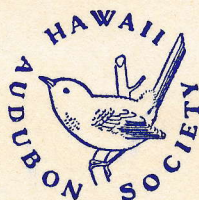


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## A BRIEF HISTORY OF THE NENE RESTORATION PROJECT AT POHAKULOLOA, HAWAII

by

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Territorial Board of Agriculture and Forestry

It is with a feeling of satisfaction and accomplishment that we review the six years since the Nene Restoration Project was established. Since the project was created to help conserve and rear this rare native bird in captivity as part of a plan to save it from extinction, results have been quite successful. Each year young Nene have been reared at the project. Even more important is the fact that without exception all of the young geese raised there have nested and produced young upon reaching breeding age. The potential of the Nene Restoration Project for rearing birds, and the related phases of plans to re-establish them in the wild, have never looked brighter.

The sad plight of the Nene or Hawaiian Goose in the wild was brought to the attention of the world when Charles W. and Elizabeth R. Schwartz published the book entitled, "The Game Birds in Hawaii," in 1949. The book was the result of a comprehensive two year survey concerning game birds in Hawaii, their status, populations, and recommendations for management. It was revealed that the Nene was in grave danger of becoming extinct unless strong efforts were made immediately to save this vanishing species of waterfowl.

The 1949 Territorial Legislature appropriated \$5,000 to begin a Nene Restoration Project. This project was designed by J. Donald Smith, then <sup>the</sup> Game Conservationist with the Board of Agriculture and Forestry, to propagate the birds as intensively as possible in captivity. A later phase of this Nene project was to conduct an ecological survey to determine, if possible, what factors were causing the decline and disappearance of the once numerous Nene. Fortunately, Mr. Herbert C. Shipman of Keaau, Hawaii had long been greatly interested in this native bird and aware of its declining numbers. He had for many years kept a captive flock at his estate in Keaau and in 1949 his flock of eleven, plus one ancient goose in Kona, Hawaii and a lone gander at the Honolulu Zoo were the only captive Nene in existence. Mr. Shipman generously agreed to lend the Board of Agriculture two pairs of Nene to begin the propagating project at Pohakuloa. The first large 100 foot by 50 foot pen was constructed at the Fish and Game Division's Pohakuloa field headquarters located at the 6,500 foot elevation between the volcanoes of Mauna Loa and Mauna Kea on the Island of Hawaii. These first two pairs of Nene were placed in this pen in the fall of 1949.

Unfortunately, one of the female geese became ill a few months after the project began. She was sent to Honolulu to the Territorial Veterinary Pathologist for treatment but died a short while later. Autopsy revealed that a large abscess of long standing in the plural cavity had caused her death. A short while later, a pig hunter captured a wild female Nene on the slopes of Mauna Loa. This Nene was brought to the Pohakuloa project. Early in 1950 the Honolulu Zoo gander was taken to Pohakuloa to become the mate of this wild caught goose.



In December of 1949 the geese of the intact pair lent by Mr. Shipman laid four eggs that were faithfully incubated. One egg was destroyed by the goose on New Year's day. It contained a partially developed embryo that had died about the tenth day of incubation. Two of the remaining eggs hatched early in January, 1950; the third egg appeared to be infertile.

The concern over the fate of the Nene was felt by conservationists throughout the world. The Severn Wildfowl Trust of England sent Mr. John Yealland, then the Curator of the Trust, to Hawaii to assist in the rearing of the first young Nene that had been produced at the Pohakuloa project. Much additional information and advice concerning the care and rearing of Nene was obtained from Mr. Yealland. When he returned to England in the summer of 1950, he took with him two Nene, a gift from Mr. Shipman to the Severn Wildfowl Trust. This would insure breeding stock at widely separated places in the event that some catastrophe wiped out the Hawaiian birds. Early in 1951 word was received from England that both Nene at Severn had laid eggs, and that a gander was urgently needed. Mr. Shipman sent by air the gander from Pohakuloa whose mate had died.

With the departure of this gander to England, the original Nene breeding stock in the project was reduced to a single pair of geese loaned by Mr. Shipman, and a pair composed of the wild caught goose and the Honolulu Zoo gander. Results obtained during subsequent breeding seasons indicated that this Zoo gander was sterile, however, the wild caught goose later hatched young when paired with another gander.

In the fall of 1950 the original pair produced four eggs which were "robbed" from the nest, a method recommended by Mr. Yealland to increase production. When the first clutch is taken, geese generally lay a second. These four eggs were placed in an incubator and developed strong embryos; however, they failed to hatch, dying at about the twenty-eighth day. Incubation period is approximately 30 days. A few weeks later the original pair laid a second clutch that was left to be incubated by the goose. In January, 1951, all five eggs of this clutch hatched; however, one gosling was stepped on by the goose and died. Another was weak and died the second day. The remaining three grew into strong and healthy adults. The wild caught goose, that was mated with the Zoo gander, also laid eggs during the winter of 1950-51, but three clutches totaling twelve eggs all proved infertile.

In the winter of 1951-52 the potential looked quite good. Encouraging was the fact that the first young produced at Pohakuloa were a mated pair and laid eggs this season. Three Nene were reared this season at the project, all of them from the original pair. Eggs were again "robbed" and placed in incubators, but none of these hatched.

During the fall of 1952 arrangements were made to obtain muscovy ducks to be used as foster mothers. The potential looked better than ever with three possible Nene pairs of breeding age. All of the first clutches were removed and placed under foster mothers or in incubators. Of the first clutch laid by the original pair, the only known fertile birds, one egg was placed in an incubator and three under a two-year old Nene goose. The egg in the incubator developed for three weeks and died. One of three eggs under the two-year old Nene hatched and the other two were infertile. The second clutch from the original pair was also "robbed" and placed under a three-year old goose whose eggs were infertile. One of these eggs developed to the hatching point and died, the remaining eggs were infertile. The original pair did not lay a third clutch. The wild caught goose, still mated to the Zoo gander, laid three clutches as she had done the previous year but none were fertile.

In the fall of 1953 the Honolulu Zoo gander that was with the wild caught goose was returned to the Zoo, since in the two nesting seasons together this pair failed to produce fertile eggs. A three-year old gander raised at Pohakuloa was placed with the wild caught goose. Other shifts were made in an attempt to increase the breeding potential. This shifting of birds was successful and young were produced by two of the pairs hatched earlier at Pohakuloa from the original pair. A pair composed of a two-



year old gander and a three-year old goose produced three goslings in January, 1954. A three-year old pair hatched in 1951 produced one gosling. The goose of the original pair failed to lay this season.

In October, 1954, the four-year old pair that produced one young the previous winter was taken to Mr. Shipman's Ainahou ranch where he had constructed special pens. This pair was a replacement to Mr. Shipman for the original pair loaned to the Board in 1949 so that the Nene Restoration Project could be initiated.

In late November of 1954 the pair that had produced three young the season before laid four eggs and began incubation. Two of these eggs hatched on December 28, the other two eggs showed no sign of development.

In the early part of 1955 three eggs were again "robbed" from the original pair and placed under a muscovy duck. Two of these three eggs placed under the muscovy duck hatched on February 18, 1955. This success in utilizing muscovy ducks as foster mothers marked a new potential in production at Pohakuloa. The young Nene with the muscovy duck grew well and were strong and healthy. The muscovy flock was subsequently increased to raise further the production potential. It had been found that Nene would lay a second and even a third clutch.

On January 18, 1955, a new goose was loaned to the project by Mr. Shipman as a mate for one of the project's ganders. This goose, along with the four goslings hatched in the winter of 1954-55, brought the total to 18 Nene at the Pohakuloa project at the end of the rearing season.

The first pair of birds hatched at the project in 1950 were placed in the Honolulu Zoo in April, 1955. By studying the nesting of these birds under warmer conditions at sea level, it was felt that additional information could be gained. This pair nested in early 1956 in a special cage prepared for them in an area where they could not be seen or disturbed by Zoo visitors and on February 5, 1956, they hatched and reared one young from a clutch of two eggs.

During November, 1955, the five-year old goose that had produced three goslings in the 1953-54 season, and two in the 1954-55 season, laid five eggs which were "robbed" and placed under a muscovy duck. The goose started her second clutch on December 6, and by the 14th she had laid 5 eggs and started to incubate them. However, on the 20th an unusual, extremely heavy rain at Pohakuloa flooded her nest and she deserted the eggs. Although these eggs were placed in an incubator and later under a muscovy duck, they failed to hatch. On December 21, two eggs from the first clutch of five eggs laid by this goose, and placed under a muscovy duck, hatched. Two other eggs contained dead embryos about 24 days old, while the remaining egg appeared infertile. The cause of death in the two embryos was thought to be lack of moisture, as the air space was large and the embryos appeared to be desiccated.

The wild caught goose, with the Pohakuloa reared gander that had been placed with her in 1953, laid two eggs early in January, 1956. Candling indicated one was fertile. This egg was placed under a muscovy duck and hatched on February 17.

On January 10, the original goose began a clutch of four eggs, and the eggs were left with her to be incubated. On February 16, three hatched.

Also on January 10, the five-year old goose began her third clutch of eggs. Two of these hatched, while two contained embryos almost fully developed. The fifth appeared infertile. The two goslings from this clutch appeared small and weak and on February 27, one was found dead in the nest, which was still being used as a brooding place.

Remaining eggs laid by other geese at Pohakuloa proved to be infertile as they were laid by immature birds.



Seven goslings were reared out of a total of eight hatched during the winter of 1955-56. This made 23 Nene at the Pohakuloa project at the completion of this nesting season.

With the breeding potential at an all time high, it is planned to have a flock of 25 muscovy ducks as brooders at the project for the next season, so that all potentially fertile eggs can be incubated by muscovy ducks or Nene.

During the years since 1949 continued interest and concern about the fate of the Nene has been expressed throughout the conservation minded world. Several noted authorities in this field offered suggestions and visited the project.

In July, 1955, a flock of wild Nene was reported on the lower slopes of Mauna Kea. Subsequent field trips by Fish and Game biologists revealed a group of 24 Nene that habitually spent the night in a large grassy pasture area there. This discovery was particularly encouraging because very few wild Nene had been sighted during the past six years.

In the meantime arrangements are being made to conduct a study, plans for which were laid in 1949, for an ecological survey by an outstanding waterfowl biologist to determine, if possible, how the Nene may be re-established in the wild.

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We are pleased to bring to our readers the following supplementary article on Lord Rothschild, which was written by his niece, Miriam Rothschild, and which gives an insight into his colorful personality. We are indebted to Dr. Dean Amadon for sending this to us, and also for calling to our attention that the number of birds in the Rothschild collection should have read 280,000, not 28,000, as given in our account.

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Excerpt from "A Collection of Essays and Scientific Papers Brought Together to Celebrate the Ninety-fourth Birthday of Karl Jordan," Trans. Roy. Ent. Soc., London, Vol. 107, Dec. 6, 1955, pp. 2-3.

It is difficult to envisage a queerer state of affairs than that which K.J. found at Tring when he arrived there in 1893. Walter Rothschild was then twenty-four years of age and a most eccentric figure. He was always just about to leave the Rothschild banking house in disgrace, not for any serious misdeed, but because he displayed a quite remarkable lack of business acumen coupled with curious but very extravagant tastes, and -- worst of all -- while pretending to attend the House of Commons actually spent all his time at the Natural History Museum! From the age of seven years he had been an ardent collector, but he also possessed that genuine, rather naive enthusiasm for animals which characterizes relatively few zoologists. He went up to Cambridge accompanied by a large flock of kiwis, and could be seen bowling down Piccadilly behind four lively zebras. He was endowed with a most remarkable, somewhat freakish memory which retained the specific characters of large groups of animals and enabled him to pick out, instantly, any new species without recourse to the relevant literature. His collecting was also a trifle eccentric; he was for instance obsessed by size and felt impelled to collect -- at whatever cost -- the largest sponge, the largest tortoise, the largest ape and the like for his museum. He himself was a large man with an enormous head, standing six feet three and eventually attaining a weight of three hundred pounds. In addition he suffered from a peculiar impediment in his speech together with a certain inability to control his voice, so that he alternately spoke with an embarrassing stammer or in a loud bellow. Although he was essentially gregarious and jolly, with boundless good nature, this physical disability, coupled with the knowledge of his father's constant, bitter disapproval of everything he did or liked, had made him shy and uncouth in society. In a sense he never grew up, remaining all his life the truant, rather irresponsible schoolboy, escaping with his butterfly net and pill boxes into the fields, and in later life secretly buying the largest boa constrictor in the world when his



curators at the Museum were urging the purchase of some less spectacular but more important addition to the collection.\* Yet Lord Rothschild was both so very peculiar and so very kindly, and also so richly endowed with those nameless qualities which combine to make a natural gentleman, that all those who knew him well liked him and found him delightful, and those with whom he came into daily contact grew, as time went on, increasingly fond of him. Everyone was always astonishingly ready to rally round and take responsibility for the latest scrape, whether it entailed coping with cassowaries or chorus girls, a final income tax demand or a hungry iguana. Moreover, working with him was always easy, even if at times it must have appeared to his curators like a partnership with a rogue elephant!

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\* W.R. was also a miraculous collector of books. In his article "In Memory of Lord Rothschild" Dr. Jordan dismisses this subject with a touch of asperity. "The Library of the Museum contains a number of rare old books on travel and natural history of little use for systematic zoology . . ." I fear that at least one student of the flea has spent many an unprofitable but vastly agreeable afternoon in the Museum library marvelling over Moses Harris's original drawings for the Aurelian and similar unique volumes. Dr. Jordan's irritation was, however, understandable; there was never any surplus money available for running the Museum!

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BOOK REVIEW (Reviewed by Unoyo Kojima)

BIRDS OF JAPAN IN NATURAL COLORS (IN JAPANESE TEXT) by Keisuke Kobayashi

Color illustrations and line drawings by Takashi Miyamoto

Publisher: Hōiku sha, Osaka, Japan, 1956

Price: \$6.00 or \$4.50 if more than 10 subscriptions (Orders may be placed with Miss Grenville Hatch)

Although this book is written in Japanese, the colored drawings are so animated that any one interested in birds who has done some field work will be able to identify the birds by comparing the drawings with the live birds.

As long as one is able to identify the family of the bird, he is able to identify quickly the species by looking in the English index which is arranged alphabetically with the plate and the bird numbers. The text gives the bird number in English and the species in Japanese and English (common names as well as the scientific names). The drawings are very well spaced so there's no mistake as to the corresponding birds to the numbers. The sexes are notated by the universal symbols used for sex designations. Since the drawings are very clear, the summer and winter plumages are very easily distinguishable even without reading the Japanese characters labelling the birds.

Twenty-two orders, 59 families, and 425 species of birds of Japan proper are listed, as well as migrants and accidentals seen in the Japan proper of post World War II, which extends from Hokkaido, the extreme north, to Yoron shima of Amami gunto, the extreme south. Birds of former possessions are not included.

Field identification has been made easy by illustrations in natural color, which show sex differences, mature and immature birds, winter and summer plumages. Silhouettes and black and white line drawings have also been used, especially for the flight patterns of hawks, ducks, snipes and plovers. With very few exceptions, the illustrations were drawn and colored by the artist, Takashi Miyamoto, from the specimens collected by the author. A year's work was needed to complete the beautifully colored illustrations. A number of fine photographs of birds, taken by the author, add to the beauty of the volume.

Other features of the book are the pages on the topography of a bird, charts of nests and eggs of birds breeding in Japan, charts and indices of names, English and scientific, as well as Japanese.



In conclusion I cannot over emphasize the wonderful workmanship of the plates. Just looking over the plates will give anyone interested in birds a feeling of harmony of shape and color.

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We extend our thanks to Janet Bell, who has made the index for the volume just concluded. MAHALO NUI, Janet!

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NEWS NOTES:

Department of Zoology  
University of Washington  
Seattle 5, Washington  
May 24, 1956

Dear Friends and members:

..... I have been a visiting lecturer at the University of Washington this year and am now staying on here indefinitely as assistant professor of zoology and curator of zoology of the State Museum.

We shall be very pleased to see any of you that come to Seattle. We have had good visits with Bob and Billie Pyle and they stayed with us a few days when they first got here. Bob and I have had one excellent week-end trip together - to Protection Island near the Straits of Juan de Fuca where Rhinoceros Auklets and Tufted Puffins and other fascinating birds are breeding. Dr. Niko Tinbergen of Oxford, the famous student of gull and other animal behavior, was with us.

The Cooper Ornithological Society meetings here June 15-17 should be very interesting and will include field-trips to see auklets, murrelets and many other birds.

Sincerely,  
/s/ Frank Richardson  
Frank Richardson

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FIELD NOTES:

Field Trip, June 10, 1956

On June 10th, under the leadership of Tom McGuire, we departed from our scheduled trip to Kawailoa, because of changes made in the area by the army, and went to Puu-manawahua, the entrance to which lies just beyond the locked gate at Pa Lehua. This proved an interesting, short, easy walk, through a forested area, leading to an abandoned army camp, from which a magnificent view was seen. The most prominent tree along the way, the black wattle, was in full bloom.

The most striking feature of the trip, bird-wise, was the heavy concentration of Brazilian cardinals, mostly young, in the abandoned pineapple fields a few miles below the gate. Other birds seen were:

Amakihi.....	5
Elepaio.....	4
Leiothrix.....	8
Linnet.....	11
North American	
Cardinal.....	5
Ricebird.....	17
White-eye.....	17



## FIELD NOTES: (Continued)

Field Trip, June 24, 1956

The June 24th trip to Pauoa Flats was marred by drenching rain, which caused the trip to be somewhat shortened. Good birding was reported, despite weather. Leiothrix were, of course, numerous, but rather surprisingly, apapane were fairly common, several amakihi were seen, and others heard, and Japanese tit and Shama thrush were also heard. Few elepaio were also seen.

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## AUGUST ACTIVITIES:

FIELD TRIPS: August 12 - To Kawaiiki trail, under the leadership of Tom McGuire. Come along, and see how you enjoy this new trail. Meet at the Punchbowl Street side of the Library of Hawaii at 8:00 a.m.

August 26 - Around the island to greet the newly arrived shore birds wherever we may find them. Meet at the Punchbowl Street side of the Library of Hawaii at 8:00 a.m.

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## NO MEETING

but on...August 18 - We will go to Popoia. This is an annual event to which  
(Saturday) we all look forward. Bring a picnic supper, and a flashlight, meet at the Library of Hawaii (Punchbowl Street side) at 3:00 p.m., or at the Kaneohe end of Kailua Park at 4:00 p.m. A boatman will take us to the island (charge \$1.00 round trip). We will remain until well after dark to see and hear the shearwaters.

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