

Mariana Crow Update #4:
The Rota Bridled White-eye (*Zosterops rotensis*)

Below: Baby white-eyes, about 5 days old



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Note: The following is a journal entry from one of my white-eye nest observation days. This nest, Southern Cross 2, was particularly special to me because I found it while the pair was still building and was able to monitor it all the way through to completion. After many hours of observation, staring at these two white-eyes through a spotting scope, I was even able to distinguish the male from female (though the sexes have previously been thought to have identical plumage). The female I called “O” because her white eye-ring appeared more prominent and bold. Later, I determined that the actual eye-ring was probably not different from the males, but only appeared more prominent due to the lack of other strong facial markings which I observed in “Mask”, the male. With a good look at the birds face I was almost always able to distinguish Mask from O. However, with only a fleeting glance I usually did not feel sure enough to name the bird I was observing. I do not yet know whether the distinguishing facial markings that I noticed for this pair can be used more generally for the species.



May 6, 2009

I arrive at my spot at 06:30, hidden under Pandanus bushes, and quickly set up the scope. I am watching a white-eye nest. The tiny cup is nearly hidden among leaves, high in a Hernandia tree, 15 meters from where I sit. It is just light enough to see: the chicks are still there—huddled together, dozing. Two little grey and yellow fluff-balls. They will fledge any day now.

At 0637 the female, “O”, arrives at the nest but without the usual mouthful of worms. She hops to the nest, then hops out, to a nearby branch, and sits there for a few seconds before flying away. At 06:40 she comes again, repeating the process. And again at 6:45, but this time she is more persistent in getting her message across. She hops from the nest to the branch, then back to the nest and off to the branch again, making soft churring sounds each time she flies away from the nest. The chicks beg upon her every approach, their bright orange gapes flashing brilliantly amid the soft greens and yellows of the foliage. Until today their begging calls were silent to my ears, as young white-eye nestlings only make a muted, high-pitched peeping (audible to humans from less than a

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meter away; but how I discovered this is another story...). It seems that when the chicks reach fledging age they find their voices and begin to make soft warble calls in place of the peeping.

O arrives nearby again and finally the larger chick takes the leap. One flutter-hop from nest to branch and within no time the little fledgling had fluttered and clambered its way several feet from the nest. One of the adults begins making trips to the nest again, flitting back and forth. Baby number 2, though slightly less developed, seems to be getting antsy. Three minutes after its sibling, baby number 2 is out of the nest. It hops clumsily on gangly legs, eventually reaching the leaf-enshrouded twig where the other chick is perched. The two huddle together, quietly. Mask (the male) and O, are silent too now and set about foraging and bringing food for the hungry youngsters.



But the chicks don't get to rest for long. At 07:15, twenty-five minutes later, one of the chicks begins to wobble and flap on its perch. Mask and O become animated. On high alert, they fly back and forth from where the fledglings are perched, in the relatively open and unprotected nest tree, to a large, epiphyte-cluttered *Hernandia*, a few meters away. They are clearly doing their best to lead the youngsters towards safety, but nothing gets done too quickly when you're a 13-day old, tailless white-eye chick, only 30 minutes out of the nest.

Between 07:15 and 08:00 the adults make countless trips, churring quietly each time that they fly away from the fledglings. The larger chick begins to follow in short hops from twig to twig, then clears the space between the nest tree and the large *Hernandia* in a short flight, crashing successfully into the epiphytes. The adults are going crazy with agitated vocalizations and churring calls, now renewing their efforts on the remaining chick who, less developed, wobbles uncertainly towards the gap. At 08:05 baby #2 is standing on a twig at the edge. For a long time it seems to hesitate. Then, at 08:18 it jumps. The little bird arcs downwards through the air, flapping mightily with its long orange legs dangling ridiculously, like an oversized, uncoordinated wasp. It barely grabs



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on to some hanging fern leaves dangles precariously for a few seconds before scrambling up to the trunk. The two chicks have made it to relative safety, or so it seems. For the next half hour I watch the new family as the chicks alternately sit in hidden silence and scramble to a new perch. Each move the chicks make elicits renewed agitation of the parents and eventually their persistent calls attract the attention of some local white-eye



fans: the Micronesian Starlings.

Two juvenile starlings have taken note, peering down from their perch with piercing, yellow eyes. They see a tasty snack and come in for a closer look while the adult white-eye adults scream alarm-calls in agitated repetition. They scold their noisy opposition but there is really nothing these 10-gram birds can do when the starlings attack. There is a scuffle in the epiphytes. Adult white-eyes alarm calling, starlings flapping...eventually the starlings leave. At least one chick has survived the attack.

The other is unaccounted for, but may be hiding. At 09:35 I quietly take my leave from the white-eye family and hope for the best.

Afterwards:

In the following week I make several short visits to this nest to see if I can re-sight the fledglings. No luck, but the adults are being fairly secretive as well so I can't be sure of anything. However, 15 days after their two chicks fledged, the pair is building a new nest. Is it just them, or are there one or two young tag-alongs? I don't know the answer

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to this question yet, as Ken just found their new nest on the 21st, but future observations may tell...

Now that I've hopefully gotten you interested in White-eyes, the following is a scientific description of what we are doing with White-eyes and why the *Zosterops* genus is so fascinating from an evolutionary standpoint.

In early April, as the crow breeding season came to an end, the focus of our work shifted to a 3-month side project: nest-searching and monitoring of the endemic and critically endangered Rota Bridled White-eye (*Zosterops rotensis*). Until recently the Rota Bridled White-eye was considered one of three sub-species of Bridled White-eyes (*Zosterops conspiciellatus*) occurring in the Mariana Islands. The numerous and behaviorally distinct Saipan Bridled White-eye is found on Saipan and Tinian and the Guam Bridled White-eye was common on Guam before the introduction of the Brown Tree Snake (the bird is now extinct).

The Rota Bridled White-eye (hereafter Rota BWE) is a tiny, warbler-like passerine that inhabits high elevation (300-450 meters) cliff line forest in the sabana region. The sabana is the local name for the 450 meter grassy plateau which dominates the western half of Rota. Historically forested, the sabana plateau was cleared by the Japanese during their occupation of Rota, in order to grow sugar cane. The plateau is now primarily

grassland and the native limestone forests are limited to the cliff line.



The forest at “Southern Cross”, a beautiful part of Rota BWEs cliffline forest habitat

Zosterops, a genus consisting of approximately 80 white-eye species, has a fascinating evolutionary history. In an article about the diversification and expansion of a “great speciator,” Moyle et al. (2009) describes why the white-eye group is so unusual and exciting for evolutionary biologists: the *Zosterops* genus is one of the most species-rich of all bird genera, yet the genetic differences between species in this group are less than those found within single avian species. The actual quote, for the scientists among you, is:

“The combination of low molecular divergence and high species diversity within Clade B is unparalleled among birds. This level of molecular divergence is exceeded within single described avian species; however,

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Zosterops ranks among the most species-rich bird genera.”

The article goes on to describe how this genus seems predisposed to quickly evolving changes in dispersal ability. Many endemic island populations of *Zosterops* white-eyes exemplify “behavioral flightlessness,” meaning that while their wings and power of flight are normal, they do not disperse, especially over water gaps (even gaps as small as 2 km!). This “behavioral flightlessness” is believed to be one important factor leading to the many, genetically similar, yet behaviorally diverse, species and sub-species of *Zosterops* white-eyes.

The Rota and Saipan Bridled White-eyes, while nearly identical in appearance, have some striking behavioral differences. The most fascinating of these, which was hinted at in Fred Amidon’s Master’s thesis on the Rota Bridled White-eye, is Amidon’s observation that while Rota BWEs sing, the Saipan BWEs on Saipan and Tinian appear not to. After reading this I e-mailed Fred Amidon to ask if he has any new information regarding White-eye singing behavior. His response was,

“I suspect that the Saipan bridled white-eyes may sing but no one bothered to report it. I’ve spent a fair amount of time on Saipan and Tinian over the last couple of years for surveys and still haven’t heard them sing. However, I may just be in the wrong place at the wrong time.”

He told me that Paul Radley, a friend of Ken’s (they worked on graduate degrees in the same lab), may be a good person to ask; Paul is the Ornithologist for the CNMI Division of Fish and Wildlife and is stationed on Saipan. If Paul doesn’t know then I might just have to make a trip to Saipan myself.

On a slightly different topic, Rota BWEs have an interesting ecological history on Rota. Once common throughout the island, they became restricted to the high, sabana region as late as 1975. The population continued to decline dramatically, after their range was restricted to high elevation forests, dropping from an estimated 10,000 in 1982 to only approximately 1,000 in 1996. The reasons for the geographic restriction and continued decline of Rota BWE are largely unknown, though habitat-loss is probably an important factor. Other pressures faced by Rota BWEs include predatory birds, such the native Micronesian Starling and Collared Kingfisher as well as the introduced Black Drongo. All three of these species are nest predators and Black Drongos and Collared Kingfishers are known to eat adult white-eyes as well. No one has ever seen a starling eat an adult white-eye, however I observed the first recorded starling attack on white-eye fledglings.

Despite these pressures, it is believed that the white-eye population on Rota has stabilized and may even be increasing, though future years of survey effort will be needed to confirm the hopeful trend. This 3-month nest-monitoring project, which Ken and I have been doing, is aimed at getting a better idea of nest outcomes for a larger sample of nests than have been monitored in the past and also to collect data on prey deliveries (bugs and worms) to nestlings. Our very optimistic goal was to find and monitor 24 nests. In seven weeks we have found a total of 17 nests (12 of them were active when found), though

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during this period we have also put some effort into searching for our lost crow. Regardless of how many nests we find, Ken and I are doing our best to monitor and determine the outcome of as many of them as we can; this is a complicated task considering that we have the camera capabilities to monitor only one nest at a time.



Sarah high up in a tree, looking for nests in the Southern Cross forest

During the time I have spent watching nests to record prey deliveries I have been lucky enough to witness many interesting (and largely unknown) facets of white-eye social behavior. Ken did his Ph.D. Dissertation work on cooperative breeding in birds (where more than two birds contribute to the rearing of a single brood) and said early on that he suspected Rota BWE's to be cooperative breeders. Sure enough, we have observed some nests have trios, rather than pairs, of adults: Who is the extra bird and why is it there? Does it actually help feed young or simply tag along for the benefits of belonging to a group? Rota BWEs have been described as non-territorial, except perhaps in the direct vicinity of their nest. Why do males sing? Or even more curious, why do males of the Saipan BWE apparently not sing? How does the frequency of song change over the nesting period? Does countersinging ever occur? Male and

female white-eyes share the duties of incubation and feeding young, but how are these and other nesting efforts divided between the sexes? Rota BWEs have been described as sexually monomorphic (males and females have the same plumage and can not be distinguished from one another) but are they really?

I have many more white-eye stories to tell. I have partial answers to some of these questions. I have more new questions than partial answers. In the next update: White-eyes, Up Close and Personal.

Mariana Crow Update #3:
Why Did the Crow Cross the Road?



Radio-tagged crow: Day 2 out of the nest

4/23/09

So, why *did* the crow cross the road?

... For our baby Marianna Crow, carrying a backpack, as of yet, we don't know. Tomorrow Ken and I will dedicate ourselves to answering this question.

It had been ten days since we had fitted the nestling crow with a transmitter. I walked to the nest, for the daily nest-check, and the adults screamed at me, as usual, from the nest tree. I heard the nestling give its croaking caw once—it sounded like it was in the nest, but I didn't see it. The past several days it had been perched at the edge of the nest, though on occasion it still crouched down inside the nest cup and disappeared from sight. I decided to climb the tree just to be sure it was still in the nest and that all was well with the harness. So up the tree I went, the sapling swaying, weakened from its too-frequent use as a ladder to the crow nest. At the top of the sapling I swung myself into the larger *Nisosperma* and climbed up to the nest: empty. I looked up, and there, two meters above my head was the baby crow. I climbed back down the tree, to the great relief of the adult crows, who had taken to dive-bombing my backside during my last few trips into their arboreal domain.

The next day my telemetry work would begin: from this day forward we would track the crow using a yagi antenna, attached to a receiver. Ken was in Saipan, attending

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a conference, and I excitedly reported over the next 5 days that the crow was doing well and that I was finding it easily with the equipment. For eight days after the crow fledged I tracked its progress, visually locating it each day and marking the GPS coordinates. The crow spent eight days within 80 meters of the nest, each day moving a little further south, towards the road. It never moved more than 30 meters from one day to the next and while it occasionally flutter-hopped from one branch to another, I never really saw it fly. On the 8th day the crow was only 12 meters from the road and I could hear it begging noisily as I drove away. Will the crow cross the road and head up towards the golf course, I wondered?

On the ninth day Ken and I went to find the crow...and it was gone. Not only had it moved from its previous location, but it had moved FAR. The adults, who normally became vocal and animated upon my arrival in the vicinity of the nest, were gone as well. We drove the roads that branched out from the nest territory, stopping periodically to scan for the signal, but with no result. After several hours of searching it was getting late in the day and we returned to the house to make sure all the equipment was functioning properly. Yes, all was well with the equipment. So where could our crow family have gone?

A previous study on juvenile dispersal of Mariana Crows found a lengthy pre-dispersal period (during which family groups stay together) of 99-537 days. During this period color-banded fledglings were re-sighted at an average of 450 meters from their nest site and at a maximum of 850 meters. Our range on the transmitters is about 1.4 kilometers, if the transmitter is at least a few meters off the ground. So why couldn't we find our bird? One consideration is that the previous study was based only on re-sighting color-banded birds, with the resulting bias that if crows traveled outside the boundaries of the study area they would be excluded from future detections. It looks like our crow family is one that would have been "lost" from a study based on re-sighting color-banded birds. Since the adults are gone from this territory



A kingfisher I photographed near the crow nest

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too, so we have no reason to think that our fledgling is in trouble. We just have to find it!

5/2/09

Oh, how optimistic I was during those days when our crow was just recently lost. Ten days later, I would not say I've lost all hope, but I am definitely a bit discouraged. Since I last wrote, I've been listening to static 8-hours a day, straining to hear a faint tone through the noise, and only hearing the occasional phantom beep. We have traveled the island, end-to-end, listening to static. I have spent days testing the range and limitations of our extra transmitters, asking questions such as, "what happens to the signal if I toss this transmitter down a 10-foot crevice?" I've spent two nights secretly climbing hundred-foot radio towers, trying to get better reception. I've learned a lot about the capabilities of our telemetry equipment and I have been inspired to write a poem about my crow search:

*The static in my ears may drive me to tears
While the crow that I'm looking for lives years and years,
But the pack on its back has a hole or a crack
Through which all of the numbers fell out.*

*Number one forty-nine point zero-two-zero
Megahertz, if you please
Megahertz on the floor, guess they flew out the door
'Cuz I tell you in truth I can hear them no more
As I swim through these static-filled seas.*

I don't know how this poem ends yet, but I hope it ends with the Megahertz getting homesick and deciding to come back to the transmitter, where they will reside for the next 12 months (as specified by the manufacturer).

So, our crow has been MIA for 11 days on an island that is only 85 square kilometers. At this point it seems likely that either a) someone shot the crow and destroyed the transmitter, or b) the crow flew to an isolated, cliffy part of the island from which we have not yet been able to detect the signal. My goal, over the next weeks, will be to either find the transmitter signal or to eliminate option b) in the process.

*Right: Yet another spectacular sunset,
viewed from the roof.*



Mariana Crow Update #2:
Endemic Birds and Introduced Snakes



Above: Nestling crow with transmitter (note the antenna sticking out between the wings)

April 4, 2009

The time had arrived...: I would climb up to the crow nest and remove the chick, to band and measure it and, most importantly, see if it was large enough to fit with a radio transmitter. It was 10:30 a.m. and already another warm and humid day in tropical paradise. I climbed a tree next to the crow nest by shimmying several meters up a sapling and then clambering onto a larger tree with one high branch overhanging the crow nest. I climbed quickly and was surprised to look down on not just the chick, but an adult as well: the two were snuggled side by side, barely room for both of them in the nest cup.

The adult flushed immediately and began to caw loudly, drawing the attention of her mate who flew in to help ward off the predatory primate. As I reached down for the

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chick the adults increased the intensity of their aggression, finally attacking me overtly, biting my fingers and my back. Of course they did not dissuade me from my single-minded mission and soon I had pulled the chick from its nest and was back on the ground with Ken and the baby bird. I held the chick while Ken fitted color bands onto the legs, took body measurements and drew blood. The chick was large—bigger than we had expected and so we made the decision to go ahead with the transmitter. Though it's flight feathers remained stubby, it's body weight was nearly that of an adult. Most of the growing it had left would be put into completing its plumage and we hoped it would not grow enough to necessitate a harness replacement.

So, the first transmitter is on a wild crow and Ken and I are feeling quite celebratory. The many hours of planning and practice, trial and error and refinement of the harness design have finally paid off.

Now that I've spilled the beans on the most exciting recent news, I will write about a few of the events that preceded it. Ken and I spent 4 days in Guam, using a pair of captive crows to try out the backpack harnesses (for attaching radio transmitters) and getting practice in fitting the harnesses properly on the crows. The two captive crows are the only remnants of Guam's wild crow population which, along with all the other forest birds, was extirpated by the introduced brown tree snake. The pair of crows are part of the DAWR (Guam Department of Aquatic and Wildlife Resources) captive breeding program, as are small captive colonies of Micronesian Kingfishers and Guam Rails, two species that were endemic to Guam but are now extinct in the Wild. During these four days on Guam I gained a wealth of hands-on knowledge about backpack style transmitters and was even able to improve the design by changing the closure method from crimped metal bands to simple knots.

But the most important lesson was learned several days after we returned from Guam. We had left transmitters in place on the two captive crows, to see how they would hold up long term. It was reported to us that the male has had no apparent problems and continues to wear the transmitter. The female however, managed to get her upper mandible stuck in the section of rubber tubing that encases the cotton-thread breakaway and lies along the keel. One of the facility caretakers found her



Above: Sarah and Ken with nestling crow



Transmitter on captive crow (looking down at the upper back)

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on the ground struggling and removed the transmitter. We were lucky to learn of this design flaw before any wild crows were fitted with transmitters and the problem was easily corrected by using a smaller-gauge tube.

Along with gaining experience with backpack harness design and techniques I learned a great deal about brown tree snakes. Ken and I stayed with Ginger and Al (friends of Ken) who are both biologists working on the brown tree snake project. Ginger is the lead dog handler for the snake project and I was invited to go out with her while she worked the dog (a specially trained snake-sniffing dog). The snake team uses dogs (along with traps and human search teams) to detect snakes in key places such as the airport and at ports, in an effort to keep snakes from spreading from Guam to other islands. The dogs are also part of an emergency response team, which travels to any island that calls in a snake sighting on the snake hotline (“call 1-888-snake” and “Don’t Give Snakes a Break!” are the snake-team’s slogans, seen on bumper stickers, tee-shirts and posters). It was fascinating to watch Ginger and the dog at work. The dog responds to Gingers command to “go work” by weaving back and forth across the road and in the surrounding forest, trying to pick up the scent of a snake. If the dog detects a strong enough scent in a localized area (meaning that there is either a snake or a snake shed [skin] nearby) he gives the signal: sits and looks at Ginger. During this 2 hour night time excursion the dog found two snakes and the human team (4 people) found two others.



*John (a DAWR employee)
with a brown tree snake*

The brown tree snake (*Boiga irregularis*) first arrived in Guam during the late 40s or early 50s, probably as an accidental stowaway on planes carrying military surplus equipment from the Admiralty Islands. The snake’s extensive native range includes parts of Asia, the Philippines, Indonesia, New Guinea and Australia. However, due to variations in body structure and markings throughout the snake’s native range it is known that the ancestors of Guam’s snakes inhabit the Admiralty Islands. The limiting factor on brown tree snakes in their native range is thought to be low juvenile survival—a result caused by the lack of abundant, small prey for young snakes to feed on. Unfortunately for Guam’s forest birds, small lizards are extremely abundant, allowing the snake population to grow to population densities 20 times that of their native range. At the peak of the snake explosion there were found to be about 10,000 snakes per square kilometer.

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The brown tree snake is extremely adaptable (both in its prey base and habitat use) and thus, over a period of about 35 years it single-handedly exterminated all of Guam's forest birds, including 5 endemic species (i.e. species found nowhere else). The only reason it took as long as this is because Guam is a large island and the snakes were introduced only to the southern tip of the island. The snakes spread north from this point, steadily exterminating the birds as their population expanded over the island.



Guam, 45 km long and 550 km², is the largest island in Micronesia. Rota is only 20 km long and 85 km² and many other islands (in the Marianas and elsewhere in Micronesia) are only a fraction of this size. The biggest fear of biologists working on the other, snake-free Mariana Islands is that the snake could become established elsewhere due to the frequent air traffic to and from Guam. The same profusion of small lizards would allow the snake populations to soar...and an entire island's of avifauna could be gone in a couple of decades.

Shortly after our return from Guam we had a huge disappointment. Our crow nest with a young chick was depredated. Unfortunately we did not catch the predation event on video, due to it's timing—probably very shortly before the camera was switched out, based on behavior that was filmed that morning. Our nest cameras have a battery lifetime of 7-hours and are switched once per day, so nighttime and early morning hours are not filmed (better cameras will be ordered soon!). On the morning of the 28th, the footage showed a suspicious-looking hunk of meat caught between the twigs of the outer nest platform. The adults had not been present when Ken arrived and did not show up while he replaced the video camera—this is very unusual, especially for a nest with a young chick, and Ken suspected immediately that the nest had failed. Later, watching the video, we were fascinated to observe the behavior of the adults, whom returned to their nest about an hour and a half after the camera was replaced. In fact it was their behavior that confirmed our suspicions about the odd looking “piece of meat” that was wedged in the outer nest platform: the adults proceeded, with apparent agitation, to dislodge and consume the body of their nestling over a period of about 20 minutes.

It is not unusual for some birds to eat their own dead chicks or eggs. In fact similar footage was caught on a nest camera the previous year although, at that time, it was feared that the adults had killed their own young due to human disturbance. However, with the evidence from this nest pointing strongly towards outside predation as the cause of death for the nestling, last years footage is being considered in a new light. Our reasons for believing that this pair did not kill their own young include observations that the initial disturbance of their nest, 11 days earlier, when the chick was only a few

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days old, did not cause aberrant parental behavior, and also that the adults displayed little agitation during the daily camera switching (15 meters from the nest tree) and even fed the chick during my presence on several of these visits. Additionally, the manner in which the chick's carcass was lodged firmly between twigs suggests that a predator was in the act of pulling the chick from the nest when it abandoned the predation attempt (presumably because it was driven away by the adult crows). Two common nest predators are rats and monitor lizards and since the nest remained undisturbed in the struggle, Ken has suggested that a rat is the likely culprit. The Mariana Fruit Bat is the only native mammal species of the Mariana Islands and the unfortunate introduction of rats, cats, and several ungulates has negatively impacted much of the native flora and fauna.

However, regardless of the cause, the failure of one of our two crow nests was a huge disappointment, particularly since it left us with only one active nest, and thus only one chance to put a radio transmitter on a fledgling crow. How lucky we are, that this chick has survived to near fledgling age, allowing us to fit it with a transmitter. The pilot study now begins in earnest and there are a plethora of fascinating questions to ask, both about the function of the harness design and about the life of a fledgling crow:

- Will the transmitter stay on the crow?
- Will the nestling grow significantly, necessitating a harness change before it fledges? Will it get its bill or legs caught in any part of the harness?
- How close to the nest will it stay during the weeks and months after fledging?
- How long will it associate with its parents?
- When it disperses, how far will it go?
- If it dies or is killed, what will be the cause?

While one fledgling will provide only anecdotal answers to the latter questions, the information gained on the feasibility of our harness design will allow for the planning of a large-scale study in the coming years. As James Ha (at University of Washington) so aptly stated in response to our news about this first transmitter-carrying crow, "Let's see what this little fluffball can tell us!"

Best Regards to all,

Sarah

Update #1: The Crow's Fool and the Haunted Tree



3/21/09

Hello All,

I have been on the island of Rota for about two weeks now. During this time I have been tricked by a crow, attacked by a crow, climbed a haunted tree, tried to befriend a psychotic baby bat and enjoyed snorkeling and hiking through the pristine natural beauty of this tiny Micronesian island.

I have come here as a Mariana Crow Technician, hired by Ken Levenstein, a post-doctoral researcher at University of Washington. During this six-month position, the goal is to monitor crow nests and track fledglings and adults using radio telemetry. The telemetry aspect is new to this project (which has been working with the crow for 4 years) and this year is really more of a pilot study. As of yet, we have not had harnesses on birds and there have been many complications. The crows' breeding season, which typically lasts from August through March, is coming to an end. However, we still have two active nests, recently discovered with small nestlings. These two nestlings, along

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with their parents, are my hopeful candidates for the application of radio telemetry harnesses.

The Mariana Crow, called Aga by the native Chamorros, is a critically endangered species, with only about 150 individuals surviving in the wild—all on the island of Rota. The crow is endemic to Guam and Rota, but was extirpated from Guam due to predation by the introduced brown tree snake. (Note: Guam is about 30 miles south of Rota). The snake population on Guam exploded in the seventies, resulting, within about 30 years, in the extinction or extirpation of all forest birds on the island. Thankfully, the snake has not made it to Rota or the other Mariana Islands; however its proclivity for stowing away in airplane wheel wells and cargo makes this possibility a constant threat.

I suppose you all are wondering how I was tricked and then attacked by a crow. These incidents led up to the discovery of the first nestling, in a territory where the pair of crows is known for being particularly aggressive. We had thought the nest was empty until a local Chamorro man called Ken to inform him of an Aga nest he had found, which he wanted to show us. We followed him to the nest and were thrilled to see a large chick on the nest. I only had a brief glimpse of the Aga chick before we left the area in an effort not to disturb the birds, but it looked very developed and was certainly near fledgling age. We came back the next day with a mirror on a long pole, to get a good look at the chick. We stood below the nest, a stick platform 10 meters up a slender *Neisosperma* tree, and I raised the pole-mirror above the nest. Immediately a crow jumped from the nest, fluttered to the ground, and ran, with great speed and agility. Ken charged after the fledgling but it disappeared from sight about 50 meters from the nest. It is common for chicks to fledge before they can fly well, however the agility displayed by this bird was unusual for a fledgling. However, it definitely seemed unable to fly and that gave us hope that we would find it eventually. A rain shower moved in and soaked us, as we hid in the forest, waiting for the fledgling to make a sound and clue us in to its location. After 15 minutes of the deafening, drenching downpour we decided to leave and come back in the afternoon. We didn't want to disturb the new fledgling too much in such wet conditions.

Around mid-day I wrote in my journal: “this afternoon may be my last chance to get a harness on a fledgling crow. Even though I don't believe in a god I am praying to one now---that we can catch this bird, which fledged from its nest this morning.”

The rain had cleared up and we returned to the nest site with a harness and banding materials. Ken and I split up, alternately hiding in shallow limestone caves and sneaking around the surrounding forest, trying to get closer to the crows. The adults were nearby, but were being very quiet. The fledgling was nowhere to be seen or heard.

I was hiding at the edge of a cave near the adults and Ken was searching for the fledgling nearby. We had been there for over an hour. I was starting to worry that we might not find the fledgling after all. Suddenly the fledgling crow fluttered to the ground from a shrub, landing literally at my feet, and began to hop slowly along the ground. I sprang to action, and nearly grabbed the bird as it flapped out of my reach. I called Ken as I leapt over branches and through the obstacle course of dense vegetation, trying to catch the clumsy, yet evasive bird. I nearly caught up to it again when it hopped upwards, from branch to branch, out of reach in a tree. Ken had arrived at my side and we stared up at the fledgling. “Wait,” said Ken. “That's an adult!” And sure enough, it

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was—it was banded, the faded green and red colors on one leg telling identifying it as the male of the pair. The bird, bedraggled and wet from the rain, had done such a convincing behavioral impression of a fledgling that I hadn't even considered that it could be an adult. "The fledgling must be nearby," said Ken. The adult was probably trying to lead us away from it, he thought, and we both renewed our search efforts, scanning the ground in the area where the adult had first landed on the ground, leading me away from the cave.

Shortly Ken called me over. He was at the nest, listening intently. There were cheeping sounds—a recently hatched baby crow. Suddenly it all became clear: the "fledgling" that we saw flutter from the nest in the morning had been the adult, just as the adult had landed on the ground in the afternoon, leading me away from the nest. We had been looking for a fledgling that didn't exist. We were tricked by a crow.

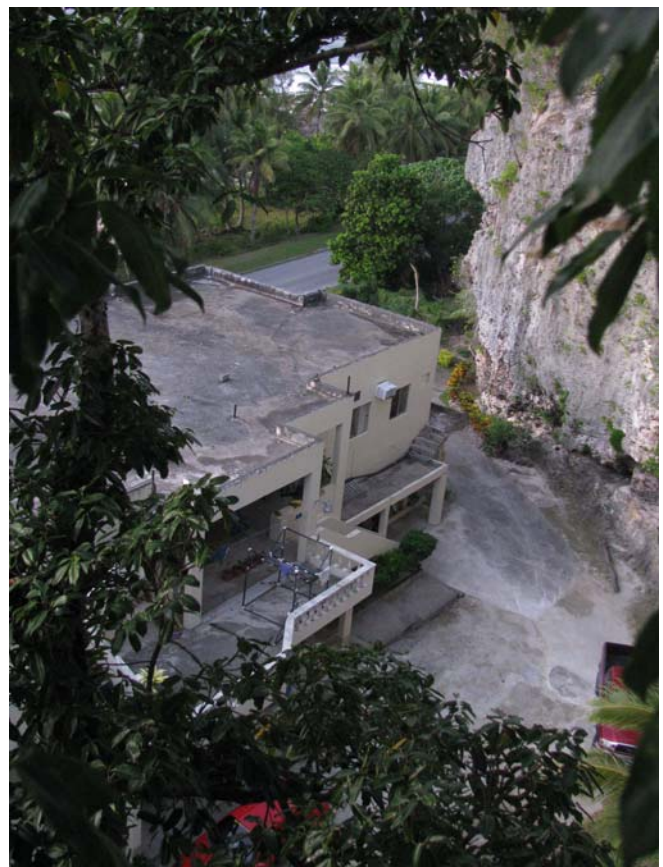
Later, after giving the Aga family a break from disturbance, I climbed a nearby tree to get a look at the chick. At this point the crow which had previously tricked me now attacked me, aggressively defending his nestling. He persistently bit my fingers and pecked the top of my head, making himself an easy target, had I wanted to capture him. This attack was quite a show of aggression, accompanied by screaming and tearing of small twigs from the tree, but the force behind the display was surprisingly subdued. The crows are strong birds, capable of breaking human skin, yet these bites and pecks not painful. Why did the crow hold back? Perhaps a more forceful attack would have put the adult at greater risk of predation, making the risk greater than the benefit for such a long-lived species. Contrastingly, at the next nest I climbed (also containing a small chick) the adults made an aggressive vocal display but did not approach within an arms length of my body, as I neared the nest.

It is evening now and I am going to go watch the sunset from a haunted fig tree, where I have a 75-foot high perch looking west, over the ocean. I hope you are all well. I will send another update soon.

Love, Sarah

Right: Looking down at the house from my perch in the fig tree. Just across the road is the ocean.

Below: Baby bat, ready to attack!



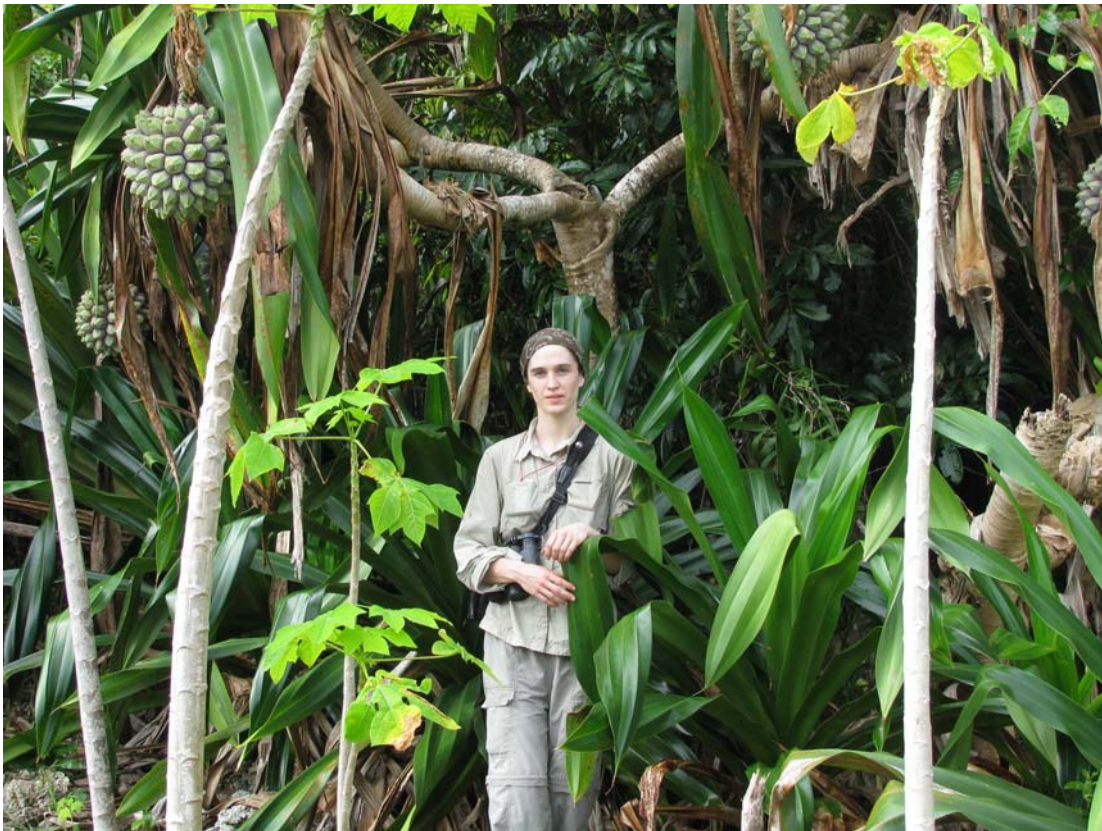
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Above: From the air—the far southwestern end of Rota. The house I live in is circled.



Below: At the edge of the jungle, under a Pandanus tree.



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Right: The rocky shore at As Matmos, on the northeastern end of the island.

Below: Typical beach scene in Rota (always empty).

