2004 Translocation of Cahow chicks to Nonsuch Island

"It was the best of times; it was the worst of times"

The 2003-2004 Cahow nesting season certainly represented everything that could go both wrong and right in the field of endangered species management as the season began with a frantic recovery from the effects of hurricane 'Fabian'. This severe category 3 storm struck Bermuda on September 5, 2003, and had a devastating effect on the exposed Cahow nesting islands, completely overwashing three of the islands with 35' waves. The partial collapse and weakening of two of the islands necessitated a frantic and ultimately successful race to repair or replace scores of damaged or destroyed Cahow nest burrows. This had to take place, in mainly rough conditions, during a short 5-week period before the return of the birds for their nesting season, and pointed out the inherent vulnerability of the present breeding sites to storms, erosion and rising sea levels.

All this took place at the same time that three years of preparatory work came to fruition to address this very issue and re-introduce the Cahow to a more suitable habitat where the species will be both safe from hurricanes and erosion and will have enough room to build up a larger population. Nonsuch Island has been under restoration as an example of Bermuda's pre-colonial native plant and animal communities since 1962 thanks largely to the dedication and vision of former conservation officer David Wingate and now closely resembles the habitat that the Cahow was described as nesting in by the early settlers. Because of the size and higher elevation of Nonsuch, one of my main goals upon assuming the post of conservation officer in 2000 was to attempt to establish a new nesting colony of Cahows on the island using translocation techniques already used successfully with several related gadfly Petrel species in Australia and New Zealand. In this technique, chicks are monitored through their development and moved some 14-18 days before fledging to a complex of new burrows at a new colony site. Between 2001 and 2004 data has been collected on Cahow fledgling growth (weight gain/loss, wing chord (length) development, feeding frequency and approximate feed size). In 2003 a translocation site was established on Nonsuch Island down-slope and south-east of the Octagon building. Nine specifically designed plastic nest-boxes and eight cement artificial nest burrows were installed in a forest clearing and along a coastal hillside. 2004 was chosen as the initial trial year when the timing of the transfer of chicks and methodology of the translocation would be fine-tuned and any problems worked out.

Nicholas Carlile, project manager of Threatened Fauna Ecology with the New South Wales Dept. of Environment and Conservation, Australia, had considerable experience with the successful translocation of the endangered Gould's Petrel *Pterodroma leucoptera* from their only breeding site on Cabbage tree Island to a new colony site on Boondelbah Island, off the coast of Port Stephens, NSW. Mr. Carlile first visited Bermuda in 2000 while on a Churchill Scholarship-supported trip to visit endangered petrel recovery programs in the Northern Hemisphere. As a result of this visit, I was able to visit Australia in 2001 to observe the recovery and translocation programs for the Gould's Petrel and gain experience in handling, banding and measurement procedures for Petrels and a variety of other seabirds.

With all preparatory work completed for the Cahow and the translocation site on Nonsuch Island, It was arranged with the help of donations made towards Cahow recovery work for Mr. Carlile to travel to Bermuda and stay at Nonsuch from 8th May to 15th June, 2004, to assist and lend his experience and advice for the trial year of the Cahow Translocation Project. He also provided training in assessment of translocated chicks and feeding techniques to myself and several staff from the Department of Conservation Services. Plumage development was introduced as a means of determining the development of chicks, along with weight and wing-chord (length) growth in the weeks leading to the translocation period. When a chicks wing-chord went above 190mm it was considered ready for translocation after several other factors were assessed.

Between 13th May and 1st June 2004, 14 chicks were translocated from the four breeding islands with 15 chicks remaining in their original nest sites as a control. The translocated chicks were between 68 and 88 days old when moved to Nonsuch Island. Chicks were given a total of 68 feeds with a mean weight of 41 grams (range 22-67) with an average of 5 feeds per chick (range 3-8). The translocated chicks were fed from 14th May until 9th June 2004 with a maximum of 5 birds being fed in any one session.

In each feeding session, the translocated chicks were fed both squid and fresh fish. Squid were human-quality and obtained at local supermarkets. Three species of fish were netted fresh by Chris Flook of BAMZ and provided depending on availability. Initially Anchovies were used, followed by Pilchards (Red-cheeked Sardine) and finally Hog-mouth Fry. The latter were too small to feed individually to the translocated chicks and were stuffed into squid bodies (mantles). All other fish were fed whole to the birds. Feeding of individual chicks was carried out every other day until their wing chord reached 250mm or they had lost all of their natal down and achieved adult plumage.

Once the translocated chicks began to come out of their burrows at night to exercise and explore their surroundings in preparation for eventual departure, they were monitored by the translocation team and volunteers, with a total of 56 hours of night watches carried out. Accurate recording of the activities of exercising chicks was helped by access to ‘night-vision’ equipment, made available by a visiting documentary crew (“The Journey”: producer Deirdre Brennan, a film on the Cahow supported by the Bermuda Audubon Society).

Some amazing behavior by Cahow chicks, never before observed, was recorded during exercising periods. A number of chicks climbed trees or vegetation to either exercise or fledge (depart), with one individual recorded 3 m (10 feet) above the ground in a Casuarina. Two chicks were observed exercising under tree cover during early morning or late afternoon periods. One chick was also recorded using a soil burrow the night before fledging, even carrying out burrowing activity!

All 14 translocated chicks fledged successfully from Nonsuch Island, the first on 27th May and the final chick on 10th June 2004. Translocated chicks varied between 82 and 92 days old when they fledged, with an average weight of 231 grams (range 188-278 grams) and mean wing chord of 250 mm (range 225-259 mm). This compares favorably with

normally fledging chicks between 2002 and 2004, and seems to indicate that the translocation techniques resulted in normally fledging, healthy chicks.

In addition to the deliberately translocated chicks, one other Cahow chick departed from Nonsuch Island during 2004. In early June, normal weighing of non-translocated, 'control' chicks on one of the present nesting rocks revealed that one of these chicks had stopped normal development and was seriously underweight. This was most likely a result of the death or premature abandonment of one of the adults. Since it requires both adults to successfully raise a chick, it became obvious that it would not survive without intervention. Efforts to feed the chick *in situ* at its burrow failed when it left the nest at night and disappeared for the next 4 days, despite intensive searching of the small nesting island. Imagine our surprise when the chick reappeared in its burrow, looking very bedraggled and now at a critically low weight of 146 grams (normal weight at this stage of development being 250-400 grams). Although our mutual feeling was that this chick was probably past saving, I made the decision to move the chick to the rehabilitation facility at BAMZ under the care of head aquarist Jennifer Gray, who has had considerable experience in nursing abandoned and underweight Cahow chicks back to health. Over the next several weeks, she was not only able to nurse this chick, now known as 'Pip-squeak', back to health but was able to bring its weight up to a peak of 435 grams, the second-highest recorded for any chick during 2004! Pip-squeak eventually recovered and developed its beautiful adult plumage, enabling it to be moved to one of the translocation burrows (# R817) on Nonsuch Island on the 7th July. That night, I watched the chick come out of the burrow for a short time, exercise and go back into its proper nest, indicating that it had accepted this as its new home base. The following night, Jennifer carried out the night watch and was rewarded by 'Pip-squeak' emerging, climbing into a Bay-grape tree, exercising and eventually taking off like a helicopter from a concrete nest lid on a neighboring burrow. This chick, like the others had been banded (or ringed) and we will watch with great interest for their eventual return. I would like to thank Jennifer for her dedication in enabling this chick to survive and fledge successfully. Special thanks also go to Mr. Nicholas Carlile and everyone that supported and assisted in this exciting and promising project, including my wife, Leila, who once again assumed her role as a 'Cahow widow', taking care of our children and enabling me to put in the long hours needed for this work.

Jeremy Madeiros
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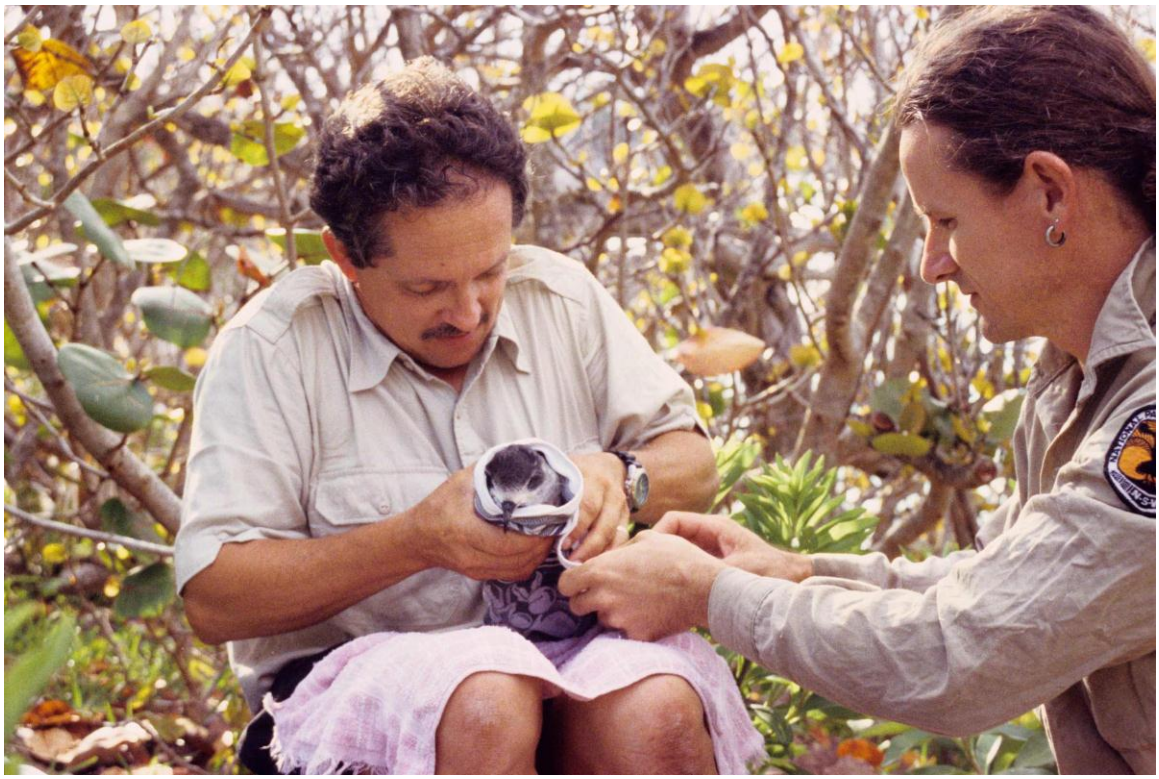
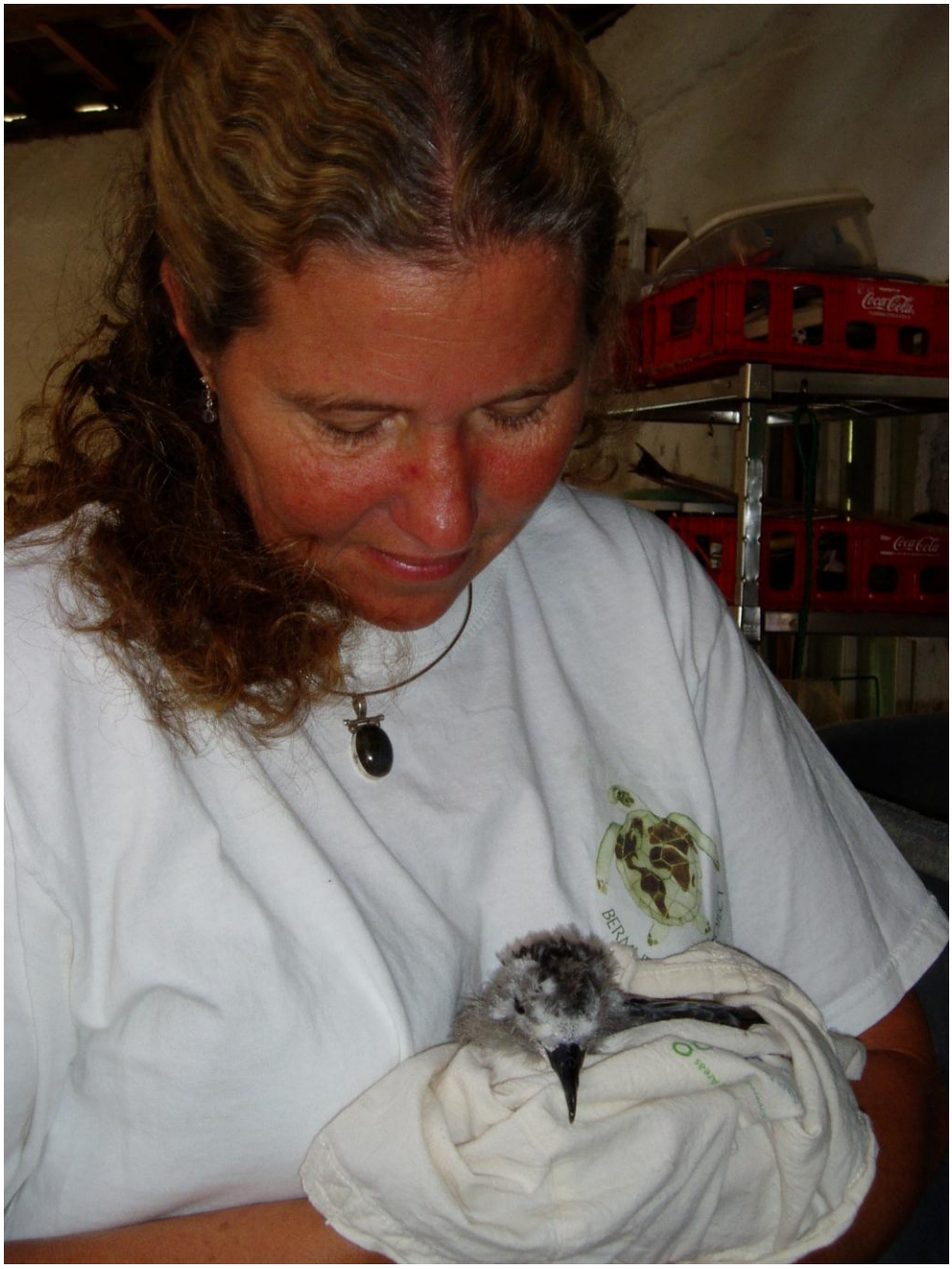


1. Jeremy Madeiros and Nicholas Carlile preparing translocated Cahow chick for feeding
(Photo by Dr. Annie Glasspool)

2. Preparing to return Cahow chick back to translocation burrow after feeding
(Photo by Dr. Annie Glasspool)

3. Translocated Cahow chick removed from burrow for feeding and measurement
(Photo by Dr. Annie Glasspool)

4. Feeding of Pilchards to translocated Cahow chick on Nonsuch Island
(Photo by Dr. Annie Glasspool)



5. Jennifer Gray with Cahow chick 'Pip-squeak'
(Photo by Jeremy Madeiros)