# Friendly Ground-Dove
# (*Gallicolumba stairi*)

## 5-Year Review
## Summary and Evaluation

**U.S. Fish and Wildlife Service**
**Pacific Islands Fish and Wildlife Office**
**Honolulu, Hawai‘i**

# 5-YEAR REVIEW

**Species reviewed:** Friendly Ground-Dove (*Gallicolumba stairi*)

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# 5-YEAR REVIEW
# Friendly Ground-Dove/*Gallicolumba stairi*

## 1.0 GENERAL INFORMATION

### 1.1 Reviewers:

James Breeden, Wildlife Biologist, Pacific Islands Fish and Wildlife Office (PIFWO)
John Vetter, Animal Recovery Coordinator, PIFWO
Megan Laut, Conservation and Restoration Team Manager, PIFWO

**Lead Regional or Headquarters Office:**
Region 1, Portland Regional Office, Portland, OR

**Lead Field Office:**
Region 12, Pacific Islands Fish and Wildlife Office, Honolulu, HI

**Cooperating Field Office:**
N/A

**Cooperating Regional Office:**
N/A

### 1.2 Methodology used to complete the review:

This review was conducted by staff of the Pacific Islands Fish and Wildlife Office of the U.S. Fish and Wildlife Service (Service), beginning in June 2021. The review was based on the final rule listing this species; peer-reviewed literature, gray literature (government, academic, business, and industry reports), and expert elicitation. The evaluation completed by James Breeden, Wildlife Biologist, was reviewed by John Vetter, Animal Recovery Coordinator, and Megan Laut, Conservation and Restoration Team Manager.

### 1.3 Background:

#### 1.3.1 FR Notice citation announcing initiation of this review:

[USFWS] U.S. Fish and Wildlife Service. 2019. Endangered and Threatened Wildlife and Plants; Initiation of 5-Year Status Reviews for 91 Species in Oregon, Washington, Hawaii, and American Samoa. Federal Register 84(112): 27152–27154, June 11, 2019.

### 1.3.2 Listing history

Original Listing
**FR notice:** [USFWS] U.S. Fish and Wildlife Service. 2016. Endangered and Threatened Wildlife and Plants; Endangered Status for Five Species From American Samoa; final rule. Department of the Interior, Federal Register 81 (184): 65466–65508.

**Date listed:** October 24, 2016
**Entity listed:** *Gallicolumba stairi*
**Classification:** Endangered

Revised Listing, if applicable
**FR notice:** N/A
**Date listed:** N/A
**Entity listed:** N/A
**Classification:** N/A

### 1.3.3 Associated rulemakings:

N/A

### 1.3.4 Review History:

This is the first 5-year review for the friendly ground-dove.

### 1.3.5 Species' Recovery Priority Number at start of this 5-year review:

9

### 1.3.6 Current Recovery Plan or Outline

**Name of plan or outline:** Draft Recovery Plan for Five Species from American Sāmoa
**Date issued:** May 17, 2021
**Dates of previous revisions, if applicable**: N/A

## 2.0 REVIEW ANALYSIS

### 2.1 Application of the 1996 Distinct Population Segment (DPS) policy

#### 2.1.1 Is the species under review a vertebrate?

__X__ **Yes**
_____ **No**

**2.1.2 Is the species under review listed as a DPS?**

__X__ **Yes**
____ **No**

**2.1.3 Was the DPS listed prior to 1996?**

____ **Yes**
__X__ **No**

**2.1.3.1 Prior to this 5-year review, was the DPS classification reviewed to ensure it meets the 1996 policy standards?**

____ **Yes**
____ **No**

**2.1.3.2 Does the DPS listing meet the discreteness and significance elements of the 1996 DPS policy?**

____ **Yes**
____ **No**

**2.1.4 Is there relevant new information for this species regarding the application of the DPS policy?**

____ **Yes**
__X__ **No**

**2.2 Recovery Criteria**

**2.2.1 Does the species have a final, approved recovery plan containing objective, measurable criteria?**

____ **Yes**
__X__ **No**

**2.2.2 Adequacy of recovery criteria.**

**2.2.2.1 Do the recovery criteria reflect the best available and most up-to date information on the biology of the species and its habitat?**

____ **Yes**
____ **No**

**2.2.2.2 Are all of the 5 listing factors that are relevant to the species addressed in the recovery criteria?**

**____ Yes**
**____ No**

**2.2.3 List the recovery criteria as they appear in the recovery plan, and discuss how each criterion has or has not been met, citing information:**

## 2.3 Updated Information and Current Species Status

### 2.3.1 Biology and Habitat

#### 2.3.1.1 New information on the species' biology and life history:

The tu'aimeo (friendly [shy] ground-dove, *Gallicolumba stairi*) is a medium-sized bird, approximately 10 inches (in) (26 centimeters) long (Watling 2001, p 117) and weighing between 3.6 to 5.8 ounces (102 to 165 grams) (Baptisa et al. 1997, pp. 180–186). Males are generally larger than females (Baptisa et al. 1997, pp. 180–186). Friendly ground-doves are mostly rufous and dark brown dove with a black bill and purplish red legs and feet (Baptisa et al. 1997, p. 185; Watling 2001, p. 117). Adult males have purple wing coverts, white feathering on lower breast, and gray crown (Pyle et al. 2017, p. 15). Adult females have brown wing coverts, lack the white feathering on the lower breast, and have brown crowns (Pyle et al. 2017, p. 15). Juveniles resemble adult females (Watling 2001, p. 117; Pyle et al. 2017, p. 15).

In American Sāmoa, the friendly ground-dove is reported to occur primarily in shaded forests or thickets on or near steep, forested slopes, sometimes with an open understory and fine scree or exposed soil (Kayano et al. 2019, p. 19; Tulafono 2006, in litt., entire). They utilize littoral forest and scrub, lowland rainforest, and agroforest and have been observed foraging in forested areas disturbed by human activity (Pyle et al. 2018, p. 18; Kayano et al. 2019, p. 19). Outside American Sāmoa, the species is known to inhabit brushy vegetation or native forest on offshore islands, native forest on limestone (Tonga), and forest habitats on large, high islands (Steadman and Freifeld 1998, p. 617; Clunie 1999, pp. 42–43; Freifeld et al. 2001, p. 79; Watling 2001, p. 118). The friendly ground-dove forages on the ground and in the forest understory on seeds, fruit, buds, snails, and insects (Clunie 1999, p. 42; Craig 2009, p. 125). Amerson et al. (1982a, p. 69) reports observing the species foraging on fallen fruits from a *Macaranga harveyana* tree.

Home range estimates, using the minimum convex polygon method, from three marked individuals in American Sāmoa were 7, 49, and 94 acres (3, 20, and 38 hectares) (Kayano et al. 2019, p. 16). Kayano et al. (2019, p. 16)

reported that these home ranges overlapped in a central area, suggesting friendly ground-doves are not substantially territorial.

Kayano et al. (2019, p. 19) reported observations of courting individuals in American Sāmoa in April–May and observed juvenile friendly ground-doves in May, indicating breeding likely occurs in the austral winter, prior to the dry seasons. The friendly ground-dove's breeding cycle is likely typical for doves with most breeding centered around the nest site. Once a nest is constructed, the female lays and incubates the egg(s), potentially 13–16 days (Baptisa et al. 1997, pp. 180–186; Myers 2002, p. 11; Kremer et al. 2014, pp. 70–71). The egg(s) hatches after incubation and the emerging chick(s) is fed and cared for by the female (and potentially the male), for potentially 16–18 days, until it or they leave the nest (i.e., fledging). The fledgling(s) is dependent on parental care for potentially 8–10 weeks post-fledging. Specific details on the breeding characteristics of the species are outlined below.

Nests of the friendly ground-dove consist of interwoven vines, stems, and rootlets and occur 3–10 feet (1–3 meters) above the ground (Baptisa et al. 1997, pp. 180–186). Clutch size is 1–2 eggs (Baptisa et al. 1997, pp. 180–186). Rinke et al. (1992, p. 309) reported the following measurements from eight eggs from captive bred friendly ground-doves from Tonga: mean length 1.22 in (31 millimeters [mm]) (range 1.17–1.33 in [29.6–33.7 mm]) and mean width 0.96 in (24.5 mm) (range 0.93–0.98 [23.7–25.0 mm]). Similar data is not available for the American Sāmoa Distinct Population Segment (DPS). Duration of incubation for the friendly ground-dove is unknown. However, data from related species ranged from 13–16 days (Baptisa et al. 1997, pp. 180–186). Information on the duration of the fledgling stage is unknown. Kremer et al. (2014, p. 71) report that the white-throated ground-dove (*Alopecoenas xanthonura*) is weaned at 50–60 days in captivity. Kayano et al. (2019, p. 20) noted that both adults care for young post-fledgling.

#### 2.3.1.2 Abundance, population trends (e.g., increasing, decreasing, stable), demographic features (e.g., age structure, sex ratio, family size, birth rate, age at mortality, mortality rate, etc.), or demographic trends:

Friendly gound-dove breeding success, juvenile survival, adult survival, and lifespan are unknown and specific data on the duration of the different breeding stages is unavailable. Birdlife International (2016, entire) estimated that total population size for the species was between 2,500 and 9,999 individuals. Kayano et al. (2019, p. 21) gave a preliminary population estimate of 249 individuals for the American Sāmoa DPS of the species in 2018; with more birds estimated for Ofu then Olosega, 145 and 104 individuals, respectively. The locations of reported friendly ground-dove observations on Ofu and Olosega are summarized in Figure 1.

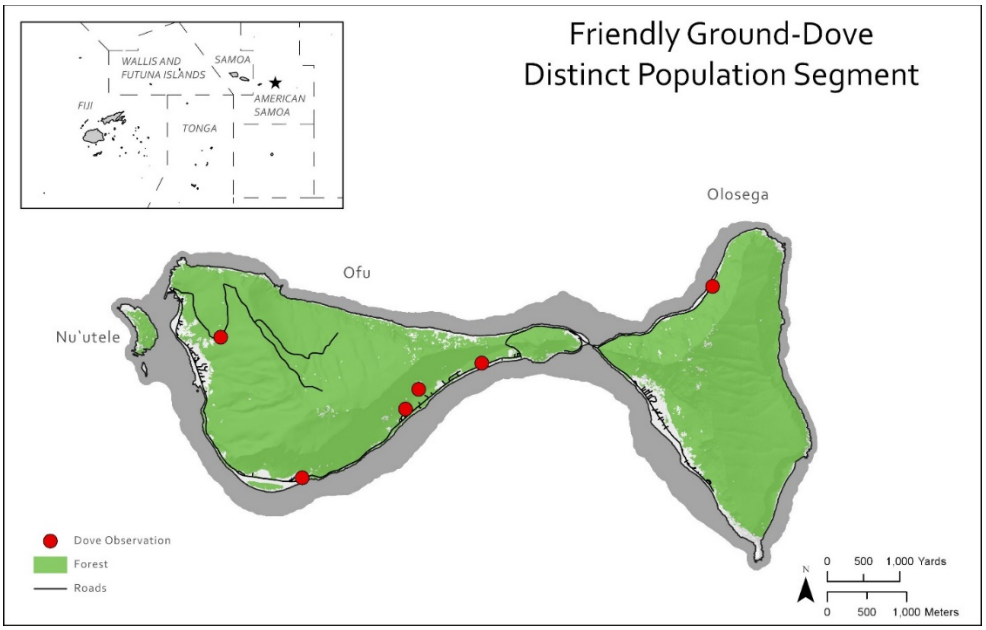

Figure 1. Locations of reported friendly ground-dove observations from the late 1970s to 2018.

The friendly ground-dove's distribution has been reduced from estimated historic levels. In the Samoan archipelago it is known to only occur in ʻUpolu, Nuʻulua, Nuʻutele, and Ofu, and Olsoega in the Manuʻa Islands (Figure 2; Freifeld et al. 2001, p. 79; Parrish and Sherley 2012, p. 158; Birdlife International 2016, entire; Pratt and Mittermeier 2016, p. 223; Pyle and Kayano 2019, p. 8). Atherton and Jefferies (2012, p. 100) reported that the species was absent from Savaiʻi. For the American Sāmoa DPS, the species is only reported to occur on Ofu and Olosega (Pyle and Kayano 2019, p. 8). In Fiji, the species is no longer found in Vatulele and while in Tonga it is no longer found in the Tongatapu groups (Figure 3 and Figure 4). In Wallis and Futuna the species is now restricted to Alofi, though Thibault et al. (2015, p.32) reported the species was absent in 2008, 2011, and 2014.

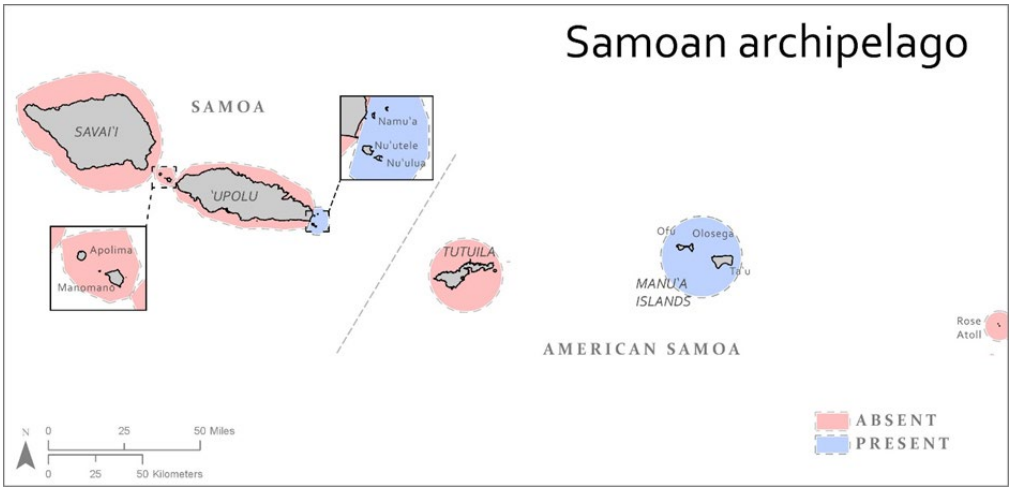


Figure 2. The estimated current distribution of the friendly ground-dove in the Samoan archipelago.

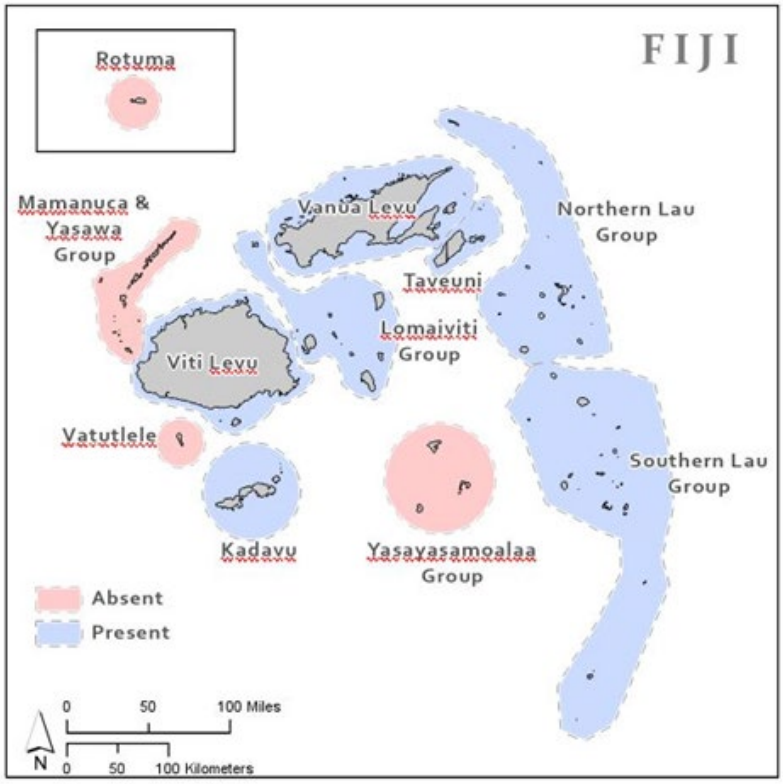


Figure 3. The estimated current range of the friendly ground-dove in the Fijian archipelago.

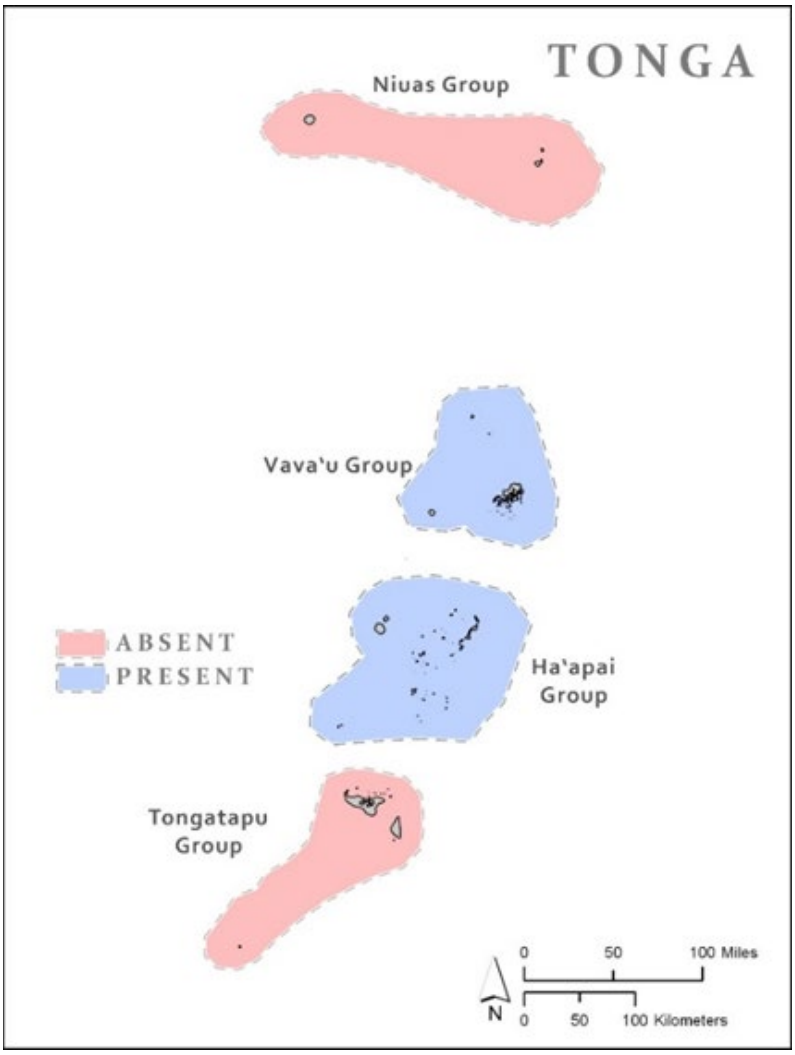

Figure 4. The estimated current range of the friendly ground-dove in the Tongan archipelago.

**2.3.1.3 Genetics, genetic variation, or trends in genetic variation (e.g., loss of genetic variation, genetic drift, inbreeding, etc.):**

Some authors recognize two subspecies of the friendly ground-dove: One, slightly smaller, in the Samoan archipelago (*Gallicolumba stairi stairi*), and the other in Tonga and Fiji (*Gallicolumba stairi vitiensis*) (Mayr 1945, pp. 131–132). However, morphological differences between the two are slight (Watling 2001, p. 117), and no genetic or other studies have validated the existence of separate subspecies.

**2.3.1.4 Taxonomic classification or changes in nomenclature:**

Genetic work by Jonsson et al. (2011, entire) determined that the original *Gallicolumba* genus includes two separate genera: *Alopecoenas* and *Gallicolumba*. Bruce et al. (2016, pp. 89–90) recommends that the more

senior genus *Pampusana* (Bonaparte 1855) replaces the junior genus *Alopecoenas* (Sharpe 1899).

**2.3.1.5 Spatial distribution, trends in spatial distribution (e.g., increasingly fragmented, increased numbers of corridors, etc.), or historic range (e.g., corrections to the historical range, change in distribution of the species' within its historic range, etc.):**

The friendly ground-dove is endemic to the Samoan, Fijian and Tongan archipelagos and the Wallis and Futuna Islands (Figure 5; Watling 2001, p. 118). In the Samoan archipelago it occurred in Savai'i, 'Upolu, Nu'ulua, Nu'utele, and Ofu, and Olsoega in the Manu'a Islands. There are no records of the species occurring on Tutuila and Ta'ū. In Fiji it's known to have occurred on the main islands of Viti Levu, Vanua Levu, Taveuni, Kadaavu, Vatulele and their associated offshore islands and in the Lomaiviti, Northern Lau, and Southern Lau groups (Watling 2001, p. 118). In Tonga it occurred in the Vava'u, Ha'apai, and Tongatapu groups. In Wallis and Futuna it occurred on Wallis, Futuna, and Alofi (Watling 2001, p. 118).

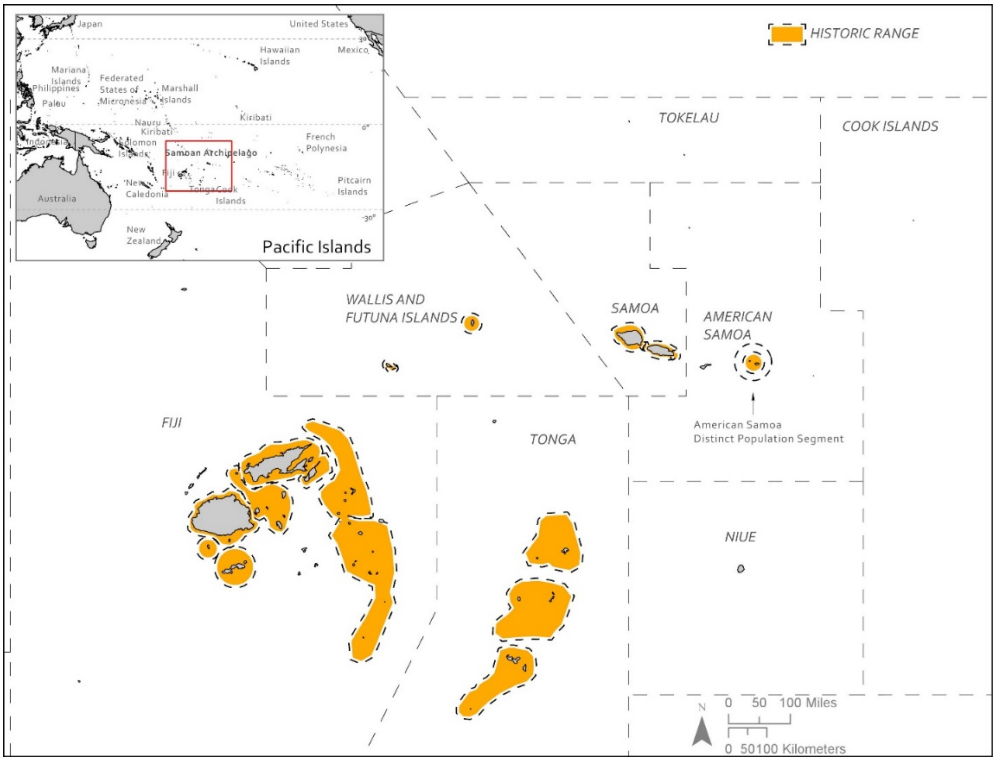

Figure 5. The estimated historic range of the friendly ground-dove (Watling 2001, p. 118).

There are no overall population estimates for the species historically. For the American Sāmoa DPS, Amerson et al. (1982a, p. 69) estimate a total population of about 100 birds on Ofu and possibly Olosega in the late 1970s. Engbring and Ramsey (1989, p. 57) described the population on Ofu as ''very

small,'' but did not attempt a population estimate for 1986 (Table 1). There are no prior population estimates for the American Sāmoa DPS.

Table 1. Known populations of the friendly ground-dove from listing to this 5-year review.

| Date | Populations | Individuals | Recovery Criteria[1] |
|---|---|---|---|
| 2016 listing | 1 | <100[2] | N/A |
| 2019 recovery outline | unknown | unknown | N/A |
| 2021 5-year review | unknown | unknown | N/A |

[1]N/A = not available; the recovery plan and species-specific recovery criteria is currently under development and is expected to publish in 2021.
[2] Engbring and Ramsey 1989, p. 57

#### 2.3.1.6 Habitat or ecosystem conditions (e.g., amount, distribution, and suitability of the habitat or ecosystem):

Before the arrival of Polynesians, approximately 3,000 years ago, the Samoan archipelago was likely covered by forest, except for recent volcanic flows, marshes, and steep and windswept regions of the islands (Amerson et al. 1982b, p. 20; Mueller-Dombois and Fosberg 1998, p. 360). Thousands of year of subsistence agriculture and, more recent, commercial agriculture has resulted in the alteration and great reduction in area of forests at lower elevations in the Samoan archipelago (Whistler 1994, p. 40; Mueller-Dombois and Fosberg 1998, p. 361; Whistler 2002, pp. 130–131). The loss or modification of lowland and coastal forests has been implicated as a limiting factor for populations of the friendly ground-dove and has likely pushed this species into more disturbed areas or forested habitat at higher elevations (Watling 2001, p. 118).

Approximately 70 percent of American Sāmoa is forested, with the majority classified as lowland tropical rainforest (Figure 6). Montane rainforest makes up a smaller percent of the forest areas and is primarily restricted to Ta‘u with a small amount on Tutuila (Figure 6).

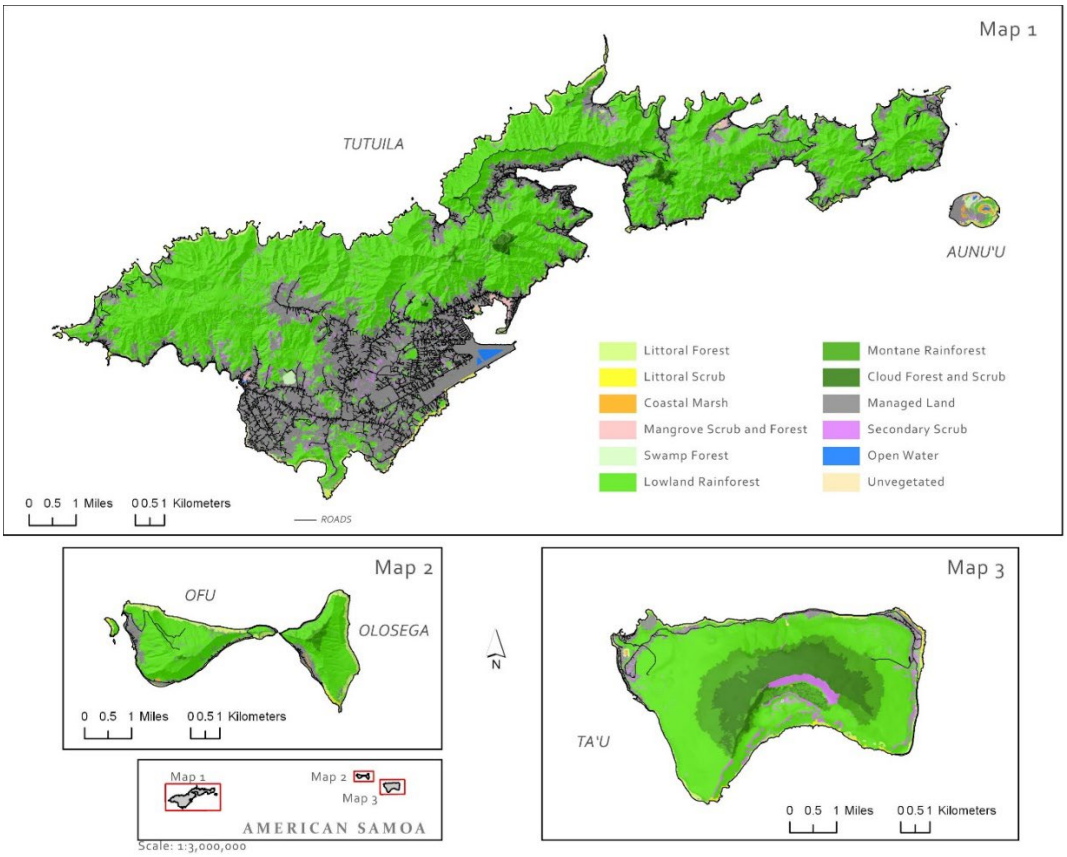


Figure 6. Vegetation land cover on American Sāmoa (Meyer et al., 2017, entire).

### 2.3.2 Five-Factor Analysis (threats, conservation measures, and regulatory mechanisms)

#### 2.3.2.1 Present or threatened destruction, modification or curtailment of its habitat or range:

*Habitat Destruction and Modification by Agriculture and Development* – On the island of Tutuila, American Sāmoa, agriculture and urban development covers approximately 8,100 ac (3,278 ha [24 percent]) of the island, and up to 20,250 ac (8,195 ha [60 percent]) of the island contains slopes of less than 30 percent where additional land clearing is feasible (ASCC 2010, p. 13; DWMR 2006, p. 25). Farmers are increasingly encroaching into some of the steep forested areas as a result of suitable flat lands already being occupied with urban development and agriculture (ASCC 2010, p. 13). Consequently, agricultural plots have spread from low elevations up to middle and some high elevations on Tutuila.

*Habitat Destruction or Modification by Nonnative Ungulates* – Feral pigs (*Sus scrofa*) are known to cause deleterious impacts to ecosystem processes and functions throughout their worldwide distribution (Aplet et al. 1991, p. 56; Anderson and Stone 1993, p. 201; Campbell and Long 2009, p. 2,319). Feral pigs are extremely destructive and have both direct and indirect impacts on native plant communities. Feral pigs are a major vector for the establishment and spread of invasive, nonnative plant species by dispersing plant seeds on their hooves and fur, and in their feces (Diong 1982, pp. 169–170, 196–197), which also serve to fertilize disturbed soil (Siemann et al. 2009, p. 547). In addition, pig rooting and wallowing contributes to erosion by clearing vegetation and creating large areas of disturbed soil, especially on slopes (Smith 1985, pp. 190, 192, 196, 200, 204, 230–231; Stone 1985, pp. 254–255, 262–264; Tomich 1986, pp. 120– 126; Cuddihy and Stone 1990, pp. 64–65; Aplet et al. 1991, p. 56; Loope et al. 1991, pp. 18–19; Gagne and Cuddihy 1999, p. 52; Nogueira-Filho et al. 2009, p. 3,681; CNMI–SWARS 2010, p. 15; Dunkell et al. 2011, pp. 175–177; Kessler 2011, pp. 320, 323). Erosion resulting from rooting and trampling by feral pigs impacts native plant communities by contributing to watershed degradation and alteration of plant nutrient status, and increasing the likelihood of landslides (Vitousek et al. 2009, pp. 3,074–3,086; Chan-Halbrendt et al. 2010, p. 251; Kessler 2011, pp. 320–324).

In American Sāmoa, feral pigs negatively affect forested habitats. Feral pigs have been present in American Sāmoa since humans first settled the islands (American Sāmoa Historic Preservation Office 2002, p. 5). In the past, hunting pressure kept their numbers down, however, increasing urbanization and increasing availability of material goods has resulted in the decline in the practice of pig hunting to almost nothing (Whistler 1992, p. 21; 1994, p. 41). Feral pigs are moderately common to abundant in many forested areas, where they spread invasive plants, damage understory vegetation, and destroy riparian areas by their feeding and wallowing behavior (DMWR 2006, p. 23; ASCC 2010, p. 15).

Feral pigs are a serious problem in the National Park of American Sāmoa (NPSA) because of the damage they cause to native vegetation through their rooting and wallowing (Whistler 1992, p. 21; Whistler 1994, p. 41; Hoshide 1996, p. 2; Cowie and Cook 1999, p. 48; Togia pers. comm. in Loope et al. 2013, p. 321). Such damage to understory vegetation is likely to reduce foraging opportunities for the friendly ground-dove. Feral pig densities have been reduced in some areas by snaring and hunting, but remain high in other areas (ASCC 2010, p. 15).

*Habitat Destruction and Modification by Nonnative Plant Species* – Nonnative plants are known to have invaded native ecosystems in American Sāmoa and Sāmoa, with documented adverse impacts to native forests (Space and Flynn 2000, pp. 5, 12; Space and Flynn 2002, pp. 4–5; Whistler 2002, p.

122; Atkinson and Medeiros 2006, pp. 17–18; Craig 2009, pp. 94, 98; ASCC 2010, p. 22; NPSA 2012, in litt., entire; Atherton and Jeffries 2012, p. 103; Butler and Stirnemann 2013, p. 30; MNRE 2013, p. 29). The native flora of the Samoan archipelago (plant species that were present before humans arrived) consisted of approximately 550 taxa, 30 percent of which were endemic (species that occur only in the American Sāmoa and Sāmoa) (Whistler 2002, p. 8). An additional 250 plant species have been introduced intentionally or accidentally and have become naturalized, with 20 or more of these considered invasive or potentially invasive in American Sāmoa (Whistler 2002, p. 8; Space and Flynn 2000, pp. 23–24). Of these approximately 20 or more nonnative pest plant species, at least 11 have altered or have the potential to alter friendly ground-dove foraging and nesting habitat and include: *Adenanthera pavonina* (lopa, red bean tree, coral bean tree), *Castilla elastica* (pulu mamoe, Mexican rubber tree), *Cinnamomum verum* (tinamoni, cinnamon), *Clidemia hirta* (Koster's curse), tamaligi, *Funtumia elastica* (pulu vao, African rubber tree), *Leucaena leucocephala* (fua pepe, lusina, wild tamarind,), *Merremia peltata* (fue lautetele, merremia), *Mikania micrantha* (fue saina, mile-a-minute vine), *Psidium cattleianum* (kuava, strawberry guava), and *Spathodea campanulata* (faapasi, African tulip) (Atkinson and Medeiros 2006, p. 18; Craig 2009, pp. 94, 97–98; ASCC 2010, p. 15).

Nonnative plants can degrade or destroy native habitat in Pacific island environments by: (1) modifying light availability by altering canopy structure; (2) altering soil-water regimes; (3) modifying nutrient cycling; (4) converting native-dominated plant communities to nonnative plant communities; and (5) increasing the frequency of landslides and erosion (Smith 1985, pp. 217–218; Cuddihy and Stone 1990, p. 74; Matson 1990, p. 245; D'Antonio and Vitousek 1992, p. 73; Vitousek et al. 1997, pp. 6–9; Atkinson and Medeiros 2006, p. 16). Nonnative plant species often exploit disturbance caused by other factors such as tropical cyclones, agriculture, development, and feral ungulates. In combination, these disturbances reinforce or exacerbate their negative impacts to native habitats.

#### 2.3.2.2 Overutilization for commercial, recreational, scientific, or educational purposes:

Pigeon-catching was a traditional practice in ancient Samoan society (Craig 2009, p. 104). Hunting of terrestrial birds and bats in American Sāmoa primarily for subsistence purposes continued until the documented decline of wildlife populations led to the enactment of a hunting ban and formal hunting regulations (Craig et al. 1994, pp. 345– 346). The bird species most commonly taken were the lupe (Pacific pigeon, *Ducula ducula*) and the manutagi (purple-capped fruit-dove, *Ptilinopus porphyraceus*). Although the manuma (many-colored fruit dove, *Ptilinopus perousii*) is too rare to be sought by hunters, a few may have been killed each year by hunters in search

of the Pacific pigeon or purple-capped fruit-dove (Craig 2009, p. 106). The accidental killing of the friendly ground-dove by hunters in pursuit of other bird species (during a sanctioned hunting season) has the potential to occur. However, poaching is not considered a current threat to the friendly ground-dove in American Sāmoa (Seamon 2004a, in litt., entire; Seamon 2004b, in litt., entire). In addition, the use of firearms on the islands of Ofu and Olosega has rarely, if ever, been observed (Caruso 2015, in litt., entire). Based on the best available scientific and commercial information, we do not consider the overutilization for commercial, recreational, scientific, or educational purposes to be a current threat to the friendly ground-dove.

**2.3.2.3 Disease or predation:**

*Disease* – Research suggests that avian malaria may be indigenous and non-pathogenic in American Sāmoa, and, therefore, is unlikely to limit populations of the friendly ground-dove (Jarvi et al. 2003, p. 636; Seamon 2004a, in litt., entire). Although other blood parasites are common in many bird species in American Sāmoa, none have been reported to date in friendly ground-dove samples (Atkinson et al. 2006, p. 232). The best available information does not show there are other avian diseases that may be affecting this species.

*Predation by Domestic and Feral Cats* – Predation by domestic and feral cats (collectively referred to as cats, *Felis catus*) have been directly responsible for the extinction of numerous birds on oceanic islands (Medina et al. 2011, p. 6). Native mammalian carnivores are absent from oceanic islands because of their low dispersal ability, but once introduced by humans, they can become significant predators on native animals such as seabirds and land birds that are not adapted to predation by terrestrial carnivores (Nogales et al. 2013, p. 804; Scott et al. 1986, p. 363; Ainley et al. 1997, p. 24; Hess and Banko 2006, in litt., entire). Cats have been observed on all of the islands of American Sāmoa (Coffman 1977, p. 787) and have been observed in remote areas known to be frequented by ground-doves and may prey on friendly ground-doves (Arcilla 2015, in litt., entire). There are no confirmed observations of predation by cats. However, Kayano et al. (2019, p. 19) reported finding a dead juvenile friendly ground-dove and suspected that cat predation was the likely cause of death.

*Predation by Rats* – Nest predation by rats (*Rattus* spp.) has negative impacts on many island birds (Atkinson 1977, p. 129; Atkinson 1985, pp. 55–70; Butler and Stirnemann 2013, p. 29; O'Donnell et al. 2015, pp. 24–26). Three species of rats occur in American Sāmoa and are likely to be present on the islands of Ofu and Olosega: the Polynesian rat (*Rattus exulans*), Norway rat (*Rattus norvegicus*), and black rat (*Rattus rattus*) (Coffman 1977, pp.766, 772; Atkinson 1985, p. 38; DMWR 2006, p. 22; Caruso 2015, in litt., entire). The best available information is not specific to rat predation on the American Sāmoa DPS of the friendly ground-dove, but the presence of rats throughout

American Sāmoa makes it likely that they may play a role in limiting populations of this species.

#### 2.3.2.4 Inadequacy of existing regulatory mechanisms:

Based on the best available information, no existing Federal regulatory mechanisms address the threats to the friendly ground-dove. Some existing regulatory mechanisms in Sāmoa and American Sāmoa have the potential to offer some protection of the friendly ground-dove and its habitat, but their implementation does not reduce or remove threats to the species such as habitat destruction or modification or predation by nonnative species such that listing is not warranted (Table 2). For these reasons, existing regulatory mechanisms do not address the threats to the friendly ground-dove.

#### 2.3.2.5 Other natural or manmade factors affecting its continued existence:

*Tropical Cyclones (Hurricanes)* – Tropical Cyclones (hurricanes) are a common natural disturbance in the tropical Pacific and have occurred in the Samoan archipelago with varying frequency and intensity. Although severe storms are a natural disturbance with which the Mao has coexisted for millennia, such storms can exacerbate the threats to its remaining small, isolated populations by, at least temporarily, damaging or redistributing habitat and food resources for the birds and causing direct mortality of individuals (Wiley and Wunderle 1993, pp. 340–341; Wunderle and Wiley 1996, p. 261).

*Low Numbers of Individuals and Populations* – Species with low numbers of individuals, restricted distributions, and small, isolated populations are often more susceptible to extinction as a result of natural catastrophes such as hurricanes or disease outbreaks, demographic fluctuations, or inbreeding depression (Shaffer 1981, p. 131). These problems associated with small population size are further magnified by interactions with each other and with other threats, such as habitat loss and predation (Lacy 2000, pp. 45–47). The American Sāmoa DPS of the friendly ground-dove is at risk of extinction because of its low number of individuals and limited distribution on the islands of Ofu and Olosega, conditions that render this DPS vulnerable to the small-population stressors listed above. These stressors include environmental catastrophes, such as hurricanes, which could immediately extinguish some or all of the remaining populations; demographic stochasticity that could leave the species without sufficient males or females to be viable; and inbreeding depression or loss of adaptive potential that can be associated with loss of genetic diversity and result in eventual extinction. These small population stressors are a threat to the American Sāmoa DPS of the friendly ground-dove, and this threat is exacerbated by habitat loss and degradation and predation by nonnative mammals.

*Effects of Climate Change* – There are no climate change studies that directly

address impacts to the specific habitats of the American Sāmoa DPS of the friendly ground-dove. The scientific assessment completed by the Pacific Science Climate Science Program (Australian Bureau of Meteorology and Commonwealth Scientific and Industrial and Research Organization 2011, Vol. 1 and Vol. 2, entire) provides general projections or trends for predicted changes in climate and associated changes in ambient temperature, precipitation, hurricanes, and sea level rise for countries in the western tropical Pacific region including Sāmoa (used as a proxy for American Sāmoa).

Although there is not specific information on the impacts of the effects of climate change to the American Sāmoa DPS of the friendly ground-dove, increased ambient temperature and precipitation, and increased severity of hurricanes, would likely exacerbate other threats to this species as well as provide additional stresses on its habitat. The probability of species extinction as a result of climate change impacts increases when its range is restricted, habitat decreases, and numbers of populations decline (IPCC 2007, p. 48). The American Sāmoa DPS of the friendly ground-dove is limited by its restricted range and low numbers of individuals. Therefore, this species is expected to be particularly vulnerable to the environmental effects of climate change and subsequent impacts to its habitat. Although we cannot predict the timing, extent, or magnitude of specific impacts, we do expect the effects of climate change to exacerbate the current threats to these species, such as habitat loss and degradation.

Table 2. Status of threats to the friendly ground-dove and ongoing conservation efforts.

| Threat | Listing Factor | Current Status | Conservation/Management Efforts |
|---|---|---|---|
| Deforestation - agricultural/urban development | A | Ongoing | None |
| Nonnative plants | A | Ongoing | None |
| Nonnative ungulates | A | Ongoing | None |
| Collection | B | Ongoing | None |
| Cat predation | C | Ongoing | None |
| Rat predation | C | Ongoing | None |
| Inadequate existing regulatory mechanisms | D | Ongoing | Partial; Some existing regulatory mechanisms in Sāmoa and American Sāmoa have the potential to offer |

| Threat | Listing Factor | Current Status | Conservation/Management Efforts |
|---|---|---|---|
| | | | some protection of the friendly ground-dove and its habitat, but their implementation does not reduce or remove threats to the species such as habitat destruction or modification or predation by nonnative species such that listing is not warranted. |
| Cyclone impacts | E | Ongoing | None |
| Low population size | E | Ongoing | None |
| Loss of genetic diversity | E | Ongoing | None |

### 2.4 Synthesis

The friendly ground-dove is a medium-sized dove native to the Samoan, Fijian and Tongan archipelagos and Wallis and Futuna Islands. The American Sāmoa population of the friendly ground-dove was listed as endangered and a Distinct Population Segment (DPS) under the Endangered Species Act in 2016. Historically and currently, the American Sāmoa DPS of the friendly ground-dove is only known to occur on the islands of Ofu and Olosega. Population trend information is unavailable, but the population has remained consistently small (< 100 individuals) since at least the late 1970s.

The habitat of the American Sāmoa DPS of the friendly ground-dove remains degraded and destroyed by past land-clearing for agriculture, and hurricanes exacerbate the poor status of this habitat, a threat that is likely to continue in the future and worsen under the projected effects of climate change. The threat of predation by nonnative mammals such as rats and cats are a current threat and likely to continue in the future. The DPS of the friendly ground-dove persists in low numbers of individuals and in few and disjunct populations on two small islands, a threat that interacts synergistically with other threats. These factors pose threats to the American Sāmoa DPS of the friendly ground-dove, whether we consider their effects individually or cumulatively. Current Territorial wildlife laws and regulations and conservation efforts do not address the threats to this DPS, and these threats will continue in the future. Given the extent of threats, declining numbers of individuals and populations, and lack of management of these threats, this species best fits the definition of endangered. A draft recovery plan is expected to be completed in 2021.

## 3.0 RESULTS

### 3.1 Recommended Classification:

**____ Downlist to Threatened**

____ **Uplist to Endangered**
____ **Delist** (Indicate reasons for delisting per 50 CFR 424.11):

____ Extinction
____ *Recovery*
____ *Original data for classification in error*

_X__ **No change is needed**

**3.2 New Recovery Priority Number:**
No change

**Brief Rationale:**

**3.3 Listing and Reclassification Priority Number:**
No change

**Reclassification (from Threatened to Endangered) Priority Number: ____**
**Reclassification (from Endangered to Threatened) Priority Number: ____**
**Delisting (regardless of current classification) Priority Number: ____**

**Brief Rationale:**

## 4.0 RECOMMENDATIONS FOR FUTURE ACTIONS

- Finalize the Draft Recovery Plan for Five Species from American Sāmoa
- Identify and survey extant populations of moa and the habitats in which they occur to assess current distribution, abundance, and habitat use.
- Survey historically occupied areas for any persisting populations.
- Develop fine-scale climate models for the American Sāmoa DPS of friendly ground-dove to identify future suitable habitat based on existing and historical ranges and to determine potential future climate conditions.
- Identify and prioritize areas necessary for recovery, including critical habitat, and delineate representative management units
- Ensure long-term protection of management units.
- Monitor management and use results to adapt management actions.
- Develop and implement control programs for cats and rats, updating methods as new technology becomes available.
- Control other threats to specific species as appropriate.
- Monitor management and use results to adapt management actions.
- Expand the distribution of existing wild populations and establish additional populations.
- Utilize regulations and policy to support species recovery.

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**U.S. FISH AND WILDLIFE SERVICE**
**5-YEAR REVIEW of Mao *(Gymnomyza samoensis)***

**Current Classification**: Endangered

**Recommendation resulting from the 5-Year Review**:

____ Downlist to Threatened
____ Uplist to Endangered
____ Delist
__X__ No change needed

**Appropriate Listing/Reclassification Priority Number, if applicable**:

**Review Conducted By**:
James Breeden, Wildlife Biologist, PIFWO
John Vetter, Animal Recovery Coordinator, PIFWO
Megan Laut, Conservation and Restoration Team Manager, PIFWO

**FIELD OFFICE APPROVAL**:

for MEGAN LAUT Digitally signed by MEGAN LAUT Date: 2021.07.01 12:52:28 -10'00' _____ Date _____

**Lead Field Supervisor, Fish and Wildlife Service**