	1	0	0	0	0	0	0	0	0	2
A6	1	2	3	0	0	0	0	0	0	0	6
A7	1	1	3	0	0	0	0	0	0	0	5
A8	5	2	3	1	0	0	0	0	1	0	12
A9	9	3	3	0	1	0	0	0	0	0	16
A10	7	3	3	0	1	0	0	0	0	0	14
A11	0	1	2	0	0	0	0	0	0	0	3
A12	2	0	3	0	0	0	0	0	0	0	5
A14	0	0	2	0	0	0	0	0	0	0	2
A15	12	0	3	0	0	0	1	0	0	0	16
A16	0	2	4	0	0	0	0	0	0	0	6
A17	6	0	0	0	0	0	0	0	0	0	6
A18	1	0	1	0	0	0	0	0	0	0	2
A19	2	1	0	0	0	0	0	0	0	0	3
A20	0	1	1	1	0	0	0	0	0	0	3
A21	3	0	0	0	0	1	0	0	0	0	4
B1	1	5	1	0	0	1	0	0	0	0	8
B2	2	1	3	0	0	0	0	0	0	0	6
B3	7	0	0	0	0	0	0	0	0	0	7
B4	1	6	7	0	1	0	0	0	0	0	15
B5	1	4	2	0	0	1	0	0	0	0	8
B6	8	4	2	0	0	1	0	0	0	0	15
B7	3	2	4	0	0	0	0	0	0	0	9
B8	0	2	0	0	0	0	0	0	0	0	2
B9	0	3	0	0	0	0	0	0	0	0	3
Total Per Species	86	49	60	3	3	6	1	1	2	0	211

Total Birds Collected

\*BRWE=Bridled White-eye, GOWE=Golden White-eye, RUFA=Rufous Fantails, MIHO=Micronesian Honeyeater, MIST=Micronesian Starlings, COKI=Collared Kingfisher, MAFD=Mariana Fruit Dove, PHDO=Philippine Collared Dove, WTGD=White-throated Ground Dove, YEBI=Yellow Bittern

**Table 3: Species mist net collection summary at Site A, Saipan, CNMI**

### Husbandry and Research Sample Collection Methods

A total of 43 Golden White-eyes (GOWE) and 52 Rufous Fantails (RUFA) were transported to the bird room at the Summer Holiday hotel for acclimatization and potential translocation. Once birds were collected in the field, they were transported back to the climate-controlled bird holding room. Both species 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 (Figure 3). Weights were taken each day on all birds as a measure to monitor health status. 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.

Fecal samples were collected during routine cleaning on all birds to determine potential parasite loads, as well as for further parasite testing and a stress hormone study conducted *ex situ* post-translocation. MAC colleagues at Disney's Animal Kingdom have been conducting a multi-year study of the hormone corticosterone along with other stress markers in the CNMI birds since 2011. These data will be used to better understand the effect our translocation methods have on the target species.



**Figure 3: H. Bailey measures bill length in GOWE (Photo credit: Kasey Clarke)**

Staff rotated through the bird room to assist with all aspects of husbandry. The daily schedule was as follows:

5:30 – 6:00 AM:

- In teams of 1 -2 people per species, weigh all birds in holding boxes (scales built in to holding boxes to eliminate the need for repeated handling). Record weights and note any significant changes.
- While birds are being weighed, prepare morning diets for GOWE and set aside special fly trays for RUFA. Obtain clean water dishes for all boxes.
- Clean all holding boxes
  - Collect fecals from each box (labeled to know which bird it came from) for parasite and endocrine studies as needed
  - Add fresh paper
  - Provide new water dish and fresh water
  - Add new tray of food
- After all boxes have been cleaned, add fresh flies to RUFA boxes using special collection trays
- For any birds with significant or continued weight loss, add additional food as needed (additional flies for RUFA, additional mealworms or nectar for GOWE)

9:00 AM – 10:00 AM:

- Check all food for GOWE – refresh fruit and add mealworms as needed
- Check all food for RUFA – add mealworms as needed, provide new tray of flies

12:30 PM – 1:30 PM

- Check all food for GOWE – refresh fruit and add mealworms as needed
- Check all food for RUFA – add mealworms as needed, provide new tray of flies
- Obtain mid-day weight for any birds being monitored for weight loss concerns

3:30 PM – 4:30 PM

- Clean all GOWE boxes
- Clean RUFA boxes if fecals needed for endocrine study
- Check all food for GOWE – refresh fruit and add mealworms as needed
- Check all food for RUFA – add mealworms as needed, provide new tray of flies (4 total trays of flies daily)
- In teams of 1 -2 people per species, weigh all birds in holding boxes (scales built in to holding boxes to eliminate the need for repeated handling). Record weights and note any significant changes.

5:30 PM – 6:30 PM

- Lights turned off in bird holding room
- Nightlights on in kitchen and exam room

Four changes were made to the captive husbandry of the birds from previous years. First, unique plastic band combinations were placed on the birds and veterinary exams were done on the day of capture. This allowed us to minimally handle the birds during the remainder of the holding period. Banding the

birds with the unique plastic band combination also meant that the crating for translocation process was minimized.

The second major change to husbandry procedures was the lack of papaya on the island. Typhoon Yutu struck Saipan in 2018 and decimated the papaya production for the year. As such, we had to rely on store-purchased frozen and canned food items for the GOWE. The types of canned and frozen fruits on the island are not consistent in availability. However, we were able to consistently purchase the following items:

- Frozen Mango
- Frozen Blue berries
- Frozen Mixed Berries (Strawberry, Blueberry, Raspberry, Blackberry)
- Frozen Peaches
- Canned Peaches
- Fresh Grapes
- Fresh Banana

The third change to husbandry was that we weighed all birds twice a day for the holding period. Typically, only RUFA are weighed twice daily. However, with shortage of papaya, it was decided to closely monitor the weights of the GOWE to make sure they were consuming the non-fresh fruit diet items.

Finally, the fourth change to husbandry was a schedule to “wean” the RUFA off of flies. After the RUFA had been in holding for at least 48 hours, we reduced the number of fly-feedings from 4-a-day to 2-a-day. After 1-2 days of 2 fly feeds per day, the birds were given 1 fly feeding in the AM. By the time of translocation, all birds were weaned from flies. Fly feeding were still provided in limited quantities to birds that were under monitoring for weight loss.

## GOWE

Golden White-eyes (GOWE) were targeted for collection first during collection. Between 27 April – 4 May 2019, 43 GOWE were trapped and transported to the bird room for holding. All GOWE were held for translocation this year as none were previously banded or showed signs of health issues that may prevent translocation.

Transport from field to holding is arranged to minimize time in the transport boxes and in the heat of the field. Average holding time in the field boxes for GOWE was 2 hours and 26 minutes. Based on tarsus length and other factors (weight 1-day post-capture), 22 male and 21 female GOWE were captured and transported to bird holding. The average weights for GOWE were 17.5g at capture and 16.5g the first morning post-capture; max/min: 22.4g/15.3g at capture, 20.8g/15.8g at Day 1 for males and 17.7g/13.4g at capture, 17.5g/12.6g at Day 1 for hens. On the first morning post-capture, the average weight loss was 5.24%, however, 10% of the GOWE gained weight over their capture weight on the first day of holding. Over the holding period, the GOWE had an average weight gain of 2.75% from first morning weight post-capture.

In the past as well as this year, GOWE have been adaptable and relatively easy to transition to captive diets. GOWE were maintained on a mix of frozen, fresh, and canned fruit items, imported mealworms,

and *Zupreem*<sup>®</sup> fruit- blend pellets (using a mix of small and medium size parrot pellets), as well as *Nekton Plus*<sup>®</sup> nectar supplement if the birds were experiencing continued weight loss, lethargy, or a lack of fecal production. The basic diet provided once daily to the GOWE was ½ T. *Zupreem*<sup>®</sup>, 1" x ½" piece of fruit (canned, frozen or fresh), and 5-10 mealworms; fruit and mealworms were added as needed. Individual birds did show preferences to the various food items; some preferred the frozen berries or other fruit items, others the canned peaches or fresh grapes and banana. Care was taken to offer preferred food items to individual birds.

Very few issues were encountered with the GOWE in holding other than the need to supplement some of the birds with nectar and/or additional mealworm. The lighting in the room was limited and additional lighting was added behind the holding racks to allow the birds enough lighting to consume their food. After monitored several birds in one row for weight loss, it was determined that the lighting was not adequate for eating; once additional lighting was installed all monitored birds began to gain weight routinely.

### RUFA

Rufous Fantails (RUFA) were targeted for collection after sufficient flies were produced by the fly traps. RUFA were trapped from 27 April – 4 May 2019. During this period, 52 RUFA (32 males, 18 females, and 2 unknown sex as determined by DNA feather sexing post translocation) were transported to the bird room for translocation. Trap-to-transport average holding time in the field boxes for RUFA was 2 hours and 26 minutes.

The average weights for RUFA were 7.7g at capture and 7.6g the first morning post-capture; max/min: 9.1g/7.3g for males and 7.80g/6.8g for hens. On the first morning post-capture, the average weight loss was 1.88%, however, 21 or 40.4% of the RUFA either lost no weight or gained weight from their capture weight on the first day of holding. The RUFA had an average weight gain of 0.24% from capture weight over the holding period.

Rufous Fantails have been challenging to maintain in captivity as they require a fully insectivorous diet and prey primarily on aerial insects in the wild. Past years have shown that feeding small mealworms post-capture increases the fantails' interest in mealworms as a food source. At capture in the field, fantails were provided with a dish of fresh flies. Once in the bird room, RUFA were maintained on 4 feedings per day of the following: ~30-40 flies per feeding, ½ T. mealworms (mix of small and large mealworms) per feeding. Additional fly and mealworm feeding were provided if the birds were experiencing continued weight loss, lethargy, or a lack of fecal production. Mixing the large and small mealworms increased the consumption of the mealworms by the fantails. After 2-3 days in holding, fantails will generally switch to consuming large mealworm readily (while still receiving fly feedings 4 times a day).

This year, to help ensure that RUFA were able to sustain their weight on a diet of mealworms during translocation; the birds were transitioned from 4 fly-feedings per day to 0 fly-feedings prior to translocation. Because of the timeline for translocation, some birds were transitioned from 4 feedings to 1 feeding quicker than the first group to transition. These birds were monitored closely to make sure their weight was stable with the diet changes. If birds were being monitored for weight loss, they were provided with at least 1 fly-feeding. Table 4.

RUFA Numbers	Capture date	4 Fly-feedings	2 Fly-feedings	1 Fly-feeding	0 Fly-feeding
RUFA 1-9	4/27/2019	4/27/2019	5/2/2019	5/3/2019	5/4/2019
RUFA 10-20	4/28/2019	4/28/2019	5/2/2019	5/3/2019	5/4/2019
RUFA 21-25	4/29/2019	4/29/2019	5/2/2019	5/3/2019	5/4/2019
RUFA 26-34	4/30/2019	4/30/2019	5/2/2019	5/3/2019	5/4/2019
RUFA 35-36	5/1/2019	5/1/2019	5/3/2019	5/4/2019	5/5/2019
RUFA 37-43	5/2/2019	5/2/2019	-	5/4/2019	5/5/2019
RUFA 44-49	5/3/2019	5/3/2019	-	5/5/2019	5/6/2019
RUFA 50-52	5/4/2019	5/4/2019	-	5/5/2019	5/6/2019

**Table 4: RUFA Fly Feedings**

On the morning of translocation, the birds were weighed and fed in the bird room holding crates. Monitored RUFA were provided flies. The birds for translocation were boxed in the transport crates starting at 10:15 AM and were loaded on to the boat at 1:45 PM on 7 May 2019.

Health of the birds was good for the 2019 trapping season. Despite the rough field conditions (dry and tree cover impacted heavily by Typhoon Yutu), the average capture weights of the RUFA was 7.7g; in comparison to the average capture weight in 2018 of 7.5g. The GOWE average capture weight of 17.5g was also good in comparison to the 2018 average capture weight of 16.8 g. All the GOWE and RUFA had evidence of feather mites and were treated topically with ivermectin. Holding mortality was very low in 2019. One RUFA was found dead on the third morning post-capture. This bird was thin on the morning of death; the day prior to death, it was being monitored for weight loss and received additional feedings. There was no obvious cause-of-death on gross necropsy.

### Translocation

In previous years, birds were crated the afternoon prior to translocation. In 2019, because the birds were already plastic banded with unique band combinations, we were able to crate the birds on the day of translocation. At 10:15 AM from 12:45 AM on 7 May 2019, all birds were crated for translocation. As birds were moved into the transport crate, the bands were confirmed, and overall body condition was checked. All birds were in good condition and therefore could be sent for translocation.

The CNMI DFW was able to contract the Emerald Star, a Coast Guard-approved vessel, to transport birds and staff to the island of Alamagan for this year's translocation effort (Figures 4-11). As the project has utilized the Emerald Star for previous translocation efforts, preparations of the bird cargo area and crew accommodations were simplified based on experience. A total of six MAC team members (Hannah Bailey, John Bender, Dr. Kami Fox, Amanda Hausman, Anne Heitman, and Scott Newland) travelled with a team from CNMI DFW to execute the translocation.

After a smooth journey of approximately 14 hours, the Emerald Star arrived just offshore of the island of Alamagan. Around 6am on 8 May 2019 MAC team members prepared the birds for transfer to the island. This included a final clean-out of the transport crates, to ensure that no food or insects were inadvertently introduced to Alamagan along with the birds. The bird crates were then loaded in groups of four onto a small motorboat and transferred from the Emerald Star onshore to Alamagan. Once onshore, the combined DFW and MAC team transported the crates up the island slope to the release site.



At the release site, birds were released individually from the transport crates. Releases began at 7:56AM and concluded by 8:27AM. A total of 43 GOWE and 51 RUFA were released successfully onto Alamagan. All birds flew from the transport crates without assistance, and no birds required medical attention during the trip. The birds experienced zero mortality and 100% successful release onto Alamagan.

After the release, all transport crates were transferred back to the Emerald Star. With the remaining available time before departure back to Saipan, the translocation team took a small hike up the slopes to attempt to observe additional birds on the island. Specifically, the team was looking for signs of GOWE, either banded or un-banded, that would offer some insight to any successful establishment of the 2018 translocation of GOWE and RUFA. While no RUFA were spotted, the team did encounter a group of three un-banded GOWE some distance away from the release site. While un-scientific, this observation does provide anecdotal support that GOWE from the 2018 translocation may have established.



Figure 4: MAC and CNMI DFW crew with the Emerald Star (Photo Credit: PBC)



**Figure 5: Transport crates secured on Emerald Star (Photo credit: Kami Fox, DVM)**



**Figure 6: Dinghy transporting birds from Emerald Star to Alamagan (Photo credit: Kami Fox, DVM)**



**Figures 7-11 (clockwise): Transport crates offloaded from dinghy; hiking transport crates up to staging area; crates at staging area, ready to be transported to release site; birds released from crates individually (Photo credits: Amanda Hausman)**

### **Education and Outreach: Objectives 4-7**

1. Conduct Library Programs for Tinian, Rota and Saipan.
  - a. Kerri Lammering, Leanne Blinco and Erin Tate conducted education program at public libraries of Tinian, Rota and Saipan. Topics discussed were:
    - i. Awareness of local bird species
    - ii. Conservation Concerns effecting these birds
    - iii. What the MAC project is doing to help these birds
    - iv. How can you help!
2. Conduct High School Classroom and Field Trip Experiences (Figures 12-13).
  - b. In 2018 the PBC team conducted teacher workshops. Through these workshops, Keri, Erin and the CNMI PSS science coordinator, Asap Ogumoro, developed a fieldtrip opportunity for the teachers and students. In 2019 Keri and Erin conducted initial outreach programs to inform students about endemic birds living in CNMI, what conservation issues these endemic birds are facing and what the MAC program is doing to help these birds. These classroom visits were designed to prepare students for their field visit and to promote internship opportunities. The following week 76 high school students visited the mist net field site and the bird care room.
3. Provide public presentations of MAC Program activities.
  - c. On 26 April 2018, Hannah Bailey, Houston Zoo, presented a public program on MAC project activities at the auditorium of the National Park Service's American Memorial Park (Figure 14).
4. Host local, High School student interns.
  - d. Four high school students from Kagman High School were selected to participate as interns for the 2019 MAC project. Selected by their science teacher, Mr. David Bucher, the four students spent two weekends working with MAC team members both in the field and at the bird room. The students learned about our collection and field techniques, as well as how to properly care for the birds prior to translocation.





**Figures 12-13: Educator Workshop for teachers in the CNMI public schools (Photo credit: Lammering/Tate)**



**Figure 14: Public presentation on MAC Program at American Memorial Park (Photo credit: Herb Roberts)**

## **MAC 2019 Project Support and Funding**

### **Major Contributors**

*CNMI Department of Land and Natural Resources*

*Disney Conservation Fund: 2-year award for 2017-19 totaling \$49,800*

### **Contributing/Participating Zoos (\$2500 plus travel expenses for participating staff)**

Aquarium of the Pacific

National Aviary

Audubon Zoo

North Carolina Zoo

Disney's Animal Kingdom

St. Louis Zoo

Fort Wayne Children's Zoo

Sedgwick County Zoo

Honolulu Zoo

Toledo Zoo

Houston Zoo

### **Additional Support**

*Arizona Center for Nature Conservation at Phoenix Zoo: \$1000*

*Doug Pratt: Donation of all artwork for staff shirts and educational trading cards*

## **2019 MAC Program Team**

