

HAWAIIAN GOOSE

Branta sandvicensis

Other: *Nene*

monotypic

native resident, endemic, endangered

We refer here to the Hawaiian Goose by its Hawaiian name "Nene". The Nene, a species endemic to the *Southeastern Hawaiian Islands* and the official state (formerly territorial) bird of Hawaii (Bryan 1958), was well-known by the first European explorers to visit Hawaii; e.g., both wild and domesticated individuals were noted during Cook's voyage as early as 23 Dec 1778 (Ellis 1782; Cook and King 1784, and in Beaglehole 1967:630). Meares (1791) noted 12 geese being given as a gift to a passing ship in 1789, and Archibald Menzies (1794) reported them between Hualalai and Mauna Loa on Hawai'i I as "quite a new species not yet described". Forty years later, it was finally described by Vigors (1834) based on two birds sent from Hawai'i I to London in 1832 by the well-known N American botanist David Douglas (Wilson and Evans 1899, Olson 1989a), who met his mysterious death on the island two years later. Although placed in a monotypic genus ("*Nesochen*"; Salvadori 1895) until 1993, as based on the lack of webbing to the toes (AOU 1993; see [Synonymies](#)), the Nene's closest relatives are the [Canada](#) and [Cackling](#) geese (Miller 1950, Livezey 1996, Quinn et al. 1991, Paxinos et al. 2002, AOU 2004), species that infrequently occur in Hawaii, and the Nene has since been placed in *Branta* (see also Delacour and Mayr 1945). Molecular data suggest that the Nene diverged from these taxa < 800,000 years ago (Fleisher and McIntosh 2001, Paxinos et al. 2002). At least three other species of *Branta*, closely related to Nene, are known from the subfossil record (Olson and James 1982b, 1991; Burney et al. 2001, Fleischer and McIntosh 2002; Paxinos et al. 2002, Ziegler 2002, Olson 2013), including a very large species that may have been flightless on Hawai'i I and another commonly found fossil goose from Hawai'i I, named *Geochen rhuax* by Wetmore (1943), which was placed in *Branta* by Olson (2013).

At the time of description the range of Nene was probably restricted to the upper slopes of Maui and Hawai'i I (Peale 1848; Cassin 1858; Finsch 1880; Dole 1869, 1879; Wilson and Evans 1899; Perkins 1903; Brigham 1909; Baldwin 1945a), although remnant populations possibly persisted on Moloka'i through the 1920s (see below). Declines were noted as early as 1850 and were precipitous during the second half of the 19th century (Henshaw 1902a, Baldwin 1946, Banko and Elder 1990). After nearly becoming extinct in the 1940s, extensive propagation efforts and predator-control programs were initiated on Kaua'i, Maui, Moloka'i, and Hawai'i I (Berger 1972, 1978, 1981; Kear and Berger 1980; Black et al. 1991, 1997; USFWS 2004a). Populations in the wild were estimated at 1200-1300 individuals in 2003 and by 2011-2015 they had stabilized at about 2500, prompting the cessation of propagation efforts in 2011 (USFWS 2004a, BLI 2016). See Banko and Elder (1990) for a complete history of the Nene and its propagation in Hawaii, and Greenway (1967), Berger (1972, 1981), Zimmerman (1974), Kear and Berger (1980), Banko and Manuwal (1982), and Banko et al. (1999) for general summaries of the biology, natural history, and conservation strategies for the Nene; Banko (1979) summarizes 90 specimens known at that time.

Succumbing to pressures from hunting throughout the 1800s (*cf.* C. de Vargny in Korn 1981; *PoP* 14[7]:18), introduced predators, and habitat alteration, populations of Nene on **Hawai'i** plummeted from estimates of 25,000 in the late 1700s to a low of 20-30 birds in the wild and 13 in captivity in 1949-1951 (Baldwin 1945a, Schwartz and Schwartz 1949, Smith 1952, Dunmire 1961, Ripley 1965; *E* 17:7-10, 31:1-7, 34:123-124). The Legislature of the (then) Territory of Hawaii had been interested in saving the Nene from extinction as early as the late 1920s (Locey 1937; reports in *HFA* 1927-1933), and in 1949 they appropriated \$6,000 toward recovery efforts of the Nene. In the early 1950s, propagation efforts were initiated at Pohakuloa, in Slimbridge England (*E* 16:66-67), and in Letchfield Connecticut, originating with birds from the only viable captive flock in existence, which had been maintained by Hilo rancher Herbert Shipman since 1918 (*E* 26:96-104, 28:103-106; Elder and Woodside 1958, Kear and Berger 1980). This captive flock had survived despite various setbacks, including an ill-advised political decision to break up the flock in 1935, and a tsunami in 1949 that killed all but 11 birds (Smith 1952).

Nene bred very successfully in captivity (*E* 17:47-48, 28:103-106, 31:41-43; Banko 1982, Banko and Manuwal 1982, USFWS 1983a), eventually resulting in the propagation of over 2,500 captive-reared birds throughout the state, between 1960 and 2000, by the [Hui Manu](#) and state and federal agencies (*E* 25:9, 34:135-142, 36:104-108, 37:129-130; Banko 1978; Stone et al. 1983a, 1983b). Productivity in the wild initially was low (Banko 1980, 1982; Devick 1982), but supported by continued reintroductions and predator-control measures (Stone et al. 1983b; Scott and Kepler 1985, Scott et al. 1985, 1986; Hoshide et al. 1990; Black et al. 1997; USFWS 2004a), wild populations on Hawai'i I have grown slightly from about 300 individuals in 1980 to 349 in 2003, 481 in 2006, and 542 in 2011 (USFWS 2004a, VanderWerf 2013a, BLI 2016). Island-wide [DOFAW Waterbird Surveys](#) in 1980-2007 recorded a low of 230 individuals on Hawai'i in 1988 and a high of 550 in 1996. They breed and molt in scattered locations throughout Volcano NP (where numbers in winter have declined since a peak in the 1990s; [Graph](#)), Hakalau NWR, elsewhere on the slopes of Mauna Kea, in the saddle between Mauna Kea and Mauna Loa, on Mt. Haulalai, on the Shipman Ranch at Ke'eau, and at Puuanahulu near Kailua-Kona, and they disperse upslope to dry subalpine scrub after breeding, with highest densities at 1600-2100 m elevation (Stone et al. 1983; Scott et al. 1986; Hess et al. 2012; Leopold and Hess 2013, 2014). They are occasionally noted in lowland and coastal areas after breeding; e.g., at Hapuna Beach, near South Point, and along the Puna coast (*E* 35:32, 60:25-28), several near Honoka'a in early May 2005, and frequently at Waiakea Pond in Hilo in 2008-2016, usually 1-4 birds but 13 there 17 Nov 2016. In 2012-2015, birds were translocated to both Hawai'i and Maui from nuisance populations on Kaua'i (see below).

Following records suggesting that Nene nested in Haleakala Crater in the late 1800s and early 1900s (Finsch 1880, Banko and Elder 1991), they were reintroduced on **Maui** in 1962, when 35 birds were released in Haleakala Crater (Yocom 1968, Kear and Berger 1980). Continued introductions and predator-control measures (*e.g.*, *E* 32:21-22, 33:33-34) have resulted in a breeding population estimated at 144 birds in 1990 (Hodges 1991), 251 in 2003 (USFWS 2004a), about 360 birds in 2006, and 416 in 2011 (VanderWerf 2013a). Several birds from this population have been found elsewhere on Maui, including at propagation sites on Haleakala from which returning birds had

originated (Banko and Elder 1990, *E* 60:25-28). In the early-to-mid 2010s, Nene were observed regularly within Haleakala Crater year-round, and were increasingly found at lower elevations in pairs or small groups up to 8; e.g., near Hana, at Kanaha Pond, and at Kealia NWR near Kihei (see also *E* 35:32, 60:25-28).

On *Moloka'i*, at least a couple of pairs were reported nesting near Keonokuino in the 1880-1890s and in 1923-1926 (Munro 1952, Banko and Elder 1990, G. Munro in Dibben-Young 2016). A widely cited report of three Nene on Moloka'i in 1950, possibly captive birds that escaped there in 1935, does not appear to be substantiated. Beginning in 2001, 55 Nene were released into open propagation pens on Pu'u O Hoku Ranch near the east end of *Moloka'i*, in proximity to the site of a second-hand reports of historical breeding (Munro 1952). It was hoped that a population of >200 individuals could be maintained on Moloka'i (USFWS 2004a). Through the mid-2010s, juveniles and adults began to be observed elsewhere around the island, including Halawa (initially in 2003), Puuhala (2004), Kainalu (2005) Ho'olehua and Kalae (2009), Pohakupili and Paalau (2012) and in widespread localities thereafter. In 2011, following continued propagation and predator-control measures, the a population of 83 birds was estimated (VanderWerf 2013a).

On *Kaua'i*, several birds from a captive flock present on a ranch S of Lihu'e during the early 1980s escaped when pens were damaged by Hurricane Iwa in Nov 1982. These birds began breeding successfully along the coast from Maha'ulepu to Lihu'e, and had increased to an estimated 135 birds by 1996. Reintroduction programs, initiated at Kilauea NWR with 38 trans-located birds in 1991-1994 (*HFW* 6[3]:9, 8[1]:11; USFWS 2016) and along the Napali Coast in 1995, resulted in successful breeding and increasing populations (Denny 1999). The breeding population at Kilauea NWR had exceeded 50 pairs by 2002 and 150 pairs by 2011 (USFWS 2016; see [Graph](#), [HRBP](#) 5303). The population along The Napali Coast had exceeded 25 pairs by 2002 and had expanded to Kokee SP, where breeding was first reported in 2003. Island-wide [DOFAW Waterbird Surveys](#) in 1980-2007 also reflected this increase, from just one bird counted in 1989 to 620 birds in 2003 (USFWS 2004, *AB* 59:102), and populations continued to increase to about 1500 birds in 2011 (VanderWerf 2013a, BLI 2016). The Kaua'i population at this time was considered one of the most robust populations in Hawaii due to the lack of mongooses on this island. Success on Kaua'i also suggests that lowland habitats, where food is lush and more abundant, may be preferred over upslope regions as long as predators can be controlled (Baker and Baker 1996, *FN* 50:999). Beginning in early 2012, DOFAW began translocating 100s of Nene from the vicinity of the Lihue Airport, where they had become a nuisance, to relocation populations on Hawai'i I and Maui.

Breeding populations on Hawai'i I, Maui, Moloka'i, and Kaua'i nest in Dec-Apr, generally in isolated pairs and often in upland areas. During May-Nov they often migrate down to mid-slope elevations and sometimes as far as the coast (see above). Nene are also capable of inter-island flights as evidenced by several records of banded birds flying between Maui and Hawai'i I during the 1960s and 1970s (Banko and Elder 1990); most of these involved birds returning ("homing") to propagation sites from which they originated.

On *O'ahu*, a family of Nene including nest with three eggs, discovered on private property in Wai'anae in 1987 (*HWN* 2[1]:2), may have been transported there or have been of translocated birds that migrated to O'ahu (see below). One was observed at Kaena

Point, 17 Apr 2008, which flew in from the direction of Kaua'i, circled around, and flew back out to sea in the direction of Kaua'i again. This bird presumably was a natural dispersant from Kaua'i, perhaps assisted by a storm located between the two islands at the time. During 2014 a pair of banded Nene arrived to O'ahu and bred at the Ki'i Unit of JCNWR. These birds had been translocated from near the Lihue Airport to Hawai'i I and were attempting to return to Kaua'i. The pair was first photographed at Kahuku 14 Jan 2014 and (presumably the same pair) at Makapu'u Point 19 Jan 2014 ([HRBP 5992](#)). They were then observed nesting at JCNWR, with 4 eggs present in Feb, and 3 goslings present in late Mar-early Apr ([HRBP 5993](#)) that were later banded. The banded parents and two full-grown goslings were observed through 2014 in the Kahuku area (including at Turtle Bay Resort and Kuilima WTP) and occasionally in the Pearl Harbor area; one parent and two chicks were observed in these areas throughout 2015 and in Jan 2016; and thereafter one to two chicks were observed sporadically at JCNWR through 2016 ([HRBP 6315](#)).

This breeding pair on O'ahu likely was observed briefly at Koele Lodge, Lana'i, 30-31 Dec 2013 ([HRBP 5991](#)). The species had not been previously recorded on Lana'i; however, because the birds had recently been translocated we choose not to include the species on the official Lana'i bird list. Other unsubstantiated reports of isolated birds from O'ahu and elsewhere in the Southeastern Islands may have been of local escapees or resulted from misidentifications of migratory species.

[Acronyms and Abbreviations](#)

[Literature cited](#)

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