



Maui's Mitred Parakeets (*Aratinga mitrata*) – Part 1 of 2

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Mitred parakeets (*Aratinga mitrata*) are native to the eastern Andes Mountains in South America ranging from central Peru south through central Bolivia and northwestern Paraguay to north-central Argentina, where their area of occurrence is estimated to be 250,000 km² (96,525 mi²) spanning an elevation range of 1,000 to 3,400 m (3,281 to 11,155 ft) (Bird Life International 2006). Native habitats include a range of tropical and sub-tropical habitats: broadleaf forests, secondary forests (including degraded former forests), cloud forest patches, and arid montane (high-altitude) grasslands and shrublands. Natural diets are poorly known, but they probably feed on fruits, seeds, berries and nuts; and occasionally forage on ripening berries and maize in cultivated areas where they can cause considerable damage to crops (Forshaw 1989, del Hoyo *et al.* 1997, Juniper and Parr 1998, BirdLife International 2006). Commonly called mitred coures, they are 31 to 38 cm long (12 to 15 inches) including their long, graduated, pointed tails; body mass is 219 to 275 gm (7.7 to 9.7 oz). They are green in color, with olive-yellow underparts, and a purplish forehead. Their red markings are highly variable and irregularly scattered on the lores, nape, cheeks, face, breast and abdomen of adults; the bend of the wing is only sometimes red. In their native range, they nest once a year on cliffs or in tree cavities. Two to four eggs are incubated for about three weeks; and roughly eight more weeks are required for the young to fledge. A succinct description and summary of taxonomy and life history are available in Waring's (1996) report.

THE MITRED PARAKEET IN HAWAII

In Hawaii, at least 28 different parrots have been sighted in the wild since 1990 (Pyle unpubl. data) and mitred parakeets have been reported from the Islands of Hawaii, Maui and Oahu. Here, we report on the non-indigenous flock established (Pyle 2002) along Maui's windward coast. Naturalized breeding populations of mitred parakeets are also present in Florida where they have bred in the wild for over 10 years (Florida Fish and Wildlife Conservation Commission 2004; Butler 2005) and in California (California Department of Fish and Game 2006; Garrett 1998; Garrett *et al.* 1997; Collins and Kares 1997; Mabb 1997).

Broad diets are associated with established populations of exotic parrots around the world (Cassey *et al.* 2004) and mitred parakeets fit this pattern. Their diet was much more diverse than the other eight naturalized parrots studied by Garrett *et al.* (1997) in southern California, where they fed on 32 different food items, not including items at feeders. With such a potentially diverse diet, their continued persistence on

Maui seems likely and poses several potential problems (Maui Invasive Species Committee [MISC] 2002). A non-indigenous population of the closely related red-masked parakeet (*Aratinga erythrogyne*) feeds largely on kiawe (mesquite, *Prosopis pallida*), geiger trees (*Cordia sebestena*), strawberry guava (*Psidium cattleianum*) and mango (*Mangifera indica*) (N. Kalodimos unpubl. data). We did not study food habits, but earlier reports included several well-known invasive woody plants (Waring 1996; Gassmann-Duvall 2001) and mitred parakeets may be dispersing seeds from banyan trees (*Ficus* spp.), Christmas berry (*Schinus terebinthifolius*) and others over large areas in their droppings (Table 1). We did not observe parakeets feeding on miconia (*Miconia calvescens*) but several large miconia trees were discovered near the core of their range in 2006, and earlier feeding trials demonstrated that a captive mitred parakeet would eat and pass viable miconia seeds. If they are spreading viable miconia seeds, they may be undoing over a decade of work eradicating miconia on Maui.

Table 1. Reported foods of mitred parakeets on Maui.

Common name	Scientific name
Banyan	<i>Ficus</i> spp.
Rose apple	<i>Syzygium jambos</i>
Mountain apple	<i>Syzygium malaccense</i>
Java plum	<i>Syzygium cumini</i>
Strawberry guava	<i>Psidium cattleianum</i>
Common guava	<i>Psidium guajava</i>
Christmas berry	<i>Schinus terebinthifolius</i>
Papaya	<i>Carica papaya</i>
Mango	<i>Mangifera indica</i>
Lychee	<i>Litchi chinensis</i>

Thirteen (65%) of the 20 species of *Aratinga*, including mitred parakeets, are considered pest species, or are known to feed on crops (e.g., maize) in their native ranges (del Hoyo *et al.* 1997). Thus, there is concern that parakeets might become agricultural pests in Hawaii. Important foods for exotic parrots in Los Angeles include various palms (*Araceae*) (Garrett *et al.* 1997) and concern has also been expressed for Hawaii's endangered loulou palms (*Pritchardia* spp.). The mitred parakeet flock has occupied the 50 to 60-m tall sea cliffs at Huelo Point for many years and may have displaced native sea birds. Direct competition between mitred parakeets and native birds has been observed in the displacement of frigate birds (*Fregata minor palmerstoni*) from roosting areas and in competition with shearwaters (*Puffinus* spp.) and petrels (*Pterodroma* spp.) for

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nesting sites in cliff-side burrows (MISC 2002) and may also be in conflict with Hawaiian black noddies (*Anous minutus*) which still occupy these cliffs. By feeding in upland forests, parakeets might be spreading a variety of viral diseases such as adenoviruses and paramyxoviruses, and bacterial diseases such as psittacosis, and salmonellosis, which could impact Maui's native birds. Finally, if their densities increase and they spread to more urbanized neighborhoods, the parakeet's raucous early-morning flights and afternoon congregations may become a more serious nuisance.

THE FLOCK

The founding pair of this flock arrived in Hawai'i as cage birds, and escaped from a private residence in Huelo (Lat. 20° 55' 00" N; Long. 156° 13' 10" W) in 1986-87. In a video interview (King 2001) the owner stated that the first bird, believed to be a male, accidentally escaped but remained in the area and returned to feed. He bonded with another mitred parakeet in their outdoor aviary where he reportedly chewed a hole through the netting, and freed his future mate. Within three years, they were accompanied by a third mitred parakeet: the flock had begun to grow. Precise numbers were not recorded, but by late-1995 flock size was estimated to be 30 (Waring 1996) and reached 150 in 2000 (Gassmann-Duvall 2002). Since then, high counts of the flock have ranged from 90 to 200 birds (Figure 1).

The nesting and roosting cliffs at Huelo Point were only 0.5 km (0.3 mi) from the original release site, but were inaccessible without climbing ropes, and difficult to observe even with landowner permission. Thus, nest sites have not been accurately located and little is known about breeding behavior, or success and timing of nesting. Indirect evidence suggested that breeding likely began in March or April and lasted through early July. Fledglings, with relatively short tails, have appeared in flight as early as May, and young fledglings were seen perched on the nest cliffs in early July.

DISTRIBUTION AND MOVEMENT PATTERNS

The parakeet flock continued to revisit the release site on a regular basis, and high-use areas were mainly within 5 km (3.1 mi) of Huelo on the windward coast of the island of Maui. Most research, including this study, has been concentrated in and around Huelo, Waipi'o Bay, and along the Hāna Highway.

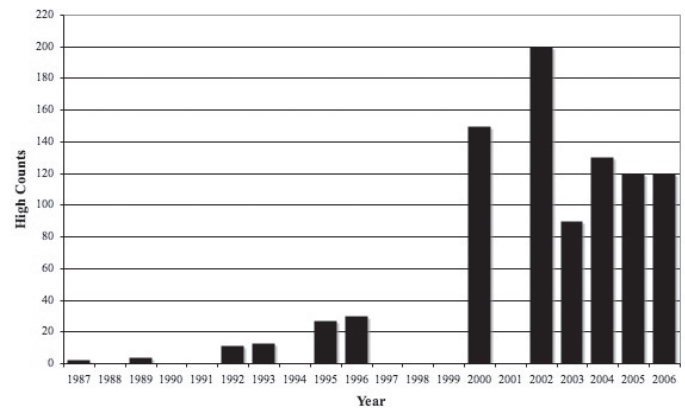


Figure 1. Numbers of mitred parakeets reported on Maui, 1987 to 2006 (Waring 1996, King 2001, Carter and Gassmann-Duvall 2002, MISC unpubl. data, and this study).

Nesting and night-roosting areas included sea cliffs at Huelo Point, and the cliffs, caves, and steep forests along Waipi'o Bay. Carter and Gassmann-Duvall (2001) twice surveyed the sea cliffs from Māliko Gulch to Huelo Point in a boat and described parakeet roost sites as small crevices 30 m (100 ft) above the ocean located all along the sea cliffs from Waipi'o Bay to Huelo Point; none were seen between Māliko and Waipi'o Bay. In 2006, we conducted a similar survey, and to our knowledge parakeet distribution has not expanded along this shoreline. However, in 2002 a small splinter group of four parakeets began nesting on the cliffs along the southwest shore of Waipi'o Bay (A. Kepler pers. comm.). This band increased to 30 in 2004 and contained 40 birds in 2005 and 2006. In 2006, we flushed 11 pairs from a cave at the base of the sea cliffs near the falls at Waipi'o Stream. This is just 1.1 km (0.7 mi) west of Huelo Point and these birds often joined the main flock in their dawn flight. At least two other *Aratingas*, the green (*A. holochlora*) and brown-throated parakeet (*A. pertinax*) are known to nest in caves (Eitniear 1997, del Hoyo *et al.* 1997).

Local foraging sites included banyan trees (*Ficus* sp.), rose apples (*Syzygium jambos*) and Java plums (*S. cuminii*) located near the sea cliffs, and at numerous locations in Huelo. Regular flight patterns indicated that more distant feeding areas ranged from Ho'olawa valley on the west, east to the valleys and ridges

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along Hanaho'i, Kailua and Nali'ilihā'ele streams, and at least as far south as the Wailoa-Ko'olau Ditch. This range closely matched both Waring's (1996) and Carter and Gassmann-Duvall's (2002) assessment of the extent of the flock's core area. Although the flock has been seen as far as Waikamoi and the Ke'anae Peninsula to the east and as far west as Peahi Gulch, the east-west extent of their core range appears to changed little in the past 10 years. Very little information is available on their distribution mauka of the Hāna Highway, but the flock has been reported at elevations up to 1300 m (4,265 ft).

As noted by previous observers (Waring 1996, Carter and Gassmann-Duvall 2001, Gassmann-Duvall 2002), flight activity in and around Huelo and vicinity typically started at first light and was most pronounced between 0600 and 0800 HST and again from 1530 to 1830 HST, with a one-hour time difference in flight activity peaks between summer and winter. Parakeet flocks flew fast and strong, continuously giving loud series of vocalizations. These calls were aptly described by Waring (1996) as loud and raucous repetitions of a harsh, rather high-pitched, "schrack". Flocks were most frequently heard before seen, and usually spotted only when well above the forest canopy or over open pastures. They formed loose flocks comprised of pairs or triplets with no obvious symmetrical structure.

Late in the nesting season, we observed the main flock as it left the Huelo Point sea cliffs at dawn. Departure times varied from 0520 to 0550 HST; none were seen leaving the cliffs after sunrise (ca. 0600 HST). Calling loudly, 40 to 50 birds usually left the north-facing cliffs in a single flock, and were often joined several minutes later by a smaller group of 10 to 15 birds from the nearby set of east-facing cliffs. Together, they circled two to three times to gain altitude before flying off shortly after sunrise (ca. 0615 HST). The satellite flock, from west Waipi'o Bay, often joined the main flock while it was circling near the shore, or heading inland towards Huelo, and eventually continuing inland to feed. Other times the Waipi'o Bay flock followed independent flight paths to the south and southwest of Waipi'o Bay while commuting to and from the forests along Ho'olawa and Ho'olawanui Streams. At times, this smaller flock regularly followed Waipi'o Stream and Mokupapa Gulch, and crossed Hāna Highway and Twin Falls.

Frequently, the parakeets started the day by landing in tall trees such as Eucalyptus (*Eucalyptus robusta*), Ironwood (*Casuarina equisetifolia*), Java plum or banyan (*Ficus* spp.) located close to the sea cliffs or near the release site. They spent up to 30 minutes preening and socializing before flying up Huelo or Hanaho'i Streams, and crossing the Hāna Highway. From here, they often landed in the forested hills south of Huelo. On other days, especially during the breeding season, the flock left the cliffs, passed over Huelo, and continued directly to the upland forests. Return flights, presumably adults returning to their nests, were observed as soon as 30 to 60 minutes later.

Throughout the day, during the spring and summer, small flights of parakeets commuted to and from upland areas, over Huelo, and on to Waipi'o Bay. In late-afternoon, large numbers gathered in tall coconut palms (*Cocos nucifera*), *Ficus*, and paperbark trees (*Melaleuca quinquenervia*) near the release site. This highly social congregation most frequently

occurred between 1530 and 1600 HST, but rarely lasted over 30 minutes. The parakeets actively preened, fed, courted and called incessantly before leaving *en masse* towards the nesting/roosting cliffs. These gatherings at the release site have remained remarkably similar since being described by Waring (1996) and Carter and Gassmann-Duvall (2001) but a new morning staging site near Waipi'o Bay formed after the satellite flock occupied this area. In our experience, the morning assemblies were less predictable and shorter than the evening assemblies; which were, in turn, more dependable in fall and winter than in spring and summer.

METHODS & RESULTS

Our study was designed to explore methods to control the mitred parakeet population. If they could be consistently attracted to bait stations, then several options for capture and removal could be proposed and tested. We also tested playbacks of local conspecific calls, and live lure birds for efficacy in attracting the parakeet flock.

Bait Stations

Several different ways of attracting mitred parakeets to bait stations were field-tested, but none were satisfactory. We employed several types of feeders, with various baits and presentations. These included large elevated platform feeders, aerial fruit and seed feeders, and food trays on bamboo tripods. We used long lines to hang aerial feeders in trees at heights up to 9 m. Tripod feeders were similar in height and size to feeders used by residents at the release site in Huelo, where they have fed on corn, peanuts, and sunflower seed, off and on, for many years. Five bait stations were established near sites visited regularly by the flock; all were within 1 km (0.6 mi) of Huelo. Each bait station had two to seven feeders stocked with a wide variety of fresh fruits, vegetables, seeds, and nuts. Fresh baits were used from June through mid-August, 2005, and included known food items when available. Other colorful fruits and vegetables were added to increase visibility. Mangoes (*Mangifera indica*) papayas (*Carica papaya*), passion fruits (*Passiflora edulis*), red apples (*Malus* sp.) and fresh corn (*Zea mays*) on the cob were used frequently. Other fresh baits included carrots (*Daucus carota*), squash (*Cucurbita* sp.), lychees (*Litchi chinensis*), oranges (*Citrus* sp.), white guavas (*Psidium guajava*), strawberry guavas (*Psidium cattleianum*), rose apples, mountain apples (*Syzygium malaccense*), starfruit (*Averrhoa carambola*), fruiting branches of various *Ficus* sp., and peppers (*Capsicum* sp.).

Fresh baits decomposed rapidly and were largely replaced by a diverse mix of whole seeds and nuts sold for large parrots, to which we added sunflower seeds (*Helianthus* sp.) and dried corn. To increase the visibility and attractiveness of seed feeders we added fresh-cut fruiting branches of strawberry guava and *Ficus*.

To avoid disrupting the parakeets or having them associate us with the bait stations, we placed and replenished feeders as quickly as possible when the parakeets were absent, and visited them infrequently. This, however, compromised our ability to directly monitor bait station use, and Trailmaster infrared monitors with cameras (Goodson and Assoc., Lenexa, KS)

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were placed at four bait sites. In addition, three bait sites were frequently observed by landowners and their employees during normal activities.

Although parakeets frequently perched near, and regularly flew by the bait stations there was no conclusive evidence that they used any of the feeders. Automatic cameras, and visual sightings, confirmed frequent use by doves (*Streptopelia chinensis* and *Geopelia striata*), other small birds (e.g., *Garrulax canorus*, *Cardinalis cardinalis*, and *Paroaria coronata*), rats (*Rattus* sp.) and domestic cats (*Felis silvestris*); no Trailmaster photos showed parakeets at the feeders.

Vocalization Recordings and Playbacks

In Costa Rica, Vehrencamp *et al.* (2003) reported that orange-fronted parakeets (*Aratinga canicularis*) would “land, approach, and interact vocally with playbacks of “chee” contact calls recorded from nearby sites...” and these parakeets were routinely netted using playbacks of contact calls (Bradbury pers. comm.). Working with an introduced flock of this species in Puerto Rico, Meyers (1994) also used playbacks of conspecific roost vocalizations to attract parakeets to netting sites. Wright and Clout (2001) recommended testing live lure birds and amplified playbacks, along with bait, to trap introduced eastern rosellas (*Psittacus eximus*) in New Zealand. Thus, we tried using vocalization playbacks to attract the parakeets in a variety of situations.

Digital audio recordings were made while the flock gathered near the original release site in Huelo prior to night roosting. This late-afternoon congregation was highly social, and gave a wide variety of vocalizations. To create excerpts for playbacks, we used audio software (Adobe Audition Ver. 1.5, Adobe Systems Incorporated, San Jose, CA) to select calls, to filter out obvious background noise, and to increase and balance volume. Selected calls were broadcast using portable amplified speakers. Playbacks initially included a wide variety of social calls, but excluded long-series of medium- or high-intensity aggression calls. Subsequent playbacks emphasized 2- and 3-note contact calls. To avoid disturbing the parakeet flock, playback sessions were unattended, or observed from heavy cover.

To determine if playbacks would make the bait stations more noticeable and attractive we broadcast parakeet calls on 29 occasions at three bait stations. Each session lasted from 1 to 4.5 hours for a total of over 75 hours of conspecific call broadcasts. About half the time, no parakeet appeared, but we monitored 17 playback sessions, for 37.5 hours, during which parakeets perched nearby, called, or flew past. In four of these sessions parakeets landed nearby and interacted vocally with the recordings, but did not feed at the bait station. Once, while calls were broadcast at the release site bait station, a morning flight of 32 birds twice circled overhead in apparent response to their taped calls. The main flock then continued its flight upstream, but two pairs split off, landed nearby, and interacted vocally with the playbacks. However, they did not approach the feeders, and left silently within 15 minutes.

We also broadcast a variety of conspecific social calls from behind 5-m tall mist nets at a morning assembly site. Six trials were conducted for a total of 15 hours, but parakeets appeared

only four times. During two of these four trials they landed as usual, perched nearby and interacted with the recordings. In one instance they clearly responded to the playbacks and stopped calling during a quiet portion of the recording, but showed no inclination to approach the broadcast speaker and nets. We also conducted seven *ad hoc* trials where high-volume contact calls were broadcast along regular morning flyways for 15 to 40 min. During one trial the playbacks elicited a loud, long-lasting, aggressive response. Otherwise, they flew over and appeared to reply to the playbacks but did not change their flight path.

During a 2006 nesting season survey of the sea cliffs, only a few scattered pairs were seen from the water on the Huelo Point cliffs, and there was no detectable reaction when high-volume parakeet calls were broadcast from the boat. The west Waipi'o Bay cliffs appeared empty until a similar broadcast flushed 11 pairs from a cave at the shoreline.

Live Lures

Live decoys are well known to increase trapping success for many avian pests such as crows, blackbirds, starlings, and house sparrows (Hygnstrom *et al.* 1994). Live lure birds have also been used to successfully trap rose-ringed parakeets (*Psittacula krameri*) in Asia (Bashir 1979, cited in Avery *et al.* 2002) and to attract African grey parrots (*Psittacus erithacus*) for capture (May and Hovetter 2005; del Hoyo *et al.* 1997). In Florida, wild monk parakeets (*Myiopsitta monachus*) approached live conspecific lures but would not enter the traps (Avery *et al.* 2002).

To assess their utility as lure birds, we conducted nine field trials using a mated pair of captive-bred, parent-reared mitred parakeets. This pair had been together for at least three years; they were strongly bonded to each other, and were not tame. Each was tethered to a long cable placed on open ground with food and water. Several additional feed trays were placed nearby on the ground to encourage the feral parakeets to approach and feed. Each trial lasted one to four hours for a total of over 20 hours. In seven trials, wild parakeets approached and interacted with the live lures. Lure birds elicited several promising, but brief, responses: flying low over the lure birds, circling overhead, perching nearby, and calling. These interactions usually lasted under a minute; but during two trials small numbers of parakeets perched nearby for over five minutes and called sporadically. In most instances only a few birds responded; the main flock seemed to ignore the lure birds. However, at Huelo Point a dawn flight of 45 parakeets left the cliffs, circled to gain altitude, and appeared ready to fly inland. Instead, they changed direction, dropped down, and made a single low pass directly over a lure bird. Live decoys appeared promising but consistently attracting the wild flock may require several months of undisturbed consistent exposure to the lure birds, along with heavy baiting with favored treats like sunflower seeds, peanuts and cracked corn.

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To Be Continued (68:2 March 2008)

**11th Annual
Great Backyard Bird Count**
February 15 – 18, 2008

Join with thousand of others to find out how many birds are being seen in your area and across the U.S. and Canada this winter. By participating in the Great Backyard Bird Count you help document where birds are and track changes in their numbers compared to previous years, helping scientists paint a picture of the state of birds this winter.

- No fee or registration required
- All ages and skill levels welcome
- Watch birds for as little as 15 minutes on one or more days of the event
- Count *anywhere* – in your backyard, balcony, schoolyard, park, or wildlife refuge

Before you count, go to www.birdcount.org for easy-to-follow instructions and local checklists. The Great Backyard Bird Count is a joint project of the National Audubon Society and the Cornell Lab of Ornithology.

Hawaii Audubon Society Research Grant
Applications Due April 1, 2008

Hawaii Audubon Society offers two grants per year for research in Hawaiian or Pacific natural history. Awards are oriented toward small-scale projects and generally do not exceed \$500. Grants are reviewed semiannually. Deadlines are April 1 for summer/fall grants and October 1 for winter/spring grants. Application guidelines are available at www.hawaii.audubon.com under "chapter news", or by contacting the HAS office at (808) 528-1432 or hiaudsoc@pixi.com.

**Hawaii Audubon Society Awards
Research Grant**

We are pleased to announce that Hawaii Audubon Society has awarded Nancy Chaney (UH Hilo) a research grant to assist her study on the role of larval development in determining the population structure of Hawaiian micro-gastropods. The genetic analysis of marine mollusks undertaken in this study will contribute to our understanding of the natural history of the Hawaiian Islands by addressing fundamental concepts regarding speciation and species dispersal. Hawaii Audubon Society research grants have traditionally funded terrestrial studies. We are pleased to extend our support for those involved in marine research. A brief summary of Nancy's findings will be included in a future issue of the *'Elepaio*.

HAS Field Trips

Contact the HAS Office at:
(808) 528-1432, hiaudsoc@pixi.com

HAWAII ISLAND

Sunday, February 10

Pu'u 'Ō'ō Trail, Saddle Road with Les Chibana

We will bird along this trail that crosses a few old lava flows from Mauna Loa checking several kipuka for native forest bird activity. The trail is fairly level with a few short grades. The footing can be uneven with some loose, gravel-sized rocks. This is not a walk for those who are unsure of their balance. If we can carpool, we might make a short extension to the area outside Kipuka 21, which is currently closed for trail work. Bring snacks and plenty of water. Sturdy walking shoes and hiking sticks are recommended. Bring sun protection and be prepared for some rainfall. Steady or heavy rain cancels. Meet at the Pu'u 'Ō'ō parking area at 9:30 a.m. The parking area is near the 23 mile marker on the south side of Saddle Road. The realignment work has made this area a little more obscure. Watch for the small signs and graded 'a'a parking area just off the road. Call Joan Carroll at (808) 883-9845 or Noreen Chun at (808) 883-2118 for more information.

O'AHU

Monday, February 18 (Presidents' Day Holiday)

Tour of Coconut Island with HAS Board Member Norma Bustos

8:30 a.m. – 12:00 p.m.

HAS has arranged a special tour of Kāne'ohe Bay's Coconut Island (Moku o Lo'e), a world renowned research facility operated by the University of Hawaii's School of Ocean and Earth Science and Technology. The two hour tour of the island and its colorful history will be followed by a picnic lunch at the Beach House where we'll enjoy beautiful views of Windward O'ahu. Bring sun protection, rain jacket, proper footwear (sneakers or athletic sandals), drinking water, lunch, and a camera. A \$5 donation is requested. **THIS TRIP IS LIMITED TO 19 PARTICIPANTS.** Call the HAS office for more information and to reserve your space.

James Campbell National Wildlife Refuge

is open from October 20, 2007 to February 17, 2008. Public access is only available via scheduled guided tours. Tours last approximately one hour; start times are as follows:

First two Saturdays of each month: 9:00 a.m.

Remaining Saturdays: 3:30 p.m.

Every Thursday: 4:00 p.m.

To reserve a space on a tour, call Pam Gibson at 637-6330 ext. 0. The refuge is closed during the remainder of the year for the protection of endangered birds during nesting season.

Excerpts from the Journal of George C. Munro December 1890 to August 1891

Contributed by Ron Walker

On December 13, 1890, George Campbell Munro arrived in Honolulu after a voyage aboard the steamship *Mariposa* which left Auckland, New Zealand on the 1st of December. He was to assist ornithologist, Henry C. Palmer in collecting birds in Hawai'i under the sponsorship of Lord Walter Rothschild for the museum collection in Tring, England. His small handwritten journal of 314 pages chronicling his ornithological and cultural experiences in Hawai'i was never published. Through the courtesy of the family of Richard C. Towill, the Hawaii Audubon Society was allowed to copy the journal and present it here in a series of excerpts in the *'Elepaio*. We acknowledge the assistance of Marti Steele, Steven Bunting, and Charlotte Walker in transcribing and editing the journal and Dr. Robert Pyle for coordinating the project with the Bishop Museum. Copies of the original journal and typed transcriptions are available at the Bishop Museum archives and the Hawaii Audubon Society office.

From 1935 to 1937, Munro started the first comprehensive survey of the birds of Hawai'i and in 1939 he helped found the "Honolulu Audubon Society" which eventually became the Hawaii Audubon Society.

Our series continues with this excerpt from the "Journal kept by George C. Munro while studying and collecting natural history specimens in the Sandwich Islands."

Part 6 (Kaua'i)

Monday, March 2nd, 1891

"A cold showery day, we went out in our oilskins but came home early in the afternoon it was disagreeable work hunting, it did not look much like a tropical climate to see us shivering with cold with our oilskins buttoned up to our ears; the thermometer stood about dark at 43 degrees the lowest we have yet experienced it. We only got two specimens an Akialoa & a Nukupuu both male, the Nukupuu when killed emits a peculiar odor, which I have noticed in other of the bush birds. We saw Akikiki & Auholowai but did not shoot any as we are saving our shot for Akialoa & Nukupuu; the two former we noticed lower down than usual on fine days, wet days most birds are lower, the Akikiki we saw almost on the ground. There is a small tree in the under wood whose smaller branches are covered with clusters of buds and flowers, & some with a berry a curious divided thing, the Iiwi & Amakihi are frequently to be seen among these flowers, but whether it is honey or insects that they get I am not sure. ..."

Tuesday, March 3rd, 1891

"Thermometer stood at 42 degrees shortly after daylight & after we had had breakfast it looked so dismally wet & cold that P. decided to take a walk down in the direction of the horses, about a mile further down, so donning our over coats we set out, when we got down there we found only one, the other one hired off Mr. Brandt was missing in searching for it on the steep hillsides, we came on a flock of goats & killed one, but not till it had taken us nearly down to the creek at the

bottom of an almost perpendicular hillside, we disemboweled it & I carried the most of the carcass to the cottage a distance of about 2 miles ascending fully 3,000 feet in that distance; the steep hillsides & cliffs between us & the Waimea Valley are covered with goats, they seem to be about every cliff, a flock passed close to us while opening the dead one, they are brown and black, sometimes marked with white, some being all white, I saw the fresh tracks of some wild dogs, I believe there are plenty where there are goats, they have gone wild from the natives. ...

"We went out for a couple of hours in the afternoon but birds were scarce at least those we wanted we saw only two Auholowai & one Akikiki shot an Ou, Auholowai & Akialoa, this time neither of the two latter were with Akikiki, I noticed a tree near the house almost the same as the N.Z Karaka, its leaf is more than double the size of the one I mentioned yesterday. There are several of the Kanakas stone tools in this house one is a poi pounder about 3 or four pounds weight of rough scoria rock it is well finished, it is about 7 inches long, another adze will be about 9 in. long it is rough except the face of solid stone, the handle at the upper end micah bent back; there a some small one but more or less broken."

Thursday, March 5th, 1891

"Hunted this forenoon on the same ridge as last night & got two more young Apapane about the same spot as the one of yesterday, one was fluttering from flower to flower the other was following an old bird about, they were larger & further advanced than the one of yesterday but evidently belonged to the same nest, their stomachs when opened were full of insect remains & caterpillars. We saw an Ou feeding on the leaves of the tree that the cattle bark, the leaves are on stalks ranged along a main leaf stalk & he was pulling off the smaller ones & flying with it in his bill to a suitable branch he would hold it under his foot while he bit small pieces off till he had nearly finished it, this tree seems to be very sappy bumps of yellow sap exuded out when the cattle bite it, they dig right into the wood so that another feeding ground of the Ou is likely to be exterminated. ...

"We put in the afternoon skinning doing 3 Akialoa, 3 Auholowai, 3 young Apapane, 1 young Iiwi, & 1 Oo. I set up for Gay and Robinson, there was nothing unusual in their stomachs all having insects and larvae, one of the Akikiki, a female had her ovaries much enlarged, the specimens we got at the last camp had white right around the eye. I know most of them had & I don't remember noticing any that had not; the Ouholowai seems to me to be more numerous than the latter going in small flocks of about 1/2 a dozen or more generally in company with the Akikiki, their chirp is nearly as long drawn as the Anauanii but they are easily detected from them on sight by their larger heads, thicker bills & larger & divided tails, we have got a few with the yellow spot on the head. ..."

2008 Federal Junior Duck Stamp Contest

Sponsored by the U.S. Fish and Wildlife Service



Students throughout Hawai'i are encouraged to participate in this year's Junior Duck Stamp Contest. The program integrates art and science in order to promote awareness of wetlands habitat and waterfowl conservation for students in kindergarten through high school.

Entries are welcomed from home-schooled students and art classes as well as schools. All entries must be postmarked no later than March 15, 2008, and sent to the U.S. Fish and Wildlife Service, Pacific Islands Office, Room 5-311, Honolulu, HI 96813. Hawaiian species that are permitted for the contest are the nene (*Branta sandvicensis*), koloa (*Anas wyvilliana*), and Laysan duck (*Anas laysanensis*). A brochure detailing the contest rules is available by contacting State Coordinator Sandra Hall at (808) 792-9530 or Sandra_hall@fws.gov. Information is also available at www.fws.gov/pacificislands (see "FJDS").

Humpback Whale

Sanctuary Ocean Count 2008

Saturdays, February 23, March 29 8:00 a.m. - 12:15 p.m.

This annual event places volunteers at various shore locations in order to count the number of humpback whales and record whale behaviors seen. Visit <http://hawaiihumpbackwhale.noaa.gov> for more information or call:

BIG ISLAND: 1-888-55-WHALE x 253

KAUAI: (808) 246-2860 O'AHU: (808) 397-2651 x 253

The Great Whale Count will take place on Maui on Saturday, February 23, 2008. Visit www.pacificwhale.org or call 1-800-942-5311 for more information.

HAS Program Meetings

Program Meetings are sponsored by HAS and the UH Biology Department, and are held at UH Mānoa's St. John lab building (Botany Building), in room 011 in the ground floor auditorium. The address is 3190 Maile Way. Attendance is free and open to the public.

February 18, Monday, 6:30 – 8:30 p.m.

Ka'ena Point Ecosystem Restoration Project, with Pauline Sato
Pauline Sato, O'ahu Program Director for The Nature Conservancy of Hawai'i will speak about the natural history of Ka'ena Point on O'ahu's West side, and will discuss the proposed Ka'ena Point Ecosystem Restoration Project, including plans to build a predator proof fence in order to protect nesting seabird colonies there.

Membership in Hawaii Audubon Society 2008

Regular Member:	\$ 25.00	Foreign Membership (Airmail)	
Student Member:	\$ 15.00	Mexico.....	\$ 26.00
Supporting Member:	\$100.00	Canada.....	\$ 28.00
		All other countries	\$ 33.00

These are annual membership dues, valid January 1 through December 31.

Donations are tax deductible and gratefully accepted.

Name _____

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New Membership Renewal

Please make checks payable to Hawaii Audubon Society and mail to us at 850 Richards St., #505, Honolulu, HI 96813.

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