Delicate Nests: Breeding the Purple-collared Woodstar

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Many bird enthusiasts have long been fascinated by the diminutive and pugnacious hummingbird. Most people associate these miracles of the bird world with the lush, equatorial tropics or springtime blossoms in city parks. There are a number of hummingbirds, however, that occupy a different ecological niche: high elevations of the Andean mountains in Ecuador and Peru.

As a consequence of their geographical location, little is known of the natural history and breeding biology of these mountain hummingbirds. One representative species of this group is the Purple-collared Woodstar *Myrtis fanny.* It is known that woodstars forage for the nectar and insects found in and around the montane blooms. They also migrate between lower and higher altitudes to find available nectar in the ever-changing environment of their mountainous habitat.

The Purple-collared Woodstar is one of the smallest hummingbirds, weighing 2.5 to 3 grams and measuring about two inches in length. Males and females are largely the same in coloration except during breeding, when the male develops turquoise coloration at the throat with a purplish band at the base, the "collar" that gives these birds their common name.

In 1991, the Zoological Society acquired two pairs of Purple-collared Woodstars, which were introduced to the Zoo's Hummingbird Aviary. Because so little is known of this species in the wild, we hoped to observe and record the breeding behavior of our birds. One of the first things we learned was their courtship behaviors. Each hummingbird species seems to have unique courtship rituals. We observed the male Purple-collared Woodstar performing two kinds of courtship flights. One is reminiscent of a helicopter: the male hovers directly over the perching female at a height of about three feet, then lowers himself in the same hovering fashion until he is only inches above her. In the other, the male hovers directly facing the perched female, only inches from her beak, and sways and rocks back and forth. This last behavior has also been observed toward other hummingbirds of both sexes, suggesting it may have an aggressive or territorial meaning at other times.

We also observed that Purple-collared Woodstars exhibit the typical breeding patterns of other hummingbirds: the male only participates in courtship and copulation, and the female is solely responsible for all other duties, including nest building. Our birds made several nesting attempts. We provided abundant supplies of nesting material, such as cotton, shed hair from horses, dogs, and hoofstock in the collection, seed pods from the silk floss plant, and spiderwebs that we twirled onto sticks. We placed these randomly throughout the aviary.

The females seemed to routinely build nests near high traffic areas in the aviary. The nests were about 1 ½ inches in diameter, 1 inch tall, and ½ inch deep, and they were made primarily of cotton, with horsehair and tiny threads woven in, bound together with spiderwebs. Tiny pieces of feathers, moss, and leaves were the finishing touches, camouflaging the exterior surface of the nest. The nests were built on the tines of bamboo palms (*chamaedorea* sp.), the runners of spider plants (*chlorophytum* sp.), and in a tababouia tree. The female spent six to 10 days constructing the nest, then sat on the nest for a period of up to three days before laying two eggs, each less than one-half inch long.

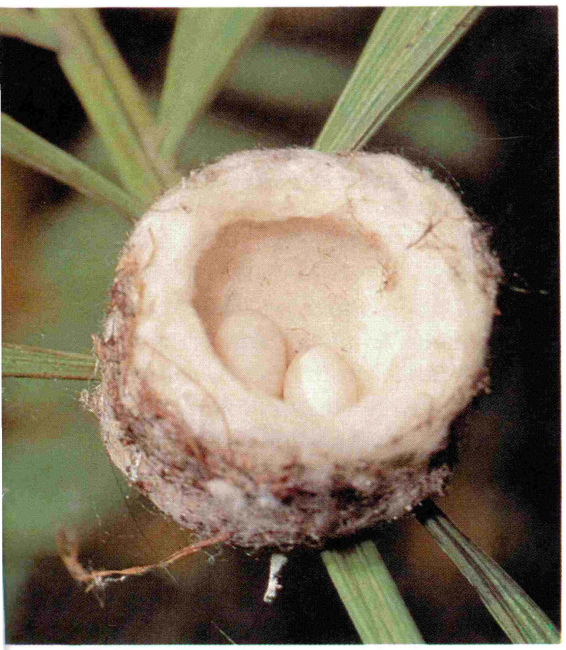
We discovered that the male continued his courtship during the nest-building and egg-laying process. The females also seemed to nest whether the males displayed breeding plumage or not. It may be that fertilization of the eggs is dependent upon the males being in full breeding plumage--all eggs laid while the males were not in full coloration turned out to be infertile. We had several infertile clutches in the aviary.

But in June 1993, a female was observed building a nest in a bamboo palm, and a male in full coloration was seen "helicoptering" over her most of the day. The female chased him off repeatedly to resume her nest building. Eight days later, she was sitting on the nest, although it did not look complete. She bound it with spiderwebs and camouflaged it the next day, while the male continued to display. Two days later, the first egg was observed, and the female remained sitting on the nest all day.

Another egg was also laid, presumably one or two days later. In this species, incubation appears to begin after both eggs are laid and, for our birds, lasts 19 days.

That 19th day turned out to be a day of surprises. Upon entering the aviary in the morning, we discovered that the nest had been disrupted--the palm frond the nest was attached to had broken, and the nest was empty! We searched the ground for the eggs, but instead we found a newly hatched chick cradled in a leaf directly below the nest. We never found the second chick or egg. The surviving chick was cold but alive, so we placed it temporarily in a warm brooder box.

The nest itself turned out to be intact, so we decided to try and remedy the situation. We lifted the palm frond with the nest back into position and secured it with duct tape. We then replaced the chick, with the female hummingbird hovering about throughout the procedure. We weren't sure if she would accept the chick once it was returned to the nest. But once we settled the tiny, naked chick into the nest, she immediately returned and began first to brood then to feed her offspring, as if there had been no disruption. She fed it exclusively nectar



Purple-collared Woodstar nest and eggs.

Mother incubating eggs in subsequent nest.

that first day, but the primary food thereafter appeared to be fruit flies.

As it turned out, the problems for this tiny hummingbird weren't over yet. We had to secure the unstable nest and palm frond two more times, the last time by actually sewing the nest to the frond with a needle and some fishing line. The female remained unconcerned--she even fed the chick in the nest while we were sewing. Then, when the chick was 14 days old, we found it out of the nest, cold and wet, in the center of a bromeliad plant. We warmed it up in a brooder box, and this time removed the nest altogether. We reinforced the nest with stronger materials and placed it on the original palm frond, but in a much more stable position. We returned the chick to the new nest, and it was again accepted and fed immediately by the mother.

The chick was becoming increasingly more active, showing signs of fledging at 21 days of age by fluttering its wings while still sitting in the nest. It also began preening. Then, at 26 days old, it was found out of the nest again, on the ground. Because of our ongoing concern for this little bird, we decided to remove it to the Zoo's Avian Propagation Center. There, we handfed it until it learned to eat on its own. On August 24, at 32 days of age, the chick was fully fledged and independent. Two months later, it began to develop the colorful throat patch that told us our intrepid survivor was a male.

But yet another surprise awaited us. After we removed the chick to the Avian Propagation Center, the same female began nest building again. She built a second nest in the same bamboo palm frond, but with new materials and of more sound construction than the first. On September 3, two eggs were confirmed, which both hatched on September 17. The two chicks developed normally, with no precarious incidents.

Then at 26 days of age, the two chicks took their first flights. They were quite clumsy, demonstrating poor coordination. Unfortunately, one of the chicks disappeared shortly after these initial flights and was never found. However, by the next day, the remaining chick was flying with coordination and direction. The mother continued to feed the chick fruit flies three to four times per hour for about another week, until it began eating on its own. Within another week, this chick was independent—the second successful rearing of this species in the collection.

We learned several lessons from that 1993 breeding season. One is that these birds do not seem to require large territories in order to breed successfully. The male Purple-collared Woodstars can coexist peacefully with the breeding female and the young without disrupting the breeding cycle. We also learned that the female woodstars are attentive and persistent mothers, regardless of interference or physical manipulation by humans. With these points in mind, hopefully the future will bring more opportunities to further refine captive management strategies for nesting hummingbird species.

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Bibliography

Dunning, John S. (1982). South American Land Birds. A photographic aid to identification. Newton Square, PA, Harrowood Books.

Gould, John. (1990). John Gould's Hummingbirds. Secaucus, NJ, Wellfleet Press.

Greenwalt, Crawford H. (1990). Hummingbirds. New York, NY, Dover Publications, Inc.

Product List

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Photos courtesy of the San Diego Zoo.

Mother Woodstar feeding chick in reinforced nest.