

**AVIAN SPECIES ASSESSMENT FOR THE
KUHIO HIGHWAY, MANOA STREAM FORD CROSSING PROJECT**

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EXECUTIVE SUMMARY

The Hawaii Biological Survey of the Bishop Museum conducted a biological assessment of avian species in the area of the Manoa (Kauai) Stream Crossing of Kuhio Highway near Haena Dry Cave. Native Hawaiian bird species observed in the area were the White-Tailed Tropicbird, the Pacific Golden Plover and the Wandering Tattler. No adverse impacts are anticipated to occur to native birds because of the small scale and temporary nature of these impacts resulting from the Kuhio Highway road crossing construction project. This bridge construction project should not adversely impact nesting or the food supply of the native indigenous birds observed flying in the general area. Additionally, no adverse impacts are expected for other native forest birds because of the Kuhio Highway, Manoa Stream construction project. This is because native forest birds no longer inhabit this low-elevation area.

INTRODUCTION

The Hawaii Biological Survey of the Bishop Museum conducted an avian assessment of native and endangered birds at the Kuhio Highway crossing area of Manoa Stream, Kauai. The objectives of the avian species assessment were to 1) determine species composition of native and introduced birds, with an emphasis on Threatened and Endangered species, 2) evaluate habitat quality for native birds, and 3) evaluate potential consequences associated with the completion of the Kuhio Highway, Manoa Stream, bridge crossing construction project.

STUDY AREA

To assess the impacts of bridge replacement or expansion, the area of Manoa Stream where it intersects Kuhio Highway was surveyed. There is no wetland area where Manoa Stream enters the ocean because flow disappears into the alluvium below Kuhio Highway. The lack of wetlands and small size of Manoa Stream indicates there is little potential habitat for endangered Hawaiian waterbirds in the area of Kuhio Highway. Bird surveys started approximately 100 m upstream of Kuhio Highway and extended down to the ocean. Habitat consisted almost entirely of introduced plants and the area has been heavily disturbed for many years. Additionally, the heavy use of the beach and the constant loud vehicular traffic around the Manoa Stream crossing area likely limits more sensitive native waterbirds and migratory birds from inhabiting or frequenting this area.

The following plant species indicate the disturbed nature of this site and were found in the study area and are shown in Table 1.

Table 1. Plant species observed at Manoa Stream, Kauai near the Kuhio Highway crossing on March 13, 2000.

Plant Species	Geographic Status
African tulip (<i>Spathodea campanulata</i>)	Introduced
Akoko (<i>Chamaesyce degeneri</i>)	Indigenous
Ape (<i>Alocasia macrorrhiza</i>)	Introduced
Avocado (<i>Persea americana</i>)	Introduced
Bermuda grass (<i>Cynodon dactylon</i>)	Introduced
Coconut (<i>Cocos nucifera</i>)	Introduced
<i>Commelina difusa</i>	Introduced
Common guava (<i>Psidium guajava</i>)	Introduced

Table 1 (Continued). Plant species observed at Manoa Stream, Kauai.

Plant Species	Geographic Status
<i>Cordyline fruticosa</i>	Introduced
<i>Crinum asiaticum</i>	Introduced
<i>Crotalaria</i> sp.	Introduced
False kamani (<i>Terminalia catappa</i>)	Introduced
<i>Ficus indica</i>	Introduced
<i>Ficus</i> sp.	Introduced
Hala (<i>Pandanus tectorius</i>)	Indigenous
<i>Ipomea</i> sp.	Introduced
Ironwood (<i>Casuarina equisetifolia</i>)	Introduced
Java plum (<i>Syzygium cumini</i>)	Introduced
Kukui (<i>Aleurites mollucana</i>)	Introduced
<i>Lantana camara</i>	Introduced
<i>Leucaena leucocephala</i>	Introduced
Lilikoi (<i>Passiflora edulis</i>)	Introduced
<i>Macadamia integrifolia</i>	Introduced
Maile hohono (<i>Ageratum conyzoides</i>)	Introduced
Mango (<i>Mangifera indica</i>)	Introduced
Maunaloa (<i>Canavalia cathartica</i>)	Introduced
Naupaka (<i>Scaevola sericea</i>)	Indigenous
<i>Nesolepus</i> sp.	Introduced
Noni (<i>Morinda citrifolia</i>)	Introduced
Octopus tree (<i>Schefflera actinophylla</i>)	Introduced
<i>Oxalis corniculata</i>	Introduced
<i>Panicum maximum</i>	Introduced
Papaya (<i>Carica papaya</i>)	Introduced
<i>Pluchea odorata</i>	Introduced
Pothos (<i>Epipremnum pinnatum</i>)	Introduced
Seagrape (<i>Coccoloba uvifera</i>)	Introduced
Sleeping grass (<i>Mimosa pudica</i>)	Introduced
<i>Thelyperis parasitica</i>	Introduced
<i>Wedelia trilobata</i>	Introduced
White ginger (<i>Hedychium coronarium</i>)	Introduced

Avian Surveys

Surveys of avifauna in Manoa Stream in the area of the Kuhio Highway crossing were conducted on 13 March 2000. Four census stations were set up at approximately 50 m intervals within the stream starting at the stream mouth and working approximately 100 m upstream of the bridge. Fixed plot methods were used, whereby all species seen or heard within a 20 m radius of census stations were recorded. Special emphasis was placed on detecting native Hawaiian species. The presence of any native bird species in or around the stream corridor but outside of the census areas was also recorded.

RESULTS AND DISCUSSION

Native Birds:

According to the Bishop Museum historical bird sighting database (Bob Pyle, pers. comm.) there are no historical records of rare or endangered Hawaiian birds being found in the Manoa Stream, Kauai area, or more broadly in the Haena Dry Cave area. Endangered waterbirds such as the Common Moorhen (*Gallinula chloropus sandvicensis*) or Koloa (*Anas*

wyvilliana) would be unlikely to be found in the Manoa Stream area because of the small size of the stream and lack of wetlands at the stream mouth.

No native landbirds were seen in the study area. This was expected for two reasons. First, native Hawaiian landbirds are rarely found in areas where the native habitat has been destroyed (Perkins 1903; Berger 1981). Habitats within and around the Manoa Stream crossing of Kuhio Highway reflect long periods of human disturbance and occupation.

The second reason no native landbirds were expected in this area is because this site lies within the low elevation “mosquito zone”. Since Hawaiian birds evolved in the absence of mosquitoes, they are highly susceptible to mosquito transmitted diseases such as avian malaria (Warner 1968; van Riper et al. 1986). The presence of mosquitoes below 1500 m elevation on all Hawaiian islands is believed to be a major factor limiting the abundance of lowland native forest bird populations, even in otherwise suitable habitat (van Riper et al. 1986).

Table 2. Bird Species Observed at Manoa Stream, Kauai near Kuhio Highway crossing on March 13, 2000.

Bird Species	Threatened and Endangered Status	Geographic Status
White-Tailed Tropicbird (<i>Phaeton lepturus dorotheae</i>)	None	Native (Indigenous)
Pacific Golden-Plover (<i>Pluvialis fulva</i>)	None	Native (Indigenous)
Wandering Tattler (<i>Heteroscelus incanus</i>)	None	Native (Indigenous)
Red Junglefowl (<i>Gallus gallus</i>)	None	Introduced
House Sparrow (<i>Passer domesticus</i>)	None	Introduced
Zebra Dove (<i>Geopelia striata</i>)	None	Introduced
Common Myna (<i>Acridotheres tristis</i>)	None	Introduced
House Finch (<i>Carpodacus mexicanus</i>)	None	Introduced
Japanese White-eye (<i>Zosterops japonicus</i>)	None	Introduced

Introduced birds:

Japanese White-eyes, *Zosterops japonicus*, are the most abundant land birds in the Hawaiian Islands (Scott et al. 1986). They were first introduced from Japan in 1929 to Oahu (Caum 1933), with an introduction to the Big Island in 1937 (Berger 1981). Japanese White-eyes are omnivores, feeding mostly on fruit, nectar, and insects from understory sites (Guest 1973; Conant 1975). These birds occur from sea-level to the highest elevations on Kauai in a broad range of vegetation types, however they tend to be most abundant in lowland areas where introduced species dominate the ground cover. The population of Japanese White-eyes appears to have “exploded” within the past 40 years (Scott et al. 1986). Jungle fowl, *Gallus gallus*, were brought to Hawaii by the first Polynesians and remain common throughout Kauai.

House Finches, *Carpodacus mexicanus*, were introduced to Hawaii before 1870, probably from San Francisco (Caum 1933). By the 1940’s they were well established on all Hawaiian Islands (Munro 1944). House Finches are omnivorous and feed on a variety of seeds, buds, and fruit. They are common in cities, agricultural areas, and most types of forest, from sea-level to 2500 m elevation (Berger 1981). Grasslands and open woodlands appear to be their preferred habitat.

Common Mynas, *Acridotheres tristis*, were introduced from India in 1865 (Caum 1933) and are common to abundant in most lowland areas except forest interiors. These birds are

terrestrial omnivores and occur from sea-level to 2300 m elevation on the island of Hawaii (Scott et al. 1986). They appear to prefer dry woodlands and partly open forests with low shrub cover at low elevations. These birds seldom enter high elevation native forests. Common introduced birds such as the Northern Cardinal (*Cardinalis cardinalis*), Chestnut Mannikin (*Lonchura malacca*), and others also occur in the study area, and undoubtedly would have been observed in a more intensive survey.

ENVIRONMENTAL CONSEQUENCES

Avian Species (Native Birds):

No adverse impacts are anticipated to occur to native Hawaiian waterbirds or migratory birds because of the small scale and temporary nature of impacts resulting from the Kuhio Highway Bridge construction project. Additionally, no adverse impacts are expected for native forest birds because these birds no longer inhabit this area. However, best management practices should be employed during construction to prevent soil erosion into nearshore ocean areas.

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