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CPSU/UH Avian History Report 9
HISTORY OF ENDEMIC HAWAIIAN BIRDS

Part I. POPULATION HISTORIES--SPECIES ACCOUNTS
Forest Birds: 'Akialoa, Nukupu'u & 'Akiapōlā'au

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Part I. POPULATION HISTORIES--SPECIES ACCOUNTS
Forest Birds:

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ABSTRACT

Hemignathus procerus is a small, short-tailed, yellowish to olive-green forest bird with an extremely long decurved bill. It is endemic to the island of Kaua'i. Exhaustive search of literature and field journals uncovered some 81 observational notes, collection records, reports, and related statements on relative abundance and geographical distribution from 1888 to 1977. All records are serially numbered, arranged in geographical and chronological order, referenced, and systematically analyzed.

Hemignathus procerus was found by ornithologists in the 1890's to be quite numerous in some localities and scarce in others over a broad altitudinal and geographical range. By 1900 fewer were reported in the principal specimen collecting areas. Since 1900 this species has reportedly been seen only four times. It was last seen in 1965. None were detected during 500 days of intensive field surveys conducted islandwide from 1968 to 1975. The Kaua'i 'Akialoa is presumably extinct.

34. Hemignathus procerus
'Akialoa

Hemignathus procerus is a small (ca. 7-inch long), short-tailed, mostly yellow (male) to mostly olive (female) forest bird with an extremely long decurved bill (Wilson & Evans 1892; Rothschild 1893). It is endemic to the island of Kaua'i. Originally described by Cabanis in 1899 (Rothschild 1893) H. procerus differs chiefly from H. obscurus on O'ahu, Lana'i, and Hawai'i by the males having a culmen more than 2.5 inches long (Rothschild 1900). 'Akialoa is the native Hawaiian name for both H. procerus and H. obscurus (Pyle 1977).

Numbers and principal repositories of 102 H. procerus specimens are as follows: Bernice Pauahi Bishop Museum (26), American Museum of Natural History (25), National Museum of Natural History (8), and 43 scattered in 11 other U. S. and foreign museums (Banko 1979 report) (1).

Wilson and Evans (1892), Rothschild (1893), and Perkins (1903) document nearly all of what is known of the Kaua'i 'Akialoa from field observations. Berger (1972) provides a recent overview of this species.

OBSERVATIONS, REPORTS, AND SPECIMEN RECORDS

Drawing conclusions from a large volume of historical information on relative abundance and distribution of Hemignathus procerus required that data be geographically arranged and chronologically ordered in a systematic fashion, as outlined in the Introduction to Part I (CPSU/UH Avian History Report 4). Records presented in Appendix I satisfy criteria necessary for basic documentation and comparative analysis.

In the following descriptive account, sources of published information are cited by author and year in the usual style. One or two digit numbers in parentheses refer to specific records in Appendix I. Sources of published and unpublished information listed in Appendix I may be traced to complete references in the bibliography.

Early Notes and Records (1888-1900):

V. Knudsen obtained three specimens of H. procerus prior to the arrival of S. B. Wilson in 1888, but neither the date nor locality of collection was apparently recorded (Stejneger 1888) (14). Of a total of 10 specimens collected by Wilson none were labeled with the name of the locality, while the year of collection (1888) was inscribed on the tags of only four (16,

17). Wilson (1890) noted that this species ranged "from the lowest forest zone to 3000 ft. or perhaps higher" and that he obtained but a few examples, it being "very scarce" in September (1, 15); later (Wilson & Evans 1892), after incorporating G. C. Munro's 1891 observations, he modified his statement on relative abundance of this species to one which stated only that it "appeared to be rather scarce" (2). Munro (Wilson & Evans 1892) termed the H. procerus "more common" than Nukupu'u (Hemignathus lucidus hanapepe) and noted that it "seems to inhabit the whole forest region of Kauai" (3). Later, Munro (1944) stated that this species was found in "all parts" of the Kaua'i forest (in 1891), from the upper plateau to the forest edges near the sea coast on the north side (5). Informed by H. C. Palmer and G. C. Munro, Rothschild (1893) stated in 1891 that 'Akialoa was "seen" on the south and southwest sides of Kaua'i from 900 to "probably 3000 to 4000 ft. elevation," was "common at 3000 ft. - only a few seen higher" - on the west side of the island, and was "not quite so numerous (as on the south and southwest sides) on the north and northeast sides at elevations of about 600 to 2000 to 3000 ft." (31, 31a, 32). Rothschild (1893) summarized the range of this species by stating, "Palmer believes that it inhabits all the upland forests of the island" (4). Palmer is associated with the collecting of some 26 specimens of H. procerus in 1891, all in undesignated localities (20). Three specimens taken by unspecified collectors in 1891 and 1892 found their way into Wilson's collection (18, 19).

Perkins (1903, field journal) collected widely on Kaua'i in 1894 and 1895, leaving a trail of specific records which will be cited later by locality. In addition, Perkins (Banko 1979 report) obtained five specimens of H. procerus in undesignated place(s), tagging three "4000" feet elevation (21, 22). In conclusion, Perkins (1903) stated that this species was "not at all rare at various elevations and in many localities," that it was "much more numerous and much more widespread" than the Nukupu'u, and that it was noticed "generally" throughout the forest wherever he collected birds "from nearly the highest point of the mountains to 1,500 feet and even at lower elevations" (6-8).

Munro is quoted by Wilson and Evans (1892) as stating that toward the end of March 1891, the Kaua'i 'Akialoa was "as plentiful at Halemanu (V. Knudsen's mountain house, on the western end of Kaua'i, MAKAHA POINT quadrangle) as at Kahōluamanu (43). Perkins (field journal) recorded seeing this species several times and collected one at a certain place ca. 4000 feet elevation along the trail up from Halemanu in May 1895, commenting that this species was "not common just here" at that season (35-37). Later, about 1900, A. F. Judd collected a specimen below Halemanu, at Pu'uka Pele (38).

On the north side of Kaua'i, near Hanalei, Munro recorded hearing and seeing this species "generally in pairs chasing each other about," terming it "not uncommon" when visiting the area with Palmer in April 1891 (40, 41).

The Kaua'i 'Akialoa was also seen and/or collected on the southwest and southeast sides of the island. Wilson and Evans (1892) quote Munro as saying this species was "less common" above Makaweli in January and February 1891 than at other places visited (76). Two specimens were secured near Makaweli in November 1893, apparently by F. Gay and A. Robinson (77). Perkins (field journal) stated that H. procerus was "fairly common" between 2000 and 3000 feet along one ridge between Hanapēpē and Makaweli during his visit in January and February 1897 (79), and one specimen was taken by an undesignated collector near Makaweli a few years later on 5 February 1899 (78). Perkins (field journal) also found this species to be present in the southeast part of the island "at a good elevation in the mountains some miles west from Lihue" during his July and August 1896 visit (81).

But it is from the south central part of Kaua'i, in the area of F. Gay's mountain house at Kahōluamanu, that the Kaua'i 'Akialoa was most often seen and collected during the early 1888 to 1900 period. Munro was quoted by Wilson and Evans (1892) and Rothschild (1893) as stating that this species at the end of February and beginning of March 1891 was "more common" at Kahōluamanu than at Makaweli, and towards the end of March 1891 was "as plentiful" at Kahōluamanu as at Halemanu (42, 43). Munro is credited with one specimen collected at Kahōluamanu on an unrecorded date in 1891 (44). Perkins (field journal) collected at least five specimens on the upper slopes and ridges of Hanapēpē Valley "quite a few miles from Makaweli," and recorded seeing this species on another occasion during his May and June 1894 visit (45, 51, 52). Perkins (field journal) also collected three specimens and noted presence of the 'Akialoa on two other occasions in the Kahōluamanu area during this same period. Perkins revisited Kahōluamanu in April 1895 where between the 13th and 28th of the month he recorded collecting 11 specimens (losing one) and seeing a number of others (53-62). Upon returning in October to the "high plateau above Waimea" Perkins (field journal) judged that he saw about three 'Akialoa to one of Nukupu'u (63). The name of Perkins is associated with some 14 or 15 specimens collected in the Kahōluamanu area during the 1894/1895 period (64, 65).

Bryan and Seale (1901) observed and collected 'Akialoa in the Kahōluamanu area in April and May 1900. Seale apparently took four specimens, one of which was "well on the way toward the summit of Waialeale" (Bryan & Seale 1901; Banko 1979 report). Bryan and Seale (1901) recorded seeing "a number of others" than those collected but noted that they were "very wary and hard to approach, generally keeping to the higher altitudes, none being seen below 3500 ft." elevation (66-68).

In addition to the above records there are a number of specimens in various repositories with incomplete data. Munro's name is on labels of four specimens obtained in unspecified place(s) in 1898. H. W. Henshaw's name is associated with the

collection of one specimen taken on 11 February 1899 in an undesignated locality, though he is not known from the literature to have ever visited Kaua'i (Banko 1979 report). Some 16 other specimens without name of collector or locality are extant, most known or presumed taken in the 1890's (one obtained in 1900).

Later Observations (1901-1959):

Donaghho (1941) reported seeing one 'Akialoa in the upper Wai'alae Valley "along the trail further down (than 'Ō'ū seen) on 6 October (presumably in 1941) (69). Munro (1944) credits Donaghho's sighting (28), made somewhere above Kahōluamanu, and goes on to say that he (Munro) had not seen or heard anything of it in "all his visits to the Kauai forests since 1920" and that the species is probably near extinction (9, 10). Richardson and Bowles (1964) reported that Knudsen seemed "certain" to have seen a group in an unspecified locality in 1957 (29).

Recent Records (1960-1979):

During their June to August 1960 survey Richardson and Bowles (1964), collecting one of only two individuals seen, rediscovered what were apparently among the last surviving 'Akialoa at 4000 feet elevation in the high forested ridge country within a mile southeast of the upper Koaie River cabin (70-72). Hart (1974) reported that he did not see this species during an undated (? 1974) 4-day field trip in the west Alaka'i Swamp (39). Donaghho (1965) stated that the range of this species is "now (August 1965) bounded by the Koaie to the west and the Olokele to the east" (33). L. N. Huber, an ornithologist employed by the Smithsonian Institution, and R. S. Heiden reported watching a single 'Akialoa from 12 to 15 minutes (total time) in March 1965 "close to one mile past the Koaie Cabin, on the Koaie - Wai'alae Trail" (Huber & Heiden 1966) (73); their 1965 observation records the last time H. procerus was seen alive.

Anonymous (1966) stated that none were seen during a 28 to 30 May 1966 field trip (? to Alaka'i Swamp) (30), and Donaghho (1978) reported that it was "not found" on a trip he made within "two miles from the Koaie gulch" on 28 August 1967 (74). The Hawaii Division of Fish and Game (1969 report) officially classed H. procerus as endangered (11). Berger (1970) stated that this species "must be very rare, probably close to extinction" (34). Speaking for the U. S. Fish and Wildlife Service's biologist, John Sincock, Marshall (1975) stated that this species had not been seen or heard in 500 days of intensive field work (islandwide) from 1968 to 1975 (12). Atkinson (1977) speculated that it survived "in very low numbers" (13).

CHRONOLOGICAL DISTRIBUTION OF RECORDS

Distribution of some 82 records of Hemignathus procerus, including negative statements, is shown in Table 1. All but one of the collection records and all but four of the reported observations of this species were made during the 1888 to 1900 period. No sightings were reported during the period 1967 through 1980.

TABLE 1. Distribution of 82 H. procerus records by decade.

1770's - 0	1840's - 0	1910's - 0
1780's - 0	1850's - 0	1920's - 1
1790's - 0	1860's - 0	1930's - 0
1800's - 0	1870's - 0	1940's - 3
1810's - 0	1880's - 6	1950's - 1
1820's - 0	1890's - 54	1960's - 8
1830's - 0	1900's - 5	1970's - 4

GEOGRAPHICAL DISTRIBUTION OF RECORDS

Of a total of 47 records which are traceable to a specific quadrant, 33 (70%) are referable to WAIMEA CANYON. The remaining 14 records originated in MAKAHA POINT (4), HAENA (1), HANAIEI (2), WAIALEALE (1), HANAPEPE (5), and KOLOA (1). Geographical distribution of records is shown in Figure 1.

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APPENDIX I

1. Observations, reports, and specimen records are organized by island group, island, district, and/or quadrangle map. Order of listing, names and locations of district, and quadrangle boundaries are explained and illustrated in CPSU/UH Avian History Report 4: Introduction to Part I, Population Histories--Species Accounts.
 2. Acronyms composed of the first three letters of the author's (or senior author's) last name, the first letter of the first name, and the last two digits of the year of publication represent sources found in the bibliography under References Cited. For example, BRYW01 = Bryan, W. A., and A. Seale. 1901. Notes on the birds of Kauai. Bishop Museum Occas. Papers. 1(3): 129-137. In cases where it is necessary to distinguish between two or more articles published by an author in any given year, letters are added to the acronym in alphabetical sequence. For example, BRYW01a = Bryan, W. A. 1901a. A key to the birds of the Hawaiian group. Bishop Museum Press. 76 pp.
- Parenthetical numbers such as (5), represent references listed under Unpublished Sources Cited in the bibliography.
3. Place-names are cited in original form.
 4. Parenthetical information is qualified.

Relative Abundance/Locality		Elev. (ft.)	Date	Source
<u>Hemignathus procerus</u>				
Island of Kaua'i				
ISLANDWIDE INFERENCE				
1	very scarce / ranges from the lowest forest zone to 3000 ft. or perhaps higher	....	(1887-1888)	WILS90
2	appeared to be rather scarce / (in undesig-nated localities)	....	Sept. (1888)	WILS92
3	Munro: more common and enjoys a wider range than Nukupuu / seems to inhabit the whole forest region of Kauai	....	(1890's)	WILS92
4	Palmer believes it inhabits / all the upland forests of the island	....	(1891/1893)	ROTW93
5	found / in all parts of the Kauai forest from the upper plateau to the forest edges near the sea coast on the N side	....	(1891)	MUNG44
6	not at all rare / at various elevations and in many localities	....	(1894-1897)	PERR03
7	noticed / generally throughout the forests... wherever I collected birds, from nearly the highest point of the mountains to 1,500 ft. and even at lower elevations	....	(1894-1897)	PERR03
8	much more numerous than Nukupuu / much more widely spread than Nukupuu	....	(1894-1897)	PERR03

9	I have not seen or heard anything of this bird / in all my visits to the Kauai forests	....	since 1920	MUN344
10	probably near extinction / (islandwide)	....	(1944)	MUN344
11	officially classed as endangered / (island-wide)	....	(1969)	(2)
12	not seen or heard in 500 days of intensive field work / island-wide surveys	....	1968-1975	MARD75
13	surviving in very low numbers / (island-wide)	....	(1977)	ATKI77

UNDESIGNATED LOCALITY

14	Knudsen collected 3 specimens / undesignated locality	....	(ca. 1887)	(1)
15	obtained but few examples / undesignated locality	....	Sept. (1888)	WILS92
16	Wilson collected 6 specimens / undesignated locality	....	1888	(1)
17	Wilson obtained 4 specimens / undesignated locality	....	(? 1888)	(1)
18	unknown collector obtained 1 specimen for Wilson / undesignated locality	....	1891	(1)
19	unknown collector obtained 2 specimens for Wilson / undesignated locality	....	1892	(1)
20	Palmer collected 26 specimens / undesignated localities	....	(1891)	(1)
21	Perkins collected 3 specimens / undesignated place(s)	4000	(1894/1895)	(1)

UNDESIGNATED LOCALITY (con't.)

22	Perkins collected 2 specimens / unspecified place(s)	....	(1894/1895)	(1)
23	Munro collected 4 specimens / undesignated place(s)	....	1898	(1)
24	1 specimen collected (? Henshaw) / unspecified locality	....	11 Feb. 1899	(1)
25	unknown collectors obtained 7 specimens / unspecified localities	....	(1890's)	(1)
26	unknown collector(s) obtained 8 specimens / undesignated localities	....	(1890's ?)	(1)
27	undesignated collector obtained 1 specimen / undesignated locality	....	1900	(1)
28	Donaghho: reported seeing it / on the upper plateau (near Kaholuananu ?)	....	Oct. 1941	MUN344
29	Knudsen seems certain to have seen a group / unspecified locality	....	1957	RICF64
30	not seen / unspecified locality (Alakai Swamp area)	....	28-30 May 1966	ANON66

MULTIQUADRANGLE

31	seen / on the S and SW sides of Kauai from 900 to probably 3000-4000 ft. elevation	....	(1891)	ROTW93
31a	met with . . . though not quite so numerous (as on the S and SW sides of Kauai) / on the N and NE sides (of Kauai) at elevations of about 600 to 2000 and 3000 ft.	....	(1891)	ROTW93

32	common at 3,000 feet...only a few seen higher / W side of island	....	(1891)	ROTW93
33	its range now (islandwide) / bounded by the Koaie to the W and the Olokele to the E	....	Aug. 1965	DONW65
34	must be very rare, probably close to extinction / (Alakai Swamp)	....	(1970)	BERA70

MAKAHA POINT

35	one seen / along trail up from Knudsen's mountain house, Halemanu	ca. 4000	8 May (1895)	(3)
36	seen several times in this spot; collected one; not common just here at this season / up from Knudsen's mountain house, Halemanu	ca. 4000	19 May (1895)	(3)
37	perkins collected 1 specimen / Halemanu	....	(1895)	(1)
38	Judd collected 1 specimen / Pu'uuka Pele	(ca. 1900)	(1)

HAENA

39	not seen / West Alakai Swamp	undated 4-day field trip (1974 ?)	HARA74
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HANALEI

40	seemed to have a different chirp / at Hanalei	April 1891	MUNG44
41	Munro: not uncommon, generally in pairs chasing each other about / near Hanalei	April (1891)	WILS92

WAI MEA CANYON

42	Munro: more common (than at Makaweli) / Kaholuamanu	.....	end of Feb., beginning of March (1891)	WILS92
43	Munro: as plentiful as at Kaholuamanu / Halemanu	.....	towards end of March 1891	WILS92
44	Munro collected 1 specimen / Kaholuamanu	.....	1891	(1)
45	seen / up in the mountains a long way from Makaweli	.....	17, 22 May (1894)	(3)
45	collected specimen / unspecified distance up from Gay's mountain house over 3,000 ft. above Makaweli (Kaholuamanu)	.....	25 May (1894)	(3)
47	1 collected / across stream and up ridge from Gay's mountain house	.....	28 May (1894)	(3)
48	1 collected / upwards from Gay's mountain house	.....	2 June (1894)	(3)
49	1 seen / down from Gay's mountain house	.....	3 June (1894)	(3)
50	1 seen / across gulches to left looking uphill and up from Gay's mountain house	.....	6 June (1894)	(3)
51	1 collected / upon dividing ridge Hanapepe Valley half day's walk and quite a few miles from Makaweli	.....	11 June (1894)	(3)
52	collected at least 4 specimens / unspecified locality up Hanapepe Valley half day's walk and quite a few miles from Makaweli	.....	12-15 June (1894)	(3)
53	1 collected / Kaholuamanu Plateau	.....	13 April (1895)	(3)
54	saw 3, 1 shot & lost / Kaholuamanu Plateau	.....	15 April (1895)	(3)

55	1 collected / Kaholuamanu Plateau	....	15 April (1895)	(3)
56	2 seen, 1 collected / up from Gay's mountain house, Kaholuamanu Plateau	....	20 April (1895)	(3)
57	1 collected / less than mile above house, Kaholuamanu Plateau	....	19 April (1895)	(3)
58	saw 3, collected 2 / up from Gay's mountain house, Kaholuamanu Plateau	....	21 April (1895)	(3)
59	saw several, collected 2 / up from Gay's mountain house, Kaholuamanu Plateau	....	23 April (1895)	(3)
60	saw 2 / up from Gay's mountain house, Kaholuamanu Plateau	....	24 April (1895)	(3)
61	saw a few, collected 3 / penetrated a good deal farther back than before up from Gay's mountain house, Kaholuamanu Plateau	....	25 April (1895)	(3)
62	1 collected / went far out up from Gay's mountain house, Kaholuamanu Plateau	....	28 April (1895)	(3)
63	about 3 (Akialoa) seen to / of Nukupu (the rarest) / high plateau above Waimea revisited (? Gay's mountain house)	....	Oct. 1895	(3)
64	Perkins collected 12 specimens / Kaholuamanu	....	(1894/1895)	(1)
65	undesignated collector (? Perkins) obtained 2 specimens / Kaholuamanu	....	Oct. (1894/1895)	(1)
66	collected 4 specimens...saw a number of others...very wary and hard to approach / generally keeping to the higher altitudes, none being seen below 3500 ft. (Kaholuamanu)	....	(12 April-4 May 1900)	BRYN01
67	Seale collected 4 specimens / (? Kaholuamanu)	....	19-30 April 1900	(1)

WAIMEA CANYON (con't.)

68	specimen taken / well on the way towards the summit of Waialeale (from Kaholuamanu)	....	30 April (1900)	BRYW01
69	1 seen / along the trail farther down (than Ou seen)...upper Waialeale Valley	....	6 Oct. (1941)	DONW41
70	1 collected / in high forested ridge country within a mile SE of the upper Koaie River cabin	4000	20 July (1960)	RICF64
71	Richardson collected 1 specimen / about 1.5 miles SE of Koaie cabin	....	20 July 1960	(1)
72	only 2 individuals...seen / both in high forested ridge country within a mile SE of the upper Koaie River cabin	4000	(June-Aug. 1960)	RICF64
73	watched 1...total observation time twelve to fifteen minutes / close to one mile past the Koaie Cabin, on the Koaie - Waialeale Trail	....	March 1965	HUBL66
74	not found / on a trip in to the Alakai...got back two miles from the Koaie gulch	....	28 Aug. 1967	DONW67

WAIALEALE

75	many...quite numerous...secured 2 / on our first hunting ground by the head of the Hanapepe Valley	20 April 1891	MUNG44
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HANAPEPE

76	Munro: less common than at other places visited / above Makaweli	Jan. and Feb. 1891	WILS92
77	(Gay and Robinson) collected 2 specimens / near Makaweli	....	27, 28 Nov. 1893	(1)

- | | | | | |
|----|---|---------------|----------------|-----|
| 78 | 1 specimen obtained (undesignated collector)
/ near Makaweli | | 5 Feb. 1899 | (1) |
| 79 | fairly common / on one ridge between
Hanapepe and Makaweli | 2000-
3000 | Jan./Feb. 1897 | (3) |
| 80 | Munro collected 3 specimens / near Makaweli | .... | 1898 | (1) |
- KOLCA
- | | | | | |
|----|--|------|----------------|-----|
| 81 | present / at a good elevation in the
mountains some miles W from Lihue...dense
masses of staghorn fern | | July/Aug. 1896 | (3) |
|----|--|------|----------------|-----|

ABSTRACT

Hemignathus obscurus ellisianus is a small, short-tailed, mostly olive-green forest bird with a conspicuous superciliary line and a very long decurved brown bill. It is endemic to the island of O'ahu. Exhaustive search of literature and field journals uncovered only 19 observational notes, collection records, and related statements on relative abundance and geographical distribution from 1837 to 1977. Records are serially numbered, referenced, and systematically analyzed.

Collection of several specimens, presumably in the mountains back of Honolulu, document existence of H. o. ellisianus in 1837. No further records exist until 1892 when one of a pair was shot for a specimen but was unrecoverable. Possible but unverified sightings were reported in 1935, 1937, and 1939. None have been reported in the past 40 years despite increased observer activity. All specimens taken in 1837 have since disappeared. The O'ahu 'Akialoa is presumably extinct.

35. Hemignathus obscurus ellisianus
'Akialoa

Hemignathus obscurus ellisianus is a small (ca. 6-7 inch long), short-tailed, mostly olive-green forest bird with a very long (1.75-inch) decurved bill (Rothschild 1893). It is endemic to the island of O'ahu. First described by Gray in 1860, the O'ahu 'Akialoa differs chiefly from its congeners on Lāna'i and Hawai'i by having a conspicuous yellow superciliary line and brown bill (Rothschild 1893). Specimens obtained in 1837 were apparently lost and none have been collected since (Banko 1979 report). The most recent overview of what little is known of the O'ahu 'Akialoa is that given by Berger (1972).

In the following historical account, one or two digit numbers in parentheses refer to specific records in the Appendix. Sources listed in the Appendix may be traced to complete references in the bibliography.

Early Notes and Records (1837-1899):

Rothschild (1893) stated that (F.) Deppe obtained several specimens of 'Akialoa in the "interior" of O'ahu (5). These were possibly obtained up the Nu'uuanu Valley in January 1837 where Deppe was known to have collected birds (Banko 1979 report). Rothschild (1907) knew of the location of but one specimen, then in the "Berlin Museum" (4). A recent survey of Hawaiian bird specimens in repositories worldwide, including the Institute für Spezielle Zoologie und Zoologisches in Berlin and three other museums in Germany, was unsuccessful in locating even a single specimen (Banko 1979 report).

Wilson (1890) and Wilson and Evans (1894) failed to report H. o. ellisianus as a result of "a brief expedition" made by Wilson in 1888. However, an "accurate description" of it was given to Wilson by a native who said he had seen it during that year "near Waialua" (7, 8). Wilson stated later (1890) that the 'Akialoa "must be nearly, if not quite, extinct in the remaining forests" (7).

Rothschild (1900), in Palmer's diary, quotes Palmer (who in March 1893 stayed with R. C. L. Perkins in a mountain house near Waialua) as stating that 'Akialoa "have been" present, presumably in the Waialua area (9). Perhaps Palmer talked to the same native who conveyed a similar impression to S. B. Wilson five years previously. In any event, Palmer was not successful in finding the 'Akialoa on O'ahu.

Perkins (1903, field journal) was convinced that he saw a pair in October 1892 while collecting on "a narrow ridge high up in the mountains" above Nu'uuanu Valley (18, 19). Perkins (field journal) shot one but was unable to recover it, stating later

(1903) that this species was "excessively rare" and "may now be extinct" (18, 19).

Munro (1944a) credits H. Craddock with seeing this species in 1937, and Donaghho (1963) repeats this report by Craddock, adding that the observation was made along Kipapa Trail (16, 17). Northwood (1940, field journal) noted seeing one "feeding on ohia blossoms" near the van Holt house, Pālehua, on 19 February 1939, watching it "for 2 or 3 minutes" and describing it as "olive green...larger and slimmer than Amakihi...(with a) very long curved beak" (11, 15). However, Northwood (field journal) was unable to detect it again on 26 February 1939 when he again searched the Pālehua area (12). Baldwin (1944) and Munro (1944a) documented the Northwood report (13, 14). In addition, Donaghho (1963) credited his mother with seeing this species ca. 1935 about halfway up the slopes of Mt. Ka'ala, saying that she saw a bird with "a very long curved bill" and was "certain" of identification (10). Such reports led Munro (1944b) to state that Donaghho "feels sure" that this species "still exists" on O'ahu (1).

Berger (1970) states that the 'Akialoa is "certainly extinct" on O'ahu, while Atkinson (1977) acknowledges its extinction (2, 3).

CHRONOLOGICAL DISTRIBUTION OF RECORDS

Distribution of some 19 records of Hemignathus obscurus ellisianus by decade is shown in Table 2. All records directly or indirectly refer to an unknown number of specimens collected in 1837 and/or sighting of a pair in 1892. A total of nine records in the 1930's and 1940's relate to three possible sightings, one each in 1935, 1939, and 1940. Both 1970 records refer to its extinction.

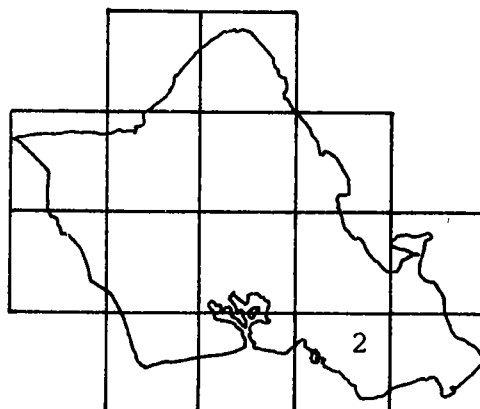
TABLE 2. Distribution of 19 H. o. ellisianus records by decade.

1770's - 0	1840's - 0	1910's - 0
1780's - 0	1850's - 0	1920's - 0
1790's - 0	1860's - 0	1930's - 7
1800's - 0	1870's - 0	1940's - 2
1810's - 0	1880's - 2	1950's - 0
1820's - 0	1890's - 3	1960's - 0
1830's - 3	1900's - 0	1970's - 2

GEOGRAPHICAL DISTRIBUTION OF RECORDS

Geographical distribution of the only two positive records of Hemignathus obscurus ellisianus is shown in Figure 2. While it is not absolutely certain that one record [collection of TYPE specimen(s)] was taken in HONOLULU quadrangle as shown, it is known that the collector (F. Deppe) obtained birds in Nu'uuanu Valley located therein. The sole remaining positive record is that of R. C. L. Perkins who sighted a pair and shot one unrecoverable specimen in Nu'uuanu Valley in 1892.

FIGURE 2. Distribution of two positive records of H. o. ellisianus, per quadrangle, on Island of O'ahu, in 1837 and 1892.



SUMMARY AND CONCLUSIONS

The collection of several specimens of Hemignathus obscurus ellisianus in 1837, presumably in the mountains back of Honolulu, indicates the existence of a substantial population at that time. This species had almost disappeared on O'ahu by the 1880's and 1890's when only one of three ornithologists succeeded in shooting (but failed to recover) one of a pair seen. Three sightings, including one description, were reported by as many observers in different localities in Wai'anae and Ko'olau Ranges in 1935, 1937, and 1939. These observations were credited to the appropriate observers without contrary opinion by three ornithologists of that period. In the past 40 years no sightings of H. o. ellisianus have been reported despite the much more frequent and thorough observational coverage of its potential range; the O'ahu 'Akialoa is presumably extinct.

APPENDIX II

1. Observations, reports, and specimen records are organized by island group, island, district, and/or quadrangle map. Order of listing, names and locations of district, and quadrangle boundaries are explained and illustrated in CPSU/UH Avian History Report 4: Introduction to Part I, Population Histories--Species Accounts.
 2. Acronyms composed of the first three letters of the author's (or senior author's) last name, the first letter of the first name, and the last two digits of the year of publication represent sources found in the bibliography under References Cited. For example, BRYW01 = Bryan, W. A., and A. Seale. 1901. Notes on the birds of Kauai. Bishop Museum Occas. Papers. 1(3): 129-137. In cases where it is necessary to distinguish between two or more articles published by an author in any given year, letters are added to the acronym in alphabetical sequence. For example, BRYW01a = Bryan, W. A. 1901a. A key to the birds of the Hawaiian group. Bishop Museum Press. 76 pp.
- Parentetical numbers such as (5), represent references listed under Unpublished Sources Cited in the bibliography.
3. Place-names are cited in original form.
 4. Parentetical information is qualified.

Relative Abundance/Locality	Elev. (ft.)	Date	Source
<u>Hemignathus obscurus ellisianus</u>			
Island of O'ahu			
ISLANDWIDE INFERENCE			
1 Donaghho: feels sure (it) still exists / on Oahu	(1944)	MUNG44
2 certainly extinct / (on Oahu)	(1970)	BERA70
3 extinct / (islandwide)	(1977)	ATKI77
UNDESIGNATED LOCALITY			
4 Lichtenstein says that Herr Deppe procured several specimens, but there is only one in the Berlin Museum, and we have no knowledge where the others may be / unspecified	(1837-1838)	ROTW07
5 Deppe: procured several specimens / interior of Oahu	(1838)	ROTW93
6 Banko: Deppe collected an unknown number of specimens / undesignated place(s) (Nuuanu Valley ?)	(Jan. 1837)	(1)
7 not met with in a brief expedition...must be nearly, if not quite, extinct / in the remaining forests	(1887-1888)	WILS90

HALEIWA

- | | | | | |
|----|--|------|-----------------|--------|
| 8 | ...believe that (it) still exists in diminished numbers...accurate description of it given to me by a native...who said he had seen it during that year (1888) near Waialua...admit...my failure (and that of others) to find it points to its possible extinction | .... | (1888) | WILS94 |
| 9 | Palmer's Diary: have been present / (vicinity Waialua or Wailua) | .... | (21 March 1893) | ROTW00 |
| 10 | mother certain of identification...bird with a very long curved bill / Mt. Kaala, about halfway up | .... | ca. 1935 | DONW63 |

SCHOFIELD BARRACKS

- | | | | | |
|----|---|------|-------------------|--------|
| 11 | Northwood: watched...for 2 or 3 minutes...olive green...larger and slimmer than Amakihi...very long curved beak / feeding on ohia blossoms ...near van Holt house...Palehua | .... | 19 Feb. 1939 | (2) |
| 12 | Northwood: none (detected) / Palehua | .... | 26 Feb. 1939 | (2) |
| 13 | one seen by J. d'Arcy Northwood / (? Palehua) | .... | recently (? 1939) | 3ALP44 |
| 14 | Northwood (sure he saw 1) / (? Palehua) | .... | (1939) | MUN344 |
| 15 | I have watched (it) feeding on the nectar of lehua blossoms / in the Waianae mountains | .... | (1940) | NCRJ40 |

WAIPAHU

- | | | | | |
|----|---|------|--------|--------|
| 16 | observations made by Harold Craddock / Kipapa trail | | (1937) | DONW63 |
|----|---|------|--------|--------|

WAIPAHAU (con't.)

17	Harold Craddock is sure he saw one / (? Kipapa trail)	1937	MUN344
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HONOLULU

18	Perkins: ? pair seen; one shot, unrecovered / upper slopes of Nuuanu Valley	Oct. 1892	(3)
19	excessively rare...may now be extinct...a pair seen on one occasion / a narrow ridge high up in the mountains (Nuuanu Valley)	....	(1892-1897)	PERR03

ABSTRACT

Hemignathus obscurus lanaiensis is a small, short-tailed, yellowish or olive-green forest bird with no distinct superciliary line and a very long decurved black bill. It is endemic to the island of Lāna'i. Exhaustive search of literature and field journals uncovered only 14 observational notes, collection records, and related statements on relative abundance and geographical distribution from 1892 to 1978. Records are serially numbered, referenced, and systematically analyzed.

Only six H. o. lanaiensis were seen or heard in 1892 when the first three specimens were collected. It was glimpsed but once during a series of extended searches in 1894, and has not been positively reported since. The Lāna'i 'Akialoa is presumably extinct.

36. Hemignathus obscurus lanaiensis
'Akialoa

Hemignathus obscurus lanaiensis is a small (ca. 6-7 inch long), short-tailed, mostly olive-green forest bird with a very long (1.7-1.9 inch) decurved bill (Rothschild 1893). It is endemic to the island of Lāna'i. First described by Rothschild in 1893, the Lāna'i 'Akialoa differs chiefly from its congeners on O'ahu and Hawai'i by having no distinct superciliary line and a black bill (Rothschild 1900). Two specimens are in the American Museum of Natural History and a third is presumably lost (Banko 1979 report).

In the following historical account, one or two digit numbers in parentheses refer to specific records in the Appendix. Sources listed in the Appendix may be traced to complete references in the bibliography.

Early Notes and Records (1892-1894):

Rothschild (1893) states that Palmer collected the first of only three specimens on 15 November 1892 in the upper forest region near Lāna'ihale (1, 2). Hartert (1919) confirmed the collection of three specimens adding that Palmer reported hearing four and seeing two more, presumably in the upper forest as well, from 15 to 26 November 1892 (3, 4).

Perkins (field journal) saw a single Lāna'i 'Akialoa in the flat above the head of the gulch behind Kō'ele on 9 January 1894 (5). Perkins (field journal) then recorded an unsuccessful search for this species in the same area, one trip made almost to the highest peak during the 11 to 13 January period, two unsuccessful 3- to 4-hour searches on 23 and 24 January, and a "week's vain search" terminating 4 July 1894 (6, 7, 9). Then in February 1894 Perkins (field journal) logged an "unsuccessful 3-week's search upwards from where I believe (Palmer) camped, Waiapaa" (8). Later, Perkins (1903) wrote that only one was seen "at the edge of a precipitous cliff" and that this species was "excessively rare (and) may now be extinct" (10).

Later Observations (1895-1978):

Munro (1944) watched for it 20 years and on only one occasion saw a bird that might reasonably be this species but could not be certain (11).

The Hawaii Division of Fish and Game (1969 report) stated that the Lāna'i 'Akialoa was "thought to be extinct or extirpated" (12). Berger (1970) wrote that it was "certainly extinct" and Atkinson (1977) judged it to have become extinct after 1892, though the "decline may have begun earlier" (13, 14).

CHRONOLOGICAL DISTRIBUTION OF RECORDS

Distribution of some 14 records of Hemignathus obscurus lanaiensis by decade is shown in Table 3. All directly or indirectly refer to a total of six detected and/or collection of three specimens in 1892 and one observation in 1894. One was possibly seen in the 1920's or 1930's, according to an account in the 1940's. The three records in the 1960's and 1970's refer to its presumed extinction.

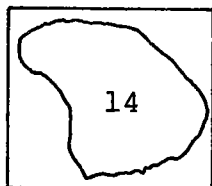
TABLE 3. Distribution of 14 H. o. lanaiensis records by decade.

1770's - 0	1840's - 0	1910's - 0
1780's - 0	1850's - 0	1920's - 0
1790's - 0	1860's - 0	1930's - 0
1800's - 0	1870's - 0	1940's - 1
1810's - 0	1880's - 0	1950's - 0
1820's - 0	1890's - 10	1960's - 1
1830's - 0	1900's - 0	1970's - 2

GEOGRAPHICAL DISTRIBUTION OF RECORDS

Though the islands of Moloka'i and Maui are not far away, the Lāna'i 'Akialoa has never been recorded other than on the island to which it belongs. Thus, all references ultimately derive from Lāna'i as shown in Figure 3. The flat above the head of the gulch behind Kō'ele is where one of the seven individuals known to have been detected was seen. Localities where the other six were seen or heard are not known.

FIGURE 3. Distribution of 14 observations, reports, and museum records of H. o. lanaiensis, per quadrangle, on Island of Lanai, 1890's to 1970's.



SUMMARY AND CONCLUSIONS

Hemignathus obscurus lanaiensis seems to have been seen by only two early ornithologists for certain, by Palmer who collected three out of apparently only six detected in November 1892, and Perkins who saw only one during a series of extended searches for this species in January and February 1894. Munro saw one possibly of this species during his 20 years of residence on Lāna'i (1911-1930); however, it seems reasonably certain that depopulation of the Lāna'i 'Akialoa was well advanced by 1892 and complete a few years later.

APPENDIX III

1. Observations, reports, and specimen records are organized by island group, island, district, and/or quadrangle map. Order of listing, names and locations of district, and quadrangle boundaries are explained and illustrated in CPSU/UH Avian History Report 4: Introduction to Part I, Population Histories--Species Accounts.
2. Acronyms composed of the first three letters of the author's (or senior author's) last name, the first letter of the first name, and the last two digits of the year of publication represent sources found in the bibliography under References Cited. For example, BRYW01 = Bryan, W. A., and A. Seale. 1901. Notes on the birds of Kauai. Bishop Museum Occas. Papers. 1(3): 129-137. In cases where it is necessary to distinguish between two or more articles published by an author in any given year, letters are added to the acronym in alphabetical sequence. For example, BRYW01a = Bryan, W. A. 1901a. A key to the birds of the Hawaiian group. Bishop Museum Press. 76 pp.

Parenthetical numbers such as (5), represent references listed under Unpublished Sources Cited in the bibliography.

3. Place-names are cited in original form.
4. Parenthetical information is qualified.

Relative Abundance/Locality		Elev. (ft.)	Date	Source
<u>Hemignathus obscurus lanaiensis</u>				
Island of Lāna'i				
1	Palmer collected the first specimen...very rare / near Lanaihale	....	15 Nov. (1892)	ROTW93
2	rare...Palmer collected 3 specimens / upper forest region	....	(1892)	ROTW93
3	3 specimens obtained / high up in the mountains	....	15, 21, 22 Nov. 1892	HARE19
4	Palmer reported hearing 4 and seeing 2 more / (upper forest)	....	21, 23, 24, 26 Nov. 1892	HARE19
5	Perkins: 1 seen / flat above head of gulch behind Koele	....	9 Jan. (1894)	(3)
6	Perkins: none seen / collecting trips, one almost to highest peak, from camp near head of gulch behind Koele	....	11-13 Jan. (1894)	(3)
7	Perkins: unsuccessful search for 3 or 4 hours / flat above head of gulch behind Koele	....	23, 24, Jan. (1894)	(3)
8	Perkins: unsuccessful 3-weeks search / upwards from where I believe Rothschild's collectors camped, Waiapaa; no doubt it was on the top above this that the <u>Hemignathus</u> was got	....	Feb. (1894)	(3)
9	Perkins: week's vain search / flat and neighborhood above head of gulch behind Koele	....	4 July (1894)	(3)

- 10 excessively rare...may now be extinct....
1 seen / at the edge of a precipitous cliff
..... (1894) PERR03
- 11 watched for it for 20 years and on only one
occasion saw a bird that might reasonably be
supposed to be this species...more yellow in
color than any other Lanai bird, about the size
and with the action of an akialoa, but I could
not say for certain that it was this bird...
never again saw a bird I even remotely thought
might be an akialoa / across a small valley from
my position, moving up the steep hillside flying
from tree to tree (unspecified locality)
..... (1944) MUNG44a
- 12 HDFG: thought to be extinct or extirpated /
(islandwide) (1969) (4)
- 13 certainly extinct / (islandwide) (1970) BERA70
- 14 extinct...after 1892...but decline may have
begun earlier / (islandwide) (1977) ATKI77

ABSTRACT

Hemignathus obscurus obscurus is a small, short-tailed, mostly olive-green forest bird without a superciliary stripe, possessing a long decurved bill. It is endemic to the island of Hawai'i. Exhaustive search of literature and field journals uncovered only 82 observational notes, collection records, and related statements on relative abundance and geographical distribution from 1779 to 1977. Records are serially numbered, referenced, and systematically analyzed.

Some 106 specimens are known to have been taken from 1779 to 1903. Ornithologists found this species in the 1890's varying from numerous to scarce over a wide elevational range in all districts. Depopulation, apparently already underway by the late 1890's and early 1900's, continued possibly as late as 1940 when the last sighting was reported. The Hawai'i 'Akialoa is presumably extinct.

37. Hemignathus obscurus obscurus
'Akialoa

Hemignathus obscurus obscurus is a small (ca. 6-7 inch long), short-tailed, mostly olive-green forest bird with a very long (1.2-1.66 inch) decurved bill (Rothschild 1893). It is endemic to the island of Hawai'i. First described by (J. G.) Gmelin in 1788 (Rothschild 1893), the Hawai'i 'Akialoa differs chiefly from its congeners on O'ahu and Lāna'i by being altogether smaller with a much shorter bill (Rothschild 1900).

Numbers and principal repositories of some 106 specimens are as follows: B. P. Bishop Museum (34), American Museum of Natural History (18), and Harvard Museum of Comparative Zoology (11) (Banko 1979 report).

Perkins (1903) gives the most complete account of its natural history. Henshaw (1902) added other first-hand impressions of its habits.

In the following historical account, one or two digit numbers in parentheses refer to specific records in the Appendix. Sources listed in the Appendix may be traced to complete references in the bibliography.

Early Notes and Records (1779-1903):

Captain Cook's naturalists were the first to secure specimens of the Hawai'i 'Akialoa, taking two examples during several days' excursion inland from Kealahou Bay in January/February 1779 (Stresemann 1950; Banko 1979 report) (49, 50). In 1840 and 1841 naturalists of the U. S. Exploring Expedition obtained an unspecified number of specimens from "thick woody districts" but left no record of the specific localities where they were obtained (Peale 1848; Banko 1979 report) (13, 14). T. Ballieu took one specimen in 1876, possibly on or near Pulehua Ranch where he was known to stay, and J. D. Mills collected two examples sometime between 1851 and 1877, presumably somewhere in the Hilo area where he was resident during that period (Banko 1979 report) (15, 16).

Wilson collected a single specimen each at Punalala (? Punalulu), Waimea, and 'Ōla'a in 1887/1888, and, though no name was on the undated tag, was probably responsible for the sole example taken in Mānā (Banko 1979 report) (17, 31, 63, 82). Later, Wilson (1890; Wilson & Evans 1892) stated that he "did not notice" this species during a long stay in the higher forest region of Kona (? Pulehua), that it occupied the lower forest zone (1100-2500 ft elev.), and must be considered "a scarce bird"; also, that it was reported by an old native to be "extremely rare" in 'Ōla'a, District of Puna (1, 2, 61, 62).

H. C. Palmer, G. C. Munro, R. C. L. Perkins, and H. W. Henshaw, all with more collecting experience on the island of Hawai'i than S. B. Wilson, left a decidedly different impression of abundance and distribution.

The name of H. C. Palmer is inscribed on tags of some 16 specimens taken in 1891 and 1892 in mostly undesignated places but including Waimea near the mountain house where Wilson stayed for some time (probably Pulehwa), and in the vicinity of "banana houses" a half-day's journey upslope from Hilo (Banko 1979 report) (18, 32, 44, 69). From Palmer's visits to these and other localities, Rothschild (1893) stated that Palmer believed that Hawai'i 'Akialoa occupied "pretty well all the upland forests," inhabiting "dense forest" where they were "generally not at all rare" (except for Kohala District where he saw none). Palmer (Rothschild 1893) found them "common" in Kona at elevations of ca. 2000 to 6000 feet, "comparatively numerous" in Hāmākua District between 2000 and 5000 feet, "numbers" above Hilo at elevations of 1400 to 3000 feet, and "a few" in the upper parts of Puna District (4, 33, 59, 68, 68a).

Many years later, Palmer's assistant, G. C. Munro wrote (1944) of that period that the Hawai'i 'Akialoa was "well distributed over the Hawaii forests" being seen "on the Kohala (? Hawi) side of Kohala mountains," and were "common" in Kona, being "plentiful" at Nawina (? Nāhuina) on 11 November 1891 (3, 30, 34, 50a). Munro's name is on the tags of two specimens taken in Kona in 1891, one dated 1 October and the other dated 11 November (38, 39).

Perkins (field journal) obtained at least 25 specimens of Hawai'i 'Akialoa during visits to Hawai'i in 1892, 1894, 1895, and 1896 (Banko 1979 report). Birds were collected in Kona District at 2000 feet (1), 3000 feet (1 or 2), and 4000 feet (4); on Mauna Loa at ca. 2500 feet (1) and 4000 feet (5); at Pulehwa Ranch at 4000 feet (2) and unspecified elevations (2); Kīlauea (1); 2 or 3 in Ka'ū District; and 6 or 7 "above the highest cane fields" in 'Amauulu (above Hilo) (19, 20, 40-43, 46-48, 51-53, 57, 70, 72-75). Besides these collection records Perkins (field journal) noted in June 1892 that this species was "occasionally seen" ca. 2500 feet elevation (apparently at Pulehwa), seen "a very long day's tramp up the mountain" (Mauna Loa) from Kīlauea (on 23 July 1894), and found "in considerable numbers" from June to September 1895, "from about 1200 ft. in Puna District to about 6 or 7 miles up Mauna Loa above Kilauea and as far down from the crater as the halfway house between Pahala and the volcano" (26, 45, 54). Perkins (1903) later stated that this species was "abundant" in Ka'ū District in the koa woods 3 or 4 miles from Kilauea where it could be observed "on stunted bushy Koa trees that are occasionally met with," that it was "numerous" in the heart of the virgin forest of Mauna Kea north of the Wailuku River, but that it was "less common" at from 1500 to 2000 feet elevation in 'Ōla'a than elsewhere (55, 56, 64, 76).

In Kona, Perkins (1893) first wrote that the Hawai'i 'Akialoa was found "in both (North and South) Districts "from about 1700 to somewhat over 3000 feet, and up to 4000 ft...right up into the haunts of the 'Akiapola'au" (*Hemignathus wilsoni*) (5, 37). Summing up his many observations of this species from 1892 to 1896 Perkins (1903) stated that the Hawai'i 'Akialoa was "common" in Kona "not only in the denser forest but also in the open parts at all elevations" where it was to be found "in the very tallest flowering trees, frequently two to eight in a single tree, but requiring to be looked for amongst the extra-ordinary numbers of commoner Drepanids" (35, 36). Of its general distribution over the entire island of Hawai'i, Perkins (1903) wrote that this species was found "in each district," frequenting both the lower and upper parts of the continuous forest, that it was "not rare" in many localities but was "less common" at 1500 to 2000 feet where it was chiefly observed (6-8).

A total of 43 'Akialoa was collected in windward Hawai'i by H. W. Henshaw from 1898 to 1902, at Kaūmana (15); Kaiwiki (12); 'Ōla'a (9) and 1600 feet elevation 'Ōla'a (1); "Kapahula" (? Kapāpala, Ka'ū) (2); Honomū (1); Volcano (1); and (2) in undesignated localities (Banko 1979 report) (22, 52, 60, 66, 67, 71, 77, 78). Henshaw (1902) found fewer of this species than Perkins, stating of the 'Akialoa in 'Ōla'a, that it was "found only after long search" and then only on a few occasions, and "whatever may have been the case formerly it is now rare in the deep forests" (65). Likewise, Henshaw (1902) wrote that while the 'Akialoa was "more numerous" in the "still denser" forest of koa and 'Ōhi'a north of the Wailuku River (above Hilo), it was "by no means common," an apparent reduction since Perkins (1903) found them "numerous" in the same area a few years previously (79). Similarly, the statement by Henshaw (1902) that this species "must be considered rare on Hawaii generally" is in contrast to earlier opinions by H. C. Palmer, G. C. Munro, and R. C. L. Perkins (10).

There were a few other collections of the 'Akialoa during this early period (Banko 1979 report). A. Koebele collected three specimens near Kīlauea in September 1896 (58). "Kahuo" inscribed his name on a specimen tag dated 16 June 1901 (21). C. E. Blacow collected three specimens at 'Umikoa, Hāmākua, in September 1903 (81), and some 10 examples were taken by undesignated collectors in unspecified localities, presumably before or shortly after 1900 (23).

Later Statements (1904-1977):

The collection of 'Akialoa by Blacow at 'Umikoa in 1903 seems to be the last positive occurrence record of 'Akialoa on Hawai'i; however, Baldwin (1941) stated that Blacow reported seeing it in "windward forests" in 1940 (24). Munro (1944) reported that he "did not see any in 1936 and 1937 and as far as I know none have been seen since (? 1890's) in Ka'u, Kona or the

Kohala mountains" (11). Donaghho (1963) wrote, "if the call of the Kauai species is similar to this one (on Hawai'i) then I heard one near Keanakolu," but gave no date of this record (? 1937) (80). Richards and Baldwin (1953) stated that they kept an "unsuccessful" lookout for the 'Akialoa during field trips (25). It is known from Richards' field journal that he visited the Keanakolu area on the northeast slopes of Mauna Kea during his 1950 to 1951 observation and collecting study.

The Hawaii Division of Fish and Game (1969 report) stated that the 'Akialoa was "thought to be extinct or extirpated from this particular island (Hawai'i) (12). Atkinson (1977) stated that the 'Akialoa presumably became extinct in west Hawai'i sometime between 1894 and 1896, and in east Hawai'i between 1896 and 1936 (27, 28).

CHRONOLOGICAL DISTRIBUTION OF RECORDS

Distribution of some 82 records of Hemignathus obscurus obscurus, including negative statements, is shown for the period 1779 to 1977 in Table 4. All of the collection records and the last verifiable observation of this species were made during the 1888 to 1903 period. No sightings were reported after 1940.

TABLE 4. Distribution of 82 H. o. obscurus records by decade.

1770's - 2	1840's - 2	1910's - 0
1780's - 0	1850's - 0	1920's - 0
1790's - 0	1860's - 0	1930's - 1
1800's - 0	1870's - 1	1940's - 2
1810's - 0	1880's - 8	1950's - 1
1820's - 0	1890's - 60	1960's - 1
1830's - 0	1900's - 3	1970's - 1

GEOGRAPHICAL DISTRIBUTION OF RECORDS

Of a total of 39 records which refer to specific quadrangles, 25 (64%) can be traced to four, viz. PIIHONUA (8), MTN. VIEW (7), PUU LEHUA (5), and KILAUEA CRATER (5). The balance of the records (14) may be traced to nine widely separated quadrangles, HAWI (1), KAMUELA (2), KEALAKEKUA (3), VOLCANO (1), HILO (3), PAPAIIKOU (1), KEANAKOLU (1), UMIKOA (1), and MAKALAHAU (1). Geographical distribution of records is shown in Figure 4.

COMPLETENESS OF DATA, BIAS, ERRONEOUS AND DOUBTFUL RECORDS

The occurrence of 'Akialoa in windward forests of Hawai'i as late as 1940, as told by C. E. Blacow to P. H. Baldwin, was not recognized by Munro (1944). While Donaghho's (1963) assertion, presumably based on an audible impression dating back to ca. 1937, is mutually supportive of Blacow's statement, neither report has since been recognized. Nevertheless, since Blacow (a resident rancher in the 'Umikoa area) had collected the last specimens of record in 1903, it appears that his 1940 report, at least, should be perceived as a credible record.

SUMMARY AND CONCLUSIONS

Hemignathus obscurus obscurus is a small, short-tailed, mostly olive-green forest bird without a superciliary stripe, possessing a long decurved bill. It is endemic to the island of Hawai'i. Some 106 specimens are known to have been taken from 1779 to 1903. Ornithologists in the 1890's found this species varying in relative abundance from numerous to less than common over a wide elevational range in all districts. Depopulation, apparently already underway by the late 1890's and early 1900's continued until about 1940 when the last sighting was reported. The Hawai'i 'Akialoa is presumably extinct.

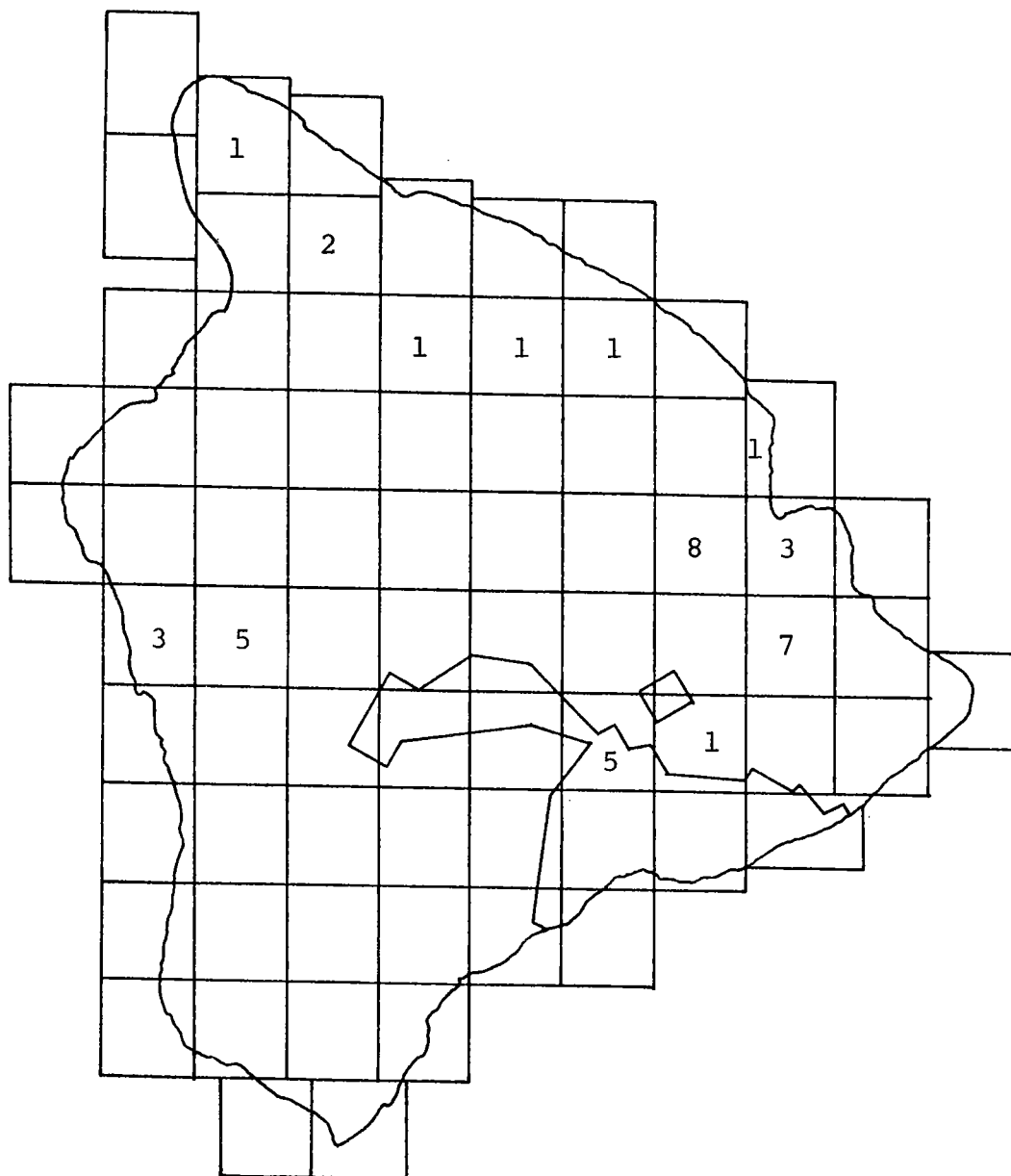


FIGURE 4. Distribution of 39 observations, reports, and museum records of *H. o. obscurus*, per quadrangle, on Island of Hawai'i, 1779-1977.

APPENDIX IV

1. Observations, reports, and specimen records are organized by island group, island, district, and/or quadrangle map. Order of listing, names and locations of district, and quadrangle boundaries are explained and illustrated in CPSU/UH Avian History Report 4: Introduction to Part I, Population Histories--Species Accounts.
2. Acronyms composed of the first three letters of the author's (or senior author's) last name, the first letter of the first name, and the last two digits of the year of publication represent sources found in the bibliography under References Cited. For example, BRYW01 = Bryan, W. A., and A. Seale. 1901. Notes on the birds of Kauai. Bishop Museum Occas. Papers. 1(3): 129-137. In cases where it is necessary to distinguish between two or more articles published by an author in any given year, letters are added to the acronym in alphabetical sequence. For example, BRYW01a = Bryan, W. A. 1901a. A key to the birds of the Hawaiian group. Bishop Museum Press. 76 pp.

Parenthetical numbers such as (5), represent references listed under Unpublished Sources Cited in the bibliography.

3. Place-names are cited in original form.
4. Parenthetical information is qualified.

Relative Abundance/Locality		Elev. (ft.)	Date	Source
<u>Hemignathus obscurus obscurus</u>				
Island of Hawai'i				
ISLANDWIDE INFERENCE				
1	(unspecified relative abundance) / occupies the lower forest zone	1100-2500	(1887-1888)	WILS90
2	it must...be considered a scarce bird / occupies the lower forest zone	1100-2500	(1887-1888)	WILS92
3	well distributed / over the Hawaii forests	....	1891	MUN344a
4	common / Palmer believes that these birds inhabit pretty well all the upland forests except Kohala district	....	(1891/1892)	ROT#93
5	by no means confined / to the lower forest, but extends its range right up into the haunts of the (akiapolaa) (from rather below 4000 ft.)	....	(June/Oct. 1892)	PERR93
6	not rare / in many localities; in all the districts	....	(1892-1895)	PERR03
7	less common / at 1500 to 2000 feet, where I chiefly observed it	....	1895, 1896	PERR03
8	found / in each district of the large island and frequents both the lower and upper parts of the continuous forest	....	(1892-1895)	PERR03

9	less numerous than (Akiapolaau, Amakihi, Creeper, Akepa) / more widely distributed than Akiapolaau	....	(1892-1896)	PERR03
10	must be considered as rare / on Hawaii generally	....	(1894-1902)	HENH02
11	did not see any in 1936 and 1937 and as far as I know none have been seen since (? 1890's) / in Kau, Kona, or the Kohala mountains	....	(1944)	MUNG44a
12	HDFG: thought to be extinct or extirpated from this particular island / island of Hawaii	....	(1969)	(1)
UNDESIGNATED LOCALITY				
13	obtained specimens / thick woody districts	....	(1840-1841)	PEAT48
14	Banko: U. S. Exploring Expedition naturalists collected an undetermined number of specimens * undescribed locality	....	1840/1841	(4)
15	Banko: Ballieu collected 1 specimen / undesignated locality (? near Puu Lehua)	....	1876	(4)
16	Banko: Mills collected 2 specimens / undescribed locality	....	(1851-1887)	(4)
17	Banko: Wilson collected 1 specimen / Punalala (? Punalulu)	....	Feb. 1898	(4)
18	Banko: Palmer collected 15 specimens / undescribed place(s)	....	1891/1892	(4)
19	Banko: Perkins collected 1 specimen / Mauna Loa (? Kona)	ca. 2500	(1892-1896)	(4)
20	Banko: Perkins collected 5 specimens / Mauna Loa (? Kona)	ca. 4000	(1892-1896)	(4)

UNDESIGNATED LOCALITY (con't.)

21	Banko: Kuhuo collected 1 specimen / unspecified locality	....	16 June 1901	(4)
22	Banko: Henshaw collected 2 specimens / unspecified place(s)	....	1898-1902	(4)
23	Banko: unspecified collectors obtained 10 specimens / unspecified localities	....	unspecified dates (? 1890's)	(4)
24	Blacow pers. comm. to P. Baldwin: seen / in windward forests (? Hamakua)	....	1940	BALP41
25	kept unsuccessful lookout / field trips to unspecified places	....	(1953)	RICL53

MULTIDISTRICT

26	Perkins: in considerable numbers / from about 1200 feet in Puna district to about 6 or 7 miles up Mauna Loa above Kilauea, and as far down from the crater as the halfway house between Pahala and the volcano	....	June-Sept. 1895	(3)
27	presumed extinct / west Hawaii	....	(1894-1896)	ATKI77
28	presumed extinct / east Hawaii	....	(1896-1936)	ATKI77

Kohala District

DISTRICTWIDE INFERENCE

29	numerous / in the Kohala mountains	(1892-1896)	PERR03
----	------------------------------------	------	-------------	--------

HAWI

30 seen / on the Kohala side of the Kohala mountains (? 1891) MUNG44a

KAMUELA

31 Banko: Wilson collected 1 specimen / Waimea 2 March 1888 (4)

32 Banko: Palmer collected 1 specimen / Waimea 1891/1892 (4)

Kona District

33 common / district of Kona, SW side of island 2000-5000 (1891/1892) ROTW93

34 common / in Kona 1891 MUNG44a

35 common / in Kona...not only in the denser forest but also in the open parts at all elevations 1892, 1894 PERR03

36 common / in Kona...in the very tallest flowering trees, frequently two to eight in a single tree, but requiring to be looked for amongst the extraordinary numbers of commoner Drepanids (1892-1896) PERR03

37 found / in both districts (from about 1700 to somewhat over 3000 feet and up to 4000 feet) (June/Oct. 1892) PERR03

UNSPECIFIED LOCALITY

38 Banko: Munro collected 1 specimen / Kona 1 Oct. 1891 (4)

39 Banko: Munro collected 1 specimen / Kona 11 Nov. 1891 (4)

UNSPECIFIED LOCALITY (con't.)

40	Banko: Perkins collected 1 specimen / Kona	2000	1892-1896	(4)
41	Banko: Perkins collected 1 specimen / Kona	3000	1892-1896	(4)
42	Banko: Perkins collected 4 specimens / Kona	4000	1892-1896	(4)
43	Banko: 1 specimen collected (? Perkins) / Kona	3000	1892-1896	(4)

PUU LEHUA

44	1 specimen procured by Palmer / not very far from the mountain house in which Mr. Scott Wilson had stayed for some time (? Pulehua)	ca. 5000	(Sept. 1891)	ROTW93
45	Perkins: occasionally seen / (? vicinity Pulehua)	ca. 2500	June 1892	(3)
46	Perkins: obtained 1 specimen / vicinity Pulehua	....	22 July (1892)	(3)
47	Perkins: collected 1 specimen / vicinity Pulehua	....	2 Aug. (1894)	(3)
48	Banko: Perkins collected 2 specimens / Pulehua Ranch	4000	1892-1896	(4)

KEALAKEKUA

49	2 specimens obtained / during several days excursion from Kealakekua Bay into the interior	....	Jan./Feb. 1779	STRE50
50	Banko: Captain Cook's naturalists collected 2 specimens / (? vicinity of Kaawaloa)	....	1779	(4)

50a plentiful / at Nawina (? Nahuina)

11 Nov. 1891

MUNG44a

Ka'u District

UNSPECIFIED LOCALITY

- | | | | | |
|----|--|------|-----------|-----|
| 51 | Banko: Perkins collected 2 specimens /
Ka'u District | | 1892-1896 | (4) |
| 52 | Banko: Henshaw collected 2 specimens /
Kapahula (? Kapapala, Ka'u) | | 1898-1902 | (4) |
| 53 | Banko: undesignated collector (? Perkins)
obtained 1 specimen / Ka'u District | | 1892-1896 | (4) |

Hawaii Volcanoes
National Park

KILAUEA CRATER

- | | | | | |
|----|--|------|----------------|--------|
| 54 | Perkins: seen / very long day's tramp up
the mountain (Mauna Loa) from Kilauea (Volcano
House) | | 23 July (1894) | (3) |
| 55 | can be observed / a few miles from the
Volcano in Kau (District) on stunted bushy
Koa trees that are occasionally met with in
those woods | | (1894-1896) | PERR03 |
| 56 | abundant / in Kau district in the Koa woods
three or four miles from Kilauea | | (1895, 1896) | PERR03 |
| 57 | Banko: Perkins collected 1 specimen / Kilauea | .... | (1892-1896) | (4) |
| 58 | Banko: Koebele collected 3 specimens /
Kilauea | | Sept. 1896 | (4) |

Kīlauea District

MULTIQUADRANGLE

59 a few / upper parts of Puna district on the (1892) ROTW93
 E side...they inhabit dense forests where they
 were generally not at all rare

VOLCANO

60 Banko: Henshaw collected 1 specimen / Volcano 1898-1902 (4)

MOUNTAIN VIEW

61 reported by old native to be extremely rare; (1887-1888) WILS90
 obtained specimen(s) / Olaa in the district of
 Puna

62 reported to be extremely rare / Olaa, District (1887-1888) WILS92
 of Puna

63 Banko: Wilson collected 1 specimen / Olaa Sept. 1887 (4)

64 less common (than elsewhere on Hawaii) / 1500-2000 1894-1896 PERR03
 Olaa

65 found only after long search...and then only (1894-1902) HENH02
 on a few occasions...whatever may have been the
 case formerly it is now rare / deep forests of
 Olaa

66 Banko: Henshaw collected 1 specimen / Olaa 1600 1898-1902 (4)

67 Banko: Henshaw collected 9 specimens / Olaa, 1898-1902 (4)
 unspecified elevation(s)

Mauna Kea District

MULTIQUADRANGLE

68 comparatively numerous / Hamakua district 2000- (1892) ROTW93
NE (Hawaii) 5000

HILO

68a numbers seen / above Hilo 1400- (1891/1892) ROTW93
3000

69 specimen taken / vicinity banana houses, 19 Oct. (1892) ROTW93
slopes of Mauna Kea, half-day journey up
mountain from Hilo

70 Banko: Perkins collected 1 specimen / Hilo 1892-1896 (4)

PAPA'IKOU

71 Banko: Henshaw collected 1 specimen / Honouliuli 1898-1902 (4)

PIIHOHONUA

72 Perkins: collected 1 / across branch of the 27 Dec. (1895) (3)
Wailuku River from camp in dense forest well
above highest cane fields in Anauulu, Mauna Kea

73 Perkins: collected 2 / more to the S of my (Jan. 1896) (3)
former trails from camp in dense forest well
above highest cane fields in Anauulu, near fork
of Wailuku River, Mauna Kea

74 Perkins: collected 3 / in dense forest well 21 Dec. (1895) (3)
above highest cane fields in Anauulu near fork
of Wailuku River, Mauna Kea

PIIHONUA (con't.)

- 75 Perkins: collected 1 / high in dense forest
well above highest cane fields in Amaulu near
fork of Wailuku River, Mauna Kea 20 Dec. (1895) (3)
- 76 numerous / in the heart of the virgin forest
of Mauna Kea, N of the Wailuku River 1895, 1896 PERR03
- 77 Banko: Henshaw collected 12 specimens /
Kaiwiki 1898-1902 (4)
- 78 Banko: Henshaw collected 15 specimens /
Kaumana 1898-1902 (4)
- 79 more numerous (than in Olaa) though by no
means common / in the still denser forest
(than Olaa) of Koa and Ohia N of the Wailuku
River (1894-1902) HENH02

KEANAKOLU

- 80 If the call of the Kauai species is similar
to this one, then I heard one / near Keanakolu unspecified date
(? 1937) DONW63

UMIKOA

- 81 Banko: Blacow collected 3 specimens /
Umikoa, Hamakua Sept. 1903 (4)

MAKALAHAU

- 82 Banko: 1 specimen collected (? Wilson) / Mana (? 1888) (4)

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ABSTRACT

Hemignathus lucidus hanapepe is a small, short-tailed, yellow-headed forest bird with a strongly decurved bill. It is endemic to the island of Kaua'i. Exhaustive search of literature and field journals uncovered some 47 observational notes, collection records, reports, and related statements on relative abundance and geographical distribution from 1888 to 1977. Records are serially numbered, arranged in geographical and chronological order, referenced, and systematically analyzed.

Ornithologists from 1888 to 1897 found H. l. hanapepe local and scarce over a broad altitudinal but restricted geographical range. Depopulation first became apparent by 1900 when none were found by two collectors in a 3-week search of formerly occupied habitat. Following a 60-year gap in sightings after 1899, two were found near the headwaters of the Koai'e River during a series of extensive surveys in 1960. One or two were sighted in the same general area in 1961, 1965, and 1968; however, none were detected in more than 500 days of systematic and comprehensive surveys from 1968 to 1975. The Kaua'i Nukupu'u, the last of its kind, is presumably extinct.

38. Hemignathus lucidus hanapepe
Nukupu'u

Hemignathus lucidus hanapepe is a small (5-6 inch long), short-tailed, forest bird with yellow head and yellowish olive-green back and long, strongly decurved bill (Rothschild 1893). It is endemic to the island of Kaua'i where it was discovered by S. B. Wilson in 1888 (Wilson & Evans 1892). The Kaua'i Nukupu'u differs from its congeners on O'ahu by having a yellow rather than green head and no distinct superciliary stripe, and on Maui by having the yellow on its head merge gradually rather than abruptly into its olive-green back (Rothschild 1893).

Numbers and principal repositories of some 34 specimens are: British Museum of Natural History (11), American Museum of Natural History (9), and Cambridge Museum of Zoology (5 including two syntypes) (Banko 1979 report).

Perkins (1903) gives the most complete eye-witness account of its relative abundance, distribution, and habits. Berger (1972) provides a short contemporary overview.

In the following historical account, one or two digit numbers in parentheses refer to specific records in the Appendix. Sources cited in the Appendix may be traced to complete references in the bibliography.

Early Notes and Records (1888-1899):

Wilson (1890) collected the first specimens (5 in number) in 1888 in the "forest surrounding the little mountain-house belonging to the Sinclair family in the district of Hanapepe (Kaholuamanu)...about 3000 ft. elevation...some 5 hours ride (horseback) from any other habitation" (17). Speaking later of this 9-day collecting visit Wilson and Evans (1892) commented that this species was "very scarce," and that a local naturalist, F. Gay, had "never seen specimens until I showed him" (17, 18). Three of Wilson's specimens were taken in the month of September (Banko 1979 report) (19).

W. R. Rothschild's collector, H. C. Palmer, and/or his assistant, G. C. Munro, are credited with taking a total of 10 specimens in 1891 and 1893, one at least at Kahōluamanu (Munro 1944; Banko 1979 report) (7, 8, 20, 22, 45). According to Rothschild (1893), Palmer (presumably assisted by Munro) collected two specimens above Makaweli at about 1000 feet elevation and the rest at an elevation of 3000 feet or so (probably Kahōluamanu) (21). Rothschild (1893) reported that Palmer found this species to be "very scarce," and that all individuals seen and all specimens collected were "within a range of 15 miles, district of Waimea" (21). Speaking later of his experiences

Munro (1944) stated that the Nukupu'u was "not common" and "seldom found below 4000 ft. elevation," and that Palmer and he "would have taken few specimens but for its habit of accompanying little flocks of Creepers (Loxops maculatus bairdi) whose chirping drew our attention" when collecting at about 3000 feet elevation, presumably near Kahōluamanu (23).

R. C. L. Perkins (field journal, 1895) collected one Nukupu'u and noted seeing another on his visit to Kahōluamanu in late May and early June 1894, remarking that this species was found in the "upper forest" though stragglers "may occur at times" in lower elevations (23-27). In 1895 Perkins (field journal) noted on 13 April that one was possibly seen (but none heard) on the Kahōluamanu Plateau, and on 15 April that this species was "neither seen nor heard" and that it must be largely elsewhere at that season "unless it has got scarce" (28, 29). However, on 21 and 23 April and in May 1894, Perkins collected a single specimen each day, one at 4000 feet elevation (9, 28, 29). However, Perkins found the situation reversed on his return visit in October 1895, remarking (op. cit.) that although the Nukupu'u was "definitely the rarest of forest birds on Kaua'i, except Phaeornis palmeri, he observed both parents and young and in numbers "many more...than I cared to shoot" (32). According to a survey of Nukupu'u specimens in repositories worldwide, Perkins obtained 11 in October 1895 (Banko 1979 report) (33).

Returning to Kaua'i again in January and February 1897 Perkins (field journal) collected one of several Nukupu'u seen "on one ridge between Hanapepe and Makaweli" at 2000 to 3000 feet elevation, some "1,000 feet below the elevation at which I had previously seen it" (34). Summing up these and collecting trips to other localities, Perkins (1903) later stated that this species was "local and not common," and that it was found only over a "limited portion" of the high plateau and "about some of the side-gulches of the Hanapepe watershed" at between 2000-3000 feet elevation, though "rarely more than six in one day" were to be met with in these lower elevations on the west side of the Hanapēpē River (35-37).

There are other records. Unspecified collectors, presumably in the 1890's, obtained four specimens on undesignated dates in undisclosed localities (10). One specimen was taken by an undesignated collector (probably Perkins) near Makaweli in February 1897 (47), and Munro's name is on the tags of two specimens taken near Makaweli on 5 June 1899 (46).

Later Observations (1900-1959):

The Nukupu'u on Kaua'i seems not to have been seen or recorded for a period of 60 years after 1899. Bryan and Seale (1901) failed to observe this species during their 12 April to 4 May 1900 collecting trip to Kahōluamanu, nor was it found by Donaghho (1941) in October 1941 on visits to the Kōke'e area,

around the head of Kalalau Valley, and above the Robinson mountain house at Kahōluamanu (11). Munro (1944) expressed doubt that the Nukupu'u on Kaua'i had been seen "since 1899" and stated that it was "probably near extinction" (1).

Recent Records (1960-1979):

Richardson and Bowles (1964) rediscovered the Kaua'i Nukupu'u on 16 August 1960 when they caught a fleeting glimpse of only two, one probably an immature or female, in the high forested region of the upper Koai'e River drainage about a mile southeast of the upper Koai'e River cabin (39). King (1961) reported seeing two during a 2-day (3-4 March) trip into the Alaka'i Swamp, one at 1700 hours and another a half-hour later in the upper Koai'e River drainage (12, 40). However, Anonymous (1966) found none during a 28 to 30 May 1966 trip into the Alaka'i (13). Donaghho (1965) recorded seeing one along the Koai'e-Wai'ala Trail on 12 August 1965 (42), stating that he believed that the range of the species was then bounded by the Koai'e to the west and the Olokele to the east (43). Donaghho (1967) did not find it on 28 August 1967 when he penetrated "two miles from the Koaie gulch" (44). Gauthey et al. (1968) saw two birds in flight 50 feet distant, which he suspected were Nukupu'u, on 31 May 1968 near the head of Koai'e stream (41). Gauthey et al. (1968) stated that these birds appeared larger than the other greenish honeycreepers (Loxops spp.) and gave the appearance of having yellow heads and breasts, differentiated from greenish back and whitish bellies, and with long, black bills decurved "about like that of an Iiwi's" (41).

The Kaua'i Nukupu'u was officially classed as "endangered" in 1969 by the Hawaii Division of Fish and Game (1969 report). Berger (1970) classed this species as "very rare," inhabiting the depths of the Alaka'i Swamp (14).

Sincock (1972), biologist for the U. S. Fish and Wildlife Service, stated that it was "4 years before I saw the Kaua'i Nukupu'u," but he furnished no date or locality for his observation (3). Referring to Sincock's observation, Marshall (1975) stated that only one bird was found "after 500 days of searching" (4). Hart (1974) stated that he did not see this species on an undated (? 1974) 4-day field trip into the West Alaka'i Swamp (16). Atkinson (1977) wrote that the Kaua'i Nukupu'u "survives in very low numbers...but major decline may have begun earlier than 1899" (5).

CHRONOLOGICAL DISTRIBUTION OF RECORDS

Distribution of some 47 records of Hemignathus lucidus hanapepe including negative reports and summary statements, is shown for the period 1888 to 1977 in Table 5. All of the collection records and all but four of the reported observations of this species were made during the 1888 to 1899 period. No sightings have been reported during the recent 1965 through 1979 period.

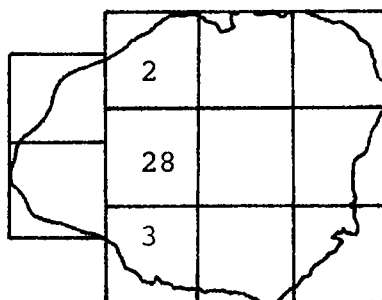
TABLE 5. Distribution of 47 H. l. hanapepe records by decade.

1770's - 0	1840's - 0	1910's - 0
1780's - 0	1850's - 0	1920's - 0
1790's - 0	1860's - 0	1930's - 0
1800's - 0	1870's - 0	1940's - 2
1810's - 0	1880's - 3	1950's - 0
1820's - 0	1890's - 28	1960's - 9
1830's - 0	1900's - 0	1970's - 5

GEOGRAPHICAL DISTRIBUTION OF RECORDS

Of a total of 33 records which are traceable to a specific quadrant, 28 (85%) are referable to WAIMEA CANYON. The remaining five records are traceable to HAENA (2) and HANAPEPE (3); however, both HAENA observations are negative leaving only two quadrants with positive records. The restrictive range indicated agrees with statements of range and relative scarcity made by early-period ornithologists. Geographical distribution of records is shown in Figure 5.

FIGURE 5. Distribution of 33 observations, reports, and museum records of H. l. hanapepe, per quadrangle, on Island of Kaua'i, 1888-1979.



COMPLETENESS OF DATA, BIAS, ERRONEOUS AND DOUBTFUL RECORDS

The statement by Marshall (1975) that one Kaua'i Nukupu'u had been seen in 500 days of searching is taken to mean that U. S. Fish and Wildlife Service surveys conducted islandwide from 1968 through 1975 were negative. The lack of positive reports by that agency after 1976 apparently extends the negative result period through 1979.

Bias in chronological distribution of records is created by the almost total lack of field observers for a period of 60 years, from 1900 through 1959. Geographical bias stemming from lack of systematic coverage of habitats during early and later periods is apparent. However, all representative habitats were intensively surveyed by the U. S. Fish and Wildlife Service from 1968 to 1975 with negative results.

SUMMARY

Hemignathus lucidus hanapepe is a small, short-tailed, yellow-headed forest bird with long, strongly decurved bill. Some 34 specimens are known to have been taken from 1888 to 1899 by scientific and casual collectors who found this species scarce over a broad altitudinal but restricted geographical range.

Depopulation became apparent in 1900 when two ornithologists found none during a 3-week search in formerly occupied habitat. Intensive surveys in 1960 revealed the existence of two individuals in Alaka'i Swamp near the headwaters of the Koai'e River, but after sightings of one or two in the same general area in 1961, 1965, and 1968 the last surviving group apparently disappeared.

CONCLUSIONS

Observed to be scarce over a broad altitudinal but restricted geographical range by the early ornithologists and casual collectors in the 1890's, the Kaua'i Nukupu'u depopulated to the point where only a few individuals remained by the early 1960's. The last positive sightings seem to have been of two individuals near the headwaters of Koai'e stream on 31 May 1968. Some 500 man-days of intensive field surveys (from 1968 to 1975) failed to uncover any evidence of its continued existence. The Kaua'i Nukupu'u is presumably extinct.

APPENDIX V

1. Observations, reports, and specimen records are organized by island group, island, district, and/or quadrangle map. Order of listing, names and locations of district, and quadrangle boundaries are explained and illustrated in CPSU/UH Avian History Report 4: Introduction to Part I, Population Histories--Species Accounts.
2. Acronyms composed of the first three letters of the author's (or senior author's) last name, the first letter of the first name, and the last two digits of the year of publication represent sources found in the bibliography under References Cited. For example, BRYW01 = Bryan, W. A., and A. Seale. 1901. Notes on the birds of Kauai. Bishop Museum Occas. Papers. 1(3): 129-137. In cases where it is necessary to distinguish between two or more articles published by an author in any given year, letters are added to the acronym in alphabetical sequence. For example, BRYW01a = Bryan, W. A. 1901a. A key to the birds of the Hawaiian group. Bishop Museum Press. 76 pp.

Parenthetical numbers such as (5), represent references listed under Unpublished Sources Cited in the bibliography.

3. Place-names are cited in original form.
4. Parenthetical information is qualified.

Relative Abundance/Locality	Elev. (ft.)	Date	Source
<u>Hemignathus lucidus hanapepe</u>			
Island of Kaua'i			
ISLANDWIDE INFERENCE			
1 probably near to extinction...doubt if it has been seen since 1899	(1944)	MUNG44
2 HDFG: officially classed as endangered	(1969)	(1)
3 (it was) 4 years before I saw the Kauai Nukupuu	(1972)	SINJ72
4 one bird seen (1973) after 500 days of searching	(1968-1975)	MARD75
5 survives in very low numbers...but major decline may have begun earlier than 1899	(1977)	ATKI77
UNDESIGNATED LOCALITY			
6 ...not common...seldom found below 4000 ft. elevation / unspecified areas	(1891/1893)	MUNG44
7 Banko: Palmer collected 6 specimens / unspecified place(s)	1891/1893	(2)
8 Banko: 3 specimens collected (? Palmer, ? Munro) / unspecified place(s)	1891/1893	(2)
9 Banko: Perkins collected 1 specimen / unspecified location	4000	May 1894	(2)

10 Banko: unspecified collector(s) obtained 4 specimens / unspecified places unspecified dates (? 1890's) (2)

MULTIQUADRANGLE

11 not found / on visits to Kokee area...around the head of the Kalalau Valley, and the area above the Robinson mountain house, Kaholuamanu (Oct. 1941) DONW41

12 saw two on two-day trip / Alakai Swamp 3 March 1961 KINB61

13 not seen / Alakai Swamp area 28-30 May 1966 ANCN56

14 very rare / inhabiting the depths of the Alakai Swamp (1970) BERA70

HAENA

15 Perkins: total absence...from forest which appears most suitable is highly remarkable / up from Knudsen's mountain house, Halemanu (ca. 4000) 19 May (1895) (3)

16 not seen / West Alakai Swamp undated 4-day field trip (1974 ?) HARA74

WAIMEA CANYON

17 very scarce...Gay had never seen specimens until I showed him / forest surrounding the little mountain-house belonging to the Sinclair family in the district of Hanapepe ...some five hours ride from any other habitation, (Kaholuamanu) ca. 3000 (1888) WILS90

WAIMEA CANYON (con't.)

- 18 that this bird is very scarce is pretty clear; only obtained 5 during a stay of 9 days / Sinclair's mountain cottage (Kaholuamanu) ca. 3000 (1888) WILS92
- 19 Banko: Wilson collected 5 specimens / near mountain cottage belonging to Sinclair family (Kaholuamanu) (Sept. 1988) (2)
- 20 1 (diseased specimen) collected / Kaholuamanu (1891) MUNG44
- 21 Palmer: found (it) to be very scarce... collected 2 specimens above Makaweli ca. 1000 ft. el., rest at elevation of 3000 feet or so.... none seen elsewhere / all seen and specimens obtained within a range of 15 miles, district of Waimea (1891) BOTW93
- 22 Palmer collected 1 specimen / Kuluamani (? Kaholuamanu) (1891) (2)
- 23 seldom found below 4000 ft. elevation... not common and we would have taken few specimens but for its habit of accompanying little flocks of (Creepers, Loxops maculatus bairdi) whose chirping drew our attention / Waimea District (? Kaholuamanu) ca. 3000 (1890's) MUNG44
- 24 Perkins: collected 1 specimen / long way up from Gay's mountain house over 3000 ft. above Makaweli (? Kaholuamanu) 20 May (1894) (3)
- 25 Perkins: none heard / unspecified distance up from Gay's mountain house over 3000 ft. above Makaweli 25 May (1894) (3)
- 26 Perkins: 1 seen / upwards from Gay's mountain house over 3000 ft. above Makaweli 2 June (1894) (3)

27	found / in the upper forest	....	(May/June 1894)	PERR95
28	stragglers / may occur at times in lower elevations	....	(May/June 1894)	PERR95
29	Perkins: 1 possibly seen; none heard / Kaholuamanu Plateau	....	13 April (1895)	(3)
30	Perkins: neither seen nor heard; must be largely elsewhere at this season unless it has got scarce / Kaholuamanu Plateau	....	15 April (1895)	(3)
31	Perkins: collected 1 specimen / up from Gay's mountain house, Kaholuamanu Plateau	....	21 April (1895)	(3)
32	perkins: collected 1 specimen / up from Gay's mountain house, Kaholuamanu Plateau	....	23 April (1895)	(3)
33	perkins: definitely the rarest of forest birds (on Kauai) except <u>Phaeornis palmeri</u> ; parents and young seen; <u>in all I saw many more...</u> than I cared to shoot at / high plateau above Waimea revisited (? Gay's mountain house; Kaholuamanu)	....	Oct. 1895	(3)
34	Banko: Perkins collected 11 specimens / Kaholuamanu	....	Oct. 1895	(1)
35	Perkins: saw several, collected 1 specimen / on one ridge between Hanapepe and Makaweli... 2,000 to 3,000 feet; this was 1,000 feet below the elevation at which I had previously seen it	....	Jan./Feb. 1897	3)
36	by no means a common bird...range is rather restricted / found only over a limited portion on the high plateau of that island whence came the original specimens obtained by Wilson	....	(1894-1897)	PERR03

WAI MEA CANYON (con't.)

- 37 local and not common / on the high plateau
and about some of the side gulches of the
Hanapepe water shed 2000-
3000 (1894-1897) PERR03
- 38 (specimens) can be obtained...always can
be met with in certain favored spots
frequenting the Koa trees...rarely more
than 6 seen in one day / at lower elevations
in the forests forming part of the Hanapepe
watershed, on the W side of the main river 2000-
3000 (1894-1897) PERR03
- 39 fleeting glimpse of only 2...1 probably an
immature or female / in the high, forested
ridge region, of the upper Koaie River drainage
(about a mile SE of the upper Koaie River cabin) 16 Aug. (1960) RICF64
- 40 1 seen at 5 p.m....another a half hour later
/ (upper Koaie River drainage, ? vicinity of
cabin) 3/4 March 1961 KINB61
- 41 saw 2 birds in flight...3 or 4 seconds....
within 50 feet in good light...suspected of
being Nukupuu...appeared larger than the other
greenish Honeycreepers...gave appearance of
having yellow heads and breasts, differentiated
from greenish back and whitish bellies...bill
appeared long, black and decurved about like
that of an Iiwi's / near the head of Koaie stream
..... 31 May 1968 GAUJ68
- 42 1 seen / Koaie - Waialae Trail 12 Aug. 1965 DONW65
- 43 its range now / bounded by the Koaie to the
W and the Olokele to the E Aug. 1965 DONW65
- 44 not found / on a trip in to the Alakai...got
back two miles from the Koaie gulch 28 Aug. 1967 DONW67

HANAPEPE

- | | | | | |
|----|--|----------|-------------|--------|
| 45 | Palmer: 2 specimens obtained / above
Makaweli | ca. 1000 | (1891/1893) | ROTW93 |
| 46 | Banko: Munro collected 2 specimens /
Makaweli | | 5 June 1899 | (2) |
| 47 | Banko: unspecified collector (? Perkins)
obtained 1 specimen / Makaweli | | Feb. 1897 | (2) |

ABSTRACT

Hemignathus lucidus lucidus is a small, short-tailed, forest bird with a green head and distinct superciliary stripe. It is endemic to the island of O'ahu. Exhaustive search of literature and field journals uncovered only 17 observational notes, collection records, reports, and related statements on relative abundance and geographical distribution from 1888 to 1977. Records are serially numbered, arranged in geographical and chronological order, referenced, and systematically analyzed.

The existence of H. l. lucidus is known only from nine specimens and a few notes made in 1837, the year of its discovery. Though it reportedly existed in some numbers until about 1860, no other first-hand account of this species exists. The O'ahu Nukupu'u is presumably extinct.

39. Hemignathus lucidus lucidus
Nukupu'u

Hemignathus lucidus lucidus is a small (5-6 inch long), short-tailed, forest bird with green head and long, strongly decurved bill (Rothschild 1893). It is endemic to the island of O'ahu where it was discovered by (F.) Deppe in 1837 (Rothschild 1893). The O'ahu Nukupu'u differs from its congeners on Kaua'i and Maui by having a green rather than yellow head and a distinct superciliary stripe (Rothschild 1893).

Numbers and repositories of the existing nine specimens are: Cambridge Museum of Zoology (2), Naturhistorisches Museum (Vienna) (2), Harvard Museum of Comparative Zoology (TYPE), and one each in the American Museum of Natural History, British Museum of Natural History, Rijksmuseum van Natuurlijke Historie (Leiden), and Senckenberg Museum (Frankfurt) (Banko 1979 report).

Rothschild (1893) gives the most complete account of its history. Berger (1972) provides a concise contemporary synthesis.

In the following historical account, one or two digit numbers in parentheses refer to specific records in the Appendix. Sources listed in the Appendix may be traced to complete references in the bibliography.

Early Notes and Records (1837-1903):

(H.) Lichtenstein (1839), in the original German language description of H. l. lucidus, stated that "Herr Deppe fand sie auf Oahu, in ziemlicher Menge um die Blüthen der Pisang - Pflanzungen schwärmend, und verschaffte sie sich in allen den verschiedenen Kleidern. Es war im Monat Januar." A literal English translation of Lichtenstein's statement might read, "Mr. Deppe discovered it on Oahu, quite numerous, swarming around the flowers of the banana - plantations, and took them in all of their different plumages. This was in the month of January" (1837). Lichtenstein's (1839) statement was no doubt the source of Rothschild's (1893, 1907) subsequent remarks that Deppe found this species "in great numbers" (9-11). Wilson and Evans (1894) assumed from the account of J. K. Townsend (H. Deppe's collecting companion) that the specimens were taken in Nuano (Nu'uano) Valley, then some 5 miles from Honolulu (15). Perkins (1903) credits this assumption by Wilson and Evans (1894) (14). However, the source for the statement by Rothschild (1893) that the O'ahu Nukupu'u was "formerly reported to be not uncommon just above Honolulu" may have originated from Deppe or Rothschild's collector, H. C. Palmer (16). Palmer was doubtlessly responsible for Rothschild's comment that populations "have been present" in the vicinity of a mountain huse near Waialua or Wailua (17).

Whatever the situation, at least nine specimens were secured by Deppe and Townsend (Banko 1979 report) (12), and living birds were not detected or suspected of being extant from 1887 to 1900 by Wilson (1890), Palmer (Rothschild 1893), Wilson and Evans (1894), or Perkins (1903) who all believed this species to be evidently extinct during their collecting visits (1-3, 5). Perkins (1903) passed along the information that this species was "reported by native and other sources to occur in some numbers at least until about 1860...(frequenting) what must now be considered as the lower belt of continuous forest...range... apparently that of the koa tree" (4).

Later Statements (1904-1977):

The Hawaii Division of Fish and Game (1969 report) stated that the O'ahu Nukupu'u was "thought to be" extinct or extirpated (6). Berger (1970) judged it to be extinct (7). Atkinson (1977), based on Perkins (1903), stated that it became extinct between 1860 and 1890 (8). The nebulous second-hand report by Donaghho (1963) that J. d'Arcy Northwood saw a "bright yellow" breasted "Akiapolaa" along Poamoho Trail about 1939 was never verified (13).

CHRONOLOGICAL DISTRIBUTION OF RECORDS

Distribution of 17 records of Hemignathus lucidus lucidus, including negative reports and summary statements, is shown for the period 1837 to 1977 in Table 6. Records in the 1830's refer to field observations and/or specimens collected. The 11 records from 1880's to 1970's consist of negative reports and summary statements. Hemignathus lucidus lucidus was seen only in 1837 when specimens were secured.

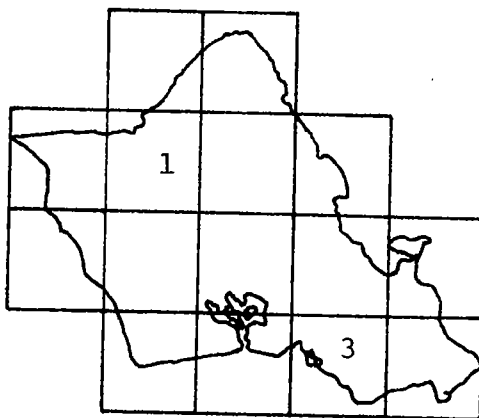
TABLE 6. Distribution of 17 H. l. lucidus records by decade.

1770's - 0	1840's - 0	1910's - 0
1780's - 0	1850's - 0	1920's - 0
1790's - 0	1860's - 0	1930's - 1
1800's - 0	1870's - 0	1940's - 0
1810's - 0	1880's - 1	1950's - 0
1820's - 0	1890's - 4	1960's - 1
1830's - 6	1900's - 2	1970's - 2

GEOGRAPHICAL DISTRIBUTION OF RECORDS

Only four of the 17 records of Hemignathus lucidus lucidus are referable to specific quadrangles, three to HONOLULU in the southern Ko'olau Range, and one to HALEIWA in the northern Wai'anae Mountains. Distribution of these four records is shown in Figure 6.

FIGURE 6. Distribution of four reports and museum records of H. l. lucidus, per quadrangle, on Island of O'ahu, 1837-1977.



SUMMARY AND CONCLUSIONS

Hemignathus lucidus lucidus is known only from a few notes and nine specimens preserved by a German collector, F. Deppe, and his American companion, J. K. Townsend, from their 1837 visit to O'ahu. Although this species reportedly existed in some numbers until about 1860, no other first-hand accounts of its occurrence are extant. Hemignathus lucidus lucidus thus is known as a living species for a period of only about 25 years.

APPENDIX VI

1. Observations, reports, and specimen records are organized by island group, island, district, and/or quadrangle map. Order of listing, names and locations of district, and quadrangle boundaries are explained and illustrated in CPSU/UH Avian History Report 4: Introduction to Part I, Population Histories--Species Accounts.
2. Acronyms composed of the first three letters of the author's (or senior author's) last name, the first letter of the first name, and the last two digits of the year of publication represent sources found in the bibliography under References Cited. For example, BRYW01 = Bryan, W. A., and A. Seale. 1901. Notes on the birds of Kauai. Bishop Museum Occas. Papers. 1(3): 129-137. In cases where it is necessary to distinguish between two or more articles published by an author in any given year, letters are added to the acronym in alphabetical sequence. For example, BRYW01a = Bryan, W. A. 1901a. A key to the birds of the Hawaiian group. Bishop Museum Press. 76 pp.

Parenthetical numbers such as (5), represent references listed under Unpublished Sources Cited in the bibliography.
3. Place-names are cited in original form.
4. Parenthetical information is qualified.

Relative Abundance/Locality		Elev. (ft.)	Date	Source
<u>Hemignathus lucidus lucidus</u>				
Island of O'ahu				
ISLANDWIDE INFERENCE				
1	not net with...fear...it may have become extinct / in the remaining forests	....	(1887-1888)	WILS90
2	there is reason to fear that it has become extinct / (islandwide)	....	(1893)	WILS94
3	evidently extinct	....	(1893)	ROTW93
4	reported by native and other sources to occur in some numbers at least until about 1860 / frequented what must now be considered as the lower belt of continuous forest...range ...apparently that of the koa tree	....	(1903)	PERR03
5	almost certainly extinct / (islandwide)	....	(1903)	PERR03
6	HDFG: thought to be extinct or extirpated from this particular island / (islandwide)	....	(1969)	(1)
7	extinct / (islandwide)	....	(1970)	BERA70
8	extinct / (islandwide)	....	(1860 - ca. 1890)	ATKI77

UNDESIGNATED LOCALITY

- | | | | | |
|----|---|------|------------------|--------|
| 9 | Deppe: found it . . . quite numerous swarming around the flowers of the banana-plantations | .... | (1837) | LICH39 |
| 10 | Deppe: saw this bird in great numbers... apparently common / flying round the flowers of the banana plantations | .... | 1838 (1837) | ROTW07 |
| 11 | found in great numbers-by Deppe / unspecified place(s) | .... | Jan. 1838 (1837) | ROTW93 |
| 12 | Banko: Deppe and Townsend collected 9 specimens / unspecified place(s) (? Nuuanu Valley) | .... | (1837) | (2) |

HAUULA

- | | | | | |
|----|---|------|----------|--------|
| 13 | Northwood: reported 1 Akiapolauu (? Nukupu'u) seen...breast bright yellow / Poamoho trail | | ca. 1939 | DCNW63 |
|----|---|------|----------|--------|

HONOLULU

- | | | | | |
|----|---|------|-----------|--------|
| 14 | specimens obtained by Deppe and Townsend / Nuuanu Valley | .... | 1837 | PERR03 |
| 15 | we may well suppose that this species was found / Nuano (Nuuanu) Valley | .... | Jan. 1837 | WILS94 |
| 16 | formerly reported to be not uncommon / just above Honolulu | .... | (1893) | ROTW93 |

HALEIWA

- | | | | | |
|----|--|------|-----------------|--------|
| 17 | have been present / (in vicinity of) mountain house near Waialua or Wailua | | April-June 1893 | ROTW93 |
|----|--|------|-----------------|--------|

ABSTRACT

Hemignathus lucidus affinus is a small, short-tailed forest bird with a yellow head. It is endemic to the island of Maui. Exhaustive search of literature and field journals uncovered only 37 observational notes, collection records, reports, and related statements on relative abundance and geographical distribution from 1892 to 1979. Records are serially numbered, arranged in geographical and chronological order, referenced, and systematically analyzed.

Ornithologists from 1879 to 1896 found H. l. affinus on the northwest slopes of Haleakalā to vary in relative abundance from the most numerous species in 1879 to rather numerous in 1895/1896. There are no other records of the species inhabiting this area. Hemignathus lucidus affinus was rediscovered in 1967 on the east flank of Haleakalā in Kīpahulu Valley where it was previously unknown. Sightings of single birds were made in the Kīpahulu Valley area in 1975, 1978, and 1979 as a result of greatly increased observer activity. It is concluded that the Maui Nukupu'u is practically extinct and each sighting may be the last.

40. Hemignathus lucidus affinus
Nukupu'u

Hemignathus lucidus affinus is a small (5-6 inch long), short-tailed, forest bird with yellow head and long, strongly decurved bill (Rothschild 1893). It is endemic to the island of Maui where it was discovered by H. C. Palmer in 1892 (Rothschild 1893). The Maui Nukupu'u differs from its congeners on O'ahu by having a yellow instead of green head, and on Kaua'i by having the yellow on its head distinctly separated from its olive-green back (Rothschild 1893).

Numbers and principal repositories of some 36 specimens are: American Museum of Natural History (12 incl. TYPE), British Museum of Natural History (8), and Cambridge Museum of Zoology (6).

Rothschild (1893) and Perkins (1903) give the most complete early accounts of the Maui Nukupu'u. Berger (1972) provides a brief contemporary synthesis.

In the following historical account, one or two digit numbers in parentheses refer to specific records in the Appendix. Sources listed in the Appendix may be traced to complete references in the bibliography.

Early Notes and Records (1879-1901):

Finsch (1880) seems to have been the first to comment on the relative abundance of the Nukupu'u on Maui, calling it the "commonest species" he observed, it going "in small flocks from tree to tree" in July 1879 (10). H. C. Palmer, while encamped above Olinda at ca. 5000 feet elevation in August 1892, collected the TYPE and 12 other specimens and termed it "not shy but somewhat scarce" and "not at all plentiful but less rare than H. (lucidus) hanapepe on Kaua'i" (Rothschild 1893; Banko 1979 report) (1, 11-14a).

A few years later in 1894, Perkins (field journal) notes the taking of a specimen by (E.) Weiske on 12 March at 6000 feet elevation on Haleakalā, presumably above Olinda, and then goes on to document his own collection of 11 specimens taken from 16 March to 10 April 1894 above Olinda at elevations ranging from 5000 to ca. 7000 feet (16-26). Perkins (field journal) noted seeing as many as four and collecting as many as three Nukupu'u in any one day during his 1894 visit. Perkins (1895) stated that this species was found in the upper forest (presumably meaning above Olinda), though "stragglers may occur at times in lower elevations (27, 28). Later, after a return visit to Maui in 1896 when he obtained nine more specimens, Perkins (1903) wrote that the Nukupu'u was "rather numerous" and that "on some occasions a dozen or more adults have been observed on a single day" but that

it was also "possible to search all day without a glimpse" (5, 29). Perkins (1903) agreed with Palmer that the Nukupu'u on Maui was more restricted in range than H. l. hanapepe on Kaua'i, as he observed the Maui Nukupu'u occurring only on the northwest slope of Haleakalā where it was "chiefly found about a mile below the upper edge of the forest at an elevation of 4000-5000 above the sea" (29). In addition to examples taken by Palmer and Perkins there are two specimens of Maui Nukupu'u without collector's name, locality, or date on the tags (Banko 1979 report) (6).

Henshaw (1902), who observed and collected birds on Maui at least once (in June 1901), noted that this species was "generally confined to the more elevated forest," though he apparently collected no specimens (7).

Later Observations (1902-1929):

According to Gregory (1929), G. C. Munro made a "careful" search "along the Kula Ranch and Haleakala Ranch pipelines" for nine days in February 1928 but failed to find any trace of this species. Later, Munro (1944) wrote that the Maui Nukupu'u had not been seen since R. C. L. Perkins collected on the island (in 1896) (2).

Recent Records (1930-1979):

Like Munro (Gregory 1929), Richards and Baldwin (1953) kept an unsuccessful lookout for the Nukupu'u during field trips on Maui (8).

Banko (1968) observed three Nukupu'u, one each at 5710, 5890, and 5910 feet elevation, along a newly opened trail in Kīpahulu Valley on the east slope of Haleakalā crater on 24 August 1967 (31-33). A few days later on 11 September, G. Morrison (National Park Service) reported seeing one along the same trail but at a much higher elevation (6700 ft) (34). In 1969, the Hawaii Division of Fish and Game (1969 report) officially classed the Maui Nukupu'u as an endangered species (4).

Marshall (1975) reported only two Nukupu'u seen during the 1973 Hāna Rain Forest Project "in the same general areas (and in) much lower population densities (than) Maui Parrotbill" (Pseudonestor xanthophrys), but regrettably gave no further details (9). In 1975, M. Stemmermann (S. Conant, pers. comm.) saw one of this species approximately 0.5 mile northeast of Pu'u'alaia on the northeast slope of Haleakalā at ca. 6500 feet elevation on 11 June (35). S. Conant (pers. comm.) observed one in 1978 at about 4800 feet elevation in Kīpahulu Valley (36), and M. Stemmermann noted another at ca. 3600 feet elevation in Kīpahulu Valley on 29 March 1979 (37). Rediscovery of the species in 1967 was noted by Atkinson (1977) who made no comment on its relative abundance (3).

CHRONOLOGICAL DISTRIBUTION OF RECORDS

Distribution of 38 records of Hemignathus lucidus affinus, including negative reports and summary statements, is shown for the period 1879 to 1979 in Table 7. There is a 71-year gap in records between the last observation in 1896 and sightings in 1967. Only three other positive records of this species exist, sightings of single birds in 1975, 1978, and 1979.

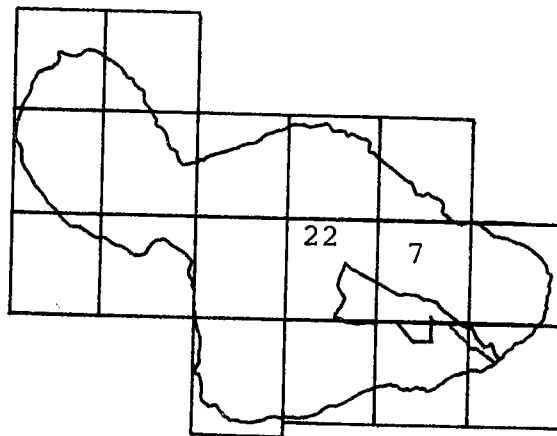
TABLE 7. Distribution of 38 H. l. affinus records by decade.

1770's - 0	1840's - 0	1910's - 0
1780's - 0	1850's - 0	1920's - 1
1790's - 0	1860's - 0	1930's - 0
1800's - 0	1870's - 1	1940's - 1
1810's - 0	1880's - 0	1950's - 1
1820's - 0	1890's - 23	1960's - 6
1830's - 0	1900's - 1	1970's - 4

GEOGRAPHICAL DISTRIBUTION OF RECORDS

Twenty-nine of the 38 records of Hemignathus lucidus affinus are referable to specific quadrangles, viz. KILOHANA (22) and NAHIKI (7), as shown in Figure 7. There are no positive records of this species in KILOHANA after 1896, or in NAHIKI before 1967, indicating depopulation of the Maui Nukupu'u sub-population on the northwestern flank of Haleakalā from 1896 to 1967.

FIGURE 7. Distribution of 29 observations and museum records of H. l. affinus, per quadrangle, on Island of Maui, 1879-1979.



SUMMARY AND CONCLUSIONS

Ornithologists from 1879 to 1996 found Hemignathus lucidus affinus on the upper northwest slopes of Haleakalā to vary in relative abundance from the most numerous species (in 1879) to rather numerous in 1895/1896. Observers in the 1920's and 1950's failed to find this species in expected localities. The Maui Nukupu'u was rediscovered in 1967 on the east slope of Haleakalā when three individuals were observed in the isolated upper reaches of the Kīpahulu Valley. Re-sightings of single birds in 1973, 1975, and 1978 in the same general area resulted from increased observational effort over a much longer period of time. The population of H. l. affinus thus has declined in the past 85 years to reach a point of practical extinction. Each sighting may ultimately prove to be the last.

APPENDIX VII

1. Observations, reports, and specimen records are organized by island group, island, district, and/or quadrangle map. Order of listing, names and locations of district, and quadrangle boundaries are explained and illustrated in CPSU/UH Avian History Report 4: Introduction to Part I, Population Histories--Species Accounts.
2. Acronyms composed of the first three letters of the author's (or senior author's) last name, the first letter of the first name, and the last two digits of the year of publication represent sources found in the bibliography under References Cited. For example, BRYW01 = Bryan, W. A., and A. Seale. 1901. Notes on the birds of Kauai. Bishop Museum Occas. Papers. 1(3): 129-137. In cases where it is necessary to distinguish between two or more articles published by an author in any given year, letters are added to the acronym in alphabetical sequence. For example, BRYW01a = Bryan, W. A. 1901a. A key to the birds of the Hawaiian group. Bishop Museum Press. 76 pp.

Parenthetical numbers such as (5), represent references listed under Unpublished Sources Cited in the bibliography.

3. Place-names are cited in original form.
4. Parenthetical information is qualified.

Relative Abundance/Locality	Elev. (ft.)	Date	Source
<u>Hemignathus lucidus affinus</u>			
Island of Maui			
ISLANDWIDE INFERENCE			
1 Palmer: not at all plentiful but less rare than <u>H. (lucidus) hanapepe</u> on Kauai...not shy but somewhat scarce / <u>forest</u> region of the little-known and unexplored island of Maui	(1892)	ROTW93
2 has not been seen since Perkins collected on Maui (1896) / (islandwide)	(1944)	MUNG44
3 rediscovered / (Kipahulu Valley)	(1967)	ATKI77
4 HDEG: officially classed as endangered / island of Maui	(1969)	(2)
UNDESIGNATED LOCALITY			
5 Banko: Perkins collected 9 specimens / unspecified place(s) (? above Olinda)	1896	(1)
6 Banko: unspecified collectors obtained 2 specimens / unspecified place(s)	unspecified date(s) (? 1895-1900)	(1)
7 found / generally confined to the more elevated forest	(1902)	HENH02
8 kept unsuccessful lookout / field trips to unspecified places	(1953)	RICL53

MARD75

(1975)

9 only 2 seen during 1973 Hana Rain Forest Project / occurs in same general area (and in) much lower population densities than Maui Parrotbill

KILOHANA

FINO80

(July 1879)

ca. 5400

10 commonest species...it goes in small flocks from tree to tree / vicinity Olinda

ROTW93

2 Aug. (1892)

....

11 Palmer: collected 3 specimens / encamped 5,000 feet high on the mountain (somewhere above Olinda, Haleakala), forest not very dense...small ohias, a few koa trees, and a sprinkling of mamane

ROTW93

7 Aug. (1892)

....

12 Palmer: one heard singing / (above Olinda)

ROTW93

12 Aug. (1892)

....

13 Palmer: collected 2 specimens / different sides of the ridges

ROTW93

16 Aug. (1892)

....

14 Palmer: one obtained / (above Olinda)

(1)

(1892)

....

14a Banko: Palmer collected the type and 12 other specimens

(3)

(12 March 1894)

6000

15 Perkins: Weiske collected 1 specimen / Haleakala

(3)

16 March 1894

ca. 7000

16 Perkins: collected 1 specimen / above Olinda

(3)

17 March 1894

ca. 5000

17 Perkins: collected 1 specimen / above Olinda

(3)

22 March 1894

ca. 5000

18 Perkins: collected 3 specimens / above Olinda

KILOHANA (con't.)

- 19 Perkins: unsuccessful search / above Olinda ca. 5000 23 March 1894 (3)
- 20 Perkins: saw 4; collected 1 specimen / above Olinda ca. 5000 30 March 1894 (3)
- 21 Perkins: unsuccessful search / above Olinda ca. 5000 2 April 1894 (3)
- 22 Perkins: collected 2 specimens / above Olinda ca. 5000 3 April 1894 (3)
- 23 Perkins: collected 2 specimens / above Olinda ca. 5000 5 April 1894 (3)
- 24 Perkins: heard / above Olinda ca. 5000 6 April 1894 (3)
- 25 Perkins: collected 1 specimen / above Olinda ca. 5000 10 April 1894 (3)
- 26 Banko: Perkins collected 11 specimens / Haleakala (above Olinda) 5000 1394 (1)
- 27 found / in the upper forest (above Olinda) (March/May 1894) PERR95
- 28 stragglers / may occur at times in lower elevations (March/May 1894) PERR95
- 29 rather numerous; on some occasions a dozen or more adults have been observed on a single day; possible to search all day without glimpse / even more restricted (than Kauai Nukupuu) is the range of H. (emignathus lucidus) affinis, as at present known to me on the NW slope of Haleakala, where it is chiefly found about a mile below the upper edge of the forest at an elevation of 4,000-4,500 ft. above the sea (1894, 1896) PERR03

30 Munro: careful search....failed to reveal any trace / the forest between, above, and below ...trails along the Kula Ranch pipeline...to the end of the flume at the Haepuaena stream ...and Haleakala Ranch pipeline (to) the Haleakala Ranch pipeline (to) Waikamoi stream 9 days in Feb. (1928) 3REH29

Haleakala National Park

NAHIKI

31	one seen / Kipahulu Valley	5710	24 Aug. 1967	BANW68
32	one seen / Kipahulu Valley	5290	24 Aug. 1967	BANW68
33	one seen / Kipahulu Valley	5910	24 Aug. 1967	BANW68
34	Morrison: saw 1 / Kipahulu Valley	6720	11 Sept. 1967	BANW63
35	Stemmermann: saw 1 / approximately 0.5 mile NE Pu'u'alaea	ca. 6500	11 June 1975	(4)
36	Conant: saw 1 / Kipahulu Valley	ca. 4800	16 Aug. 1978	(4)
37	Stemmermann: saw 1 / Kipahulu Valley	ca. 3600	29 March 1979	(4)

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ABSTRACT

Hemignathus wilsoni is a small, short-tailed, mostly olive-green forest bird with strongly decurved black bill and having a straight lower mandible. It is endemic to the island of Hawai'i. Exhaustive search of literature and field journals uncovered some 267 observational notes, collection records, reports, and related statements on relative abundance and geographical distribution from 1877 to 1978. All records are serially numbered, arranged in geographical and chronological order, referenced, and systematically analyzed.

Ornithologists up to 1896 reported this species widely distributed and common to numerous in the upper forest. Observers from 1902 to 1978 found progressively fewer in all districts. Only on a few hundred acres of the upper Keauhou Ranch and the contiguous Kīlauea Forest Reserve is a viable population plainly evident, and even in this locality numbers are comparatively fewer than in the recent past, and apparently still declining. The long-term outlook for survival of this species is bleak.

41. Hemignathus wilsoni
'Akiapōlā'au

The 'Akiapōlā'au is a small (5-6 inch long), short-tailed, bright to dull mostly olive-green forest bird with yellow breast and strongly decurved black bill having a straight lower mandible (Wilson & Evans 1892; Rothschild 1893). Endemic to the island of Hawai'i, Hemignathus wilsoni was described and named by Rothschild (1893). Principal repositories of some 192 specimens are: B. P. Bishop Museum (64), American Museum of Natural History (29), and British Museum of Natural History (22) (Banko 1979 report).

Rothschild (1893) gives the most complete early description and history of this species, clearing up confusion on its synonymy which persisted as late as Wilson and Evans (1892). Henshaw (1902) and Perkins (1903) state most of what is known regarding its habits and behavior. Berger (1972) provides a contemporary comprehensive treatment.

OBSERVATIONS, REPORTS, AND SPECIMEN RECORDS

Drawing conclusions from a large volume of historical information on relative abundance and distribution of Hemignathus wilsoni required that data be geographically arranged and chronologically ordered in a systematic fashion, as outlined in the Introduction to Part I (CPSU/UH Avian History Report 4). Records presented in the Appendix satisfy criteria necessary for basic documentation and comparative analysis.

In the following descriptive account, sources of published information are cited by author and year in the usual style. One, two, or three digit numbers in parentheses refer to specific records in the Appendix. Sources of published and unpublished information listed in the Appendix may be traced to complete references in the bibliography.

Early Notes and Records (1887-1904):

An undesignated collector, possibly T. Ballieu, obtained and preserved an example of H. wilsoni as early as 1877 (Banko 1979 report), but this skin (now in the Museum of Comparative Zoology, Harvard University) was apparently overlooked by the early-day British taxonomists S. B. Wilson and W. R. Rothschild. Wilson (Banko 1979 report) apparently collected a total of 14 specimens in 1887/1888 as follows: Mānā (1), Mānā dairy (3), Kona (2) (3, according to Wilson & Evans 1892), and 8 in undesignated localities (9, 23, 264, 265). Wilson (1890), and Wilson and Evans (1892) wrote later that they found this species in

"considerable numbers" in the māmane woods near Mānā in January 1888, "decidely rare" in Kona where specimens were taken at ca. 5000 feet elevation, and that it seemed to range (islandwide) from 3500 to 5000 feet elevation as they "never met with it" in the lower forest zone (.1, 21, 22, 266, 267).

Rothschild (1893) stated that "numbers" of this species were seen by Palmer (in 1891 and 1892) from 2000 to 5000/6000 feet elevation in Hāmākua District, and that Palmer found it "very common" in Kona at from 2000 to 4000 feet, and "a few" above 4000 feet elevation (24, 28, 217). Rothschild (1893), in summing up Palmer's observations, wrote that Palmer believed that "all of the upland forests" were inhabited by this species (3). None of the tags on the 30 specimens collected by Palmer bore the name of the locality where it was taken though several specimens were collected at ca. 5000 feet elevation, "not very far from the mountain-house in which Mr. Scott Wilson had stayed for some time...(in) upper Kaawaloa district" (now Pulehua Ranch) (Banko 1979 report) (10, 35). G. C. Munro, Palmer's assistant, is credited with taking three additional specimens during this period, two in Hāmākua District and one in South Kona District (Banko 1979 report) (25, 216).

Perkins (field journal) collected about 30 specimens of 'Akiapōlā'au in 1892, 1894, 1895, and 1896 (Banko 1979 report). Most specimens were taken in Kona District at 4000 feet elevation (4) and unspecified elevations on Pulehua Ranch (5), with nine secured in Ka'ū District (26, 36-42, 47). Three specimens were taken near Hilo at 2000 feet elevation (246-248). Perkins also secured two specimens on "Mauna Loa," six specimens in undesignated localities, and is credited with two others whose tags lack specific date or locality information (11-14, 26, 36-42, 47, 244-248). Noting relative abundance of this species in the above and other localities, Perkins (1903, field journal) "saw great numbers...old...and young" in the "dense forest well above the highest cane fields in Amaulu ('Amaulu) near fork of Wailuku River" on 21 December 1895; called them "numerous" in the forests of mixed koa, māmane, and naio from 3500 feet upwards (but not less than 3500 ft) in the "middle Kona district"; "found" them present in the māmane woods of the Waimea District; "common...a dozen or more could be seen any day" up to the year 1896 from "1.5 to 2 miles of the Volcano House" (toward Mauna Loa); and "abundant from about 1200 ft in Puna District to about 6 or 7 miles up Mauna Loa above Kilauea and as far down from the crater as the halfway house (Dolloway's) between Pahala and the volcano" (18, 30, 31, 67, 166, 218, 245). Perkins (1893) summed up his early (1892) observations of 'Akiapōlā'au in Kona by stating that this species was "a common bird from rather below 4000 ft. to some hundreds of feet above that altitude and most probably much higher still" and that it "belongs to the upper district" in the Kona area (1, 2). Later, after his experiences in windward districts of the island, Perkins (1903) termed this species "widely distributed" and "abundant in localities differing greatly in their climates" (4).

A few years later, from 1898 to 1902, H. W. Henshaw collected some 74 'Akiapōlā'au specimens in various localities, as follows: Kaiwiki (32); Kaūmana, 2000 feet elevation (1); 'Ōla'a (9); 'Ōla'a, 1800 feet elevation (3); 'Ōla'a, 2400 feet elevation (10); 'Ōla'a, unspecified elevations (9); Volcano (7); Volcano, 4500 feet elevation (1); Pāhala (1); 'Ōhaikea (houses), Ka'ū District (1); "Kapahulu" (? Kapāpala) (1); and 8 in unspecified localities (Banko 1979 report) (16, 48, 64, 66, 192, 193, 213-215, 251, 252). In addition, it was probably Henshaw who collected one specimen at 'Āinapō, possibly about 1900 (Banko 1979 report) (65). In contrast to Perkins who had a few years earlier found the 'Akiapōlā'au "common" and "abundant" in certain localities, Henshaw (1902) stated that this species was "rather rare so far as the general forest is concerned," being "rather common" only in certain localities above Hilo north of the Wailuku River (5, 250).

Three other collectors obtained small numbers of birds shortly before or after 1900 (Banko 1979 report). A. Koebele secured eight specimens at Kīlauea in September 1896 (167). A. M. Walcott obtained two examples at Kīlauea on 2 April, and four at Kaiwiki on 7 and 8 April 1901 (168, 249). C. E. Blacow collected four examples in 1903 and 1905, two at "Horner's Ranch" ('Umikoa) in Hāmākua District (one at 7300 ft, the other at 7500 ft elev.) and two at undesignated place(s) in Hāmākua District, presumably at or near 'Umikoa (219, 260-262). In addition, two nests of this species were collected on Horner's Ranch at 7500 feet elevation on 27 June 1904 (Bryan 1905).

In addition to the foregoing collections by early ornithologists, Bryan (1901) reported a specimen from Kona taken at from 4000 to 5000 feet, and Banko (1979 report) noted seven specimens had been taken by undesignated collectors (probably in the 1890's in Ka'ū District) and seven undated specimens in undesignated locations.

Later Observations (1906-1959):

There seems to have been no 'Akiapōlā'au specimens collected or reported from 1906 through 1936. No ornithological observers were known to have lived on or visited the island of Hawai'i during this 31-year period. However, W. R. Donaghho and H. G. Craddock initiated bird surveys in and near Hawaii (Volcanoes) National Park in 1937, with the following results.

On 30 June 1937 Donaghho (1937 report, 1951b) saw three 'Akiapōlā'au near the Kīlauea Forest Reserve boundary on a 7-mile hike from Kīpukapuāulu (Bird Park) through Brown's (Keauhou) Ranch (68, 69); and again, on 2 July, detected a pair somewhere in a pastured area on the Ranch on the last leg of a hike from the vicinity of Keawewai water tank to Kīlauea (50, 51, 73), and earlier the same day saw 11 and heard seven others from where his hike began at the Mauna Loa trailhead at 6700 feet elevation down

to Keawewai water tank and into the koa forest (52). On 13 July 1937 Donaghho (1937 report, 1951b) and Craddock (1937 report) saw one or two and heard others on a hike in the Upper 'Ōla'a Forest Reserve [near the National Park Service (NPS) 'Ōla'a Tract] from Volcano toward Kūlani (Cone), Donaghho mentioning in his report that "they begin to appear when one begins to get into the koa forest" (194-196). On 20 July Donaghho (1951b) reported hearing one "near campsite (at) end of Mauna Loa truck trail" (Strip Road), perhaps the same as the one noted the same day "in a kipuka of mixed Koa, Ohia and Mamane...on way from Kipuka Maunaiu to Cache No. 2, Mauna Loa truck trail" (161, 169). Craddock (1937 report) "heard 2" somewhere on the Mauna Loa slope near the Truck Trail (Strip Road), also on 20 July 1937. On 9 August 1937 Donaghho (1937 report, 1951c) "saw 1" just above his head in some māmane trees along the road entering Kīpukakulalio from the south boundary of Hawaii (Volcanoes) National Park (148, 170). Craddock (1937 report) saw one and heard three near the Truck Trail (Strip Road) on 1 September 1937, while Donaghho (1937 report) noted hearing one at the end of the Truck Trail sometime during this summer period (172). On 11 September Donaghho (1951d) reported seeing one and hearing others "now and then" while hiking along the edge of the koa rain forest (near/at) beginning of the Pu'u'ō'ō Trail from Keauhou Ranch to Mauna Kea, Kūlani (Cone) and Lalaau being visible (53). Donaghho (1951d) also noted seeing and hearing one in the māmane forest up from Pu'u'uloa in the Mauna Kea Forest Reserve on 14 September 1937 (239). Summing up his June to August 1937 observations of 'Akiapōlā'au for the Park Superintendent, Donaghho (1937 report) termed this species "not rare" in the wet koa forest, saying that it can "frequently" be found in the Park south of the Truck Trail (Strip Road) (149, 171).

P. H. Baldwin began observing birds in and near Hawaii (Volcanoes) National Park in 1938, noting 'Akiapōlā'au on several occasions but not until after Donald Abbott, an associate, collected two specimens on 24 and 25 August in or near the Park at Kīpukakulalio, Kapāpala, Ka'ū District (Baldwin 1941; Banko 1979 report) (70, 151). Baldwin (field journal) "saw several" in the Keawewai area on 10 September 1938, and the next day heard this species several times between 0522 and 0526 hours in the koa grove near Keawewai cabin; counted six or eight during a morning's horseback ride between Keawewai and Pu'ukīpū, and three during his ride (1500-1830 hours) from Keawewai to Keauhou Ranch (54, 74-77). Later, on 25 November 1938, Baldwin (field journal) saw one "for certain" and possibly another (but heard neither) during a (0910-1245 hours) walk west, south and return to Camp 5500 near the Mauna Loa Truck Trail (Strip Road), Kīpukakulalio (173).

In 1939 Baldwin (field journal) saw one 'Akiapōlā'au and heard two others in the Kīpukakēkake area on a 10-mile (0930-1700 hours) hike from Kīpukakī through lower Keauhou Ranch on 1 January (71). One 'Akiapōlā'au was "seen and heard" by Baldwin (field journal) in a clump of koa at 5900 feet elevation near the

Mauna Loa Truck Trail on 4 February (162), and a few days later on 6 February he heard one slightly lower near the Truck Trail at 5500 feet elevation (174). Baldwin (field journal) noted the absence of this species later in the year when he visited the "old campsite" in the 5500 feet elevation kīpuka near the Truck Trail on 4 July (175), but heard it near the Truck Trail at 6250 feet elevation on 6 July 1939 (163).

In February and March 1940 this species was seen by several individuals on Mauna Kea in Forest Reserve lands above Pepe'ekeo (H. Baldwin correspondence, minutes of Manu Iki Society) (253, 254).

Donaghho (1940) noted two pairs of 'Akiapōlā'au in two different kīpukas on the upper slopes of Mauna Loa in Hawaii (Volcanoes) National Park in May 1940, and on Mauna Kea that same month found it "not uncommon" in the koa belt, counting 24, and noted that it was also to be found above the koa in the māmane (176, 220, 224).

In September and October 1940, Baldwin (1941) termed the 'Akiapōlā'au "uncommon" during surveys of about 1.5 square miles of koa parkland in Kīpukakulalio lying within the Park at from 5400 to 6700 feet elevation. During this survey Baldwin (1941) stated that he saw "about a dozen individuals" with but a single young following adults in 2 pairs out of the 4 of 5 (pairs) observed" (177), and that he judged this species to be "present in greater concentration in the wetter koa parkland of Keawewai than in Kīpuka Kulalio" (78). Baldwin (field journal) saw one or two in the Keawewai area on 6 August 1941 but noted that there were "not so many seen and heard as in 1938" and that the numbers "seemed reduced" (NPS report) (79, 80). Northwood (field journal) also recorded this species "seen" in Hawaii (Volcanoes) National Park (in Kīpukakulalio) on 18 August 1941 (152).

The 'Akiapōlā'au seems to have gone unreported in 1942, ornithologists apparently being much involved in the early stages of World War II, but Northwood (1943) recorded this species as "seen" in an unspecified locality in Hawaii (Volcanoes) National Park, presumably that year but possibly referring to his 1941 sighting (153). Baldwin (1944) "counted 1" along three trails covering a total of five acres in koa groves in the Park, presumably in the Strip Road-Kīpukakulalio area in 1943 (154). However, on Mauna Kea Baldwin (field journal) saw one at 7250 feet elevation in the māmane forest at the lower edge of the Forest Reserve 1 mile northwest of Pu'u Lā'au on 19 April 1943, and the next day stated that he saw or heard "perhaps...more than a half-dozen" in 2 hours (0800-1000 hours) in the Pu'u Lā'au forest 1 mile northwest of (State) Forest Service cabin in the Mauna Kea Forest Reserve (228, 229).

The only other acknowledgments of the existence of 'Akiapōlā'au from 1941 to 1946 seem to be an NPS report that this species had been seen in Kīpukapuauulu on 16 July 1944, a

statement by Munro (1944) that it had been seen recently in the Park, and a statement by Richards and Baldwin (1953) that this species was seen from 4150 to 5500 feet elevation in and near Hawaii (Volcanoes) National Park during the 1941 to 1946 period (17, 178, 179).

Baldwin (Banko 1979 report) collected two 'Akiapōlā'au specimens on Keauhou Ranch 2 miles west of Solomon's Waterhole, taking one at 6700 feet and one at 6750 feet elevation on 24 October 1948 (82). Baldwin (field journal) noted the presence of this species 0.25 mile west of Solomon's Waterhole again on 12 September 1949 (83). Several years later, Baldwin (1953) determined from an extensive series of repetitive counts carried out from 1940 to 1949 at various localities in Hawaii (Volcanoes) National Park that, in 100 days of censusing, 'Akiapōlā'au could be expected to be recorded 48 days in Plot 6 (Kīpukakulalio, 5500 ft elev.); 1 day in Plot 7 (Kīpukapuauulu, 4050 ft elev.); 1 day in Plot 12 (Kīpukakulalio, 5900 ft elev.); and 0 days in Plot 1 (Kīpukakeanabihopa, 2300 ft elev.), Plot 2 (Kīpukanēnē No. 2, 3000 ft elev.), Plot 3 (Kīpukanēnē No. 3, 3000 ft elev.), Plot 4 (Nāpau Lava Trees, 2850 ft elev.), Plot 8 (Twin Craters, 3650 ft elev.), Plot 10 (Mauna Loa, 7500 ft elev.), Plot 13 ('Āinahou Gate, 3050 ft elev.), Plot 17 (Kalanaokuaiki Pali, 3300 ft elev.), and Plot 18 (Luamanu, 3650 ft elev.) (144). Total count days in the foregoing areas ranged from 23 in Plot 4 to 110 in Plot 6 (Baldwin 1953) (144).

Ornithological surveys by L. P. Richards from August to December 1950 confirmed the existence of 'Akiapōlā'au in areas where they were previously reported by others and, in a few cases, made their presence known in localities where they had not previously been seen. Richards (field journal) documented his impressions of 'Akiapōlā'au numbers as follows: "heard tapping and possibly the notes" on Stainback highway about 500 yards southwest of the 1942 lava flow on 19 August; "only 1 seen...(it was) collected...believe now I saw 1 (in the same area) yesterday ...hooked bill quite visible" between the 1- and 2-mile markers (3800-4200 ft elev.) on the trail from end of Haunani Street, Volcano, to Pu'u Kūlani in Upper 'Ōla'a Forest Reserve on 13 October; "1 pair observed briefly" on hike from Kīpukakulalio to Kīpukapuauulu on 14 October; "none seen" (1300-1815 hours) on 2-mile hike 27 October, and "2 seen" (0745-1215 hours) on 1.5-mile hike 28 October along Pu'u'ō'ō Trail south from Saddle Road; "observed 3" (pair and apparent juvenile) for about 4 hours (1400-1800 hours)...collecting 2" (one at 6425 ft elev.) in small māmane groves on Mauna Kea about 0.5 mile back toward Humu'ulu from Hopuwai on 14 December; and "observed 1" on 15 December, noted an unspecified number on 16 December, and saw "several" on 17 December in much the same area (85, 180, 197, 198, 240, 255-259).

'Akiapōlā'au seem not to have been detected at all during the next four years, from 1951 through 1954. However, Botsford et al. (1955) reported that on 1 January 1955 11 observers in

five parties censused a total of two in 23 party-hours of observations which ranged in Hawaii (Volcanoes) National Park from near Nāpau Crater to 5500 feet elevation along the Strip Road, and this information was subsequently included in reports by NPS and Anonymous (1955) (55, 155, 181). A total of four were censused during the following 31 December 1955 Christmas Count, apparently all or principally along the Keauhou (Nobriga) Ranch road, 8 hours of the count being conducted on foot and 0.5 hour by car (Anon. 1956) (56).

In Kona District, W. H. Elder (field journal) noted seeing one 'Akiapōlā'au at 6700 feet elevation "up from Koa Mill," Yee Hop Ranch, Honomalino, during a 1 to 4 October 1956 field trip (46), and D. Woodside saw one north of Keanapa'akai near upper edge of Hōnaunau Forest Reserve on an unspecified date the same month (Sakai & Ralph 1978) (45a).

A 3-year gap in 'Akiapōlā'au records occurred in 1957, 1958, and 1959 after the three foregoing reports in 1955 and 1956.

Recent Records (1960-1978):

Dunmire (1961) failed to detect even one 'Akiapōlā'au in 10 censuses (30.5 total hours) along the Mauna Loa Strip Road between 4000 and 6700 feet elevation at various seasons of the year in 1960 and 1961 (160) and recognized a late 1950's gap in records (145, 157). However, Hanson (1960) reported "1 seen" in Kīpukapuāulu (Bird Park) during Easter, presumably in 1960 (182); King (1961) noted "1 seen" along a trail "about a mile into the tree fern jungle" from Wright Road on 27 February 1961 (199); and Ward (field journal) logged "1 seen" in Keauhou Ranch just outside the northwest boundary of Hawaii (Volcanoes) National Park at an elevation of 5000 feet on 24 June 1961 (72). No 'Akiapōlā'au were reported seen in 1962 and 1963. Ward (field journal) noted seeing one on a brief visit to the Pu'u Lā'au area of Mauna Kea on 17 April 1964 (230), and King and Bratley (1964) reported seeing another in the same area a few days later, 18 to 20 April (221).

Banko (field journal) noted that R. Baldwin reported seeing an 'Akiapōlā'au, about 25 feet away, chipping on an 'ohi'a tree trunk in a low-lying kīpuka in Hawaii (Volcanoes) National Park, along the trail from Makaopuhi Crater to Nāpau Crater during the summer of 1965 (191); learned from S. Greenwell, in a 6 January 1967 interview, that ranch hand Henreiques saw two strange yellow (headed) birds with long hooked bills, presumably 'Akiapōlā'au, on two days near the airstrip he constructed "a couple of years ago" for Pulehua Ranch (43).

Ward (field journal) "saw 1" in the Pu'u Lā'au area of Mauna Kea, presumably in October 1966 (231). Presence of this species was noted again by Ord (1967) on a brief visit to this same area in November 1966 (232). However, Donaghho (1966) reported

finding none on 30 May 1966 where one could formerly "depend upon seeing it" along the Mauna Loa Strip Road in the Kūlani-Keawewai area, and in the Hopuwai camp area of Mauna Kea (86, 158, 241). On 13 June 1966 Berger (1972) found a male, and two days later saw two males and one female about 6800 feet elevation in the māmane-naio ecosystem on Mauna Kea (222).

There seems to have been no 'Akiapōlā'au reported in 1967 and only one in 1968, a single individual noted along a dirt road east of the Pu'u Lā'au cabin on Mauna Kea on 19 December by Donaghho (1969) (233). The Hawaii Division of Fish and Game (1969 report) officially designated the 'Akiapōlā'au as an endangered species in 1969 (6).

There were only four 'Akiapōlā'au reported seen in 1970: a single bird "watched" about 300 yards southwest of the rainshed near Mauna Loa Strip Road at 5350 feet elevation on 28 April (NPS files) (183); one seen (Banko, field journal) chipping bark on a Cheirodendron tree at 5640 feet elevation during a 3-hour survey (1400-1700 hours) on 6 October along the boundary fence between Keauhou Ranch and the Kīlauea Forest Reserve (87); and a male and female seen chipping koa bark during a 6.75-hour survey (0945-1530 hours) on 31 December near the power pole 115 about 0.25 mile above Keawewai camp along the jeep road at 6160 feet elevation (Banko, field journal) (88).

Three 'Akiapōlā'au sightings were recorded in 1971: a male seen in a grove of naio trees at 5500 feet elevation during a 2.5-hour survey (1415-1645 hours) along a Keauhou Ranch paddock fence on 11 February (Banko, field journal); another male observed poking its head repeatedly into 'ōhi'a blossoms at the edge of the Kohala forest on 29 June (van Riper 1973), which was later disavowed (Sakai & Ralph 1978); and a third male feeding in 'ōhi'a trees at 5500 feet elevation 1.5 miles southeast of the Moanua communications relay station on the west slope of Hualālai on 11 August (van Riper 1973) (20, 20a, 33, 34, 89).

From 11 January to 20 July 1972 Berger (1972 report) completed a series of 22 surveys along a grid of four transects in a 200-acre International Biological Program (IBP) study plot located at about 5000 feet elevation in the Kīlauea Forest Reserve adjacent to Keauhou Ranch and reported detecting a single 'Akiapōlā'au on only six occasions (12 Jan., 7 Feb., 15 Mar. on Transects 3 and 4; 20 May and 21 May on Transects 1 and 4) during a total of 36 hours and 10 minutes of survey time (113-134). In addition to observations made along transects, Banko (field journal) noted that Berger and students reported seeing three 'Akiapōlā'au between Pu'u Lalaau and Kulani on 14 January 1972, and Berger (1972 report) found one singing in a cutover area about 0.25 mile south of the study area on 21 May 1972 (90, 91). Berger (1972 report) also noted that he had seen this species (presumably in 1972) at 5700 feet elevation near the IBP study area along the jeep trail to Keawewai; heard three singing in a cutover area about 0.25 mile south of the IBP study area on

19 August; and that (J.) Jacobi "saw 2 and heard 4 or 5" along the upper fence of the Forest Reserve about 0.25 mile south of the study area on 19 August 1972 (99, 100, 104). From these, and possibly knowledge of other sightings, Berger (1972 report) stated that the collected data suggested a minimum of three pairs was resident in the IBP study area and "possibly the largest surviving group" (96, 97). In another study Berger (1972a report) noted the disappearance of 'Akiapōlā'au from Hawaii Volcanoes National Park since the 1940's (146).

Due to an upsurge in involvement by field biologists in IBP studies in 1972 there was a corresponding increase in 'Akiapōlā'au sighted in the Pu'u Lalaau-Kūlani area that year. U. S. Fish and Wildlife Service files contain reports of one seen and heard in the IBP study area at 5400 feet elevation on 29 May, two seen and heard at 0915 hours along Transect 1 on 5 June, one seen and heard near the beginning of Transect 1 at 5400 feet elevation on 12 June, and one heard and seen near the IBP weather station (5400 ft elev.) on 24 June (92-95).

Jacobi (1974) systematically logged 'Akiapōlā'au he detected while afield in and near the IBP study area between 29 May and 5 December 1972, finding none on several trips from ca. 7 miles north of Park Headquarters (Hawaii Volcanoes National) north to Pu'ukūpū (6100 ft elev.), but found eight in four different groups on a continuous 3 December trip from Pu'u Kūlani to the east boundary of Keauhou Ranch (102, 103). In all, Jacobi (1974) recorded 60 between 5000 and 5600 feet elevation on 34 different occasions, many no doubt repeated sightings of the same bird (101). Anonymous (1973a) reported seeing one in late July or early August 1972 somewhere (in undescribed locality) in the upper Kīlauea Forest Reserve (98). Gagné (1973) reported that 29 'Akiapōlā'au were censused in Kīlauea Forest Reserve on 30 December 1972 and one somewhere in the Kūlani Cone to Pu'u Maka'ala area that same day (19, 57).

On 18 January 1973 van Riper (1973) found an active nest of the 'Akiapōlā'au, claimed to be the first ever reported, in an unmentioned locality in Kīlauea Forest Reserve (60).

U. S. Fish and Wildlife Service files contain a report that a single 'Akiapōlā'au was observed low in a Cheirodendron tree at about 4000 feet elevation 2 km (1.25 miles) south of the Saddle Road on "Tree Planting Road" on 30 January 1973 (242). Mull (1974) reported that no 'Akiapōlā'au were found during the 30 December 1973 Christmas Count in Kīpukapuaulu, along the rim of Kīlauea Crater, along Mauna Loa Strip Road, Mauna Loa Trail, and in the Volcano-Wright Road area (159, 164, 184, 185, 200), though one was censused in Keauhou Ranch and eight were counted that day in Kīlauea Forest Reserve (58, 59).

In Kona, Banko (field journal) states that N. Carlson reported seeing one yellow-headed male on 22 March 1973 about 200 yards north and 50 yards downslope of Hōnaunau Forest Reserve

upper boundary gate with Kēōkea (44), and Banko (field journal) heard a loud, clear 3-note whistle repeated two or three times believed to be that of an 'Akiapōlā'au, at 4400 feet elevation approximately 1.5 miles south of Hapu Camp, KAUNENE quadrangle, on 3 July 1973 (45).

On Mauna Kea, van Riper (1973) stated that a "localized" population could be found in the dry māmane-naio forest but furnished no details (223).

On 12 April 1974 Smith and Jacobi (1974) reported hearing and seeing an 'Akiapōlā'au in dense rain forest at 4000 feet elevation in the National Park Service 'Ōla'a Tract, and on 17 April stated that another of this species was heard at an undisclosed location in this same Tract (201, 203). Jacobi and Warshauer (1975 report) acknowledged the 12 April sighting and went on to say that the individual detected on 17 April was heard "in from the Volcano Ag. Exp. Station...Ōlaa Tract...in the same general area as the one seen and heard 12 April" (202, 204). Jacobi and Warshauer (1975 report) go on to note that no 'Akiapōlā'au were recorded in some 23 days of a biological reconnaissance they conducted in either the small or large sections of the 'Ōla'a Tract from January 1974 to January 1975 (205). Smith and Jacobi (1974) stated that four female and five male 'Akiapōlā'au were observed in an unspecified locality in the Kīlauea Forest Reserve on 15 June, presumably in 1974 (61).

On the southwestern slope of Mauna Kea, in study areas at 6500, 7000, and 7500 feet elevation in the Ka'ohe Game Management Area, van Riper (field journal) recorded most 'Akiapōlā'au at 7400 feet where māmane was most common, never observing this species below 7100 feet elevation in surveys carried out from March 1973 to October 1974 (237).

Back in the Park area, Mull (1975) reported that 14 'Akiapōlā'au were censused on Keauhou Ranch and six in Kīlauea Forest Reserve on the 14 December 1974 Christmas Count (62, 63).

Conant (1975, 1975 report) conducted periodic monthly censuses from December 1972 to March 1975 on 12 transects in different ecosystems in and near Hawaii Volcanoes National Park finding 2.8 ± 1.97 'Akiapōlā'au per 40 ha (98.8 acres) along Transect 91 in Kīlauea Forest Reserve, and 2.5 ± 1.27 per 40 ha along Transect 92 in upper Keauhou Ranch where the highest population densities were found (105-107).

In much more extensive surveys by the U. S. Fish and Wildlife Service along the eastern slope of Mauna Loa, Marshall (1975) stated that the 'Akiapōlā'au was consistently found only from Keauhou Ranch and Kīlauea Forest Reserve where average densities of 19.0 individuals per 100 acres were found in limited areas (112). By contrast, Marshall (1975) stated that a recent U. S. Fish and Wildlife Service survey of 392 transect miles of māmane-naio forest on Mauna Kea produced only 12 individuals

(227). Since census sample criteria used on Mauna Loa or Mauna Kea were not described by Marshall (1975), data obtained by the U. S. Fish and Wildlife Service is not directly comparable to that gathered by Conant (1975, 1975 report).

Pratt et al. (1977) stated that three observers, during a period of extraordinary concentration of this species (together with that of Loxops spp.), reported observing 50 in 5 hours along about 1 mile of boundary fence between Keauhou Ranch and Kīlauea Forest Reserve on 19 August 1975, but only 22 in 8 hours the next day in much the same area (108, 109).

Katahira (1975) noted the sighting of one 'Akiapōlā'au in mid-July 1975 in the "scorched" koa belt next to the Mauna Loa Strip Road (186). Donaghho (1975) stated that he heard one and possibly saw another on Keauhou Ranch near Keawewai on 4 October 1975 and saw two in Kīlauea Forest Reserve in the Keawewai area the next day (110, 111). Conant (1978 report) stated that none were observed on 1976 to 1977 systematic surveys, and expressed doubt that the 'Akiapōlā'au still existed in the Kalapana Extension in Hawaii Volcanoes National Park (212a).

On Mauna Kea, van Riper et al. (1978) computed that two 'Akiapōlā'au were censused per km^2 (0.62 mile^2) on 2,380 m (7807 ft) elevation transect between Pu'u o Kauha and approximately 1.6 km (1 mile) north of Pu'u Lā'au cabin on 24 September 1975 (237a).

The U. S. Fish and Wildlife Service (1978 report) stated that the 'Akiapōlā'au was recorded 226 times in 39,168 minutes of observation, 4,896 count periods, and 2,452 sampling stations along 329 km (204 miles) of trail in 105,938 ha (42,871 acre) area of windward Hawai'i (7a). The results of this 3-month survey in the summer of 1977 were restated by Scott et al. (1977 report) (7b).

Anonymous (1978) reported that five were found on 1 October 1977, one at "one of the lowest altitude records for the species" 1 mile north of 'Ōla'a Tract near Pu'u Maka'ala (210).

On Mauna Kea, Shallenberger (1977) stated that although none were detected on surveys conducted from November 1976 to January 1977 in the U. S. Army Pōhakuloa Training Area it seemed reasonable to expect this species in portions of the native forest, noting that Pratt saw one bird near Pu'u Lā'au late in March 1977 (227a, 237b). Pyle (1978) noted that one 'Akiapōlā'au was detected at Pu'u Lā'au on 12 September 1977 (238).

Atkinson (1977), from evidence recently available, stated that the 'Akiapōlā'au "survives locally in low numbers" (7).

Katahira (1978) reported that the 2 January 1978 Christmas Count recorded 22 on Keauhou Ranch, one on Transect 31, and five on Transect 30, but none from 4000 to 6600 feet elevation along

Mauna Loa Strip Road, none from 6600 to 8200 feet elevation along the Mauna Loa Trail, none in Kīpukapuāulu and Kīlauea Crater areas, none in the Volcano and 'Ōla'a Tract areas, none along the Stainback Highway and in the Pu'u Maka'ala areas, and none in the Waiākea Forest Reserve (141-143, 187-190, 206, 207, 211, 212). National Park Service files contain a report by B. Kahakua that a single 'Akiapōlā'au was watched feeding in Kīpukamauna'iu at 5600 to 5800 feet elevation in Hawaii Volcanoes National Park on 17 August 1978 (165).

In Kona, Sakai (Sakai & Ralph 1978) observed two (female with juvenile) for about a minute 1.2 miles west of Hooper Camp, South Kona, at 5000 feet elevation on 17 April 1978 (45b), and Scott (Sakai & Ralph 1978) reported that "more were seen," presumably on recent U. S. Fish and Wildlife Service surveys in North and South Kona Districts (27a).

Summarizing results of U. S. Fish and Wildlife Service surveys in Kona in the summer of 1978, Whitten (1978) stated that agency spokesman E. Kridler reported that the survey team of 11 biologists found this species in "disappointing" numbers, "perhaps in low hundreds," in some 243 miles of transects, including 5,800 count periods at 2900 stations (27b).

CHRONOLOGICAL DISTRIBUTION OF RECORDS

Distribution of some 270 records of Hemignathus wilsoni, including negative reports, is shown in Table 8. The pattern shown reflects the increase in ornithological activity from the late 1880's to 1905, lack of field observers from 1906 to 1936, and the upswing in observational recording during the contemporary period (1937 to 1978) despite substantial depopulation.

TABLE 8. Distribution of 270 Hemignathus wilsoni records by decade.

1770's - 0	1840's - 0	1910's - 0
1780's - 0	1850's - 0	1920's - 0
1790's - 0	1860's - 0	1930's - 33
1800's - 0	1870's - 1	1940's - 23
1810's - 0	1880's - 10	1950's - 17
1820's - 0	1890's - 43	1960's - 18
1830's - 0	1900's - 18	1970's - 107

GEOGRAPHICAL DISTRIBUTION OF RECORDS

Of a total of 192 records of Hemignathus wilsoni which are referable to a specific quadrant, 71 (37%) originated in KULANI, 31 (16%) are traceable to KILAUEA CRATER, and 16 (8%) are derived from VOLCANO. Geographical distribution of records is exhibited in Figure 8.

COMPLETENESS OF DATA, BIAS, ERRONEOUS AND DOUBTFUL RECORDS

Bias in chronological distribution of records is due primarily to a lack of field observers for a period of over 30 years (from 1906 to 1936). Geographical distribution of records is also noticeably skewed in favor of Hawaii Volcanoes National Park and vicinity because of biological studies in and near the Park. Only one record is known to be invalid, a fact pointed out directly in the text.

SUMMARY

Hemignathus wilsoni is a small, short-tailed, olive-green forest bird with yellow breast and strongly decurved black bill having a straight lower mandible. It is endemic to the island of Hawai'i. Some 186 specimens are known to have been taken over a broad altitudinal and geographical range during the 1887 to 1905

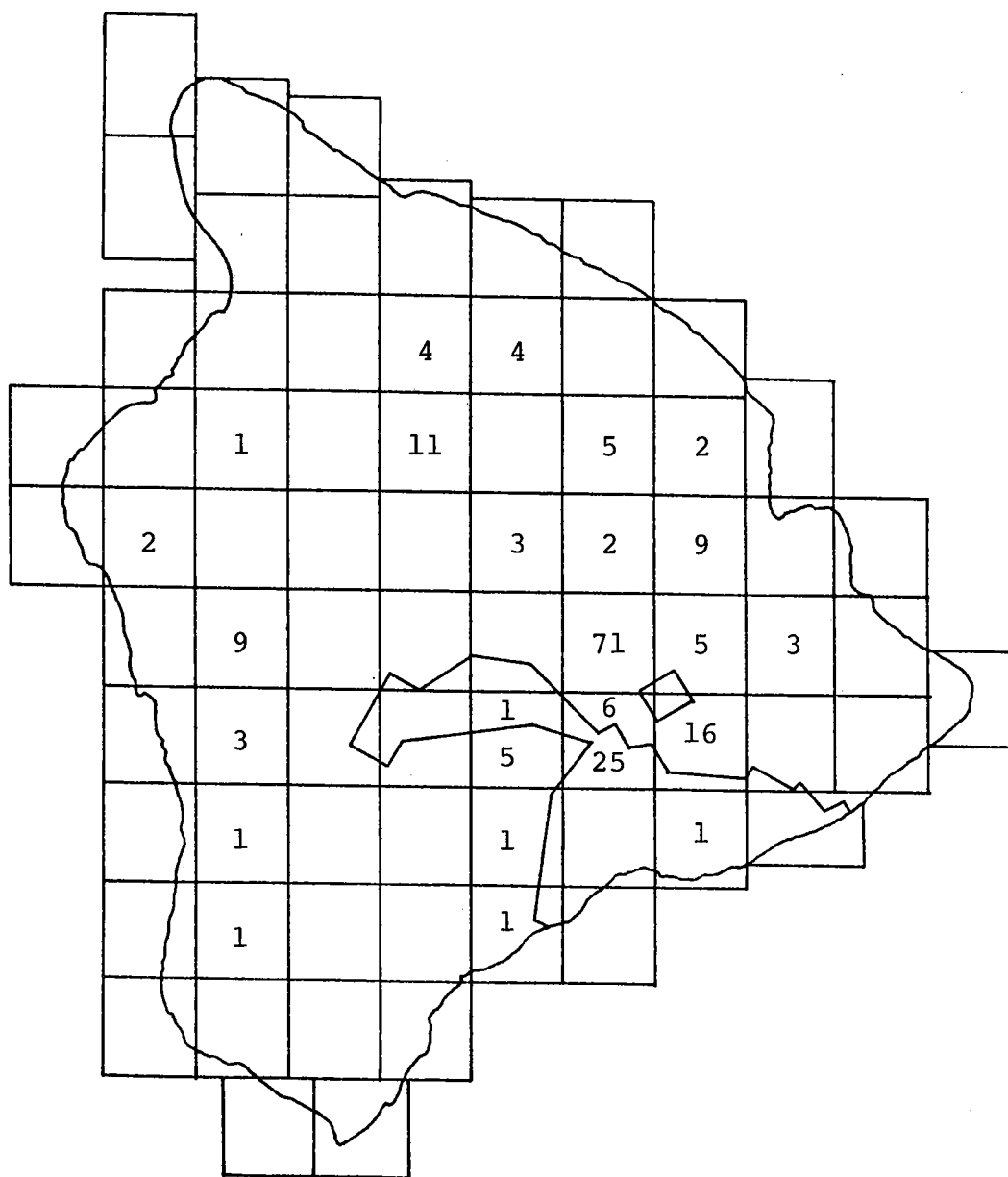


FIGURE 8. Distribution of 192 observations, reports, and museum records of *Hemignathus wilsoni*, per quadrangle, on Island of Hawai'i, 1887 to 1978.

period. Ornithologists up to 1896 reported this species to be widely distributed and common to numerous in the upper forest. Observers from 1898 to 1902, 1937 to 1950, and 1960 to 1978 have found progressively fewer of this species in all districts. By 1978 the 'Akiapōlā'au was almost completely depopulated from all districts except in northern Ka'ū district where a small remnant population remained in Keauhou Ranch and Kīlauea Forest Reserve.

CONCLUSIONS

The 'Akiapōlā'au has depopulated in the past 80 years to the point where it is entirely absent or extremely rare over virtually all of its former range. Only on a few hundred acres of the upper Keauhou Ranch and the contiguous Kīlauea Forest Reserve is a viable population plainly evident, and even there numbers are comparatively few and apparently still declining. Unless various elements of the present relict population unexpectedly stabilize and/or increase soon, the long-term outlook for survival of this species is bleak.

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APPENDIX VIII

1. Observations, reports, and specimen records are organized by island group, island, district, and/or quadrangle map. Order of listing, names and locations of district, and quadrangle boundaries are explained and illustrated in CPSU/UH Avian History Report 4: Introduction to Part I, Population Histories--Species Accounts.
2. Acronyms composed of the first three letters of the author's (or senior author's) last name, the first letter of the first name, and the last two digits of the year of publication represent sources found in the bibliography under References Cited. For example, BRYW01 = Bryan, W. A., and A. Seale. 1901. Notes on the birds of Kauai. Bishop Museum Occas. Papers. 1(3): 129-137. In cases where it is necessary to distinguish between two or more articles published by an author in any given year, letters are added to the acronym in alphabetical sequence. For example, BRYW01a = Bryan, W. A. 1901a. A key to the birds of the Hawaiian group. Bishop Museum Press. 76 pp.

Parenthetical numbers such as (5), represent references listed under Unpublished Sources Cited in the bibliography.
3. Place-names are cited in original form.
4. Parenthetical information is qualified.

Relative Abundance/Locality	Elev. (ft.)	Date	Source
<u>Hemignathus wilsoni</u>			
Island of Hawai'i			
ISLANDWIDE INFERENCE			
.1 seems to range from 3500-5000 ft....never met with in lower forest zone	(1887/1888)	WILS92
1 a common bird / from rather below 4,000 feet to some hundreds of feet above that altitude, and most probably much higher still	(June/Oct. 1892)	PERR93
2 belongs / to the upper district	3000-4000	(June/Oct. 1892)	PERR93
3 palmer: believe them to inhabit all the upland forests / (islandwide)	(1892)	ROTH93
4 abundant / in localities differing greatly in their climates; widely distributed	(1892-1896)	PERR93
5 rather rare / so far as the general forest is concerned	(1892-1902)	HENH02
6 HDPG: officially classed as endangered / (islandwide)	(1969)	(15)
7 survives locally in low numbers / (islandwide)	(1977)	ATKI77

MULTIDISTRICT

7a	recorded 226 times by survey team members in 39,168 minutes of observations, 4,896 count periods, 2,452 sampling stations along 329 km. (204 miles) of trail / 105,938 ha. (42,871 acres) forest habitat in windward Hawaii	....	Summer 1977	USFW73
7b	Scott et al.: survey team recorded 128 during 4,896 eight-minute count periods and 98 at other times...observed on 15 of 21 transects and during 1.90 percent of the count periods...distributed widely...found only at the higher elevations / 105,938 ha (42,871 acre) area in windward Hawai'i	....	June-Aug. 1977	(28)

UNDESIGNATED LOCALITY

8	Banko: unspecified collector (? Ballieu) obtained 1 specimen / unspecified place(s)	....	1877	(1)
9	Banko: Wilson collected 8 specimens / unspecified localities	....	1887/1888	(1)
10	Banko: Palmer collected 30 specimens / undesignated localities	....	1891/1892	(1)
11	Banko: Perkins collected 2 specimens / undesignated place(s)	....	1892-1896	(1)
12	Banko: Perkins collected 1 specimen / Mauna Loa	....	1892-1896	(1)
13	Banko: Perkins collected 6 specimens / undesignated localities	....	1892-1896	(1)
14	Banko: Perkins collected 1 specimen / Mauna Loa	(?) 3000	1892-1896	(1)

UNDESIGNATED LOCALITY (con't.)

- | | | | | |
|----|---|------|--------------|--------|
| 15 | Banko: unspecified collector(s) obtained 7 specimens / unspecified place(s) | .... | (ca. 1900 ?) | (1) |
| 16 | Banko: Henshaw collected 8 specimens / undesignated place(s) | .... | 1898-1902 | (1) |
| 17 | has been seen since (1891), I think in fair numbers / near the Hawaii National Park | .... | (1944) | MUNG44 |

MULTIQUADRANGLE

- | | | | | |
|----|---|------|-----------------|--------|
| 18 | perkins: abundant / from about 1200 feet in Puna district to about 6 or 7 miles up Mauna Loa above Kilauea, and as far down from the crater as the halfway house between Pahala and the volcano | .... | June-Sept. 1895 | (2) |
| 19 | 1 censused / Kulani Cone to Puu Makaala | .... | 30 Dec. 1972 | GAGW73 |

Kohala District

- | | | | | |
|-----|--|------|--------------|--------|
| 20 | 1 male observed...feeding in ohia...poking repeatedly into the flowers / edge of the Kohala forest | .... | 29 June 1971 | VANC73 |
| 20a | van Riper: considers sighting of male at edge of Kohala forest on 29 June 1971 invalid | .... | (1973) | SAKH78 |

Kona District

UNDESIGNATED LOCALITY

- | | | | | |
|----|---|----------|-------------|--------|
| 21 | first specimens...obtained / district of Kona | ca. 5000 | (1887-1888) | WILS90 |
|----|---|----------|-------------|--------|

22	decidedly rare / Kona	....	(1887-1888)	WILS92
23	Banko: Wilson collected 2 specimens / Kona District	....	1887/1888	(1)
24	Palmer: a few were seen / Kona District	above 4000	(1891)	ROTW93
25	Banko: Munro collected 1 specimen / South Kona District	....	1891/1892	(1)
26	Banko: Perkins collected 4 specimens / Kona District	4000	1892-1895	(1)
27	specimen in collection / Kona	4000-5000	(1901)	BRYW01
27a	Scott: more were seen / South Kona	....	(1978)	SAKH78
27b	Kridler: survey team found them in disappearing numbers...perhaps in low hundreds / survey of 311,000 acres from Hualalai to South Point; 5800 count periods at 2900 stations on 243 miles of transects censused by 11 biologists	....	Summer of 1978	WHIH78
MULTIQUADRANGLE				
28	Palmer found this bird very common / Kona District, SW side of the island	2000-4000	(1891)	ROTW93
29	common / in Kona	....	(1891)	MUNG44
30	numerous / in the forests of mixed Koa, Mamane, and Naio, from 3500 ft. upwards... in the middle Kona district	....	(1892-1895)	PERR03
31	not seen / below 3,500 feet, middle Kona district	....	(1892-1896)	PERR03

PUU ANAHULU

- 32 Banko: Wilson collected 1 specimen / Puwawaa 1887/1888 (1)
(Puuwaawaa)

KAILUA

- 33 van Riper: 1 seen in daylong walking survey 11 Aug. 1971 (7)
/ 0.5 mile below 4,900 ft. el. telephone
(microwave) reflectors, W slope of Hualalai
- 34 observed only once on this mountain...a male 5500 11 Aug. 1971 VANC73
feeding in ohia trees...remained in the immed-
iate area for over 7 minutes, going from tree
to tree / 1.5 miles SE of the Moanua radio
relay station

PUU LEHUA

- 35 several specimens shot by Palmer / not ca. 5000 (Sept. 1891) ROTW93
very far from the mountain-house in which
Mr. Scott Wilson had stayed for sometime...
upper Kaawaloa district (Pulehua)
- 36 Perkins: collected 2 specimens / vicinity 3 July (1892) (2)
Pulehua
- 37 Perkins: obtained specimen(s) / vicinity 9 July (1892) (2)
Pulehua
- 38 Perkins: 1 watched / vicinity Pulehua 11 July (1892) (2)
- 39 Perkins: collected 2 specimens / vicinity 13 July (1892) (2)
Pulehua
- 40 Perkins: obtained specimen / vicinity Pulehua 22 July (1892) (2)

- 41 Banko: Perkins collected 2 specimens /
Pulehua Ranch 1892-1896 (1)
- 42 Banko: Perkins collected 3 specimens /
Pulehua Ranch 4000 1892-1896 (1)
- 43 Banko: Henriques via S. Greenwell: saw
2 strange yellow birds with long, hooked bills
on 2 days (1 each day?) a couple of years ago
/ during airstrip construction near (Pulehua)
ranch headquarters 4070 (1965) (8)

KAUNENE

- 44 Banko: (N.) Carlson reported seeing 1
yellow-headed male / 200 yards N and 50 yards
downslope of Honaunau Forest Reserve upslope
gate at boundary with Keokea 22 March 1973 (8)
- 45 Banko: heard loud, clear, 3-note whistle
repeated 2 or 3 times after short intervals...
almost certainly that of akiapolau...searched
for but not seen / approximately 1.5 miles
S of Hapu Camp, Kaunene Quad. map 4400 3 July 1973 (8)
- 45a Woodside: 1 seen / N of Keanapaakai, near
upper edge of Honaunau Forest Reserve, on
Mauna (Loa) Oct. 1956 SAKH73

PUU POHAKULOA

- 45b observed 2 (female w/juv.) for about a
minute / 2 km. (1.2 miles) W of Hooper Camp,
South Kona 5000 17 April 1978 SAKH73

PAPA

- 46 Elder: 1 seen / up from Ohia Mill, Yee Hop Ranch, Honomolino 6700 1-4 Oct. 1956 (23)

Ka'u District

UNDESIGNATED LOCALITY

- 47 Banko: Perkins collected 9 specimens / Ka'u District 1892-1896 (1)
- 48 Banko: Henshaw collected 1 specimen / Kapahulu (? Kapapala) 1898-1902 (1)
- 49 Banko: 7 specimens taken by unnamed collectors / Ka'u District (? 1890's) (1)
- 50 pair heard / Koa kipukas in pastured area along hike from Keawewai to Kilauea 2 July 1937 DCNW51b
- 51 heard (quite a few)...saw 1 / in Koa forest on hike from vicinity Keawewai water tanks to Kilauea 2 July 1937 DCNW51b
- 52 Donaggho: saw 11, heard 7 others / from about 5700 ft. el. Mauna Loa trail down to Keawewai water tank and into koa forest thence making a "C" and out again going S, thence down to Brown's Ranch 2 July 1937 (24)
- 53 heard now and then...1 seen / along edge of koa rain forest beginning of Puu Oo trail, Keaouhou Ranch to Mauna Kea, Kulani and Lalaaau visible 11 Sept. 1937 DCNW51d
- 54 (P.) Baldwin: counted...3 / horseback ride from Keawewai to Keaouhou Ranch (hdgs.) 1500-1830 hours 11 Sept. 1938 (9)

55	2 censused (Christmas Count) / Nobriga Ranch Road (Keauhou Ranch)	....	1 Jan. 1955	ANON55
56	4 censused (Christmas Count) / Keauhou (Nobriga) Ranch Road (8 hours on foot, 0.5 hour by car)	....	31 Dec. 1955	ANON56
57	29 censused / Kilauea Forest Reserve	....	30 Dec. 1972	GAGW73
58	censused 8 / Kilauea Forest Reserve	....	30 Dec. 1973	MULW74
59	censused 1 / Keauhou Ranch	....	30 Dec. 1973	MULW74
60	active nest found...first ever reported / Kilauea Forest	....	18 Jan. 1973	VANC73
61	4 females and 5 males observed / Kilauea Forest Reserve	....	15 June (1974)	SMIH74
62	censused 6 / Kilauea Forest Reserve	....	14 Dec. 1974	MULW75
63	censused 14 / Keauhou Ranch	....	14 Dec. 1974	MULW75
PAHALA				
64	Banko: Henshaw collected 1 specimen / Pahala	....	1898-1902	(1)
WOOD VALLEY				
65	Banko: 1 specimen collected / 'Ainapō	....	(ca. 1900)	(1)
KIPUKA PAKEKAKE				
66	Banko: Henshaw collected 1 specimen / 'Ōhaieka (houses)	....	1898-1902	(1)

KILAUEA CRATER

- 67 can be observed / a few miles from the Volcano (1894-1896) PERR03
in Kau (on) stunted, bushy Koa trees, that are
occasionally met with in those woods
- 68 3 seen / Koa - olapa - naio growth, Keauhou DONW51a
Ranch near Forest Reserve boundary, on hike
from Kipuka Puaulu
- 69 Donaghho: saw 3 / from Kipuka Puaulu N into (24)
Brown's Ranch koa forest thence SE to fence-line
and back via tanks and ranch house (7 miles)
- 70 Banko: (D. Abbott) collected 2 specimens / (1)
Kipukakulalio, Kapāpala, Ka'u
- 71 (P.) Baldwin: 1 seen, 2 others heard / (9)
Kipuka Kekake area on 10 mile hike from
Kipuka Ki through lower Keauhou Ranch
(0930-1700 hours)
- 72 Ward: 1 seen / Keauhou Ranch, just outside 5000 24 June 1961 (3)
N.W. boundary of Hawaii National Park

KULANI

- 73 saw pair / just before leaving the forest... DONW51b
(in) a drier area where the undergrowth was
naio...on hike from Keawewai to Kilauea
- 74 (P.) Baldwin: saw several / Keawewai area (9)
10 Sept. 1938
- 75 (P.) Baldwin: heard / Koa grove near Keawewai (9)
cabin 11 Sept. 1938
- 76 (P.) Baldwin: heard several times (0522-0526 (9)
hours) / Keawewai cabin 11 Sept. 1938

- 77 (P.) Baldwin: counted 6, possibly 8 / morning horseback ride between Keawewai and Puu Kipu 11 Sept. 1938 (9)
- 78 present in greater concentration (than in Kipuka Kulalio) / in the wetter Koa parkland of Keawewai (1940) BALP41
- 79 (P.) Baldwin: not so many seen and heard as in 1938, though 1 or 2 were seen / Keawewai area 6 Aug. 1941 (9)
- 80 N.P.S.: numbers...seemed reduced (over those found in 1938) / vicinity of Keawewai Aug. 1941 (4)
- 81 (P.) Baldwin: present (with iiwis, apapanes, amakihi, akepas, creepers); 3 specimens collected / in large...koa clumps in understory of Naio, Metr., Styphelia (traversed on hike N from end of Strip Road to 7,500 ft. Keauhou Ranch 1-2 miles W of Solomon's Waterhole, and return via 6850 ft. contour) 24 Oct. 1948 (9)
- 82 Banko: Baldwin collected 2 specimens / 2 miles W of Solomon's Waterhole, Keauhou, Kau, 6700 ft. (1), 6750 ft. (1), elevation 24 Oct. 1948 (1)
- 83 (P.) Baldwin: present / Solomon's Waterhole 12 Sept. 1949 (9)
- 84 (P.) Baldwin: present / 0.25 mile W Solomon's Waterhole 12 Sept. 1949 (9)
- 85 Richards: heard tapping and possibly the notes / on Stainback highway about 500 yards S.W. 1942 lava flow 5500 19 Aug. 1950 (10)
- 86 (none found)...formerly could depend upon seeing it here / Kulani - Keawewai area 30 May 1966 DONW66

KULANI (con't.)

87	Banko: 1 seen chipping partially dead <u>Cheirodendron</u> ...it flew to live ohia where it searched a large limb for insects briefly... then it went on to koa briefly before disappearing...survey from 1400 - 1700 hours / along boundary fence Keaunohou Ranch - Kilauea Forest Reserve	5640	6 Oct. 1970	(8)
88	Banko: watched male and female chipping dead koa bark...survey from 0945-1530 / near telephone pole 115, 0.25 mile above Keawewai Camp along paddock fence, Keaunohou Ranch	6160	31 Dec. 1970	(8)
89	Banko: watched male in naio trees (no feeding)...survey from 1415 - 1645 hours / along paddock fence, Keaunohou Ranch	5500	11 Feb. 1971	(8)
90	Banko: Berger and students: saw 3 / in or near I.B.P. study area, between Puu Lalaau and Kulani	....	14 Jan. 1972	(8)
91	Berger: found 1 singing / cutover area about 0.25 mile S of the I.B.P. Study Plot	....	21 May 1972	(16)
92	U.S.F.W.S.: 1 seen and heard / I.B.P. study area, Kilauea Forest Reserve	5400	29 May 1972	(11)
93	U.S.F.W.S.: 2 seen and heard / I.B.P. study transect No. 1, (Kilauea Forest Reserve) (0915 hours)	....	5 June 1972	(11)
94	U.S.F.W.S.: 1 seen and heard / I.B.P. transect No. 1 near beginning	5400	12 June 1972	(11)
95	U.S.F.W.S.: 1 heard and seen / near weather station, I.B.P. Study Area, Kilauea Forest Reserve (1025 hours)	5400	24 June 1972	(11)

- 96 Berger: possibly the largest surviving group
/ Kilauea Forest Reserve, I.B.P. 200-acre
study area (11) censuses: (16)
11 Jan., 6 Feb., 14 March,
20 May, 20 July 1972
- 97 data suggest a minimum of 3 pairs / Kilauea
Forest Reserve, I.B.P. 200 acre study area (11) censuses: (16)
11 Jan., 6 Feb., 14 March,
20 May, 20 July 1972
- 98 good observations...long, curved upper
mandible / upper Kilauea Forest Reserve late July and
early Aug. 1972 ANON73a
- 99 Jacobi saw 2 and heard 4 or 5 / along the
upper fence of the Forest Reserve about
0.25 mile N of the (IBP) weather station 16 Aug. 1972 (16)
- 100 heard 3 singing / cutover area about 0.25 mile 19 Aug. 1972 (16)
S of the IBP study plot
- 101 recorded 60...on 34 different occasions... 5000-
many...certainly repeated sightings of the 5600
same bird...of 28 foraging notes 19 were
related to koa, 4 to ohia, and 5 to naio...
kolea (Myrsine sp.) also mentioned / chiefly
in the area from the E boundary of the Keauhou
Ranch to Puu Kulani
- 102 continuous trip...yielded 8 in 4 different 3 Dec. 1972 JACJ74
groups / from Puu Kulani to the E boundary of
the Keauhou Ranch
- 103 none sighted / on several trips N to Puu Kipu 6100 JACJ74
(from approximately 7 miles N of...Park Head-
quarters between 29 May
and 5 Dec. 1972
- 104 have seen / on jeep trail to Keawewai camp ca. 5700 (1972) (16)

KULANI (con't.)

- 105 have highest population densities / in
Kilauea Forest Reserve and Upper Keauhou Ranch
(from data collected monthly on 12 transects in
different ecosystems including Hawaii Volcanoes
National Park) March 1972 - July 1973; CONS75
Aug. 1974 - Nov. 1974
- 106 Conant: 2.8 ± 1.97 birds per 40 ha., 93%
occurrence frequency / monthly censuses,
Kilauea Forest Reserve (Transect 91)
Dec. 1972 - July 1973; (17)
Aug. 1974 - March 1975
- 107 Conant: 2.5 ± 1.27 birds per 40 ha., 100%
occurrence frequency / monthly censuses,
upper Keauhou Ranch (Transect 92)
Dec. 1972 - July 1973; (17)
Aug. 1974 - March 1975
- 108 3 observers saw 50 in 5 hours during
exceptional period of high numbers and
activity / about 1 mile along boundary fence
between Kilauea Forest Reserve and Keauhou
Ranch approximately 11 mile N.W. of Volcano
.....
19 Aug. 1975 PRAH77
- 109 3 observers observed 22 in 3 hours...mostly
in logged area...none found downslope where
they were so abundant 19 Aug. (possible
explanation given) / along approximately 1 mile
of boundary fence between Kilauea Forest Reserve
and Keauhou Ranch, including recently logged
area, approximately 11 miles N.W. of Volcano
.....
20 Aug. 1975 PRAH77
- 110 no certain sightings; 1 heard and 1 possibly
seen / Keauhou, near Keawewai
4 Oct. 1975 DONW75
- 111 saw 2 / Kilauea Forest Reserve, Keawewai area
5 Oct. 1975 DONW75
- 112 consistently reported only from...average
densities of 19.0 birds per 100 acres are found
in limited areas / Keauhou Ranch and Kilauea
Forest Reserve on Mauna (Loa)
(1975) MARD75

113	Berger: censused 2 / Transect 1, 200-acre IBP study plot, Kilauea Forest Reserve (0945-1200 hours)	....	11 Jan. 1972	(16)
114	Berger: censused 0 / Transect 2, 200-acre IBP study plot, Kilauea Forest Reserve (1215 - 1325 hours)	....	11 Jan. 1972	(16)
115	Berger: censused 0 / Transect 3, 200-acre IBP Study Plot, Kilauea Forest Reserve (1215-1320 hours)	....	12 Jan. 1972	(16)
116	Berger: censused 1 / Transect 4, 200-acre IBP Study Plot, Kilauea Forest Reserve (0923-1135 hours)	....	12 Jan. 1972	(16)
117	Berger: censused 0 / Transect 1, 200-acre IBP Study Plot, Kilauea Forest Reserve (1130-1400 hours)	....	6 Feb. 1972	(16)
118	Berger: censused 0 / Transect 2, 200-acre IBP Study Plot, Kilauea Forest Reserve (1427-1618 hours)	....	6 Feb. 1972	(16)
119	Berger: censused 0 / Transect 3, 200-acre IBP Study Plot, Kilauea Forest Reserve (1240-1430 hours)	....	7 Feb. 1972	(16)
120	Berger: censused 1 / Transect 4, 200-acre IBP Study Plot, Kilauea Forest Reserve (1000-1215 hours)	....	7 Feb. 1972	(16)
121	Berger: censused 0 / Transect 1, 200-acre IBP Study Plot, Kilauea Forest Reserve (0955-1225 hours)	....	14 March 1972	(16)
122	Berger: censused 0 / Transect 2, 200-acre IBP Study Plot, Kilauea Forest Reserve (1246-1400 hours)	....	14 March 1972	(16)

KULANI (con't.)

123	Berger: censused 1 / Transect 3, 200-acre IBP Study Plot, Kilauea Forest Reserve (0930-1125 hours)	....	15 March 1972	(16)
124	Berger: censused 1 / Transect 4, 200-acre IBP Study Plot, Kilauea Forest Reserve (1151-1350 hours)	....	15 March 1972	(16)
125	Berger: censused 0 / Transect 3, 200-acre IBP Study Plot, Kilauea Forest Reserve (0910-1125 hours)	....	23 April 1972	(16)
126	Berger: censused 0 / Transect 4, 200-acre IBP Study Plot, Kilauea Forest Reserve (1148-1325 hours)	....	23 April 1972	(16)
127	Berger: censused 1 / Transect 1, 200-acre IBP Study Plot, Kilauea Forest Reserve (1220-1410 hours)	....	20 May 1972	(16)
128	Berger: censused 0 / Transect 2, 200-acre IBP Study Plot, Kilauea Forest Reserve (1425-1535 hours)	....	20 May 1972	(16)
129	Berger: censused 0 / Transect 3, 200-acre IBP Study Plot, Kilauea Forest Reserve (1225-1337)	....	21 May 1972	(16)
130	Berger: censused 1 / Transect 4, 200-acre IBP Study Plot, Kilauea Forest Reserve (0950-1140)	....	21 May 1972	(16)
131	Berger: censused 0 / Transect 3, 200-acre IBP Study Plot, Kilauea Forest Reserve (1203-1255 hours)	....	18 July 1972	(16)

132	Berger: censused 0 / Transect 4, 200-acre IBP Study Plot, Kilauea Forest Reserve (1015-1140 hours)	....	18 July 1972	(16)
133	Berger: censused 0 / Transect 1, 200-acre IBP Study Plot, Kilauea Forest Reserve (1315-1430 hours)	....	20 July 1972	(16)
134	Berger: censused 0 / Transect 2, 200-acre IBP Study Plot, Kilauea Forest Reserve (1445-1538 hours)	....	20 July 1972	(16)
135	1 censused Christmas Count / Kulani Project Transect 28 mauka	....	2 Jan. 1978	KATL78
136	0 censused Christmas Count / Kulani Project Transect 28 makai	....	2 Jan. 1978	KATL78
137	0 censused Christmas Count / Kilauea Forest Reserve (adjoining Keauhou Ranch)	....	2 Jan. 1978	KATL78
138	4 censused Christmas Count / Kilauea Forest Reserve (Keauhou Ranch Transect 30)	....	2 Jan. 1978	KATL78
139	0 censused Christmas Count / Kilauea Forest Reserve (Keauhou Ranch Transect 31)	....	2 Jan. 1978	KATL78
140	2 censused Christmas Count / Keauhou Ranch Transect 29	....	2 Jan. 1978	KATL78
141	5 censused Christmas Count / Keauhou Ranch Transect 30	....	2 Jan. 1978	KATL78
142	1 censused Christmas Count / Keauhou Ranch Transect 31	....	2 Jan. 1978	KATL78
143	22 censused Christmas Count / Keauhou Ranch	....	2 Jan. 1978	KATL78

Hawaii Volcanoes
National Park

PARK-WIDE INFERENCE

- 144 determined from extensive series of repetitive (1940-1949) BALP53
counts that, in a hundred days of censusing,
species could be expected to be recorded /
twelve census plots in Hawaii National Park
ranging 20 miles on the flanks of the volcanoes
Kilauea and Mauna Loa

			Total Count Days
0 days in....Plot:	1:	Kipuka Keana Bihopa	2300 (64)
0 days in....Plot:	2:	Kipuka Nene No. 2	3000 (73)
0 days in....Plot:	3:	Kipuka Nene No. 3	3000 (73)
0 days in....Plot:	4:	Napau Lava trees	2850 (23)
48 days in....Plot:	6:	Kipuka Kulalio	5500 (110)
1 day in....Plot:	7:	Kipuka Puaulu	4050 (92)
0 days in....Plot:	8:	Twin Craters	3650 (100)
0 days in....Plot:	10:	Mauna Loa	7500 (41)
1 day in....Plot:	12:	Kipuka Kulalio	5900 (53)
0 days in....Plot:	13:	Ainahou Gate	3050 (54)
0 days in....Plot:	17:	Kalanaokuaiki Pali	3300 (61)
0 days in....Plot:	18:	Lua Manu	3650 (66)

- 146 Berger: abstract: apparent disappearance 1970-1972 (18)
since 1940's / from Hawaii Volcanoes National
Park

UNDESIGNATED LOCALITY

- 147 Craddock: heard 2 / Mauna Loa slope near 20 July 1937 (25)
truck trail (Strip Road)
- 148 Donaghho: saw 1 / Mauna Loa slope (near 9 Aug. 1937 (24)
truck trail)

149	Donaghho: found not rare / in wet koa forest (Hawaii National Park area)	....	June-Aug. 1937	(24)
150	Craddock: saw 1, heard 3 / Mauna Loa slope near truck trail	....	1 Sept. 1937	(25)
151	Abbott: collected 2 / Kipuka Kulalio (Hawaii National Park)	....	Aug. 1938	BALP41
152	Northwood: seen / Kipuka Kulalio, Hawaii National Park	....	18 Aug. 1941	(5)
153	seen / Hawaii National Park	....	(1943)	NORO43
154	counted 1 / three parallel trails....to cover a total of five acres...in Koa groves, slopes of Mauna Loa (? Strip Road area, Hawaii National Park)	....	(1943 ?)	BALP44
155	N.P.S.: 2 seen Christmas Count / Hawaii National Park	....	1 Jan. (1955)	(4)
156	N.P.S.: seen / (? Hawaii National Park)	....	June 1955	(4)
157	has not been observed...for several years / within (Hawaii National Park)	....	(1961)	DUNW61
158	(none found)...formerly could depend upon seeing it here / Mauna Loa Strip Road	....	30 May 1966	DCNW66
159	censused 0 / Mauna Loa Strip Road	....	30 Dec. 1973	MULW74
MULTIQUADRANGLE				
160	not seen in 10 trips...30.5 hours / Mauna Loa Strip Road	4000- 5700	April (2 trips), May (2 trips), June, Aug., Nov., Dec. (2 trips) 1960; March 1961	DUNW62

KIPUKA PAKEKAKE

161	heard 1 / near campsite end of Mauna Loa truck trail	.....	20 July 1937	DONW51b
162	(P.) Baldwin: 1 seen and heard / Koa clump near Mauna Loa truck trail	5900	4 Feb. 1939	(9)
163	(P.) Baldwin: heard / from the E side of the road...near Mauna Loa truck trail	6250	6 July 1939	(9)
164	censused 0 / Mauna Loa trail	6600- 8200	30 Dec. 1973	MULW74
165	N.P.S.: (B.) Kahakua: watched 1 feeding / Kipuka Maunaiu, Hawaii Volcanoes National Park (ca. 1400 hours)	5600- 5800	17 Aug. 1978	(12)

KILAUEA CRATER

166	Perkins: common....a dozen or more could be seen any day / 1.5-2 miles of Volcano House (toward Mauna Loa)	.....	up to 1896	(13)
167	Banko: Koebele collected 3 specimens / Kilauea	.....	Sept. 1896	(1)
168	Banko: Walcott collected 2 specimens / Kilauea	.....	2 April 1901	(1)
169	1 noted / kipuka of mixed Koa, Ohia and Mamane...on way from Kipuka Maunaiu to Cache No. 2, Mauna Loa truck trail	.....	20 July 1937	DONW51b
170	1 seen just above my head / mamane trees along road entering Kipuka Kulalii from S Park boundary	.....	9 Aug. 1937	DONW51c

171	Donaghho: frequently can be found / in (Hawaii National) Park, S of the truck trail (Strip Road)	5000-6500	June-Aug. 1937	(24)
172	Donaghho: heard 1 / at the end of the truck trail (Hawaii National Park)	....	June-Aug. 1937	(24)
173	(P.) Baldwin: saw 1 for certain, another probable not heard / along walk W, S, and return to Camp 5500 near Mauna Loa truck trail, Kipuka Kulalio (0910-1245 hours)	....	25 Nov. 1938	(9)
174	(P.) Baldwin: 1 heard / Mauna Loa truck trail vicinity	5500	6 Feb. 1939	(9)
175	(P.) Baldwin: not seen or heard / near old campsite, kipuka near Mauna Loa truck trail	5500	4 July 1939	(9)
176	2 pairs...noted / in 2 different Kipukas on the upper slopes of Mauna Loa in the Park	....	May 1940	DOWN40
177	uncommon...about a dozen individuals seen... single young following adults in 2 pairs out of the four or five (pairs) observed / in an area embracing about 1.5 square miles of Koa parkland, Kipuka Kulalio (Hawaii National Park)	5400-6700	Sept., Oct. 1940	BALP41
178	N.P.S.: seen / Bird Park	....	16 July 1944	(4)
179	seen / in and near Hawaii National Park	4150-5500	1941-1946	RICL53
180	Richards: 1 pair observed briefly / hike from Kipuka Kulalio to Bird Park	....	14 Oct. 1950	(10)

KILAUEA CRATER (con't.)

181	2 seen (Christmas Count) / 11 observers in 5 parties; total party-hours 23 (20 on foot, 3 by car); total party-miles 45 (16 on foot, 29 by car) Halina Pali road, Napau Crater trail to Pulu factory, Twin Craters, Golf Course, Nobruga Ranch road, Bird Park, Mauna Loa truck trail to 5500 ft. el. (0600-1500 hours)	....	1 Jan. (1955)	BOTI55
182	1 seen / Bird Park	....	Easter vacation (1960)	HANC60
183	N.P.S.: 1 watched / about 300 yds. SW Rainshed, Mauna Loa Strip road	5350	28 April 1970	(12)
184	censused 0 / Bird Park, Hawaii Volcanoes National Park	....	30 Dec. 1973	MULW74
185	censused 0 / rim of Kilauea Crater	....	30 Dec. 1973	MULW74
186	1 reported seen mid-July 1975 / area next to the (Mauna Loa Strip) road in the koa belt...now scorched	....	(13 Sept. 1975)	KATL75
187	0 censused (Christmas Count) / Mauna Loa road	4000-6600	2 Jan. 1978	KATL78
188	0 censused (Christmas Count) / Mauna Loa trail	6600-8200	2 Jan. 1978	KATL78
189	0 censused (Christmas Count) / Kipuka puauulu and adjacent areas, Hawaii Volcanoes National Park	....	2 Jan. 1978	KATL78
190	0 censused (Christmas Count) / rim of Kilauea crater, Hawaii Volcanoes National park	....	2 Jan. 1978	KATL78

MAKAOPUHI CRATER

- 191 Banko: Baldwin: reported seeing 1 chipping on ohia tree trunk about 25 feet away / in a depressed kipuka along trail from Makaopuhi Crater to Napau Crater
 Summer 1965 (8)
- Kīlauea District
- VOLCANO
- 192 Banko: Henshaw collected 7 specimens / Volcano
 1898-1902 (1)
- 193 Banko: Henshaw collected 1 specimen / Volcano
 4500 1898-1902 (1)
- 194 heard...but not as many as on July 2 trip (Keawewai to Kilauea hike) / not long after entering the Koa forest, along Kulani Cone trail from Volcano area
 13 July 1937 DONW51b
- 195 Craddock: saw 1 or 2 / in the Upper Olaa forest reserve about a mile or so from Park boundary
 13 July 1937 (25)
- 196 Donaghho: begin to appear / when one begins to get into the koa forest (along trail from Volcano to Kulani)
 13 July 1937 (24)
- 197 Banko: (L. P.) Richards collected 1 specimen / Upper Olaa Forest Reserve, along trail to Puu kulani
 13 Oct. 1950 (1)
- 198 Richards: only 1 seen...collected...believe now I saw 1 yesterday...hooked bill quite visible / between the 1 mile and 2 mile markers on trail from end of Haunani St., Volcano, to Puu Kulani, Upper Olaa Forest Reserve
 3800-4200 13 Oct. 1950 (10)

VOLCANO (con't.)

199	1 seen / along a trail about a mile into the tree fern jungle from Wright Road	....	27 Feb. 1961	KINB61
200	censused 0 / Volcano, Wright Road, Upper Olaa Forest Reserve	....	30 Dec. 1973	MULW74
201	heard and saw 1 dull green individual / Olaa Tract in dense rain forest	4000	12 April (1974)	SMIH74
202	Jacobi: 1 seen and heard / in closed <u>Metrosideros</u> forest in from the Volcano Ag. Exp. Sta., Olaa Tract (National Park Service)	....	12 April 1974	(26)
203	1 heard / Olaa Tract	3900	17 April (1974)	SMIH74
204	Jacobi and Warshauer: 1 heard / in closed <u>Metrosideros</u> forest in from the Volcano Ag. Exp. Sta., Olaa Tract (N.P.S.) (in the same general area as the one seen and heard 12 Apr 1974)	....	17 April 1974	(26)
205	Jacobi and Warshauer: not recorded / in surveys covering open <u>Metrosideros</u> forest beyond the end of Wright Road and in the Small Tract Section, <u>Cibotium</u> forest along trail to the koa forest and beyond the end of Olaa Back Road or in A. koa forest in Large Tract Section, Olaa Tract (N.P.S.)	....	Jan. 1974 - Jan. 1975 (23 days)	(26)
206	0 censused (Christmas Count) / Volcano community	....	2 Jan. 1978	KATL78
207	0 censused (Christmas Count) / Olaa Tract, N.P.S.	....	2 Jan. 1978	KATL78

PUU MAKAAALA

208	Banko: saw 1 chipping bark on unidentified dead tree / along N leg of former military jeep trail around gas testing area, vicinity Puu Makaala	....	30 Dec. 1972	(8)
209	censused 0 / Kulani road and Puu Makaala	....	30 Dec. 1973	MULW74
210	5 found....one of lowest altitude records for the species / 1 mile N of Olaa Tract near Puu Makaala	3800	1 Oct. 1977	ANON78
211	0 censused (Christmas Count) / Stainback Highway and Puu Makaala	....	2 Jan. 1978	KATL78
212	0 censused (Christmas Count) / Waiakea Forest Reserve (Transect 27)	....	2 Jan. 1978	KATL78

KALAPANA

212a	Conant: none observed on systematic surveys ...doubtful that it still exists / Kalapana Extension, Hawaii Volcanoes National Park	1976-1977	(27)
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MOUNTAIN VIEW

213	Banko: Henshaw collected 3 specimens / Olaa	1800	1898-1902	(1)
214	Banko: Henshaw collected 10 specimens / Olaa	2400	1898-1902	(1)
215	Banko: Henshaw collected 9 specimens / Olaa (undesignated elevation)	....	1898-1902	(1)

Mauna Kea District

UNDESIGNATED LOCALITY

216	Banko: Munro collected 2 specimens / Hamakua District	....	1891/1892	(1)
217	Palmer: numbers were seen / Hamakua district, N.E. side, (Mauna Kea)	2000- 5000 or 6000	(1892)	ROTW93
218	found / in the Mamane woods of the Waimea district	....	(1892-1896 ?)	PERR03
219	Banko: Blacow collected 1 specimen / Hamakua District (? Umikoa)	....	6 May 1905	(1)
220	also found / in the Mamane higher up (above Koa belt), Mauna Kea	....	May 1940	DONW40
221	1 seen / Kaohi Game Management Area	....	18-20 April 1964	KINW64
222	found a male...two days later saw 2 males and 1 female in the area / (Mamane - naio ecosystem on Mauna Kea)	ca. 6800	13 June 1966	BERA72
223	localized population...can be found / dry Mamane-Naio forest on Mauna Kea	....	(1973)	VANC73
MULTIQUADRANGLE				
224	not uncommon...counted 24 / in the Koa belt of Mauna Kea	....	May 1940	DONW40
225	very rare...sighted only in Mamane-Naio forest / on Mauna Kea	....	(1970)	BERA70
226	seen recently / only in the Mamane-Naio ecosystem on Mauna Kea	....	(1972)	BERA72

227	recent survey 392 transect miles produced only 12 individuals / mamane - naio forest on Mauna Kea	....	(1975)	MARD75
227a	although none were seen it seems reasonable to expect that they inhabit at least portions of the native forest / Pohakuloa Training Area (U. S. Army)	....	late Nov. 1976 - Jan. 1977	SHAR77
AHUMOA				
228	(P.) Baldwin: 1 seen / 1 mile NW Puu Laau ...mamane forest at lower edge of Forest Reserve...Mauna Kea	7250	19 April 1943	(9)
229	(P.) Baldwin: perhaps seeing or hearing more than a half dozen...(0800-1000 hours) / Puu Laau forest, 1 mile NW of forest service cabin, Mauna Kea Forest Reserve	....	20 April 1943	(9)
230	Ward: saw 1...on brief visit...stopped every quarter of a mile or so to look and listen / (Puu Laau vicinity)	....	17 April 1964	(14)
231	Ward: saw 1 / Puu Laau area	....	(Oct. 1966)	(6)
232	seen...flying tour / Puu Laau area	....	16-23 Nov. 1966	ORDW67
233	1 noted / (along a dirt road running E of the cabin...Puu Laau)	....	19 Dec. 1968	DOWN69
234	saw 1 or more...on 21 days...during 71 days of field work / in the Kaohe and Mauna Kea Game Management areas	....	11 June 1966 - 7 Feb. 1970	BERA72
235	Banko: (Rick) Warner, student at H.P.A., and (Nick) Mitchell reported seeing 1 or 2 / about 1 mile NE of Ahumoa, in Kaohe Game Reserve, Mauna Kea	....	21 May 1972	(8)

PIIHONUA (con't.)

252 Banko: Henshaw collected 32 specimens / 1898-1902 (1)
Kaiwiki

AKAKA FALLS

253 (H.) Baldwin: unstated number seen by Mr. (3 Feb. 1940)
and Mrs. Blacow, H. Baldwin / Forest Reserve (7 March 1940)
above Pepekeo, lands of Kawauni (Kawai Nui)
and Makahana (Makahana?) (above cane line -
6 February 1940 minutes of Manuiki Society)

254 Manu Iki Soc.: E. Tomoguchi reported seeing (5 March 1940)
one / Pepekeo bird area

PUU AKALA

255 Richards: observed group of 2 and 3 under 14 Dec. 1950
ideal weather and terrain conditions for about
4 hours, collected 2, 1400-1800 hours / in the
small mamane groves about 0.5 mile back toward
Humuulu from Hopuwai...Mauna Kea

256 Banko: (L. P.) Richards collected 1 specimen 6425 14 Dec. 1950 (1)
/ Hopuwai, Keanakolu Trail, Mauna Kea

257 Richards: observed 1, 0930-1800 hours / 15 Dec. 1950 (10)
mamane groves about 0.5 mile back toward Humuulu
...from Hopuwai...and between Puu Kanakaleonui
and Hopuwai...Mauna Kea

258 Richards: noted, number unspecified, 16 Dec. 1950 (10)
1315-1630 hours / hike along jeep road from
Hopuwai cabin to Forestry cabin at 3000 ft.
in direction of Puu Kanakaleonui, thence on
road mauka to 8500 ft. about 0.25 mile from

base of Puu Kanakaleonui (thence return to Hopuwai at 1735 hours)

259 Richards: several seen, 1100-1600 hours / hike from Hopuwai cabin to Forestry cabin 8000 ft. near Puu Kanakaleonui, thence to summit of Kanakaleonui, (thence return to Hopuwai via jeep trail arriving 1700) 17 Dec. 1950 (10)

UMIKOA

260 Banko: Blacow collected 1 specimen / Horner's Ranch (Umikoa) 7300 15 Aug. 1903 (1)

261 Banko: Blacow collected 1 specimen / Horner's Ranch (Umikoa) 7500 18 Aug. 1903 (1)

262 Banko: Blacow collected 1 specimen / Hamakua District (? Umikoa) 28 Dec. 1903 (1)

263 2 nests collected / among the Mamane...on Horner's Ranch, Hamakua 7500 27 June 1904 BRYW05

MAKALAHAU

264 Banko: Wilson collected 1 specimen / Mana 1887/1888 (1)

265 Banko: Wilson collected 3 specimens / Mana dairy 1887/1888 (1)

266 found it in considerable numbers / Mamane woods near Mana... (1887/1888) WILS92

267 found it in considerable numbers / in the mamane woods, near Mana (Jan. 1888) WILS90

