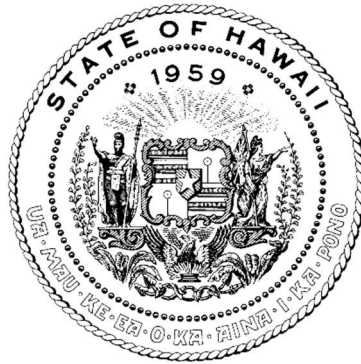


**REPORT TO THE THIRTY-SECOND LEGISLATURE  
STATE OF HAWAI‘I  
2024 REGULAR SESSION**

**REQUESTING THE DEPARTMENT OF LAND AND NATURAL RESOURCES TO  
PROVIDE UPDATED STATISTICS AND FACTS RELATING TO THE DECLINE OF  
PALILA ON MAUNA KEA AND INVESTIGATE THE FACTORS CAUSING THE  
DECLINE OF THE PALILA POPULATION**



Prepared by

THE STATE OF HAWAI‘I  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
DIVISION OF FORESTRY AND WILDLIFE

In Response to House Concurrent Resolution 50, Regular Session of 2023

Honolulu, Hawai‘i

December 2023

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Palila (*Loxioides bailleui*) currently are found only on the southwest slopes of Mauna Kea. Population surveys have been conducted annually since 1998 at standardized points along transects. The population estimates provided in this report are based on the number of birds detected during the survey, the probability of birds being detected (calculated using statistical models), and the area of habitat used by palila. Population estimates are based on the palila core use area, which is currently the primary range and distribution of palila (Figure 1).

Palila surveys have been conducted on transects that bisect the core palila population and areas outside the core across critical habitat. On average, only 1.4% of the birds detected during a survey were located on transects outside the core area. Beginning in 2008, surveys have concentrated on transects within the core, as most of the remaining population is in this area. A full mountain survey is scheduled for every five years, with the most recent conducted in 2022.

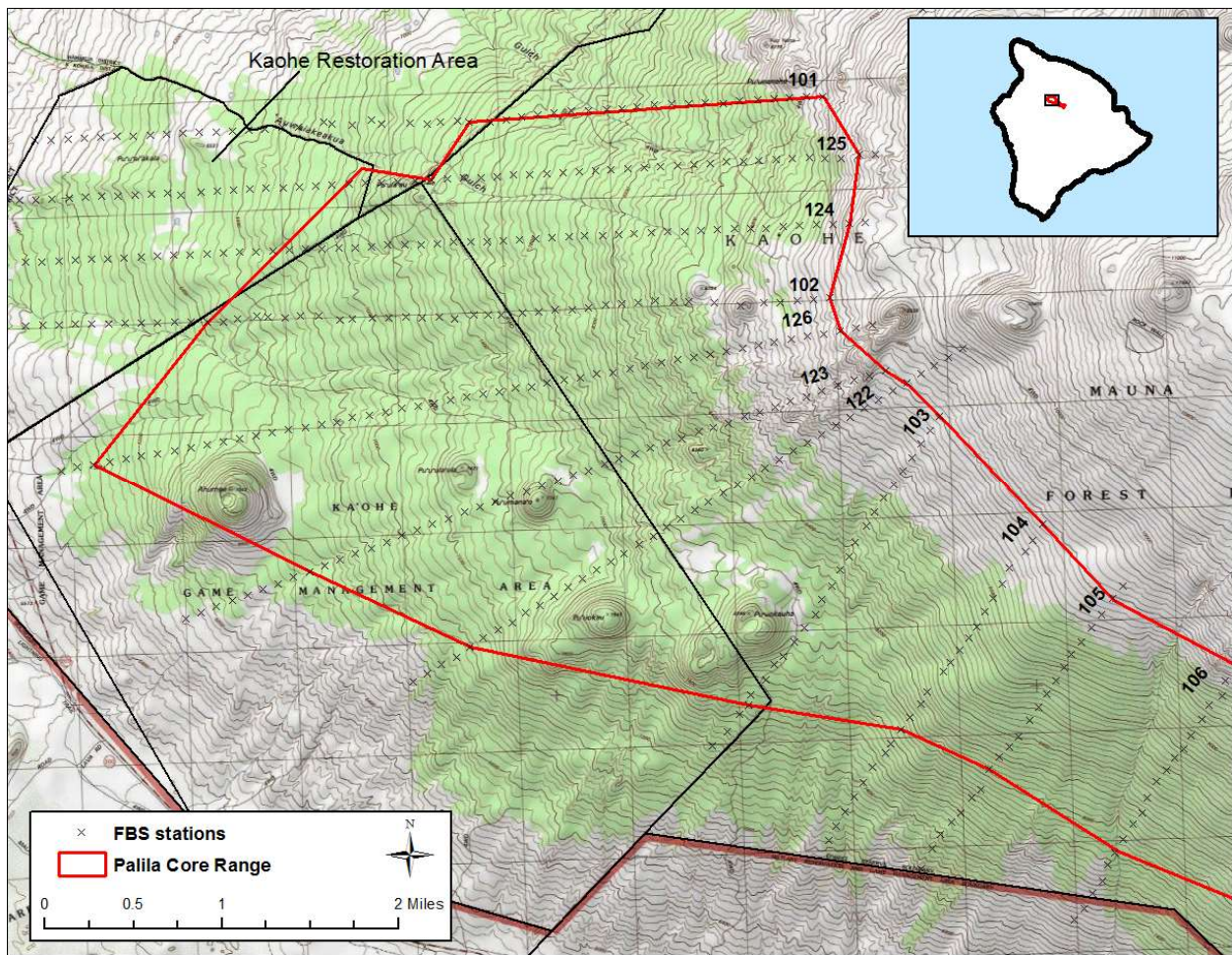
Evidence indicates that the palila population is declining dramatically (Genz et al. 2022, Table 1). A recent report published by the Department, the Pacific Cooperative Studies Unit, and United States Geological Survey gave population estimates of 1,432, 1,312, and 678 in 2019, 2020, and 2021, respectively (Genz et al. 2022, Table 1). The 2021 population estimate of 678 palila is the lowest estimate since annual surveys began in 1998. The Department began conducting quarterly palila population surveys in 2022 to more closely monitor the palila population. Survey data from the 2022 and 2023 annual surveys is currently being analyzed and results, including an updated population estimate, are expected to be publicly available by July 2024.

The cause of palila decline is currently unclear but is thought to be a combination of factors including destruction of the dryland forest ecosystem that sustained the palila due to introduced ungulates and invasive insects (*Naio* thrips), predation by introduced small mammal predators (cats, rats, and mongooses), and other environmental factors. Further investigation is a priority for the Department. The Department received funding from the U.S. Department of Defense Readiness and Environmental Protection Integration (REPI) Program to conduct a demographic study on palila to better understand causes of the population decline and plan recovery actions. This study project will commence in Fiscal Year (FY) 24 and include monitoring of palila nests to determine whether and to what extent invasive predators such as cats, rats, and mongooses are implicated in the decline. The Department and the United States Fish and Wildlife Service are also seeking funding to analyze previously collected *mamane* phenology survey data. This analysis could indicate whether, and to what extent, change in food availability, possibly due to changing climatic conditions, is a potential cause of decline for palila.

Identifying and addressing limiting factors is the highest priority for palila management, and critical given the species' long-time gradual and recent dramatic decline.

## REFERENCES

Genz, A.S., K.W. Brinck, C.K. Asing, L. Berry, R.J. Camp, P.C. Banko. 2022. 2019–2021 Palila abundance estimates and trend. Hawaii Cooperative Studies Unit Technical Report. <https://dspace.lib.hawaii.edu/handle/10790/6858>



**Figure 1.** Palila Core Range - current range and distribution of Palila on the southwest portion of Mauna Kea. Depicted are actual transects used in surveys.

**Table 1.** Number of Palila observed by year inside and outside the core area (on count detection only), and population estimate and 95% confidence interval lower limit and upper limit of the population estimate.

Year	# Detections Inside	# Detections Outside	Population Estimate	Lower Limit	Upper Limit
1998	313	2	4,634	3,786	5,565
1999	388	1	5,310	4,397	6,370
2000	234	14	3,079	2,445	3,731
2001	345	4	4,589	3,738	5,472
2002	339	9	4,616	3,794	5,560
2003	439	7	5,851	4,930	6,922
2004	371	9	5,013	4,182	5,889
2005	315	1	4,214	3,436	5,077
2006	271	16	3,909	3,161	4,734
2007	210	3	2,932	2,385	3,570
2008	186	Na	2,659	2,172	3,262
2009	189	Na	2,411	1,881	3,033
2010	151	Na	1,610	1,267	2,044
2011	119	Na	1,338	989	1,745
2012	362	0	2,133	1,698	2,619
2013	337	Na	1,756	1,454	2,080
2014	355	0	2,017	1,654	2,428
2015	192	1	1,116	852	1,406
2016	319	4	1,934	1,494	2,385
2017	248	9	1,461	1,177	1,813
2018	99	3	1,051	778	1,420
2019	146	4	1,432	1,030	1,899
2020	141	0	1,312	964	1,700
2021	101	0	678	452	940