The nene or Hawaiian goose (Branta sandvicensis), Hawaiian or koloa duck (Anas wyvilliana), and the Laysan teal (Anas laysanensis) are considered endangered species in the wild. Coincidentally, all three are noted for limited insular or island distribution, a condition which no doubt contributed to their precarious state. Endemic insular flora and fauna are often ultra-specialized and as such, generally react adversely to rapid environmental changes. If these changes are natural and minor and occur slowly, the plants and animals are often able to adapt. On the other hand, if the changes are sudden and of a large magnitude, they adapt changes cannot occur; some species all to frequently disappear altogether. In the past, changes of great magnitude were usually associated with volcanic eruptions, etc.; in some cases, entire islands disappeared, thus eliminating species all to frequently disappear.

In collections, nene are relatively easy to maintain and are only mildly aggressive during the breeding season. Fortunately, captive propagation presents no real challenge. Nesting either in the open or under sparse cover, the clutch consists of 3 to 5 buff-colored eggs. While the female alone incubates for 29 days, the gander guards the nest and this is when they can become aggressive. At Sea World in San Diego, all eggs are removed from the nest after a full clutch is laid in late winter or early spring (January or March). The eggs are incubated in a Petersime at 99.5°F dry bulb, 84°F to 86°F wet bulb. Fertility has not proved to be a problem. Upon hatching, the goslings are placed in a bank brooder for four to six days and fed Purina Startina and fresh ground lettuce, ad lib. Once out of the brooder they are moved to indoor rearing pens. The amount of protein offered is reduced drastically at this time; if not, splayed legs and, later, drooping wings will result. The birds are maintained to fledge on a diet consisting almost entirely of lettuce with small amounts of Startina and meal worms. It is best if they are kept on grass. If large numbers of young are in a single rearing unit, care must be taken to insure that larger, dominant birds do not pick at the

The legs have become stronger along with the beak. Larger, dominant birds do not pick at the
The Hawaiian or koloa duck occupies the low-lying wetlands of the island group. Their former range was apparently all of the islands except Lanai and Kahoolawe but they are now apparently confined to the few remaining wetlands and rivers of Kauai. As is the case with many endangered species, habitat destruction has been extremely detrimental. Like the nene, they probably were never abundant. It is estimated that there are approximately 3,000 individuals existing in the wild. Delacour gives an account of a population census in both 1923 and 1946-47, compiled by Schwartz. Mr. Woodhouse of the Kekaha Sugar Company estimated that the six square mile Mana Marsh of Kauai contained approximately 2,400 birds prior to its drainage in 1923. When Schwartz surveyed the same area in 1946-47, only 30 birds remained. Hunting, without a doubt, helped to further reduce the population.

In appearance they are nondescript and are distinctly smaller than the common mallard. The female being redder than the female mallard which the male hints at the drake mallard in eclipse plumage. In essence, they can best be described as degenerate, insular mallards.

In the wild they are semi-solitary, often observed singularly or in pairs, although there are accounts in the early 1900's of Hawaiian ducks forming flocks. Like their mainland counterparts, they are ground nesters and lay 6 to 12 pale greenish eggs. The female alone incubates for 26 to 29 days. In 1951, the San Diego Zoo and the Wildfowl Trust received birds which had been reared at the Honolulu Zoo and bred them that same year. Many aviculturists and zoos are reluctant to bother with them due to their tendency to hybridize and their overall dull plumage. At Sea World many young have been reared over the years. Hybridization is a definite problem and birds must be watched continuously if maintained in a mixed collection. It is my opinion that this species must be isolated from closely related species to alleviate this problem. As is the case with all waterfowl species at Sea World, eggs are collected and young are reared by hand. The eggs are incubated at 99.5°F dry bulb reading, and 84° to 86°F wet bulb, in a Petersime Model 4 incubator. A bank brooder is used for the first ten days after which they are transferred to indoor/outdoor runs. The ducklings are offered Startina chow and lettuce as well as meal worms.

Laysan Island is located approximately 700 miles northwest of Oahu, Hawaii, and is the ancestral home of the Laysan teal. photos by Frank Todd
See color photo of Nene Geese on back cover.

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This little duck has evolved into what some taxonomists consider a full species. Its total domain consists of merely a single island measuring but 3 x 2 miles. Between the years of 1828 and 1911, no less than nine census attempts were made. Only in 1902 did the population appear to be less than 100 birds. However, in 1912 only seven birds were seen. Figures excerpted from the Atoll Research Bulletin of December 31, 1973 by Ely and Clapp indicates the population has never been stable and was prone to extreme fluctuations. These fluctuations, in many instances, appear to be normal.

1828 — small flocks
1902 — less than 100 birds
1912 — 7
1915 — 13
1916 — 25
1923 — 20
1924 — 2
1930 — one female
1951 — 39
1957 — 580 to 740
1961 — 688 to 746
1965 — 150 to 200
1969 — 479
1973 — 500 to 600

While the 1978 census suggested a population of approximately 350 to 400 birds, there is some reason to believe that at one time the total population was reduced to but a single gravid female.

The Laysan teal's history of decline is reminiscent of the nene and the koloa. The main difference being the generally much smaller population before man-induced pressures caused further reductions. Guano excavation on the island commenced in 1890 and continued until 1910. Apart from the destruction of habitat by the digging, tragic introduction of nonspecialized, prolific rabbits in 1903 resulted in the destruction of the island's vegetation. This loss of natural cover almost caused extinction of the teal in 1912 and again in 1930. Extermination of the rabbits and other species began in 1912 but was not completed. Again, in 1916, the rabbits were abundant and a few were killed by a landing party. In 1923, the Tanager Expedition visited the island and the task was at last completed. However, almost all vegetation had been destroyed and blowing sand was rapidly filling in the lagoon. By 1915, the drifting sand had filled the last source of fresh water on the island. The tenacious birds nevertheless were able to survive. Interestingly, the survival of the teal appears to be linked to the presence of brine flies associated with a brackish water lagoon in the center of the island. During periods of drought when even the lagoon dries up, the brine flies disappear. During such times, the population drops significantly. Indeed, in 1930, the population had declined to a very few birds and only one female was observed. She was on a nest that had been apparently destroyed by a curlew. As mentioned previously, it is believed by some that the entire existing population arose from this single female which was apparently gravid at the time and re-nested.

In appearance, Laysan teal are similar to that of the koloa but smaller and tend to be redder or a washed-out brown color. A white eye ring is always visible although highly variable in size.

It was not until 1958 that these birds were attempted in captivity. Ely and Clapp state that in 1958, 36 adults were collected and transported to the Honolulu Zoo for acclimation and eventual distribution to selected aviculturists in the U.S. and Europe. In the Wilson Bulletin, Ripley reports he received two pair in 1958. In July and August of 1959, one female produced eight young from two clutches of five eggs each. He further states that the Wildfowl Trust had eggs in early spring of 1960. Our experience at Sea World indicates this insular mallard is quite easy to manage. Like the koloa, it will hybridize but not quite as readily. They nest on the ground in vegetated areas. Clutch size is four to eight greenish white eggs; the female alone incubates for 26 days. Breeding commences in late February and continues through August. Rearing techniques are the same as for the Hawaiian duck. Fortunately, this species is well established in captivity at this time.

There can be no doubt that the diligent work by propagators the world over is responsible for the currently healthy populations of the nene and Laysan teal. We do not believe this to be the case with the Hawaiian duck, because in our opinion, no pure ones exist in collections outside of Hawaii.

Captive propagation is not the total answer for the plight of all endangered animals, but in many cases, it has contributed greatly to the continued existence of the species. Few animals in the world better illustrate this than the nene. It is unlikely that this species would have survived if aviculturists had not intervened.

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