

# AMERICAN COOT AND BLACK-NECKED STILT ON THE ISLAND OF HAWAII

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Ornithologists studying the wetland avifauna of the island of Hawaii during the late 1800s reported two endemic species (Hawaiian Rail *Porzana sandwichensis* and Hawaiian Duck *Anas wyvilliana*), three endemic subspecies (American [Hawaiian] Coot *Fulica americana alai*, Black-necked [Hawaiian] Stilt *Himantopus mexicanus knudseni*, and Common [Hawaiian] Moorhen *Gallinula chloropus sandwicensis*), and one indigenous species (Black-crowned Night-Heron *Nycticorax nycticorax hoactli*) (Wilson and Evans 1890-1899, Rothschild 1893-1900, Henshaw 1902, Perkins 1903). The rail is now extinct. The moorhen, although present on other islands, has been extirpated from Hawaii. The coot, moorhen and duck are classified as endangered by the State of Hawaii and the Federal government (USFWS 1983). One other endangered endemic water bird, the stilt, was apparently absent from the island from 1896 to as recently as the early 1960s (Walker 1962, Banko 1979, Paton and Scott 1985). Research is currently being conducted on the Hawaiian Duck by the Hawaiian Division of Forestry and Wildlife (HDFW), as information on this species is limited (Jon Giffin pers. comm.). Surveys of the wetlands of Hawaii conducted over the past 20 years by the HDFW have provided baseline data on the population trends of the coot and stilt (unpubl. data on file, Dept. of Land and Natural Resources, HDFW). The purpose of this paper is to summarize existing knowledge of these two endemic water birds on the island of Hawaii.

## STUDY AREA AND METHODS

The HDFW (then the Division of Fish and Game) initiated an annual census of migratory waterfowl in 1950. Native water birds were added to the count in 1958, but it was not until 1963 that all of the primary wetlands used by the coot and stilt on Hawaii were included. These wetlands (Aimakapa, Opaepa, Waiakea, and Lokoaka; Figure 1) have been described by Shallenberger (1977). Ponds on Hawaii are small, less than 11 ha (Armstrong 1973), with vegetation surrounding the ponds generally short, providing few places for coots and stilts to hide from observers. The HDFW census is conducted on one day in January, surveying all major wetlands on the island. Eight observers usually conduct the survey, with observers varying from year to year. A summer census, on one day in either late July or early

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August, was initiated in 1968 to monitor population trends of native water-birds during the critical summer months when water is generally scarce.

From 1975 through 1979, Scott regularly surveyed ponds in the Hilo area. Paton censused the major wetlands of the island opportunistically from January 1980 through December 1982. None of these surveys were conducted during standardized tidal or weather conditions; nonetheless we believe that the data give a realistic picture of true population figures.

Paton did the statistical analysis using MINITAB on the Colorado State University computer system. A priori alpha values of 0.05 were considered significant.

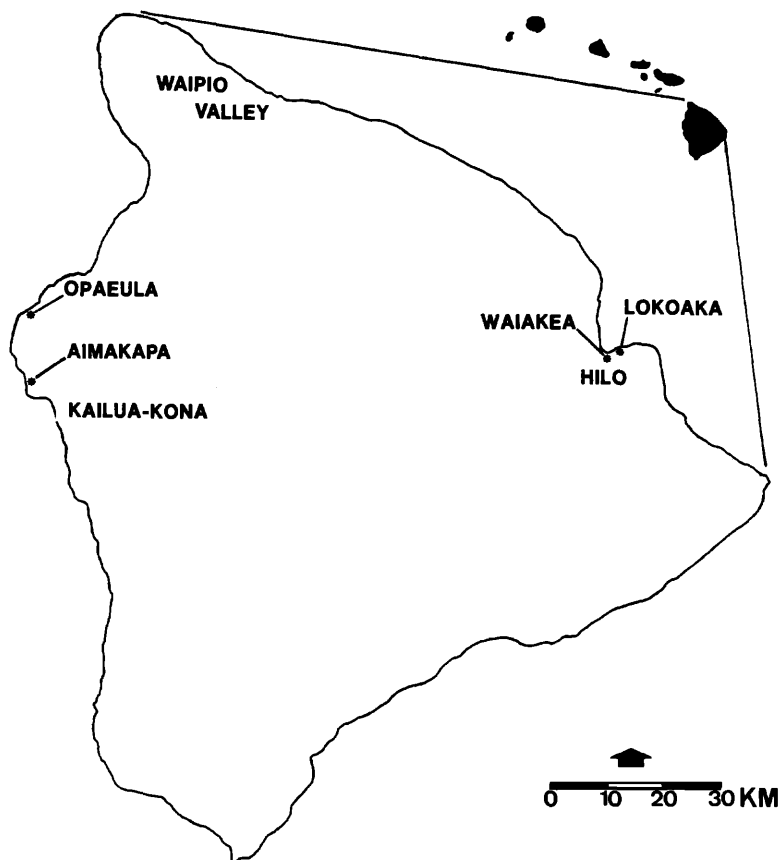


Figure 1. Map of the island of Hawaii showing the primary wetlands used by American Coot and Black-necked Stilt.

## RESULTS

**AMERICAN COOT.** Information concerning coot population trends prior to 1958 can only be considered speculative. Data reported before the initiation of HDFW censuses were subjective and, therefore, no meaningful inferences could be made to present population levels. The coot was thought to be a common species in the wetlands at lower elevations on Hawaii in the late 1800s, though no population estimates were reported (Henshaw 1902, Perkins 1903). Schwartz and Schwartz (1952) listed the species as "rare" on Hawaii, occurring in a few ponds, reservoirs, and the taro fields of Waipio Valley. These authors did not mention if they visited Aimakapa or Opaepa.

Quantitative data collected since 1963 suggest that the coot population has risen recently. In comparing coot winter population figures from 1963 to 1971 with those of 1972 through 1981, one can see that the number of coots has significantly increased in the past decade (Mann-Whitney Test,  $p=0.006$ ; Figure 2). The median number of coots counted from 1963 to 1971 was 37.5 (range 20-46), whereas from 1972 through 1981 the median count was 62.5 (range 10-110). This increase occurred primarily on the west side of the island. The coot population at Aimakapa has increased from 11 birds in 1970 to 165 in September 1984 (HDFW, Pyle 1985).

The coot population on the east side of Hawaii has remained relatively small (median = 7.5 birds, range 3-15 during 1982). In 1968, 12 coots were observed at Waiakea Pond, whereas none were seen at Lokoaka Pond (HDFW, summer census data). By 1982, coot habitat use patterns on the east side had changed and the majority of the coots nested and foraged at Lokoaka. From November 1980 through October 1981, no coots were observed at Waiakea Pond during weekly surveys (PWCP pers. obs.).

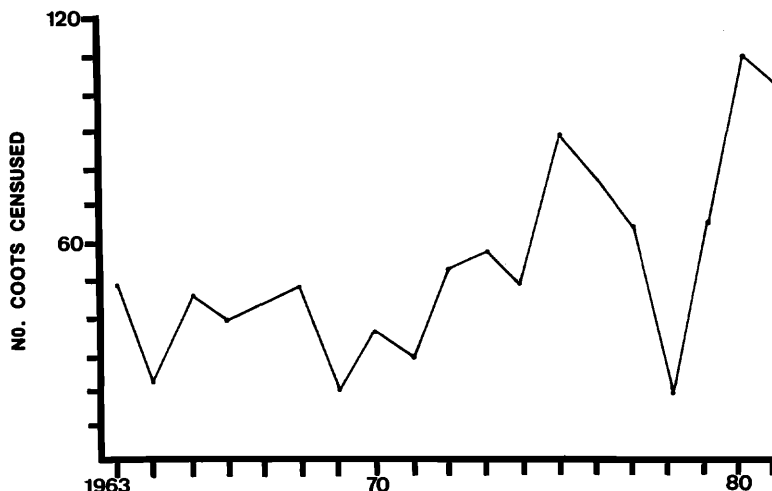


Figure 2. American Coot winter HDFW census results from 1963 to 1981.

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The breeding biology of the coot was recently summarized, but included virtually no data for Hawaii Island because most work was done with this species on Oahu (Byrd et al. 1985). Coots nest at Aimakapa and Opaepala with young observed during all months of the year. However, peak nesting activities appear to occur in July with 10 incubating pairs observed at Aimakapa and 5 incubating pairs at Opaepala (PWCP). Coleman (1978) reported two nesting peaks on Oahu: November-February and June-October. Coot nests have been recorded at Lokoaka, but nesting has not been observed at Waiakea since 1978 (JMS pers. obs.). Four pairs of coots established nests at Lokoaka Pond in 1982, with a minimum of 8 young produced (PWCP pers. obs.).

**BLACK-NECKED STILT.** The status of this species on Hawaii Island remains uncertain. There are no fossils known of this species from Hawaii Island (Olson and James 1982). S.B. Wilson collected 1 adult female stilt in June 1896 labelled "Hawaii, H.I." (Carnegie Museum 55460), which is most likely from Hawaii Island (Banko 1979). We could find no other records of stilt between 1896 and 1961 on the island. No other ornithologist doing work in the late 1800s recorded stilts on Hawaii (Rothschild 1893-1900, Henshaw 1902, Perkins 1903). It is not known if any of these men visited Opaepala, but Perkins (1893) definitely visited Aimakapa to collect birds. Munro (1944) specifically stated that "there seems to be no record of it [stilt] from Hawaii."

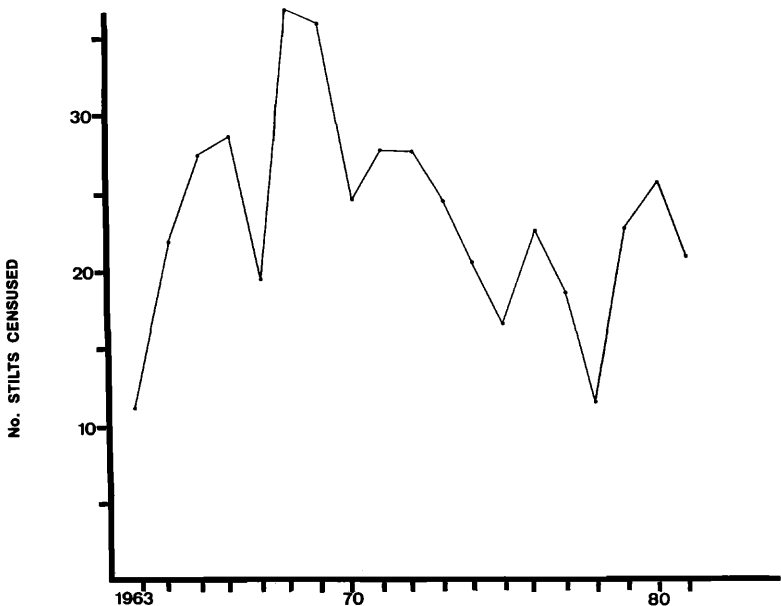


Figure 3. Black-necked Stilt winter HDFW census results from 1963 to 1981.

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The first documented record we could find of stilts on Hawaii was of two birds seen at Aimakapa in August 1961 (Walker 1962).

Since 1963, the stilt population has remained relatively stable (Figure 3). A comparison of the island's stilt population from 1963 to 1971 versus 1972 to 1981 yielded no significant difference between the two periods (Mann-Whitney Test,  $p=0.103$ ). The median count for 1963 to 1971 was 27.5 (range 11-36), whereas from 1972 to 1981 the median count was 20 (range 11-26; HDFW). The highest stilt count on Hawaii was in January 1968, when 36 birds were recorded, but 35 stilts were counted as recently as 17 October 1982 (PWCP pers. obs.).

Stilts nested at Aimakapa and Opaepala during the 1960s and 1970s (Eugene Kridler and Robert Shallenberger pers. comm.). Five stilt chicks were observed at Aimakapa in May 1982 and one chick at Opaepala on 25 September 1982 (PWCP pers. obs.). On Oahu, the stilt breeding season usually extends from March through August but is concentrated in May and June (Coleman 1981). We did find a difference between summer and winter HDFW stilt censuses (Mann-Whitney Test,  $p=0.04$ ), although the biological implications of this observation are unclear. Surprisingly, the winter counts (median = 24, range = 16-36) were greater than the summer counts (median = 19, range = 15-27). Because stilts are thought to breed primarily prior to the summer census, we would have expected to see higher counts in July-August. The higher winter counts may be the result of post-breeding movements between islands; however, these results warrant further study.

There is only one reported record of a stilt on the east side of Hawaii. One bird was observed flying over Lokoaka on 11 April 1981. A sighting later the same week in the Mountain View area was probably the same bird.

Our data suggest intra-island movements of stilts, primarily between Opaepala and Aimakapa. Censuses on 19 July, 26 July and 16 August 1981 showed the same number of birds, but in different proportions, at Aimakapa and Opaepala (16:14, 18:12 and 22:8, respectively). Inter-island movements of stilts have been documented between Kauai and Oahu, and Maui and Oahu (E. Kridler and R. Coleman pers. comm.). Intra-island movements of banded birds have also been documented (E. Kridler and R. Coleman pers. comm.).

## DISCUSSION

Increases in the coot population on Hawaii are probably due to changes in human use of the ponds on the west side of the island. Up to the early 1960s, Aimakapa was used by Hawaiians for the production of fish (E. Kridler pers. comm.). The continued disturbance caused by the maintenance of the pond's stone walls and the use of throw nets to capture fish probably limited the number of water birds using the pond. Since the early 1960s, the primary disturbance at Aimakapa is people using the beach on the west side of the pond. Water birds generally utilize only the east side of the pond now, except during crepuscular hours when human disturbance of the area is at a minimum (PWCP pers. obs.). Opaepala was used at one time by Hawaiians as a fish production pond, but now human disturbance of the area is sporadic.

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Reasons for the avoidance of Waiakea Pond by coots are difficult to determine, though some observations suggest that the encroachment of grass into the shallower regions of the pond may inhibit coot utilization of the area. Throughout 1981 Para Grass (*Brachiaria mutica*) spread rapidly over the edges of Waiakea, extending up to 6 m in areas where the water was up to 1 m deep. Also, during this period the mouth of the Wailoa River, which flows into Waiakea, was completely covered by this exotic grass (PWCP pers. obs.). Para Grass was controlled up to 1979 with herbicides by the State Department of Parks and Recreation (George Kanemota pers. comm.). The Para Grass was dredged from the edges of the pond in June 1982 and up to 5 coots were observed foraging at Waiakea from August through October 1982 (PWCP pers. obs.), indicating that lack of foraging locations at Waiakea was limiting coot use of the pond.

The absence of stilts on the east side of the island may be due to the lack of suitable foraging sites. Both Lokoaka and Waiakea have steep banks and are too deep (>1 m) to allow stilts to walk on the bottom. Aimakapa and Opaepala on the other hand are generally shallow (<20 cm) and Opaepala in particular has several large shallow mudflats ideal for stilt foraging. Aimakapa and Opaepala have been designated by the Hawaiian Waterbird Recovery Plan as 2 of 17 essential water bird habitats in the Hawaiian Islands. Present plans propose federal acquisition of both ponds (Hawaiian Waterbird Recovery Team 1977). Aimakapa and Opaepala are presently under private ownership and future preservation of these two wetlands is uncertain. Loss of this habitat would mean the probable demise of stilts from the island and cause a significant reduction in coot numbers on Hawaii. In addition to being the primary nesting and foraging areas for over 95% of the island's stilts and 90% of the coots, over 100 migratory waterfowl regularly use these areas during the winter months (Paton and Scott 1985).

With the exception of data on population trends of these two species, their ecology has been little studied on Hawaii Island, in part because the Hawaii Island population represents only 3% of the total Hawaiian population for both the coot and stilt (Shallenberger 1977). Continued development of the lowlands of the Hawaiian Islands can only result in reduced numbers of Hawaii's endemic water birds. The importance of a specific wetland may not always be evident because the factors governing the utilization of an area by birds are often not fully understood. The only known breeding records of migratory waterfowl in the Hawaiian Islands occurred at Aimakapa, when Blue-winged Teal (*Anas discors*) nested at Aimakapa in 1982 and 1983 (Paton et al. 1984), yet Blue-winged Teal are an uncommon migrant to the island. One has to keep in mind that on Hawaii, where wetlands are limited, each wetland can have biological importance.

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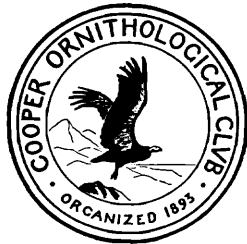
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