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CPSU/UH Avian History Report 8 A (B) (C)
HISTORY OF ENDEMIC HAWAIIAN BIRDS

Part I. POPULATION HISTORIES--SPECIES ACCOUNTS

Forest Birds:

'Amakihi, Creeper, 'Akepa & Po'o Uli

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Part I. POPULATION HISTORIES--SPECIES ACCOUNTS
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CPSU/UH Avian History Report 8B
HISTORY OF ENDEMIC HAWAIIAN BIRDS

Part I. POPULATION HISTORIES--SPECIES ACCOUNTS
Forest Birds: 'Amakihi and Creeper

ABSTRACT

Loxops parvus is a small, greenish-yellow forest bird with a slender, short, nearly straight bill. Endemic to the island of Kaua'i, it was first described in 1888. Exhaustive search of literature and field journals uncovered some 95 observational notes, collection records, reports, and related statements on relative abundance and geographical distribution from 1888 to 1978. All information is referenced, arranged in geographical and chronological order, and systematically reviewed. Subjects of data completeness, bias, erroneous and doubtful records are addressed.

Ornithologists of the 1890's described relative population abundance of L. parvus throughout the native forest in terms varying from very common to extremely numerous. A wide-ranging survey in 1960 found it to be a "moderately common" resident of native forests above 1500 feet elevation. Observers from 1961 to 1978 described it as "common to abundant" in areas mostly over 3000 feet elevation.

It is concluded that sub-populations of L. parvus utilizing native forests below 1500 feet elevation have, in the past 80 years, become extinct while those remaining above that elevation apparently declined progressively less upward. A 40-year gap of records obscures specific details of this long-term depopulation while results of recent U. S. Fish and Wildlife Service surveys are not yet available. Last records make it clear that substantial numbers of this species continue to exist in higher elevation forests.

21. Loxops parvus
'Anianiau or Lesser 'Amakihi

The 'Anianiau is a small (4- to 5-inch long), greenish-yellow forest bird with a slender, short, nearly straight bill, endemic to the island of Kaua'i (Rothschild 1893). It was described by Stejneger (1888) from specimens sent him by V. Knudsen (9). Pratt (1979) amended its name orthographically from L. parva to L. parvus. Principal repositories of 86 known specimens are: Bernice Pauahi Bishop Museum (32), American Museum of Natural History (27), and Cambridge Museum of Zoology (11) (Banko 1979 report). Eddinger (1970 Ph.D. dissertation) was the first to report on the breeding biology of the 'Anianiau. Berger (1972) provides a recent treatment on the biology of this species based on earlier accounts.

OBSERVATIONS, REPORTS, AND SPECIMEN RECORDS

Drawing conclusions from a large volume of historical information on relative abundance and distribution of 'Anianiau 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 or two 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 Status and Distribution (1888-1900):

S. B. Wilson was the first to comment on the status of the 'Anianiau stating that it was found "in small flocks" and that its range seemed to extend "throughout the forest region" (Wilson & Evans 1892) (1). F. Gay found this species "towards the summit of Waialeale," according to Wilson and Evans (1892) (2). Five specimens were collected by Wilson, one somewhere in Kō'ula and four in undesignated places (Banko 1979 report) (10, 19).

Rothschild (1900), based on information received during the early 1890's from his collector, H. C. Palmer, stated that the 'Anianiau traveled in "small flocks" and was "not very rare" (11). According to Rothschild (1900) Palmer obtained a "very

fine series" of specimens but total secured and localities other than Kahōluamanu are unknown (Banko 1979 report) (38). Munro (1944), Palmer's assistant in 1891 and later a resident of Kaua'i, stated that the 'Anianiau was "extremely numerous" and "all over the Kaua'i forest" during this early period (4).

Perkins (1894-1896 field journal, 1903; Banko 1979 report) collected nine specimens at Kahluamanu, one at Halemanu, four at 4000 feet elevation in undesignated place(s), and two at unspecified elevations and location(s) (12, 13, 36, 37, 40). Perkins (1894-1896 field journal, 1903) noted at the time that the 'Anianiau was "common" on the high plateau above Waimea, almost certainly meaning Kahōluamanu, and present at a "good elevation" in the mountains some miles west of Lihu'e (14, 39), terming it "very common" and generally distributed throughout the forest in his final pronouncement of its status (3).

Bryan and Seale (1901, 1915; Banko 1979 report) collected only two specimens at Kahōluamanu, and a third at an undesignated locality during their 12 April to 4 May 1900 visit to Kaua'i, stating that while 'Anianiau were "seen but rarely" about Kahōluamanu they became "more and more abundant" and in loose flocks of a dozen or more "so far as our explorations extended" along ridges towards the summit of Wai'ale'ale (16, 17, 42, 43).

Recent Status and Distribution (1901-1978):

The status of 'Anianiau seems not to have been noted at all during the period 1901 to 1940. Donaghho (1941) observed, presumably in October 1941, that this species was "holding up well" in the area above the Robinson (previously Gay) mountain house, Kahōluamanu (44). Munro (1944), possibly referring to Donaghho's observation, stated that the 'Anianiau was "still common in some localities" (18). Pearsall (1946, 1947) noted the presence of this species from 6 to 7 September 1946 and "saw several" during the same period at Kilohana Lookout (59, 60). Woodside (1947) found it present in the Kumuweia Ridge area, presumably that same year (61). Curl (1958) termed this species "not uncommon" somewhere near Kokee Park on 10 May 1957 (62). Eastman and Eastman (1958) reported seeing two at Kalalau Lookout sometime during the period 23 March to 14 April 1958 (63). In 1959, Hanson (1959) noted 'Anianiau to be present in the Kōke'e area in June, and Roberts (1959) stated that trees about the Danford home and elsewhere at Kōke'e were "alive" with them (64, 65).

Richardson and Bowles (1964) concluded from their June to August 1960 survey that the 'Anianiau was a "moderately common resident" of native forest areas above 1500 feet elevation, estimating that they saw a total of 104 (6). Richardson and Bowles reported they definitely saw 10 or more during each of

several days along 5 to 7 miles of trail, and "fair numbers" along trails to Pihea, Kilohana Lookout, Awa'awapuhi, etc., in a 3-day stay at Kōke'e, concluding that the range of this species approximated that of the 'Amakihi (*Loxops virens stejnegeri*) both altitudinally and with respect to forest type (koa and 'ōhi'a forest above 1500 ft elev.) (5). Bowles (Banko 1979 report) collected one specimen at 4000 feet elevation near the upper Koai'e stream in 1960 (45).

In 1961, King (1961) noted 'Anianiau "frequently" along the trail from end of Camp 10 road to Alaka'i Swamp, reporting it to be one of the "commoner species" (20, 21). Bowles (1962) returned to Kaua'i in 1961 and stated that he saw and heard this species "quite frequently" along the trail to the Koai'e cabin and observed it in the vicinity of the cabin itself (22, 46).

There seems to be only three reports of 'Anianiau in 1962, two by Ord (1962) that this species was "abundant" in the vicinity of Koai'e cabin towards dusk on 20 April 1962, and that it was "seen" on a ridge south of the cabin the next day (47, 48). Curry (1963) termed 'Anianiau "common" around Kokee Lodge earlier in February 1962 (67).

Ord (1963) stated that this species was "abundant" as a result of a 1 to 2 September 1963 field trip to Alaka'i Swamp (23). A U. S. Fish and Wildlife Service biologist banded three 'Anianiau on the ridge near Koai'e cabin on 6 and/or 7 September 1964 (52). Ward (field journal) saw and heard "25 plus or minus 5" along the trail from end of Camp 10 road to Koai'e cabin on 20 February 1964, calling this species "numerous" (24). The next day Ward (field journal) recorded "25 plus" about 2 to 3 miles along the trail from Koai'e cabin toward Wai'ale'ale (49), and the day following (22 February) recorded another 20 on the 3-hour hike from Koai'e cabin to the road-end trailhead (25). Walker (1964), apparently accompanying Ward, noted that the 'Anianiau was heard along the Camp 10 road-end to Koai'e cabin trail, found it nesting near the cabin, and that this species was "with creeper most common bird next to apapane and iiwi" along the ridge past Koai'e going deeper and deeper into the Swamp (26, 51, 53).

In 1965 Donaghho (1965) counted some 69 'Anianiau in different localities during an 11 to 15 August 1965 field trip, as follows: Mōhihi River trailhead to Koai'e cabin (10), along Koai'e to Wai'alae Trail (14), Wainiha rim (10), Koai'e-Wai'alae Trail (13), Koai'e cabin to Mōhihi River trailhead (20) (27-29, 54, 55). Banko (field journal) termed this species "common" on a 30 November 1965 hike from Mōhihi trailhead to the Koai'e cabin (30).

Several reports refer to the 'Anianiau in 1966. Anonymous (1966) stated that this species was seen and "very common" on a 28 to 30 May 1966 trip into Alaka'i Swamp (31). Donaghho (1967a)

noted "1 seen" at Kalalau Valley Lookout on 6 June (68), and Ord (1967) saw "several" during a lunch stop in the same area a few months later (68, 70).

In 1967, N. Hansen (1967) observed two in a Kōke'e garden in April (71). Berger ~~et al.~~ (1969) found four nests from 22 April to 10 June 1967 in a Kōke'e study area (72). Donaghho (1968) saw this species near the Awa'awapuhi trailhead and noted "several" flying over the road and hunting in the woods near Kalalau Valley Lookout on 5 November (73, 74). The status of the 'Anianiau was stated in the publications by the Hawaii Audubon Society, Hawaii's Birds, as "easily seen" in the Kōke'e area, and "becoming more plentiful" the further one goes into the forest (75, 76).

Four observations of 'Anianiau were noted in 1968. Orenstein (1968) recorded a "dozen or so" in Kokee State Park, including Kalalau Lookout area, on 3 January (77). Anonymous (1968) reported that this species was "observed" on a 17 February trip into Alaka'i Swamp (33). Berger ~~et al.~~ (1969) found two nests in the Kōke'e area on 15 April apparently the same ones studied later by Eddinger (1970 Ph.D. dissertation) (78, 83a). On 31 May and 1 June 1968 Sauthey ~~et al.~~ (1968) reported "approximately 20 seen and heard" in one traverse of the trail extending along the ridge and short spur ridges south-southeast from the Koai'e cabin and descending into the canyon at the source of Koai'e stream (56).

In 1969 Eddinger (1970 Ph.D. dissertation) reported finding 13 nests of the 'Anianiau (83a). The Hawaii Division of Fish and Game (1969 report) stated that this species "occurs as a breeding population" on Kaua'i (7).

In 1970 Eddinger (1970 Ph.D. dissertation) reported finding 18 nests of the 'Anianiau in his Kōke'e study area (83a). van Riper (field journal) recorded numbers of this species counted on surveys conducted from 27 to 30 April in various areas, as follows: 13 seen (2 hours) in Kokee Park and Halemanu; 40 seen (10 hours) along Mōhihi road, Kōke'e; 37 seen (8.5 hours) along Alaka'i Swamp Trail; and 6 seen (5 hours) from Girl Scout Camp at Kōke'e to Halemanu (34, 79-81). Berger (1970) stated that the 'Anianiau was "fairly common" in the Kōke'e and Alaka'i Swamp regions (83). Sears (1971) reported that two were censused in the 29 December Christmas Count, which included both the Kalalau Lookouts and the Mākaha Ridge Road (82).

In 1971, on 1 May, van Riper (field journal) noted "22 seen" in a 9.75-hour survey of Kawaikōi stream valley (84). R. Hansen (1975) reported the presence of 'Anianiau in Kokee State Park on 16 August 1971 (87). Mull and Mull (1971) saw this species "in space of a few minutes" in back of a Kōke'e cabin and stated that it was "abundant" in the area around where the Pihea Trail joins

the Alaka'i Swamp Trail sometime during the period 15 to 18 September (85, 86).

In 1972, Berger (1972) stated that the 'Anianiau was "fairly common" in the Kōke'e region (35). That same year M. Mull (1972) proposed it as a candidate for the Blue List because of "limited range" (8).

In 1973, Hart (1974a, 1974b) reported censusing of 'Anianiau on the 29 December Christmas Count in different localities as follows: Honopū Trail (2), Pu'u Kila (Pu'u o Kila) to Kalalau Lookout (2), East Alaka'i Swamp (16 hours, 7 miles) (46), and as being the third most abundant endemic bird seen in an undated (? 1973) field trip to the West Alaka'i Swamp (57, 89-91).

There seems to be only one report of this species in 1974, the report by Sears ~~et al.~~ (1975) of 53 censused during the 28 December Christmas Count, presumably all in the Kōke'e area (92).

'Anianiau were apparently not recorded in either 1975 or 1976. In 1977, Johnson (1977) recorded "several" seen at Kalalau Lookout on 19 March (93), Boynton (1978) reported that 11 were censused in Kokee State Park during the 18 December Christmas Count (ascribing the low count to fog and rain), and Pyle (1978) noted "3 or 4" present in the Kalalau Lookout area on 23 December (93-95).

J. L. Sincock has been studying the status and distribution of forest birds, including the 'Anianiau, on the island of Kaua'i since about 1967 for the U. S. Fish and Wildlife Service, but results and conclusions of his study are not yet available.

CHRONOLOGICAL DISTRIBUTION OF RECORDS

The chronological distribution of some 97 records of the 'Anianiau from the time of species discovery in the 1880's through 1978 is shown in Table 1. The pattern is typical of species endemic to Kaua'i, showing a substantial production of records (22) from discovery in the 1880's through the initial collection period ending in 1900, a complete lack during the balance of the 1900's and the 1910's through the 1930's, a smattering in the 1940's and 1950's, and a final burst in the 1960's and 1970's, greater than the total of all previous records. The rate at which notes on status and distribution were compiled from 1970 through 1977 was significantly less than the rate at which they were produced from 1960 to 1969.

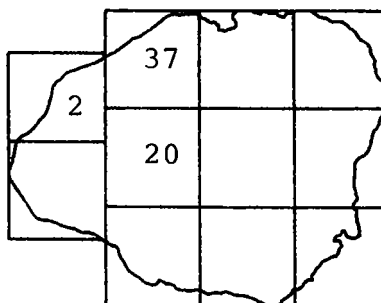
TABLE 1. Distribution of 97 Loxops parvus records by decade.

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 - 6
1810's - 0	1880's - 5	1950's - 4
1820's - 0	1890's - 11	1960's - 44
1830's - 0	1900's - 6	1970's - 21

GEOGRAPHICAL DISTRIBUTION OF RECORDS

The 59 records derived from specific quadrangles are shown in their appropriate locations in Figure 1. They reflect the wide distribution of 'Anianiau in northwestern Kaua'i, the section most frequented by early-day collectors and contemporary birdwatchers. Totals listed for HAENA (37) and WAIMEA CANYON (20) would show significant increases were it not for the fact that the 16 records noted along the trail from end of Camp 10 road to Koai'e cabin, and at unspecified locations in the Alaka'i Swamp overlap areas in both quadrants and are, therefore, listed under the heading MULTISQUADRANGLE rather than that of a specific quadrangle.

FIGURE 1. Distribution of 59 observations, reports and specimen records of Loxops parvus, per quadrangle, on Island of Kaua'i, 1880's to 1970's.



COMPLETENESS OF DATA, BIAS, ERRONEOUS AND DOUBTFUL RECORDS

Not included are records of 'Anianiau obtained during John Sincock's islandwide forest bird surveys conducted for the U. S. Fish and Wildlife Service beginning in 1967. The results of his work, the most extensive ever conducted on the island of Kaua'i, have not been released by the sponsoring agency.

Records presented herein may, in a few cases, represent sightings of Loxops maculatus bairdi or Loxops virens stejnegeri rather than that of Loxops parvus. However, the degree of bias due to misidentification of the 'Anianiau is believed to be insignificant. The diagnostic characteristics separating these three species are sufficiently apparent that most individuals can be accurately identified with reasonable care. Observers do not mention identification being a problem.

Roberts (1959) describes the trees at Danford home and elsewhere at Kōke'e as being "alive" with 'Anianiau (65). While the term "alive" is ambiguous, most readers may interpret it to mean extremely numerous. Since great numbers of 'Anianiau have not been similarly reported by others, Roberts' (1959) remark might best be regarded, in the absence of an actual estimate of numbers, as perhaps exaggerated.

SUMMARY

Loxops parvus is a small, greenish-yellow forest bird with a slender, short, nearly straight bill. Endemic to the island of Kaua'i, it was first described in 1888. It was found varying in abundance from rare to very common over a wide range from the late 1880's until 1901. A 40-year gap in observational records from 1902 to 1941 was apparently due to absence of recording naturalists. A several weeks-long bird survey in 1960 reported it to be a moderately common resident of native forest areas above 1500 feet elevation. Substantial numbers of this species continued to be sighted by observers from 1961 to 1978 who stejnegeri described its status as common to abundant.

CONCLUSION

Loxops parvus has maintained a relatively stable long-term population in mid- and upper elevation forests on Kaua'i for over 75 years.

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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.

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

Relative Abundance/Locality	Elev. (ft.)	Date	Source
<u>Loxops parvus</u>			
Island of Kaua'i			
ISLANDWIDE INFERENCE			
1 in small flocks / range seems to extend throughout the forest region	....	(1888)	WILS92
2 Gay: found / towards the summit of Waialeale	4000	(1888)	WILS92
3 very common / (generally distributed throughout the forest)	....	(1894/95/96)	PERR03
4 extremely numerous / all over the Kauai forest	....	1890's	MUNG44
5 an estimated 104 seen...10 or more... definitely seen during each of several different days along 5 to 7 miles of trail / range.. both altitudinally and with respect to forest type.. approximately that of the amakihi (koa and ohia forest areas above approximately 1500 ft.)	....	(June-Aug. 1960)	RICF64
6 moderately common resident / native forest	ca. 1500+	(June-Aug. 1960)	RICF64
7 HDFG: occurs as a breeding population	....	(1969)	(1)
8 candidate for the Blue List.. limited range	....	(1972)	MULM72

UNDESIGNATED LOCALITY

9	Banko: Knudsen collected specimen(s) / unspecified place(s)	....	before 1888	(2)
10	Banko: Wilson collected 4 specimens / unspecified place(s)	....	(1888)	(2)
11	Palmer: goes about in small flocks...is not very rare...obtained very fine series of specimens / unspecified place(s)	....	(1891/1893)	ROTW00
12	Banko: Perkins collected 4 specimens / unspecified place(s)	4000	1894/1895	(2)
13	Banko: Perkins collected 2 specimens / unspecified place(s)	....	1894/1895	(2)
14	Perkins: present / at a good elevation... in the mountains some miles W from Lihue... dense masses of staghorn fern	....	July/Aug. 1896	(6)
15	Banko: Seale and Bryan collected 1 specimen / unspecified place (? Kaholuamanu)	....	1900	(2)
16	more and more abundant...feeding about in loose flocks of a dozen or more / so far as our exploration extended.. along the ridges towards the summit of Waialeale	....	April-May (1900)	BRYW15
17	more and more abundant...met with...in loose flocks of a dozen or more / so far as our explorations extended...along the ridges towards the summit of Waialeale	....	(12 April- 4 May 1900)	BRYW01
18	still common / in some localities	....	(1944)	MUNG44

MULTIQUADRANGLE

19	Banko: Wilson collected 1 specimen / Koula	....	(1888)	(2)
20	frequently seen / along trail from end of Camp 10 road to Alakai Swamp	....	3 March 1961	KINB61
21	one of commoner species / along trail from Alakai Swamp to end Camp 10 road	....	4 March 1961	KIN561
22	seen and heard quite frequently / along the trail to Alakai Swamp Koaie cabin	....	2 Sept. 1961	BOWJ62
23	abundant / Alakai Swamp	....	1-2 Sept. 1963	ORDW63
24	Ward: numerous...25 plus or minus 5 seen and heard / along trail (from end Camp 10 road) to Koaie cabin	....	20 Feb. 1964	(4)
25	Ward: 20 recorded / on 3-hour hike from Koaie cabin to road-end trailhead	....	22 Feb. 1964	(4)
26	heard / along trail into Alakai Swamp (Koaie cabin)	....	21-23 Feb. 1964	WALR64
27	10 counted / Mohihi River to Koaie cabin	....	11 Aug. 1965	DONW65
28	10 counted / Wainiha Rim	....	13 Aug. 1965	DONW65
29	20 counted / Koaie cabin to Mohihi River	....	15 Aug. 1965	DONW65
30	Banko: common / on hike along Mohihi trail to USGS cabin on Koaie stream	....	30 Nov. 1965	(5)
31	seen...very common / Alakai Swamp area	....	28-30 May 1966	ANON66
32	next most common bird (after apapane) / Kohua Ridge	....	Aug. 1967	DONW67b

33	observed / trip into Alakai Swamp	....	17 Feb. (1968)	ANON68
34	van Riper 111: 37 seen, 0930-1800 hours, walking survey / Alakai Swamp (trail)	....	29 April 1970	(3)
35	fairly common / in the Alakai Swamp region	....	(1972)	BERA72

MAKAHA POINT

36	Perkins: one shot / up from V. Knudsen's mountain house, Halemanu	ca. 4000	11 May (1895)	(6)
37	Banko: Perkins collected 1 specimen / Halemanu	....	1894/1895	(2)

WAIMEA CANYON

38	Banko: Palmer collected specimen(s) / Kaholuamanu	....	1891/1893	(2)
39	Perkins: common / high plateau above Waimea revisited (? F. Gay's mountain house, Kaholuamanu)	....	Oct. 1895	(6)
40	Banko: Perkins collected 9 specimens / Kaholuamanu	....	1894/1895	(2)
41	Banko: Seale and Bryan collected 2 specimens / Kaholuamanu	....	1900	(2)
42	seen but rarely / about Kaholuamanu	....	(12 April-4 May 1900)	BRYW01
43	seen but rarely / about Kaholuamanu	....	April-May (1900)	BRYW15
44	holding up well / area above the Robinson mountain house, Kaholuamanu	....	(Oct. 1941)	DONW41

WAIMEA CANYON (con't.)

45	Banko: Bowles collected 1 specimen / upper Koaie (stream)	4000	1960	(2)
46	(observed in afternoon's birding) / vicinity Koaie cabin, Alakai Swamp	....	2 Sept. 1961	BOWJ62
47	abundant...towards dusk / vicinity Koaie cabin	....	20 April 1962	ORDW62
48	seen / ridge S of Koaie cabin	....	21 April 1962	ORDW62
49	Ward: 25 plus recorded...stopped every 100 yards or so to listen and watch / along trail from Koaie cabin toward Waialeale about 2 or 3 miles...side trip into deep valley on other side of plateau...and return	....	21 Feb. 1964	(4)
50	found nest / about 40 ft. above the ground in an ohia tree...a short distance from the Geological Survey cabin on the banks of the Koaie stream in the Alakai Swamp region	....	23 Feb. 1964	BERA69
51	with creeper most common bird next to apapane and iiwi / along ridge deeper and deeper into the Swamp (past Koaie cabin)	....	21-23 Feb. 1964	WALR64
52	USFWS: 3 banded / Alakai Swamp (Koaie Ridge, near cabin)	....	6, 7 Sept. 1964	(7)
53	seen nesting / (vicinity Koaie cabin)	....	(23) Sept. 1964	WALR64
54	14 counted / Koaie - Waialae trail	....	12 Aug. 1965	DONW65
55	13 counted / Koaie - Waialae trail	....	14 Aug. 1965	DONW65

56	approximately 20 seen and heard in one traverse of the ridge.. .clear skies.. .wind moderate.. .mild temperatures / along the ridge trail extending SSE from the (Koaie) cabin paralleling Koaie stream...approximately 1.5 miles to source...making short side trips out spur ridges and descending into the canyon at the stream origin.. .Alakai Swamp	31 May, 1 June 1968	GAUJ68
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57	censused 46...Christmas Count...16 hours ...7 miles / East Alakai Swamp	29 Dec. 1973	HARA74b
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HAENA

58	holding up well / Kokee area and...around the head of the Kalalau Valley	(Oct. 1941)	DONW41
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59	saw several / near Kilohana Lookout	5 Sept. 1946	PEAG46
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60	seen near cabin / Kokee	(6-7 Sept. 1946)	PEAG47
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61	present / Kumuweia Ridge area	(1947)	WOOD47
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62	not uncommon / near Kokee Park	10 May 1957	CURA58
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63	2 seen / Kalalau Lookout	(23 March-14 April 1958)	EASW58
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64	present / Kokee area	June 1959	HANC59
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55	trses alive / Danford home and elsewhere at Kokee	(1959)	ROBM59
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66	saw fair numbers...in 3 day stay / trails... to Pihea, Kilohana Lookout, Awaawaphui, etc.. . Kokee area	(28-30 June 1960)	RICF60
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67	common / around Kokee Lodge	Feb. 1962	CURH63
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HAENA (con't.)

68	1 seen / Kalalau Valley Lookout area	6 June (1966)	DONW67a
69	seen / (vicinity Kalalau Lookout)	16-23 Nov. 1966	ORDW67
70	several seen...lunch stop / Kalalau Valley Lookout area	....	16-23 Nov. 1966	ORDW67
71	observed 2 / in our garden...Kokee	....	April 1967	HANN67
72	4 nests found / Kokee study area	....	22 April-10 June 1967	BERA69
73	seen / near Awaawapuhi trailhead	....	5 Nov. (1967)	DONW68
74	several / flying over the road and hunting in the woods near the comfort station... (Kalalau) Lookout	....	5 Nov. (1967)	DONW68
75	becoming more plentiful / the further one goes into the forest.. (from Kokee)	....	(1967)	HAWA67
76	may be easily seen / in the Kokee area	....	(1967)	HAWA67
77	dozen or so / Kokee State Park and Kalalau Lookout	....	3 Jan. 1968	ORER68
78	2 nests found / Kokee region	....	15 April 1968	BERA69
79	van Riper 111: 13 seen, 1500-1700 hours, walking survey / Kokee Park, Halemanu	....	27 April 1970	(3)
80	van Riper 111: 40 seen, 0700-1700 hours, walking survey / Mohihi Road, Kokee	....	28 April 1970	(3)
81	van Riper III: 6 seen, 0900-1400 hours, walking survey / Girl Scout Camp at Kokee to Halemanu	....	30 April 1970	(3)

82	2 censused...Christmas Count / main Belt Road from Wailua to Kokee, including both Kalalau lookouts, Makaha Ridge Road.. (0730 to 1700 hours)	....	29 Dec. 1970	SEAW71
83	fairly common / Kokee and Alakai Swamp regions	....	(1970)	BERA70
83a	Eddinger: 33 nests found / 2 sq. mile study area E of Kalalau Lookout bounded on W by Kalalau Road and on N by Puu O Kila	....	1968 (2) 1969 (13) 1970 (18)	(8)
84	van Riper 111: 22 seen, 0700-1645 hours, walking survey / Kawai Koi Stream valley	....	1 May 1971	(3)
85	abundant / area around where the Pihea trail joins the Alakai Swamp trail	....	(15-18 Sept. 1971)	MULW71
86	seen...in space of few minutes / in back of cabin.. .Kokee	....	(15-18 Sept. 1971)	MULW71
87	present / Kokee State Park	....	16 Aug. 1971	HANR75
89	censused 2 / Honopu trail	....	29 Dec. 1973	HARA74b
90	censused 2 / Puu Kila to Kalalau Lookout	....	29 Dec. 1973	HARA74b
91	third most abundant endemic bird seen / West Alakai Swamp	....	4-day field trip (1973 ?)	HARA74a
92	censused 53. ...Christmas Count / Waimea area, center E of junction of Kokee Road from Raimea and Kekaha	....	28 Dec. 1974	SEAW75
93	several seen / Kalalau Lookout	....	19 March 1977	JOHB77
94	11 censused...Christmas Count / Kokee State Park...low counts due to fog, rain	....	18 Dec. 1977	BOYD78
95	3 or 4 present / Kalalau Lookout, Kokee	....	23 Dec. 1977	PYLR78

ABSTRACT

Endemic to the island of Hawai'i, Loxops ~~sagittirostris~~ is a small, greenish forest bird, more robust than its congeners, with a long, blackish, nearly straight, oriole-like bill. Exhaustive search uncovered only three eyewitness records relating to population abundance and distribution. Unfamiliar to the native Hawaiians of the late 19th century, and seen by only four naturalists of European descent, this species has not been sighted since 1901 in spite of intensive searching. It is presumed extinct.

22. Loxops sagittirostris
Greater 'Amakihi

The Greater 'Amakihi is a small (ca. 6.5-inch long), olive-green forest bird, decidedly larger than its congeners, with a nearly straight, robust, blackish bill (Rothschild 1893). It apparently had no native Hawaiian name. Endemic to the island of Hawai'i, its known range was limited to the dense forest a few miles in extent upon either side of the Wailuku River above Hilo (Henshaw 1902). It was described by Rothschild (1892) from specimens taken that same year by his collector, H. C. Palmer. Repositories of 27 of the 32 known specimens are: B. P. Bishop Museum (16), American Museum of Natural History (5, incl. type and co-type), British Museum of Natural History (3), and Museum of Comparative Zoology, Harvard University (3); the remaining five specimens are scattered in four other museums (Banko 1979 report).

OBSERVATIONS, REPORTS, AND SPECIMEN RECORDS

Drawing conclusions from a large volume of historical information on relative abundance and distribution of the Greater 'Amakihi 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 or two 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.

Status and Distribution (1892-1977):

In his field diary Palmer (Rothschild 1900) saw a bird new to him, which Rothschild thought was probably this species, near the "sheep station of Mr. Hanneberg" (? Pu'u'ō'ō Ranch) in March 1892, though its note was not heard nor specimen obtained until 23 April when Palmer encamped above Hilo near the Wailuku River (4, 5). According to Rothschild (1893), Palmer collected four specimens and observed this species at elevations ranging from 500 to 1500 feet all within the radius of a few miles in Hilo District (5). Later, in a correction to his 1893 account, Rothschild (1900) stated "Palmer evidently made a mistake in saying that he obtained it at altitudes from 500 to 1500 feet, for Perkins found it only at heights of about 2000 feet, and

Mr. Henshaw tells me (in litt.) that he did not see it below 1800 feet" (6, 7, 8).

Perkins (field journal) shot one and heard another across a branch of the Wailuku River from his camp in dense forest "well above the highest cane fields" in 'Amauulu, just above Hilo, on 26 December 1895 (10). He took six more specimens the following month "more to the south of my former trails from camp" (11). Later, Perkins (1903) stated that this species was "one of the most local of the Drepanididae," ranging from 1200 to 3000 feet on either side of the Wailuku River above Hilo (12). Perkins (1903) related that he saw but two on his first visit (securing one as a specimen), but upon a second visit to another locality he noticed several individuals each day - as many as 12 one morning during the course of a long hike (12). Perkins (1903) visited each locality for a period of about two weeks, taking at least four specimens at an elevation of 2000 feet and three at unspecified elevations (Banko 1979 report).

Later, in 1901, A. M. Walcott secured three specimens in an undisclosed locality during 8 and 9 April, and two examples at an undesignated place on an unspecified date (Banko 1979 report) (14, 15).

Henshaw (1902) stated that this species, which he called the Green Solitaire, was "one of the rarest" and that one might watch for it in vain for days, seeing it only "occasionally when a pair may be called up out of the forest fastnesses" (17). Henshaw (1902) noted that its range was "limited to the dense forest" a few miles in extent upon either side of the Wailuku River at an elevation of from 2000 to 4000 feet (17). Henshaw collected a total of 21 specimens near Hilo, in Kaiwiki (Banko 1979 report).

No one has reported seeing the Greater 'Amakihi since Henshaw collected the last specimen of recorded date in June 1901. Richards and Baldwin (1953) searched unsuccessfully for it in the type locality (18), presumably ca. 1950 or 1951 when Richards visited Hawaii. The Hawaii Division of Fish and Game (1969 report) stated that this species was "thought to be extinct or extirpated" (1). Berger (1970) stated that it might still survive in extensive cloud forests along the Hāmākua coast (3), but none were reported as a result of an intensive wide-ranging survey of the whole windward flank of Mauna Kea by the U. S. Fish and Wildlife Service in 1977. Atkinson (1977) presumed this species to be extinct (2).

CHRONOLOGICAL DISTRIBUTION OF RECORDS

The chronological distribution of 18 records is shown below in Table 2. Due to the short historical life of the Greater 'Amakihi, the four records from the 1950's to 1970's refer to extinction, rather than existence.

TABLE 2. Distribution of 18 Loxops sagittirostris 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 - 0
1810's - 0	1880's - 0	1950's - 1
1820's - 0	1890's - 9	1960's - 1
1830's - 0	1900's - 5	1970's - 2

GEOGRAPHICAL DISTRIBUTION OF RECORDS

It is clearly evident that the historical range of the Greater 'Amakihi was restricted to the Hilo area. According to the collection and most reliable observational records made during the decade after discovery, this species ranged along both banks of the Wailuku River from about 1800 to 4000 feet elevation. H. W. Henshaw, residing in Hilo during the discovery period, stated that its range was "limited to the dense forest a few miles in extent upon either side of the Wailuku River," which delineates the north boundary of Hilo. Perkins apparently took six of possibly seven specimens "well above (the) highest cane fields in Amaula" (Amauulu), which today extend to 1600 feet elevation. Twenty-one of Henshaw's 22 specimens were taken in "Kaiwiki," the name of a land division some 3 miles north of Piipihonua, an upper elevation suburb of Hilo.

SUMMARY

Native Hawaiians were apparently unfamiliar with the Greater 'Amakihi, at least no native name for it was known. Population status and distribution of the species is known today only from brief eyewitness notes recorded by three naturalists who obtained 27 of the 32 specimens extant. All specimens and positive sightings originated from a single sharply-delineated area on the island of Hawai'i during a 10-year period, 1892 to 1901.

CONCLUSIONS

The small precinctive population of Greater 'Amakihi had a historical life-span of only 10 years, from 1892 to 1901. It has not been sighted for over 75 years in spite of intensive and extensive searches. It is presumably extinct.

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APPENDIX II

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<u>Loxops sagittirostris</u>			
Island of Hawai'i			
ISLANDWIDE INFERENCE			
1 thought to be extinct or extirpated	(1969)	(1)
2 presumed extinct	(1977)	ATKI77
MULTIQUADRANGLE			
3 might still survive / extensive cloud forests along the Hamakua Coast	(1970)	BERA70
Mauna Kea District			
PIIHONUA and UPPER PIIHONUA			
4 Palmer: probably seen / sheep station of Mr. Hanneberg	(March 1892)	ROTW00
5 Palmer: obtained two specimens, heard others / slopes of Mauna Kea above Hilo near Wailuku (R.) in radius of a few miles	ca. 500- 1500	23 April 1892	ROTW93
6 Palmer evidently made a mistake in saying that he obtained it at altitudes of from 500 to 1500 feet	(1892)	ROTW00

7	Perkins found it only at heights of about 2000 feet	....	(1895/1896)	ROTWOO
8	Mr. Henshaw tells me (in litt.) that he did not see it below 1800 feet	....	(1900/1901)	ROTWOO
9	Banko: Palmer collected 2 specimens / unspecified place(s)	....	1892	(2)
10	Perkins: shot one, heard another / across branch of the Wailuku River from camp in dense forest well above highest cane fields in Amaula, Mauna Kea	....	26 Dec. (1895)	(6)
11	Perkins: now obtained 6 (specimens) / more to the S of my former trails from camp in dense forest well above highest cane fields in Amaula, near fork Wailuku River, Mauna Kea	....	(Jan. 1896)	(6)
12	one of the most local of the Drepanididae... 1200- saw but two specimens (obtained one) on 3000 first visit...saw as many as twelve one morning during course of a long march (six taken) on second visit...noticed several individuals almost every day...visit to each locality about two weeks duration... / forests behind Hilo... on either side of the Wailuku River		(1895/1896)	PERR03
13	Banko: Perkins collected 4 specimens / above Hilo	2000	1896	(2)
14	Banko: Walcott collected 2 specimens / unspecified place(s)	....	(1901)	(2)
15	Banko: Walcott collected 3 specimens / unspecified place(s)	....	1901	(2)

PIIHONUA and UPPER PIIHONUA (con't.)

- | | | | | |
|----|---|---------------|-------------|--------|
| 16 | Banko: Henshaw collected 21 specimens /
Kaiwiki | | 1900/1901 | (2) |
| 17 | one of the rarest...one may watch for it for
days in vain...occasionally a pair may be
called up out of the forest fastnesses /
limited to the dense forest a few miles in
extent upon either side of the Wailuku River | 2000-
4000 | (1901/1902) | HENH02 |
| 18 | searched unsuccessfully / type locality | .... | (1953) | RICL53 |

ABSTRACT

Loxops maculatus is a small, greenish or red forest bird with a straight, short to medium length bill. Six subspecies are recognized, one from each of the forested islands. Exhaustive search of literature and field journals uncovered some 631 observational notes, collection records, reports, and statements on relative abundance and geographical distribution from 1837 to 1978. All information is referenced, arranged in geographical and chronological order, and systematically analyzed. The subjects of completeness, bias, erroneous and doubtful records are addressed. Results are summarized and conclusions drawn.

Ornithologists of the 1890's found populations of L. maculatus on Kaua'i to be common and widely distributed in both upper and lower forest zones; on O'ahu to vary between absent and abundant locally; on Lāna'i to be ubiquitous throughout the forest; on East and West Maui to be extremely abundant to hardly less so; and on Hawai'i to vary from rare or absent in the Puna forest and below 2000 feet elevation to extremely common to abundant in all other localities visited.

Recent observers report relative abundance of this species on Kaua'i to vary from fairly common to abundant locally in forests over 3000 feet elevation; absent to very rare on O'ahu; unreported since 1967 on Moloka'i; unreported since 1937 on Lāna'i; locally uncommon to abundant above ca. 3000 feet elevation on East Maui; and absent, or rare, everywhere on Hawai'i except in Keauhou Ranch-Kīlauea Forest Reserve where sub-populations vary from rare to common locally.

A gap in records obscures status of all six races almost everywhere from ca. 1902 to ca. 1940.

Results of comprehensive U. S. Fish and Wildlife Service (USFWS) surveys since about 1967 are not yet available. Pending availability of detailed USFWS survey results it is concluded that three of the six geographical races of L. maculatus are actually or practically extinct (on O'ahu, Mōkoka'i, Lāna'i) while the remainder (on Kaua'i, Maui, and Hawai'i) have disappeared below ca. 3500 feet and are in various stages of long-term depopulation above that elevation.

Loxops maculatus
'Alauwahio

The 'Alauwahio, or Hawaiian Creeper, is a small (4- to 5-inch long), usually greenish forest bird with a straight bill of short to medium length (Rothschild 1893). One subspecies on each of six islands is recognized. Amadon (1950), amended by Pratt (1979), gives names of the six presently recognized subspecies, including name of original describer, year of publication, and respective island of origin, as follows: L. maculatus bairdi (Stejneger) 1887, Kaua'i; L. maculatus maculatus (Cabanis) 1850, O'ahu; L. maculatus flammeus Wilson 1889 (1890), Moloka'i; L. maculatus montanus (Wilson) 1889 (1890), Lāna'i; L. maculatus newtoni (Rothschild) 1893, Maui; and L. maculatus mana (Wilson) 1891, Hawai'i.

Loxops maculatus bairdi (Kaua'i) differs from its congeners in being called 'Akikiki, after its call, instead of 'Alauwahio. Loxops maculatus flammeus (Moloka'i) also differs from its congeners in being called Kakawahie instead of 'Alauwahio, and by being red instead-of greenish.

Numbers and principal repositories of specimens are as follows: L. maculatus bairdi 93 (30 in B. P. Bishop Museum); L. maculatus maculatus 69 (29 in American Museum of Natural History); L. maculatus flammeus 134 (40 in B. P. Bishop Museum); L. maculatus montanus 65 (21 in American Museum of Natural History); L. maculatus newtoni 78 (29 in American Museum of Natural History); and L. maculatus mana 199 (89 in B. P. Bishop Museum) (Banko 1979 report).

Perkins (1903) comments on the relative abundance, distribution, and natural history of all six subspecies in a systematic early treatment. Berger (1972) includes information from a number of sources in a recent comprehensive account.

OBSERVATIONS, REPORTS AND SPECIMEN RECORDS

Drawing conclusions from a large volume of historical information on relative abundance and distribution of 'Alauwahio 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 Appendixes satisfy criteria necessary for basic documentation and comparative analysis.

In the following descriptive accounts, 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 Appendixes. Sources of published and unpublished information in the Appendixes may be traced to complete references in the bibliography.

23. Loxops maculatus bairdi
'Akikiki

Early Status and Distribution (1888-1900):

V. Knudsen collected an unknown number of specimens of the 'Akikiki, or Kaua'i Creeper, in undesignated place(s) on Kaua'i before 1888 but left no written record of what was seen.

Scott Wilson was the first to record numbers and distribution of the 'Akikiki on Kaua'i, stating that although he collected all six of his specimens in one locality, this species was "usually met with in small flocks of from 8 to 12," and noting further that its range "seems to reach an elevation of 3000 ft." (Wilson & Evans 1891; Banko 1979 report) (9, 10). Rothschild (1893, 1900), no doubt repeating what was communicated to him by his collector, H. C. Palmer, called the 'Akikiki "common" on the south and west sides of Kaua'i, "rare" on the north and northeast sides, and said that it was "undoubtedly found all over the island at altitudes from a thousand feet probably to the uppermost peaks" (2, 16-18). Palmer collected one specimen at Halemanu and another at Kaholuamanu in 1893, securing a third at an undisclosed place and time (Banko 1979 report) (11, 37, 50). Years later, Munro (1944a) stated that "few" were found at lower levels but they were "common" at over 4000 feet elevation, occurring "in small flocks" at Kaholuamanu (? 1891) (60).

R. C. L. Perkins noted or collected specimens of 'Akikiki on a number of occasions during successive visits to Kaua'i in the mid-1890's. On 19 and 25 May 1894 Perkins (field journal) shot specimen(s) at over 3000 feet elevation while staying at Kahōluamanu, F. Gay's mountain house above Makaweli (51, 52). Perkins (field journal) returned to Kaholuamanu about a year later and collected one 'Akikiki specimen on each of four days in April 1895, noted that there were "plenty" on the Kahōluamanu plateau on the 13th, and found them "common" in October the same year when he "revisited the high plateau above Waimea," presumably Kahōluamanu (51-58). Perkins secured a total of six specimens at Kaholuamanu in 1894 and 1895, and five at unspecified places--one at an elevation of 4000 feet (Banko 1979 report) (12, 13, 59). Some miles to the east, in July and August of 1896, Perkins (field journal) noted the presence of 'Akikiki at a "good elevation" in the mountains some miles west of Līhu'e where there were "dense masses" of staghorn fern (14). In summing up his experiences later, Perkins (1903) stated that the 'Akikiki "abounds in the upper and lower forest region" and that it was "common and widely distributed" (3, 4). Bryan and Seale (1915) were the last of the early ornithologists to seek specimens on Kaua'i, taking "a good series" during their 12 April to 4 May 1900 visit, at least one of which was secured at Kahōluamanu (Banko 1979 report) (15, 61).

Later Observations and Reports (1901-1978):

There is no record of anyone collecting or observing 'Akikiki for more than 40 years after W. H. Bryan and A. Seale obtained specimens in 1900. Donaghho (1941) visited Kahōluamanu in October 1941 and reported 'Akikiki to be "not rare" in the area above the Robinson (formerly F. Gay's) mountain house (62). In 1943, presumably September, Northwood (1943) reported seeing "a pair" of 'Akikiki in the Kōke'e area (38). Pearsall (1947) saw two near a Kōke'e cabin during 6 to 7 September 1946, while Hanson (1959) merely noted their presence in the Kōke'e area in June 1959 (39, 40). There seems to be no further records of 'Akikiki in the 1940's and 1950's.

Richardson and Bowles (1964) conducted a survey of birds on Kaua'i from June to August 1960, reporting no 'Akikiki in elevations lower than that of Kōke'e but seeing "no less than 50" on several different days along only 3 or 4 miles of trail. Richardson and Bowles estimated seeing "at least 375" on three trips into the essentially undisturbed higher elevation forest to the east of Mōhihi River, and reckoned the total population in the Alaka'i Swamp area must be "in the thousands" (20, 21). Richardson collected one specimen near the Koai'e stream, at ca. 3750 feet elevation during the survey (Banko 1979 report) (63). Richardson and Bowles also noted a "small group" of 'Akikiki seen in the disturbed native forest near the Mōhihi River about 4 miles east of Kōke'e (41). They summed up the population status of the species in and near the Alaka'i Swamp area by calling it an "abundant resident" (19). Returning to the Koai'e cabin on 2 September 1961 Bowles (1962) noted that this species was "occasionally seen" (64).

After making a trip in and out of the Alaka'i Swamp from the end of the Camp 10 road on 3 and 4 March 1961, and seeing four and eight 'Akikiki on two days in succession, King (1961) stated that this bird was "one of the commoner species" (23-25). Ord (1962, 1963) made a trip to Koai'e cabin from the end of Camp 10 road from 20 to 22 April 1962, and another from 1 to 2 September 1963, reporting that he "only recorded 12" on the first trip (which included a sidetrip along ridge south of Koai'e cabin), but noted them to be "abundant" on his second visit (26, 27). A U. S. Fish and Wildlife Service biologist banded three 'Akikiki on 6 September 1964 on the ridge near Koai'e cabin (65). Ward (field journal) paid a visit to the cabin on Koai'e stream from 20 to 22 February 1964, noted 'Akikiki to be "numerous - tame...10 seen and heard" on the 20th near the cabin; recorded more than 10 on the 21st during a 2- to 3-mile hike along the trail from the cabin toward Wai'ale'ale, including a side trip into a deep valley on the other side of the plateau and return; and recorded six on the 3-hour hike from the cabin to road-end trailhead on the 22nd (28, 66, 67). Walker (1964), on an overlapping trip from 21 to 23 February 1964, stated that the 'Akikiki was the "most common bird next to apapane and iiwi along ridge (past Koai'e cabin) deeper and deeper into the Swamp,"

being "numerous" along the trail from the cabin up and over the ridge into "Ooaa valley" (68, 69).

Donaghho (1965a) tallied 'Akikiki during a series of hikes he made in the Alaka'i Swamp area during four days in August 1965, counting four along Mōhihi to Koai'e cabin trail on the 11th, 37 along the Koai'e-Wai'ala'e Trail on the 12th, four at Wainiha Rim on the 13th, 23 along the Koai'e-Wai'ala'e Trail on the 14th, and five from Koai'e cabin to Mōhihi River trailhead on the 15th (29, 30, 70-72). In 1965 Banko (field journal) noted this species to be "common" on a 30 November hike along Mōhihi Trail to Koai'e cabin, "scarce" along the first mile or so of trail from the Koai'e cabin toward Wai'ala'e cabin on 1 December, and again "common" on the return hike 2 December from the Koai'e cabin to the Mōhihi River trailhead (31, 32, 73).

Six of a total of seven records of 'Akikiki noted during the 1966 to 1969 period were of birds seen or heard. The U. S. Fish and Wildlife Service banded two, recapturing one (banded 9/6/64) on the ridge near Koai'e cabin on 14 May 1966 (74). Anonymous (1966) reported that this species was seen and was "very common" in the Alaka'i Swamp area from 28 to 30 May 1966 (33). Ord (1967) stated that this species was seen in the vicinity of Kalalau Lookout during the period 16 to 23 November 1966 (42). Hansen (1967) reported possibly seeing two in a Kōke'e garden in April 1967 (43). Donaghho (1967c) stated that he saw "over two dozen" on a trip he made 28 August 1967 into the Alaka'i getting "back 2 miles from the Koai'e gulch" (75). Gauthey ~~et al.~~ (1968) reported that there were "approximately 8 seen and heard" during one traverse of the ridge extending south-southeast from the Koai'e cabin approximately 1.5 miles to source of Koai'e stream, making short side trips out spur ridges during a 31 May to 1 June 1968 visit (76). The Hawaii Division of Fish and Game (1969 report) stated only that the 'Akikiki occurred as a breeding population on Kaua'i (5).

The number of records or statements relative to the population status of 'Akikiki declined sharply in the 1970's with only nine examples found for the 1970 to 1978 period. Mull and Mull (1971) stated that this species **was** "easily seen...half dozen or more within less than an hour" along Pihea Trail near its junction with the Alaka'i Swamp Trail during the period 15 to 18 September 1971 (44). Berger (1970, 1972) stated that it was "relatively common" in the Alaka'i Swamp area found it to be "less common," presumably in 1972, in the Kōke'e area (45). M. Mull (1972) listed the 'Akikiki as a candidate for the Blue List because of limited range (6).

In 1973, 15 were censused in East Alaka'i Swamp and 10 were censused along Honopū Trail on the 29 December Christmas Count (46, 77). The following year on 28 December 1974, Sears ~~et al.~~ (1975) reported that 13 were censused on the Christmas Count, presumably in the Kōke'e area (47). Hart (1974b) stated that this species was the "sixth most numerous endemic-bird seen" in the West Alaka'i Swamp on a 4-day field trip (? 1974).

Atkinson (1977), probably based on observations made during his 1968 field trip with J. R. Gauthey and C. Huddleston, called the 'Akikiki "relatively common" (7). Pyle reported three seen along the Alaka'i Loop Trail on 16 September 1977 (Pyle 1978a), one found in the upper Kalalau Lookout parking lot on 27 January 1978 (Pyle 1978b), and another seen near the Lookout on 15 April 1978 (Pyle 1978c) (48a, 49, 49a).

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.
- 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>Loxops maculatus bairdi</u>				
Island of Kaua'i				
ISLANDWIDE INFERENCE				
1	usually met with in small flocks of from 8-12 / seems to reach an elevation of 3,000 feet	....	(1888)	WILS91
2	undoubtedly found / all over the island at altitudes from a thousand feet probably to the uppermost peaks	....	(1891/1893)	ROTW93
3	abounds / in the upper and lower forest region	....	(1894/1895)	PERR03
4	common / widely distributed	....	(1894/1895)	PERR03
5	HDFG: occurs as a breeding population	....	(1969)	(1)
6	candidate for the Blue List....limited range	....	(1972)	MULM72
7	relatively common	....	(1977)	ATKI77
LJNDESIGNATED LOCALITY				
8	Banko: Knudsen collected specimen(s) / unspecified place(s)	....	pre 1888	(2)
9	all my examples were obtained in one locality	....	(1888)	WILS91
10	Banko: Wilson collected 6 specimens / unspecified place(s)	....	1888	(2)

11	Banko: Palmer collected 1 specimen / unspecified place	....	(1891/1893)	(2)
12	Banko: Perkins collected 3 specimens / unspecified place(s)	....	(1894/1895)	(2)
13	Banko: Perkins collected 2 specimens	4000	(1894/1895)	(2)
14	Perkins: present / at a good elevation... in the mountains some miles W from Lihue... dense masses of staghorn fern	....	July/Aug. 1896	(3)
15	secured a good series (of specimens) / unspecified place(s)	....	(12 April-4 May 1900)	BRYW15

MULTIQUADRANGLE

16	rare / on the N and NE side of the island	1000-3000	(1891/1893)	ROTW93
17	common / on the W side of the island	1000-3000	(1891/1893)	ROTW93
18	Palmer: common / on the S side of the island	1000-3000	(1891/1893)	ROTW00
19	abundant resident / in some regions of native forest in or near the Alakai Swamp area	....	(June-Aug. 1960)	RICF64
20	no less than 50...seen on several different days / along only 3 or 4 miles of trail	....	(June-Aug. 1960)	RICF64
21	estimated seeing at least 375 / on...3 trips into the essentially undisturbed forest at higher elevations, to the E of (Mohihi River)	above 3750	(June-Aug. 1960)	RICF64
22	total population...must be in the thousands / (native forest in or near the Alakai Swamp area)	....	(June-Aug. 1960)	RICF64

MULTIQUADRANGLE (con't.)

23	saw 4 / Alakai Swamp	....	3 March 1961	KINB61
24	one of the commoner species / along trail from Alakai Swamp to end Camp 10 road	....	4 March 1961	KINB61
25	saw 8 / Alakai Swamp	....	4 March 1961	KINB61
26	only recorded 12...3-day field trip / along trail to Koaie cabin from end of Camp 10 road ...along ridge S of Koaie cabin...return hike to Camp 10 road end	....	20-22 April 1962	ORDW62
27	abundant / Alakai Swamp	....	1-2 Sept. 1963	ORDW63
28	Ward: 6 recorded / on 3-hour hike from Koaie cabin to road-end trailhead	....	22 Feb. 1964	(4)
29	4 counted / Mohihi River - Koaie cabin	....	11 Aug. 1965	DONW65a
30	5 counted / Koaie cabin - Mohihi River	....	15 Aug. 1965	DONW65a
31	Banko: common / on hike along Mohihi trail to USGS cabin	....	30 Nov. 1965	(5)
32	Banko: common / hike from Koaie Stream cabin to Mohihi trailhead	....	2 Dec. 1965	(5)
33	seen...very common / Alakai Swamp area	....	28-30 May 1966	ANON66
34	relatively common / Alakai Swamp region	....	(1970)	BERA70
35	relatively common bird / in the Alakai Swamp region	....	(1972)	BERA72
36	3 seen / Alakai loop trail	16 Sept. 1977	PYLR78a

MAKAHA POINT

37	Banko: Palmer collected 1 specimen / Halemanu	1893	(2)
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HAENA

38	pair seen / Rokee area	(? Sept.) 1943	NORJ43
39	saw 2 / near cabin, Kokee	...	(6-7 Sept. 1946)	PEAG47
40	present / Kokee area	....	June 1959	HANC59
41	small group...seen / in the disturbed native forest near the Mohihi River about 4 miles E of Kokee	....	(June-Aug. 1960)	RICF64
42	seen / (vicinity Kalalau Lookout)	....	16-23 Nov. 1966	ORDW67
43	2 possibly seen / in our garden...Kokee	....	April 1967	HANN67
44	easily seen...half dozen or more within less than an hour / Pihea trail...near junction with Alakai Swamp trail	....	(15-18 Sept. 1971)	MULW71
45	less common / in the Kokee area	....	(1972)	BERA72
46	censused 10...Christmas Count / Honopu trail	....	29 Dec. 1973	HARA74a
47	censused 13...Christmas Count / Waimea area, center E of junction of Kokee Road from Waimea and Kekaha	....	28 Dec. 1974	SEAW75
48	sixth most numerous endemic bird seen / West Alakai Swamp	....	4-day field trip (1974 ?)	HARA74b
48a	three seen / along Alaka'i Loop Trail	....	16 Sept. 1978	PYLR78a

HAENA (con't.)

- | | | | | |
|-----|---|------|---------------|---------|
| 49 | 1 found / in the parking lot of the upper
Kalalau lookout in Kokee | | 27 Jan. 1978 | PYLR78b |
| 49a | 1 seen / near Kalalau Lookout | .... | 15 April 1978 | PYLR78c |

WAIMEA CANYON

- | | | | | |
|----|---|-------|-----------------|-----|
| 50 | Banko: Palmer collected 1 specimen /
Kaholuamanu | | 1893 | (2) |
| 51 | Perkins: shot specimen(s) / vicinity
F. Gay's mountain house above Makaweli | 3000+ | 19 May (1894) | (3) |
| 52 | Perkins: shot specimen(s) / unspecified
distance up from F. Gay's mountain house
above Makaweli | 3000+ | 25 May (1894) | (3) |
| 53 | Perkins: plenty; collected 1 / Kaholuamanu
plateau (F. Gay's mountain house) | | 13 April (1895) | (3) |
| 54 | Perkins: seen / Kaholuamanu plateau
(F. Gay's mountain house) | | 15 April (1895) | (3) |
| 55 | Perkins: obtained 1 / up from F. Gay's
mountain house, Kaholuamanu plateau | | 20 April (1895) | (3) |
| 56 | Perkins: shot 1 / up from F. Gay's mountain
house, Kaholuamanu plateau | | 23 April (1895) | (3) |
| 57 | Perkins: shot 1 / went far up from F. Gay's
mountain house, Kaholuamanu plateau | | 28 April (1895) | (3) |
| 58 | Perkins: common / high plateau above Waimea
revisited (? F. Gay's mountain house) | | Oct. 1895 | (3) |
| 59 | Banko: Perkins collected 6 specimens /
Kaholuamanu | | (1894/1895) | (2) |

60	found few at lower levels but they were common at over 4000 ft. elevation...went in small flocks / at Kaholuamanu	....	(? 1891)	MUNG44a
61	Banko: Bryan collected 1 specimen / Kaholuamanu	....	1900	(2)
62	not rare / area above the Robinson mountain house, Kaholuamanu	....	(Oct. 1941)	DONW41
63	Banko: Richardson collected 1 specimen / near Koaie (stream)	ca. 3750	1960	(2)
64	occasionally seen / vicinity Koaie cabin, Alakai Swamp	....	2 Sept. 1961	BOWJ62
65	USFWS: banded 3 / Alakai Swamp (Koaie Ridge, near cabin)	....	6 Sept. 1964	(6)
66	Ward: numerous - tame...10 seen and heard / near (Koaie) cabin	....	20 Feb. 1964	(4)
67	Ward: 10 plus recorded...stopped every 100 yards or so to listen and watch / along trail from Koaie cabin toward Waialeale about 2 or 3 miles...side trip into deep valley on other side of plateau.. and return	....	21 Feb. 1964	(4)
68	most common bird next to apapane and iiwi / along ridge deeper and deeper into the swamp (past Koaie cabin)	....	21-23 Feb. 1964	WALR64
69	numerous / along trail from (Koaie cabin) up and over the ridge into Ooaa valley	....	21-23 Feb. 1964	WALR64
70	37 counted / Koaie - Waialeale trail	....	12 Aug. 1965	DONW65a
71	4 counted / Wainiha, Rim	....	13 Aug. 1965	DONW65a

WAIMEA CANYON (con't.)

72	23 counted / Koaie - Waialae trail	....	14 Aug. 1965	DONW65a
73	Banko: scarce / first mile or so of trail between Koaie stream cabin and Waialae cabin	....	1 Dec. 1965	(5)
74	USFWS: banded 2, recaptured 1 banded 9/6/64 / Alakai Swamp (Koaie Ridge, near cabin)	....	14 May 1966	(6)
75	over two dozen seen / on a trip in to the Alakai...got back 2 miles from the Koaie gulch	....	28 Aug. 1967	DONW67c
76	approximately 8 seen and heard in one traverse of the ridge.. .clear skies.. .wind moderate.. .mild temperatures.. .no more than 3 seen at once / along the ridge trail extending SSE from the (Koaie) cabin paralleling Koaie stream...approximately 1.5 miles to source... making short side trips out spur ridges and descending into the canyon at the stream origin, Alakai Swamp	....	31 May, 1 June 1968	GAUJ68
77	censused 15.. .Christmas Count / East Alakai Swamp	....	29 Dec. 1973	HARA74a

24. Loxops maculatus maculatus
'Alauwahio

Early Status and Distribution (1836/1837-1917):

J. K. Townsend and F. Deppe collected the type and supplementary specimens of the 'Alauwahio, or O'ahu Creeper, when they companioned together on O'ahu in 1836 and 1837, but they left no written record of the status and distribution of this subspecies (Banko 1979 report) (6a). Three additional specimens, obtained in undesignated place(s) on unspecified dates and apparently by unknown collectors, found their way to various museums in 1842 and 1866 (Banko 1979 report) (6b). Wilson and Evans (1899) state that an unspecified number of immature specimens were collected in 1888 but left no record of how many were obtained or where they were taken (6c). The statement by Wilson and Evans (1899) that they found the 'Alauwahio "fairly common" in the district of Halemanu "where there is still some forest remaining" suggests that perhaps they were taken in the north central Ko'olau Range (50).

Since H. C. Palmer was the only bird collector of record in the Hawaiian Islands in 1891, he was credited with the taking of three 'Alauwahio specimens at Hale'au'au (gulch) in November 1891 (Banko 1979 report) (27). Subsequent research indicates that Palmer was on the Kona coast of the island of Hawai'i in November 1891 (Rothschild 1900). R. C. L. Perkins did not arrive in the Hawaiian Islands until 1892 (Perkins 1913); however, sometime after 5 November 1892, according to an undated entry in his field journal, Perkins "first came across the little bird Oreomyza maculata" (now Loxops maculatus maculatus) near Hale'au'au. Thus "1891" on the labels of the three specimens (in Museum of Comparative Zoology, Harvard) appears to be in error unless obtained originally by someone other than Perkins. In any event, H. C. Palmer was not the collector in the year of record (1891) as indicated by Appendix record No. 27. Rothschild (1893) stated that the "first of a fine series" of O'ahu 'Alauwahio was taken by Palmer on 10 April 1893 while he was staying with Perkins in a mountain house near Waialua (28, 29). Rothschild went on to say that Palmer found this species only in the uplands of Wailua (Waialua) District where it was "not at all rare" on the "southeast side of the mountains at elevations of 1500 feet to the top of the (Wai'anae) range" (28, 29, 31).

Perkins (1913, field journal) indicated that he collected and observed birds on O'ahu during the following periods: April, May, November, ? December 1892; January to March 1893; February 1896; January to April 1897; and brief intermittent excursions in 1901 and 1902. During these periods Perkins visited various localities where he collected the following numbers of specimens: Hale'au'au (9), Kawaihoa (14), Waialua (12), Leilehua Ranch (1), Waipi'o (1), unrecorded place(s) in the Ko'olau Range (2), unrecorded place(s) in the Wai'anae Range (2), and unrecorded

place(s) in undesignated districts (2) for a total of 43 examples taken (Banko 1979 report) (8-10, 33-35, 40, 85).

During his principal collecting periods in 1892 and 1893 Perkins (field journal) noted that the O'ahu 'Alauwahio occurred "in some numbers usually only far back in the forests" of the Ko'olau Range; was "fairly common" far back in the forests of the Wahiawā District; was present at Kawaihoa and near Hale'au'au where it was first seen; and that "quite a few" were to be found on Ka'ala "in the direction of the Gap" (15, 16, 30, 32). Speaking of this species, Perkins (1903) stated that it "seems to have disappeared from the mountains in the vicinity of Honolulu where it formerly occurred," a statement Munro (1950) later seems to have used to support his statement that Perkins "never saw or heard" it in the mountains near Honolulu (118, 119).

After completion of field observations Perkins (1903) wrote that 'this species was "less numerous" but seen "in hundreds" on O'ahu (in thousands on other islands) and "found on both mountain ranges where it is common enough" (1). Perkins' recollections of observations made of this species 50 years previously (Munro 1950) conveyed a similar impression, relating that "scores" were seen in the Wai'anāe mountains where it was "quite common" or "common enough" at ca. 1500 feet elevation on the east side from Hale'iwa south to Wahiawā, and that it was seen "abundantly" in the forest at Wahiawā (18, 36, 37, 51).

Bryan (1905) stated that during an extended field trip in the Wai'anāe Range from 21 January to 9 March 1901 he found the 'Alauwahio "fairly well restricted to the forest belt" and associating "in small unorganized flocks of a half a dozen individuals" (17).

L. Miller collected four specimens at Leilehua Ranch in 1903 (41). Later, MacCaughey (1917) stated that this species was "in small numbers at the present time in the Manoa Rain Forest" (120).

Later Observations and Reports (1935-1978) :

After a gap of about 20 years, in 1935, after tramping "fully 200 miles" of newly-made trails, G. C. Munro reported not seeing "a single one" (Perkins & Munro 1949) (19). Nevertheless, there were several reports later in the 1930's. Northwood (field journal) noted "16 seen or heard" on Poamoho Trail, in an unspecified Forest Reserve, on 3 May 1936 (52). Later, Northwood (field journal) noted this species on Poamoho Trail as follows: "plentiful and singing" (24 January 1937), "watched pair" (24 November 1938), "pair.. where I watched them before" (10 September 1939), "found" (17 December 1939), "none" (27 September 1940), "1 seen" (11 November 1940), and "present" (8 December 1940) (52-56, 59-61).

There are four other notes, including two Christmas Counts, of O'ahu 'Alauwahio observed on and in the vicinity of Poamoho Trail in the 1940's. Northwood (1940) and H. Baldwin et al. (1940) recorded that five were censused by two observers hiking 4 miles in 5 hours along 'Ōpae'ula Trail and return on 24 December 1939 (57, 58). H. Baldwin et al. (1941) and Anonymous (1941) reported the following year that eight were censused by an unrecorded number of observers hiking for 9 hours along 15 miles of Poamoho, Castle, and Summit trails on 22 December 1940 (62, 63). Smith (1947) obtained "a good view of one" in a 8 June 1947 hike along Poamoho Trail (64), and Porter (1948) reported one, "possibly this species" seen on the lower third of Poamoho Trail on 23 November 1947 (65).

'Alauwahio were also recorded elsewhere on the island of O'ahu in the 1930's and 1940's. Northwood (field journal) noted "several" along Makaleha Trail to the head of Mākua Valley on 1 October 1939 (24). P. Baldwin (field journal) estimated that during the period 19, 25, 26 February 1939 he "saw 3 pairs" in a belt from about a mile in from the beginning of (Kīpapa) Trail to about 3 miles (86). Northwood (field journal) reported seeing an unspecified number on Kīpapa Trail on 10 March 1940 (87), while Anonymous (1947) noted that the 29 December 1946 Christmas Count of 'Alauwahio was the "lowest" for this trail, most being seen in the "middle forest" (no numbers mentioned) (88). Shallenberger and Pratt (1978a) and Shallenberger and Vaughn (1978b) evaluated one pre-1942 record of unspecified numbers of 'Alauwahio sighted along Kīpapa Trail, as "possible" (91).

'Alauwahio were also reported further south in the Ko'olau Range in the 1940's. Anonymous (1947) reported that one was censused in the forest above Honolulu during the 29 December 1946 Christmas Count (121). Griffey (1947) identified and described one seen during the period 3 to 7 April 1947 near a residence on Kewalo Street, Makiki, Honolulu (122).

This species was also reported a few times in the Wai'anae Range during the 1940's. Hamilton (1946) said that one was "definitely identified" on Pālehua Trail on 14 April 1946 (42). Clark (1948) obtained a "long look at 2" on Kalena Trail on 9 May 1948 (43), Johnson (1948) reported "1 seen" on Kalena Trail on 10 October 1948, and Gossard (1949) noted that one was the total count for the day along Pālehua Trail in September 1949 (45). While Munro (1944a) acknowledged such sightings, he repeated that he did not see "a single individual" on the "many miles" he covered in 1935 (21). Later, Munro (1950) remarked that the O'ahu 'Alauwahio was "a species I never saw in life" (20).

Reports of 'Alauwahio in the Wai'anae Range tapered off in the 1950's and practically ceased in the 1960's and 1970's in spite of increased observational activity by members of the Hawaii Audubon Society. Pyle (1977) recorded the identification of one at 'Ōhikilolo on 11 October 1976 (25), and Anonymous (1973a) noted "1 probably seen" along Dupont Trail on the north

flank of Mt. Ka'ala a few days prior to 11 December 1972 (38). Shallenberger and Pratt (1978a) and Shallenberger and Vaughn (1978b) evaluated these reports as "possible" (26, 39).

Farther south along Kalena Trail, King and Stephenson (1958) noted "2 seen" on 14 September 1958, and Rockafellow (1961), without reporting numbers, logged the presence of this species as "seen" on 10 September 1961 (46, 47). Shallenberger and Pratt (1978a) and Shallenberger and Vaughn (1978b) evaluated three of the four sightings of more than two 'Alauwahio reported along Kalena Trail from 1948 to 1961 as "possible," and the fourth as "virtually certain" (49). One of two sightings of one 'Alauwahio reported seen along Pālehua Trail from 1946 to 1961 was evaluated by Shallenberger and Pratt (1978a) and Shallenberger and Vaughn (1978b) as "probable," the other— as "highly unlikely" (48). In addition, one sighting of one 'Alauwahio reported along Bowman Trail (?) during the 1940 to 1978 period was evaluated as "possible" (Shallenberger & Pratt 1978a; Shallenberger & Vaughn 1978b) (14).

'Alauwahio were reported many more times in the Ko'olau Range than in the Wai'anāe Range in the 28-year period 1950 to 1978. In the north-central Ko'olau's, along Poamoho and 'Ōpae'ula trails, the presence (or absence) of this species was noted a total of 16 times, as follows: Hatch (1950a) "1 seen" on 16 April 1950; Richards (field journal) "2 seen" on 9 September 1950 and "1 seen" on 3 January 1952; Donaghho (1965b) "absent (on 5 July 1965)...where I have counted as many as 7 or 8"; Donaghho (1966a) "none seen.. found conditions just as disappointing as before" on 13 November 1965; Donaghho (1966b) "none" on 17 April 1966; Ely (1966) "Ord may have seen 2" (8-May 1966); Anonymous (1967) unspecified number "possibly seen" on 8 January 1967; Donaghho (1969) "saw 2 and heard possibly as many as 6" on 19 July and "heard but not seen" on 20 July (1968); Mull (1972b) "Obata glimpsed a bird that could have been a female" on 11 June 1972; Anonymous (1973c) "observed 2 probable" (15 January 1973); Wilson (1974) reported—that Gagné and Jacobi saw "a pair" in 1973 and "1 seen" on 30 June 1974; Marshall (1975) "only recent sightings along Poamoho trail"; and Shallenberger and Vaughn (1978b) reported that Swedberg and Donaghho "observed flocks ...estimated to number in total between 30 and 50 birds... 1 collected at random" on (? 19) September 1968 (66-81). Shallenberger and Pratt (1978a) and Shallenberger and Vaughn (1978b) evaluated 10 sightings of from one to two birds (8 in 1948) recorded along Poamoho Trail from 1940 to 1974 as: "1 virtually certain, 3 probable, 4 possible and 2 highly unlikely"; and 1 sighting of 1+ recorded along 'Ōpae'ula Trail as "possible" (83, 84).

In the south-central Ko'olau's, in WAIPAHI and KANEOHE quadrangles, the presence or absence of 'Alauwahio during the 1950 to 1978 period was noted a total of 18 times on 'Aiea Trail, as follows: Hatch (1950b) "1 seen" on 9 July 1950; Anonymous (1956a) "3 censused" during 26 December 1955 Christmas Count;

Hatch (1957) "2 censused" during 23 December 1956 Christmas Count; Anonymous (1958) "1 censused" during 22 December 1957 Christmas Count; Rockafellow (1958) "identified" (no number given) (15 March 1958); Eastman and Eastman (1958) "1 seen" (23 March to 14 April 1958); Hatch (1958) "2 seen" on 24 May 1958; Anonymous (1959) "1 censused" on 21 December 1958 Christmas Count; Anonymous (1960) "1 censused" on 27 December 1959 Christmas Count; Rockafellow (1960) "seen" (no number given) on 24 January 1960; Titcomb (1960) "1 seen" (18-20 July 1960); Marrack (1962) "unsuccessful search" on 12 November 1961; Anonymous (1962) "2 censused" on 31 December 1961 Christmas Count; Hatch (1964) "2 observed" on 3 May 1964; Anonymous (1969) "2 censused" on 29 December 1968 Christmas Count; Rockafellow (1975) commented on "absence" during the (1974) Christmas Count; Obata (1975) "1 seen" (June 1975); and Shallenberger and Pratt (1978a) "1 possibly seen" during the period 19 December 1977 to 9 March 1978 (95-112). Shallenberger and Pratt (1978a) and Shallenberger and Vaughn (1978b) evaluated 16 sightings of from one to three observed from 1950 to 1976 along 'Aiea Trail, as follows: "1 virtually certain, 1 probable, 12 possible, and 2 highly unlikely" (117).

There are a few other records from the south-central Ko'olau's. On Kipapa Trail, Richards (field journal) "collected 1 specimen" on 20 July 1950 and Donaghho (1966a) saw "none" on 3 December 1965 (89, 90). Shallenberger and Pratt (1978a) and Shallenberger and Vaughn (1978b) stated that Bruner "observed 1" 20 feet away for 2.5 minutes at 2000 feet elevation south of Mānana Trail on 30 December 1977 (92), apparently the only one positively identified in 200 man-days of field work (19 December 1977 to 9 March 1978) in the central Ko'olau Range (93, 113). Shallenberger and Vaughn (1978b) also reported other possible but apparently not conclusive sightings, as follows: Shallenberger and Collins "1 observed" for 2 minutes at 50 to 60 feet distance at 1100 feet elevation in North Hālawā Valley on 10 February 1975; Stemmermann possibly sighting one at 1400 feet elevation on 19 February 1978; and Atkinson and Taylor possibly hearing up to three on 13 January, or four on 3 March 1978 on the North Fork of Hālawā stream (114-116). Pyle (1978b) states that three of these sightings (those on 30 December 1977, 29 January and 10 February 1978) "are the best verified reports" in 3 years (94). Shallenberger and Pratt (1978a) and Shallenberger and Vaughn (1978b) concluded after the 200 man-day survey of the central Ko'olāu Range from 19 December 1977 to 9 March 1978, that judging from the only three positive sightings made the "apparent scarcity" of 'Alauwahio was "real" (22, 23).

In the southern Ko'olau Range, the possible presence or absence of 'Alauwahio seems to have been reported from 1950 to 1978 a total of only five times. In logging the 31 December 1961 Christmas Count, Anonymous (1962) recorded "2 censused" near Mānoa Falls (123). Kaigler (1970) was "almost sure" that an individual with a "straight bill" and "different" call note than 'Amakihi seen (in May) in a hillside area above Melemele Drive,

Honolulu, was an 'Alauwahio (124). Mull (1972a) reports this species "not found" in Moanalua Valley, presumably—that same year (1972) (125). Dunn and Dunn (1973) recorded "good probable sightings of 1 or possibly 2" along Wa'ahila Ridge Trail on 10 June 1973 (126). Yoshida (1973) logged one "probable" seen on Wa'ahila Ridge Trail on 18 June 1973 (127). Shallenberger and Vaughn (1978b) reported that Stemmermann 'observed 1" for 10 minutes 30 to—40 feet away at 1000 feet elevation in the Moanalua Valley on 29 January 1978 (130).

In considering the validity of the previous and one former reports, Shallenberger and Pratt (1978a) and Shallenberger and Vaughn (1978b) evaluated Griffey's 1947 report as "highly unlikely"; Kaigler's 1970 sighting in Mānoa Valley (Melemele Drive) as "probable"; Dunn and Dunn's 10 June 1973, and Yoshida's 18 June 1973 probable sightings along the Wa'ahila Ridge Trail as "possible"; and credited Stemmermann's positive identification of one in the Moanalua Valley 29 January 1978 (128, 129, 131, 132).

Several statements have been made about the islandwide status of the O'ahu 'Alauwahio in recent years from 1970 to 1978. Berger (1970, 1972) called this species "rare" in two recent reports (2, 3). Atkinson (1977) used the same term (4). Shallenberger and Vaughn (1978b), after evaluating 41 sightings recorded on O'ahu from 1939 to 1978 (3 as "virtually certain," 6 as "probable," 26 as "possible," and 6 as "highly unlikely"), stated that their study confirmed populations to be "precariously low" (5, 6).

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.
- 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>Loxops maculatus maculatus</u>			
Island of O'ahu			
ISLANDWIDE INFERENCE			
1 less numerous (than L. <u>maculata</u> on other islands). ..seen in hundreds (other subspecies in thousands). ..found on both mountain ranges where it is common enough	(1892/1902)	PERR03
2 rare / (islandwide)	(1970)	BERA70
3 rare / (islandwide)	(1972)	BERA72
4 now rare / (islandwide)	(1977)	ATKI77
5 41 sightings recorded in Elepaio 1939-1978 evaluated: virtually certain (3), probable (6), possible (26), highly unlikely (6) / (islandwide)	(1978)	SHAR78b
6 study confirms populations precariously low / (islandwide)	(1978)	SHAR78b
UNDESIGNATED LOCALITY			
6a Banko: J. K. Townsend and F. Deppe collected specimens / (? Nuuanu Valley)	1836/1837	(2)
6b Banko: 3 specimens taken by unknown collectors / unspecified place(s)	(? 1842 and ? 1866)	(2)

6c	immature specimens collected / undesignated place(s)	....	(1888)	WILS99
7	Banko: Bryan and Seale collected 13 specimens / Waianae (range) Pukaloa cabin/house (?)	....	1901	(2)
8	Banko: Perkins collected 2 specimens / Koolau (range)	....	(1892/1893)	(2)
9	Banko: Perkins collected 2 specimens / Waianae (range)	1400	(1892/1893)	(2)
10	Banko: Perkins collected 2 specimens / unspecified place(s)	....	(1892/1893)	(2)
11	none seen since 1947 / unspecified place(s)	....	(15 Dec. 1966)	DONW67b
12	HDFG: occurs as a breeding population / unspecified place(s)	....	(1969)	(1)
13	may exist in fair numbers / in remote sections of native forest	....	(1975)	MARD75
14	1 sighting of 1 recorded in Elepaio 1939-1978 evaluated as possible / Bowman trail (?) (Waianae Range)	....	1940-1978	SHAR78a SHAR78b

MULTIQUADRANGLE

15	Perkins: found in some numbers / usually only far back in the forests, Koolau Range	....	(1892/1893)	(3)
16	Perkins: fairly common; good series obtained / far back in the forest, Wahisua district; far back in the forest at Kawailoa; near Haleauau in the Waianae Range	....	(1892/1893)	(3)

MULTIQUADRANGLE (con't.)

- | | | | | |
|----|--|------|--------------------------------|---------|
| 17 | found associated in small unorganized flocks of a half a dozen individuals / fairly well restricted in its range to the forest belt of the Waianae mountains | .... | 21 Jan.-9 March 1901) | BRYW05 |
| 18 | Perkins: common enough at ca. 1500 feet or rather more / E side Waianae Mtns. vicinity Haleiwa Hotel S to opposite Wahiawa | .... | (1892/1893) | MUNG50 |
| 19 | Munro: did not see a single one / fully 200 miles, covering most sections of the forest..tramping the new CCC trails.. ■ 2 days per week | .... | July-Oct. 1935 | PERR49 |
| 20 | a species I never saw in life / many miles of newly-made CCC trails that I tramped during the bird survey | .... | (1891 to 1950) | MUNG50 |
| 21 | did not see a single individual but other observers report having seen it since, commonly / many miles of newly made CCC trails | .... | (1935) | MUNG44a |
| 22 | only 3 positively identified...alarmed and saddened by the scarcity (on 200 man-day survey) / central Koolau Range | | 19 Dec. 1977 -
9 March 1978 | SHAR78a |
| 23 | concluded that apparent scarcity on 200 man-days of surveys is real / central Koolau Range | | 19 Dec. 1977 -
9 March 1978 | SHAR78b |

Wai'anae District

KAENA

- | | | | | |
|----|---|------|-------------|-----|
| 24 | Northwood: several / Makaleha trail to head of Makua valley | | 1 Oct. 1939 | (7) |
|----|---|------|-------------|-----|

25	1 identified / Ohikilolo, Waianae Range	....	11 Oct. 1976	PYLR77
26	1 sighting of 1 recorded in <u>Elepaio</u> 1939-1978 evaluated as possible / Ohikilolo (Waianae Range)	....	1976	SHAR78a SHAR78b

HALEIWA

27	Banko: Palmer collected 3 specimens / Haleauau (gulch)	....	Nov. 1891	(2)
28	first specimen obtained / with Mr. Perkins in mountain house near Waialua or Wailua	....	10 April (1893)	ROTW93
29	fine series obtained / with Mr. Perkins in mountain house near Waialua or Wailua	....	April-June 1893	ROTW93
30	Perkins: first seen / vicinity Haleauau, Kaala side	....	(1892)	(3)
31	not at all rare / Wailua district, SE side of mountains at elevations of 1500 feet to top of range	....	(1893)	ROTW93
32	Perkins: quite a few / Kaala in the direction of the Sap	....	(1893)	(3)
33	Banko: Perkins collected 9 specimens / Haleauau (gulch)	....	1893-1902	(2)
34	Banko: Perkins collected 14 specimens / Kawailoa (gulch)	....	1893-1902	(2)
35	Banko: Perkins collected 12 specimens / Wailua (Waialua)	....	1893-1902	(2)

HALEIWA (con't.)

36	Perkins: saw scores / first found it in the Waianae Mountains on the E side of the range when I was staying at the (? Emerson) ranch house...near...where Haleiwa Hotel was later built	....	1892 to 1903	MUNG50
37	Perkins: quite common / vicinity Haleauau	....	1902 to 1904	MUNG50
38	1 probably seen / on Dupont trail on the N flank of Mt. Kaala in the Waianae Range	....	few days prior (to 11 Dec. 1972)	ANON73a
39	1 sighting of 1 recorded in <u>Elepaio</u> 1939-1978 evaluated as possible / Dupont trail (Waianae Range)	....	1972	SHAR78a SHAR78b

SCHOFIELD BARRACKS

40	Banko: Perkins collected 1 specimen / Leilehua Ranch	....	(1892-1903)	(2)
41	Banko: Miller collected 4 specimens / Leilehua Ranch	....	1903	(2)
42	1 definitely identified / Palehua trail	....	14 April 1946	HAME46
43	long look at 2 / Kalena trail	....	9 May 1948	CLAM48
44	1 seen / Kalena trail	....	10 Oct. 1948	JOHE48
45	1...total count for the day / Palehua trail	....	Sept. 1949	GOSG49
46	2 seen / Kalena trail, above Schofield Barracks	....	14 Sept. 1958	KINJ58
47	seen / Kalena trail	....	10 Sept. 1961	ROCR61

- | | | | | |
|----|--|------|-----------|--------------------|
| 48 | 2 sightings of 1 recorded in <u>Elepaio</u>
1939-1978 evaluated: probable (1), highly
unlikely (1) / Palehua (Waianae Range) | | 1946-1961 | SHAR78a
SHAR78b |
| 49 | 4 sightings of 2+ recorded in <u>Elepaio</u>
1939-1978 evaluated: virtually certain (1),
possible (3) / Kalena (Waianae Range) | | 1948-1961 | SHAR78a
SHAR78b |

HAUULA

- | | | | | |
|----|---|------|----------------|--------|
| 50 | fairly common / in the district of Halemanu
...where there is still some forest remaining | | (1887-1888) | WILS99 |
| 51 | Perkins: saw it abundantly / in the forest
at Whiawa | | (1893/1896) | MUNG50 |
| 52 | Northwood: 16 seen or heard / Poamoho trail,
Forest Reserve | | 3 May 1936 | (7) |
| 53 | Northwood: plentiful and singing / Poamoho
trail | | 24 Jan. 1937 | (7) |
| 54 | Northwood: watched pair / Poamoho trail | .... | 24 Nov. 1938 | (7) |
| 55 | Northwood: pair.. .where I watched them
before / Poamoho trail | | 10 Sept. 1939 | (7) |
| 56 | Northwood: found / Poamoho to Summit trail | .... | 17 Dec. 1939 | (7) |
| 57 | 5 censused (2 observers, 5 hours, 4 miles) /
along Opaaula trail and return | | 24 Dec. 1939 | NORJ40 |
| 58 | 5 seen.. .Christmas Count (2 observers,
5 hours, 4 miles) / along Opaaula trail and
return | | 24 Dec. (1939) | BALH40 |
| 59 | Northwood: none / Poamoho | .... | 27 Sept. 1940 | (7) |

HAUULA (con' t.)

60	Northwood: 1 seen / Poamoho	....	11 Nov. 1940	(7)
61	Northwood: present / Poamoho	....	8 Dec. 1940	(7)
62	8 censused...Christmas Count (15 miles, 9 hours) / Poamoho - Summit - Castle forest trails	1490- 2800- 250	22 Dec. 1940	ANON41
63	8 seen...Christmas Count (part of unspecified numbers 15 miles, 9 hours) / forest trails, Poamoho - Castle - Summit (0830-1730 hours)	1490- 2800- 250	22 Dec. (1940)	BALH41
64	good view of one / hike along the Poamoho trail	....	8 June 1947	SMID47
65	one, possible this species, seen / lower third of the Poamoho trail	....	23 Nov. 1947	PORR48
66	1 seen / Poamoho trail	....	16 April 1950	HATG50a
67	Richards: 2 seen / Poamoho trail, between Poamoho and Halemano streams (1030-1930 hours)	1500- 2700	9 Sept. 1950	(8)
68	Richards: 1 seen (1010-1300 hours) / hike for approximately 0.5 mile up Poamoho trail	1500	3 Jan. 1952	(8)
69	absent...where I have counted as many as 7 or 8 / Poamoho trail	....	5 July 1965	DONW65b
70	none seen / Opaepala trail...covered at least two-thirds of this trail and found conditions just as disappointing as before	....	18 Nov. 1965	DONW66a
71	none / Poamoho trail	....	17 April 1966	DONW66b

72	Ord: may have seen 2 / Poamoho trail	....	(8 May 1966)	ELYJ66
73	possibly seen / Poamoho trail	....	8 Jan. 1967	ANON67
74	definitely recognized...saw 2 and heard possibly as many as 6 / Poamoho trail.. about 2 miles in from the end of the toad	....	19 July (1968)	DONW69
75	heard but not seen...distinctive 'cips' were unmistakable / Opaaula trail...about 2 or 2.5 miles down from the Koolau summit	....	20 July (1968)	DOWN69
76	Obata: glimpsed a bird that could have been a female (<u>L. m. maculata</u>) / Poamoho trail	....	11 June 1972	MULW72b
77	observed 2 probable / Poamoho trail	....	(15 Jan. 1973)	ANON73c
78	Gagne and Jacobi: pair seen / about 0.5 mile from summit, Poamoho trail	....	1973	WILE74
79	1 seen / about 0.5 mile from summit, Poamoho trail	....	30 June 1974	WILE74
80	only recent sightings / Poamoho trail	....	(1975)	MARD75
81	Swedberg and Donaghho: observed flocks... estimated to number in total between 30 and 50 birds...1 collected at random / Poamoho trail (Koolau Range)	....	(? 19) Sept. 1968	SHAR78b
83	1 sighting of 1+ recorded in <u>Elepaio</u> 1939-1978 evaluated as possible / Opaaula trail (Koolau Range)	....	1968	SHAR78a SHAR78b
84	10 sightings of 1 - 2 birds (8 in 1948) recorded in <u>Elepaio</u> 1939-1978 evaluated: virtually certain (1), probable (3), possible (4), highly unlikely (2) / Poamoho trail (Koolau Range)	....	1940-1974	SHAR78a SHAR78b

WAIPAHO

- | | | | | |
|----|--|------|--------------------------------|--------------------|
| 85 | Banko: Perkins collected 1 specimen / Waipio | .... | (1893-1902) | (2) |
| 86 | estimate I saw 3 pairs / in a belt from about a mile in from the beginnng of (Kipapa) trail to about 3 miles | .... | 19, 25, 26 Feb. 1939 | (21) |
| 87 | Northwood: seen / Kipapa trail | .... | 10 March 1940 | (7) |
| 88 | lowest (Christmas Count)..for this trail.. confined mostly to the middle forest / Kipapa trail (7 miles hiked) | .... | 29 Dec. 1946 | ANON47 |
| 89 | Richards: 1 specimen collected (no others mentioned) / Kipapa trail near Puu Kamana, between Kipapa and Waiawa gulches | .... | 20 July 1950 | (8) |
| 90 | none seen / Kipapa trail | .... | 3 Dec. 1965 | DOWN66a |
| 91 | 1 sighting of undesignated number recorded in <u>Elepaio</u> 1939-1978 evaluated as possible / Kipapa trail (Koolau Range) | | pre-1942 | SHAR78a
SHAR78b |
| 92 | Bruner: 1 observed 2.5 minutes at 20 ft. at 1405 hours / S of Manana trail | 2000 | 30 Dec. 1977 | SHAR78b |
| 93 | 1 positively identified in 200 man-days of field work (in central Koolau Range) / in a valley S of Manana trail | | 19 Dec. 1977 -
9 March 1978 | SHAR78a |
| 94 | 3 sighted during recent forest bird survey... best verified reports.. in 3 years.. prove that the form persists despite severe habitat loss / S of Manana valley (1 on 30 Dec. 1977), Moanalua valley (1 on 29 Jan. 1978), Halawa valley (1 on 10 Feb. 1978) | .... | 1977/1978 | PYLR78a |

KANEEOHE

95	1 seen / Aiea trail	....	9 July 1950	HATG50b
96	3 censused...Christmas Count / Aiea trail to summit	....	26 Dec. 1955	ANON56a
97	2 censused...Christmas Count / Aiea trail.. ■ high on the trail...as usual	....	23 Dec. 1956	HATG57
98	1 censused...Christmas Count / Aiea trail	....	22 Dec. 1957	ANON58
99	identified / Aiea trail	....	(15 March 1958)	ROCR58
100	1 seen / Aiea trail	....	(23 March-14 April 1958)	EASW58
101	2 seen / Aiea trail	....	24 May 1958	HATG58
102	1 censused...Christmas Count / Aiea trail	....	21 Dec. 1958	ANON59
103	1 censused...Christmas Count / Aiea trail	....	27 Dec. 1959	ANON60
104	1 seen / Aiea trail	....	(18-20 July 1960)	TITM60
105	seen / Aiea trail	....	24 Jan. 1960	ROCR60
106	unsuccessful search / Aiea Heights trail	....	12 Nov. 1961	MARA62
107	2 censused...Christmas Count / Aiea trail	....	31 Dec. 1961	ANON62
108	2 observed / Aiea trail	....	3 May 1964	HATG64
109	2 censused...Christmas Count / Aiea trail	....	29 Dec. 1968	ANON69
110	comments on absence during Christmas Count / Aiea trail	....	(1974)	ROCR75
111	1 seen / Aiea trail	....	(June 1975)	OBAJ75

KANEEOHE (con't.)

112	1 possibly seen in 200 man-days of field work (in central Koolau Range) / Aiea trail	....	19 Dec. 1977 - 9 March 1978	SHAR78a
113	1 positively identified in 200 man-days of field work (in central Koolau Range) / North Halawa Valley	....	19 Dec. 1977 - 9 March 1978	SHAR78a
114	Shallenberger and Collins: 1 observed for 2 minutes at 50-60 ft., 1730 hours / North Halawa Valley	1100	10 Feb. 1978	SHAR78b
115	Stemmermann: sighting, possibly, of 1 / North Halawa Valley	1400	19 Feb. 1978	SHAR78b
116	Atkinson and Taylor: hearing, possibly, up to 3 (1/13/78) or 4 (3/3/78) individuals / N fork Halawa Stream	....	13 Jan. 1978; 3 March 1978	SHAR78b
117	16 sightings of 1-3 recorded in <u>Elepaio</u> 1939-1978 evaluated: 1 virtually certain, 1 probable, 12 possible, 2 highly unlikely / Aiea trail	....	1950-1976	SHAR78a SHAR78b

HONOLULU

118	seems to have disappeared / from the mountains in the vicinity of Honolulu where it formerly occurred	....	(1903)	PERR03
119	Perkins: never saw or heard / in the mountains near Honolulu	....	1892-1912	MUNG50
120	present, in small numbers, at the present time / Manoa Rain Forest	....	(1917)	MACV17

121	1 censused.. .Christmas Count / Alewa Heights, Kapalama Heights, Tantalus trail, Woodlawn - St. Louis trail, Kapapa trail	....	29 Dec. 1946	ANON47
122	1 identified and described / at residence on Kewalo Street, Makiki, 0.5 block upslope of Wilder, Honolulu	....	3-7 April 1947	GRIP47
123	2 censused.. .Christmas Count / Manoa Falls	....	31 Dec. 1961	ANON62
124	almost sure...of one...see straight bill... call different than amakihi / hillside area above Melemele Drive	....	(May 1970)	KAIH70
125	not found / Moanalua Valley	....	(1972)	MULW72a
126	god probable sightings of 1 or possibly 2 / Waahila Ridge trail	....	10 June.1973	DUNF73
127	probable seen...straight bill...two wing bars...creeper-like appearance / near the end of the Waahila Ridge trail	....	18 June 1973	YOSJ73
128	1 sighting of 1 recorded in <u>Elepaio</u> 1939-1978 evaluated as highly unlikely / <u>Makiki</u>	....	(1947)	SHAR78a SHAR78b
129	1 sighting of 1 recorded in <u>Elepaio</u> 1939-1978 evaluated as probable / <u>Manoa Valley</u>	....	(1970)	SHAR78a SHAR78b
130	Stemmermann: 1 observed 10 minutes at 30-40 ft., 1040 hours / Moanalua Valley	1000	29 Jan. 1978	SHAR78b
131	2 sightings of 1 - 2 recorded in <u>Elepaio</u> 1939-1978 evaluated as possible / <u>Waahila Ridge</u>	....	1973	SHAR78a SHAR78b
132	1 positively identified in 200 man-days of field work (in central Koolau Range) / Moanalua Valley	....	19 Dec. 1977 - 9 March 1978	SHAR78a

25. Loxops maculatus flammeus
Kakawahie

Early Status and Distribution (1870-1900):

The dates of 20 December 1870, 20 December 1873, 26 December 1880, and 31 December 1899 appear with the name of H. C. Palmer on labels of four specimens of Kakawahie, or Moloka'i Creeper (Banko 1979 report) (9). Since Palmer was not known to have been on Moloka'i on any of these dates (Rothschild 1900), the specimens were apparently either mislabeled and/or taken by someone else, possibly by one of the R. Meyer family who were known to collect birds during the early period (Perkins 1903).

S. B. Wilson collected three Kakawahie a half-day's hike from Meyer's residence at Kala'e in Kahanui during his June 1888 visit to Moloka'i, a fact noted by Munro (1947), and described this species a year later (Wilson & Evans 1890; Banko 1979 report) (25, 26, 37). H. C. Palmer secured 28 specimens from 14 December 1892 to 20 February 1893 but did not specify the locality in which they were taken (Banko 1979 report) (10). Palmer's name is also on the labels of 13 undated examples, also taken in unspecified places (Banko 1979 report) (10a). Rothschild (1893), apparently basing his statement on facts communicated by Palmer, stated that this species was "quite common...not at all rare" being met with "almost everywhere in the forests" in all the upper regions, chiefly in Pūko'o, Alawa (? Halawa), and Kala'e, from the deeper valleys up to the highest peaks (1). Rothschild (1893) went on to state that more of this species were seen on collecting trips out of Pūko'o "in higher elevations" while "only a few were seen" in the hills above Hālawā in forest "much higher" than near Pūko'o (48, 49).

R. C. L. Perkins obtained 27 Kakawahie specimens in May and June 1893, at least one in September 1896, and four others on unknown dates (Banko 1979 report) (11-13). Perkins' name also appears on eight other specimens dated 1902, February being designated the month of collection on the labels of seven (Banko 1979 report) (13a). Perkins (field journal) secured a total of 18 specimens during the months of May, June, and August above his lodging at Makakupa'ia, and nine during June and July 1893 more to the east, near or along Pelekunu Pali (27-35, 38-41). "Some" were even seen by Perkins (field journal) "only a few hundred feet above the sea" in a valley encountered while travelling from Pelekunu village to Kamalō (42). Perkins (1903) summed up the status and distribution of the Kakawahie by calling it "common on leeward and windward Moloka'i...most partial to dense and wet forests but not rarely small companies stray down the wooded gulches considerably below the line of continuous woodland...widely distributed" (2, 3).

Schauinsland (1900) visited Moloka'i about 1895 noting that he saw the Kakawahie "less often than apapanes and iiwis" in a

"verdant forested ravine" near a "romantic lake" (Meyer Lake) at an elevation of ca. 2000 feet (36).

Later Observations and Reports (1901-1978):

In 1902 a total of eight specimens were taken by a collector who neglected to note either his name or the locality where each was collected (Banko 1979 report) (15). Perhaps a member of the Meyer family secured them, or G. C. Munro who resided on Moloka'i for a period of years beginning about 1899. Two specimens bearing a 1902 date have H. W. Henshaw's name on the labels, and another 1902 example has Perkins' name inscribed thereon; neither are known to have visited Moloka'i that year (Banko 1979 report) (13a). Munro (1944a, 1944b), stating that the Kakawahie was found in the upper boggy forest in the 1890's, collected at least 14 specimens in 1906 and 1907 "when it was still quite common" (Banko 1979 report) (14, 16, 18, 19). Munro was probably responsible for securing six specimens which found their way into collections of museums in New Zealand in 1907 (Banko 1979 report) (17).

Bryan (1908), during a visit to Moloka'i from 15 April to 15 June 1907, collected a series of 24 Kakawahie specimens in the following localities and numbers: Pelekunu (3), Punalua (? Pu'u Alu = Pu'u ali'i) (4), Kilohana (9), Moanui (6), and unspecified place(s) (2) (Banko 1979 report) (24). Bryan (1908) cites the middle of the Hālawā forest, Mapulehu, and Kilohana as collecting localities for each one of a total of three nests collected (43, 50, 51), from a total of four camps where he collected: 1) near head of Waikolu Valley, 2) the mountain Kaunapahu (Kaunupahu), 3) near headwaters of Waialua stream, and 4) directly back of Mapulehu (23). Unfortunately, Bryan did not leave any record of the relative abundance or distribution of the Kakawahie in any of these areas, or in the forested portion of Moloka'i generally, during the time of his visit.

No one seems to have sought the Kakawahie after 1907 until Munro (1944a, 1944b, 1963) visited Moloka'i on his inter-island bird survey in 1936 and, after searching east and west side forests, reported seeing or hearing none (4, 20, 21). Donaghho (1963) stated that **this** species was reported seen by workmen in the upper Pelekunu valley, presumably in 1936, but this report was never verified (44). Pekelo (1963) logged three sight observations of an unstated number of Kakawahie out of five trips to the Pāpē'ōpae bog area back of 'Ōhi'alele near the rim of Pelekunu valley, one on each of the following dates: 21 May and 8 June 1961, and 29 April 1963 (45). From these and other experiences gained over a 10-year period on Moloka'i, Pekelo (1964) summarized the status of this species as "rare" in the dense rain forest along Pāpa'alā Pali and the Waikolu plateau (46). Pratt (1973) credits Pekelo's rediscovery but makes no mention of sighting this species during his own 3 to 14 January 1972 survey of the Pu'u Kolekole area (47).

The Kakawahie was officially classified as "Endangered" by the Hawaii Division of Fish and Game in 1969 (5). Berger (1970, 1972) calls the species "rare" (6, 7). Marshall (1975) stated that the last reported sighting was in 1967 but does not give the source of his information (22). Scott ~~et al.~~ (1977), after covering the same general area as Pekelo around Pāpa'alā Pali and Pēpē'ōpae on the Waikolu plateau, did not report finding this species after a 5-day survey of birds from 21 to 25 July 1975 (47a). Atkinson (1977), following Munro (1944a), termed the Kakawahie "rare."

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>Loxops maculatus flammeus</u>				
Island of Moloka'i				
ISLANDWIDE INFERENCE				
1	quite common...met with almost everywhere in the forests...not at all rare / in all the upper regions of Molokai, chiefly in the districts of Pukoo, Alawa, and Kalae...from the deeper valleys up to the highest peaks	....	(1892/1893)	ROTW93
2	common / on leeward and windward Molokai... most partial to dense and wet forests but not rarely small companies stray down the wooded gulches considerably below the line of continuous woodland	....	1893/1896	PERR03
3	common / widely distributed	....	1893/1896	PERR03
4	none seen / bird survey on both E and W sides of the forest	....	1936	MUNG63
5	HDFG: officially classed as endangered	....	(1969)	(1)
6	rare	....	(1970)	BERA70
7	rare	....	(1972)	BERA72
8	rare	....	(1977)	ATKI77

UNDESIGNATED LOCALITY

9	Banko: 4 specimens collected (? members of R. Meyer's family) / unspecified place(s)	....	1870/1873/1880	(2)
10	Banko: Palmer collected 28 specimens / unspecified place(s)	....	14 Dec. 1892 - 20 Feb. 1893	(2)
10a	Banko: Palmer's name is on 13 specimen labels / unspecified place(s)	....	(undated)	(2)
11	Banko: Perkins collected 28 specimens / unspecified localities	....	May, June 1893 (27); Sept. 1896 (1)	(2)
12	Banko: Perkins collected 4 specimens / unspecified place(s)	....	1893/1896	(2)
13	Banko: Perkins collected at least 1 specimen / unspecified place(s)	....	1896	(2)
13a	Banko: Perkins' name is on labels of 8 specimens / unspecified place(s)	....	Feb. 1902 (7); ? month 1902 (1)	(2)
14	found / in the upper boggy forest	....	1890's	MUNG44a
15	Banko: unspecified collector(s) obtained 8 specimens / unspecified place(s)	....	1902	(2)
16	Banko: Munro collected 14 specimens / unspecified localities	....	1906/1907	(2)
17	Banko: 6 specimens collected / unspecified place(s)	....	(1907)	(2)
18	still not uncommon...secured a good series / unspecified place(s)	....	1907	MUNG44b
19	collected a series of specimens...when it was still quite common / unspecified place(s)	....	1907	MUNG44a

UNDESIGNATED LOCALITY (con't.)

- | | | | | |
|----|---|------|-----------------------|---------|
| 20 | not found / unspecified place(s) | .... | 1936 | MUNG44b |
| 21 | no signs of it nor was its familiar chipping heard / unspecified place(s) | .... | bird survey 1935-1937 | MUNG44a |
| 22 | last reported sighting was in 1967 / habitat extremely limited (locality unspecified) | .... | (1975) | MARD75 |

MULTIQUADRANGLE

- | | | | | |
|----|--|------|------------------------|--------|
| 23 | an excellent series was collected / from 4 camps: 1) nr. head of Waikolu valley, 2) the mtn. Kaunupahu, 3) near headwaters of Waialua stream, 4) directly back of Mapulehu | .... | 15 April-15 June 1907) | BRYW08 |
| 24 | Banko: Bryan collected 24 specimens / Pelekunu (3); "Punalua" (Puu Alu = Puualii ?) (4); Kilohana (9); Moanui (6); unspecified place(s) (2) | .... | 1907 | (2) |

KAUNAKAKAI

- | | | | | |
|----|--|------|---------------|--------|
| 25 | Banko: Wilson collected 3 specimens / Kalae in Kahanui | .... | 1888 | (2) |
| 26 | obtained 3 specimens / half-day hike from Mr. Meyer's residence, Kalae | .... | (1888) | WILS90 |
| 27 | Perkins: shot 3 / a long way up from Makakupaia | .... | 13 May (1893) | (3) |
| 28 | Perkins: shot 2 / up from Makakupaia | .... | 20 May (1893) | (3) |
| 29 | Perkins: saw several / long ways above Makakupaia | .... | 21 May (1893) | (3) |

- | | | | | |
|----|--|----------|--------------------------|--------|
| 30 | Perkins: saw 6 / along ridge across gulch
N of camp in ohia forest above Makakupaia | | 23 May (1893) | (3) |
| 31 | Perkins: saw several / in the gulch and on
the ridge beyond above camp in ohia forest
above Makakupaia | | 24 May (1893) | (3) |
| 32 | Perkins: shot 5 / along ridge across gulch
N of camp in ohia forest above Makakupaia | | 26 May (1893) | (3) |
| 33 | Perkins: heard a few / high up, across big
gulch, about 6 miles up from Makakupaia | | 8 June (1893) | (3) |
| 34 | Perkins: saw 2 and shot 2 others / top of
the ridge above camp at Makakupaia | | 10 June (1893) | (3) |
| 35 | Perkins: shot at / near highest camp above
Makakupaia | | 13 Aug. (1893) | (3) |
| 36 | seen less often than apapanes and iiwis /
verdant forested ravine.. .(near) small
romantic lake | ca. 2000 | (prior 1900)
(? 1895) | SCHH00 |
| 37 | Wilson: procured 3 specimens / at Kalae,
probably in some native forest about a mile
from the (Meyer) homestead | | (1947) | MUNG47 |

KAMALO

- | | | | | |
|----|--|------|----------------|-----|
| 38 | Perkins: shot 2 specimens / forest above
bog, up from camp in ohia forest above
Makakupaia | | 29 May (1893) | (3) |
| 39 | Perkins: saw 3; shot 4 of small company;
shot 1 / densest forest across <u>Pritchardia</u> bog
above camp at Makakupaia (mostly near ridge
top Pelekunu Valley) | | 13 June (1893) | (3) |

KAMALO (con't.)

- | | | | | |
|-----|---|------|---|--------|
| 40 | Perkins: of course I saw some / near top of Pelekunu Valley ridge from Makakupaia | .... | 21 June (1893) | (3) |
| 41 | Perkins: shot 2 / near Pelekunu Pali from Makakupaia | .... | 25 June (1893) | (3) |
| 42 | Perkins: some seen / only a few hundred feet above the sea in valley on way from Pelekunu village to Kamalo | .... | (16 July 1893) | (3) |
| 43 | nest taken / on Kilohana in the wet forest | .... | 30 April (1907) | BRYW08 |
| 44 | reported seen...by workmen...I take stock... birds distinctive...not easily confused with others / upper Pelekunu Valley | .... | (1936) | DOWN63 |
| 45 | 3 sight observations...out of 5 trips / Pepeopae bog area...rim of Pelekunu Valley... back of Ohialele | | 21 May 1961;
8 June 1961;
29 April 1963 | PEKN63 |
| 46 | rare.. .summary status and distribution learned from over ten years residence (1954 to 1964) / in the dense rainforest along Papaala Pali and the Waikolo plateau | .... | (1964) | PEKN64 |
| 47 | Pekelo: rediscovered / in the northern section of this plateau (following the cliffs from Pepeopae N to Ohialele) | .... | (1973) | PRAT73 |
| 47a | (failed to detect) / high forested area from Puu Kolekole cabin at 3800 ft. elevation, N to Papaala Pali at ca. 4300 ft. elevation, NW to Pepeopae and E to Uapa | .... | 21-25 July 1975 | SCOJ77 |

HALAWA

48	more seen / in higher elevations, visited on collecting trips out of Pukoo	....	Dec. 1892	ROTW93
49	only a few were seen / hills above Halawa in forest much higher than near Pukoo	....	Jan. 1893	ROTW93
50	nest collected / middle of the Halawa forest	....	27 May (1907)	BRYWO 8
51	nest collected / at Mapulehu	....	9 June (1907)	BRYWO 8

26. Loxops maculatus montanus
'Alauwahio

Early Status and Distribution (1888-1900):

Wilson and Evans (1892) stated that four specimens of 'Alauwahio, or Lāna'i Creeper, were collected on Lāna'i, two being secured at "a spot called Lanaihale" about 3000 feet elevation and two in a gulch much lower (1, 3). However, Wilson's name is on the labels of five specimens, two secured 1 June 1888 at Lāna'ihale (3000 ft elev.), two at Waiapaa (gulch), and one from an unrecorded locality (Banko 1979 report) (4).

Rothschild (1893) noted that (H. C.) Palmer sent a "fine series" of specimens (actually 18) (Banko 1979 report) from ca. 1500 feet elevation on the southwest side of Lāna'i to the "uppermost peaks," leading him to conclude that the species "is perhaps not so very rare" (5, 6).

According to Perkins (field journal), 'Alauwahio were detected or collected in January, June, and July 1894 "up gulch behind Koele," "deep gulch other side of plateau from camp near head of gulch behind Koele," "along top ridge up from camp near head of gulch behind Koele," "up from camp near head of gulch behind Koele," and "out from camp at Halepaakai" (7-12). Perkins' name, inscribed on the labels of 27 specimens, recorded localities for the following numbers: four at Ha'alelepa'akai (peak), one in Scott Mtns. (unidentified locality), and taking 22 examples in undesignated places (probably all or mostly behind Kō'ele) (15). Later, summing up the status and distribution of 'Alauwahio, Perkins (1903) stated that this species was "common.. generally distributed.. ubiquitous throughout the Lana'i forest from 2000 feet to the actual highest point of the island" (13, 14).

Later Observations and Reports (1923-1977):

Munro (Banko 1979 report) collected eight specimens in 1923, 1924, 1927, and 1928 in the following localities: two in Kaiholena (gulch), one in Waiakeakua, one at Lāna'ihale, one at Papalahoomoe (?) plus three in undesignated place(s) (19). Munro (Gregory 1924, 1929, 1932, 1933; Munro 1944a) reported this species "probably increasing" in 1923, collection of one specimen in 1928, "still to be seen" in 1931, and "seen less often than 'Amakihi, 'Apapane and (Thrush) in often visited forests" in 1932 (16-18, 20, 21). Later, Munro (1944a) stated that the 'Alauwahio had been "scarce for some time," after he noted a "pair seen" in March 1937 (22, 23). Summing up his experiences with this species Munro (1944a) wrote that the Lana'i 'Alauwahio was "formerly common...but has declined in late years in all parts of the Lana'i forests" (24).

The pair seen in 1937 seems to be the last recorded sighting of this species. The Hawaii Division of Fish and Game (1969 report) stated that the species was "thought to be extinct or extirpated" (25). Berger (1970, 1972) and Atkinson (1977) presume it to be extinct (26-28).

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

Relative Abundance/Locality	Elev. (ft.)	Date	Source
<u>Loxops maculatus montanus</u>			
Island of Lāna'i			
1 collected 2 specimens / Lanaihale	ca. 3000	1 June 1888	WILS92
3 collected 2 specimens / gulch, much lower than 3000 ft.	June 1888	WILS92
4 Banko: Wilson collected 5 specimens / Lanaihale, 3000 ft. (2), Waiapaa (gulch) (2), unspecified locality (1)	1888	(2)
5 it is perhaps not so very rare...Palmer sent fine series / SW side of Lanai, about 1500 ft. to the uppermost peaks	(1892)	ROTW93
6 Banko: Palmer collected 18 specimens / undesignated localities	(1892)	(2)
7 Perkins: shot specimen(s) / up gulch behind Koele	5 Jan. 1894	(3)
8 Perkins: shot specimen(s) / deep gulch other side of plateau from camp near head of gulch behind Koele	17 Jan. (1894)	(3)
9 Perkins: seen / along top ridge up from camp near head of gulch behind Koele	22 Jan. (1894)	(3)
10 Perkins: heard singing / upwards from camp near head of gulch behind Koele	27 Jan. (1894)	(3)

11	Perkins: abundant...shot a few young / up from camp near head of gulch behind Koele	....	late June to 4 July (1894)	(3)
12	Perkins: shot specimen(s) / out from camp at Halepaakai	....	5-13 July (1894)	(3)
13	common / generally distributed	....	(1894)	PERR03
14	ubiquitous / throughout the Lanai forest from 2000 feet to the actual highest point of the island	....	(1894)	PERR03
15	Banko: Perkins collected 27 specimens / Haalelepaakai (peak) (4), Scott Mtns. - an unidentified locality (1), undesignated places (22)	....	1893/1894	(2)
16	Munro: probably increasing / (islandwide)	....	(1923)	GREH24
17	probably increasing / (islandwide)	....	1923 report to Bishop Museum	MUNG44a
18	Munro: 1 collected / unspecified place	....	(1928)	GREH29
19	Banko: Munro collected 8 specimens / Kaiholena (gulch) (2); Waiakeakua (1); Lanaihale (1); Papalahoomae - an unidentified locality (1); undesignated place(s) (3)	....	1923, 1924, 1927, 1928	(2)
20	Munro: still to be seen / unspecified place(s)	....	(1931)	GREH32
21	Munro: seen less often than Amakihi, Apapane, and (Thrush) in often-visited forests / (islandwide)	....	(1932)	GREH33
22	pair seen / (unspecified place)	....	March 1937	MUNG44a
23	scarce for some time / (islandwide)	....	(March 1937)	MUNG44a

Island of Lāna'i--(Continued)

24	formerly common...but has declined in late years / in all parts of the Lanai forest	....	(1944)	MUNG44a
25	HDFG: thought to be extinct OK extirpated / (islandwide)	....	(1969)	(1)
26	presumed extinct / (islandwide)	....	(1970)	BERA70
27	presumed extinct / (islandwide)	....	(1972)	BERA72
28	presumed extinct / (islandwide)	....	(1977)	ATKI77

27. Loxops maculatus newtoni
'Alauwahoo

Early Notes and Records (1879-1902):

O. Finsch collected the first specimen of the 'Alauwahoo, or Maui Creeper, near Olinda in 1879 but was confused about its correct identity and left no record of its relative abundance (Banko 1979 report) (12). Rothschild (1893, 1900) described this form in 1893 from an unknown number of specimens collected by H. C. Palmer sometime after 16 July 1892, the date Palmer discovered this species while staying at "Mr. Hocking's house" north of Olinda on the northeast slope of Haleakalā (9, 14-16).

The first account of the habitat type and relative abundance of the Maui 'Alauwahoo differs from those which appeared later. Rothschild (1893) states that it was "rather rare and extremely local, being found only on that one side of the mountain...in thick forest...where progression is very tedious and slow, on account of the dense and high ferns, which...mostly drip from the continuous rain..." (13). Palmer (diary, in Rothschild 1900) wrote under date of 1 August (1892) that it was "very numerous" in a "not very dense" forest of small 'ōhi'as, a few koas, and a sprinkling of māmane at about 5000 feet elevation, presumably in the Olinda area, and "quite common" at ca. 4000 feet elevation in the middle 'ōhi'a forest of Kīpahulu Valley on 18 September 1892 (15, 47).

Later accounts document a population of varying relative abundance in a wide variety of forest habitats over a broad geographical range in both East and West Maui districts. Rothschild's (op. cit.) first impression of limited range thus appears to represent the initial reaction of H. C. Palmer to its relative abundance and distribution rather than a balanced judgment based on wider experience.

Perkins (field journal) reported seeing the Maui 'Alauwahoo in West Maui District on a 9 March 1894 visit to the head of 'Īao Valley and later, during a May 1896 ascent from Waihe'e "to the top of the mountain" (6, 7). Perkins collected eight specimens in 'Īao Valley on his 1896 visit to Maui (Banko 1979 report) (8). In East Maui District Perkins (field journal) stayed at ca. 5000 feet elevation at "Mr. Payne's mountain house considerably higher up than Olinda" seeing "plenty" on one occasion and collecting nine specimens (5 in one day) from 13 March to 4 April 1894 (Banko 1979 report) (17-21, 23). Writing of his observations later, Perkins (1903) stated that this species **was** found from the lower to the extreme upper edge of continuous forest in both the West and East districts of Maui, being "extremely abundant" on Haleakalā (East Maui) and "hardly less than extremely abundant" in the mountains of West Maui (5, 10). Categorizing the status of this species in both districts, Perkins (1903) called the Maui 'Alauwahoo "abundant" (1).

E. Weiske collected two specimens at an unrecorded location, possibly near Olinda in 1894 (Banko 1979 report) (22). H. W. Henshaw obtained four examples in 1901 at Ukulele on the north-east slope of Haleakala above Olinda (Banko 1979 report) (24). Writing of his observations later, Henshaw (1902) stated that the Maui 'Alauwahio was "very common" in the woods of Haleakala at an elevation from 4000 to 5000 feet and "the **most** abundant of Maui birds in the vicinity of Olinda" (25, 26).

Later Observations and Reports (1903-1978):

Only G. C. Munro seems to have noted the status and distribution of the Maui 'Alauwahio during the long period between Henshaw's visit in 1901 and initiation of observations by National Park Service personnel in 1946. Munro (Gregory 1928) termed the 'Alauwahio "not uncommon," especially at higher elevations during the four days he spent from 4300 to 5000 feet elevation along several miles of the Kula and Haleakala pipelines on an undated 1927 trip (27). In 1928 Munro (Gregory 1929) spent nine days in February on Maui. He reported 'Alauwahio to be "fairly common" in the outer part of the forest but "not much in evidence" in the very wet regions in areas along the Kula Ranch pipeline to the end of the flume at the Haepuaena (Haipuaena) stream, and Haleakala Ranch pipeline to the Waiakamoi stream (28). Munro (1944a) reported that he saw "a small group" on the Kula Pipeline Trail—in 1936 (29).

In the 1940's F. Hjort (report to Park Superintendent) noted "a few" at the edge of the dense forest in upper Kīpahulu Valley during his 19 to 23 February 1945 visit (48). Baldwin (field journal) logged the following 'Alauwahio records from 20 November to 11 December 1945: "relatively common" between Hōlua cabin and 4500 feet elevation ('Āinahou), and in Kīpahulu Valley; "found" in the upper fringe of forest down to 5050 feet elevation; "several seen" along top of ridge at ca. 4500 feet elevation; "fairly numerous" from 4200 to 3800 feet elevation; ? present at 3400 feet elevation; "occasionally seen" above 2850 feet elevation; and "absent" at ca. 2600 feet elevation and presumably below (49-55).

In February 1946, National Park Service personnel reported that 'Alauwahio were "seen" in the rain forest below Pu'unianiau (30).

In a 2 to 4 December 1950 visit to the northeast rim of Haleakala Crater, Richards (field journal; Banko 1979 report) collected two specimens of 'Alauwahio and noted that they were "plentiful" in the forest, also in pukeawe (pūkiawe) outside the forest, during a long round trip (2-day) hike from Palikū cabin to approximately 8000 feet, north of Kaluanui thence downslope between Pu'u'alaea and the small hill just west of it for about half a mile and return (35, 56, 57). On 5 December 1950 Richards (field journal; Banko 1979 report) estimated seeing "40 to 50" on

a hike in a roughly 50-acre area at 6300 feet elevation northwest of Pu'u'alaea (34).

Bonsey (1951) reported the 'Alauwahio as "occasional" in Waikamoi forests during the 7 July to 11 September 1951 period (31). Carr (1959) "observed" this species at Kapalaoa, Palikū, Hōlua, and connecting trails, and all of Halemanu Trail in November 1958; in March 1959 in the vicinity of Kaulalewelewe above Honokōwai, in the gulch due east of Hosmer Grove, and at Polipoli Park and entrance road; and in April 1959 again in the gulch due east of Hosmer grove, and along Kula Pipeline Trail west of Olinda (32, 46, 58-61). Bole (1961) stated, as a result of his 23 to 30 April 1961 visit to Maui, that the 'Alauwahio was "not positively identified" in Hosmer Grove but that National Park Service Rangers had found it "numerous" along gulches in the brush zone (62, 63). Dunmire (1961) noted that this species "has not been definitely recorded for many years" within Haleakala National Park (64).

Ashmole and Ord (1963) judged the 'Alauwahio to be the "second most abundant species after apapane" in the rain forest about 0.5 mile west of Pu'u'alaea on the northwest rim of Haleakalā Crater and "extremely abundant.. could have easily tied with iwi for second-most abundant bird under better observing conditions" in the Kipahulu Valley during their 11 to 14 April 1963 visit (65, 66). Later that year, Anonymous (1964) noted four of this species at (an) undesignated place(s) in Haleakalā Crater (67). War3 (field journal) "saw 2" while overlooking the valley in the vicinity of Pu'u'alaea from 1045 to 1215 hours on 15 May 1964 (36).

Warner (1967 report) reported in detail on the altitudinal distribution of the native forest birds during the 2 to 31 August 1967 ascent of Kipahulu Valley, summarizing the relative abundance of the 'Alauwahio as "comparatively few" from 2800 to 3300 feet, "relatively common" from 3300 to 5000 feet, and "relatively uncommon" from 5000 to 7350 feet elevation (68-71).

Matthiessen (1970) stated that the 'Alauwahio was seen below Kuiki peak on the south rim of Kipahulu Valley during his 22 to 26 July 1969 descent of the outer slope of Haleakalā Crater (72). The Hawaii Division of Fish and Game (1969 report) stated that the 'Alauwahio occurred as a breeding population on Maui (2). King (field journal), during his summer and early fall 1970 visit to Haleakalā Crater, reported "about 30" of this species seen on a ridge west of Waikamoi gulch near the gauging station at 5800 feet elevation on 12 August, to be the "most common bird" on the south side of Honomanū gulch on 23 August, and to be "just a little less common than apapane" on the south side of the ridge above Kipahulu Valley on 21 September 1970 (11, 33, 73).

In 1972, M. Mull (1972) proposed the Maui 'Alauwahio as a candidate for the Blue List due to its limited range (3). Berger (1972) termed this species "relatively common" on the windward

slopes of Haleakala Crater (74), while van Riper (1972) categorized it as "fairly common" on the northeast slopes of Haleakalā Crater "in the upper rain forests where ohia...is the dominant tree" (75).

Conant and Stemmermann (1979 report), in a series of systematic surveys carried out from June 1976 to August 1978 throughout the Crater District of Haleakala National Park, termed 'Alauwahio to be "rare" with "very low" densities (76, 77). They noted that such numbers of this species which could be found were "concentrated in the rain forest above the Palikū horse pasture along the trail leading to Kuiki," although "with persistence it can be seen near Hosmer Grove and Palikū" (77, 78). A "group of 3" 'Alauwahio were seen behind Palikū Ranger Cabin—in July 1977, and adults feeding fledglings were noted in Kipahulu Valley during the period 15 to 20 August 1978 (Conant & Stemmsrmann 1979 report) (79, 80).

Atkinson (1977) called the 'Alauwahio "relatively common" on Maui (4).

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>Loxops maculatus newtoni</u>			
Island of Maui			
ISLANDWIDE			
1 abundant / both in the E and W divisions of the island	(1894/1896)	PERR03
2 HDFG: occurs as a breeding population	(1969)	(1)
3 candidate for the Blue List...limited range	(1972)	MULM72
4 relatively common	(1977)	ATKI77
West Maui District			
MULTIQUADRANGLE			
5 hardly less than extremely abundant / mountains of west Maui...from the lower to the extreme upper edge of continuous forest	(1894/1896)	PERR03
WAILUKU			
6 Perkins: seen / trip to head of Iao Valley	9 March (1894)	(3)
7 Perkins: seen / ascent from the neighborhood of Waihee...to top of the mountain	May 1896	(3)
8 Banko: Perkins collected 8 specimens / Iao (valley)	1896	(2)

East Maui District

MULTIQUADRANSLE

- | | | | | |
|----|---|------|-------------|--------|
| 9 | Banko: Palmer collected specimens / unspecified localities (? Olinda) (? Kipahulu) | .... | 1892 | (2) |
| 10 | extremely abundant / on Haleakala...found from the lower to the extreme upper edge of continuous forest | .... | (1894/1896) | PERR03 |

KEANAE

- | | | | | |
|----|--|------|--------------|------|
| 11 | King: most common bird / S side Honomanu Gulch | | 23 Aug. 1970 | (10) |
|----|--|------|--------------|------|

KILOHANA

- | | | | | |
|----|---|----------|-----------------|--------|
| 12 | Banko: Finsch collected 1 specimen / Olinda | .... | 1879 | (2) |
| 13 | found to be rather rare, extremely local / thick forest, district of Makawao | .... | 16 July 1892 | ROTW93 |
| 14 | Palmer discovered it / (encamped near Mr. Hocking's house, N of Olinda) | .... | (July 1892) | ROTW93 |
| 15 | Palmer: very numerous / encamped (vicinity of Olinda) ...forest not very dense.. small ohias, a few koa trees, and a sprinkling of mamane | 5000 | 1 Aug. (1892) | ROTW00 |
| 16 | Palmer: 1 seen feeding its young / unspecified place (near Olinda) | .... | 8 Aug. (1892) | ROTW00 |
| 17 | Perkins: saw plenty / stayed at Mr. Payne's mountain house considerably higher up than Olinda | ca. 5000 | 13 March (1894) | (3) |

KILOHANA (con't.)

18	Perkins: shot 2 / vicinity Mr. Payne's place	....	28 March (1894)	(3)
19	Perkins: shot 1 / mile or so from Mr. Payne's place	....	30 March (1894)	(3)
20	Perkins: shot 5 / vicinity Mr. Payne's place	....	3 April (1894)	(3)
21	Perkins: shot 1 / within 2 miles Mr. Payne's place	....	4 April (1894)	(3)
22	Banko: Weiske Collected 2 specimens / unspecified locality (Olinda ?)	....	1894	(2)
23	Banko: Perkins collected 9 specimens / Haleakala	5000	1894	(2)
24	Banko: Henshaw collected 4 specimens / Ukulele	....	1901	(2)
25	.very common / in the woods of Haleakala	4000- 5000	(1902)	HENH02
26	the most abundant of Maui birds / in the vicinity of Olinda	....	(1902)	HENH02
27	Munro: not uncommon...during 4 days in the forest / along the Kula and Haleakala pipelines....several miles into the heart of the forest...especially at higher elevations	4300- 5000	1927	GREH28
28	Munro: fairly common in the outer part of the forest, but not much in evidence in the very wet regions / 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 Waiakamoi stream	....	9 days in Feb. (1928)	GREH29

29	saw a small group / on the Kula pipeline trail	....	1936	MUNG44a
30	NPS: seen / rain forest below Puu Nianiau ...Haleakala	....	(Feb. 1946)	(11)
31	occasional / Waikamoi forests	....	7 July - 11 Sept. 1951	BONH51
32	observed / Kula Pipeline trail W of Olinda	....	April 1959	CARR59
33	King: about 30 seen / on ridge W of Waikamoi Gulch near gauging station	5800	12 Aug. 1970	(10)

NAHIKI

34	Richards: estimated 40-50 seen, 0700-1330 hours, after night's camping / hike around in roughly 50 acre area, NW Puu Alaea	6300	5 Dec. 1950	(8)
35	Banko: Richards collected 2 specimens / 0.5 mile NW Puualaea	....	1950	(2)
36	Ward: saw 2...(1045-1215 hours) / overlooking valley (vicinity Puualaea)	....	15 May 1964	(4)
37	Vogl: saw 2 twice...at (1200 and 1430 hours) / steep slope NE of the main <u>Deschampsia</u> grassland...about 0.4 mile W of Lake Wai Eleele	6500	18 June 1969	(12)
38	Vogl: 1 seen / just W and above Lake Waieleele	6800	19 June 1969	(12)
39	vogl: group of 5 / N and downslope from Puualaea...in the heath-scrub and forest transition	6500	22 June 1969	(12)
40	Vogl: glimpses...fairly common / along trails from <u>Deschampsia</u> grasslands N and NE downslope into ohia forest	....	(17-22 June 1969)	(12)

NAHIKI (con't.)

- | | | | | |
|----|---|-----------|-------------------------------|--------|
| 41 | nest found (later abandoned) / ascending the ridge towards Kipahulu Valley. ..from Lake Waianapanapa | .... | 14 March 1971 | VANC72 |
| 42 | Shallenberger: among 5 most common birds seen / Hana Rain Forest Study Area, down forest trail as far as 6200 ft. elevation | .... | 6-13 April 1974 | (13) |
| 43 | one of five endemic forest birds most commonly heard and observed / Upper Koolau Forest Reserve (Hana Rain Forest Project base camp area) | | 6-13 April 1974
field trip | SHAR74 |
| 44 | total of 192 seen in 18 half-hour periods and stations...classed as abundant / at upper edge of forest...Koolau Forest Reserve (0800-1230 - 30 Apr) (0800-1330 1 May) | 6100-7216 | 30 April 1975;
1 May 1975 | SCOM77 |

HANA

- | | | | | |
|----|---|------|--------------------|--------|
| 45 | 2 seen / in <u>Grevillea</u> - <u>Casuarina</u> woods on Kauiki Head, back of Hana School | | (23-30 April 1961) | BOLP61 |
|----|---|------|--------------------|--------|

MAKENA

- | | | | | |
|----|--|------|------------|--------|
| 46 | observed / Polipoli Park and entrance road | | March 1959 | CARR59 |
|----|--|------|------------|--------|

Haleakala National Park

- | | | | | |
|----|--|----------|-----------------|--------|
| 47 | Palmer: quite common / camp No. 5...in the....middle ohia forest (Kipahulu Valley) | ca. 4000 | 18 Sept. (1892) | ROTW93 |
| 48 | Hjort: few / edge of dense forest, upper Kipahulu Valley | .... | 19-23 Feb. 1945 | (14) |

49	Baldwin: relatively common / (Ainahou) between Holua Cabin and 4500 ft. elevation	....	20-25 Nov. 1945	(15)
50	Baldwin: found / upper fringe of forest, Kipahulu Valley down to 5050 ft. elevation	....	29 Nov.-11 Dec. 1945	(15)
51	Baldwin: several seen / top of ridge	ca. 4500	29 Nov.-11 Dec. 1945	(15)
52	Baldwin: fairly numerous	4200- 3800	29 Nov.-11 Dec. 1945	(15)
53	Baldwin: ? present	3400	29 Nov.-11 Dec. 1945	(15)
54	Baldwin: occasionally seen	above 2850	29 Nov.-11 Dec. 1945	(15)
55	Baldwin: absent	ca. 2600	29 Nov.-11 Dec. 1945	(15)
56	Richards: plentiful in forest, also in pukeawe (pūkiawe) outside forest (0900-1730 hours) / hike from Paliku cabin to approxi- mately 8000 ft., N of Kaluanui thence downslope between Puu Alaea and small hill just W of it continuing for about 0.5 mile	....	2 Dec. 1950	(8)
57	Richards: noted, number unspecified (0830-1800 hours) / hike from Paliku cabin to same locality as 2 December	....	4 Dec. 1950	(8)
58	observed / Kapalaoa, Paliku, Holua cabins and connecting trails.. all of Halemanu trail	....	Nov. 1958	CARR59
59	observed / vicinity of Kaulalewelewe above Honokowai	....	March 1959	CARR59
60	observed / gulch due E of Hosmer Grove	....	March 1959	CARR59
61	observed / gulch due E of Hosmer Grove	....	April 1959	CARR59

Haleakala National
Park (con't.)

62	not positively identified / Hosmer Grove	....	(23-30 April 1961)	BOLP61
63	National Park Rangers: numerous / along gulches in brush zone	....	(23-30 April 1961)	BOLP61
64	has not been definitely recorded...for many years / within Haleakala National Park	....	(1961)	DUNW61
65	extremely abundant...could have easily tied with iiwi for second most abundant bird under better observing conditions / Kipahulu valley	ca. 6500	11-14 April 1963	ASHP63
66	second most abundant species after apapane ...followed by iiwi and amakihi / rain forest, about 0.5 mile W of Puu Alaea, NE rim of Haleakala crater	....	11-14 April 1963	ASHP63
67	4 noted / Haleakala crater, unspecified place(s)	....	28 Nov. 1963	ANON64
68	Warner: comparatively few / Kipahulu Valley	2800-3300	Aug. 1967	(16)
69	Warner: relatively common / Kipahulu Valley	3300-5000	Aug. 1967	(16)
70	Warner: relatively common / Kipahulu Valley	5000-7350	Aug. 1967	(16)
71	Warner: no drepaniids whatsoever encountered below 860 m. (2800 ft.) elevation...at 860 m. drepaniids began to appear, but in extremely low numbers...from 860 m. to about 1050 m. (3300 ft.) impression was of steadily increasing abundance of drepaniids with smaller numbers of	....	2-31 Aug. 1967	(17)

creepers than apapanes or amakihi...from 1050 m.
 (3300 ft.) to 1540 m. (5000 ft.), based on a
 subjective relative abundance scale of 0 to 10,
 creepers (4) followed fourth after apapane (10),
 iiwi (6) and amakihi (5)...relatively large
 numbers of immature drepaniids noted.. after a
 few days in the rain forest it became clear
 that impressions of relative abundance were
 misleading...creeper being rather sedentary and
 dull green being especially difficult to see..
 from 1540 m. (5000 ft.) to 2260 m. (7350 ft.)
 elevation, based on a subjective relative
 abundance scale of 0 to 10 (not comparable
 directly to that of lower elevation), creepers
 (3) followed fourth after apapane (10), iiwi
 (7) and amakihi (7)...creepers seeming less
 abundant than at elevations 1050 to 1540 m.
 (3300-5000 ft.) elevation...Broussaisa a
 principal food source of creepers / Kipahulu
 Valley; biological survey from sea-level to
 tree-line

- | | | | | |
|----|--|------|-------------------------|--------|
| 72 | seen / S rim Kipahulu Valley below Kuiki peak | .... | 22-26 July 1969 | MATP70 |
| 73 | King: just a little less common than apapane
/ S side of ridge above Kipahulu Valley | | 21 Sept. 1970 | (10) |
| 74 | relatively common bird / on the windward
slopes of Haleakala Crater | | (1972) | BERA72 |
| 75 | fairly common / on the NE slope of Haleakala
Crater...in the upper rain forests where ohia
...is the dominant tree | | (1972) | VANC72 |
| 76 | Conant and Stemmernann: . . . rare . . .
judging from data collected on surveys
throughout / Crater District | | (June 1976 - Aug. 1978) | (29) |

Haleakala National
Park '(con't.)

- | | | | | |
|----|--|-------|-------------------------|------|
| 77 | Conant and Stemmermann: ■ ■ ■ densities very low on Crater District surveys, although with persistence it can be seen / near Hosmer Grove and Paliku | ..... | (June 1976 - Aug. 1978) | (29) |
| 78 | Conant and Stemmermann: concentrated in the rain forest (Crater District surveys) / above the Paliku horse pasture along the trail leading to Kuiki | ..... | (June 1976 - Aug. 1978) | (29) |
| 79 | Conant and Stemmermann: saw group of 3 / behind Paliku Ranger Cabin | ..... | July 1977 | (29) |
| 80 | Conant: observed adults feeding fledglings / Kipahulu Valley | ..... | 15-20 Aug. 1978 | (29) |

28. Loxops maculatus mana
Hawai'i Creeper

Early Notes and Records (1877-1903):

No native name is known for L. m. mana. Evidently the Hawaiians did not distinguish the Hawai'i Creeper from the 'Amakihi (Loxops virens virens) which it closely resembles.

Wilson and Evans (1893) described the Hawai'i Creeper in 1891 from examples collected in 1887 and 1888. Wilson and Evans (1893) state that only three specimens were collected, the distinctiveness of the species not being recognized at the time. An additional two examples evidently turned up later, as labels on a total of five specimens bear Wilson's name (Banko 1979 report). Singles were taken in Keauhou (Kona) on 13 June 1887, in Keauhou (Ka'ū) in September 1887, and at Mānā and Mānā dairy on 12 March 1888; one skin bearing only Wilson's name and date of 1911 is also preserved (Banko 1979 report) (10, 47, 53, 246, 247).

H. C. Palmer's name is on the labels of 28 specimens of Hawai'i Creeper which were collected as follows: nine from September to December 1891, and one on 15 March 1892 in undesignated localities; and 18 in August 1893 (16 on the 25th) in Kona (Banko 1979 report) (11, 35). G. C. Munro, Palmer's assistant at the time, also secured two specimens in Kona and one example in Hāmākua during this period (Banko 1979 report) (33, 242). Rothschild (1900) mentions that Palmer "saw some" in Hōnaunau in November 1891 and states, apparently on advice from Palmer, that this species was "quite numerous" and generally met with "in small flocks of from 2 to 6 individuals in the upper forest of Kona"; and "not uncommon, though less numerous" in districts of Hāmākua and Hilo on the northeast side, and in Puna on the east side (of the island) (18, 37, 48). Rothschild (1900) also quotes H. W. Henshaw as stating that this species was "rare in Olaa even in winter," occurring at altitudes of about 1000 feet up to an indeterminate elevation (129). Munro (1944a) stated of this period a half-century later, that the Hawai'i Creeper was "quite numerous in some parts (and) very scarce in others for no apparent reason" (2).

R. C. L. Perkins collected 28 specimens in 1892, 1894, and 1896, obtaining eight at 4000 feet elevation in Kona; seven in undesignated localities ("2 or 3" shot and another seen at Pulehua Ranch, Kona); two in Kaūmana at 2000 feet elevation; and one at Kīlauea (Perkins, field journal; Banko 1979 report) (12, 36, 184, 259, 260). In Kona, Perkins (1893) "failed to notice" the Hawai'i Creeper in the lower forest (1700-3000 ft elev.), stating later (1903) that they were "altogether wanting" at this elevation but "common enough" at 4000 feet elevation (17, 19, 34). Perkins (1903) termed this species "extremely common" in the dry upper woods of Kona (ca. 3500 ft elev. in middle Kona)

and Ka'ū, as well as the lower rain-soaked forest of Hilo District (19, 21, 38). On the windward side of Hawai'i Perkins (field journal; 1903; 1947 letter) found this species "absent" in a "considerable extent" of the Puna Forest, "seen" on a very long day's tramp (23 July 1894) up the mountain (Mauna Loa) from Kīlauea, "common" at from 1.5 to 2 miles from the Volcano House, and "seen" in dense forest above highest cane fields in 'Amaulu, above Hilo (132, 182, 186, 258). Perkins (1903) summarized the relative abundance and status of the Hawai'i Creeper by stating that it was "very abundant" in many localities, being both "widely" and "generally distributed" over the large island (1, 20, 22).

H. W. Henshaw collected 114 specimens of the Hawai'i Creeper: from 1898 to 1900, and in 1902, as indicated for the following elevations and localities: one at 1600 feet elevation, five at 2400 feet elevation, three at 4000 feet elevation, and 37 at unspecified elevations, all in 'Ōla'a; 46 at Kaiwiki; 14 at Volcano; one at Hilo; three near 'Ōhaikea (houses, Ka'ū); one near Pāhala; one at Kuaia (near Laupāhoehoe); and two in unspecified localities (Banko 1979 report) (13, 128, 130, 131, 138, 155, 248, 261, 263). Summing up his observations Henshaw (1902) termed the Hawai'i Creeper "numerous" in the forests of mixed koa and 'ōhi'a along the Wailuku River, "rare" throughout the 'Ōla'a woods even at an elevation of from 2000 to 3000 feet, "common" in the koa woods above the (Kilauea) Volcano where he obtained many of his specimens, and "appears not to be found at all" below 2000 feet elevation (23, 133, 183, 244).

Other ornithologists and naturalists observed and collected this species in windward Hawai'i as follows: A. Koebele obtained five at Kīlauea in September 1896; A. Seale took eight in the same locality from 28 March to 11 April 1901; A. M. Walcott collected one at an undesignated place on 29 March, and two in Kaiwiki on 6 April 1901; Bryan (1903) noted that he saw this species "on more than one occasion" near the Volcano House in October 1902; and C. E. Blacow secured 11 examples at Horner's Ranch ('Umikoa), Pa'auilo, from 11 July to 26 August 1903, and one at 6500 feet elevation at the same location on 28 December 1903 (Banko 1979 report) (12a, 187, 188, 247a, 262).

Later Observations and Reports (1904-1978):

After an observational gap of more than 30 years Munro (1944a) reported that he did not see the Hawai'i Creeper during his Inter-island bird surveys from 1935 to 1937 (14). This species thus went unnoted from date of last collection on 28 December 1903 until it was recorded by Williams (1936) to be "fairly common" but "not as numerous as the amakihi" on the slopes of Mauna Loa in Hawaii (Volcanoes) National Park, (160).

The Hawai'i Creeper was reported the following year, in 1937, by W. R. Donaghho and H. G. Craddock in several areas of

the Park. In June, Donaghho (1937 report, 1947a, 1947b, 1951a) noted the following observations: "possibly" two "seen" in Kīpukapuāulu (Bird Park) on the 14th; "saw 8" at from 6000 to 7000 feet along the Mauna Loa Truck Trail on the 16th; "saw 3...collected 1" in kīpuka along Mauna Loa Strip Road at more than 5000 feet elevation on the 18th; "3 more seen" in a larger grove down the slope; and on 24 June, noting "none" where seen and collected on the 18th (169, 170, 172, 189-191). Craddock (June, July 1937 reports), recognizing this species "by its feeding habits and shape of bill," saw "only 13" in the Park from 12 to 30 June; (1) on Mauna Loa road up to an elevation of 7500 feet; and (2) at the end of the Mauna Loa Truck Trail (161, 192, 193). Hiking outside the Park on 30 June 1937 Donaghho (1937 report, 1951b) reported seeing three and hearing six while traveling from Kīpukapuāulu north into Brown's (Keauhou) Ranch koa forest, "thence southeast to fence-line and back via tanks and ranch house (7 miles)" (139, 140).

On 2 July 1937 Donaghho (1937 report, 1951b) reported that he "saw 20 and heard 13" from about 6700 feet elevation of Mauna Loa down to Keawewai water tank and into the koa forest, thence making a "c" and out again going south, thence down to Brown's Ranch (house) (49, 55). Donaghho (1951b) called it "common on the limbs" in the forest east-northeast from Keawewai water tanks that day (54). Later, in July, Donaghho (1951b) stated there was a "great number" in the koa forest along Kūlanī Cone Trail from the Volcano area on the 13th (56); "a few" and "more numerous" than 'Amakihi along first several miles of Kūlanī Cone Trail from the Volcano area on the 13th (141, 142); "1 seen" around the (CCC) camp near Kīlauea Iki, and "1 present" in tree at campsite at end of Mauna Loa Truck Trail on the 19th (194); "present" in a kīpuka of mixed koa, 'ōhi'a, and māmane on the way to Kīpuka Maunaiu to Cache No. 2, Mauna Loa Truck Trail on the 20th (196); "1 heard" between end of Mauna Loa Truck Trail and Three Trees Kīpuka, and "several seen" at Three Trees Kīpuka on the 21st (173, 174); and "1 seen singing" near Three Trees Kīpuka on the 22nd (175).

On 13 July 1937 Craddock (1937 report) "saw 7" on a hike along 29-mile road and the first 5 miles of trail from the end of Haunani Road, Volcano, to Pu'u Kūlanī (143) - the same day Donaghho (1951b) reported it in "great number" along the same trail, suggesting that they traveled together (56). On 20 July Craddock (1937 report) "heard 2" on the slope of Mauna Loa near the Truck Trail (195). On 26 August 1937 Donaghho (1951e) reported "many in some koa forest" and "present" in Keauhou Ranch north of Kīpukakī toward Pu'u'ō'ō Trail (144, 145).

Summing up his June to August 1937 observations, Donaghho (1937 report) stated that the Hawai'i Creeper was "quite common" in the koa forest above (Kīlauea) Volcano, "not rarely found" in the dry forests south of the Volcano, "rare" other than in koa forest above the Volcano, and mentioned the "several found" at 6000 feet elevation in Three Trees Kīpuka south of the Truck Trail (176, 202-204).

On 1 September 1937 Craddock (1937 report) "saw 6" on Mauna Loa slopes near Truck Trail (205), while on 12 September that year, Donaghho (1951a) reported hearing this species along the Pu'u'ō'ō Trail just above Keawewai and seeing "a small koa tree full...what a flock! easily 100" (present) (57, 58). Later, Baldwin (1941) questioned the validity of Donaghho's 1937 observations of this species (162).

H. Baldwin et al. (1938) recorded "26 seen" by four observers in one party traveling 10 miles on foot from 0600 to 1300 hours on the 18 December 1937 Christmas Count (163).

In contrast to the many observations of Hawai'i Creeper reported in and near the Park in 1937, P. Baldwin (field journal) logged the presence of this species (usually only 1 or 2 seen at a time) on about 10 occasions in 1938, as follows: one specimen collected in Kīpukakulalio, Kapāpala, Ka'u, at 5500 feet elevation where D. Abbott reported it "rare" on 3 August; one seen and heard in Upper 'Ōla'a Forest Reserve about 1 mile (and another possibly identified at 2 miles) along Kūlanī Cone Trail from end of road on 7 August; noted report by D. Abbott that he was "sure" he had seen this species near Makaopuhi Crater (recently, before 11 September); an unspecified number "seen" and possibly hear³ at Keawewai and "at least 2" seen at Pu'u Kaipu (Pu'ukīpū), Keauhou, on 11 September; "saw two or more" in Upper 'Ōla'a Forest Reserve on 7 October; and "heard and seen...1 collected" in the interior of Kīpukakulalio (5500 ft elev.) near Mauna Loa Truck Trail on 25 November (59-63, 127, 146-148, 206, 235). In referring to the 1938 period later, P. Baldwin (1941) termed the Hawai'i Creeper "common" in the koa-'ōhi'a forests around Keawewai (64).

H. Baldwin et al. (1939) recorded that five observers in one party hiking from 0600 to 1230 hours along an established 10-mile route from Kīpukapuāulu to Kīlauea Iki had logged "13 seen" on the 18 December 1938 Christmas Count (164).

In 1939 P. Baldwin (field journal) and National Park Service reports incorporating his findings, reported observations of the Hawai'i Creeper as follows: "1 seen" in Kīpuka Kehaki area on a 10-mile hike from Kīpukakī through lower Keauhou Ranch on 1 January; "may have heard 1" while climbing side of Kāne-nui-o-Hamo volcanic cone on 5 January; "pair seen" about 0.5 mile north of gate along Kūlanī Cone Trail on 7 February; "pair seen" at 6150 to 6250 feet elevation in clump of koa 150 yards to the northeast of koa clump off Mauna Loa Truck Trail, and "either 2 or 3 seen" at 5500 feet elevation near old camp off Mauna Loa Truck Trail, both observations on 4 February; "observed" on hike to Kalapana in May; "none seen" near old campsite in the kīpuka near Mauna Loa Truck Trail 4 July; "9 seen" in Kīpukakulalio and Kīpukamauna'iu on 19 December; and "3 seen" at 4-mile marker, Kūlanī Cone Trail on 26 December (65, 149, 150, 165, 207-210, 237).

In 1940 P. H. Baldwin expended most of his observational energy in periodic systematic surveys of birds in some 12 plots located in the Park, reporting results in 1953. However, Baldwin (1941) commented on declining status of the Hawai'i Creeper and confusion of identity with the 'Amakihi (Loxops virens virens), and summarized impressions of relative abundance of the Creeper in various areas inside and outside the Park in 1940 as follows: "abundant" in the koa-'ōhi'a forests of Kūlanī Cone; "uncommon" in koa forests of Kīpukakulālio where the male song was "heard frequently" but is now (1940) "heard less often"; and "rare" in the koa-'ōhi'a forests of Kīpukapuāulu and in the 'ōhi'a forests of the Nāpau Crater area (66, 212-216, 238).

Donaghho (1940), presumably summarizing impressions gained from previous field trips, stated that the Hawai'i Creeper was "slightly more numerous" than 'Akiapōlā'au (Hemignathus wilsoni) in two different kīpukas on the upper slopes of Mauna Loa in the Park, and the koa belt of Mauna Kea and in the māmane higher up (211, 243).

Richards (field journal) observed the Hawai'i Creeper in several districts of the island of Hawai'i during his visit of August 1950 to January 1951. On Hualālai, Kona District, Richards (field journal) mentioned seeing "a pair" on a horseback trip made from headquarters of Pu'uwa'awa'a Ranch to Shangrila and 0.25 mile beyond on 25 August, and "1 seen" halfway between Poohohoo and Pu'unāhāhā (near Shangrila) the next day (40, 41). On 26 September near Shangrila at 4250 to 4600 feet elevation, he saw "a flock of 3 or 4," seeing "5 and collecting 1" at 4250 to 4550 feet elevation on the 28th (42, 43). Again, on 20 and 21 October, Richards (field journal) obtained "a good set of notes" mentioning four seen at 4250 to 4500 feet elevation in the Shangrila area (44).

Along the Volcano-Kūlanī Cone Trail, Richards (field journal; Banko 1979 report) "saw 2" and collected one during a 2.5-mile hike at an elevation of 3400 to 3900 feet from end of Haunani Road toward Pu'u Kūlanī (151, 152). Along the same trail again on 16 and 17 January 1951, he mentioned seeing an unspecified number of the Hawai'i Creeper in the area of the 2-mile trail marker (153, 154). In the same general area, some 2 miles to the west, Richards (field journal) stated that Baldwin had "noted" presence of this species during a 29 October 1950 hike on Keauhou Ranch near the "old koa mill" (73).

On Mauna Kea, Richards noted "singing and chirping" of this species and a single and "scattered flock of about 6" seen during a hike from Hopuwai cabin to Pu'ukanakaleonui and return on 16 December 1950 (254). The next day an unspecified number were noted by Richards in the same general area (255).

Baldwin (field journal) stated that this species, judging from song and behavior, was "present" 1 mile northwest of the cabin at Pu'u Lā'au in the Mauna Kea Forest Reserve on 20 April

1943 (249). The National Park Service reported that this species was "seen" (probably by P. Baldwin) in April 1945 during a hike to an unmapped cinder cone at about 3700 feet elevation, below Kūlani Cone in the vicinity of Mtn. View flume road (136). Rockafellow (1952) stated that "several" were seen each day in the vicinity of Kīlauea Crater, and "9" were noted along Byron's Cliff Trail and Hilina Pali during the 13 to 25 September 1952 period, mentioning identification as a problem (217, 233, 241).

Baldwin (1953) reported on 10 years' (1940-1949) results of counting of forest birds in 12 widely separated plots in the Park, determining that the Hawai'i Creeper could not be detected in 100 days of censusing in all but three of the plots. In the remainder of the plots Baldwin (1953) calculated that this species could be expected to be encountered 10 out of 100 census-days in Kīpukakulālio (5500 ft elev.), and two of 100 count-days in each of the Kīpukapuāulu (4050 ft) and Twin Craters (Thurston Lava Tube) (3650 ft) areas (166).

There seems to be only three reports of Hawai'i Creepers seen or heard from 1953 to 1957, all made during the 31 December 1955 Christmas Count in and near the Park. Anonymous (1956b) recorded that observers logged "4 censused" at Kīpukakulālio and along Mauna Loa Road to 5500 feet elevation, "3 censused" along the route from Kīpukapuāulu to Kīlauea Military Camp, and "1 censused" somewhere along Wright Road in the Volcano area (156, 218, 219).

In 1958 Eastman and Eastman (1958) noted "1 seen" on the Halema'uma'u Trail below the Volcano House during the 23 March to 14 April visit (220). Mench (1962) "saw a few" in Kīpukapuāulu in June 1960 (221).

Dunmire (1961, 1962) conducted systematic counts of birds in various areas of the Park from 1958 to 1961. For the Hawai'i Creeper he reported "none seen" in 30.5 hours of censusing from 4000 to 6700 feet elevation along the Mauna Loa Strip Road, and only one seen in the Kīlauea section during the 1958 to 1960 period, concluding that this species was "now very rare" in the upper rain forest or koa parkland on Mauna Loa (15, 222-224). In the 'Ōla'a Tract off Wright Road in the Volcano area, Dunmire (1962) reported only "1 seen" during 16.75 survey hours run in October and November 1959; May, June, and July 1960; and April 1961 (6 trips) (167).

In 1964, Ward (field journal) "saw a few" Hawai'i Creepers on a brief 17 April visit to the Mauna Kea Forest Reserve, stopping "every quarter of a mile or so to look and listen" in the vicinity of Pu'u Lā'au (250). In the Ka'ohe Game Management Area on Mauna Kea, King and Bratley (1964) reported "several seen" during an 18 to 20 April visit, though "identification was usually difficult" (251).

Hawai'i Creepers seem to have been noted only 11 times during the 5-year period, 1965 to 1969. Donaghho (1966c) "noted 1" on the lower slopes of Kūlani on 28 May, and on Mauna Kea reported this species "seen" in koa forest near Hopuwai outcamp on 30 May 1966 (74, 256). A few days later on 8 June 1966, Donaghho (1967a) "spotted black lores of a creeper" in Hawaii Volcanoes National Park around the bend of the Strip Road near Three Trees Kīpuka (177). In 1967 Donaghho (1968) noted that this species was "seen" at the nectar of 'ōhi'a blossoms near the end of Mauna Loa Strip Road on 25 December (1978). Orenstein (1968) reported "about 4 seen" at the top of the Mauna Loa Strip Road the next day (179), "only 1" seen showing "definite creeping behavior" in 'ōhi'a forest along the Kahuku-'Āinapō Trail (Ka'u District) on 27 December (50), and "1 seen" at Pu'u Lā'au on Mauna Kea on 28 December 1967 (252). T. Pratt (1967) thought that the Hawai'i Creeper was "possibly present" in the rain forest "about a mile from the school" (Hawaii Preparatory Academy) (30), but left no record of sightings. Cogswell (1970) logged "2 seen" at "Lava Tubes" (? Thurston) sometime in 1969 (234). Berger (1972) conducted bird surveys on the island of Hawai'i during the 1965 to 1969 period but "saw only 4" in unspecified places (16). The Hawaii Division of Fish and Game (1969 report) stated that the Creeper occurs as a breeding population on the island of Hawai'i but does not mention location (3).

In 1970, Banko (field journal) logged "1 seen" in naio with 'Amakihi in a koa kipuka just west of Solomon's Waterhole, Keauhou, during a survey from 1400 to 1730 hours on 13 October (75), and "1 seen" during a 0945 to 1530 hours survey in the same area at 6280 to 6460 feet elevation on 31 December (76). Berger (1970) termed this species as "uncommon" in undesignated localities on the island of Hawai'i in 1970 (4).

In 1971 on 12 February, Banko (field journal) noted "1 seen searching for insects 10 - 15 ft. up main trunk of 25 ft. high naio" tree at 5640 feet elevation in a 0900 to 1000 hour survey of birds in a logged-off section of Keauhou Ranch (77). Stroburb (1971) noted this species "seen" in Kīpukapuaulu on 2 June (225).

From 11 January to 20 July 1972 Berger (1972 report) spent more than 36 hours conducting bird censuses along four transects in a 200-acre International Biological Program (IBP) Study Plot in Kilauea Forest Reserve adjacent to Keauhou Ranch (78-99). Only two Hawai'i Creepers were censused (on 11 January) during a total of 21 counts (78). This species was seen by Berger on one additional occasion (14 January) on Keauhou Ranch near the IBP Study Area between Pu'u Lā'au and Kūlani Cone (Banko, field journal) (82). Anonymous (1973b) also reported "good observations.. straight bill.. foraging in ohia bark" in much the same area (upper Kilauea Forest Reserve) in late July and early August 1972 (100).

There were other observations of Hawai'i Creepers later in 1972. P. Banko (field journal) "watched 2 foraging up and down koa trunks and branches" along an old road cut in Kilauea Forest on 18 October (101). On 23 October, P. Banko (field journal) "watched 1 ten minutes from less than 20-feet foraging up and down naio trees" along the boundary of the Kilauea Forest Reserve less than 0.25 mile north of parking lot adjacent to IBP Study Area, and for 5 minutes watched another of this species "going up and down koa branches" in Kilauea Forest Reserve between IBP Study Area Transects 3 and 4 (102, 103). Gagné (1973) reported "1 censused" in Kilauea Forest Reserve on the 30 December 1972 Christmas Count (104). Berger (1972) termed this species "uncommon" in 1972, stating that "so little is known about the present distribution...that we do not know whether it is uncommon or so rare that it is on the verge of extinction" (7). M. Mull (1972) suggested it as a candidate for the Blue List because of "limited range" (6).

Forest bird surveys were conducted in the Kohala mountains from 1970 to 1972 by van Riper (1982 report). He recorded L. m. mana only 11 times (1 aural, 10 visual detections) in seven of 47 count periods, stating that it was "observed most often... between Puu Eke and the Kehena Ditch Trail, being quite rare to absent in other areas.. ." (28, 29, 29a).

The only Hawai'i Creepers reported for certain in 1973 were those logged by participants in the 30 December Christmas Count (P. Banko, field journal; Mull 1974), as follows: "1 censused" in Kilauea Forest Reserve, "2 censused" along west leg of former military jeep trail in the gas testing area near Pu'u Maka'ala, and none being reported by observers conducting censuses in Keauhou Ranch, Volcano-Wright Road-Upper 'Ōla'a Forest Reserve, Volcano Community, Mauna Loa at Strip Road and trail, Kīpukapuauulu, and along rim of Kilauea Crater (106, 107, 134, 137, 157, 180, 226-228). In the Kohala Mtns., van Riper (1973) stated that "a number of birds...along the Kahena (Kehena) ditch trail...look and act very much like Creepers...observed groups of 3 to 5," but gave no specific date for the observation (32).

In 1974, Smith and Jacobi (1974) "observed 3" in the Kilauea Forest Reserve on 15 June (108). Mull (1975) recorded that the 14 December 1974 Christmas Count observers identified the Hawai'i Creeper in only two locations, counting 11 in Keauhou Ranch and two in the adjacent Kilauea Forest Reserve (109, 110). Conant (1975) conducted a series of systematic monthly censuses along an array of transects in and near Hawaii Volcanoes National Park from December 1972 to July 1973, and from August 1974 to March 1975, reporting that the highest population densities of Hawai'i Creeper were found in Kilauea Forest Reserve and Keauhou Ranch, estimating 2.6 ± 2.13 individuals per 40 ha (79% occurrence frequency) detected along Transect 91, and 1.8 ± 2.05 birds per 40 ha (69% occurrence frequency) along Transect 92 (105, 111, 112).

There were other observations of the Hawai'i Creeper in the Kīlauea Forest Reserve-Keauhou Ranch area in 1975. Pratt *et al.* (1977) reported that three observers - tallied, in two surveys of the same general area along the Kilauea Forest-Keauhou Ranch boundary on two consecutive days, an extraordinary 50 to 75 Hawai'i Creepers in 5 hours on 19 August, and 40 in 8 hours on 20 August, during an exceptional period of high numbers and activity (113, 114). Later, on 4 October 1975, Donaghho (1975) reported "2 seen-by Mulls" on a side road branching off the road running along Kilauea (Forest Reserve) fence in the Keawewai area, and "1 seen" in open area on trail in Kilauea Forest Reserve (115, 116). Katahira (1977) reported that 21 participants travelling 26 party-miles in 56 party-hours censused 17 Hawai'i Creepers within a 15-mile diameter circle centered on Kūlani Cone (mostly in Keauhou Ranch and Kilauea Forest Reserve) in 1975, and with an increased effort in 1976 counted 23 (116a, 116b).

Marshall (1975) stated that "extensive work has shown it to be at least as rare as akiapolaau on Mauna Loa...very rare...proposed for Interior's endangered list...reported consistently **only** from Kilauea Forest Reserve and Keauhou Ranch" (51, 52). The U. S. Fish and Wildlife Service (1975) termed this species "**rare**" and "restricted to a small area of forest between 5000 and 6000 ft. elevation" (8). On Mauna Kea, van Riper *et al.* (1978) estimated that based on total counts of an 80 ha enclosure [between Pu'u O Kauha and approximately 1.6 km (1 mile) north of Pu'u Lā'au cabin] on 17, 23, 25, and 26 September 1975, there were 1.2 Hawai'i Creepers per square kilometer (0.62 sq. mile) (253).

Shallenberger (1977) conducted bird (and mammal) surveys in the western Mauna Loa-Mauna Kea Saddle, within the U. S. Army Pbhakuloa Training Area, from late November 1976 to January 1977, and concluded that, in view of negative results and lack of observations in surrounding habitats, the Hawai'i Creeper was the "least likely" of three endangered forest bird species to occur in Pbhakuloa Training Area (245).

In 1978, Pyle (1978b) recorded "a group of 5 seen...some immature...1 possibly heard previously" at a 5800 feet elevation kīpuka on the Saddle Road, on 5 February 1978 (257). Katahira (1978) reported that the 2 January 1978 Christmas Count observers censused the Hawai'i Creeper in the following localities and numbers: 13 in Keauhou Ranch (Kilauea Forest Reserve), nine in Keauhou Ranch (Transect 29), nine in Keauhou Ranch (Transect 30), 10 in Kūlani Project (Transect 28), three in Waiākea Forest Reserve, and none in transects along (or in) Stainback Highway and Pu'u Maka'ala, Volcano Community, 'Ōla'a Tract, Mauna Loa Trail, Mauna Loa Strip Road, Kīpukapuaulu and adjacent areas, and rim of Kīlauea Crater (117-126, 135, 158, 168, 181, 229-231).

Whitten (1977), reporting on results of May to August 1977 U. S. Fish and Wildlife forest bird surveys conducted from Hawaii

Volcanoes National Park north to the northeast slopes of Mauna Kea, stated that the survey team counted "quite a few" Creepers. Whitten (1977) stated that the survey team obtained information from 2700 observation stops along 204 transect miles between 3500 and 4900 feet elevation (24).

In a preliminary report detailing results of this same survey, Scott ~~et al.~~ (1977 report) and the U. S. Fish and Wildlife Service (1978) stated that 394 Hawai'i Creepers were recorded during 4896 8-minute count periods, and 158 at other times, in 1300 man-days of counting effort along 204 miles of trail in a 261,669-acre area of windward Hawai'i (26, 27).

A similar survey was conducted by the U. S. Fish and Wildlife Service in leeward Hawai'i in 1978. Whitten (1978) quoted an agency representative as stating that smaller numbers of Hawai'i Creepers were found from Hualālai to South Point than in the Hāmākua or Ka'ū forests but that a pre-analysis of the data indicated that the "number may be in the high hundreds" (39). A total of 11 biologists carried out 5800 count periods at 2900 stations along 243 miles of transects covering some 311,000 acres (125,455 ha) to obtain the desired results (39).

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>Loxops maculatus mana</u>			
Island of Hawai'i			
ISLANDWIDE INFERENCE			
1 very abundant / in many localities; widely distributed	(1892-1896)	PERR03
2 quite numerous in some parts...very scarce in others for no apparent reason / (localities unspecified)	(1890's)	MUNG44a
3 HDFG: occurs as a breeding population	(1969)	(1)
4 uncommon	(1970)	BERA70
5 uncommon	(1972)	BERA72
6 candidate for the Blue List...limited range	(1972)	MULM72
7 so little is known about the present distribution...that we do not know whether it is uncommon or so rare that it is on the verge of extinction	(1972)	BERA72
8 rare / restricted to a small area of forest	5000- 6000	(1975)	USFW75
9 rare / (islandwide)	(1977)	ATKI77

UNDESIGNATED DISTRICT

10	only obtained 3 specimens / inhabiting.. same localities as Amakihi	....	(1887-1888)	WILS93
11	Banko: Palmer collected 10 specimens / unspecified localities	....	1892	(2)
12	Banko: Perkins collected 7 specimens / unspecified localities	....	1892-1896	(2)
12a	Banko: Walcott collected 1 specimen / unspecified place	....	29 March (1901)	(2)
13	Banko: Henshaw collected 2 specimens / unspecified place(s)	....	1898-1902	(2)
14	said to be still present though I did not see it / (unspecified place(s))	....	bird surveys 1935-1937	MUNG44a
15	now very rare / in the upper rain forest or koa parkland on Mauna Loa	....	(1958-1960)	DUNW61
16	saw only 4 / (unspecified place(s))	....	1965-1969	BERA72

MULTIDISTRICT

17	failed to notice / in the lower forests	ca. 1700-3000+	(June/Oct. 1892)	PERR93
18	not uncommon, though less numerous / districts of Hamakua and Hilo on the NE side, and in Puna on the E side	....	(189.2)	ROIWO0
19	altogether wanting / in the lower forest	ca. 1700-3000+	(1892-1896)	PERR03
20	a very abundant bird / generally distributed over the large island	....	(1892-1896)	PERRO3

MULTIDISTRICT (con't.)

- | | | | | |
|----|---|------------|-----------------------|--------|
| 21 | extremely common / in the dry upper woods of Kona and Kau, as well as the lower rain-soaked forest of Hilo district | .... | (1892-1896) | PERR03 |
| 22 | in great abundance / lower forests of the windward side | .... | (1892-1896) | PERR03 |
| 23 | appears not to be found at all | below 2000 | (1894-1902) | HENH02 |
| 24 | USFWS survey team counted quite a few / from Hawaii National Park to NE slopes of Mauna Kea; 2700 observation stops; 204 transect miles | 3500-4900 | May-Aug. 1977 | WHIH77 |
| 26 | recorded 552 times by survey team members in 39,168 minutes of observation, 4896 count periods, 2452 sampling stations along 329 km. (204 miles) of trail / 105,938 ha (261,773-acre) study area, windward Hawaii | .... | 1977 - 3-month period | USFW78 |
| 27 | Scott, Kepler, Kridler: survey team recorded 394 during 4896 eight-minute count periods and 158 at other times...observed on 17 of 21 transects surveyed and during 4.49 percent of the count periods.. rather widespread at the higher elevations...largest numbers being found on transects 20, 21 and 22...many immature accompanying adults.. 2452 census stations along 329 km. (204 miles) of trail ...1300 man-days in the field / 105,938 ha (261,773-acre) area, windward Hawaii | .... | (June-Bug.) 1977 | (18) |

Kohala District

MULTIQUADRANGLE

- | | | | | |
|-----|--|------|-------------|------|
| 28 | van Riper 111: 2 seen, unspecified hours,
walking survey / Kihena (Kehena) ditch, from
cabin to end of ditch, Kohala Mtns. | | 8 July 1971 | (19) |
| 29 | van Riper 111: 4 seen, unspecified hours,
walking survey / down (Kehena) ditch and
surrounding area | | 9 July 1971 | (19) |
| 29a | van Riper 111: observed most often between
Puu Eke and the Kehena Ditch Trail, being
quite rare to absent in other areas of the
forest..."recorded (1 aural, 10 visual) in 7
of 47 count periods...0.010 relative abundance,
0.15 species frequency, 1.57 species incidence | | (1970-1972) | (30) |

KAMUELA

- | | | | | |
|----|---|------|---------------|--------|
| 30 | possibly present / rainforest...about a mile
...from the school (Hawaii Preparatory Academy) | | (1967) | PRAT67 |
| 31 | van Riper 111: none seen, unspecified hours,
walking survey / Hamakua ditch, cabin to end
of ditch | | 20 March 1971 | (19) |
| 32 | a number of birds in this area look and act
very much like Creepers.. observed groups of
3 to 5 / along the far reaches of the Kahena
(Kehena) ditch trail.. Kohala area | | (1973) | VANC73 |

Kona District

UNDESIGNATED LOCALITY

33	Banko: Munro collected 2 specimens / Kona	....	1891/1892	(2)
34	common enough / Kona	4000	(June/Oct. 1892)	PERR93
35	Banko: Palmer collected 18 specimens / Kona	....	(1893)	(2)
36	Banko: Perkins collected 8 specimens / Kona	4000	1892-1896	(2)

MULTIQUADRANGLE

37	Palmer: quite numerous; generally met in small flocks of from 2 to 6 individuals / in upper forest of Kona	....	(1891)	ROTW00
38	extremely common / in the middle Kona district	ca. 3500+	(1892-1896)	PERR03
39	Kridler: data must be analyzed before a population estimate may be made.. number may be in the high hundreds...found above 5000 foot elevation on Hualalai and in South Kona... smaller numbers than in the Hamakua or Kau forests / survey of 311,000 acres on the W side ranging from Hualalai to South Point; 5800 count periods at 2900 stations on 243 miles of transects worked by 11 biologists	....	(1978)	WHIH78

HUALALAI

40	Richards: noted (pair mentioned) / horseback from Hdqs. Puuwaawaa Ranch to Shangrila.. hike 0.25 mile beyond	25 Aug. 1950	(8)
----	--	------	--------------	-----

- | | | | | |
|----|--|---------------|------------------|-----|
| 41 | Richards: noted (1 mentioned) / half-way between Poohohoo and Puu Nahaha...near Shangrila...Puuwaawaa Ranch | .... | 26 Aug. 1950 | (8) |
| 42 | Richards: flock of 3 or 4 seen / near Shangrila, Puuwaawaa Ranch | 4250-
4600 | 26 Sept. 1950 | (8) |
| 43 | Richards: noted (mentioned seeing 5) 1 collected, 0900-1900 hours / S of Shangrila, Puuwaawaa Ranch...back and forth all day long | 4250-
4550 | 28 Sept. 1950 | (8) |
| 44 | Richards: good notes obtained (4 mentioned) (0700-1845 hours) 20 Oct; 0830-1100 hours 21 Oct. / Shangrila, up to 0.25 mile S of cabin, Puuwaawaa Ranch | 4250-
4500 | 20, 21 Oct. 1950 | (8) |

PUU LEHUA

- | | | | | |
|----|---|------|---------------|-----|
| 45 | Perkins: shot 2 or 3 / vicinity Pulehua | .... | 2 Aug. (1892) | (3) |
| 46 | Perkins: saw 1 / vicinity Pulehua | .... | 4 Aug. (1892) | (3) |

KEALAKEKUA

- | | | | | |
|----|---|------|------|-----|
| 47 | Banko: Wilson collected 1 specimen / Keauhou (Kona) | | 1887 | (2) |
|----|---|------|------|-----|

PUU POHAKULOA

- | | | | | |
|----|---|------|-------------|---------|
| 48 | Palmer: saw some / Honaunau, a dairy belonging to a Mr. Johnson...about 6000 feet above the sea and some 20 miles to the S of Pulehua (half-day's horse ride up Mauna Loa to above 9000 feet) | | (Nov. 1891) | ROTWO 0 |
|----|---|------|-------------|---------|

Ka'u District

MULTIQUADRANGLE

- | | | | | |
|----|---|------|--------------|---------|
| 49 | present / in Koa forest on hike from vicinity
Keawewai water tanks to Kilauea | | 2 July 1937 | DONW51b |
| 50 | 1 seen...only one...(showing) definite
creeping behavior / in ohia forest...Kahuku
- Ainapo trail | | 27 Dec. 1967 | ORER68 |
| 51 | extensive work has shown it to be as least
as rare as akiapolaau / on Mauna Loa | | (1975) | MARD75 |
| 52 | very rare.. formally proposed for Interior's
endangered list / reported consistently only
from Kilauea Forest Reserve and Keauhou Ranch | | (1975) | MARD75 |

KULANI

- | | | | | |
|----|--|------|---------------|---------|
| 53 | Banko: Wilson collected 1 specimen / Keauhou | .... | 1887 | (2) |
| 54 | common on the limbs / in the forest ENE from
Keawewai water tanks | | 2 July 1937 | DONW51b |
| 55 | Donaghho: saw 20, heard 13 / from about
6700 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 | (20) |
| 56 | in great number / koa forest, Kulani Cone
trail from Volcano area | | 13 July 1937 | DONW51b |
| 57 | small koa tree full...what a flock!...easily
100 / along Puuoo trail above Keawewai, past
open pastures | | 12 Sept. 1937 | DONW51e |

58	heard / along Puuoo trail just above Keawewai	....	12 Sept. 1937	DONW51e
59	Baldwin: seen (but not described) / Keawewai	....	10-11 Sept. 1938	(21)
60	Baldwin: at least 2 heard and seen / Puu Kaipu (Puukipu)	....	11 Sept. 1938	(21)
61	Baldwin: heard ? / Koa grove near Keawewai cabin	....	11 Sept. 1938	(21)
62	Baldwin: seen and heard / Puu Kaipu (Puukipu)	....	11 Sept. 1938	(21)
63	Baldwin: saw 2 or more / upper Olaa Forest Reserve	....	(7 Oct. 1938)	(21)
64	common / koa-ohia forests, Keawewai	....	1938	BALP41
65	Baldwin: pair seen / about 0.5 mile N of gate along Kulani Cone trail	....	7 Feb. 1939	(21)
66	abundant / koa-ohia forests, Kulani Cone	....	1940	BALP41
67	Baldwin: heard...rather frequently...saw several.. one very close / koa forest along the Puuoo trail 0.5 mile N of Keawewai	....	6 Aug. 1941	(21)
68	Baldwin: present (with iiwi, apapanes, amakihis, akiapolaaus, akepas in mixed flock) / in large.. .koa clumps in understory of <u>Naiu</u> , <u>Metr.</u> , <u>Styphelia</u> (traversed on hike N from end of Strip Road to 7500 ft. Keauhou Ranch 1-2 miles W of Solomon's Waterhole, and return via 6850 ft. contour)	....	24 Oct. 1948	(21)
69	Baldwin: present / hike along N base Kulani Cone	....	10 May 1949	(21)
70	Baldwin: present / 0.25 mile W Solomon's Waterhole	12 Sept. 1949	(21)

KULANI (con't.)

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|----|---|-----------|---------------|---------|
| 71 | Baldwin: present...collected 1 / Solomon's Waterhole | | 12 Sept. 1949 | (21) |
| 72 | Banko: Baldwin collectd 1 specimen / near Solomon's Waterhole, Keauhou, Kau | | 1949 | (2) |
| 73 | Richards: Baldwin: noted (number unspecified) / Keauhou Ranch, on about 1.5 mile hike (beginning 3 gates up Puuoo trail jeep road) in general direction Puuoo trail, then NE for 0.75 crossing "Old Koa Mill Road" headed for Kilauea Forest Reserve, return via "O.K.M. Rd." | .... | 29 Oct. 1950 | (8) |
| 74 | 1 noted / on the lower slopes of Kulani | .... | 28 May 1966 | DONW66c |
| 75 | Banko: 1 seen in naio with Amakihi...survey from 1400-1730 hours / koa kipuka just W of Solomon's Waterhole | 6280-6400 | 13 Oct. 1970 | (5) |
| 76 | Banko: 1 seen...survey from 0945-1530 hours / W of Solomon's Waterhole | 6280-6460 | 31 Dec. 1970 | (5) |
| 77 | Banko: 1 seen searching for insects 10-15 feet up main trunk of 25 ft. naio...survey from 0900-1000 hours / logged-off forest Keauhou Ranch | 5640 | 12 Feb. 1971 | (5) |
| 78 | Berger: censused 2 / Transect 1, 200-acre IBP Study Plot, Kilauea Forest Reserve (0945-1200 hours) | .... | 11 Jan. 1972 | (22) |
| 79 | Berger: censused - / Transect 2, 200-acre IBP Study Plot, Kilauea Forest Reserve (1215-1325 hours) | .... | 11 Jan. 1972 | (22) |

80	Berger: censused - / Transect 4, 200-acre IBP Study Plot, Kilauea Forest Reserve (0923-1135 hours)	....	12 Jan. 1972	(22)
81	Berger: censused - / Transect 3, 200-acre IBP Study Plot, Kilauea Forest Reserve (1215-1320 hours)	....	12 Jan. 1972	(22)
82	Banko: seen by Berger and students / in or near IBP Study Area, between Puu Laau and Kulani	....	14 Jan. 1972	(5)
83	Berger: censused - / Transect 1, 200-acre IBP Study Plot, Kilauea Forest Reserve (1130-1400 hours)	....	6 Feb. 1972	(22)
84	Berger: censused - / Transect 2, 200-acre IBP Study Plot, Kilauea Forest Reserve (1427-1618 hours)	....	6 Feb. 1972	(22)
85	Berger: censused - / Transect 4, 200-acre IBP Study Plot, Kilauea Forest Reserve (1000-1215 hours)	....	7 Feb. 1972	(22)
86	Berger: censused - / Transect 3, 200-acre IBP Study Plot, Kilauea Forest Reserve (1240-1430 hours)	....	7 Feb. 1972	(22)
87	Berger: censused - / Transect 1, 200-acre IBP Study Plot, Kilauea Forest Reserve (0955-1225 hours)	....	14 March 1972	(22)
88	Berger: censused - / Transect 2, 200-acre IBP Study Plot, Kilauea Forest Reserve (1246-1400 hours)	....	14 March 1972	(22)
89	Berger: censused - / Transect 3, 200-acre IBP Study Plot, Kilauea Forest Reserve (0930-1125 hours)	....	15 March 1972	(22)

KULANI (con't.)

90	Berger: censused - / Transect 4, 200-acre IBP Study Plot, Kilauea Forest Reserve (1151-1350 hours)	....	15 March 1972	(22)
91	Berger: censused - / Transect 3, 200-acre IBP Study Plot, Kilauea Forest Reserve (0910-1125 hours)	....	23 April 1972	(22)
92	Berger: censused - / Transect 4, 200-acre IBP Study Plot, Kilauea Forest Reserve (1148-1325 hours)	....	23 April 1972	(22)
93	Berger: censused - / Transect 1, 200-acre IBP Study Plot, Kilauea Forest Reserve (1220-1410 hours)	....	20 May 1972	(22)
94	Berger: censused - / Transect 2, 200-acre IBP Study Plot, Kilauea Forest Reserve (1425-1535 hours)	....	20 May 1972	(22)
95	Berger: censused - / Transect 4, 200-acre IBP Study Plot, Kilauea Forest Reserve (0950-1140 hours)	....	21 May 1972	(22)
96	Berger: censused - / Transect 3, 200-acre IBP Study Plot, Kilauea Forest Reserve (1225-1337 hours)	....	21 May 1972	(22)
97	Berger: censused - / Transect 4, 200-acre IBP Study Plot, Kilauea Forest Reserve (1015-1140 hours)	....	18 July 1972	(22)
98	Berger: censused - / Transect 3, 200-acre IBP Study Plot, Kilauea Forest Reserve (1203-1255 hours)	....	18 July 1972	(22)

99	Berger: censused - / Transect 1, 200-acre IBP Study Plot, Kilauea Forest Reserve (1315-1430 hours)	....	20 July 1972	(22)
100	good observations of 1...straight bill.. foraging in ohia bark / upper Kilauea Forest Reserve	....	late July and early Aug. 1972	ANON73b
101	P. Banko: watched 2 foraging up and down koa trunks and branches (positive identification) / Kilauea Forest along old road cut (1130 hours)	....	18 Oct. 1972	(23)
102	P. Banko: watched 1 ten minutes from less than 20 ft. foraging up and down Naio trees / along boundary of Kilauea Forest Reserve, less than 0.25 mile N IBP transect parking area (1415 hours)	....	23 Oct. 1972	(23)
103	P. Banko: watched 1 five minutes going up and down koa branches / Kilauea Forest Reserve IBP transects 3 and 4 (1330 hours)	....	23 Oct. 1972	(23)
104	1 censused...Christmas Count / Kilauea Forest Reserve	....	30 Dec. 1972	GAGW73
105	have highest population densities / in Keauhou 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; Aug. 1974 - Nov. 1974	CONS75
106	censused 0...Christmas Count / Keauhou Ranch	....	30 Dec. 1973	MULW74
107	censused 1...Christmas Count / Kilauea Forest Reserve	....	30 Dec. 1973	MULW74
108	3 observed / Kilauea Forest Reserve	....	15 June (1974)	SMIH74
109	censused 11...Christmas Count / Keauhou Ranch	....	14 Dec. 1974	MULW75

KULANI (con't.)

110	censused 2...Christmas Count / Kilauea Forest Reserve	....	14 Dec. 1974	MULW75
111	Conant: 2.6±2.13 birds per 40 ha., 79% occurrence frequency / monthly censuses, Kilauea Forest Reserve (Transect 91)	....	Dec. 1972 - July 1973; Aug. 1974 - March 1975	(24)
112	Conant: 1.8±2.05 birds per 40 ha., 69% occurrence frequency / monthly censuses, Kilauea Forest Reserve (Transect 92)	....	Dec. 1972 - July 1973; Aug. 1974 - March 1975	(24)
113	3 observers saw 50-75 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 miles NW of Volcano	....	19 Aug. 1975	PRAH77
114	3 observers saw 40 in 8 hours...mostly in logged area...none found downslope where so abundant 19 Aug.. possible explanations given / along approximately 1 mile boundary fence between Kilauea Forest Reserve and Keauhou Ranch, including recently logged area, approximately 11 miles NW of Volcano	....	20 Aug. 1975	PRAH77
115	2 seen by Mulls / on a side road branching off the road running along Kilauea (Forest) fence, Keawewai area	....	4 Oct. 1975	DONW75
116	1 seen / open area on trail, Kilauea Forest Reserve	....	4 Oct. 1975	DONW75
116a	17 censused....Christmas Count / Keauhou Ranch, K. F. R., H. V. N. P. and adjacent areas	....	1975	KATL77
116b	23 censused....Christmas Count / Keauhou Ranch, K. F. R., H. V. N. P. and adjacent areas	....	1976	KATL77

117	3 censused...Christmas Count / Waiakea Forest Reserve Transect 27	....	2 Jan. 1978	KATL78
118	8 censused...Christmas Count / Kulani Project Transect 28 downslope	....	2 Jan. 1978	KATL78
119	2 censused...Christmas Count / Kulani Project Transect 28 upslope	....	2 Jan. 1978	KATL78
120	9 censused...Christmas Count / Keauhou Ranch Transect 29	....	2 Jan. 1978	KATL78
121	9 censused...Christmas Count / Keauhou Ranch Transect 30	....	2 Jan. 1978	KATL78
122	0 censused...Christmas Count / Kilauea Forest Reserve (Keauhou Ranch Transect 30)	....	2 Jan. 1978	KATL78
123	0 censused...Christmas Count / Keauhou Ranch Transect 31	....	2 Jan. 1978	KATL78
124	13 censused...Christmas Count / Keauhou Ranch	....	2 Jan. 1978	KATL78
125	0 censused...Christmas Count / Kilauea Forest Reserve (Keauhou Ranch Transect 31)	....	2 Jan. 1978	KATL78
126	9 censused...Christmas Count / Kilauea Forest Reserve (Keauhou Ranch)	....	2 Jan. 1978	KATL78

KIPUKA PAKEKAKE

127	Banko: Baldwin collected 1 specimen / Kipukakulalo, Kapapala, Kau	5500	1938	(2)
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PAHALA

128	Banko: Henshaw collected 1 specimen / Pahala	1898-1902	(2)
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Kīlauea District

MULTIQUADRANGLE

129	Henshaw: rare / in Olaa, even in winter, occurring at altitudes of about 1000 feet up to an indeterminate height	(1900)	ROTW00
130	Banko: Henshaw collected 9 specimens / Olaa, 1600 ft. (1), 2400 ft. (5), 4000 ft. (3) elevations	....	1898-1902	(2)
131	Banko: Henshaw collected 37 specimens / Olaa, unspecified elevations	....	1898-1902	(2)
132	absent / in a considerable extent of the Puna forest	....	(1892-1896)	PERR03
133	rare / throughout the Olaa woods even at an elevation at from 2000 to 3000 feet	....	(1894-1902)	HENH02
134	censused 2...Christmas Count / Kulani Road and Puu Makaala	....	30 Dec. 1973	MULW74
135	censused 0...Christmas Count / Stainback Highway and Puu Makaala	....	2 Jan. 1978	KATL78

PUU MAKAAALA

136	NPS: seen / hike...to an unmapped cinder cone below Kulani Cone (vicinity Mt. View flume road)	3700	(April 1945)	(11)
137	Banko: 2 censused...survey 0645-0845 hours / along W leg of former military jeep trail, gas testing area, Puu Makaala locality	....	30 Dec. 1973	(5)

KILAUEA CRATER

138	Banko: Henshaw collected 3 specimens / Ohaikea (houses,) Ka'ū	....	1898-1902	(2)
139	seen / koa-olapa-naio growth, Keauhou Ranch near Forest Reserve boundary on hike from Kipuka Puaulu	....	30 June 1937	DONW51a
140	Donaghho: saw 3, heard 6 / from Kipuka Puaulu N into Brown's Ranch koa forest thence SE to fence-line and back via tanks and ranch house (7 miles)	....	30 June 1937	(20)
141	a few / along first several miles of Kulani Cone trail from Volcano area	....	13 July 1937	DONW51b
142	Donaghho: more numerous than amakihi which was rarer / along Volcano to Kulani trail	....	13 July 1937	(20)
143	Craddock: saw 7 / 29-Mile Road (first 5 miles of trail from end of Haunani Road to Puu Kulani)	....	13 July 1937	(25)
144	many...in some koa forest / Keauhou Ranch N of Kipuka Ki toward Puu Oo trail	....	26 Aug. 1937	DONW51e
145	present / Keauhou Ranch N of Kipuka Ki toward the Puu OO trail	....	26 Aug. 1937	DONW51e
146	Baldwin: 1 identified (later questioned) / about 2 miles along Kulani trail from end of road	....	7 Aug. 1938	(21)
147	Baldwin: 1 identified by sight and sound / about 1 mile along Kulani trail from end of road, Upper Olaa Reserve	....	7 Aug. 1938	(21)
148	Baldwin: 1 seen and heard / vicinity 1 mile marker area and return, Kulani Cone trail	26 Nov. 1938	(21)

KILAUEA CRATER (con't.)

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|-----|---|-----------|--------------|------|
| 149 | Baldwin: 1 seen (0930-1500 hours) / Kipuka Kehaki area on 10 mile hike from Kipuka Ki through lower Keauhou Ranch | | 1 Jan. 1939 | (21) |
| 150 | NPS: 3 seen / at 4 mile, Kulani trail | .... | 26 Dec. 1939 | (11) |
| 151 | Richards: 2 seen...1 collected (1130-1830 hours) / 2.5 mile hike along trail from end of Haunani St., Volcano, to Puu Kulani, Upper Olaa Forest Reserve | 3400-3700 | 12 Oct. 1950 | (8) |
| 152 | Banko: Richards collected 1 specimen / Volcano - Kulani trail | 3900 | 1950 | (2) |
| 153 | Richards: noted (number unspecified) (1115-1745 hours) / hike to just beyond 2 mile marker on trail to Puu Kulani from end of Haunani St., Volcano | .... | 16 Jan. 1951 | (8) |
| 154 | Richards: noted (number unspecified) (0900-1700 hours) / hike to 2 mile marker on trail to Puu Kulani from end of Haunani St., Volcano | | 17 Jan. 1951 | (8) |

VOLCANO

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|-----|--|------|--------------|---------|
| 155 | Banko: Henshaw collected 14 specimens / Volcano | | 1898-1902 | (2) |
| 156 | 1 censused...Christmas Count / Wright Road (0.5 hour on foot, 0.5 hour by car) | | 31 Dec. 1955 | ANON56b |
| 157 | censused 0...Christmas Count / Volcano, Wright Road, and Upper Olaa Forest Reserve | .... | 30 Dec. 1973 | MULW74 |
| 158 | censused 0...Christmas Count / Volcano Community | .... | 2 Jan. 1978 | KATL78 |

Hawaii Volcanoes National Park

PARKWIDE INFERENCE

159	comments on declining status and confusion of identity with amakhi by some observers	(1940)	BALP41
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UNDESIGNATED LOCALITY

160	fairly common on the slopes of Mauna Loa... not as numerous as the amakihi	(1936)	WILK36
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161	Craddock: saw only 13...recognized by its feeding habits and shape of bill	12-30 June 1937	(26)
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162	Donaghho's (1937) account of this species and its song questioned	(1940)	BALP41
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MULTIQUADRANGLE

163	26 seen.. .Christmas Count (0600-1300 hours) / 4 observers in one party, 10 miles on foot from Kipuka Puaulu through adjacent golf course to KMC, through Kilauea Iki Crater, excluding area between KMC and Kilauea Iki	18 Dec. (1937)	BALH38
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164	13 seen.. .Christmas Count (0600-1230 hours) / 5 observers in one party, 10 miles on foot from Kipuka Puaulu through adjacent golf course to KMC, through Kilauea Iki Crater (excluding area between KMC and Kilauea Iki)	18 Dec. (1938)	BALH39
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165	NPS: observed / hike to Kalapana (? from end of Chain of Craters road)	May 1939	(11)
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MULTIQUADRANGLE

- 166 determined **from** extensive series of repetitive counts that, in a hundred days of censusing, species could be expected to be recorded / 12 census plots in Hawaii National Park ranging 20 miles on the flanks of the volcanoes Kilauea and Mauna Loa: (1940-1949) BALP53

			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)
10 days in...	Plot: 6 Kipuka Kulalio	5500	(110)
2 days in...	Plot: 7 Kipuka Puaulu	4050	(92)
2 days in...	Plot: 8 Twin Craters	3650	(100)
0 days in...	Plot: 10 Mauna Loa	7500	(41)
0 days 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)

- 167 1 seen in 6 trips...16.75 hours / Olaa Tract (from Wright Road) Oct., Nov. 1959; May, June, July 1960; April 1961 DUNW62
- 168 censused 0...Christmas Count / Olaa Tract, NPS 2 Jan. 1978 KATL78

PUU ULAULA

- 169 saw 3...collected 1 / kipuka of koa about a hundred yards up the slope from the end of the Mauna Loa (Strip) Road 18 June 1937 DONW47a

170	3 more seen / larger grove further down the slope...near end of (Mauna Loa Strip) road	....	18 June 1937	DONW47a
171	none seen where noted on last trip / koa kipuka above end Mauna Loa Strip Road	....	24 June 1937	DONW47b

KIPUKA PAKEKAKE

172	Donaghho: saw 8 / Mauna Loa truck trail	6000- 7000	16 June 1937	(20)
173	Donaghho: 1 heard / between end of Mauna Loa truck trail and Three Trees Kipuka	....	21 July 1937	(20)
174	Donaghho: several seen / Three Trees Kipuka	....	21 July 1937	(20)
175	1 seen singing / near Three Trees Kipuka	....	22 July 1937	DONW51c
176	Donaghho: found several / Three Trees Kipuka S of truck trail	6000	June-Aug. 1937	(20)
177	spotted black lores of a creeper / around bend (of road) adjacent to Three Trees Kipuka	....	8 June (1966)	DONW67a
178	seen / at the nectar of ohia blossoms near the end of (Mauna Loa Strip) road	....	25 Dec. 1967	DONW68
179	about 4 seen / top of the Mauna Loa Strip Road	....	26 Dec. 1967	ORER68
180	censused 0...Christmas Count / Mauna Loa trail	6600- 8200	30 Dec. 1973	MULW74
181	censused 0.. .Christmas Count / Mauna Loa trail	6600- 8200	2 Jan. 1978	KATL78

KILAUEA CRATER

182	Perkins: seen / very long day's tramp up the mountain from Kilauea (Volcano House)	....	23 July (1894)	(3)
183	common / in the koa woods above (Kilauea) volcano	....	(1894-1902)	HENH02
184	Banko: Perkins collected 1 specimen / Kilauea	....	(1892-1896)	(2)
185	Banko: Koebele collected 5 specimens / Kilauea	....	1896	(2)
186	Perkins: common / 1.5 - 2 miles of Volcano House (toward Mauna Loa)	....	(1892-1896)	(27)
187	Banko: Seale collected 8 specimens / Kilauea	....	1901	(2)
188	seen on more than one occasion / Volcano House	....	(Oct. 1902)	BRYW03
189	Donaghho: saw 2 (possibly) / Kipuka Puaulu	....	14 June 1937	(20)
190	Donaghho: saw 8 / Mauna Loa slope, near truck trail	....	16 June 1937	(20)
191	3 seen, 2 collected / kipukas along Mauna Loa strip road	5000+	18 June 1937	DONW47a
192	Craddock: saw 11 / Mauna Loa road up to 7500 ft. el.	....	18 June 1837	(28)
193	Craddock: saw 2 / end of Mauna Loa truck trail	....	24 June 1937	(28)
194	1 present / in tree at campsite end of Mauna Loa truck trail	....	19 July 1937	DONW51b

195	Craddock: heard 2 / Mauna Loa slopes near truck trail	....	20 July 1937	(25)
196	present / kipuka of mixed koa, ohia and mamane...on way from Kipuka Kaunaiu to Cache No. 2, Mauna Loa truck trail	....	20 July 1937	DONW51b
197	several seen / mamane trees along road entering Kipuka Kulalio from S Park boundary	....	9 Aug. 1937	DONW51d
198	Donaghho: saw 2 / Mauna Loa slope, near truck trail	....	9 Aug. 1937	(20)
199	Donaghho: saw 6 / Mauna Loa slope, near truck trail	....	9 Aug. 1937	(20)
200	2 seen / grove of large koa near Mauna Loa truck trail, Kipuka Kulalio	....	9 Aug. 1937	DONW51d
201	1 seen / near giant koa along Mauna Loa trail above Kipuka Ki	....	26 Aug. 1937	DONW51e
202	Donaghho: rare / other than in koa forest above (Kilauea) volcano	....	June-Aug. 1937	(20)
203	Donaghho: not rarely found / in the dry forests S of (Kilauea) volcano	....	June-Aug. 1937	(20)
204	Donaghho: quite common / in the koa forest above (Kilauea) volcano	....	June-Aug. 1937	(20)
205	Craddock: saw 6 / Mauna Loa slopes near truck trail	....	1 Sept. 1937	(25)
206	Baldwin: heard and seen...collected 1 / interior Kipuka Kulalio, near Mauna Loa truck trail	5500	25 Nov. 1938	(21)

KILAUEA CRATER (con't.)

207	Baldwin: pair seen / in koa clump 150 yards to the NE of koa clump off Mauna Loa truck trail	6150-6250	4 Feb. 1939	(21)
208	Baldwin: either 2 or 3 seen / near old camp, Mauna Loa truck trail	5500	4 Feb. 1939	(21)
209	Baldwin: none seen / near old campsite, kipuka near Mauna Loa truck trail	5500	4 July 1939	(21)
210	NPS: 9 seen / Kipuka Kulalio, Kipukamaunaiu	....	19 Dec. 1939	(11)
211	slightly more numerous...than akiapolau / in 2 different kipukas on the upper slopes of Mauna Loa in the Park	....	May 1940	DONW40
212	male song heard less often than in spring / Kipuka Kulalio	....	(1940)	BALP41
213	seldom if ever, to be seen there now / within Kilauea Crater	....	(1940)	BALP41
214	rare / ohia-koa forests, Kipuka Puaulu (Bird Park)	....	1940	BALP41
215	uncommon / koa forests, Kipuka Kulalio	....	1940	BALP41
216	male song...heard frequently in spring / Kipuka Kulalio	....	(1940)	BALP41
217	saw several each day / (vicinity Kilauea Crater)	....	13-25 Sept. 1952	ROCR52
218	4 censused.. Christmas Count / Mauna Loa road to 5500 ft. el. and Kipuka Kulalio (4 hours on foot, 1.5 hours by car)	....	31 Dec. 1955	ANON56b

219	3 censused...Christmas Count / Bird Park, and walk to KMC via golf course (6 hours on foot)	....	31 Dec. 1955	ANON56b
220	1 seen / on the Halemaumau trail below the Volcano House	....	(23 March-14 April 1958)	EASW58
221	saw a few / Bird Park	....	June 1960	MENM62
222	only 1 seen / in the Mauna Loa strip area of the Kilauea section	....	1958-1960	DUNW62
223	not seen in 10 trips.. .30.5 hours / Mauna Loa Strip	4000-6700	April (2 trips), May (2 trips), June, Aug., Nov., Dec. (2 trips) 1960; March 1961	DUNW62
224	now very rare / in the upper rain forest on koa parkland on Mauna Loa	....	(1961)	DUNW61
225	seen / Kipuka Puaulu (Bird Park)	....	(2 June 1971)	STRC71
226	censused 0...Christmas Count / rim of Kilauea Crater	....	30 Dec. 1973	MULW74
227	censused 0...Christmas Count / Mauna Loa strip road	....	30 Dec. 1973	MULW74
228	censused 0.. .Christmas Count / Bird Park	....	30 Dec. 1973	MULW74
229	censused 0.. .Christmas Count / Mauna Loa (Strip) road	4000-6600	2 Jan. 1978	KATL78
230	censused 0...Christmas Count / rim of Kilauea Crater	....	2 Jan. 1978	KATL78
231	censused 0...Christmas Count / Kipuka Puaulu and adjacent areas	....	2 Jan. 1978	KATL78

VOLCANO

232	1 seen / around (CCC) camp (near Kilauea Iki)	....	19 July 1937	DOWN51b
233	having difficulty (telling the difference) between the amakihi and the olive-backed creeper about this time...after all, the creeper creeps.. why didn't I let that decide for me... / Kilauea Iki trail	....	17 Sept. 1952	ROCR52
234	2 seen / (Lava Tubes)	....	(1969)	COGH70

MAKAOPUHI CRATER

235	Baldwin: Abbott: rare (1 collected Kipuka Kulalio 3 Aug 1938) / ohia forests, Makaopuhi Crater rim	....	1938	BALP41
236	Baldwin: Abbott: sure he saw / Makaopuhi Crater	....	prior 11 Sept. 1938	(21)
237	Baldwin: may have heard one / going up the side of Kane Nui O Haino	....	5 Jan. 1939	(21)
238	rare / ohia forests, Napau Crater area	....	1940	BALP41
239	Baldwin: possibly present / moderately open ohia forest with mature trees, Kahue, 2500 ft...down to 2200 ft. el.	....	12 Sept. 1941	(21)
240	Baldwin: 1 definitely identified / Apua Forest	2600	12 Nov. 1941	(21)
241	9 noted / Byron's Cliff trail and Hilina Pali	16 Sept. 1952	ROCR52

Mauna Kea District

UNSPECIFIED LOCALITY

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|-----|---|------|-----------|--------|
| 242 | Banko: Munro collected 1 specimen / Hamakua | | 1891/1892 | (2) |
| 243 | slightly more numerous...than Akiapolaau /
in the koa belt of Mauna Kea and in the
mamane higher up | | May 1940 | DONW40 |

MULTIQUADRANGLE

- | | | | | |
|-----|---|------|------------------------------|--------|
| 244 | numerous / in the forests of mixed koa and
ohia along the Wailuku River | | (1894-1902) | HENH02 |
| 245 | of 3 endangered forest bird species listed as
"possible" for PTA, because of sightings within
nearby forest or similar habitat elsewhere on
Hawaii, <u>Loxops maculata mana</u> is least likely
to occur in PTA forests...I am unaware of any
sightings in forests immediately surrounding
PTA / U. S. Army Pohakuloa Training Area | | late Nov. 1976;
Jan. 1977 | SHAR77 |

MAKALAHAU

- | | | | | |
|-----|--|------|------|-----|
| 246 | Banko: Wilson collected 1 specimen / Mana | .... | 1888 | (2) |
| 247 | Banko: Wilson collected 1 specimen / Mana
dairy | | 1888 | (2) |

UMIKOA

- | | | | | |
|------|--|------|--|-----|
| 247a | Banko: Blacow collected 12 specimens /
Horner's Ranch ('Umikoa) | | 11 July-26 Aug. 1903
(11); 28 Dec. 1903 (1) | (2) |
|------|--|------|--|-----|

KEANAKOLU

- 248 Banko: Henshaw collected 1 specimen / Kuaia 1898-1902 (2)
(near Laupahoehoe)

AHUMOA

- 249 Baldwin: present. Judging from song and 20 April 1943 (21)
behavior / Puu Laau forest, 1 mile NW of
forest service cabin, Mauna Kea Forest Reserve
- 250 Ward: saw a few on brief visit...stopped 17 April 1964 (4)
every quarter of a mile or so to look and
listen.. hard to distinguish (from amakihi) /
vicinity Puu Laau
- 251 several...seen...identification was usually 18-20 April 1964 KINW64
difficult / Kaohe Game Management Area
- 252 1 seen / Puu Laau 28 Dec. 1967 ORER68
- 253 1.2 per km² (0.62 mile²) estimated based on 17, 23, 25, 26 Sept. VANC78
total counts of 80-ha enclosure / between
Puu O Kauha and approximately 1.6 km (1 mile)
N of Puu Laau cabin

PUU AKALA

- 254 Richards: noted singing and chirping (single 16 Dec. 1950 (8)
and scattered flock of about 6 mentioned)
(1315-1630 hours) / hike along jeep road from
Hopuwai cabin to Forestry cabin at 8000 ft.
in direction of Puu Kanakaleonui, thence on
road downslope to 8500 ft. about 0.25 mile
from base of Puu Kanakaleonui (thence return
to Hopuwai at 1735 hours)

- 255 Richards: noted (number unspecified) 17 Dec. 1950 (8)
 (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 at
 1700)
- 256 seen / in koa forest...about 200 yards beyond 30 May 1966 DONW66c
 Hopuwai outcamp.. Huumula Sheep Station..
 Mauna Kea

UPPER PIIHONUA

- 257 a group of 5 seen...some immature found... 5800 5 Feb. 1978 PYLR78b
 1 possibly heard previously / kipuka on
 Saddle Road

PIIHONUA

- 258 Perkins: seen / more to the S of my former (Jan. 1896) (3)
 trails from camp in dense forest well above
 highest cane fields in Amaula, near fork of
 Wailuku River, Mauna Kea
- 259 Perkins: shot specimen(s) / in the forest (Jan. 1896) (3)
 at Kaumana
- 260 Banko: Perkins collected 2 specimens / 2000 (1892-1896) (2)
 Kaumana
- 261 Banko: Henshaw collected 46 specimens / 1898-1902 (2)
 Kaiwiki
- 262 Banko: Walcott collected 2 specimens / 1901 (2)
 Kaiwiki

HILO

- 263 Banko: Henshaw collected 1 specimen / Hilo 1898-1902 (2)

CHRONOLOGICAL DISTRIBUTION OF RECORDS

Distribution of some 654 Loxops maculatus ('Alauwahio) occurrence records from 1837 to 1978 is shown in Table 3. Relatively few records of this species appear from initial collection of the species on O'ahu about 1837 until the 1887 to 1905 period when pioneering ornithological activity in the Hawaiian Islands bloomed. A substantial gap in records occurred from 1906 until about 1936 when interest by contemporary resident observers was initiated.

TABLE 3. Distribution of 654 Loxops maculatus records by decade.

1770's - 0	1840's - 1	1910's - 1
1780's - 0	1850's - 0	1920's - 9
1790's - 0	1860's - 1	1930's - 85
1800's - 0	1870's - 3	1940's - 52
1810's - 0	1880's - 18	1950's - 48
1820's - 0	1890's - 137	1960's - 99
1830's - 1	1900's - 34	1970's - 165

Field work by P. H. Baldwin, W. R. Donaghho, H. G. Craddock, L. P. Richards, G. C. Munfo, J. d'Arcy Northwood, and H. Baldwin in the late 1930's and early 1940's stimulated observational activity by increasing membership in the Hawaii Audubon Society in the 1940's and 1950's. Information from students of ornithology with professional backgrounds helped swell the volume of recorded data in the 1960's and by the late 1970's had largely displaced casually gathered information.

GEOGRAPHICAL DISTRIBUTION OF RECORDS

Of some 491 records of Loxops maculatus ('Alauwahio) which can be traced to specific quadrangles, about 24% originated from O'ahu and 40% from Hawai'i, islands of principal ornithological activity. The wide intra-island distribution of observation and collection records of this species is reflected in Figures 2 and 3.

COMPLETENESS OF DATA, **BIAS**, ERRONEOUS AND DOUBTFUL RECORDS

Information from U. S. Fish and Wildlife Service islandwide surveys on Kaua'i beginning about 1967, and on Hawai'i from 1976 to 1979, was not available for inclusion in this report. Contemporary knowledge of 'Alauwahio population status and distribution on Kaua'i and Hawai'i is, therefore, potentially greater than that presented.

Loxops maculatus and L. virens closely resemble each other in appearance, and occasionally in behavior, on O'ahu and Hawai'i. Field observers have long recognized the inherent difficulty in positively identifying L. maculatus, historically a much less abundant species on both islands than L. virens. Nevertheless, the identity of L. virens has been confused with that of L. maculatus sufficiently often in the literature as to significantly bias the historical record.

Shallenberger and Pratt (1978) have studied reports published since the advent of popular ornithology on O'ahu for the purpose of clarifying the status of L. m. maculatus versus L. v. chloris as much as possible. They evaluated sightings of L. m. maculatus published in The 'Elepaio (Journal of Hawaii Audubon Society) from 1939 to 1978, concluding that of 41 reports only three were virtually certain, the balance being judged either probable (6), possible (26), or highly unlikely (6).

On Hawai'i, accurate separation of L. m. mana versus L. v. virens in the field is even more difficult. Even native Hawaiians in the 1890's had no name for L. m. mana, apparently not recognizing its specific identity, although Perkins (1903) thought it "highly unlikely" that a bird so different in voice and habits had no special name in the days of the old professional bird hunters. Nevertheless, S. B. Wilson stated that he obtained only three specimens of L. m. mana, confessing at the same time that he did not recognize its distinctness from L. v. virens until similarities with the Kaua'i form (L. m. bairdi) were pointed out by a colleague (Wilson & Evans 1893) (10). Actually, another specimen of L. m. mana in Wilson's collection possibly escaped detection at the time as labels on four specimens now bear his name (Banko 1979 report).

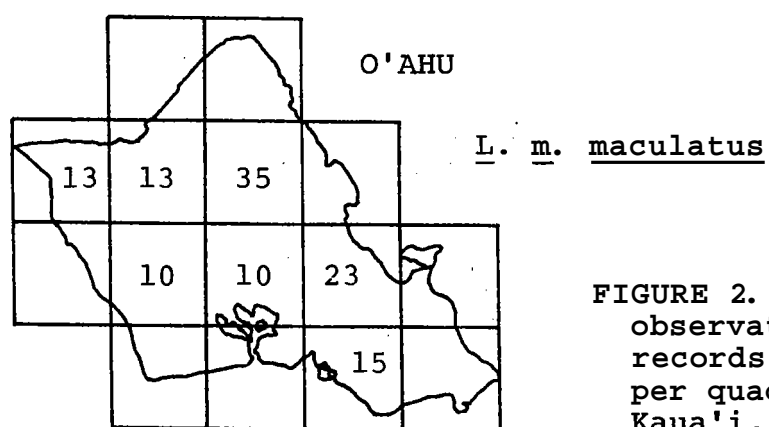
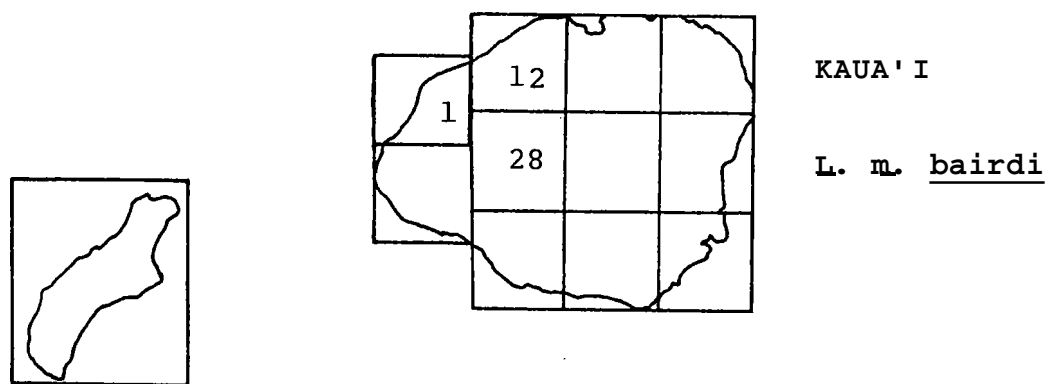
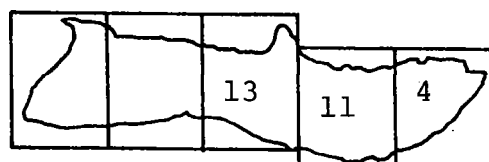


FIGURE 2. Distribution of 289 observations, reports, and museum records of Loxops maculatus subspp., per quadrangle, on islands of Kaua'i, O'ahu, Moloka'i, Lāna'i, and Maui.

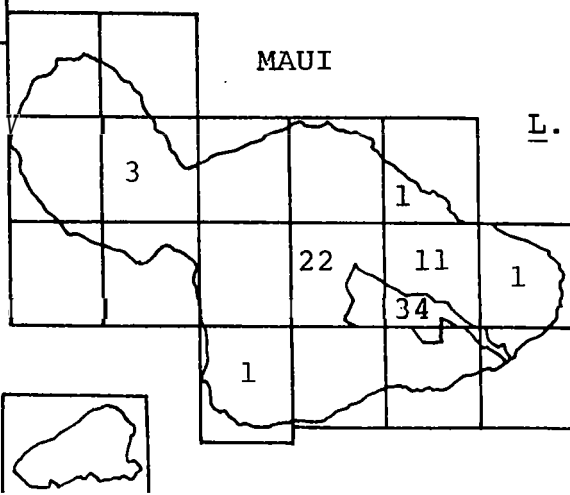
MOLOKA'I

L. m. flammeus



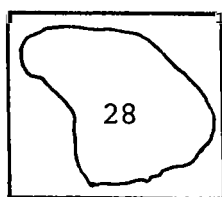
MAUI

L. m. newtoni



LĀNA'I

L. m. montanus



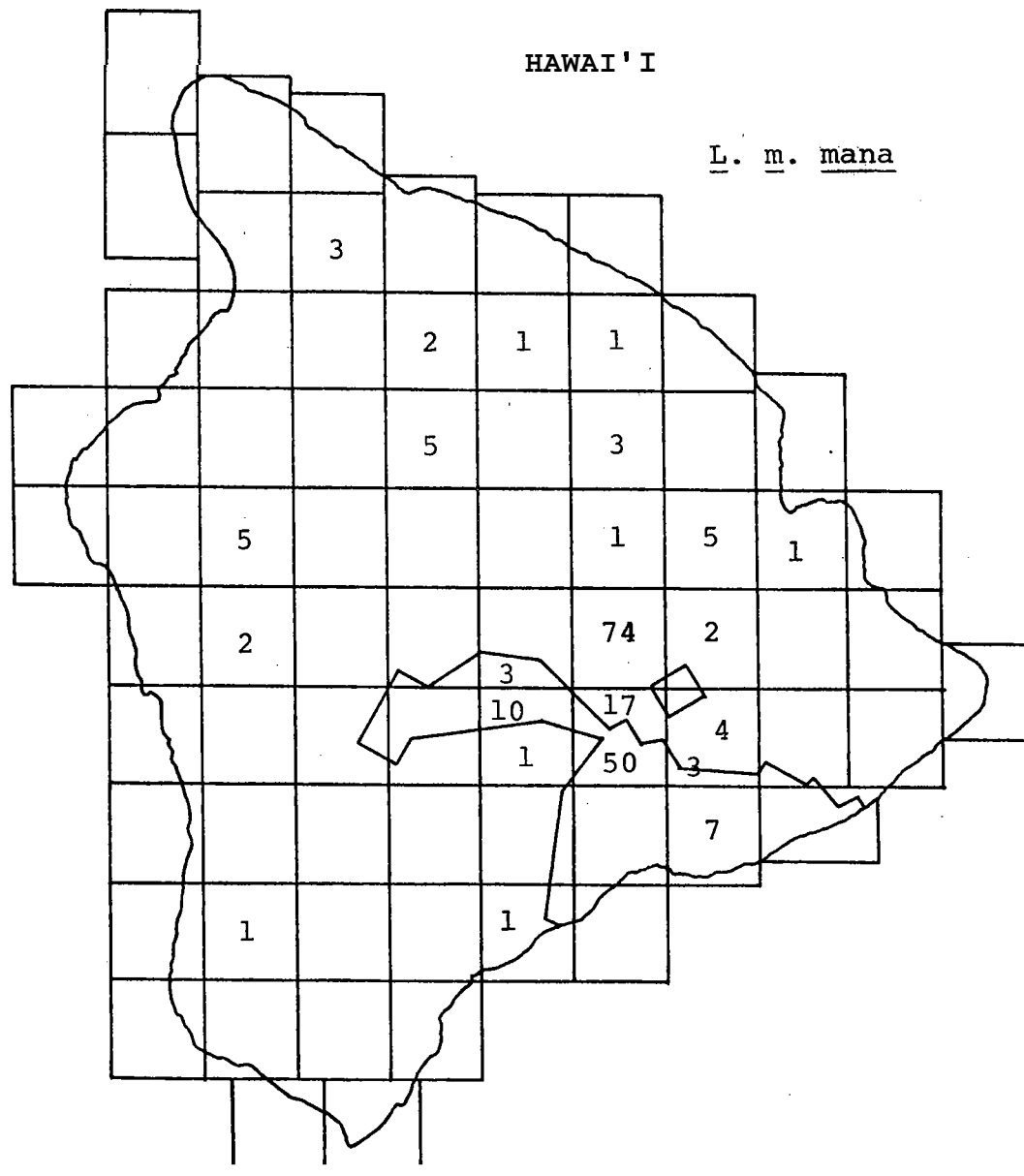


FIGURE 3. Distribution of 202 observations, reports, and museum records of Loxops maculatus mana, per quadrangle, on Island of Hawai'i.

Scott *et al.* (1979) clarify and illustrate both major and minor diagnostic field characters of L. m. mana compared with three other "look-alikes," mention that the close similar appearance of L. maculata and L. virens on Hawai'i was noticed previously by H. W. Henshaw, G. C. Munro, and R. T. Peterson, but make no reference to a bias in the historical record.

There seems to be little reason to question the validity of statements on the status and distribution of L. m. mana by the principal early authorities previously cited (Rothschild 1900, Henshaw 1902, Perkins 1903). Their observations and/or related statements were based on years of field work and aggregate collection of some 160 specimens in all principal districts of the island.

A near absolute gap in occurrence records of this subspecies exists from 1904 through 1936. From 1937 to 1978 some 214 notes pertinent to the status and distribution of L. m. mana were recorded. Considering the potential for confusing L. v. virens with L. m. mana, factual conclusions relative to the population status—and distribution of L. m. mana during the past 40 years can hardly be drawn without an attempt to analyze the validity of this body of data.

Some 12 references to the Hawai'i Creeper (Hawaii Division of Fish and Game 1969 report; Berger 1970, 1972; M. Mull 1972; USFWS 1975, 1978; Atkinson 1977; Scott *et al.* 1977 report; Whitten 1977, 1978) are summary conclusions based on informed discriminating observations (3-9, 16, 24, 26, 27, 39). This body of information is, therefore, placed outside the purpose of critical review proposed here and will not be analyzed further.

A critical district-by-district evaluation of Hawai'i Creeper occurrence records from 1937 to 1978 follows.

Kohala District

The six reports of L. m. mana in Kohala District (28-32) are sufficiently convincing when taken together that the occurrence of this species in that disjunct area during the 1937 to 1978 period should be considered valid.

Mauna Kea District

Only 11 observational notes and statements pertinent to the Status of Hawai'i Creeper in Mauna Kea District after 1937 are apparent. As previously cited (243, 245, 249-257), Donaghho (1940) found them "slightly more numerous" than 'Akiapōlā'au (Hemignathus wilsoni) in the koa belt and in the māmane higher up in May 1940; Baldwin (field journal) noted their presence "judging from song and behavior" in Pu'u Lā'au forest 1 mile northwest of the forestry cabin on 20 April 1943; L. P. Richards

noted "singing and chirping" from a single and scattered **flock** of about six on 16 December 1950, and an unspecified number the following day along the jeep road between Hopuwai cabin and the forestry cabin below Pu'ukanakaleonui; Ward (field journal) saw "a few" and found them "hard to distinguish" on a brief visit to the Pu'u Lā'au area on 17 April 1964; King (1964) saw "several" somewhere in the Ka'ohe Game Management Area from 18 to 20 April 1964 and noted identification was "usually difficult"; Donaghho (1966c) noted it "seen" in koa forest about 200 yards beyond Hopuwai outcamp of the Humu'ula Sheep Station; Orenstein reported "1 seen" at Pu'u Lā'au on 20 December 1967; van Riper ~~et al.~~ (1975) estimated densities of 1.2 per km² based on total counts in 80 ha enclosure about 1.6 km (1 mile) north of Pu'u Lā'au cabin; Shallenberger (1977) termed it, as a result of a negative weeks-long survey in December 1976 and January 1977, to be the "least likely" of three endangered forest birds to occur within Pōhakuloa Training Area; Scott ~~et al.~~ (1977 report), reporting on a U. S. Fish and Wildlife Service survey conducted in part along the entire east flank of Mauna Kea from June to August 1977, stated that 394 of this species was recorded during 4896 8-minute count periods, and 158 at other times (in 1399 man-days of effort) along 204 miles of trail transects in a 261,773-acre area of potential forest habitat; and Pyle (1978b) reported that "a group of 5" were-seen and one possibly heard previously at a 5800 feet elevation kipuka along the Saddle Road on 5 February 1978.

There seems to be no particular reason to challenge the validity of the foregoing body of data. The great majority were made by experienced observers or recorded under the direction of well qualified leaders. Most records appear reasonable and, more importantly, mutually reinforcing.

Kona District

L. P. Richards observed and collected L. m. mana near Shangrila, Pu'uwa'awa'a Ranch, Hualālai, in September and October 1950 as cited (40-44). It would appear that Richards' notes, supported as they are by a collection record, correctly recognized L. m. mana. The only other record of Hawai'i Creeper in Kona from 1937 to 1978 seems to be that of Whitten's (1978) newspaper article which publicized results of a U. S. Fish and Wildlife Service survey estimating that "high hundreds" might be calculated in Kona District from an unstated number detected along 243 miles of transects in 311,000 acres of potential forest habitat from Hualālai to South Point. Details on date, locality, and numbers of Hawai'i Creeper actually seen or heard by U. S. Fish and Wildlife Service biologists had not been published by the time this report was being written.

Ka'ū District

Except for the multitudes of observational reports of L. m. mana in and near Hawaii Volcanoes National Park which will be evaluated together later, this species seems to have been reported on the eastern flank of Mauna Loa only once since 1936, the "1 seen" by Orenstein (1969) somewhere along the Kahuku-'Āinapō Trail on 27 December 1967 showing "definite creeping behavior" (50). Without positive supporting evidence this characteristic is not diagnostic (Scott et al. 1979) and Orenstein's identification should be discounted accordingly.

Kīlauea District

There seems to be only four records of Hawai'i Creeper observed in Kīlauea District, outside of Hawaii Volcanoes National Park and vicinity, after 1936 (134-137). A National Park Service report cites one seen (? by P. Baldwin) in April 1945 at 3700 feet elevation on a hike to an unmapped cinder cone below Kiilani Cone in the vicinity of Mtn. View flume road. Mull (1974) and Banko (field journal) reported two were censused in the 30 December 1973 Christmas Count in the vicinity of Pu'u Maka'ala (in the same general area of the Mtn. View flume road cinder cone). Katahira (1978) stated that none of this species were censused in the Stainback Highway-Pu'u Maka'ala area on the 2 January 1978 Christmas Count. Though L. m. mana is rarely reported in the area from Pu'u Maka'ala to Kūlanī Cone there seems to be no reason to question any of these records.

Hawaii Volcanoes National Park= Keauhou Ranch-Kīlauea Forest Reserve

In contrast to the low number of records in other districts, some 169 observations, reports, collection records, and summary statements relating to occurrence of L. m. mana in and near Hawaii Volcanoes National Park were made after 1935. Readers may wish to refresh their memories either by reviewing previously presented information, or the actual records listed in Appendix VIII (49, 54-127, 134-137, 139-154, 156-181, 189-241). Since mention is rarely made in the records themselves of the diagnostic characteristics separating L. virens from L. maculatus, little or no basis exists for independent judgment of identification accuracy. A degree of assessment is possible, however, if observations of one observer are compared with findings by others and full use is made of such clues and other facts as may be available.

Observations and judgments of opinion are best evaluated for identification accuracy by comparing them in chronological order area-by-area. For comparative purposes Hawaii Volcanoes National Park and vicinity is best treated as a single general district or as one or the other of six more or less geographically distinct

areas, as follows: Volcano-Kūlani Trail-'Ōla'a Tract, Keawewai-Upper Keauhou Ranch-Kīlauea Forest Reserve, Mid- and Upper Mauna Loa Strip (Truck Trail), Kipukapuaulu-Kipukakī-Lower Keauhou Ranch, Kīlauea Crater-Kīlauea Iki-Thurston Lava Tube (Twin Craters), and Makaopuhi-Kalapana-'Āpua.

Volcano-Kūlani Trail-'Ōla'a Tract

There seems to be only about 16 records of Hawai'i Creeper in this area, all compiled between 1937 and 1955.

Along the trail to Kiilani Cone, Donaghho (1937 report, 1951b) noted "a few" Hawai'i Creeper, terming them "in great number in the koa forest" and called this species "more numerous than amakihi which was rarer" on 13 July 1937; apparently accompanying Donaghho on the same hike Craddock (1937 report) "saw 7" (54, 141-143).

On 7 August 1938, Baldwin (field journal) identified one by sight and sound along the Kūlani Trail, but later that day questioned the accuracy of his identification; returning to the same area on 7 October Baldwin "saw 2 or more" in upper 'Ōla'a Forest Reserve, and on 26 November he saw and heard one near the 1-mile marker along Kūlani Trail (63, 146-148). Baldwin (field journal) noted "pair seen" about 0.5 mile north of gate along Kūlani Cone Trail on 7 February 1939 (65). A National Park Service report (presumably that of Baldwin) also recorded three seen at 4-mile marker, Kūlani Trail, on 26 December 1939 (150).

Richards (field journal) collected one (3900 ft elev.) of two Hawai'i Creepers seen along Kūlani Trail on 12 October 1950, and noted unspecified number(s) on 16 and 17 January 1951 (152-154).

One was reported seen in six trips (16.75 hours total) to the 'Ōla'a Tract from 1959 to 1961 (Dunmire 1962) (167), and one was censused during the 1955 Christmas Count somewhere along Wright Road (Anon. 1956b) (156). I spent many hours along the trail from the end of Wright Road to Kūlani Cone in the late 1960's and early 1970's but never once recorded the presence of this species. In addition, none were reported in that general area during the 1973 and 1978 Christmas Count (157, 158).

Keawewai-Upper Keauhou Ranch-Kīlauea Forest Reserve

Some 70 Hawai'i Creeper records (both positive and negative) were recorded from 1937 to 1978 in the Keawewai-Upper Keauhou Ranch-Kīlauea Forest Reserve area as previously cited (54-62, 64, 66-126). The repetitious history of Hawai'i Creeper sightings in this locality was previously cited, and it is not necessary to repeat it here. Except for the dense rain forest in the 209-acre International Biological Program study tract in upper Kīlauea

Forest Reserve (where no Creepers were apparently noted on some 20 surveys over a period of months), the area possesses an exceptionally strong history of sightings. Though Baldwin (1941) usually noted only small numbers seen and/or heard on any one visit, he termed this species "common" in the koa-'ōhi'a forests around Keawewai in 1938 (64), and "abundant" at Kūlani Cone in 1940 (Baldwin 1941).

The statement by Donaghho (1951e) that he observed "a small koa tree full...what a flock! easily 100" along Pu'u'o'o Trail above Keawewai past open pastures on 12 September 1937 (57), appears offhand to be open to question. However, Pratt ~~et al.~~ (1977) counted 50 to 75 in 5 hours in a nearby area during what was termed a period of "extraordinary" concentration and activity of this species at roughly the same time of year almost 40 years later, on 19 August 1975 (113). Along this line it will be recalled that, in the case of Loxops maculatus mana on O'ahu, a very rare subspecies in recent years, a remarkable aggregation of between 30 and 50 individuals was witnessed on (? 19) September 1968, of which one was collected (Shallenberger & Vaughn 1975). A close inspection of the collection record of H. C. Palmer shows that in 1893 18 were obtained in one month (Banko 1979 report); further investigation of label data reveals that all were taken in Kona District on a single day, 25 August! The flocking of Loxops inaculatus on O'ahu and Hawai'i during late August and early September may, therefore, be a normal, rather than extraordinary, social phenomenon as previously indicated. Viewed in this light, Donaghho's observations (1937 report), which include one stating that 20 were sighted and 13 heard on a long hike in upper Keauhou Ranch on 2 July 1937 (55), can hardly be dismissed. Donaghho's (1951b) report that this species was "common on the limbs" in the forest east-northeast from the Keawewai water tanks is a further clue to the authenticity of his reports (54). As late as the 1976 Christmas Count some 23 Hawai'i Creeper were noted on Keauhou Ranch-Kīlauea Forest Reserve census routes, albeit by many observers (116b). Conant (1975 report) found the highest population densities of Hawai'i Creeper on 12 transects surveyed from March 1972 to November 1974 to be in upper Keauhou Ranch and Kīlauea Forest Reserve (105). While the center of Hawai'i Creeper abundance is evidently still in the upper Keauhou Ranch-Kīlauea Forest Reserve area there can be little doubt that the population status of this species has declined from a species commonly encountered there 40 years ago to one much less frequently seen today.

Mid- and Upper Mauna Loa Strip (Truck Trail)

There are some 29 previously cited observational records or related statements of Hawai'i Creeper made from 1937 to 1978 in Hawaii Volcanoes National Park above Kīpukakī (161, 169-181, 193, 194, 196, 197, 200, 201, 206, 208-210, 212, 215, 216, 218, 223, 224). [Another 10 observations made along the Strip Road are indefinite as to altitude but probably fall largely in the

subject area (190-192, 195, 198, 199, 205, 207, 222, 227)]. The striking contrast between the positive observations and occasional collection records of Donaghho and Baldwin made during the late 1930's and early 1940's in the upper Mauna Loa Strip area (169-176, 194, 196, 197, 200, 201, 206, 208, 210, 212, 216), and the predominately negative records left by largely experienced observers after 1955 (180, 181, 222-224) casts doubt on the validity of a few positive records left by more casual visitors in the 1960's. For this and more obvious reasons it seems clear that a few records left by associates of a touring group of birdwatchers should be heavily discounted or regarded as erroneous.

In summary, even with moderate discounting of apparently valid early records, e.g., 169, 190, 196, 199, etc., (Baldwin 1941), the status of Hawai'i Creeper in the mid- and upper elevations of the Mauna Loa Strip has without doubt declined during the past 40 years. Where it was once noted as "fairly common" in 1936 (Williams 1936) and "uncommon" by Baldwin (1941) it has not been reported for many years. Detection by Baldwin (1953) in Plot 10, Kipukakulalio, on an extensive series of surveys from 1940 to 1949 led him to conclude that this species could be expected to be counted there on only 10 out of 100 days (166). The single individual observed by Dunmire (1961) somewhere in the Mauna Loa Strip during his 1958 to 1960 surveys seems to be the last Hawai'i Creeper reported in this area, or within the Park at large.

Kīpukapuaulu-Kīpukakī-Lower-Keauhou Ranch

There seems to be a total of only about 13 statements and observational notes pertaining to occurrence of Hawai'i Creepers in the area around Kīpukapuaulu (Bird Park) from 1937 to 1978. These records divide themselves rather uniformly from Donaghho's (field journal, 1951a, 1951e) notes ranging from mere presence recorded to "3 seen and 6 heard" in lower Keauhou Ranch in the vicinity of Kīpukapuaulu in June and August 1937 (139, 140, 144, 145), to "1 seen" by Baldwin on a 10-mile hike (0930-1500 hours) on 1 January 1939 from Kipukakī through lower Keauhou Ranch (149). Baldwin (1940) noted the Hawai'i Creeper as "rare" in Kīpukapuaulu in 1940 (214), but no actual dated records of this species appears extant for either Kīpukakī or Kipukapuaulu.

In view of the above evidence and negative reports by Mull (1974) and Katahira (1978) and further lack of positive evidence, it appears necessary to disregard or heavily discount the sightings of Anonymous (1956b), Mench (1962), and Stroburg (1971) (219, 221, 225). Hawai'i Creepers evidently declined from a species only rarely observed in the Kipukapuaulu area in the late 1930's to one which has not been seen since the 1940's. After analyzing an extensive series of repetitive counts taken in Plot 7 of Kipukapuaulu from 1940 to 1949, Baldwin (1953) concluded that Hawai'i Creepers could be expected to be recorded

in Plot 7 there on only two out of every 100 days. Dunmire (1962) did not detect any Hawai'i Creepers in 30.5 hours of censusing (10 visits) in the Mauna Loa Strip from 1958 to 1960 (223). The date of Baldwin's last sighting of the species in the Kipukapuauulu area was not uncovered in the search for information.

Kīlauea Crater-Kīlauea Iki-Thurston Lava Tube (Twin Craters)

Donaghho (1951b) reported one seen near the old CCC camp on 19 July 1937 (232). Baldwin (1953), during his 1940 to 1949 series of repetitive counts, detected Hawai'i Creeper nearby, in Plot 8, Twin Craters, at a rate which suggested that only two could be expected to be found there in 100 days of censusing (166). Baldwin (1941) stated that this species was "seldom, if ever, seen" within Kīlauea Crater "now" (213), implying decline in that area by 1940. I censused birds along the rims of Kīlauea Crater and Kīlauea Iki for several years in the late 1960's and early 1970's (Christmas Counts) and observed them informally about my residence near the former between 1966 and 1979, all without a single positive sighting or audible suggestion of their presence. Negative Christmas Counts in 1973 (Mull 1974) and 1977 (Katahira 1978) also exist (226, 230). On the basis of negative information recorded since the 1940's it appears that the Rockafellow (1952) note of nine noted along Byron's Cliff (Kīlauea Crater) Trail on 16 September 1952, the Eastman and Eastman (1958) report of one seen on the Halema'uma'u Trail below the Volcano House, and the report by Cogswell (1970) that two were seen at "Lava Tubes" might be questioned (220, 233, 241).

Makaopuhi-Kalapana-'Āpua

D. Abbott, who had collected a specimen of the Hawai'i Creeper at Kīpukakulalio on 3 August 1938, reported that this species was "rare" around Makaopuhi Crater, presumably based on his "almost certain" observation of the species in this area sometime prior to 11 September 1938 (Baldwin field journal, 1941) (235, 236). Baldwin (field journal) "may have heard one" while he was hiking up the side of Kāne-nui-o-Hamo on 5 January 1939 (237), reporting the species "rare" in the Nāpau Crater area in 1940 (Baldwin 1941) (238). A National Park Service report (presumably based on observations of P. Baldwin) stated that this species had been observed in May 1939 on a hike, apparently from the end of the Chain-of-Craters road at Makaopuhi Crater, to Kalapana (165). Baldwin (field journal) noted the possible presence of Hawai'i Creeper in moderately open 'ōhi'a forest of mature trees at Kahue, 2500 feet elevation, down to 2200 feet elevation on 12 September 1941, and "definitely identified" one at 2600 feet elevation in the 'Āpua forest on 12 November 1941 (239, 240). However, none were apparently detected in systematic repetitious surveys of census plots from 1940 to 1949 in other lower elevation forests (Plots 1, 2, 3, 4, 13, 17).

Hawai'i Creeper have thus not been positively reported in lower elevation forests after November 1941.

SUMMARY

The 'Alauwahio (Loxops maculatus) is a small, usually greenish forest bird with a straight bill of short to medium length. Six subspecies are recognized, one each from the islands of Kaua'i, O'ahu, Moloka'i, Lāna'i, Maui, and Hawai'i. The subspecies on Kaua'i differs from its congeners in being called 'Akikiki, after its call, instead of 'Alauwahio. The Moloka'i subspecies differs from its congeners in being called Kakawahie instead of 'Alauwahio, and by being red instead of greenish. The subspecies on Hawai'i has no native name. Subspecies on O'ahu, and especially on Hawai'i, strongly resemble Loxops virens chloris and L. virens virens, respectively.

Kaua'i

The 'Akikiki was a common and widely distributed bird on Kaua'i in the 1890's, abounding in both the upper and lower forest zones. A population of thousands was estimated to exist in the higher forests of the island as late as 1960. There seems to be no information on the status of populations in lower (1500-2500 ft) and mid-elevation (2500-3500 ft) forests except unpublished results of surveys conducted by the U. S. Fish and Wildlife Service since about 1967.

O'ahu

Although less numerous in the 1890's than its congeners on other islands, 'Alauwahio were fairly common and widely distributed in the upper forests of both the Wai'anae and Ko'olau ranges. Although absent in the vicinity of Honolulu this species was found to be "common enough" at ca. 1500 feet elevation on the east side of the Wai'anaes from Hale'iwa south to Wahiawa where it was "abundantly" seen. In the Ko'olau range the 'Alauwahio was usually found in numbers only "far back" in the forests. Its numbers in the 1890's were estimated "in hundreds," compared with "thousands" of its congeners estimated living on other islands. Statements of relative population abundance during the 1890's and early 1900's are well supported by collection of specimens in many localities. A total of 69 specimens are known.

A gap in observational records occurs from about 1905 to approximately 1935. Since 1935 an absence of diagnostic field identifications, unsupported by specimen collection, confounds the historical record of its relative abundance. Whatever the degree of confusion it is well established that few 'Alauwahio

exist on O'ahu today. A 200 man-day survey from November 1977 to March 1978, primarily in the Ko'olau Range, resulted in the sighting of only three individual birds.

Moloka'i

Kakawahie were common and widely distributed on Moloka'i in the 1890's. Early ornithologists found this species in both leeward and windward forests, especially in dense and wet habitats and even occasionally down the wooded gulches considerably below the line of continuous woodland. A total of 134 known specimens, collected in a variety of localities as late as 1907, supports early statements pertaining to its relative abundance and wide distribution during this early period.

A near absolute gap in observational activity or positive records exists from 1908 through the 1950's. By the 1960's only a few individuals were known to remain in the dense rain forest along Pāpa'alā Pali and the Waikolu plateau. Date, locality, and number of individuals reported seen in 1967, apparently the last sighting, were not cited. A 5-day survey of the Pāpa'alā Pali and Waikolu plateau area by three biologists in 1975 resulted in none seen.

Lāna'i

The 'Alauwahio was ubiquitous throughout the Lāna'i forest from 2000 feet elevation to the highest point of land in 1894. Collection of some 65 specimens in various localities supports this and similar statements in the historical record of the 1890's.

An absence of recorders from 1895 through 1922 is responsible for a lack of information on the population status of this species for a period of 28 years. Collection of eight specimens in 1923, 1924, 1927, and 1928 attested to continued survival of 'Alauwahio in at least four localities during that period. The statement that it was "still to be seen" in 1931 and that it had been "scarce for some time" after a "pair" was seen in March 1937, indicates continuation of population decline. The 1937 sighting seems to be the last recorded.

Maui

The 'Alauwahio was found ranging from the lower to extreme upper edge of continuous forest, being "extremely abundant" on Haleakalā (East Maui) and "hardly less than extremely abundant" in the mountains of West Maui. A nearly total gap in records from West Maui and the lower forest areas of Haleakalā after 1894 obscures the status of this species over most of its historical range for a period of more than 80 years. On West Maui this species seems to have gone wholly unnoticed since 1896.

Scattered observations and systematic counts which have been made in and near Haleakala National Park since the 1930's, suggest that population reduction of 'Alauwahio in low and mid-elevation forests since the 1890's has been severe, if not complete in many areas. Subpopulations in higher elevations occur at densities ranging locally from low to high.

Hawai'i

Scores of observations and collection of over 170 specimens of Hawai'i Creeper during the 1890's testify to populations of this species being widely and generally distributed over the large island, and "abundant" in many localities. It was termed "extremely common" in the dry upper woods of Kona and Ka'u, as well as in the lower rain-soaked forests of Hilo District, but rare or absent in the Puna forest and apparently everywhere below 2000 feet elevation.

A near absolute gap in observational records occurs from about 1905 to 1935. From 1936 to ca. 1960 Loxops virens virens is mistakenly identified as Loxops maculatus mana in a significant number of cases, especially by casual observers. Results of systematic surveys by trained ornithologists between 1972 and 1978 show that Hawai'i Creeper have undergone a severe-to-catastrophic decline in all districts for which information on relative abundance exists. Where once "abundant" or "extremely common," as in the dry upper woods of Kona and Ka'u, and the rain-soaked lower forest of Hilo District, this species is now rare or entirely absent. A core of reliable records left by observers in the 1940's and 1950's suggests, when compared with results of recent surveys, that a number of subpopulations in Hawaii Volcanoes National Park and vicinity disappeared during the past 40 years, and depopulated significantly in the past 20 years. Comparative evaluation of a succession of reliable records from 1938 to 1978 suggests that subpopulations of Hawai'i Creeper have disappeared from moderate numbers observed (and collected) in the Volcano-Kiilani Trail-'Ōla'a Tract area from 1937 to 1955; declined substantially from an abundant to an uncommon species in the Keawewai-Upper Keauhou Ranch-Kīlauea Forest Reserve from 1940 to 1978; disappeared since 1961 from the mid-to upper elevations of Mauna Loa Strip where they were occasionally, or even frequently in some areas, encountered in the late 1930's; and disappeared since the 1940's where they were formerly rare from the Kīpukapuaulu-Kīpukakī-Lower Keauhou Ranch area, the Kīlauea Crater-Kīlauea Iki-Thurston Lava Tube (Twin Craters) area, and the Makaopuhi-Kalapana-'Āpua area.

CONCLUSIONS

Loxops maculatus bairdi on Kaua'i remains a relatively abundant forest bird in habitats over 3500 feet elevation; status of populations in lower forests is known only to federal surveyor(s) who have not yet published findings.

On O'ahu, populations of L. m. maculatus have experienced a drastic decline in the past 80 years and are now in the final stage of complete depopulation.

A common forest bird on Moloka'i in the 1890's, L. m. flammeus completely disappeared in less than 70 years. None have been reported since 1963.

Absolute depopulation of L. m. montanus on Lāna'i was apparently consummated sometime after 1937 when the last pair of this once-common and widespread species was seen.

Extremely abundant on Haleakalā (East Maui), hardly less than extremely abundant on West Maui, and found over a wide elevational range in both East and West Maui districts, contemporary populations of L. m. newtoni are apparently found in large numbers only locally in upper elevation forests of Haleakalā. Subpopulations at low elevations on East Maui appear to have disappeared entirely while at least some elements of mid-elevation populations remain extant. Absence of positive sightings on West Maui since the 1890's may reflect observer disinterest rather than total depopulation; components of the West Maui subpopulation may exist, especially in the higher elevations.

Populations of L. m. mana on Hawai'i declined radically in all districts over a long-term 80-year time span. Once extremely common in Kona, Ka'ū, and Hilo areas, and less abundant but widely distributed elsewhere (except in Kohala where information is lacking), this subspecies has declined to the degree that it is only occasionally detected; elsewhere it has disappeared. This species has entirely disappeared from areas in Hawaii Volcanoes National Park where in the late 1930's and early 1940's it was frequently noted seasonally in upper elevations, at least locally, and rarely seen at lower and mid-elevations. Hawai'i Creeper were last reliably observed in the Park during the 1958 to 1960 period when one was reported seen along the Mauna Loa Strip. The last remaining locality on the island where this species exists in substantial numbers is upper Keauhou Ranch and Kilauea Forest Reserve; elsewhere it is uncommon, rare, or most often entirely absent.

Thus, where L. maculatus was known as a moderately to extremely abundant species on six islands during the 1890's, it has depopulated (provisionally) imperceptively on one (Kaua'i), moderately on one (Maui), severely on two (O'ahu and Hawai'i), and apparently completely on two (Moloka'i and Lāna'i). Little

or no information is available on which to base a judgment of its population status at low and mid-elevations on Kaua'i and East Maui, and at all elevational levels on West Maui.

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CPSU/UH Avian History Report 8C
HISTORY OF ENDEMIC HAWAIIAN BIRDS

Part I. POPULATION HISTORIES--SPECIES ACCOUNTS
Forest Birds: 'Ākepa and Po'o Uli

ABSTRACT

Loxops coccineus is a small, orangish or greenish forest bird with a short stout bill and distinctly notched tail. Four subspecies have been recognized since 1893: L. c. caeruleirostris on Kaua'i, L. c. rufus on O'ahu, L. c. ochraceus on Maui, and L. c. coccineus on Hawai'i. Exhaustive search of literature and field journals uncovered some 444 observational notes, collection records, reports, and related statements on relative abundance and geographical distribution from 1779 to 1978. All information is referenced, arranged in geographical and chronological order, and systematically reviewed. Subjects of completeness of data, bias, erroneous and doubtful records are addressed. Findings are summarized and conclusions drawn.

Ornithologists of the 1890's described relative population abundance of L. coccineus on Kaua'i as common and widely distributed; on O'ahu as very rare; on East Maui (no records for West Maui) as locally common or abundant; and on Hawai'i as very widely distributed and common or abundant, at least locally, in koa forests of Kohala, Kona, Ka'ū, and Hilo Districts.

Recent observers term the species on Kaua'i as moderately common in or adjacent to Alaka'i Swamp and apparently rare or absent elsewhere; extremely rare on O'ahu (sighted only twice this century); very rare on East Maui; and on Hawai'i uncommon to rare in Kona District, fairly common in upper Ka'ū Forest Reserve, Keauhou Ranch, and Kīlauea Forest Reserve north to Piha on east flank of Mauna Kea; absent or very rare elsewhere.

A gap in records obscures status of all four races almost everywhere from ca. 1902 to ca. 1940. Results of comprehensive U. S. Fish and Wildlife Service (USFWS) surveys since about 1967 are not yet published. Pending availability of detailed USFWS survey results it is concluded that races on O'ahu and Maui are actually or practically extinct, those on Kaua'i and Hawai'i cannot predictably be found below ca. 3500 feet, and the remaining subpopulations are in various stages of long-term depopulation above that elevation.

Loxops coccineus
'Ākepa

The 'Ākepa is a small (4-5 inch long), orangish or greenish forest bird with a short stout bill and distinctly notched tail (Rothschild 1900). One subspecies on each of four islands--Kaua'i, O'ahu, Maui, and Hawai'i--is recognized. Amadon (1950), amended by Pratt (1979), lists names of the four recognized subspecies, including name of original describer, year of publication, and respective island of origin, as follows: L. c. caeruleirostris (Wilson) 1889 (1890), Kaua'i; L. c. rufus (Bloxam) 1826, O'ahu; L. c. ochraceus Rothschild 1893, Maui; and L. c. coccineus (Gmelin) 1789, Hawai'i.

LOXOps coccineus caeruleirostris (Kaua'i) differs from its congeners in being called 'Akeke'e. Loxops coccineus rufus (O'ahu) and L. c. ochraceus (Maui) both are called 'Akepeu'ie. Loxops coccineus coccineus (Hawai'i) is called 'Akakane. The name 'Ākepa applies at the species level or when preceded by an island name, e.g., Kaua'i 'Ākepa, O'ahu 'Ākepa, Maui 'Ākepa, and Hawai'i 'Ākepa (Pyle 1977).

Numbers and principal repositories of specimens are as follows: L. c. caeruleirostris 93 (28, incl. 17 pickled in British Museum of Natural History); L. c. rufus 17 (4, including TYPE, in American Museum of Natural History); L. c. ochraceus 54 (24 in American Museum of Natural History); and L. c. coccineus 215 (71 in Bernice Pauahi Bishop Museum) (Banko 1979 report).

Perkins (1903) comments on the relative abundance, distribution, and natural history of all four subspecies in a systematic early treatment. Berger (1972) provides a comprehensive overview of the species in a recent account.

OBSERVATIONS, REPORTS AND SPECIMEN RECORDS

Drawing conclusions from a large volume of historical information on relative abundance and distribution of 'Ākepa 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 Appendixes satisfy criteria necessary for basic documentation and comparative analysis.

In the following descriptive accounts, 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 Appendixes. Sources of published and unpublished information listed in the Appendixes may be traced to complete references in the bibliography.

29. *Loxops coccineus caeruleirostris*
'Akeke'e

Early Notes and Records (1888-1900):

Wilson (1889; Banko 1979 report) described the 'Akeke'e from four specimens taken at 3000 feet elevation above Makaweli in September and October 1888 (62, 63). Wilson stated later that the 'Akeke'e "cannot be common" for he "seldom saw it," and "never" in the lower forest zone (Wilson & Evans 1890) (1, 6).

L. W. Rothschild's collector, H. C. Palmer, and his assistant, G. C. Munro, took about 28 specimens mostly from undesignated localities but at least seven from above the Kalalau Valley on 25 March 1891, and two from the Kaholuamanu area at an unspecified day and month that same year (Munro 1944; Banko 1979 report) (7, 37, 64). In relating Palmer's observations of this species later, Rothschild (1900) stated that about 30 specimens were obtained and that it was "always seen in flocks only at a considerable height in the mountains," only once being seen at low elevations near Makaweli (13). Writing of his early experiences, Munro (1944a) stated that the 'Akeke'e was found "generally in small flocks" between 4000 and 5000 feet elevation --in stormy weather down to about 3500 feet-- but that it was not seen at as low an elevation as the 'Akikiki with which it sometimes associated (2).

Perkins (field journal) first noted seeing the 'Akeke'e near Kalalau pali on 9 May 1895 (39). Labels on two undated specimens bearing Perkins' name and inscribed "4000" feet elevation were probably taken there or near Halemanu where he was staying at the time (Banko 1979 report) (38). A total of 10 specimens were taken by Perkins in May 1894 and April 1895 at an elevation of more than 3000 feet an unspecified distance above F. Gay's mountain house near Kaholuamanu (Perkins, field journal; Banko 1979 report) (65-71, 74). Perkins (field journal) called this species "common" on the "high plateau above Waimea" when he visited Kaholuamanu again in October 1895 (72). In writing of the 'Akeke'e later, Perkins (1903) stated that it was "common locally," and "common over a large part of the high plateau" (8, 73).

Bryan and Seale (1915; Banko 1979 report) collected one specimen at Kaholuamanu during their 12 April to 4 May 1900 visit, stating that the 'Akeke'e was "quite plentiful...8 to 15 will sometimes alight in clumps of trees on the ridges 2 or 3 miles above Kaholuamano" (75, 76).

Later Observations and Reports (1901-1977):

The 'Akeke'e seems to have gone unreported for more than 40 years after W. A. Bryan observed them at Kaholuamanu in 1900. In

October 1941 Donaghho (1941) found this species "mostly in small companies of from 5 to a dozen," noting their presence at Kahōluamanu, "far in the Alakai Swamp," "around the Ranger's cabin" (? Kōke'e), and along the Kaunuohoa (Ka-unu-o-Hua) Ridge Trail (14, 40). Pearsall (1947) also noted "5 seen" in the Kōke'e area during the period 6 to 7 September 1946 (41).

Hanson (1959) noted the presence of this species in the Kōke'e area in June 1959 (42). A year later, during a June to August 1960 survey, Richardson and Bowles (1964) found that this species "could not always be differentiated" from 'Amakihi and 'Anianiau and, as a result, were probably "at least a bit more common" than indicated by their observations (10). From "a total of 26" sighted individually or in small groups, Richardson and Bowles (1964) concluded that this species was a "moderately common, resident...widely scattered in the higher ohia forests and, to some extent, in the mixed **koa** forest" (9, 11). "Several" were seen along trails to Pihea, Kilohana Lookout, and Awa'awapuhi in a 28 to 30 June stay at Kōke'e; a "group of 5" were noted in 'ōhi'a trees just above the Wainiha Pali, east of Kohua Ridge on 22 July 1960; and one was collected by Richardson at ca. 3250 feet elevation near Koai'e stream on an unspecified date (Richardson 1960; Richardson & Bowles 1964; Banko 1979 report) (43, 44, 77).

King (1961) saw "11 and possibly others" on 3 March 1961, and the next day counted "13 and possibly others," calling the 'Akeke'e "one of the commoner species along trail from Alakai Swamp to end of Camp 10 road" (16, 17). Bowles (1962) stated that this species was seen "occasionally" in the vicinity of Koai'e cabin in the Alaka'i Swamp, on 2 September 1961 (78).

In 1964, Ward (field journal) saw five 'Akeke'e, terming it "numerous" from end of Camp 10 road to Koai'e cabin on 20 February 1964 (19). On 21 February, War3 (field journal) tape-recorded two but did not mention numbers seen in traveling along trail from Koai'e cabin toward Wai'ale'ale about 2 or 3 miles and return (80). On a 3-hour hike returning from Koai'e cabin to end of Camp 10 road on 22 February, Ward (field journal) recorded 10 'Akeke'e (20). Walker (1964) noted presence of this species along the trail to Koai'e cabin and "saw several" along the ridge "deeper and deeper into the Alaka'i Swamp" from 21 to 23 February 1964 (21, 22).

Ward (field journal) returned to Koai'e cabin and beyond on 2 May 1965, reporting "5" seen on the hike (23). Donaghho (1965) spent from 11 to 15 August 1965 in the Alaka'i Swamp area reporting the following numbers of 'Akeke'e seen in the various areas visited: three along Mōhihi River Trail to Koai'e cabin, six along the trail from Koai'e cabin to Wai'alae cabin, one at Wainiha Rim, five along the Wai'alae cabin to Koai'e cabin Trail, and two along the trail from Koai'e cabin to Mōhihi River trailhead (24-26, 81, 82). Hancock (1966) stated that the 'Akeke'e was "seen in small numbers" in the area of the Koai'e

cabin during undesignated date(s) in September 1965 (83). Banko (field journal) noted this species "seen...not common" on a 30 November 1965 hike along Mōhihi Trail to Koai'e cabin, and "rare" on the return trek 2 December (27, 28).

Anonymous (1966) reported 'Akeke'e were seen and "very common" in an unspecified area of the Alaka'i Swamp from 28 to 30 May 1966 (29). Donaghho (1967_a, 1967_b) logged "1 seen" in the Kalalau Lookout area on 6 June 1966, and on 28 August that year noted "3 seen" on a hike he made into Alaka'i Swamp, penetrating 2 miles beyond Koai'e cabin (30, 45). Ord (1967) stated this species was "seen" near Kalalau Lookout from 16 to 23 November 1966 (46).

Orenstein (1968) detected "one or perhaps two" in the Alaka'i Swamp on 3 January 1968 (31). Anonymous (1968) "observed" the 'Akeke'e on an Alaka'i Swamp trip on 17 February 1968 (32). Gauthey ~~et al.~~ (1968) noted "approximately 5 seen and heard" in one traverse of the ridge trail extending south-southeast from the Koai'e cabin on a 31 May to 1 June 1968 visit (84).

Eddinger (1972, 1973) reported finding a nest of the 'Akeke'e on 9 March 1969 and noted that this species was "not common...but have seen as many as 5 in one day of field work" in his Kokee Park study area (47, 48). The Hawaii Division of Fish and Game (1969 report) listed the 'Akeke'e as a breeding resident on Kaua'i.

In 1970 and 1971, Stroburb (1971) stated that "at least one" 'Akeke'e was seen along 1.5 miles of Alaka'i Swamp Trail on 2 June 1970 (12). Sears (1971) logged "2 censused" in the Kōke'e area on the 29 December 1969 Christmas Count (49). Berger (1970) stated that this species was "fairly common" in the Alaka'i Swamp region (33). Mull (1971) noted that it was "easily seen...a half-dozen or more" noted within less than an hour along Pihea Trail near junction with Alaka'i Swamp Trail (50).

In 1972, Berger (1972) and Eddinger (1972) stated that the 'Akeke'e was "fairly common only in the Alakai Swamp region" (34, 35) and "less common" at Kōke'e (51, 52). M. Mull (1972) listed the 'Akeke'e as a candidate for the Blue List because of "limited range" (4).

Reporting the 29 December 1973 Christmas Count, Hart (1974_a) recorded numbers of this species tallied in the various areas as follows: one in East Alaka'i Swamp, eight from Pu'u Kila to Kalalau Lookout, 12 at Pu'u Kila Lookout, 11 in the Camp Sloggett (Mōhihi) area, and five along Honopū Trail (53-56, 85).

Hart (1974_b) stated that this species was the seventh most numerous bird seen in the West Alaka'i Swamp, presumably that year, and Sears (1975) logged "7 censused" on the 28 December 1974 Christmas Count, apparently all in the Kōke'e area (57, 58).

There seems to be no reports of 'Akeke'e observed in 1975 and 1976. Johnson (1977) stated that one was "enticed" with a tape recording in the koa forest near Kōke'e on 19 March 1977 (59). Pyle (1978a) stated that there were "4 seen" along the Alaka'i Loop Trail on 15 September 1977 (36). Boynton (1978) reported "2 censused" in the 18 December 1977 Christmas Count, the low count being due to "fog and rain" (60). Pyle (1978b) logged "2 found" at Kalalau Lookout on 23 December 1977 (61). Atkinson (1977) termed the 'Akeke'e "fairly common" but did not specify the area (5).

APPENDIX IX

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>Loxops</u> <u>coccineus caeruleirostris</u>			
Island of Kaua'i			
ISLANDWIDE INFERENCE			
1 cannot be common / never seen in lower forest zone	Oct. 1888	WILS90
2 found...in company with the Kauai creeper but did not see it at as low an elevation... generally in small flocks / their natural habitat is between 4000 and 5000 ft. elevation but in stormy weather they come down to about 3500 ft.	(1891)	MUNG44a
3 HDFG: occurs as a breeding population	(1969)	(1)
4 candidate for the Blue List...limited range	(1972)	MULM72
5 fairly common	(1977)	ATKI77
UNDESIGNATED LOCALITY			
6 I seldom saw it / unspecified place(s)	Oct. 1888	WILS90
7 Banko: Palmer collected about 28 specimens / unspecified place(s)	1891/1893	(2)
8 common locally / unspecified	(1894-1896)	PERR03

9	moderately common resident, widely scattered / in the higher ohia forests and, to some extent, in the mixed koa forest	....	(June-Aug. 1960)	RICF64
10	could not always be differentiated (from amakihi and anianiau); and, probably...are at least a bit more common than our observations indicate / (in the higher ohia and mixed koa forests)	....	(June-Aug. 1960)	RICF64
11	occasionally sighted either individually or in small groups; a total of 26 were seen for certain / (in the higher ohia and mixed koa forests)	....	(June-Aug. 1960)	RICF64
12	at least one seen / mile and a half along Alakai Swamp trail	....	(2 June 1970)	STRC71

MULTIQUADRANGLE

13	about 30 specimens obtained; always seen in flocks / only at a considerable height in the mountains; only once were they observed close to Makaweli at low elevations	....	(1891/1893)	ROTWO0
14	found mostly in small companies of from 5 to a dozen / noted at Kaholuamanu, seen far in the Alakai Swamp, as well as around the Ranger's cabin (? Kokee)	....	(Oct. 1941)	DONW41
15	11 seen, possibly others / Alakai Swamp	....	3 March 1961	KINB61
16	13 seen, possibly others / Alakai Swamp	....	4 March 1961	KINB61
17	one of the commoner species / along trail from Alakai Swamp to end of Camp 10 road	....	4 March 1961	KINB61

MULTIQUADRANGLE (con't.)

18	abundant / Alakai Swamp	....	1-2 Sept. 1963	ORDW63
19	Ward: numerous...5 seen and heard / along trail (from end Camp 10 road) to Koaie cabin	....	20 Feb. 1964	(3)
20	Ward: 10 recorded / on 3-hour hike from Koaie cabin to road-end trailhead	....	22 Feb. 1964	(3)
21	heard / along trail into Alakai Swamp (Koaie cabin)	....	21-23 Feb. 1964	WALR64
22	saw several / along ridge deeper and deeper into the swamp (past Koaie cabin)	....	21-23 Feb. 1964	WALR64
23	Ward: saw 5 / on hike to Koaie cabin and beyond, return	....	2 May 1965	(3)
24	3 counted / Mohihi River - Koaie cabin	....	11 Aug. 1965	DONW65
25	1 counted / Wainika Rim	....	13 Aug. 1965	DONW65
26	2 counted / Koaie Cabin - Mohihi River	....	15 Aug. 1965	DONW65
27	Banko: seen...not common / on hike along Mohihi trail to USGS cabin on Koaie stream	....	30 Nov. 1965	(4)
28	Banko: rare / hike from Koaie Stream cabin to Mohihi trailhead	....	2 Dec. 1965	(4)
29	seen...very common / Alakai Swamp area	....	28-30 May 1966	ANON66
30	3 seen...one at start of the trail / on trip in to the Alakai...got back 2 miles from the Koaie gulch	....	28 Aug. 1967	DONW67b
31	one or perhaps two / Alakai Swamp	....	(3 Jan. 1968)	ORER68

32	observed / trip into the Alakai Swamp	....	17 Feb. (1968)	ANON68
33	fairly common / Alakai Swamp region	....	(1970)	BERA70
34	fairly common / only in the Alakai Swamp region	....	(1972)	EDDC72
35	fairly common / only in the Alakai Swamp region	....	(1972)	BERA72
36	4 seen / Alakai loop trail	....	15 Sept. 1977	PYLR78a

HAENA

37	we took 7 specimens from flocks / above the Kalalau Valley	....	25 March 1891	MUNG44a
38	Banko: Perkins collected 2 specimens / undesignated place(s)	4000	1894/1895	(2)
39	Perkins: seen / near Kalalau pali from Halemanu, V. Kundsens mountain house, about 4000 feet elevation and 4 hours walk up from Knudsen's residence at Waiawa	....	9 May (1895)	(5)
40	small company also noted / Kaunuohoa Ridge trail (Kaunuo Hua)	....	(Oct. 1941)	DONW41
41	5 seen / Kokee area	....	6-7 Sept. 1946	PEAG47
42	present / Kokee area	....	June 1959	HANC59
43	several seen...in 3 days stay / trails...to Pihea, Kilohana Lookout, Awaawapuhi, etc... Kokee area	....	(28-30 June 1960)	RICF60
44	group of 5 seen / in ohia trees just above the Wainiha Pali, E of Kohua Ridge	....	22 July (1960)	RICF64

HAENA (con't.)

45	1 seen / Kalalau Valley Lookout area	....	6 June (1966)	DONW67a
46	seen / (vicinity Kalalau Lookout)	....	16-23 Nov. 1966	ORDW67
47	not common...but I have seen as many as 5 in one day of field work...nest found / in the Kokee area	....	9 March 1969	EDDC73
48	first nest discovered / Kokee State Park	....	9 March 1969	EDDC72
49	2 censused...Christmas Count / main belt road from Wailua to Kokee, including both Kalalau lookouts, Makaha Ridge Road (0730-1700 hours)	....	29 Dec. 1969	SEAW70
50	easily seen...half dozen or more within less than an hour / Pihea trail...near junction with Alakai Swamp trail	....	(15-18 Sept. 1971)	MULW71
51	less common / at Kokee	....	(1972)	BERA72
52	less common...but have seen as many as 5 in one day of field work / at Kokee State Park	....	(1972)	EDDC72
53	censused 8...Christmas Count / Puu Kila to Kalalau Lookout	....	29 Dec. 1973	HARA74a
54	censused 12...Christmas Count / Puu Kila Lookout	....	29 Dec. 1973	HARA74a
55	censused 11...Christmas Count / Mohihi (Camp Sloggett area)	....	29 Dec. 1973	HARA74a
56	censused 5...Christmas Count / Honopu trail	....	29 Dec. 1973	HARA74a
57	seventh most numerous endemic bird seen / West Alakai Swamp	....	4-day field trip (1974 ?)	HARA74b

58	censused 7...Christmas Count / Waimea area, center E of junction of Kokee Road from Waimea and Kekaha	....	28 Dec. 1974	SEAW75
59	1 enticed with tape recording / koa forest near Kokee	....	19 March 1977	JOHB77
60	2 censused...Cristmas Count / Kokee State Park...low count due to fog, rain	....	18 Dec. 1977	BOYD78
61	2 found / Kalalau Lookout, Kokee	....	23 Dec. 1977	PYLR78b

WAIMEA CANYON

62	specimens taken / Waimea	3000	Oct. 1888	WILS90
63	Banko: Wilson collected 4 specimens / above Makaweli	3000	1888	(2)
64	Banko: Palmer collected 2 specimens / Kaholuamanu	....	1891	(2)
65	Perkins: shot specimen(s) / unspecified distance up from F. Gay's mountain house above Makaweli	3000+	25 May (1894)	(5)
66	Perkins: plenty, shot 1 / Kaholuamanu Plateau (F. Gay's mountain house)	....	13 April (1895)	(5)
57	Perkins: shot 1 / Kaholuamanu Plateau (F. Gay's mountain house)	....	15 April (1895)	(5)
68	Perkins: shot 1, lost several / up from F. Gay's mountain house, Kaholuamanu Plateau	....	20 April (1895)	(5)
69	Perkins: shot 1 / up from F. Gay's mountain house, Kaholuamanu Plateau	....	21 April (1895)	(5)

WAIMEA CANYON (con't.)

70	Perkins: shot 2 / a long way back up from F. Gay's mountain house, Kaholuamanu Plateau	....	25 April (1895)	(5)
71	Perkins: shot 4 / went far out up from F. Gay's mountain house, Kaholuamanu Plateau	....	28 April (1895)	(5)
72	Perkins: common / high plateau above Waimea revisited; (? F. Gay's mountain house)	....	Oct. 1895	(5)
73	common / over a large part of the high plateau	....	(1894-1896)	PERR03
74	Banko: Perkins collected 10 specimens / Kaholuamanu	....	1894/1895	(2)
75	quite plentiful...8 to 15 will sometimes alight in a clump of trees / on the ridges 2 or 3 miles above Kaholuamano (Kaholuamanu)	....	(12 April-4 May 1900)	BRYW15
76	Banko: Bryan collected 1 specimen / Kaholuamanu	....	1900	(2)
77	Banko: Richardson collected 1 specimen / Koaie Stream	ca. 3250	1960	(2)
78	occasionally seen / vicinity Koaie cabin, Alakai Swamp	....	2 Sept. 1961	BOWJ62
79	seen / ridge S of Koaie cabin	....	21 April 1962	ORDW62
80	Ward: 2 recorded...stopped every 100 yards or so to listen and watch / along trail from Koaie cabin toward Waialeale about 2 or 3 miles...side trip into deep valley on other side of plateau...and return	....	21 Feb. 1964	(3)
81	6 counted / Koaie - Waialae trail	....	12 Aug. 1965	DONW65

82	5 counted / Koaie - Waialae trail	....	14 Aug. 1965	DONW65
83	seen in small numbers / (USGS Koaie River cabin)	....	(Sept. 1965)	HANJ66
84	approximately 5 seen and heard in one traverse of the ridge...clear skies...wind moderate...mild temperatures / along the ridge trail extending SSE from the (Koaie) cabin paralleling Koaie stream...approximately 1.5 miles to source...making short side trips out spur ridges and descending into the canyon at the stream origin.. .Alakai Swamp	....	31 May, 1 June 1968	GAUJ68
85	censused 1 . . . Christmas Count / East Alakai Swamp	....	29 Dec. 1973	HARA74a

30. Loxops coccineus rufus
'Akepeu'ie

Early Notes and Records (1824-1901):

A. Bloxam collected two specimens of the 'Akepeu'ie in 1824 and/or 1825, describing this species for the first time in 1826 (Amadon 1950; Banko 1979 report) (20). The names of J. K. Townsend and F. Deppe are identified with labels on five examples taken in 1837, perhaps in the Nu'uauu Valley (21, 22). One specimen, possibly obtained during the cruise of the H. M. S. Sulphur in 1836 to 1842, is dated 1845 (5). In addition to the foregoing eight specimens, there are a total of seven other examples, all without localities, names, or dates, presumably secured before collecting of Hawaiian birds began in earnest in the late 1800's (6).

Wilson (Wilson & Evans 1896) did not meet with the 'Akepeu'ie, and Rothschild (1900) states that only one specimen was taken in the course of many months, a "perfectly adult male" shot on 20 April 1893 "in the mountains of Wailua (Waialua) district" by Wolstenholme, H. C. Palmer's assistant at the time (.1, 9, 10). Rothschild (1900) added that the species "was, no doubt, more numerous in former days...at present it must be decidedly rare.. .." However, there are apparently two specimens dated 1893, the TYPE from the "Palmer coll." dated 24 April described originally in error as L. wolstenholmi (Rothschild 1893) in the collection of the American Museum of Natural History, and an adult female dated 24 April also labeled "H. L. (C.) Palmer coll. #2048" in the Royal Ontario Museum. Further research is needed to clear up the confusion surrounding the origin of the second specimen.

Perkins (field journal) states that, besides the specimen shot by Wolstenholme, one was heard "far back in the mountains from Kawailoa mountain house" (11, 12). Some years later, in 1900 or 1901, Perkins (field journal) stated that he "came across a pair far back in the forest, Wahiawa District" (13), but neither S. B. Wilson or R. C. L. Perkins were successful in securing specimens.

Later Observations and Reports (1902-1978):

Donaghho (Munro 1944b; Donaghho 1954, 1963) believed he saw a male 'Akepeu'ie on Kīpapa Trail in the mid- or late 1930's (17). While Donaghho was uncertain of the date and year, he saw it "plainly and noted its small size...brown above...washed with orange about the head and front...duller in color than the Hawaii (subspecies)...female.. .sat in full view of binoculars" (18, 19).

The Hawaii Division of Fish and Game (1969 report) stated that the O'ahu 'Akepeu'ie was "thought to be extinct or

extirpated" (1). Berger (1970, 1972) stated that it was "presumed extinct" and later "extinct" (2, 3). Atkinson (1977) listed it as "possibly extinct" (4).

Ralph and Pyle (1977) and Shallenberger and Vaughn (1978) reported that Shallenberger and Collins observed an 'Akepeu'ie "with field marks of female" very carefully at 2350 feet elevation on the Schofield to Wai-Kāne Trail on 13 December (Shallenberger & Vaughn) and 14 December 1976 (Ralph & Pyle) (14, 15). However, Shallenberger and Vaughn (1978) noted "none recorded" on or off the Schofield to Wai-Kāne Trail in systematic bird surveys carried out in the central Ko'olau Range from 19 December 1977 to 9 March 1978 (16).

APPENDIX X

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

Relative Abundance/Locality	Elev. (ft.)	Date	Source
<u>Loxops coccineus rufus</u>			
Island of O'ahu			
ISLANDWIDE INFERENCE			
.1 none met with	(1888)	WILS96
1 HDFG: thought to be extinct or extirpated from this particular island	(1969)	(1)
2 presumed extinct	(1970)	BERA72
3 extinct	(1972)	BERA72
4 possibly extinct	(1977)	ATKI77
UNDESIGNATED LOCALITY			
5 Banko: 1 specimen collected (? H.M.S. Sulphur expedition 1836-1842) / unspecified locality	1845	(2)
6 Banko: unspecified collector(s) obtained 7 specimens / undesignated place(s)	(? prior 1893)	(2)
7 now very rare, but no doubt attainable since I recently heard a pair calling to each other far back in the forest / unspecified locality	(1900/1901)	PERR03

Ko'olau District

HAUULA

8	Banko: Palmer collected 1 specimen / Wailua district (Waialua)	....	24 April 1893	(2)
9	shot / near Waialua or Wailua	....	20 April (1893)	ROTW00
10	must be decidely rare...only 1 obtained in the course of many months / mountains of Wailua district	....	20 April (1893)	ROTW00
11	Perkins: specimen shot by Wolstenholme / far back in the mountains from Kawailoa mountain house	....	(April 1893)	(5)
12	Perkins: 1 heard beside specimen shot / far back in the mountains from Kawailoa mountain house	....	(April 1893)	(5)
13	Perkins: came across a pair / far back in the forest, Wahiawa district	....	(1900/1901)	(5)
14	Shallenberger and Collins: 1 observed / top of Schofield - Waikane trail	....	13 Dec. 1976	SHAR78
15	bird with field marks of female.. .very carefully observed / on the Schofield - Waikane trail	2350	14 Dec. 1976	RALC77
16	none recorded on systematic surveys / in central Koolau Range on or off Schofield - Waikane trail	....	19 Dec. 1977 - 9 March 1978	SHAR78

WAIPAHI

- | | | | | |
|----|--|-------|--------|---------|
| 17 | Donaghho: believed seen...saw it plainly and noted its small size...brown above...washed with orange about the head and front...female...sat in full view (of binoculars) / (? on the Kipapa trail) | ..... | 1935 ? | MUNG44b |
| 18 | seen / Kipapa trail | ..... | 1937 | DONW54 |
| 19 | saw 1 male preening itself on a limb...seen through binoculars long enough to study it thoroughly...certain of identification...orange with brownish upper parts. ■.much duller in color than the Hawaii (subspecies) / Kipapa trail | ..... | 1939 | DONW63 |

HONOLULU

- | | | | | |
|----|--|-------|------------|-----|
| 20 | Banko: Bloxham collected 2 specimens / unspecified place(s) (? Nuuanu Valley) | ..... | 1824/18 25 | (2) |
| 21 | Banko: Townsend collected 2 specimens / unspecified place(s) (? Nuuanu Valley) | ..... | 1837 | (2) |
| 22 | Banko: Deppe collected 3 specimens / unspecified place(s) (? Nuuanu Valley) | ..... | 1837 | (2) |

31. Loxops coccineus ochraceus
 'Akepeu'ie

Early Notes and Records (1879-1901):

O. Finsch was the first to collect specimens of the Maui 'Akepeu'ie, taking both young and adults at 5400 feet elevation in the vicinity of Olinda in July 1879 - the same year S. B. Dole recognized existence of this form (Banko 1979 report) (21, 22). Wilson (1893) "not having collected at Olinda or having met with the species when exploring at similar elevations" in 1888, failed to secure any examples (5).

The Maui 'Akepeu'ie was described by Rothschild (1900) from examples collected by H. C. Palmer in 1892. A specimen dated 1891--a year no collector is known to have visited Maui--is also extant (23). Rothschild (1900) noted that "Palmer sent a fair series though it was not numerous" (6). Rothschild further recorded the fact that nine of Palmer's specimens were taken in an area where the species was "rather rare," while he (Palmer) was encamped about 5000 feet elevation on Haleakalā (apparently near Olinda) (24). Palmer also noted that "a few" were seen on 18 September 1892 at "Camp No. 5" in the "somewhat drier" middle 'ōhi'a forest in Kīpahulu Valley (Rothschild 1900) (46). Banko (1979 report) notes that Palmer is credited with taking a total of some 15 specimens (16).

Perkins (Banko 1979 report) collected 17 specimens in 1894, and one undated example, at locations unspecified on their labels (7, 8). An unknown number greater than 11 of these examples were obtained during the period 11 March to 8 April 1894 while Perkins stayed at Mr. Payne's (Paine's, according to J. S. Medeiros, pers. comm.) place "5000 ft. high" (actually closer to 4000 ft), above Olinda (25-34). Later, Perkins (1903) termed the 'Akepeu'ie "abundant in some localities" and "common locally" on Haleakalā (9, 17).

E. Weiske collected two specimens at 6000 feet elevation on Haleakala, probably above Olinda, in 1894 (Banko 1979 report) (35). In addition, two examples were taken in June 1900 and/or 1901 near Ukulele, probably by H. W. Henshaw who is known to have visited this locality during that period (36). Henshaw (1902) stated that he found the 'Akepeu'ie to be "rather rare" in June on the slopes of Haleakala, but does not mention the year (18). Another three specimens apparently were taken around 1900 but bear no dates, localities, or collector's name on their labels (Banko 1979 report) (10).

Later Observations and Reports (1902-1979):

Munro (Gregory 1929; Munro 1944a) mentions being unable to locate the 'Akepeu'ie on a "careful search" made during nine days

in February 1928 along the Kula Ranch pipeline to the end of the flume at Haepuaena stream and along the Haleakalā Ranch pipeline to Waikamoi stream (11, 37). Another visit to undisclosed place(s) in 1936 likewise produced negative results (Munro 1944a) (12).

The sighting of "3 small orange birds" in a koa tree between 2000 and 3000 feet elevation by A. Greenwell on a 24 November 1950 hike from Red Hill to Kahikinui House via Kahua Crater was logged in the field journal of L. P. Richards who reported it later (Richards & Baldwin 1953) (45, 46). Eastman and Eastman (1958) reported "1 seen" at 7000 feet elevation "near Haleakala Mountain Lodge" during the period 23 March to 14 April 1958 (38).

In the 1960's, Bole (1961) reported a rash of sightings from 24 to 28 April 1961, as follows: two at Hale Moi, Kula; 16 in widely separated groups (at Hāna the males are a brownish-orange-red); "abundant," 25 to 50 (males all sulphur-yellow with black lines through eyes) at Hosmer Grove; and an unspecified number moved into blossoming Grevillea at Hāna (39, 42, 43, 48). Bole (1961) concluded after seeing "100 plus" that this species was "not rare" on Maui (43). Stephenson and Stephenson (1961) state, obviously referring to Bole's account, that the 'Akepeu'ie was reported "feeding in Silky Oak" in the Hāna area (44). Bryan (1961) questioned the validity of Bole's sightings (44a). The Hawaii Division of Fish and Game (1969 report) listed the 'Akepeu'ie as a breeding resident on Wauai (13).

In the 1970's, D. Woodside (pers. comm.) reported seeing one adult male in a large 'ōhelo bush at the edge of the 'Ōhi'a forest at ca. 6800 feet elevation below Pu'u'alaea on 18 November 1970 (40), a sighting reported later by Hawaii State Department of Land and Natural Resources (1970) (19). Berger (1970, 1972) termed the 'Akepeu'ie "rare," stating later that it "appears to be rare" (1, 2). Scott and Sincock (1977) logged "total of 2 seen (at ca. 5600 ft elev. 0.5 mile north by northeast of Pu'u'alaea), only one during 18 half-hour periods and stations," classing it as "rare" as the result of a 30 April to 1 May 1975 survey at 1860 to 2200 m (6100-7200 ft) elevation in the Ko'olau Forest Reserve (20). Marshall (1975) stated that "only 3 reliable sightings" have been made in recent years and that it was "perhaps the rarest of Maui's forest birds" (3, 14). Atkinson (1977) reported the 'Akepeu'ie as "now very rare" (4).

The most recent sighting of this species is that believed made by Conant (1979a, 1979b) and M. Stemmermann of a female or immature seen at ca. 6300 feet elevation in Kīpahulu Valley in August 1979 (41).

APPENDIX XI

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

Relative Abundance/Locality	Elev. (ft.)	Date	Source
<u>Loxops coccineus ochraceus</u>			
Island of Maui			
ISLANDWIDE INFERENCE			
1 rare	(1970)	BERA70
2 appears to be rare	(1972)	BERA72
3 ...perhaps the rarest of Maui's forest birds, only three reliable sightings of it have been made in recent years	(1975)	MARD75
4 now very rare	(1977)	ATKI77
UNDESIGNATED LOCALITY			
5 no specimens obtained not having collected at Olinda or having met with the species when exploring at similar elevations / unspecified localities	(1888)	WILS93
6 Palmer: sent a fair series, though it was not very numerous / undesignated place(s)	(1892)	ROTW00
7 Banko: Perkins collected 17 specimens / unspecified place(s)	1894	(2)
8 Banko: Perkins collected 1 specimen / unspecified place	(? 1894)	(2)

9	common locally / unspecified localities; often seen in the koa trees but more often in the ohia	....	(1894/1896)	PERR03
10	Banko: unspecified collector(s) collected 3 specimens / undesignated place(s)	....	(? ca. 1900)	(2)
11	though I made a careful search I did not find this bird / (locality unspecified)	....	Feb. 1928	MUNG44a
12	nor did I see anything of it / (locality unspecified)	....	July 1936 survey	MUNG44a
13	HDFG: occurs as a breeding population / island of Maui	....	(1969)	(1)
14	only 3 reliable sightings in recent years / unspecified place(s)	....	(1975)	MARD75

West Maui District

UNDESIGNATED LOCALITY

15	not noticed / in the mountains of West Maui	(1894/1896)	PERR03
----	---	------	-------------	--------

East Maui District

UNDESIGNATED LOCALITY

16	Banko: Palmer collected 15 specimens / unspecified place(s)	....	1892	(2)
17	abundant / in some localities, Haleakala	....	(1894/1896)	PERR03
18	found...to be rather rare...in June / on the slopes of Haleakala	....	(1902)	HENH02

UNDESIGNATED LOCALITY (con't.)

- | | | | | |
|----|---|------------|----------------------|--------|
| 19 | 1 observed / Koolau Forest Reserve, on the N
slope of Haleakala | | (1971) | HAWS70 |
| 20 | total of 2 seen (ca. 0.5 mile N by NE of
Pu'u'alaee), only 1 during 18 half-hour
periods and stations...classed as rare /
1860-2200 m. el. at upper edge of forest...
Koolau Forest Reserve (0800-1230, 0800-1330
hours) | (ca. 5600) | 30 April, 1 May 1975 | SCOJ77 |

KILOHANA

- | | | | | |
|----|--|----------|---------------------|--------|
| 21 | Banko: Finsch collected specimen(s) /
(? Olinda area) | | (1879) | (2) |
| 22 | obtained specimens of old and young /
vicinity Olinda | ca. 5400 | (July 1879) | FINO80 |
| 23 | Banko: undesignated collector obtained
1 specimen / Olinda | | 1891 | (2) |
| 24 | Palmer: 9 obtained; rather rare / encamped
5000 ft. high on the mountain; forest not very
dense...small ohia, a few koa trees, and a
sprinkling of mamane; trail right up to the
top (from Makawao) is excellent | | Aug. (1892) | ROTW00 |
| 25 | Perkins: shot specimens / stayed at
Mr. Payne's mountain house considerably higher
up than Olinda about 5000 ft. (actually ca.
4000 ft.) elevation | | 13, 14 March (1894) | (5) |
| 26 | Perkins: shot 2 / up (from Mr. Payne's
place) to about 7000 feet then E into wet
forest | | 15 March (1894) | (5) |

27	Perkins: shot 1 / up (from Mr. Payne's place) to about 7000 feet then E into wet forest	....	16 March (1894)	(5)
28	Perkins: only shot 1 / up from Mr. Payne's place	ca. 5000	18 March (1894)	(5)
29	Perkins: shot 1 / up from Mr. Payne's place	....	27 March (1894)	(5)
30	Perkins: shot 1 / vicinity Mr. Payne's place	....	28 March (1894)	(5)
31	Perkins: shot 1 / mile or so from Mr. Payne's place	....	30 March (1894)	(5)
32	Perkins: shot 2 / vicinity Mr. Payne's place	....	3 April (1894)	(5)
33	Perkins: shot 2 / within 2 miles Mr. Payne's place	....	4 April (1894)	(5)
34	Perkins: pair seen / forest below Mr. Payne's place	....	8 April (1894)	(5)
35	Banko: Weiske collected 2 specimens / Haleakala (? above Olinda)	6000	1894	(2)
36	Banko: 2 specimens collected (? H. W. Henshaw) / Ukelele (Ukulele)	....	1900/1901	(2)
37	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 Waiakamoi stream	....	9 days in Feb. (1928)	GREH29
38	1 seen / near Haleakala Mountain Lodge	7000	(23 March-14 April 1958)	EASW58
39	2 seen / Hale Moi, Kula (also, see Source #44a)	3300	28 April (1961)	BOLB61

NAHIKI

- 40 Woodside: an adult male / below Puu Alaea ca. 6800 18 Nov. 1970 (6)
 ...in a large ohelo bush at the edge of the
 ohia forest
- 41 Conant and Stemmermann: believe female or ca. 6300 Aug. (1979) (24)
 juvenile sighted / Kipahulu Valley (25)

HANA

- 42 16 seen in widely separated groups; at Hana 24 April (1961) BOLB61
 the males are a brownish-orange-red / (Hana ?)
- 43 100 plus. ...conclusion...not rare on Maui / 29 April 1961 BOLB61
 moved into blossoming Grevillea at Hana
- 44 reported...feeding in Silky Oak / in the (1961) STEE61
 Hana area
- 44a validity of Bole's April 1961 sightings (1961) BRYE61
 questioned

LUALAILUA HILLS

- 45 Richards: 3 small orange birds were seen in 24 Nov. 1950 (8)
 koa tree in gulch between 3000-2000 ft...must
 have been akepas...seen by Amy Greenwell...
 she knows what Hawaii Akepas look like / hike
 from Red Hill to Kahikinui House, via Kahua
 Crater (0915-1730 hours)
- 46 Amy B. H. Greenwell: 3 seen / in Acacia Koa 2000- 24 Nov. 1950 RICL53
 gulch between Kipapa and Nakaaha, Hana 3000
 District, Haleakala

Haleakala National Park

- | | | | | |
|----|---|----------|---------------------|--------|
| 47 | Palmer: a few seen / Camp No. 5...somewhat
drier middle ohia forest, Kipahulu Valley | ca. 4000 | 18 Sept. (1892) | ROTW00 |
| 48 | abundant, 25 to 50...males all sulphur-yellow
with black lines through eyes / Hosmer Grove | | 27, 28 April (1961) | BOLB61 |

32. Loxops coccineus coccineus
'Akakane

Early Notes and Records (1779-1903):

'Akakane were collected and/or variously described on Captain Cook's discovery visit of 1778 to 1779, on the voyages of the H. M. S. Blonde in 1825 and H. M. S. Sulphur in 1837, and in the collection of J. D. Mills sometime during the period 1851 to 1887 (Wilson & Evans 1890; Stresemann 1950; Manning 1978; Banko 1979 report) (15, 16, 35, 61, 183). While such details as were recorded concerning the collection of these early specimens have evidently been lost, it seems clear that example(s) obtained by Cook's naturalists were taken in 1779 somewhere in Kona District, most probably near Ka'awaloa, while those collected in 1825 by or for A. Bloxam on the voyage of the H. M. S. Blonde were secured near Hilo or Volcano, or along the trail between these two localities. Some of the 13 specimens known to be without collection data were undoubtedly secured during this early period (19). T. Ballieu secured four specimens in 1877 in an undisclosed locality, perhaps Pulehua Ranch, Kona, which he is known to have visited for the purpose of collecting birds (Banko 1979 report) (62). Dole (1879) included the 'Akakane in his list of Hawaiian birds but mentions neither their relative abundance nor range during that period (1).

S. B. Wilson collected a total of five 'Akakane specimens during his 1887 to 1888 trip, as follows: Pulehua Ranch (2), Mānā (1), Reauhou (Ka'ū) (1), and Pu'ukapu (near Waimea) (1) (Wilson & Evans 1890; Banko 1979 report) (30, 31, 63, 64, 81, 82). Wilson's name is also inscribed on the labels of two specimens obtained in Kona in 1896 (41), perhaps taken during his second visit. Wilson may have been the collector of two other examples known to have been obtained in Kona in 1896 (41). Of their relative abundance and distribution Wilson (Wilson & Evans 1890) states that they were "so uncommon that during eight months collecting I obtained but 5 specimens...one of the rarest of Hawaiian birds, and cannot, I think, be far from extinct...there seems to have been less difficulty in obtaining them in former times as more than one of the old explorers procured several during comparatively brief stays on the island.. (they range) in middle and upper forest zones" (1a).

H. C. Palmer and his assistant at the time, G. C. Munro, collected some 44 specimens of 'Akakane during their six months' stay on the island of Hawai'i, from September 1891 to the end of June 1892, and again briefly during October 1892 (Rothschild 1900) (17). In only four cases can the name of the collecting locality be cited: one taken on an unknown date in Kohala by Munro, an unspecified number secured on undesignated dates at Pulehua Ranch and Hōnaunau dairy, and one obtained near some "banana houses" on the slopes of Mauna Kea above Hilo on 19 October by Palmer (32, 66, 75, 286). According to Rothschild

(1900), including statements contained in Palmer's diary, 'Akakane were noted to be "common" in Kohala at 4000 feet elevation; "comparatively numerous" in Kona between 4000 and 7000 feet elevation; "altogether more numerous" on Hualālai than at Pulehua Ranch; "in great numbers" at Hōnaunau dairy some 20 miles south of Pulehua Ranch; "pretty numerous" at the end of a 7-hour hike up the Wailuku River from Hilo; and detected in undisclosed numbers in Puna and Hāmākua districts (3, 28, 36, 37, 74, 75, 267). Munro (1944a) stated, probably drawing at least in part on field notes written at the time, that "males and females" were found at the foot of the upper peak of Hualālai in February 1892, "only males and a few immatures" were noted at 4000 feet elevation in September 1891 at Pulehua Ranch, females were "more plentiful than males" at over 4000 feet elevation in Hōnaunau on an unspecified date, and "seemed to be mating" on the northern slopes of Mauna Kea above Mānā on 18 February 1892 (53, 65, 74, 257a). Munro (1944a) stated that during the 1891 to 1892 period the 'Akakane was "common in all the forests" of the island, but between 5000 and 6000 feet elevation on the slopes of Mauna Kea this species was "more plentiful than anywhere else" (4, 253). Rothschild (1900), drawing principally if not entirely on the observations of Palmer, termed the 'Akakane "not so rare as...believed to be" inhabiting "the higher regions from between 5000 to 7000 ft., although one was occasionally shot not higher than about 3000 ft." (2).

Perkins (field journal; Banko 1979 report) collected a total of six 'Akakane specimens at Pulehua Ranch, taking one example on each of the following dates: 9, 13, 24 July, 4 August 1892; 2-14 August 1894, and noting others (67-73). Of his 1892 experiences which extended over a period of several months, June to October, Perkins (1893) reported the 'Akakane to be "the rarest species of the Drepanididae" in Kona (39). Covering later observations in August 1894, Perkins (field journal) noted that this species was "fairly common" at Pulehua Ranch but that "the females and immatures (were) easily overlooked" (72). Perkins (Banko 1979 report) also collected one specimen in Kona at 4000 feet elevation on an unspecified date (40).

Perkins (field journal) was more successful in collecting 'Akakane on the windward than leeward side of the island, taking three on 24 July and five on 25 July 1894 on the slopes of Mauna Loa above the Volcano House, in and near what is now Hawaii Volcanoes National Park (207, 208); at least six of these specimens exist in museum collections to the present day (Banko 1979 report) (211). Perkins, in a 19 September 1947 letter to O. Swezey, recalled that this species was "always to be seen but not in large numbers" from 1.5 to 2 miles up from the Volcano House (212). Perkins (field journal) summarized his June to October 1895 observations of the 'Akakane in the Kilauea area by stating that this species was "fairly common in the koa forest 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 (Kilauea) volcano" (5).

However, Perkins (field journal) collected more 'Akakane above Hilo than anywhere else, taking a total of 15 during late December 1894 and January 1895 in "dense forest well above the highest cane fields in Amaulu ('Amaulu) near fork in the Wailuku River," and two in Kaūmana, presumably during this period (269-277). Eight of these specimens with locality information exist in museum collections to the present day (Banko 1979 report) (268). In January 1896 Perkins (field journal) noted "many feeding high up in the koa trees in 'Amaulu," recalling in a 19 September 1947 letter to O. Swezey that they were "found in hundreds" there during this period (278, 279). One specimen was apparently taken by Perkins at a lower elevation, "Hilo" being inscribed on the label with no date given (Banko 1979 report) (287). Perkins (1903) later characterized this species as being "extremely partial to the koa forests, but is found in localities where there are none of these trees, as in the forest between Kilauea and Keauhou (Ka'ū) and elsewhere" (83). Regarding distribution of 'Akakane in different parts of the island Perkins (1903) wrote that it was "abundant" in parts of the Kona District, in Ka'ū, Hilo, and the Kohala mountains, "very generally" and "very widely" distributed, "common locally," and "abundant in many places" (6, 7, 9).

H. W. Henshaw observed and collected 'Akakane over a broad area in windward Hawai'i from 1895 to 1902. During this period, Henshaw (Banko 1979 report) obtained 46 specimens in Kaiwiki, six in the area of the Volcano (House), five or six at 'Āinapō, two in the vicinity of Pāhala, nine in 'Ōla'a (including 2 from 2400 ft elev.), two in or near Hilo, two above 'Amaulu 2000 feet elevation above Hilo, and one at ca. 6000 feet elevation on Baker's Ranch (an area unknown to the author) (173, 174, 181, 190, 193, 281, 282, 288). Of the status and distribution of the 'Akakane, Henshaw (1902) stated that it was "comparatively common" in the koa forests of Ka'ū, "rather rare" in most districts, and occurred with "great rarity" throughout the deep forests of 'Ōla'a "doubtless due to the general absence there of koa" (8, 79, 184).

Though they left no written record of their observations, other naturalists also collected specimens of the 'Akakane around the turn of the century (Banko 1979 report). In the Kilauea area, A. Koebele obtained 18 examples in 1896, and A. M. Walcott and A. Seale secured two each from 27 March to 2 April 1901 (209, 213, 214). In addition, there is one specimen without collector's name taken near Kilauea in 1896 (210). It was possibly taken by Koebele or R. C. L. Perkins who collected there at that time. M. L. Walton obtained two examples from the Pāhala area on 14 May 1902 and five from unspecified localities on unknown dates (Banko 1979 report) (20, 182). One specimen tagged "Horner's Ranch, 7500, 1903" was probably taken that year by L. Miller above Pa'auilo at the indicated elevation (258). There are also two 'Akakane specimens extant marked simply "Hilo" (289); they were probably taken by H. W. Henshaw or itinerant collectors who failed for one reason or another to inscribe the

pertinent details on the appropriate labels. A total of some 13 other specimens are wholly without data (19).

Later Observations and Reports (1904-1978):

There seems to be no reports of 'Akakane from 1904 to about 1935, a period of over 30 years. Donaghho (1937 report, 1954) noted 'Akakane "in the mamane on Hualalai" in 1935 but failed to find any a decade later (43, 44). Munro (1944a) states that this species was "found" in the vicinity of Hawaii (Volcanoes) National Park and on the southern slopes of Mauna Kea during his 1936 to 1937 bird survey (21). Williams (1936), writing of the 'Akakane in and near Hawaii (Volcanoes) National Park, termed it "very rare" (199).

Donaghho (1937 report, 1947, 1951a-1951d) recorded seeing and/or hearing the 'Akakane during the summer—of 1937 chiefly in and near Hawaii (Volcanoes) National Park, as follows: "saw 2 heard 2" on a 30 June 7-mile hike from Kipukapuauulu (Bird Park) north into Brown's (Keauhou) Ranch koa forest, thence southeast to fence line and back via tanks and ranchhouse; "saw 1... brilliant orange in the bright sunlight" in kīpuka near end of Mauna Loa Strip Road on 18 June; "saw 14, heard 22" on a 2 July hike from about 6700 feet elevation on Mauna Loa Trail down to Keawewai water tank and into the koa forest, thence making a "C" and out again going south thence down to Brown's Ranch; "begin to appear when one begins to get into the forest" (companion H. G. Craddock saw 1 and heard 2) on a 13 July hike along the trail leading from end of Haunani Street, Volcano, to Kūlanī Cone; "saw 7" females, as distinguished from other small forest birds by their forked tails, noted in the māmane trees along the road entering Kīpukakulālio from South Park boundary; "present" on Keauhou Ranch north of Kīpukakī in the direction of the Pu'u'ō'ō Trail on 26 August; "seen" and "heard" on an 11 September hike through Keauhou Ranch pastures and koa along Pu'u'ō'ō Trail to Keawewai; and "heard" just above Keawewai and "occasionally seen" farther along the Pu'u'ō'ō Trail from Keawewai to Mauna Kea on 12 September (87, 89-92, 191, 192, 194, 216, 219). These observations appear to have been incorporated into more generalized reports later (84-86, 88, 215, 217, 218, 221, 222). Donaghho (1951b) commented that this species was "not as numerous (? in the Park) as at Keawewai" on 13 July, later terming it "rarely a casual visitor" inside the Park (185, 197).

In the Chain of Craters region Donaghho (1937 report) termed the 'Akakane "formerly (noted by Ranger Olson ?) not uncommon... now quite rare" (235). Craddock (1937 report) "thought I saw a pair... fly over my head" during the 12 to 30 June period at Pu'uhuluhulu (236).

There seems to be only three observations of 'Akakane in 1938, all by P. Baldwin on or near upper Keauhou Ranch. Baldwin (1941) termed this species "present and almost common" in the

koa-'ōhi'a forests at Keawewai in August that year (93). On 10 September Baldwin (field journal) "saw and heard several" at Keawewai, and on 11 September noted seeing this species "twice in different localities" at Pu'ukipu (94, 95).

In 1939, reports of the Park Superintendent noted that the 'Akakane had been observed along the trail to Kalapana, presumably from the end of the Chain of Craters road in May (201, 202). Baldwin (field journal) reported that this species was "not positively found" on the 28 July 1939 follow-up he made of Ranger Olson's reported sighting along the Kalapana Trail (237).

Reports of 'Akakane in 1940 were likewise sparse. Donaghho (1940) noted "3" in the koa belt of Mauna Kea in May, and "2" in the koa forest on the south slope of Hualālai that same month (45, 254). Baldwin (field journal) wrote "possibly 2 seen" on 26 June in the Kīpukapuāulu census plot, and "never recorded again in all the counts taken in several years on this plot" (224). Baldwin (1941) wrote, "recent reports of its occurrence (e.g., Donaghho 1937),...not entirely satisfactory.. (it) has not been seen...in many hours of field work over a period of 3 summers" (in Hawaii (Volcanoes) National Park) (225). Baldwin (1941) stated that "no positive records" of its present-day occurrence had been found in the 'ōhi'a forests below and to the southeast of Kīlauea Crater, and that he judged it "rare or absent" (in the Park) (198, 238).

On 20 July 1941 Baldwin (field journal) and Richards (1953) identified one 'Akakane on a 6-mile hike from end of Kaūmana Road to the first cabin shelter on Pu'u'ō'ō Trail (2600-2850 ft elev.) (283, 284). Baldwin (field journal) "found" this species again at Keawewai on 6 August 1941 "as in 1938" seeing "1, possibly 2" in the koa-'ōhi'a forest just to the northeast of Keawewai in trips up and down the 'a'ā lava in back of the cabin (97, 98); however, Baldwin commented that this species "seems scarce" and that he did not hear it anywhere else on that date (96). Baldwin (field journal) "saw 1 and heard 2 others" at 2500 feet elevation along Kalapana Trail on 12 September 1941, thus confirming Ranger Olson's previous records for this area (239, 240). The Superintendent's report for that period indicates that its "presence (was) determined in the lower ohia forest in a narrow belt extending eastward from the Ainahou Ranch" (241). Baldwin (field journal) hiked the Kalapana Trail twice again, "possibly" hearing this species at 2500 feet elevation and seeing "several" at 2430 feet in Kealakomo on 13 November 1941 (242, 243). The next day Baldwin "saw 1" at 2430 feet elevation along the Kalapana Trail, "found several" at 2570 feet elevation 0.5 mile northeast of the 2430 feet elevation kīpuka, and "possibly" found others 0.75 mile northeast from the same kīpuka "on the edge of tree-fern zone" (244-246). The National Park Service report for November 1941 states that this species had been located in the lower 'ōhi'a forest at 'Āpua, and in the vicinity of Kalapana Trail (247).

In a 15 March 1943 letter to the Park Superintendent, Baldwin attached a sketch map of a proposed 'Akakane research area which included the upper lands of 'Āpua, Kahue, Kealakomo, and Pānau Nui east of Keauhou in the Kalapana Extension of the Park, presumably basing his recommendations on findings made during the previous years (248). The plan was never implemented, possibly due to the failure to relocate the 'Akakane on subsequent reconnaissance trips to various parts of the proposed research area on 5, 6, 18, and 19 August 1943 (249, 250). Richards and Baldwin (1953) noted a decade later that this species had been seen along the Kalapana Trail during the 1941/1943 period (251). In an unrelated event, Munro (1944a, 1945) reported that the remains of a female 'Akakane, evidently carried off course in a windstorm, had been found near the summit of Mauna Loa (ca. 13,013 ft elev.) on 2 June 1943 (205, 206).

Some five years later, on 24 October 1948, Baldwin (field journal) and Richards (1953) encountered this species "with iiwis, apapanes, amakihis, and creepers in a mixed flock," taking two Specimens, on a hike from the end of the Strip Road across Keauhou Ranch to 1 to 2 miles west of Solomon's Waterhole and return (99-101). Baldwin (field journal) noted presence of 'Akakane on a hike along the north base of Kūlanī Cone on 10 May 1949, and on 12 September that year conducted an unsuccessful search for them in the forest (6300 ft elev.) 0.5 mile west of Solomon's Waterhole (102, 103).

Richards (field journal), working in the Shangrila area of Pu'uwa'awa'a Ranch from 4250 to 4600 feet elevation, noted this species and collected two specimens on 25 August, "saw at least 3" and collected one specimen on 26 August, collected one of "5 seen" on 28 September, and noted "1 seen" on 21 October 1950 (34, 54, 57). Later, Richards (1953) stated that he had observed "about 12" during this period on the north slope of Hualālai (58).

Conducting field surveys of the Nēnē (Branta sandvicensis) from 1 to 4 October 1956, Elder (field journal) noted that the 'Akakane was "seen" above Ohia Mill at 6700 feet elevation on the C. Q. Yee Hop Ranch in South Kona (76). Eastman and Eastman noted "1 seen" along the Saddle Road above Hilo at 4000 feet elevation during the period 23 March to 14 April 1958 (263). H. Baldwin (1958) reported "none seen" in mid-August 1958 along the Saddle Road 15 miles above Hilo "where found last spring," presumably referring to the one seen in the report by Eastman and Eastman (285).

'Akakane seem to have gone unnoticed in 1959, but Dunmire (1960) and Eisenmann (1961) mention two seen in Keauhou Ranch "behind the Park" on 19 June 1960, both reports undoubtedly referring to the same birds (105, 194). Dunmire (1960) also noted that one had been seen on the same Ranch in "koa parkland" a few weeks earlier than 19 June (106). Dunmire (1961) stated that this species still occurred in the koa forests northeast of

the Mauna Loa Strip but that the last record in the Park was over 20 years ago (226). The 'Akakane was not detected in 30.5 hours of censusing birds along the Mauna Loa Strip from 4000 to 6700 feet elevation over a range of 12 months in 1960 and 1961 (Dunmire 1962) (227).

Donaghho (1966) was the next observer to detect 'Akakane, reporting "3 seen in koa forest" on 30 May 1966 about 200 yards beyond the Hopuwai outcamp, Humu'ulu Sheep Station, Mauna Kea (262). Berger (1972) reported seeing one ca. 4500 feet elevation along the Kūlanī (Stainback) Road on 11 July 1966 (186).

Banko (field journal) noted "1 seen" 27 June 1969 at Ka'ūpūlehu, Hualālai Ranch, at 4000 feet elevation (46). The Hawaii Division of Fish and Game (1969 report) listed the 'Akakane as a breeding resident of the island of Hawai'i (10).

There were many observations of this species in the 1970's due to a substantial increase in observers afield in areas outside Hawaii Volcanoes National Park. After an intermittent study of birds over a 3-year period in the Pu'u Lā'au area of Mauna Kea, Berger (1972) reported seeing one that "definitely seems to have been a transient" on 6 February 1970 (259). Berger (1970) termed this species "rare" that same year (11). Banko (field journal) saw one in a koa kīpuka at an elevation of 6280 to 6400 feet, and another in an 'ohi'a kīpuka at 6660 feet in a 3.5-hour survey west of Solomon's Waterhole on 13 October 1970 (107, 108). Later in 1970, Banko (field journal) noted two in a 7+-hour loop survey north and south of Solomon's Waterhole on 31 December (109).

In 1971 van Riper (field journal & 1972) sighted two male 'Akakane in a māmane forest at ca. 7000 feet elevation on the western slope of Mauna Kea 6.4 miles west of Pōhakuloa on 15 February; "1 male" at 5500 feet elevation in a daylong walking survey between Pu'uwa'awa'a and Hualālai Ranches on 15 or 17 June; "1 male" at 5800 feet elevation along the Pu'u'o'o Trail between the Saddle Road and Kūlanī on 5 August; "1 male" at 6800 to 7000 feet elevation on Hualālai 2 miles directly above Shangrila on 9 August; and "1 male and 1 female" 1.9 miles southeast of the Moanuihaea Radio Relay Station on the western slope of Hualālai (49-52, 59, 60, 260, 261, 264, 265). Earlier in 1971 Banko (field journal) "saw and heard 15" in a 0845 to 1145 hour 27 April survey along Kilohana-Kahuku boundary fence (6500-6950 ft elev.), and west along Forest Reserve fence to Waihaka Gulch (6520 ft elev.), and noted a report by E. Kosaka that he (Kosaka) had seen a male at 4840 feet elevation in Honokōhau I, Palani Ranch, on 25 May (47, 172). On 25 June, at 0805 to 0935 hours in the same general area, two were seen at 5900 to 6160 feet elevation west and downslope of Kahuku "parklands" near the edge of the 1950 lava flow; one was recorded from 1515 to 1645 hours at 6100 to 6400 feet elevation in the vicinity of the old C.C.C. camp; and another logged in the same area at 6040 to 6180 feet elevation (177-179). Banko also "saw

4" at 6380 to 6550 feet elevation in a 2.5-hour survey in the Solomon's Waterhole area. of Keauhou Ranch on 22 December 1971 (110).

Berger (1972 report), reporting results of a series of 22 surveys (totaling 36 hours) in a 200-acre study area in upper Kīlauea Forest Reserve (Keauhou, Ka'ū), was able to detect a single 'Akakane once on only four of 11 census dates from 11 January to 20 July 1972 (111-132). After analysis of the results of only five counts, Berger (1972 report) stated that the data suggested a minimum of "two pairs" were counted (133). Berger (1972) concluded on the basis of the two males seen that the 'Akakane "appears to be rare" (12, 13).

Jacobi (field journal) recorded 'Akakane seen from August to November 1972 in the following localities in and near the International Biological Program (IBP) study area in upper Kīlauea Forest Reserve: along Kilauea Forest-Keauhou Ranch boundary north of study area--one male and one possible female (14 August), one male and one probable female (20 August), two pairs (21 August), two males (23 October); vicinity of IBP weather station--one pair (1425-1435 hours), two males and one female (1500 hours) (21 August); along old road cut, Kilauea Forest--one pair (18 October); on or near IBP Transect 4--two males and one female (23 October), one male (29 November); 200 m west of base of Pu'u Kūlani--one male (29 November) (136-140, 142-146). In a pair of sightings during the same period, Anonymous (1973b) reported "good observations" of a male in upper Kilauea Forest Reserve in late July or early August 1972 (135), and the U. S. Fish and Wildlife Service stated that two males were seen from 0.5 to 1 mile beyond the 1952 lava flow (5600 ft elev.) along Pu'u'ō'ō Trail headed toward Mauna Kea on 10 or 11 September that same year (141). Later, during the 30 December 1972 Christmas Count, Gagné (1973) and van Riper (1973) noted "13.. male birds.. 1 immature" were censused in Kilauea Forest (147, 148). Only three days later, on 2 January 1973, van Riper (1973) "observed only 1 bright yellow female... after day's search" in the same area of Kilauea Forest where 13 males were censused on 30 December 1972 (149).

In 1973, Banko (field journal) logged the sighting of "at least 1 orange male...and 2 dull individuals" near the Hawaii Division of Fish and Game cabin on Kahuku Ranch on 18 April by G. Harry, and "saw 2 males and 4 immatures or females" at 4860 feet elevation in Honokōhau 1, near the jeep trail on Palani Ranch on 8 June (48, 180). Mull (1974) reported that 'Akakane were censused in the 30 December 1972 Christmas Count in and near Hawaii (Volcanoes) National Park as follows: one in Keauhou Ranch; 12 in Kīlauea Forest Reserve; none in the Kūlani Road (? Stainback Highway) and Pu'u Maka'ala areas; none in Volcano, Wright Road, and Upper 'Ōla'a Forest Reserve; none along Mauna Loa Trail; none along rim of Kīlauea Crater; none in the Mauna Loa Strip Road area; and none in Kipukapuauulu (150, 151, 187, 195, 228-231).

In the Mauna Kea area, van Riper (1973) stated that he saw only one 'Akakane (and it appeared to be only passing through) "in over 4 years of work" in the dry māmane-naio forest (around Pu'u Lā'au) (255). To the east in a kīpuka along the Saddle Road, Anonymous (1973a) reported seeing "a pair" at 5000 to 6000 feet elevation on an unspecified date (266). On Hualālai, van Riper (1973) stated that this species was "observed" from 5500 to 7000 feet elevation and seemed to "prefer the ohia belt that runs horizontally around the dormant volcano" (33).

In 1974, Smith and Jacobi (1974) noted a fledgling being fed by two adults in Kilauea Forest Reserve on 27 June (1521, and Mull (1975) reported six of this species censused in Kilauea Forest Reserve and nine counted on Keauhou Ranch on the 14 December 1974 Christmas Count (154, 155).

Conant (1975 report) conducted a series of systematic monthly surveys of 12 transects in different ecosystems in and near Hawaii Volcanoes National Park intermittently from March 1972 to March 1975 (153). She reported densities of 3.4 ± 2.62 birds per 40 ha (93% occurrence frequency) on Transect 91 in Kilauea Forest Reserve, and 2.5 ± 1.39 birds per 40 ha (92% occurrence frequency) on Transect 92 in the same general area (156, 157).

Pratt et al. (1977) detailed the sighting of eight 'Akakane by three observers in 5 hours on 19 August, and 10 by three observers in 8 hours on 20 August 1975 during an exceptional period of high numbers and activity along about 1 mile of boundary fence between Kilauea Forest Reserve and Keauhou Ranch approximately 11 miles northwest of Volcano (158, 159). Later that year, on 4 October 1975, Donaghho (1975) noted a male on Keauhou Ranch near Keawewai (160, 161). Katahira (1977) reported that 21 participants travelling 76 party-miles in 56 party-hours censused 45 of this species within a 15-mile diameter circle centered on Kūlani Cone (mostly in Keauhou Ranch and Kilauea Forest Reserve) on the 1975 Christmas Count; in 1976 a greater effort yielded 100 censused (Ralph & Pyle 1977) (161a, 161b).

Marshall (1975), reporting on results of U. S. Fish and Wildlife Service surveys, stated that "densities of 46 birds per 100 acres occur (on) the eastern slopes of Mauna Loa where it was found in 5 of 10 places censused...survey of 392 transect miles of māmane-naio forest on Mauna Kea produced only 2 individuals ...seems quite local in its distribution and is uncommon at best wherever found.. (it is) reported most frequently from the eastern slope of Mauna Loa and the southwest slopes of Hualālai" (22, 80, 256).

In the Kalapana Extension of Hawaii Volcanoes National Park, Conant (1978 ms.) stated that no 'Akakane were observed during her 1976 to 1977 systematic surveys, and that it was "doubtful that it still occurs there" (252).

In the western portion of the Mauna Loa-Mauna Kea Saddle, within the U. S. Army Pōhaku Loa Training area, Shallenberger (1977) thought that although no 'Akakane were detected on his surveys from late November 1976 to January 1977 when conditions were extremely dry, he believed that sightings in surrounding areas in recent years suggested that "extensive survey under more typical rainfall conditions would provide a better basis" for predicting occurrence of this species in that area (23).

The U. S. Fish and Wildlife Service surveyed some 261,669 acres of forest habitat from 3500 to 4900 feet elevation along the northeastern slope of Mauna Loa and eastern flank of Mauna Kea from June to August 1977. Results were reported variously by Scott *et al.* (1977 report), Whitten (1977), and USFWS (1978), (24-26). The most detailed information is that contained in the 8-page preliminary report of Scott *et al.*, which found: 189 'Akakane during 4,896 8-minute count periods, and 91 at other times; absent during 97.5% of count periods, and on 12 of 21 transects; and present only at higher elevations (26).

Atkinson (1977) summarized the status of the 'Akakane as "now rare" (14).

Reporting results of the 1977 Christmas Count taken 2 January 1978, Katahira (1978) recorded 'Akakane censused in various localities as follows: none at Volcano Community, Mauna Loa Road, Kīpukapuāulu, Kīlauea Crater rim, Stainback Highway, Pu'u Maka'ala, 'Ōla'a Tract, or Mauna Loa Trail; 10 on Transect 27, Waiakea Forest Reserve; 4 along Transect 28 in Kūlani Project upslope from jeep trail and 24 downslope along same transect; 12 on Transect 29; 4 on Transect 30, Keauhou Ranch; none on Keauhou Ranch Transects 30 and 31, Kīlauea Forest Reserve; none on Transect 31, Keauhou Ranch; 3 in undesignated locations, Kīlauea Forest Reserve; and 6 in unspecified localities, Keauhou Ranch (188, 196, 203, 204, 162-171, 232-234).

Some 11 biologists employed by the U. S. Fish and Wildlife Service surveyed some 311,000 acres of forest from Hualālai to Kahuku from June to August 1978. Whitten (1978) reported that numbers of 'Akakane found by the survey team were "disappointing" and that its range was found to be "more limited than the creepers" during the 5,800 count periods surveyed on 2,900 stations along 243 miles of transects (27).

Recently, Jacobi (1983 pers. comm.) termed this species "quite common in the upper mesic koa-ohia and ohia forests in the Kau Forest Reserve and then extending still with high numbers from Kīlauea Forest Reserve across to Piha on Mauna Kea where they then decrease drastically" (27a).

APPENDIX XII

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>Loxops</u> <u>coccineus coccineus</u>			
Island of Hawai'i			
ISLANDWIDE			
1 (listed) / (island of) Hawaii	(1879)	DOLS79
1a so uncommon that during eight months collecting I obtained but 5 specimens...one of the rarest of the Hawaiian birds, and cannot, I think, be far from extinct...there seems to have been less difficulty in obtaining them in former times as more than one of the old explorers procured several during comparatively brief stays on the island / range in middle and upper forest zones	(1887/1888)	WILS90
2 Palmer: not so rare as...believed to be / inhabits the higher regions from between 5000 to 7000 feet, although one was occasionally shot not higher than about 3000 feet	(1891/1892)	ROTW00
3 Palmer: several seen / Hamakua, Hilo, Puna (districts)	(1892)	ROTW00
4 common / in all the forests	(1891/1892)	MUNG44a
5 Perkins: fairly common in the koa forest / 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	(5)

6	common locally / very widely distributed	....	(1892-1896)	PERR03
7	abundant / in many places; very generally distributed	....	(1892-1896)	PERR03
8	rather rare / in most districts	....	(1894-1902)	HENH02
9	abundant / in parts of the Kona district in Kau, Hilo and the Kohala mountains...extremely partial to the koa forests	....	(1892-1896)	PERR03
10	HDFG: occurs as a breeding population	....	(1969)	(1)
11	rare	....	(1970)	BERA70
12	have seen only 2...both males	....	(1972)	BERA72
13	appears to be rare	....	(1972)	BERA72
14	now rare	....	(1977)	ATKI77

UNDESIGNATED LOCALITY

15	Banko: 1 specimen collected - voyage of H.M.S. Sulphur / unspecified place(s)	....	(1837)	(2)
16	Banko: Mills collected specimen(s) / unspecified place(s)	....	1851-1887	(2)
17	Banko: Palmer collected 43 specimens / unspecified localities	....	1891/1892	(2)
18	Banko: Henshaw collected 1 specimen / Baker's Ranch (location undetermined)	ca. 6000	1895-1902	(2)
19	Banko: unspecified collector(s) took 13 specimens / unspecified place(s)	....	(? ca. 1900)	(2)

UNDESIGNATED LOCALITY (con't.)

- 20 Banko: M. L. Walton collected 5 specimens / (? 1902) (2)
 unspecified place(s)

MULTIDISTRICT

- 21 found / in the vicinity of Hawaii National (1936-1937) survey MUNG44a
 Park and on the southern slopes of Mauna Kea
- 22 numbers reported from these areas are low; (1975) MARD75
 densities of 46 birds per 100 acres occur from
 the eastern slopes of Mauna Loa where it was
 found in 5 of 10 places censuses. A survey of
 392 transect miles of mamane-naio forest on
 Mauna Kea produced only two individuals. The
 Akepa seems quite local in its distribution and
 is uncommon at best wherever found / reported
 most frequently from E slope of Mauna Loa and
 SW slopes of Hualalai
- 23 unaware of sightings more recent (than those late Nov. 1976;
 reported in the literature by Charles van Riper Jan. 1977 SHAR77
 III and A. J. Berger) in the vicinity of PTA,
 but the varied sightings in surrounding areas
 suggest that birds of this species may also be
 found within PTA boundaries. Extensive survey
 under more typical rainfall conditions would
 provide a better basis for prediction / U. S.
 Army Pohakuloa Training Area
- 24 recorded 285 times by survey team members in (June-Aug.) 1977 USFW78
 39,168 minutes of observation (4,896 8-minute)
 count periods, 2,452 sampling stations along
 329 km (204 miles) of trail (1300 man-days in
 the field) / 105,938 ha (261,669 acre) study
 area, windward Hawaii

- | | | | | |
|-----|--|---------------|---------------------|--------|
| 25 | USFWS survey team counted quite a few /
from Hawaii National Park to NE slope
of Mauna Kea; 2700 observation stops;
204 transect miles | 3500-
4900 | May-Aug. 1977 | WHIH77 |
| 26 | Scott, Kepler, Kridler: survey team recorded
189 during 4,896 8-minute count periods and
91 at other times...observed on 9 of 21
transects surveyed and during 2.51 percent of
the count periods. .limited to higher elevations
..none observed during count periods on
transects 23 to 25...apparent 6-mile gap may be
related to subtle vegetation changes / 105,938 ha
(261,669 acre) area, windward Hawaii | | (June-Aug.) 1977 | (7) |
| 27 | Kridler: numbers found by survey team...
disappointing.. range more limited than the
creeper's...found on the NW side of Hualalai /
survey of 311,000 acres on the W side, ranging
from Hualalai to South Point; 5,800 count periods
at 2900 stations on 243 miles of transects worked
by 11 biologists | | 1978 (28 Aug. 1978) | WHIH78 |
| 27a | Jacobi: quite common in the upper mesic
koa-ohia and ohia forests in the Kau Forest
Reserve and then extending still with high
numbers from Kilauea (Forest Reserve) (north)
to Piha on Mauna Kea where they then decrease
drastically | | (1983) | (26) |

Kohala District

UNDESIGNATED LOCALITY

- | | | | | |
|----|--|------|----------|---------|
| 28 | Palmer: common / Kohala Mountains | 4000 | (1892) | ROTW00 |
| 29 | our native hunters considered it a variety
of the Ula-ai-hawane / in the Kohala mountains | | (? 1892) | MUNG44a |

KAMUELA

- | | | | | |
|----|--|------|-----------|--------|
| 30 | obtained 1 specimen / Puukapu Forest near Waimea | .... | Jan. 1888 | WILS90 |
| 31 | Banko: Wilson collected 1 specimen / Puukapu near Waimea (village) | .... | 1888 | (2) |
| 32 | Banko: Munro collected 1 specimen / Kohala | .... | 1891/1892 | (2) |

Kona District

MULTIQUADRANGLE

- | | | | | |
|----|--|-----------|--------------|--------|
| 33 | observed / Hualalai...prefer the ohia belt that runs horizontally around the dormant volcano | 5500-7000 | (1973) | VANC73 |
| 34 | Richards: noted, number unspecified, 2 specimens collected / horseback from Puuwaawaa Ranch headquarters to Shangrila, thence hiked about 0.25 mile up into forest behind cabin (1100-1400, 1715-1915 hours) | .... | 25 Aug. 1950 | (8) |

UNDESIGNATED LOCALITY

- | | | | | |
|----|---|-----------|----------------|--------|
| 35 | specimen obtained / during several days excursion from Kealekekua Bay into the interior | .... | Jan./Feb. 1779 | STRE50 |
| 36 | Palmer: comparatively numerous / Rona | 4000-7000 | (1891) | ROTW00 |
| 37 | Palmer: altogether more numerous (than at Pulehua) / on Mt. Hualalai | .... | (1891) | ROTW00 |
| 38 | Banko: Munro collected 1 specimen / Kona | .... | 1891/1892 | (2) |

39	rarest species of the Drepanididae / Kona	....	(June/Oct. 1892)	PERR93
40	Banko: Perkins collected 1 specimen / Kona	4000	(1892-1896)	(2)
41	Banko: (Wilson) collected 4 specimens / (Kona)	....	1896	(2)
42	Banko: unspecified collector took 1 specimen / Kona	....	(? ca. 1900)	(2)
43	Donaghho: seen / in the mamane on Hualalai	....	(mid-1930's)	(9)

KAILUA

44	common...later failed to find one / in mamane belt on the S slope of Hualalai	....	1935	DONW54
45	2 noted / koa forest on the S slope of Hualalai	....	May 1940	DONW40
46	Banko: 1 seen / Kaupulehu, North Kona, Hualalai Ranch	4000	27 June 1969	(10)
47	Banko: Kosaka reported seeing male / Palani Ranch (Honokohau I)	4840	25 May 1971	(4)
48	Banko: saw 2 males and 4 immatures or females / near jeep trail Palani Ranch (Honokohau I)	4860	8 June 1973	(4)
49	van Riper 111: 1 male seen in daylong walking survey / along boundary between Puuwaawaa and Hualalai Ranch	5500	15 June 1971	(11)
50	1 male...gleaning and feeding on ohia / 0.8 mile directly S of the Puuwaawaa rainshed	5500	17 June 1971	VANC72

KAILUA (con't.)

- 51 van Riper 111: 1 male, 1 female seen in 11 Aug. 1971 (11)
daylong walking survey / 0.5 mile below 4900 ft.
el. telephone (microwave) reflectors, W slope
Hualalai
- 52 1 male and 1 female both feeding on ohia... 5500 11 Aug. 1971 VANC72
from 3 to 5 minutes...on lehua buds and blossoms
in each tree / 1.9 miles SE of the Moanua Radio
Relay Station on the western slope of Hualalai

HUALALAI

- 53 found males and females / at the foot of the Feb. 1892 MUNG44a
upper peak of Hualalai
- 54 Richards: saw at least 3 / on walk 0.25 mile 26 Aug. 1950 (8)
into forest from R. L. Hind mountain house
"Shangrila"
- 55 Richards: 1 seen...collected / near 4250- 26 Sept. 1950 (8)
Shangrila, Puuwaawaa Ranch 4600
- 56 Richards: saw 5, collected 1 / S of 4250- 28 Sept. 1950 (8)
Shangrila, Puuwaawaa Ranch...back and forth 4550
all day long (0900-1900 hours)
- 57 Richards: 1 seen (0830-1100 hours) / 4250- 21 Oct. 1950 (8)
Shangrila, up to 0.25 mile S of cabin, 4500
Puuwaswaa Ranch
- 58 about 12 observed / on the N slope of Hualalai 4350 24, 26 Aug.;
26, 28 Sept.;
25 Oct. 1950 RICL53
- 59 van Riper 111: 1 male seen in daylong walking 8 Aug. 1971 (11)
survey / upper liinits of forest on Hualalai
above Shangrila, Puuwaawaa Ranch

60	1 male gleaning on leaves as well as lehua blossoms of the ohia / 2 miles directly above the Shangrila house on Puuwaawaa Ranch ...just above the koa belt and into the scrub ohia near the tree line	6800- 7000	9 Aug. 1971	VANC72
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KEALAKEKUA

61	Banko: specimen(s) collected during Captain Cook's voyage / (Kaawaloa area)	1778/17 79	(2)
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PUU LEHUA

62	Banko: Ballieu collected 4 specimens- / (Pulehua Ranch ?)	1877	(2)
63	Banko: Wilson collected 2 specimens / Pulehua Ranch	1887	(2)
64	obtained 2 specimens / Puulehua Ranch, Kona	5000	June 1887	WILS90
65	only males and a few immature(s) / Puulehua, Kona	4000	Sept. 1891	MUNG44a
66	Palmer: specimens obtained / Pulehua	....	(1891)	ROTW00
67	Perkins: obtained specimen / vicinity Pulehua	....	9 July (1892)	(5)
68	Perkins: shot specimen / vicinity Pulehua	....	13 July (1892)	(5)
69	Perkins: obtained specimen / vicinity Pulehua	....	24 July (1892)	(5)
70	Perkins: shot 1 / vicinity Pulehua	....	2 Aug. (1894)	(5)
71	Perkins: saw 2 / vicinity Pulehua	....	4 Aug. (1892)	(5)

PUU LEHUA (con't.)

- | | | | | |
|----|---|------|------------------|-----|
| 72 | Perkins: saw 2, shot 1, (one day); no doubt fairly common here but females and immatures easily overlooked / vicinity Pulehua | .... | 3-14 Aug. (1894) | (5) |
| 73 | Banko: Perkins collected 6 specimens / Pulehua Ranch | 4000 | (1892-1896) | (2) |

KAUNENE

- | | | | | |
|----|--|-------|--------|---------|
| 74 | females more plentiful than males / Honaunau | 4000+ | (1891) | MUNG443 |
|----|--|-------|--------|---------|

PUU POHAKULOA

- | | | | | |
|----|---|------|-------------|--------|
| 75 | Palmer: got some specimens; on the mamane in great numbers / Honaunau dairy belonging to a Mr. Johnson...about 6000 feet above the sea and some twenty miles to the S of Pulehua (after half-days horse ride up Mauna Loa to above 9000 feet) | | (Nov. 1891) | ROTW00 |
|----|---|------|-------------|--------|

PAPA

- | | | | | |
|----|--|------|---------------|------|
| 76 | Elder: seen / up from Ohia Mill, C. Q. Yee Hop Ranch, South Kona | 6700 | 1-4 Oct. 1956 | (12) |
|----|--|------|---------------|------|

Ka'ū District

UNDESIGNATED LOCALITY

- | | | | | |
|----|---|------|----------------|-----|
| 77 | Donaghho: not uncommon / in the wet koa forest (vicinity of Hawaii National Park) | .... | June-Aug. 1937 | (9) |
| 78 | Banko: Perkins collected 8 specimens | .... | 1892-1896 | (2) |

MULTIQUADRANGLE

- | | | | | |
|----|---|------|-------------|--------|
| 79 | comparatively common / in the koa forests of Kau | .... | (1894-1902) | HENH02 |
| 80 | densities of 46 birds per 100 acres / found in 5 of 10 places censused on eastern slopes of Mauna Loa | .... | (1975) | MARD75 |

KULANI

- | | | | | |
|----|---|------|--------------|---------|
| 81 | obtained 1 specimen / Keauhou Road 3 miles from Volcano House | .... | Sept. 1887 | WILS90 |
| 82 | Banko: Wilson collected 1 specimen / Keauhou, Kau | .... | 1888 | (2) |
| 83 | extremely partial to the koa forests, but is found in localities where there are none of these trees, as in the forest between Kilauea and Keauhou (Ka'ū) and elsewhere | .... | (1892-1896) | PERR03 |
| 84 | seen / koa-olapa-naio growth, Keauhou Ranch near Forest Reserve boundary, on hike from Kipuka Puaulu | .... | 30 June 1937 | DONW51a |
| 85 | heard / scattered groves of ohia and koa... near Keauhou Ranch headquarters on hike from Keawewai | .... | 2 July 1937 | DONW51b |
| 86 | many / in koa forest on hike from vicinity Keawewai water tanks to Kilauea | .... | 2 July 1937 | DONW51b |
| 87 | Donaghho: saw 14, heard 22 / from about 6790 ft. elevation on 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 | (9) |

KULANI (con't.)

- | | | | | |
|----|--|------|---------------|---------|
| 88 | quite a few were noted, 22 of them surely,
and some heard were uncounted, as their notes
resembled those of the Creeper to my confusion /
clump of naio...on hike from vicinity of Keawewai
to Kilauea | | 2 July 1937 | DONW51b |
| 89 | heard / along Puu OO trail just above Keawewai | .... | 12 Sept. 1937 | DONW51d |
| 90 | occasionally seen / farther along Puu OO trail
on way from Keawewai to Mauna Kea | | 12 Sept. 1937 | DONW51d |
| 91 | present / Keauhou Ranch N of Kipuka Ki toward
the Puu OO trail | | 26 Aug. 1937 | DONW51d |
| 92 | seen and heard / through pastures and
scattered koa along Puu OO trail to Keawewai
from Keauhou Ranch, Kulani and Lalaau visible | | 11 Sept. 1937 | DONW51d |
| 93 | present and almost common / koa-lehua forests
at Keawewai | | Aug. 1938 | BALP41 |
| 94 | Baldwin: saw and heard several / Keawewai | .... | 10 Sept. 1938 | (13) |
| 95 | Baldwin: seen twice in different localities /
Puu Kipu | | 11 Sept. 1938 | (13) |
| 96 | Baldwin: seems scarce...did not hear...
anywhere else / Keawewai cabin area | | 6 Aug. 1941 | (13) |
| 97 | Baldwin: found...as in September 1938...
saw 1, possibly 2 / koa-ohia forest just to the
NE of the Keawewai cabin...up and down on the
forest on the aa in back of the cabin | | 6 Aug. 1941 | (13) |
| 98 | NPS: again found...but in smaller numbers
than in September 1938 / Keawewai | | Aug. 1941 | (14) |

99	seen / near Keauhou, Kau District	6800	24 Oct. 1948	RICL53
100	Baldwin: present (with iiwis, apapanes, amakihis, akiapolaaus, creepers in mixed flock); 2 specimens taken / in large...koa clumps in understory of Naiio, Metu , <u>Styphelia</u> (traversed on hike N from end of Strip Road to 7500 ft. Keauhou Ranch 1-2 miles W of Solomon's Waterhole, and return via 6850 contour	....	24 Oct. 1948	(13)
101	Banko: 1 specimen collected (? P. H. Baldwin) / 2 miles W of Solomon's Waterhole, Keauhou, Kau	....	1948	(2)
102	present / hike along N base Kulani Cone	....	10 May 1949	(13)
103	unsuccessful search / forest 0.25 mile W of Solomon's Waterhole	6300	12 Sept. 1949	(13)
104	discovered a pair / (Keauhou Ranch)	....	(17-19 June 1960)	EISE61
105	2 seen / koa parkland ...Keauhou Ranch behind the Park	....	19 June (1960)	DUNW60
106	1 seen a few weeks earlier than 19 June / Koa parkland, Keauhou Ranch behind the Park	....	(1960)	DUNW60
107	Banko: saw immature or female...survey from 1400-1730 hours / W of Solomon's Waterhole, koa kipuka	6280- 6400	13 Oct. 1970	(4)
108	Banko: saw 1 female or immature...survey from 1400-1730 hours / in ohia kipuka W of Solomon's Waterhole	6660	13 Oct. 1970	(4)
109	Banko: saw 2 (1 male, 1 female)...survey from 0945-1530 hours / loop survey N and S of Solomon's Waterhole	....	31 Dec. 1970	(4)

KULANI (con't.)

110	Banko: saw 4...survey from 1040-1310 hours / Solomon's Waterhole area	6380- 6550	22 Dec. 1971	(4)
111	Berger: censused - / Transect 1, 200 acres IBP Study Plot, Kilauea Forest Reserve (0945-1200 hours)	....	11 Jan. 1972	(14)
112	Berger: censused 1 / Transect 2, 200 acre IBP Study Plot, Kilauea Forest Reserve (1215-1325 hours)	....	11 Jan. 1972	(14)
113	Berger: censused - / Transect 4, 200 acre IBP Study Plot, Kilauea Forest Reserve (0923-1135 hours)	....	12 Jan. 1972	(14)
114	Berger: censused - / Transect 3, 200 acre IBP Study Plot, Kilauea Forest Reserve (1215-1320 hours)	....	12 Jan. 1972	(14)
115	Berger: censused - / Transect 1, 200 acre IBP Study Plot, Kilauea Forest Reserve (1130-1400 hours)	....	6 Feb. 1972	(14)
116	Berger: censused 1 (heard only) / Transect 2, 200-acre IBP Study Plot, Kilauea Forest Reserve (1427-1618 hours)	....	6 Feb. 1972	(14)
117	Berger: censused - / Transect 4, 200 acre IBP Study Plot, Kilauea Forest Reserve (1000-1215 hours)	....	7 Feb. 1972	(14)
118	Berger: censused - / Transect 3, 200 acre IBP Study Plot, Kilauea Forest Reserve (1240-1430 hours)	....	7 Feb. 1972	(14)
119	Berger: censused - / Transect 1, 200 acre IBP Study Plot, Kilauea Forest Reserve (0955-1225 hours)	....	14 March 1972	(14)

120	Berger: censused - / Transect 2, 200 acre IBP Study Plot, Kilauea Forest Reserve (1246-1400 hours)	....	14 March 1972	(14)
121	Berger: censused - / Transect 3, 200 acre IBP Study Plot, Kilauea Forest Reserve (0930-1125 hours)	....	15 March 1972	(14)
122	Berger: censused 1 (heard only) / Transect 4, 200 acre IBP Study Plot, Kilauea Forest Reserve (1151-1350 hours)	....	15 March 1972	(14)
123	Berger: censused - / Transect 3, 200 acre IBP Study Plot, Kilauea Forest Reserve (0910-1125 hours)	....	23 April 1972	(14)
124	Berger: censused 1 (heard only) / Transect 4, 200 acre IBP Study Plot, Kilauea Forest Reserve (1148-1325 hours)	....	23 April 1972	(14)
125	Berger: censused - / Transect 1, 200 acre IBP Study Plot, Kilauea Forest Reserve (1220-1410 hours)	....	20 May 1972	(14)
126	Berger: censused - / Transect 2, 200 acre IBP Study Plot, Kilauea Forest Reserve (1425-1535 hours)	....	20 May 1972	(14)
127	Berger: censused - / Transect 4, 200 acre IBP Study Plot, Kilauea Forest Reserve (0950-1140 hours)	....	21 May 1972	(14)
128	Berger: censused - / Transect 3, 200 acre IBP Study Plot, Kilauea Forest Reserve (1225-1337 hours)	....	21 May 1972	(14)
129	Berger: censused - Transect 4, 200 acre IBP Study Plot, Kilauea Forest Reserve (1015-1140 hours)	....	18 July 1972	(14)

KULANI (con't.)

130	Berger: censused - / Transect 3, 200 acre IBP Study Plot, Kilauea Forest Reserve (1203-1255 hours)	....	18 July 1972	(14)
131	Berger: censused - / Transect 1, 200 acre IBP Study Plot, Kilauea Forest Reserve (1315-1430 hours)	....	20 July 1972	(14)
132	Berger: censused - / Transect 2, 200 acre IBP Study Plot, Kilauea Forest Reserve (1445-1538 hours)	....	20 July 1972	(14)
133	Berger: data suggest a minimum of two pairs / Kilauea Forest Reserve, IBP 200 acre study site	....	5 censuses: 11 Jan., 6 Feb., 14 March, 20 May, 20 July 1972	(15)
134	Jacobi: 1 male seen in ohia tree / Kilauea Forest along Keauhou Ranch boundary, 1 mile N IBP transect parking area (1620-1625 hours)	....	29 July 1972	(16)
135	W. & M. Mull: good observations...male / upper Kilauea Forest Reserve	....	late July and early Aug. 1972	ANON73b
136	Jacobi: 1 male and possible female seen feeding in koa foliage / Kilauea Forest along Keauhou boundary 0.25 mile N IBP transect parking area (1700 hours)	....	14 Aug. 1972	(16)
137	Jacobi: 1 male and probably 1 female foraging in koa tree / Kilauea Forest 0.25 mile N of IBP transect parking area along Keauhou boundary (1200 hours)	....	20 Aug. 1972	(16)
138	Jacobi: two pairs foraging in ohia and koa trees / Kilauea Forest 0.25 mile N of IBP transect parking area (1245 hours)	....	21 Aug. 1972	(16)

139	Jacobi: one pair feeding together in ohia and koa trees / Kilauea Forest, across from IBP weather station (1425-1435 hours)	....	21 Aug. 1972	(16)
140	Jacobi: two males and 1 female watched 10 minutes in ohia and koa / Kilauea Forest, across from IBP weather station (1500 hours)	....	21 Aug. 1972	(16)
141	USFW: 2 males seen / in koa crown, ohia-koa kipuka, 0.5 - 1 mile beyond 1952 flow along Puu OO trail headed Mauna Kea	5600	10 or 11 Sept. 1972	(17)
142	Jacobi: saw 1 pair feeding in ohia tree foliage / along old road cut, Kilauea Forest (1115-1145 hours)	....	18 Oct. 1972	(16)
143	Jacobi: 2 males and 1 female foraging in koa and ohia trees / between IBP transects 3 and 4, Kilauea Forest (1300-1345 hours)	....	23 Oct. 1972	(16)
144	Jacobi: saw 2 males in large ohia trees / less than 0.25 mile N IBP transect parking area, Kilauea Forest (1415 hours)	....	23 Oct. 1972	(16)
145	Jacobi: watched male feeding in ohia trees / Kilauea Forest near IBP transect #4 (1130 hours)	....	29 Nov. 1972	(16)
146	Jacobi: watched 1 male foraging in ohia tree / 200 m. W of base of Puu Kulani (1500 hours)	....	29 Nov. 1972	(16)
147	13 censused.. .Christmas Count / Kilauea Forest Reserve	....	30 Dec.1972	GAGW73
148	observed 13 individuals.. .male birds ranged from mottled brown to bright orange.. .1 immature, apparently a female, was patchy gray and yellow / Kilauea Forest	....	30 Dec. 1972	VANC73

KULANI (con't.)

149	observed only 1 bright yellow female...after day's search / Kilauea Forest (same area 13 found 30 Dec 1972)	....	2 Jan. 1973	VANC73
150	censused 1...Christmas Count / Keauhou Ranch	....	30 Dec. 1973	MULW74
151	censused 12...Christmas Count / Kilauea Forest Reserve	....	30 Dec. 1973	MULW74
152	1 fledgling fed by 2 adults / Kilauea Forest Reserve	....	27 June (1974)	SMIH74
153	Conant: 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; Aug. 1974 - Nov. 1974	(18)
154	censused 6...Christmas Count / Kilauea Forest Reserve	....	14 Dec. 1974	MULW75
155	censused 9...Christmas Count / Keauhou Ranch	....	14 Dec. 1974	MULW75
156	Conant: 3.4 ± 2.62 birds per 40 ha, 93% occurrence frequency / monthly censuses, Kilauea Forest Reserve (Transect 91)	....	Dec. 1972 - July 1973; Aug. 1974 - March 1975	(18)
157	Conant: 2.5 ± 1.39 birds per 40 ha, 92% occurrence frequency / monthly censuses, Kilauea Forest Reserve (Transect 92)	....	Dec. 1972 - July 1973; Aug. 1974 - March 1975	(18)
158	3 observers saw 8 (incl. 1 flock of 5) 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 miles NW of Volcano	....	19 Aug. 1975	PRAH77

159	3 observers saw 10 in 8 hours...mostly in logged area...none found downslope where so abundant 19 Aug. (possible explanations given) / along approximately 1 mile boundary fence between Kilauea Forest Reserve and Keauhou Ranch, including recently logged area, approximately 11 miles NW of Volcano	....	20 Aug. 1975	PRAH77
160	1 seen / on a side road branching off the road running along the (Kilauea) Forest fence, Keawewai area	....	4 Oct. 1975	DONW75
161	saw 1 male / Keauhou, near Keawewai	....	4 Oct. 1975	DONW75
161a	censused 45...Christmas Count / Keauhou Ranch, Kilauea Forest Reserve, adjacent areas	....	1975	KATL77
161b	censused 100...Christmas Count / Keauhou Ranch, Kilauea Forest Reserve, adjacent areas	....	1976	KATL77
162	10 censused...Christmas Count / Waiakea Forest Reserve Transect 27	....	2 Jan. 1978	KATL78
163	4 censused...Christmas Count / Kulani Project Transect 28 upslope	....	2 Jan. 1978	KATL78
164	24 censused...Christmas Count / Kulani Project Transect 28 downslope	....	2 Jan. 1978	KATL78
165	12 censused...Christmas Count / Keauhou Ranch Transect 29	....	2 Jan. 1978	KATL78
166	4 censused...Christmas Count / Keauhou Ranch Transect 30	....	2 Jan. 1978	KATL78
167	0 censused...Christmas Count / Kilauea Forest Reserve (Keauhou Ranch Transect 30)	....	2 Jan. 1978	KATL78
168	0 censused...Christmas Count / Kilauea Forest Reserve (Keauhou Ranch Transect 31)	....	2 Jan. 1978	KATL78

KULANI (con't.)

169	0 censused...Christmas Count / Keauhou Ranch Transect 31	....	2 Jan. 1978	KATL78
170	3 censused...Christmas Count / Kilauea Forest Reserve (Keauhou Ranch)	....	2 Jan. 1978	KATL78
171	6 censused...Christmas Count / Keauhou Ranch	....	2 Jan. 1978	KATL78

KEAIWA RESERVOIR

172	Banko: saw and heard 15 (0845-1145 hours) / along Kilohana - Kahuku boundary fence, 6950-6500 ft. el., and W along Forest Reserve fence to Waihaka Gulch, 6520 ft. elevation	27 April 1971	(4)
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WOOD VALLEY

173	Banko: Henshaw collected 5 specimens / Ainapo	1895-1902	(2)
174	Banko: 1 specimen collected (? H. W. Henshaw) / Ainako (Ainapo)	1902	(2)

PUU O KEOKEO

175	1 seen / Kipuka Akala	5300	3 Nov. 1950	RICL53
176	Richards: only 1 seen / Kipuka Nene, 5800 ft. el.; Kipuka Akala (?), 5300 ft. el.; Kahuku - Ainapo trail (0745-1030 hours)	....	3 Nov. 1950	(8)
177	Banko: saw 2 / W and downslope of Kahuku parklands - edge 1950 flow (0805-0935 hours)	5900- 6160	25 June 1971	(4)
178	Banko: 1 seen...survey from 1515-1645 hours / in vicinity (? CCC) Camp, Kahuku parklands	6100- 6400	25 June 1971	(4)

- | | | | | |
|-----|--|---------------|---------------|-----|
| 179 | Banko: saw 1 male / Kahuku forest edge,
vicinity (? CCC) Camp | 6040-
6180 | 25 June 1971 | (4) |
| 180 | Banko: Harry: saw at least 1 orange male
...2 dull ones / near Hawaii Fish and Game
nene cabin, Kahuku Ranch | | 18 April 1973 | (4) |

PAHALA

- | | | | | |
|-----|---|------|-----------|-----|
| 181 | Banko: Henshaw collected 2 specimens / Pahala | .... | 1895-1902 | (2) |
| 182 | Banko: M. L. Walton collected 2 specimens /
Pahala | | 1902 | (2) |

Kīlauea District

MULTIQUADRANGLE

- | | | | | |
|-----|--|----------|--------------|---------|
| 183 | Banko: specimen(s) collected during voyage
of the H.M.S. Blonde / (along Hilo to Volcano
trail ?) | | (1825) | (2) |
| 184 | great rarity / throughout the deep forests of
Olaa...doubtless due to the general absence
there of koa | | (1894-1902) | HENH02 |
| 185 | not as numerous as at Keawewai / koa forest,
Kulani Cone trail from Volcano | | 13 July 1937 | DONW51b |
| 186 | (saw one) / on the Kulani Prison road | ca. 4500 | 11 July 1966 | BERA72 |
| 187 | censused 0...Christmas Count / Kulani Road
and Puu Makaala | | 30 Dec. 1973 | MULW74 |
| 188 | censused 0...Christmas Count / Stainback
Highway and Puu Makaala | | 2 Jan. 1978 | KATL78 |

MTN. VIEW

- | | | | | |
|-----|--|-------|-----------|-----|
| 190 | Banko: Henshaw collected 9 specimens,
including 2 from 2400 ft. elevation / Olaa | | 1895-1902 | (2) |
|-----|--|-------|-----------|-----|

KILAUEA CRATER

- | | | | | |
|-----|--|-------|--------------|------|
| 191 | Donaghho: saw 2, heard 2 / from Kipuka Puaulu
N into Brown's Ranch koa forest thence SE to
fence-line and back via tanks and ranch house
(7 miles) | | 30 June 1937 | (9) |
| 192 | Craddock: saw 1, heard 2 / 29 Mile Road
(first 5 miles of trail) from end of Raunanai
Road to Puu Kulani | | 13 July 1937 | (19) |

VOLCANO

- | | | | | |
|-----|--|-------|--------------|--------|
| 193 | Banko: Henshaw collected 6 specimens /
volcano | | 1895-1902 | (2) |
| 194 | Donaghho: begin to appear when one begins
to get into the forest / along trail from
Volcano to Kulani | | 13 July 1937 | (9) |
| 195 | censused 0...Christmas Count / Volcano,
Wright Road and Upper Olaa Forest Reserve | | 30 Dec. 1973 | MULW74 |
| 196 | censused 0...Christmas Count / Volcano
community | | 2 Jan. 1978 | KATL78 |

Hawaii Volcanoes National Park

PARKWIDE INFERENCE

197	Donaghho: rarely a casual visitor / within (Hawaii National) Park	....	June-Aug. 1937	(9)
198	rare or absent	....	(1940)	BALP41

UNDESIGNATED LOCALITY

199	very rare / unspecified (Hawaii National Park area)	....	(1936)	WILK36
200	NPS: seen / (? Hawaii National Park)	....	June 1955	(14)

MULTIQUADRANGLE

201	NPS: observed / hike to Kalapana (? from end of Chain of Craters road)	....	May 1939	(14)
202	NPS: sight record / along the Kalapana trail	....	1939	(14)
203	censused 0...Christmas Count / Olaa Tract, NPS	....	2 Jan. 1978	KATL78

PUU ULAULA

204	censused 0...Christmas Count / Mauna Loa trail	6600- 8200	2 Jan. 1978	KATL78
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MAUNA LOA

- 205 identified a female by its crossed bill and 13,013 2 June 1943 MUNG44a
 what remained of its colors / found near the
 summit of Mauna Loa on the ledge of the crater
 ...evidently blown up the mountainside from the
 forest below in a windstorm
- 206 Clark: obtained specimen / by a small pool ca. (ca. 2 June 1943) MUNG45
 on Mauna Loa 13,010

KILAUEA CRATER

- 207 Perkins: shot 3 / very long day's tramp 24 July (1894) (5)
 up the mountain from Kilauea (Volcano House)
- 208 Perkins: shot 5 / up the mountain unspecified 25 July (1894) (5)
 distance from Kilauea (Volcano House)
- 209 Banko: Koebele collected 18 specimens / 1896 (2)
 Kilauea (crater) area
- 210 Banko: undesignated collector obtained 1896 (2)
 1 specimen / (? Kilauea crater)
- 211 Banko: Perkins collected 6 specimens / 1892-1896 (2)
 Kilauea (crater) area
- 212 Perkins: always to be seen but not in large (1896) (20)
 numbers / 1.5 - 2 miles of Volcano House
 (toward Mauna Loa)
- 213 Banko: Walcott collected 2 specimens / 27 March-2 April 1901 (2)
 Kilauea (crater) area
- 214 Banko: Seale collected 2 specimens / Kilauea 27 March-2 April 1901 (2)
 (crater) area

215	Donaghho: saw 1 / Mauna Loa truck trail	6000- 7000	16 June 1937	(9)
216	saw 1...brilliant orange in the bright sunlight / kipuka near end of Mauna Loa Strip road	....	18 June 1937	DONW47
217	Donaghho: saw 1 / Mauna Loa slope, near truck trail	....	18 June 1937	(9)
218	NPS: definitely identified / in the koa forest behind Kipuka Puaulu	....	June 1937	(14)
219	only females.. .noted.. .distinguished (from other species present) by forked tail / mamane trees along road entering Kipuka Kulalio from S Park boundary	....	9 Aug. 1937	DONW51c
220	Donaghho: saw 7 / Mauna Loa slope, near truck trail	....	9 Aug. 1937	(9)
221	Donaghho: 1 seen / in the ohia on Mauna Loa (HNP area)	7200	June-Aug. 1937	(9)
222	Donaghho: several seen / in a flock of drepanids...(HNP area)	ca. 5500	June-Aug. 1937	(9)
223	Craddock: heard 1 / Mauna Loa slope near truck trail	....	1 Sept. 1937	(19)
224	Baldwin: possibly 2 seen...never recorded again in all the counts taken in several years on this plot / Bird Park census plot	4050	26 June 1940	(13)
225	recent reports of its occurrence (e.g. Donaghho, 1937),...not entirely satisfactory... has not been seen...in many hours of field work over a period of 3 summers / (Hawaii National Park)	....	(1940)	BALP41

KILAUEA CRATER (con't.)

226	still occurs / in the koa forests NE of the Mauna Loa Strip...last record in the Park over 20 years ago	....	(1958-1960)	DUNW61
227	(not seen in 10 trips...30.5 hours) / Mauna Loa Strip	4000-6700	April (2 trips), May (2 trips), June, Aug., Nov., Dec. (2 trips) 1960; March 1961	DUNW62
228	censused 0...Christmas Count / Mauna Loa trail	6600-8200	30 Dec. 1973	MULW74
229	censused 0...Christmas Count / rim of Kilauea Crater	....	30 Dec. 1973	MULW74
230	censused 0...Christmas Count / Mauna Loa Strip road	4000-6000	30 Dec. 1973	MULW74
231	censused 0...Christmas Count / Bird Park	....	30 Dec. 1973	MULW74
232	censused 0...Christmas Count / Mauna Loa road	4000-6600	2 Jan. 1978	KATL78
233	censused 0...Christmas Count / Kipuka Puaulu and adjacent areas	....	2 Jan. 1978	KATL78
234	censused 0...Christmas Count / rim of Kilauea Crater	....	2 Jan. 1978	KATL78

MAKAOPUHI CRATER

235	Donaghho: formerly not uncommon...now quite rare / Chain of Craters region (HNP area)	....	1937	(9)
236	Craddock: thought I saw a pair ...fly over my head / Puu Huluhulu Crater	....	12-30 June 1937	(21)

237	Baldwin: not positively found on follow-up of Ranger Olson's reported sighting / Kalapana trail	2200	28 July 1939	(13)
238	no positive records of its present-day occurrence / in the ohia forests below and to the SE of Kilauea Crater	....	(1940)	BALP41
239	NPS: positive identification / trip to upper Apua and Kahue lands	....	12 Sept. 1941	(14)
240	Baldwin: saw 1...heard 2 others...confirms Ranger Olson's previous records for this area / moderately open ohia forest with mature trees, Rahue	2500	12 Sept. 1941	(13)
241	NPS: presence...determined / in the lower ohia forest in a narrow belt extending eastward from the Ainahou Ranch	ca. 2500	(Sept. 1941)	(14)
242	Baldwin: possibly heard / Kalapana trail	2500	13 Nov. 1941	(13)
243	Baldwin: saw several / Kealakomo, Kalapana trail	2430	13 Nov. 1941	(13)
244	Baldwin: saw 1 / Kalapana trail	2430	14 Nov. 1941	(13)
245	Baldwin: found several / 0.5 mile NE of 2430 ft. elevation kipuka, Kealakomo, Kalapana trail	2570	14 Nov. 1941	(13)
246	Baldwin: possibly found / 0.75 mile NE from kipuka, 2430 ft. el., Kealakomo, Kalapana trail...seemed on edge of tree-fern zone	....	14 Nov. 1941	(13)
247	NPS: located successfully each trip...3 days spent searching / lower ohia forest at Apua and in the vicinity of the Kalapana trail	....	Nov. 1941	(14)

MAKAOPUHI CRATER (con't.)

- | | | | | |
|-----|--|---------------|---|--------|
| 248 | Baldwin: sketch map of proposed akepa research area / upper lands of Apua, Kahue, Kealakomo and Panau Nui E of Keauhou in the Kalapana extension of HNP | .... | 15 March 1943 | (22) |
| 249 | Baldwin: none found on round-trip hike / from Kalapana trail straight s to Naulu Village | 2400 | 18 Aug. 1943 | (13) |
| 250 | Baldwin: none seen either trip...rare or absent now / (1) reconnaissance trips to Panau Nui and Kealakomo forests between Kalapana trail and the pali above the coastal flats... (2) along Kalapana trail about 2.5 miles from Makaopuhi Crater...to E humps of the W lava flow (<u>Tetraplasandra</u> trees) | | (1) 5, 6 Aug. 1943;
(2) 18, 19 Aug. 1943 | (13) |
| 251 | found on 3 occasions / Kalapana trail, HNP | 2430-
2550 | 1941/1943 | RICL53 |
| 252 | Conant: none observed during systematic surveys...doubtful that it still occurs / Kalapana Extension, HNP | .... | 1976-1977 | (23) |

Mauna Kea District

UNDESIGNATED LOCALITY

- | | | | | |
|-----|--|-------------------|----------|---------|
| 253 | more plentiful than anywhere else / on the slopes of Mauna Kea | ca. 5000-
6000 | (1892) | MUNG44a |
| 254 | 3 noted / koa belt of Mauna Kea | .... | May 1940 | DONW40 |

MULTIQUADRANGLE

- | | | | | |
|-----|---|------|--------|--------|
| 255 | in over 4 years of work in this area I have seen only one...appear to be merely passing through / dry mamane - naio forest on Mauna Kea | .... | (1973) | VANC73 |
| 256 | survey of 392 transect miles produced only 2 individuals / mamane - naio forest on Mauna Kea | .... | (1975) | MARD75 |

MAKALAHAU

- | | | | | |
|------|--|------|--------------|--------|
| 257 | collected 1 specimen / within a few miles of Mana, Hon. Sam Parker's residence | .... | (18.88) | WILS90 |
| 257a | seemed to be mating / on the northern slope of Mauna Kea above Mana | .... | 18 Feb. 1892 | MUNG44 |

UMIKOA

- | | | | | |
|-----|--|------|------|-----|
| 258 | Banko: 1 specimen collected (? L. Miller) / Horner's Ranch (Paauilo) | 7500 | 1903 | (2) |
|-----|--|------|------|-----|

AHUMOA

- | | | | | |
|-----|---|-----------|--------------|--------|
| 259 | (saw one) seems definitely to have been a transient inasmuch as I had not seen the species in that area during the preceding three years / in the mamane - naio forest in the Mauna Kea Game Management Area on Mauna Kea | 7500 | 6 Feb. 1970 | BERA72 |
| 260 | 2 males sighted / in mamane forest... 6.4 miles W of Pohakaloa on the western slope of Mauna Kea | 6980 | 15 Feb. 1971 | VANC72 |
| 261 | van Riper 111: 2 seen, unspecified hours, study/survey / Puu Laau Study Area, 500x500 yards, between cabin and cleared strip | 7100-7200 | 15 Feb. 1971 | (11) |

PUU AKALA

262	3 seen / in koa forest...about 200 yards beyond Hopuwai outcamp...Huumula Sheep Station ...Mauna Kea	30 May 1966	DONW66
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UPPER PIIHONUA

263	1 seen / Saddle Road	4000	(23 March-14 April 1958)	EASW58
264	1 male...feeding on ohia leaves / a kipuka alongside the Puu OO trail between the Saddle Road and Kulani	5800	5 Aug. 1971	VANC72
265	van Riper 111: 1 male seen in daylong survey / Kipuka ?Ohia - along Kulani power line road - 0.75 hour ride in from Saddle Road	5800	5 Aug. 1971	(11)
266	Jacobi: Mull: pair seen / in a kipuka along the Saddle Road	5000-6000	(1973)	ANON73a

PIIHONUA

267	Palmer: pretty numerous / 6 hours, 45 minute hike out of Hilo headed up Wailuku River for palm region	....	13 April 1892	ROTW00
268	Banko: Perkins collected 8 specimens / above Amaulu (Amauulu)	2000	1892-1896	(2)
269	Banko: Perkins collected 2 specimens / Kaumana, Hilo	2000	1892-1896	(2)
270	Perkins: seen / high in dense forest well above highest cane fields in Amaulu (Amauulu), near fork of Wailuku River, Mauna Kea	....	20 Dec. (1895)	(5)

271	Perkins: shot 4 / in dense forest well above highest cane fields in Amaulu (Amaulu), near fork of Wailuku River, Mauna Kea	....	21 Dec. (1895)	(5)
272	Perkins: shot 1 / in dense forest well above highest cane fields in Amaulu (Amaulu), near fork of Wailuku River, Mauna Kea	....	22 Dec. (1895)	(5)
273	Perkins: shot 2 / in dense forest well above highest cane fields in Amaulu (Amaulu), near fork of Wailuku River, Mauna Kea	....	23 Dec. (1895)	(5)
274	Perkins: shot 3 / across branch of the Wailuku River from camp in dense forest well above highest cane fields in Amaulu (Amaulu), Mauna Kea	....	24 Dec. (1895)	(5)
275	Perkins: shot 3 / across branch of the Wailuku River from camp in dense forest well above highest cane fields in Amaulu (Amaulu), Mauna Kea	....	26 Dec. (1895)	(5)
276	Perkins: shot 1 / across branch of the Wailuku River from camp in dense forest well above highest cane fields in Amaulu (Amaulu), Mauna Kea	....	27 Dec. (1895)	(5)
277	Perkins: shot 1 / more to the S of my former trails from camp in dense forest well above highest cane fields in Amaulu (Amaulu), Mauna Kea	....	(Jan. 1896)	(5)
278	Perkins: many feeding / high up in koa trees, unspecified locality forest above Amaulu (Amaulu), Mauna Kea	....	(Jan. 1896)	(5)
279	Perkins: found in hundreds / on Mauna Kea above Hilo district	....	(1895-1896); (19 Sept. 1947)	(20)
280	comparatively common / in the mixed ohia and koa forests on the N side of the Wailuku River	1800+	(1894-1902)	HENH02

PIIHONUA (con't.)

281	Banko: Henshaw collected 2 specimens / Hilo above Amaulu (Amaulu)	2000	1895-1902	(2)
282	Banko: Henshaw collected 46 specimens / Kaiwiki	....	1895-1902	(2)
283	Baldwin: 1 tentatively identified / on 6 mile hike from end of Kaumana Road to first cabin shelter on Puu OO trail	2600- 2850	20 July 1941	(13)
284	1 present / Puu OO trail, South Hilo District	2000- 3000	20 July 1941	RICL53
285	none seen...where found last spring / Saddle Road, 15 mile marker from Hilo	....	mid-Aug. 1958	BALH58

HILO

286	specimen taken / vicinity banana-houses, slopes of Mauna Kea, half-day journey up mountain from Hilo	....	19 Oct. (1892)	ROTW00
287	Banko: Perkins collected 1 specimen / Hilo	....	1892-1896	(2)
288	Banko: Henshaw collected 2 specimens / Hilo	....	1895-1902	(2)
289	Banko: unspecified collectors took 2 specimens / Hilo	....	(? ca. 1900)	(2)

CHRONOLOGICAL DISTRIBUTION OF RECORDS

Distribution of some 459 *Loxops coccineus* ('Ākepa) occurrence records from 1779 to 1978 is shown in Table 4. Collections and observations of this species were sparse during the first 100 years after the species was discovered. Only about 12 records appear from the 1770's through the 1870's, but there is a substantial upswing from the 1880's through the 1900's when some 138 notes, statements, and collection records were logged. Almost no information on relative abundance or distribution of 'Ākepa appeared from 1910 until the late 1930's when a period of more recent activity was initiated.

TABLE 4. Distribution of 459 Loxops coccineus records by decade.

1770's - 2	1840's - 1	1910's - 0
1780's - 0	1850's - 0	1920's - 2
1790's - 0	1860's - 0	1930's - 40
1800's - 0	1870's - 4	1940's - 38
1810's - 0	1880's - 13	1950's - 16
1820's - 2	1890's - 106	1960's - 60
1830's - 3	1900's - 19	1970's - 153

In the 1930's and 1940's some 78 records were tallied, chiefly by P. H. Baldwin, W. R. Donaghho, and other members of the Hawaii Audubon Society. Casual observers on recreational hikes were responsible for most of the records which appeared during the 1950's and 1960's. By the late 1960's information from professional biologists had increased significantly and by the 1970's had displaced that from casual observers.

GEOGRAPHICAL DISTRIBUTION OF RECORDS

Of some 320 records of *Loxops coccineus* ('Ākepa) which can be traced to specific quadrangles, 49 (15%) originated from the island of Kaua'i, and 228 (71%) from the island of Hawai'i.

Depopulation of the species before the 1890's is apparently responsible for the small number of records credited to O'ahu. Geographical distribution of records is shown in Figures 4 and 5.

COMPLETENESS OF DATA, **BIAS**, ERRONEOUS AND DOUBTFUL RECORDS

Information from U. S. Fish and Wildlife Service islandwide surveys on Kaua'i beginning about 1967, and on Hawai'i from 1976 to 1979, was not available for inclusion in this report. Contemporary knowledge of *Loxops coccineus* ('Ākepa) population status and distribution on Kaua'i and Hawai'i is, therefore, potentially greater than that presented.

There seems to be little if any bias in the historical record due to mistaken field identification. However, the orangish males on Oa'hu, Maui, and Hawai'i would appear offhand to be more noticeable than the grayish immature or greenish females. Perkins (field journal), after collecting one of two Hawai'i 'Ākepa seen one day, noted that the species was "no doubt fairly common here but females and immatures (are) easily overlooked" (72). Munro (1944a) noted that "females were more common than males" at 4000 feet—elevation in a Hōnaunau forest, presumably referring to his collecting experience with H. C. Palmer on the island of Hawai'i in 1891 (72). Munro (1944a) also stated that he found "only males and few immatures" at Pūlehua, Kona, in September 1891, so perhaps the degree of bias is not as significant as it might appear. In any event, it is doubtful whether the degree of error is great enough to change general impressions of relative abundance to any important degree. The less conspicuous plumage of immatures and females would, however, appear to induce a degree of bias in any statistical analysis of population numbers.

There are four almost certain erroneous observations recorded by Bole (1961) on Maui (39, 42, 43, 48); however, the improbable nature of Bole's sightings has already been pointed out by Bryan (1961).

Attention is drawn to S. B. Wilson's comment (Wilson & Evans 1890) that he found this species "so uncommon" on the island of Hawai'i in 1887 and 1888 that he was able to collect but five specimens in 8 months (1a). Wilson, who personally collected four of the five specimens taken, termed this species "one of the rarest," and believed it near extinction. Considering the fact that Wilson collected far fewer specimens than other ornithologists of that period, perhaps his statement regarding the rarity of the 'Akakane should be accepted with a degree of caution. In any event, later observers were much more successful in collecting this species and reported finding it relatively abundant and widely distributed.

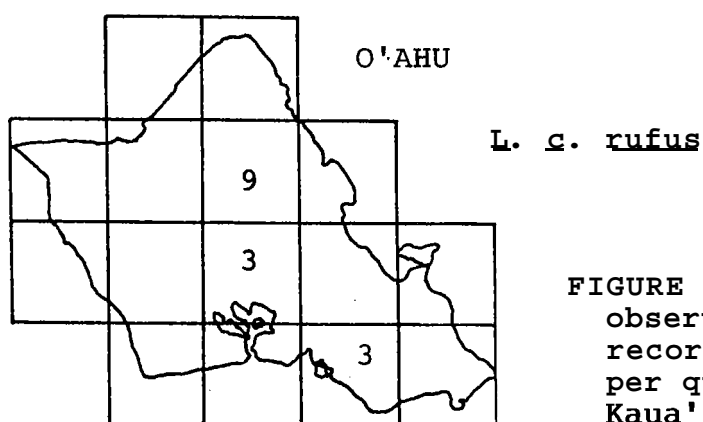
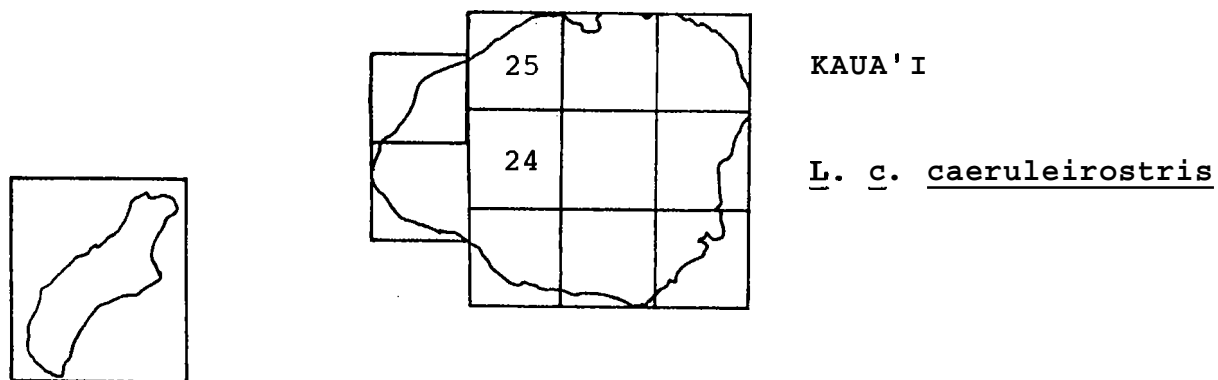
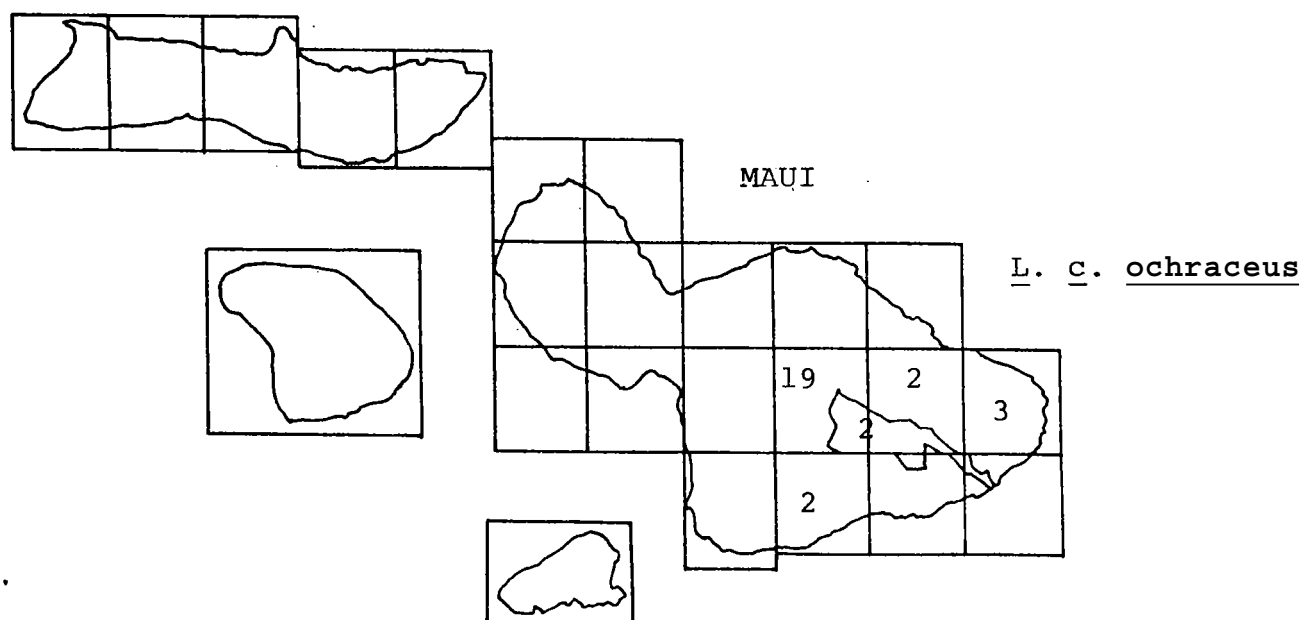


FIGURE 4. Distribution of 92 observations, reports, and museum records of Loxops coccineus subsp., per quadrangle, on islands of Kaua'i, O'ahu, and Maui, 1837-1978.



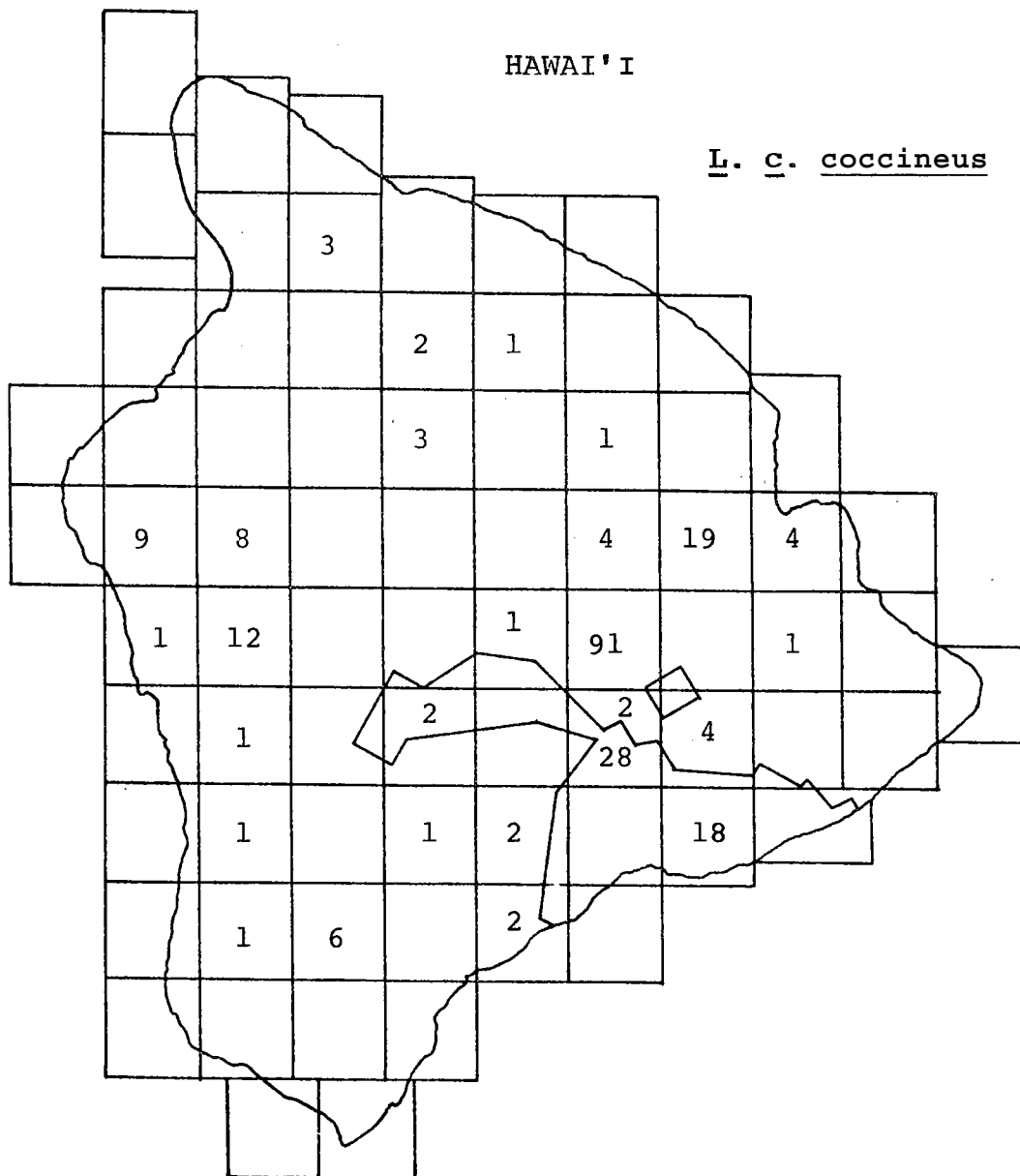


FIGURE 5. Distribution of 228 observations, reports, and museum records of Loxops coccineus coccineus, per quadrangle, on Island of Hawai'i, 1779-1978.

SUMMARY

Loxops coccineus, or 'Ākepa, is a small, orangish or greenish forest bird with a short stout bill and distinctly notched tail. Four subspecies are recognized, one each from the islands of Kaua'i (*L. c. caeruleirostris*), O'ahu (*L. c. rufus*), Maui (*L. c. ochraceus*), and Hawai'i (*L. c. coccineus*). 'Ākepa on various islands have different Hawaiian names, as follows: 'Akeke'e (Kaua'i); 'Akepeu'ie (O'ahu and Maui); and 'Akakane (Hawai'i). A gap in observational activity obscured status of populations from early 1900's to about 1940.

Kaua'i

'Akeke'e was a common and widely distributed bird of upper elevation (4000+ ft) forests in the 1890's. A wide ranging survey in 1960 found it to be a moderately common, widely scattered resident of the higher 'Ōhi'a and, to some extent, mixed koa forests where it has maintained similar relative abundance in the years since.

O'ahu

Apparently numerous from 1825 to 1837 when a total of seven specimens were taken, the 'Akepeu'ie was found to be very rare during the 1890's when only one specimen was secured. The 'Akepeu'ie has been reported seen on O'ahu only twice in the past 80 years, once in the 1930's and again in 1976.

Maui

'Akepeu'ie were locally common or abundant on Haleakalā in the 1890's but in spite of greatly increased field activity recently have been seen only five times since--in 1950, 1958, 1970, 1975, and 1979. There seems to be no records of 'Akepeu'ie on West Maui.

Hawai'i

In the 1890's, 'Akakane were found to be abundant in the Kohala mountains, on the northeast and southeast slopes of Mauna Kea, in parts of Kona District, and in what is now Hawaii Volcanoes National Park and Keauhou Ranch, Ka'ū District. 'Akakane have apparently disappeared in the Kohala mountains and have been reported along the slopes of Mauna Kea and in Kona and Ka'ū districts with decreasing frequency. A sparse population existing from low to high elevations in Hawaii Volcanoes National Park in the 1940's has disappeared. Moderate to scarce sub-populations have been reported in recent years only in the upper

mesic forests of the Ka'ū Forest Reserve northward through Keauhou Ranch and Kīlauea Forest Reserve and across the Mauna Loa-Mauna Kea saddle to Piha on Mauna Kea. Elsewhere on the island of Hawai'i 'Akakane are rare or missing entirely.

CONCLUSIONS

Loxops coccineus has maintained a relatively common and stable population on Kaua'i for the past 80 years. On O'ahu this species almost completely depopulated during the mid-1800's and has maintained a most tenuous existence since the 1890's. The subspecies on Maui, locally common or abundant on Haleakalā in the 1890's, almost completely depopulated in 60 years; only an occasional individual or two has been sighted in the past 20 years. Severe depopulation occurred on the island of Hawai'i after the 1890's. Fragmentary information from several districts, including Hawaii Volcanoes National Park where a sparse subgroup has disappeared since the 1940's, suggests continuing decline of the total population. Only the subpopulations in upper forests along the eastern flanks of Mauna Loa and Mauna Kea remain relatively substantial.

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33. Melamprosops ~~phaeosoma~~
Polo Uli

The **Po'o Uli** has the most recent and shortest history of any Hawaiian bird. Casey and Jacobi (1974) described and gave this new genus and species its Latin and Hawaiian names from two specimens collected at 6500 feet elevation on the northeastern flank of Haleakalā, Maui, on 15 and 17 September 1973. The HOLOTYPE was deposited in the B. P. Bishop Museum and the PARATYPE in the American Museum of Natural History (Casey & Jacobi 1974).

Marshall (1975) stated that only 12 individuals were identified during the 1973 Hānā Rain Forest Project and that this species was found only in a 60 ha (150-acre) tract between 5300 and 6800 feet elevation in the Ko'olau Forest Reserve. Shallenberger (1974) reported that "a 15-20 second observation," presumably of a single individual, was obtained (ca. 0.5 mile northeast of Pu'u'alāea) during a 6 to 13 April 1974 field trip. Conant (1979 reports, pers. comm.) documented two sightings (1 at 6400 & 1 at 6600 ft elev.) 0.5 mile northeast of Pu'u'alāea near the head of Hanawī stream on 21 and 22 June 1976. Little else of the status and distribution of this species seems to have been reported.

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