

Conservation Status and Recovery of *Amazona imperialis* and
Amazona arausiaca on the Island of Dominica

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ABSTRACT:

Many endemic island species, like the Imperial (*Amazona imperialis*) and Red-necked (*Amazona arausiaca*) Amazons of Dominica, are at a greater risk of extinction. When faced with natural disasters or the inevitable effects of man on the environment, island species do not possess an escape route, resulting in an irreversible decline of the species and surrounding ecosystem. With both parrot species already considered threatened with extinction, the future of Dominica's pride remains uncertain. Extensive quantitative research and parrot monitoring programs are essential to form a complete understanding of natural parrot behavior. Through the collection and analysis of data directly from the field, we can begin to understand these rare, isolated species. The information gathered from these observations helps to quantify the life history of the parrots and is essential to furthering conservation efforts.

INTRODUCTION:

The Commonwealth of Dominica, commonly referred to as the Nature Island, is home to two extant, endemic Amazon parrots, the Imperial or Sisserou Parrot (*Amazona imperialis*) and the Red-necked or Jaco Parrot (*Amazona arausiaca*). The Sisserou, the largest Amazon, grows to be about 45 cm, with a deep purple head, neck, and chest and a dark green back (Juniper 1998). Their dark plumage easily blends into the surrounding foliage, making them extremely difficult to locate high in the canopy. The Jaco usually grows to about 40cm long and is characterized by bright, iridescent green plumage with a distinct red patch on the throat or top of the chest (Juniper 1998). Both parrots are found in the area encompassing Morne Diablotin National Park, ranging in various elevations across 8,400 acres of virgin rainforest. The parrots are extremely important to the island, with the Imperial representing Dominica's national bird. They can also

be considered flagship species, or visible symbols of conservation and biodiversity to the local people (Butler, 1992). After the major hurricanes in 1979 and 1980, both species' populations were decimated, with around 60 Sisserous and 250 Jacos left in the wild (Butler, 1992). The populations continued to decline due to a substantial history of hunting the birds for food, deforestation of parrot habitat for agricultural production, the live bird trade, and other cataclysmic natural disasters. With damage to nest sites and reduction of food supplies, the parrots were forced to inhabit only a tiny region of the island. In recent years, large scale conservation programs appealing to national pride have utilized mass education in an effort to promote awareness of the plight of the parrots. In addition, various organizations have united to gain more knowledge about the rare, elusive parrots. The objective of this article is to report on the recovery status of both parrot species and the present conservation efforts, with a discussion of current threats and proposed action.



Figure 1: Imperial (left) and Red-necked (right) parrots

METHODS AND MATERIALS:

This article is based on information and data gathered from literature review, correspondence with Dominica's Forestry and Wildlife Division (FWD), and personal observations and experience in the field. On June 3, 2010, I was privileged to accompany two forestry officers, Randolph "Ronnie" Winston and Bertrand "Birdy" Jno Baptiste, into the rainforests of Morne Diablotin National Park. We visited three previously located Imperial nest sites where we observed the parental behavior and looked for signs of fledglings. The first nest site, referred to as Diablotin Trail Site, was reached by trekking part way up the Morne Diablotin trail and veering off to the left. Small red flags tied to trees about every thirty yards marked the path and served as the only guide to the nests. The second nest site, called the Middle Nest Site, could only be found by continuing westward through the forest and following the red markers. The third nest site, called the Nature Trail Site, was located near a portion of the Syndicate Trail. On June 10, 2010, I accompanied Ronnie Winston, Birdy Jno Baptiste, and Matthew Maximea to the field once more. Ronnie and I visited the Nature Trail Site, while Birdy and Matthew observed the Middle Nest Site. The Diablotin Trail Site was not visited on this day because the chick at this nest fledged a few days before. On each day and at each nest site, we recorded the site name, date, weather, the names of the people at the site, the time arrived and departed, and the behavior of the birds along with the time of each sighting. On June 3rd, if no birds were seen at a nest site, we still remained at the site for at least a half hour. At nest sites with bird activity, we watched and documented all behavior until the birds remained in the nest cavity for around an hour. On June 10th, we divided the nest sites and observed each site for seven hours due to the fact that the chicks were fledging. Binoculars were used to locate the birds in the canopy, and field notebooks were used to write down all pertinent information.

RESULTS:

MONITORING AND REPRODUCTIVE BEHAVIOR

June 3, 2010

At the Diablotin Nest Site, a fledgling had been confirmed, but zero Imperials were seen that day. The cavity was located high in a Gommier tree (*Dacryodes excelsa*), which is the most common nesting tree of the Sisserous. After at least half an hour of inactivity, we left the first site and hiked to the second sight. At the Middle Nest Site, we arrived at 9:10am and saw an Imperial sitting on a branch near the opening of the nest cavity. We could not decide whether the female was in the nest, out of the nest foraging, or if the bird outside of the nest was in fact the female. Due to the fact that Imperials are not sexually dimorphic, we were compelled to determine the sex solely on size difference and prior knowledge of parental behavior. Males usually have a flatter head and tend to weigh more than females. One identifying physical feature of a female is the presence of ruffled or disheveled chest feathers due to incubating an egg or warming a fledgling. Around 9:55am, the other parent flew back to the nest, and we determined this newcomer to be the female and the other the male. At 10:00am, both the male and female Sisserou went in the nest together, most likely to feed the chick. For the large, nearly adult-sized chick and both parents to be in the nest means that the cavity is very large. Usually Imperials nest in cavities of Gommier or Chataignier trees (*Sloanea caribea*) that have been created from branches breaking off during a strong storm. The one benefit of hurricanes to the Imperials is the creation of nest sites. The nests must be high up in the trees, camouflaged, and protected from wind and rain. The Sisserous begin looking for nests around December, begin foraging and fattening up in February, and start breeding in the spring. Incubation occurs for 26-28 days, and

50 to 60 days for fledging. Imperials do not breed every year, and they usually have a clutch size of one egg. At one point, we saw an aggressive display by both parents toward a Broad-Winged Hawk (*Buteo platypterus*). The hawk flew too closely to the nest, so the parents chased it away with loud, angry screeches. At the Nature Trail Site, we arrived to find the female resting outside of the cavity, but around 10:55am the female ventured into the cavity. We deduced that the fledgling was large at this site because the mother was feeding mostly from the entrance of the cavity. Around 11:15am, the female flew out of the cavity, but returned 20 minutes later with no sign of the male. We waiting for almost two hours for the male, but we never saw a sign of him before we had to leave. We ended our rounds at 2:00pm.



Figure 2: Diablotin Trail Site



Figure 3: Middle Nest Site, male Imperial outside of cavity

June 10, 2010

Ronnie and I arrived at the Nature Trail Site at 7:30am, which is the perfect time for fledging. The chicks usually fledge from 6 to 9 in the morning, on clear days with little chance of

rain. According to Ronnie, the Forestry division has never witnessed a chick fledge in the afternoon. At this point, the chicks are almost the same size as the adult, weighing about $\frac{3}{4}$ kilogram. Fledglings can be identified by their mostly black iris, compared to an adult's bright orange eyes. At 8:00am, the fledgling stuck its head out of the cavity then retreated. Five minutes later the female arrived and fed the fledgling thirteen times from the edge of the cavity. After feeding, the female climbed up a nearby branch to preen herself, while calling lightly to the chick. The female is aware that the rainy season is beginning, so she must have her chick out of the nest as soon as possible. Most Imperials withhold food from the chick in order to entice it outside the nest, accompanied by encouraging calls. At 8:25am the female left to forage, returned 20 minutes later, but remained outside of the nest in an attempt to lure her chick out. Soon, the female left again to return two hours later with the male. The female fed the chick five times, and then the male fed it six times. Both parents sat outside the cavity after feeding and called to the chick. At one point, Ronnie thought he saw another head in the nest when the parents were feeding. If there were two chicks in the nest, this would be extremely rare, and one chick would most likely be more developed than the other. In 2008, an Imperial nest had two chicks, which both fledged successfully. In 2009, another Imperial hatched a clutch size of two eggs, but one chick fell from the nest and died. While it is possible for Imperial parents to raise two chicks to adulthood, it is not probable. Around 11:50am, the chick came out and sat on the edge of the cavity but retreated back inside when it began raining. Even though we had already determined that the chick would not fledge today due to the bad weather, we continued to observe the parrots until two o'clock. The chick was expected to fledge over the weekend, so the Parrot Research Team planned to go out and observe for the next three days.

At the Middle Nest Site, Birdy and Matthew reported that the chick poked its head outside of the cavity multiple times but did not come all the way outside of the nest. Numerous begging calls were heard from the chick, and it is expected to fledge within a week. Even when the chick fledges, the fledgling will still produce begging calls to the parents until they can find food for themselves. Both parents are responsible for feeding the chick, and the fledgling will usually stay with the parents for a year, depending on them almost completely.

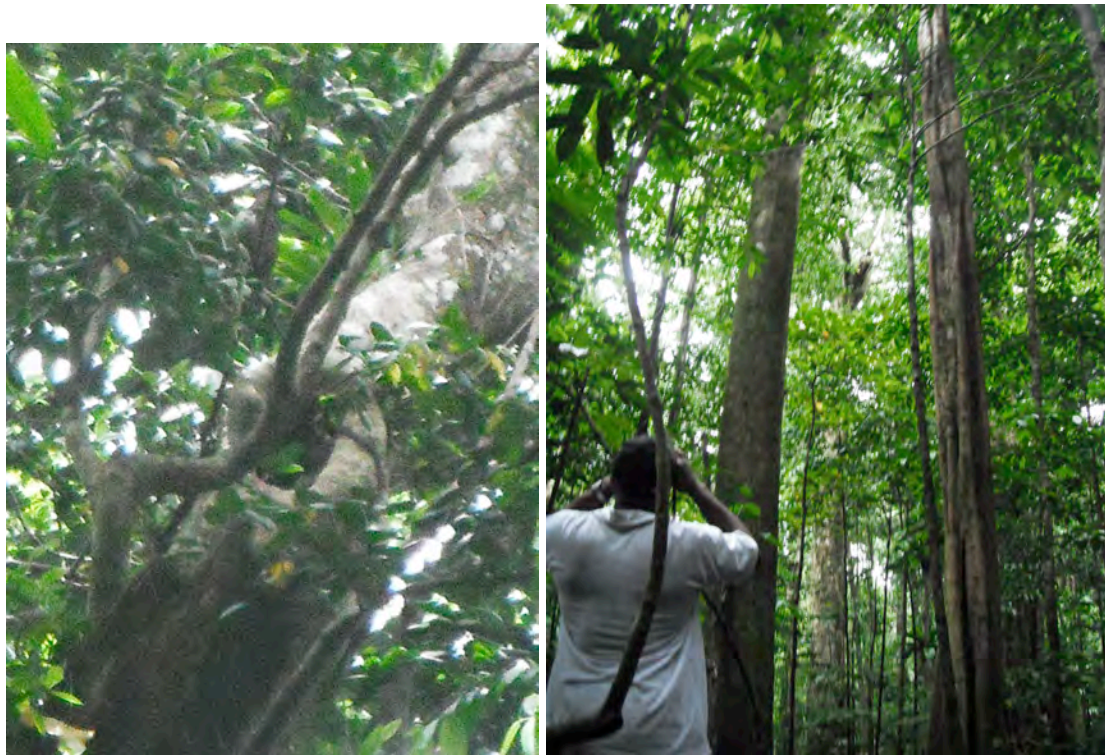


Figure 3: On left-Nature Trail Site, female above cavity, fledgling peering out of cavity; On right-Showing distance the observations were taken from the nest cavity

THE PARROTS' STATUS

Presently, both species' populations are recovering. The Jaco population is growing at a faster rate than the Sisserou due to the difference in reproduction potential. While the Sisserou

has one chick almost every other year, the Jaco breeds every year and has a two egg clutch size (Reillo, McGovern, Durand, Winston, Maximea, 2000). In 2005, a population survey was conducted that estimated the Sisserou population to be around 150-250 individuals, and the Jaco population was around 800-1000 birds (Randolph Winston, pers. comm.). The population has not been surveyed since then, but many biologists believe the numbers to be around 350 Imperials and over 1000 Red-necks (Reillo 2000). Besides large populations recovering in the Morne Diablotin region, both species have reestablished southern populations around Morne Trois Pitons National Park (Reillo 2001). The Forestry and Wildlife Division has acquired a large amount of data on the Jacos in recent years, hence why they currently only monitor Sisserou nests. Population dynamics and distribution of the Jacos have been frequently studied in the past ten years, and even intra-cavity video footage was captured of Jaco reproduction. Information regarding Imperial distribution and behavior has only recently been available due to past low population numbers and the shy, elusive nature of the parrot. The FWD has recently devised a research program focusing on a better understanding of the distribution, abundance, demographics, and reproduction of both parrots (The Commonwealth of Dominica, 2005). Quantitative analysis of bi-parental care through direct field observations is the current method of Imperial research. Nest cavities of the Imperial were first discovered through following distinct vocalizations or the birds in flight, along with searching for adequate cavities. GPS was used to plot the exact coordinates of each cavity, and then the sites were mapped using GIS. The objective of active nest monitoring is to study the reproductive process and parental care of the Sisserous, and it is essential to witness the chicks fledge and confirm their flight. If a chick falls from the nest, the FWD must relocate the chick to a nearby tree and watch whether it is able to

fly. If the chick is unable to fly, the FWD must take it to the Parrot Research and Conservation Center in order to hand raise it.

CURRENT EDUCATION PROGRAMS

Though Dominica's Forestry and Wildlife Division has continuously worked with Rare Species Conservatory Foundation, their programs were removed from the area last year (FWD, pers. comm.). Most education programs that existed under Rare were also lost, and now the only current education programs that exist are not specific to Imperial recovery. Within the Forestry and Wildlife Division, the officers divide up the island into four regions, and they visit the local schools in each section. They mostly promote basic conservation and the wise use of natural resources. An education program more specific to parrot conservation is the Caribbean Endemic Bird Festival. Occurring from the 22nd of April through the 22nd of May, the festival is an initiative of the Society for the Conservation and Study of Caribbean Birds, supported by Birdlife International. It is a month long celebration that increases awareness and respect of Caribbean birds, while explaining the current threats to conservation. Also, during forestry week in June, the officers visit schools in order to illustrate what a forestry job entails, with the last one occurring in September of 2008. Funding for large scale conservation education is the current problem facing the Forestry and Wildlife Division, causing most of the past programs to cease to exist. It is also important to point out that most Lesser Antillean island conservation focuses on habitat protection and environmental education, utilizing the limited funding available. Without access to bountiful resources, more practical, cost-efficient and labor based methods of conservation must be utilized. In comparison, Puerto Rico engages in costly intensive management programs for the Puerto-Rican Amazon (*Amazona vittata*), with access to resources from the United States (Christian, *et. al.* 1996). The differences in available funds and resources

clearly influence the structure of various parrot conservation programs. If Dominica does not find an outside source for funding once more, the degree to which the present conservation programs can grow and expand will be greatly restricted.

DISCUSSION AND CONCLUSION:

HABITAT PROTECTION AND LAW ENFORCEMENT

On January 21, 2000, Morne Diablotin National Park was established, encompassing the pristine virgin rainforest essential for Sisserou and Jaco nesting. With a large effort from the Rare Species Conservatory Foundation, they raised enough money to buy a small portion of privately owned land that had been preventing the Morne Diablotin and Northern Forest Reserve from gaining national park status. The creation of Morne Diablotin National Park was a direct result of the success of the Parrot Research and Conservation program (The Commonwealth of Dominica, 2005). Increasing awareness of the parrots' plight allowed for protection of critical habitat from logging and agricultural encroachment. In addition to the formation of the national park, the Imperial and Red-neck are both better protected by Dominican law. Presently, the penalty for poaching of an endangered parrot is a US\$2,000 fine and 3 years imprisonment. I am under the impression that most traffickers on the black market tend to receive a fairly large profit for a prized Amazon egg, enough so that a US\$2000 fine seems small in comparison. The penalty must be raised in order to successfully deter all nest snatchers. The most recent persecution of a poacher was around four years ago, where a person was attempting to capture Imperial eggs for sale overseas. Though the laws are enforced, poachers can easily succeed in stealing eggs if they possess the money and resources to scale the huge nest trees. There is not

enough time or manpower from the FWD to actively patrol the forest for poachers. Luckily, poaching and nest stealing for the live bird trade is no longer a prevalent problem.

CAPTIVE BREEDING SUCCESSES AND LIMITATIONS

At the Parrot Conservation and Research Center, a pair of Imperials and six Jacos are housed in two aviaries. Four Jacos are placed in a facility for public viewing in the Botanical Gardens. The Imperial pair and one Jaco pair are housed in a private, breeding aviary that is off limits to the public. This facility serves as the basis for a captive breeding program and maintains the species in the event of extinction. Most of the Jacos in captivity were brought in by people who found them in the forest, while one Imperial was brought into the research center by a farmer (FWD, pers. comm.). In 2002, a female chick fell out of the nest cavity while it was raining, and the FWD along with Paul Reillo from Rare Species Conservatory Foundation took the chick to the aviary to be hand-raised (Reillo 2000). This female became the mother of the first captive-bred Imperial which was born at the beginning of May 2010 (Bertrand Jno Baptiste, pers. comm.). Though it was successfully bred, the chick was rejected by the parents and became ill. The Imperial was sent to a veterinary facility in West Palm Beach, Florida, where it successfully regained its health. Considering the fact that this was the first captive breeding success of the Imperial, the limitations are evident. Even those aviculturists with countless years of experience find difficulties in breeding Amazons, especially since hand rearing of hatchlings has rarely been attempted let alone accomplished (Derrickson, 1992). Another factor to consider is the risk of a breeding facility being demolished by a hurricane, suggesting that captive parrot projects should be located elsewhere (Low, 1984).

CURRENT THREATS AND SUGGESTIONS FOR THE FUTURE

Though both parrot populations are on the rise, there are still numerous threats to both species. With almost their entire habitat nationally protected, the parrots seem safe from human encroachment for now. Only the cultivation of illegal substances or the illegal clearing of land inside the boundaries of the reserves poses a threat to the parrots' ecosystem (The Commonwealth of Dominica, 2005). Land inhabited outside of the protected parks faces serious human disturbance in the form of noise and city pollution, along with the shrinking of overall habitat. There has been some discussion on interspecies competition with the Jacos, but no evidence suggests such a theory (FWD, pers. comm.). Also, field observations suggest that the parrots seem to face little competition with other cavity nesters like the thrashers (*Margarops fuscatus* and *M. fuscus*) and can even coexist in separate cavities on the same tree (Bertrand Jno Baptiste, pers. comm.). The largest current threat to both the Sisserou and Jaco is another devastating hurricane like David or Allen that could essentially nullify all conservation efforts and annihilate current population levels. To safeguard both parrot species from extinction, I suggest a comprehensive recovery plan with immediate and long-term goals. I also recommend that the previous large-scale education programs be implemented once more, and that an environmental education team be created to carry out the task. In addition, I would advise a greater penalty for offenses against the protected parrots in order to completely deter nest snatchers. Finally, I would propose a partnering between an aviculture facility outside of Dominica and the Parrot and Conservation and Research Center in order to insure the species survival. With these suggestions and the present successes of Dominica's parrot conservation programs, the outlook for the Sisserou and Jaco seems considerably brighter.

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Figure 4: The Parrot Team, L to R: Matthew Maximea, Ali Minarcik, Ronnie Winston, Birdy Jno Baptiste

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