The Avifauna of the South Farallon Islands, California

DAVID F. DeSANTE and DAVID G. AINLEY

Studies in Avian Biology No. 4

A PUBLICATION OF THE COOPER ORNITHOLOGICAL SOCIETY

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Cover Photograph: Aerial view of Southeast Farallon Island (looking northeast).

STUDIES IN AVIAN BIOLOGY

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PREFACE

Eleven years have now passed since the Point Reyes Bird Observatory (PRBO) first established a permanent research station on the South Farallon Islands. In the course of serving as a truly positive force in limiting human disturbance (thereby aiding the population growth of existing species and the natural re-establishment of several previously extirpated species), the staff and volunteers of PRBO have studied the breeding marine birds and mammals and have conducted daily censuses of the visitant birds on and near the island. This monograph is a result of the latter effort. The data from which it is constructed—eight years of daily censuses of an offshore island—are truly remarkable. No similar data base exists anywhere in North America or, for that matter, anywhere on Earth. Such a monumental effort could not have been accomplished by a single individual, nor even by any handful of individuals. Rather it is the accomplishment of a large group of people, from both the scientific and lay communities, who gave freely of their time and energy in their commitment to the continuation of this project. It is to these people, mentioned by name in the Acknowledgments, that we respectfully and gratefully dedicate this work.

Several of these people deserve special mention. To Richard W. Stallcup, who first recognized the vast potential of the Farallones for monitoring migration, whose energy and enthusiasm continually sparked volunteers to help on the island, and who contributed greatly to an earlier version of this manuscript; to C. John Ralph, John Smail, and L. Richard Mewaldt, whose unselfish work and energy turned the vision of a permanent research station on the Farallones into a reality; to Henry Robert, who heroically manned the station, often for months at a time, during the first two tenuous years of its existence; and to T. James Lewis, whose unswerving dedication to the Farallones and competence and expertise in all matters pertaining to the island, be they scientific or maintenance, brought about the maturation of a truly permanent research station, we extend a personal message of thanks.

Dave DeSante
David Ainley

Stinson Beach, California
12 April 1979

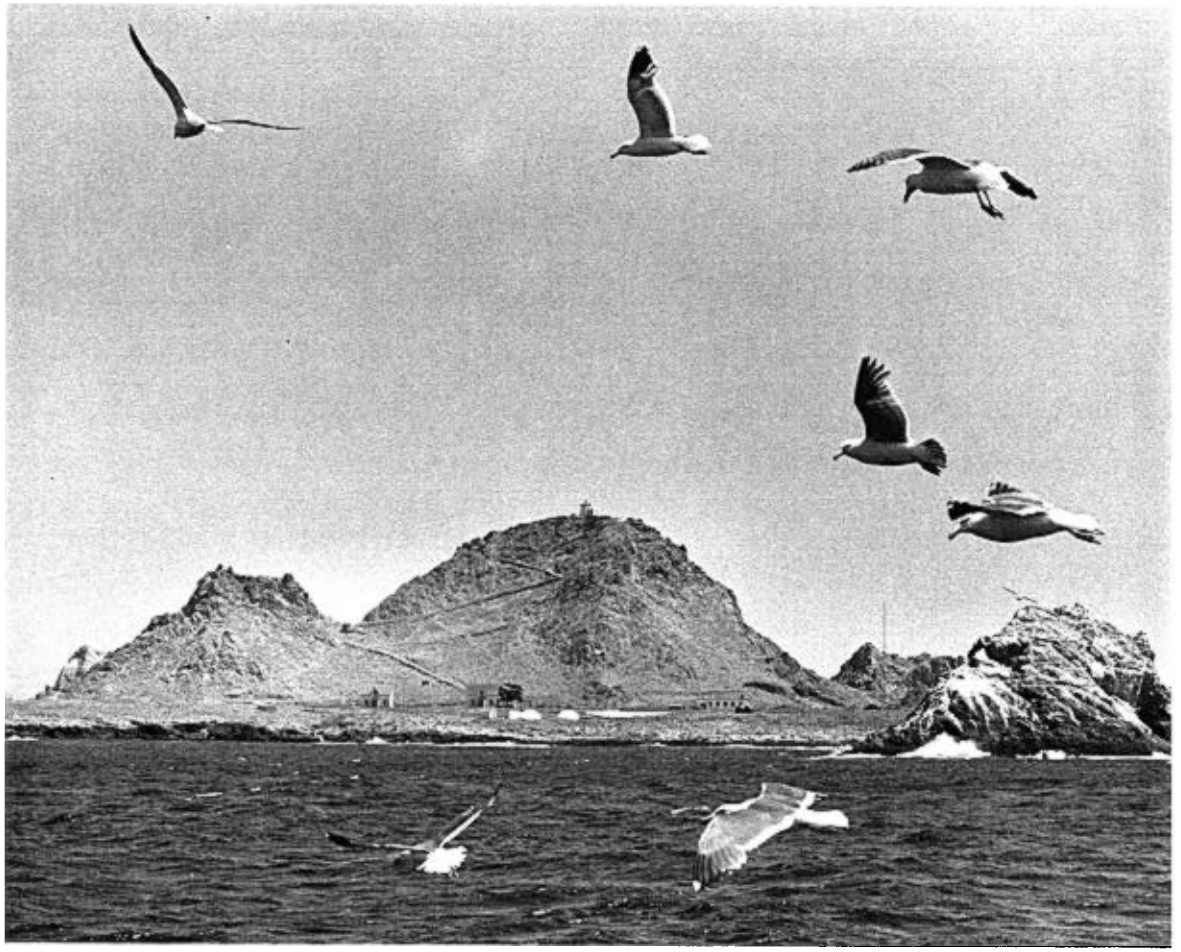
INTRODUCTION

Since publication of MacArthur and Wilson's *The Theory of Island Biogeography* (1967), the terrestrial and freshwater avifaunas of the California islands, particularly the Channel Islands, have attracted interest among ornithologists. Investigators have sought to test and refine theories relating to the origins and degrees of endemism of the species (Johnson 1972), avian species diversity relative to habitat complexity (Power 1972, 1976), and species turnover rates as effected by certain characteristics of the islands and their avifaunas (Diamond 1969, 1971; Lynch and Johnson 1974; Jones and Diamond 1976). The South Farallon Islands have heretofore been excluded from this work. Although few landbird species remain to nest at the Farallones, the frequencies of their visits have been intensively studied. This work measures the pool of potential colonists from which resident (breeding) avifaunas of the other California islands possibly originated, a subject not previously considered in detail.

Theoretical biogeography aside, an amazing number and variety of land and freshwater birds have visited the Farallones. At this writing, 223 of the 346 species recorded on or within 2 km of the island are typical of freshwater and terrestrial habitats. This represents quite an avifauna for a piece of land just 0.41 km^2 (0.16 sq. mi.) in area, and 32 km from the nearest terrestrial ecosystem. During the last 11½ years, biologists from the Point Reyes Bird Observatory (PRBO) have manned the island continuously, and every day—weather permitting—have censused the nonmarine birds. On most days during the spring and fall, traps and mist nets have been operated for the capture, diagnosis, and banding of visiting species. The present paper reports and analyzes in detail the results of the first eight years of that work and summarizes the ornithological records of past years. From this record, quantitative descriptions are made of the migratory periods of California coastal migrants, and of the rates of visitation by landbirds to an offshore California island as a function of their ecological and seasonal distribution pattern on the mainland. The breeding landbirds of the California islands are then reviewed relative to this pool of potential colonists.

As of 2 April 1976, 331 species of birds had been definitely recorded on the island or in waters within 2 km of it; 15 other species recorded in the subsequent 42-month period, to 2 October 1979, are included in the Addenda. Twenty-two of these 346 species had never before been recorded in the state of California, five of those remain unrecorded elsewhere in California, and about 74 others are extralimital on the California mainland. Details of four first records for California are published here: Gray-cheeked Thrush, Yellow-throated Warbler, Baird's Sparrow, and Cassin's Sparrow. The remaining species either breed on the island, use it for sanctuary and food during short or long periods, or are pelagic species identified from the island during their normal passage. One, the Short-tailed Albatross, is now on the verge of extinction and may never reappear. One, the Rock Dove, is feral. Two, the House Sparrow and Starling, were introduced to North America from Europe but have since reached the island under their own power. One, the California Quail, was introduced to the island and bred successfully, but is now extirpated.

Recent bird occurrences, those recorded by PRBO from 3 April 1968 to 2 April 1976, constitute the principal subject of this report. Data included were gathered



FRONTISPIECE. Southeast Farallon Island during summer 1975. This exposure, looking northeast, shows the marine terrace, Lighthouse Hill, all but two of the present buildings, the radio tower, and all of the island's trees. Photograph by Bill Parsons.

by conscientious observers (see Acknowledgments), most of whom had had experience in both banding and the identification of birds in the field and in the hand. Supplementing this information are more than 70 publications, dating from 1859, which deal with the wildlife of the Farallon Islands. In addition, Donald R. Medina visited the islands in May 1963 and collected many bird specimens which are now at the Museum of Vertebrate Zoology; PRBO also visited the islands 7–14 June and 20–26 September 1967, and banded or observed many birds. Records from these last three trips have not previously been published. The literature and unpublished data supply information on the avifauna from the mid-1800s through 1967.

In the instances of unusual or difficult-to-identify species, the consensus of at least two persons and a written description were required for acceptance of a sight record. Where only one observer was involved, a good photograph or a specimen was required. In very few instances, a single observer's sight record was accepted if the observation was accepted by the Western Field Ornithologists' California Bird Records Committee (see *Western Birds*). Identifications of such difficult-to-identify species as *Empidonax* flycatchers or certain wood warblers in immature plumage were based on the capture and keying of individuals. The library of the research station was amply stocked with literature helpful in making identifications. The birds present were recorded daily in the *Journal* of the Farallon Research Station. This and the banding records, which include measurements of difficult-to-identify species and often subspecific definitions and age differentiation, are on file at the station. In fact, Farallon data on the age ratios of several species are included in two previous reports (Ralph 1971, Stewart et al. 1974). Most of the critical specimens have been deposited in the California Academy of Sciences, San Francisco (CAS), but some have been deposited in the Museum of Vertebrate Zoology, Berkeley (MVZ), San Diego Natural History Museum (SDNHM), California State University at San Francisco, US National Museum (USNM), Academy of Natural Sciences, Philadelphia, and the Point Reyes Bird Observatory (PRBO). These specimens are listed in the Species Accounts unless previously published.

We have followed the classification and nomenclature of the American Ornithologists' Union *Check-list of North American Birds* (1957) and its supplements (1973, 1976). The exceptions are *Puffinus bulleri*, for which we used the common name, Buller's Shearwater (see Serventy et al. 1971), and *Catharacta maccormicki*, South Polar Skua (see Devillers 1977). We made no consistent attempt to include subspecific designations in this paper, but in many cases these may be found in the banding records and the Farallon *Journal*.

DESCRIPTION OF THE ISLANDS

The South Farallones are located just inside the edge of the continental shelf (37°42′N, 123°00′W) 43 km west of San Francisco, California (see Fig. 1). They comprise Southeast Farallon (the main island), West End, and several large, close-by rocks, in all an area of 41 ha. Maps of the South Farallones have been published by Emerson (1888), Bowman (1961), and Ainley and Lewis (1974). Some other rocks, 3 and 6 km northwest, are known respectively as Middle Farallon and the North Farallones; they are not considered further in this report.

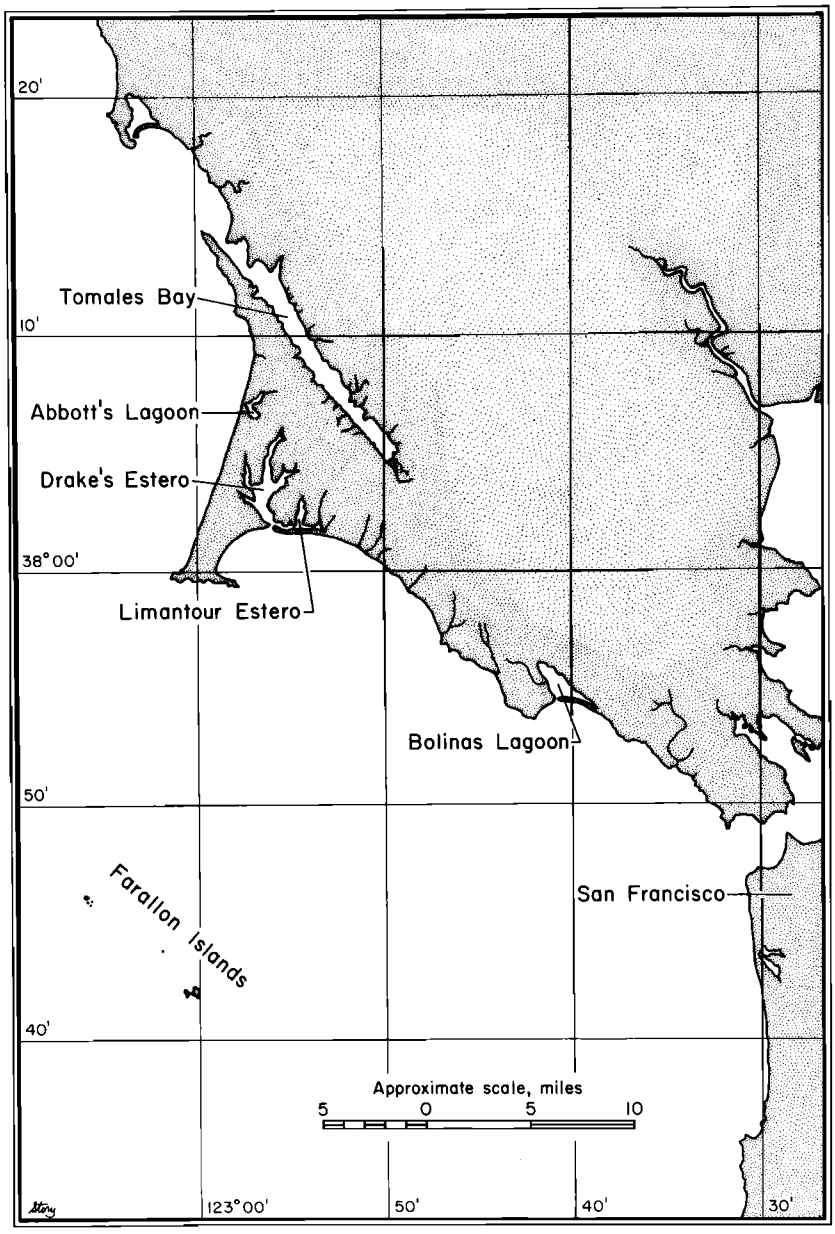


FIGURE 1. Map of coastal central California showing the location of the South Farallon Islands.

Point Reyes and Bolinas Point, Marin County, are the nearest mainland areas, 32 km due north and northeast, respectively.

The most complete descriptions of the geology, topography, and edaphic conditions are given by Blankinship and Keeler (1892), Hanna (1951), and Anderson (1960). Bowman (1961) and Ainley et al. (1974) included several habitat photographs in their reports. An ancient marine terrace, now about 16 m above sea

level, is the basic land form (see Frontispiece). From this rise several rugged hills of weathered granite, the highest of which is Lighthouse Hill (elev. 109.1 m). Rocky talus encircles this and other hills at their bases. Sandy soil occurs in most flat areas but is nowhere more than 1 m in depth. On the north and east sides of the island and on West End, seabird guano, sometimes to a depth of about 1 m, is the dominant substrate. The periphery of the island is cut profusely by deep surge channels. There are numerous sea caves, including several at higher elevations that were carved out before the last of the island's three periods of uplift (Hanna 1951). There is little fresh water except where small seeps keep the ground moist, where it leaks from a few storage tanks, or where it is placed in bird traps. Rainwater remains for long periods in some natural basins, and heavy fogs frequently dampen the substrate. It seems likely that the island has been isolated from the mainland for at least 11,000 years (Anderson 1960).

The vegetation has been described by Blankinship and Keeler (1892), Anderson (1960), Ornduff (1961), Pinney (1965), and Coulter (1972). The latter two authors discuss plant associations and distributions and provide a list of species. The 38 species of plants present in 1972 (a few more have occurred since) include 15 that are native and 23 that were introduced. This depauperate flora is due to the severe edaphic conditions and the grazing by European rabbits (*Oryctolagus cunniculus*) introduced some time before the 1870s (Hanna 1951; Ornduff 1961). Few plants grow on the rocky hills but a thick mat of grasses (*Hordeum, Vulpia*) blankets the southern quarter of the island; Farallon weed (*Lasthenia minor maritima*) is the dominant plant in other flat areas where vegetation grows (see maps in Pinney 1965 and Coulter 1972). Three trees are currently present, two 8-m-high Monterey cypresses (*Cupressus macrocarpa*) growing together in the lee of the living quarters, and one Monterey pine (*Pinus radiata*) growing prostrate to a diameter of 10 m and a height of 3 m, 100 m southeast of the living quarters (see photos in Bowman 1961). Doughty (1971) mentioned that attempts to plant trees in the late 1940s failed because of rabbits; the cypress trees present now must have been planted much earlier. One, of which only a stump now remains, was cut down sometime before 1967 and has at least 40 growth rings. Ray (1904) mentioned the existence of a grove of "evergreens." Almost all other plant species are annuals, a few of which reach 1 m in height.

The weather is influenced strongly by the cold subarctic waters of the California Current that flow by the island. Daily temperatures range from an average minimum of 10.6°C (8.9° in winter, 11.1° in summer) to an average maximum of 12.8°C (12.2° in winter, 14.4° in summer; from Coulter 1972). On rare occasions (twice from 1970 to 1974) temperatures have dipped to freezing and on equally rare occasions they have reached 20°C. Rain usually occurs only during October to April, and during 1968–1973 averaged 42.7 cm per year. On 84% of the days the wind is from the north and northwest at 10–20 knots (Blankinship and Keeler 1892). On most other days it is from the south and southwest, particularly during winter storms. On occasion winds have reached over 50 knots. Fog usually prevails during the summer; otherwise it is often overcast. The clearest weather occurs during the fall.

The only land mammal present other than the rabbit is the feral house mouse (*Mus musculus*). We do not know when it was introduced. Four species of pinnipeds breed at the South Farallones and are present year-round: Steller's sea lion (*Eu-*

metopias jubatus), California sea lion (*Zalophus californicus*), harbor seal (*Phoca vitulina*), and northern elephant seal (*Mirounga angustirostris*). Banana slugs (*Ariolimax* sp.) and an endemic subspecies of arboreal salamander (*Aneides lugubris farallonensis*) are present. The insects have not been well studied, but they include an endemic cave cricket (*Farallonophilus cavernicolus*), an endemic kelp fly (*Fucellia evermanni*), and several rather abundant beetles (tenebrionids, scarabids, coccinellids, and dermestids).

Human inhabitants, their work, and their life-styles have greatly affected the island's wildlife, especially from the early 1800s to about 1970. A lighthouse station has been present since 1854, and during the 50 years prior to that the large pinniped populations were a source of skins and meat for New England and Russian sealers. The history of human occupancy and reviews of effects on marine bird and mammal faunas are presented by Doughty (1971) and Ainley and Lewis (1974). The dogs and cats kept by the lightkeepers had potentially disruptive effects on both marine birds and landbirds. When PRBO established its research station in 1968 there were five cats, but they all disappeared not long afterwards (1972). In 1973 and 1974 the rabbits were exterminated. Since then the vegetation has become much denser and several species of plants have survived longer and formed rather large bushes. Gulls are important predators of landbirds on the island; several gull pellets have been found that contained landbird remains. During the spring, when both landbirds and gulls are present, the former tend to occur in areas free of gulls.

TERMINOLOGY AND METHODS OF ANALYSIS

One purpose of this work is to define the status and occurrence patterns of avian species on the South Farallon Islands. These definitions are based on only the eight years of census data gathered daily by the Point Reyes Bird Observatory between 3 April 1968 and 2 April 1976. Three parameters are used to define the status of any given species: the residency or length of stay, the seasonality, and the abundance of the individuals.

Residency.—The birds occurring on the Farallones are classified into two groups: residents and visitants. **Residents** are individuals known to have remained on or around the island for more than three weeks during any given season; **visitants,** on the other hand, are individuals that remained for three weeks or less. Sick or wounded individuals that remained for more than three weeks during their normal migratory period are classified as visitants. We consider the general term, visitant, to be more appropriate in describing occurrences than several more specific terms such as migrant, transient, dispersant, and vagrant. In using the latter terms, we would have had to make many more arbitrary classifications, thus greatly decreasing the value in their use.

Seasonality.—Residents may or may not breed on the island. Those that do are additionally termed **breeders.** Fifteen species (12 seabirds and three landbirds) have bred during the eight-year period analyzed here. Some, such as Black Oystercatcher and Western Gull, are present the entire year and are referred to as year-round (not permanent) residents and breeders. Others, such as Leach's Storm-Petrel and Tufted Puffin, are only present during spring and summer and are classified as spring and summer residents and breeders.

A number of species, both waterbirds and landbirds, remain on or around the

island during their nonbreeding season. The vast majority are present during the winter months and are accordingly termed winter residents. Some individuals of a given species may be present during the winter for more than three weeks while other individuals may be present for only a few days. In such cases the species is regarded as both a winter resident and a visitant. Only two nonbreeding species have been given a resident status during seasons other than winter: the Sooty Shearwater, which often appears to be resident in large flocks during the summer, and the Brown Pelican, which roosts in large numbers on the island from August (June in warm water years) to December.

Visitants, for the most part, appear during three seasons: fall, winter, and spring. For most species that do not breed or winter on the island, the separation of occurrences between spring and fall is obvious. For some, however, late spring visitants occur well into June or even early July, and fall visitants begin to arrive in late July or even earlier. The separation of spring and fall occurrences during the mid-summer months is, therefore, somewhat arbitrary. However, we have used the following guidelines to effect this classification. Individuals in, or molting into, a recognizably distinct basic (winter) plumage, and all juveniles or immatures of the year are classified as fall visitants. Individuals in breeding condition (that is, in an alternate or breeding plumage, or having enlarged gonads, a prominent cloacal protuberance, or a well developed brood patch) are classifed as spring visitants. For others, particularly waterbirds and those landbirds not classified by either of the above criteria, we used the largest break in occurrences during June or July to define the separation between spring and fall visitants. In most cases, the separation was quite distinct and presented no problems. This method results in elimination of a summer visitant class for all but two species, Starling and House Sparrow, both of which have bred on the island in recent years.

The separation of fall and winter visitants is considerably more arbitrary since winter occurrences could represent either delayed or harsh-weather southward migration or winter wandering. Since late fall occurrences for many species, even normally tropical wintering ones, exist until well into December, we chose 1 January as the arbitrary date separating fall and winter occurrences. Thus, all "valid" winter visitants occurred after 1 January and all "valid" winter residents remained until after 1 January. It should be noted that winter resident individuals that arrive in the fall are not included among the total of fall visitants.

The separation of visitants during late winter and early spring is also somewhat arbitrary. In general, a large break or a consistently timed increase in the number of occurrences is interpreted as indicating the arrival of spring visitants. Possible misclassifications between any of these seasons are mentioned within the Species Accounts.

Abundance.—As used in this work, abundance is defined by the minimum total number of individuals that have occurred in any season during the entire eight-year period. The algorithm used to determine this minimum total number for landbird species for which no banding or individual plumage data are available is: (a) all individuals present on a given day are presumed to be those present on the preceding day (unless there has been an increase in number), and (b) an individual must go unrecorded on only one day in order to establish the arrival

of a new individual. For example, if a week's census data for a given species is as follows:

Day:	1	2	3	4	5	6	7
Total present:	0	5	5	20	5	10	0
Number of arrivals:	0	5	0	15	0	5	0

it is assumed that 25 individuals occurred. It is possible, of course, that complete turnover occurred each day and that 45 individuals were involved. However, banding data (14,052 landbirds were banded on the island during the eight-year period) indicate that such complete turnover does not occur and that the daily census accounts for well over 95% of the landbirds actually present on any given day. These results supply considerable assurance that the above algorithm produces meaningful numbers. Of course, whenever banding data (capture, recapture, and sightings of banded birds) were available for any individual, or whenever distinctive individual plumage characteristics were recorded, the number of arrivals was modified accordingly.

The vast majority of landbirds tend to concentrate around the few trees, buildings, and water tanks, the top and south slope of Lighthouse Hill, the grassy marine terrace, and the two or three surge channels at the leeward (east) end of the island. These areas are readily accessible for censusing throughout the year. Visitant waterbirds, however, may occur around the entire periphery of the island, although the largest concentrations generally occur on Mussel Flat or in Mirounga Bay off the south side of the island, or on Sea Lion Flat or in Fisherman's Bay off the north side of the island. While these areas are readily censused, the shore and waters on the west side are not. Therefore, to allow for the possibility of missing waterbirds on the daily census, we relaxed the number of days on which an individual must remain unrecorded to establish the arrival of a new individual (see part b of the above algorithm) according to the following schedule: landbirds and pelagic species passing the island, 1 day; estuarine and freshwater species, shorebirds (except those preferring the rocky intertidal), and gulls, 2 days; inshore neritic diving species (loons, scoters, grebes, etc.), 3 days; and shorebirds preferring the rocky intertidal, 4 days. This method, we feel, compensates for the degree of detectability of the various species groups. In addition, this algorithm was relaxed even more during winter when resident individuals were missed but were known to be present. The actual numbers of certain rather common winter resident waterbirds, such as Surf Scoter, Black Turnstone, and Wandering Tattler, were extremely difficult to determine. These problems are dealt with individually in the Species Accounts.

We used abundance classes based upon a logarithmic scale to the base three (3). This scale provides an increasingly finer degree of classification for increasingly rarer classes. The base three was intuitively and arbitrarily chosen to meaningfully fit the quantity of data available (eight years of daily censuses of a 100-acre island). We recommend that a logarithmic scale of abundance be used whenever numerical census data are available. The abundance classes employed in this work are summarized as follows:

Log scale$_3$	Abundance classification	Code	8-yr. seasonal total of individuals	Approx. no. of individuals per season per year
1	**Extremely rare**	ER	1–3	<⅓
2	**Very rare**	VR	4–9	⅓–1
3	**Rare**	R	10–27	1–3
4	**Uncommon**	U	28–81	3–10
5	**Fairly common**	FC	82–243	10–30
6	**Common**	C	244–729	30–90
7	**Abundant**	A	730+	>90

Only two types of exceptions to this classification scheme exist. The first includes cases in which not all individuals known to have occurred on the island were identified to species (e.g., *Selasphorus* hummingbirds, *Empidonax* flycatchers). In these cases, both the absolute lower and approximate upper abundance classes are given (e.g., extremely rare to rare visitant). The second includes those species that characteristically arrive (or fly by) in large, coherent flocks. For these, abundance is reduced one class from the total number of individuals involved, or increased one class from the number of flocks involved, whichever is the lower. Fall Brant, for example, arrived in only six flocks (very rare) but included a total of 512 individuals (common). The abundance classification given this species is, therefore, rare.

We used the modifying term **sporadic** to classify species that showed marked fluctuation in seasonal abundances from one year to another. Statistically, their mean seasonal abundances have extremely high standard deviations. Application of the term is discussed within respective Species Accounts.

In the Species Accounts that follow, the numerical abundance and abundance class, the number of individuals banded, the specimen numbers for all existing specimens, and the high count and its date are given for each season. The timing of occurrences is presented both by means of the extreme seasonal dates and the timing of the peak number of arriving individuals. This peak was determined by tabulating the entire number of arriving individuals, for all eight years, in discrete ten-day intervals (e.g., early, mid-, and late April). Fall visitant status is treated first, followed by winter resident and/or visitant status, spring visitant status, and, finally, summer resident and breeding status. Old records (prior to 2 April 1968) are mentioned under the respective seasonal section. When applicable, a discussion of old breeding records and a documentation of landbird banding recoveries are presented in a final paragraph.

SPECIES ACCOUNTS

COMMON LOON—*Gavia immer*. *Fall:* rare visitant. Twenty of the 21 individuals were recorded between 12 October (1975) and 8 December (1975) with peak numbers occurring in late October and mid-November. The high count of four birds was recorded on 26 October and 12 November 1972. In addition, a single extremely early individual was present 22–24 August 1975. Interestingly, a probably flightless Common Loon was present in June 1975, and an unidentified loon was seen 6 August of that year. Possibly all three of these records represent a single summering individual. *Winter:* extremely rare visitant. A single individual was recorded 18 January 1976. *Spring:* very rare visitant. The five single individuals were recorded on 29 March 1971, 5 and 9 April and 1–2 May 1973, and 2–10 June 1975. Dawson (1911b) reported one individual on 2 June 1911.

ARCTIC LOON—*Gavia arctica*. *Fall:* fairly common visitant. Accurate numbers of this species were very difficult to obtain since the birds tended to swim well offshore, often off the more inaccessible parts of the island. The approximately 117 individuals were widely distributed between 25 August (1968) and 30 December (1971) with a rather pronounced peak from mid-November to early December. The high count of 30 birds occurred on 11 December 1975 and probably included five wintering individuals. *Winter:* uncommon resident and visitant. Approximately 38 wintering individuals were recorded between 26 October (1973) and 14 May (1971) with a high count of 15 on 8 March 1976. The 38 winter birds can be divided into 20 residents that remained near the island more than three weeks and 18 visitants. Most residents arrived in November or December; two of the 18 visitants occurred in early January while the remainder occurred in February or early March. Most wintering birds departed by late March but a few remained into May. Twenty-two of the 36 individuals were recorded during the winter 1975–76. *Spring:* fairly common visitant. The approximately 196 individuals occurred between 15 March (1974) and 9 June (1968) with one remaining from 3 June–4 July (1974). The major peak occurred in late March and a possible minor peak occurred in mid- to late April. The high count of 46 birds was recorded 22 March 1975. Ten late February and early March winter visitants could possibly represent early spring migrants.

Quite a few unidentified loons were recorded around the island: 12 fall individuals were widely scattered between 6 August (1975) and 11 December (1971); 22 winter individuals were recorded between 20 January (1972) and 6 February (1970) with a high count of 20 birds on 24 January 1975; 26 spring individuals occurred in 1971 between 1 May (24 birds) and 14 June. Most, if not all, of these unidentified loons were probably Arctic Loons.

RED-THROATED LOON—*Gavia stellata*. *Fall:* rare to uncommon visitant. Twenty-six of the 28 individuals occurred between 19 October (1971) and 19 December (1971, 1972) with a sharp peak in early November. The high count of six was recorded 1 November 1975. Two very early individuals were singles 1–9 August 1968 (possibly a summering bird) and 30 September–2 October 1975. This species was notably irregular during the fall: all but one individual were recorded during the three years 1971, 1972, and 1975. *Winter:* very rare visitant. The six individuals were recorded as follows: 9 January 1971 (two birds), 9 January 1972, 6–14 February 1970, 20 February 1973, and 25 February–1 March 1972. *Spring:* rare visitant. Eighteen of the 20 individuals occurred between 16 March (1972) and 25–30 April (1970) with a pronounced peak in late March. The high count of four was recorded 30 March 1969. Two extremely late individuals were seen 4 June 1970 and 6 July–10 August 1975, the latter a summering bird.

RED-NECKED GREBE—*Podiceps grisegena*. *Fall:* very rare visitant. The exact status of this species was very difficult to determine since individuals generally occurred off the more inaccessible parts of the island. The five single individuals were recorded on 14–15 September 1975 (an extremely early bird), 28 October and 12 November 1973, 24–27 November 1972, and 18 December 1968. *Winter:* rare resident and visitant. Sixteen individuals were recorded between 26 October (1971) and 8 April (1968) with a high count of six on 8 January 1976. The 16 winter records can be divided into 11 resident birds and five visitants. Five of the residents arrived between late October and early December, while the remaining six arrived between late December and early February. Most residents departed during February and March but one remained until 5 April (1971). Four of the five visitants were recorded in January or February and the remaining individual was recorded 8 April 1968. This late individual, recorded shortly after PRBO first arrived on the island, probably was a wintering bird, but could be considered a spring transient. If so, it is the only spring record for the island. Thoresen (1960) referred to "flocks" of this species near the island in January 1960 but this doubtless refers to misidentified Eared Grebes.

HORNED GREBE—*Podiceps auritus*. *Fall:* very rare visitant. The seven individuals occurred as follows: 16 September 1974, 5–8 October 1972, 13–17 October and 14–16 October (two birds) 1970, 26 October 1973, and 31 October 1971. A single individual was also recorded by PRBO on 21 September 1967. *Winter:* very rare resident and visitant. The eight winter occurrences can be divided into three residents (11 December 1970–18 March 1971, 11 December 1973–4 January 1974, and 24 December 1974–30 January 1975), and five visitants (a single individual on 7–8 January 1976, two additional birds on 8 January 1976, and singles on 5–6 February 1970 and 24 February 1972). The winter high count was three on 8 January 1976. *Spring:* extremely rare visitant. A single individual was recorded

on 24 April 1971. Previous spring reports of this species were for 31 March 1963 (Paxton 1963) and 7 April 1957 (Peterson 1957).

EARED GREBE—*Podiceps nigricollis*. *Fall:* uncommon to fairly common visitant. The approximately 118 individuals occurred from 31 August (1968) to 3 December (1971) with a high count of 50 fall visitants on 3 December 1971. The vast majority of Eared Grebes that arrived in the fall remained to winter around the island. In two years, however, maximum numbers were recorded in late November or early December, indicating that some individuals (about 80) were only fall transients at the island. In addition, 38 individuals, that apparently left the island before the large build-up of the wintering population, were recorded between 31 August (1968) and 19 October (1970). *Winter:* abundant resident. Astonishing numbers of this grebe, which usually inhabits inshore bays, wintered around the island. At least 3120 individuals occurred from 1 September (1974) to 26 June (1975). Scattered individuals began to appear in September and numbers gradually increased to a peak which lasted from late December to mid- or late March. The major exodus occurred in April and the species had generally departed by mid-May, but in two years stragglers remained into June, the latest being two birds present until 26 June 1975. The number of wintering individuals increased during recent years with a high count of 750 resident birds recorded 2 February–13 March 1976. This species was previously recorded by Peterson (1957) and by PRBO in September 1967.

WESTERN GREBE—*Aechmophorus occidentalis*. *Fall:* uncommon visitant. The 80 individuals occurred from 5–6 August (1974) to 13–21 December (1968) with the fairly flat peak occurring in early October. The high count of 10 was recorded 27 September 1974. *Winter:* extremely rare visitant. Single individuals were present 4 January 1976, and 21–22 January (specimen: PRBO 484) and 30 January 1971. Both of the 1971 birds were oiled. *Spring:* rare visitant. The earliest spring record was of a dying bird picked up on 10 March 1973. The remaining 22 spring records fell into three groups, with 11 individuals in late March, three in early to mid-May, and eight late individuals that arrived in early to mid-June. Many of these June birds remained a week or more with one remaining until 2 July (1972). The high count of eight was recorded on 24 March 1974.

PIED-BILLED GREBE—*Podilymbus podiceps*. *Fall:* very rare visitant. All four records were of single birds swimming about in tide pools on 13 September 1975, 16 September and 7 October 1972, and 18 October 1973.

SHORT-TAILED ALBATROSS—*Diomedea albatrus*. No recent records. The species was formerly numerous in the vicinity of the island (Finsch 1880). One was collected at the island on 20 March 1887 (Bryant 1888).

BLACK-FOOTED ALBATROSS—*Diomedea nigripes*. *Fall:* very rare visitant. The four fall occurrences included two birds on 3 September 1968, and single birds on 3 September 1969 and 2 November 1973. *Winter:* extremely rare visitant. A single bird was seen 31 January 1976. *Spring:* very rare visitant. The five spring occurrences were: 28 February 1973 (possibly a winter visitant), 7 April 1970 (two birds), and 16 April and 6 June 1975.

NORTHERN FULMAR—*Fulmarus glacialis*. *Fall:* sporadic common visitant. The 272 individuals occurred from 28 October (1971) to 31 December (1975). Peaks occurred in late October, mid-November, and late December, and the high count of 100 occurred on 30 October 1971. Most individuals (267) occurred during the four falls, 1968–1971. *Winter:* sporadic fairly common visitant. Ten of the 134 winter visitants were recorded on 29 February 1972. The remaining 124 occurred in 1976 between 12 January and 19–20 March. The high count of 100 was recorded 29 February 1976.

PINK-FOOTED SHEARWATER—*Puffinus creatopus*. *Fall:* fairly common visitant. The 105 individuals were recorded between 18 August (1974) and 9 December (1969) with a pronounced peak during early to mid-September. Single birds on 7 November (1973) and 9 December (1969) were the only occurrences after October. The high count of 25 was recorded on 3–4 and 20 September 1971. *Spring:* very rare visitant. The five spring occurrences were on 29 February 1972 (possibly a winter visitant), 21 May (two birds) and 22 June 1971, and 11 July 1973.

BULLER'S SHEARWATER—*Puffinus bulleri*. *Fall:* sporadic common to abundant visitant. The 842 occurrences extended from 22 August (1971) to 28 October (1975) with a pronounced peak during early to mid-September. The high count of 450 was recorded on 4 September 1971. All but 29 of the

occurrences, in fact, were during 1971. This species was not recorded in 1968, 1969, or 1972. There is one specimen of an individual that crashed into the lighthouse in September 1971 (U. So. Fla.).

Unidentified light-bellied shearwaters were recorded twice in 1975: 60 birds on 3 September and one on 18 September. One was also recorded by PRBO in September 1967. They were most likely Buller's Shearwaters.

SOOTY SHEARWATER—*Puffinus griseus*. *Fall:* abundant visitant. The approximately 201,880 individuals occurred from 12 August (1975) to 1 January (1973). Peak numbers occurred in late August and early September and probably represented a premigratory concentration of summering individuals. The largest numbers of this species were sighted during the falls of 1971, 1974, and 1975. The high count of 100,000 was recorded 25–26 August 1974. Numbers decreased rapidly in mid- and late September. This species was also recorded by PRBO biologists in September 1967. *Spring:* abundant visitant. The 4896 individuals occurred from 28 February (1973) to 23 May (1970) with a pronounced peak from late March to mid-April. Nearly 60% of the individuals were recorded in the spring of 1974 with the high count of 1500 occurring on 16 April. *Summer:* sporadic abundant nonbreeding resident. A total of 511,596 birds was estimated from the island: 409,602 of these occurred during the phenomenal summer of 1974, 100,042 during 1971, only 1950 in 1975, and two in 1970. This species was not recorded in the summers of 1968, 1969, 1972, or 1973. Summer numbers began increasing as early as 19 May (1975), peaked in mid- to late June, and dwindled during July to small numbers in early August. The high count was recorded on 11 and 17–18 June 1974 when at least 400,000 were seen from the island.

SHORT-TAILED SHEARWATER—*Puffinus tenuirostris*. Extremely rare visitant. This species is known to be a very rare fall and winter visitant to the waters around the island (Ainley 1976). The only record from within 2 km of the island itself, however, was of an old carcass found on an island beach in July 1971. It probably died during the winter when most occurrences from the general vicinity of the island have been noted.

MANX SHEARWATER—*Puffinus puffinus*. *Fall:* extremely rare visitant. The only record from the island was of three individuals seen 28 October 1975.

FORK-TAILED STORM-PETREL—*Oceanodroma furcata*. Extremely rare visitant. The only record from the island was a long-dead specimen (PRBO 558) picked up on 22 August 1971. Because several spring occurrences were recorded from the island in 1976 and 1977 (see Addenda), we feel that this bird may also have arrived on the island in spring.

LEACH'S STORM-PETREL—*Oceanodroma leucorhoa*. *Spring* and *summer:* abundant resident and breeder. The estimated breeding population was about 1400 birds (Ainley and Lewis 1974). They were absent from mid-September to early March. The species' breeding biology has been studied by Ainley et al. (1974) and Ainley et al. (1976). About 618 individuals were banded. This species was first recorded from the Farallones in July 1896 (Loomis 1896), and was later recorded by Dawson (1911b) and by Bowman (1961).

ASHY STORM-PETREL—*Oceanodroma homochroa*. *Year-round:* abundant resident and breeder. The estimated breeding population was about 4000 birds (Ainley and Lewis 1974). Most, but not all, individuals were absent during November and December. The species' breeding biology has been described by Ainley et al. (1974) and Ainley et al. (1976). About 2493 individuals were banded and 16 specimens (several at both MVZ and CAS) have been taken. The species was first described from a specimen collected at the Farallones (Coues 1864). Since then it has been recorded by most naturalists who visited the island.

BROWN PELICAN—*Pelecanus occidentalis*. *Fall:* abundant nonbreeding resident. At least 13,952 individuals (13 banded; specimen: PRBO 487) were recorded between 3 May (1973) and 8 February (1970). Although records existed for all months, the main population began to arrive from the Mexican breeding grounds in August and remained until mid-December with a peak in early to mid-October. Some stragglers remained well into January. The high count was 2494 on 3 October 1973. During warm-water years the resident flock began to build up as early as June but in cold water years the numbers did not begin increasing until August. Numbers have been documented as declining in recent years (Ainley 1973), but an increase seems to have taken place in 1973, 1974, and 1975. The species was previously recorded by Gruber (1884), Bryant (1888), and by PRBO in September 1967. *Winter:*

rare visitant. The 12 apparently nonbreeding individuals were widely scattered between 22 February (1976) and 11–15 April (1973). There was no evidence of a peak; the high count of two birds was recorded on 5 March 1970 and 11 April 1973. In 1959, Bowman (1961) thought they might breed on the Farallones but no substantiating evidence has been uncovered. That was a year of very high water temperatures (see Ainley 1976) and many pelicans were likely present during the spring.

RED-FOOTED BOOBY—*Sula sula*. *Fall:* extremely rare visitant. The only records for the island, and for the west coast of North America, were of a dark-tailed adult banded and photographed on 26 August 1975 and a white-tailed adult seen on 12 October 1975 (Huber and Lewis, in press).

DOUBLE-CRESTED CORMORANT—*Phalacrocorax auritus*. *Fall:* rare visitant. The 18 individuals were recorded during 1973 (14 birds) and 1975 (four birds) between 21 November and 24 December. There was no pronounced peak but the high count of six birds occurred on 26 November 1973. *Spring* and *summer:* common resident and breeder. This species was formerly much more abundant than at present. The breeding population was only 70 birds in 1972 (Ainley and Lewis 1974) but numbers increased to over 200 by 1976. The earliest arrival was 25 January 1975; egg laying occurred February to April; and the last breeding individuals or young-of-the-year usually departed by October. A total of 39 were banded. Two banded individuals have been recovered at saltwater estuaries along the adjacent coast: Bodega Bay (Sonoma Co.) and Tomales Bay (Marin Co.). Other color-banded birds have frequented Bolinas Lagoon (Fig. 1). The subspecies, *P. a. albociliatus*, was described from the Farallones (Ridgway 1884), and in earlier years along the Pacific Coast this species was commonly referred to as the "Farallon Cormorant." Most early accounts of the Farallon bird life mentioned this species (specimens: several at CAS).

BRANDT'S CORMORANT—*Phalacrocorax penicillatus*. *Year-round:* abundant resident and breeder. This was the most abundant cormorant; numbers of breeding individuals reached 22,000 in 1972 (Ainley and Lewis 1974). Most, but not all, of the population was absent from October through February. Egg laying occurred from April through June. Many of the 5199 banded birds have been recovered along the West Coast from Vancouver, British Columbia, to San Diego, California. Most early accounts of the Farallon bird life mentioned this species (specimens: PRBO 486, 546, plus several at CAS).

PELAGIC CORMORANT—*Phalacrocorax pelagicus*. *Year-round:* abundant resident and breeder. The breeding population was about 2000 birds (Ainley and Lewis 1974). Egg laying occurred during May and June. Many, but not all, individuals remained at the islands during the winter. About 41 birds were banded but no mainland recoveries have been reported. Most early accounts of the Farallon bird life mentioned this species (specimens: PRBO 544, 545, plus several at CAS).

MAGNIFICENT FRIGATEBIRD—*Fregata magnificens*. No recent records (but see Addenda). The only record, a skull found on the island in 1861 (Bryant 1888), was discussed by Ainley and Lewis (1974). Because all other northern California records of this species are from July to November, there is little doubt that this individual also occurred during the fall (see Ainley 1976).

GREAT BLUE HERON—*Ardea herodias*. *Fall:* uncommon visitant. The 30 individuals occurred from 4 August (1973) to 18 October (1974) with a pronounced peak in early September. The high count of three birds was recorded 8 September 1970. Interestingly, the species often arrived at the islands in twos. *Winter:* No recent records. However, Bryant (1888) reported that a few were seen every winter during the 1880s. *Spring:* extremely rare visitant. Single individuals were present 23 June 1973 and 29 June 1972.

GREEN HERON—*Butorides striatus*. *Fall:* extremely rare visitant. Single individuals were present 1 August 1968 and 29 September 1968. *Spring:* extremely rare visitant. Single individuals were present 29 April 1971 and 19 June 1970.

CATTLE EGRET—*Bubulcus ibis*. *Fall:* very rare visitant. The eight individuals occurred as follows: 12 October 1972, 11–24 November 1973, 24 November 1975, 3–11 December 1973 (two birds), 4–8 December 1974, and 17–28 December 1975 (two birds). The 1974 bird was banded on 7 December but found dead the next day. Other individuals appear to have subsisted by feeding on kelp flies found on and around elephant seals. The lack of records before 1972 provides evidence of the increasing numbers of this species in northern California in recent years.

GREAT EGRET—*Casmerodius albus*. *Fall:* very rare visitant. The six individuals occurred on 21 September 1969, 23 September 1974, 11 October 1975, 12 October 1971, 21 October 1972, and 7–8 November 1973. *Spring:* extremely rare visitant. Single individuals were present 13 June 1975 and 14 June 1974.

SNOWY EGRET—*Egretta thula*. *Fall:* very rare visitant. The five individuals occurred as follows: 23–24 July 1972, 27 August 1970, 13 October 1973, and 4 and 19–20 December 1975. Bryant (1888) reported three seen on one day but gave no date.

BLACK-CROWNED NIGHT HERON—*Nycticorax nycticorax*. *Fall:* extremely rare visitant. A single individual was present on 5 September 1973.

AMERICAN BITTERN—*Botaurus lentiginosus*. *Fall:* extremely rare visitant. A single bird was seen on 12 October 1970.

WHITE-FACED IBIS—*Plegadis chihi*. No recent records. Bryant (1888) reported one collected from a flock of six in the spring of 1884.

CANADA GOOSE—*Branta canadensis*. *Fall:* extremely rare visitant. The only fall record was of a flock of 18 that passed the island on 18 December 1970. *Winter:* extremely rare resident. A single individual was present on the island from 18 December 1975 to 8 February 1976.

BRANT—*Branta bernicla*. *Fall:* rare visitant. The 532 individuals were recorded in only six flocks: a flock of 180 on 4 November 1970, two flocks totaling 150 on 5 November 1970, a flock of 50 on 6 November 1969, two birds on 13 November 1971, and a flock of 150 on 25 November 1970. All of the large flocks were flying south. *Spring:* extremely rare visitant. A single flock of five flew past the island 19 March 1974. Peterson (1957) reported a flock of 150 on 7 April 1957.

WHITE-FRONTED GOOSE—*Anser albifrons*. *Fall:* extremely rare visitant. Single individuals were present 28 September 1968 and 12 October–24 November 1975. *Spring:* extremely rare visitant. A single individual was present 3–5 May 1971.

MALLARD—*Anas platyrhynchos*. *Fall:* very rare visitant. The eight individuals occurred as follows: 12 and 12–20 September 1975, 13 September 1969, 2 October 1968, 31 October 1971, 11–16 and 14–16 November 1972, and 14–15 November 1973 (found dead, PRBO 721). *Spring:* extremely rare visitant. A single bird was present 15 April 1975.

GADWALL—*Anas strepera*. *Fall:* extremely rare visitant. Single individuals were present 3–7 September 1969, and 18 December 1968. The first bird was captured and released on both 3 and 7 September.

PINTAIL—*Anas acuta*. *Fall:* common visitant. The 1252 individuals (three banded; specimen: PRBO 720) arrived in flocks or as single birds on 91 days between 18 August (1969) and 8 December (1973). There appeared to be two peaks, one in late August to early September and the other in late September. Only 41 individuals occurred in November and only one in December. The high count of 150 was recorded 25 August 1974. Individuals tended to occur in coherent flocks, especially in the early part of the period, and flew by the island without alighting. Some individuals, however, stopped and remained for several days, usually frequenting tide pools. Cogswell (1955) also reported Pintails on 3 October 1954. *Winter:* extremely rare visitant. A single individual was present 2 January 1976. *Spring:* extremely rare visitant. A single individual was present 20 March 1973.

On five additional occasions between 15 August (1969) and 9 November (1969), unidentified ducks (36 total individuals) flew by the island. In September 1967, PRBO also recorded an unidentified duck. These were all probably Pintails.

GREEN-WINGED TEAL—*Anas crecca*. *Fall:* rare to uncommon visitant. The 26 individuals (one banded) occurred from 4 September (1968) to 28 November (1969) with a pronounced peak during early to mid-October. Only four birds each occurred in September and November. The high count of eight was recorded 4 October 1972. *Winter:* extremely rare visitant. A single individual was present 17 January 1972.

In addition, eight unidentified teal were recorded during the fall. Single teal were present 14 September 1973, 28 September and 5 November 1975, and 15 November 1971; a flock of four on 25 August 1974 was the earliest date for any teal. At least a few of these were probably Green-winged Teal.

BLUE-WINGED TEAL—*Anas discors*. *Fall:* extremely rare to rare visitant. The only positively identified individual was a ♂ seen 13 October 1970.

CINNAMON TEAL—*Anas cyanoptera*. *Fall:* extremely rare to rare visitant. The only positively identified individual was present 23–25 October 1974. *Spring:* very rare visitant. There were three records of 10 individuals seen as follows: 30 January 1976 (six birds), 21 February 1976, and 1 March 1974 (three birds). These occurrences were all very early for spring migrants on the island, but in light of the known very early spring migration schedule of this species on the mainland and several other very early spring occurrences (of hummingbirds and swallows) on the island in 1976, they are here considered to be spring occurrences. Interestingly, there were no occurrences of Cinnamon (or Blue-winged/Cinnamon-type) Teal between 25 October and 30 January.

There were also fall records of 22 individuals of Blue-winged/Cinnamon-type teal unidentified as to species. These were as follows: three birds on both 15 and 24 September 1974; one on 22 September 1971; two on 1 October 1975; two, thought to be Cinnamon, on 2 October 1968; one, thought to be Cinnamon, on 12–14 October, and four on 14 October 1970; and six on 24 October 1975. An unidentified teal of this type was also recorded in spring on 19 June 1968.

AMERICAN WIGEON—*Anas americana*. *Fall:* rare visitant. The 14 individuals occurred from 15 September (1973) to 13 October (1970), with one bird remaining to 15 October (1972). The high count of five was recorded 13 October 1970.

NORTHERN SHOVELER—*Anas clypeata*. *Fall:* extremely rare visitant. An individual was present 24 September 1972 and two were present 1 October 1968.

GREATER SCAUP—*Aythya marila*. *Fall:* extremely rare visitant. The only positively identified individual was present 16 October 1973.

LESSER SCAUP—*Aythya affinis*. *Fall:* Very rare visitant. The six individuals were present 29 September, 2–3 (found dead) and 5–17 October 1974, and 7–11, 7–14, and 8 November 1973. The first two November individuals became oiled and died (specimen: PRBO 717).

In addition, two unidentified scaup were recorded: one on 22 January 1975 and the other on 8 February 1971. These were the only winter scaup from the island.

COMMON GOLDENEYE—*Bucephala clangula*. *Winter:* extremely rare visitant. A single individual was present 18 January 1974. *Spring:* very rare visitant. Individuals were present 12 April, 15 and 15–17 May 1970, and 6 June 1968.

OLDSQUAW—*Clangula hyemalis*. *Fall:* rare visitant. The 11 individuals occurred as follows: 16 October 1973 (two birds), 13 November–4 December 1970, 17–18 November 1968, 30 November 1975 (two birds), 5 December 1973, 7 December 1968, and 29 December 1975 (three birds). *Winter:* very rare visitant. The five single individuals were present 6 January 1971 (adult ♂), 9 and 24 January 1974, 16 February 1971 (♀), and 17–19 February 1976. The latter two birds may well have been early spring visitants. *Spring:* extremely rare visitant. Single individuals were present 2 March 1974 and 10 March 1971.

HARLEQUIN DUCK—*Histrionicus histrionicus*. *Fall:* extremely rare visitant. A single ♀ was present 13–23 October 1973. *Winter:* extremely rare visitant. Single individuals were present 9 January 1974 (♀), and 6–8 (immature ♂) and 13 (♀) February 1970.

WHITE-WINGED SCOTER—*Melanitta deglandi*. *Fall:* uncommon visitant. The 98 individuals (specimen: PRBO 370) arrived as single birds or in flocks on 18 days between 14 September (1972) and 29 December (1968) with a peak in late October. The 14 September bird was the only one recorded before 17 October (1973). Numbers varied greatly from year to year: none was present in 1974 and 1975, two to nine individuals were present during 1968, 1969, 1970, and 1972, but large numbers occurred in 1971 and 1973. During 1973, many remained from late October to December but then departed. The high count of 35 was recorded 30 October 1971. *Winter:* uncommon resident and visitant. The 43 winter individuals (specimen: PRBO 525) included 14 residents and 29 visitants. Individuals were resident only during the first four winters of the study. Most arrived in late November or early December but others arrived as early as 27 October (1970) and as late as 5 February (1970). Most (seven) departed in April (latest: 26 April 1972), but one remained to 9 June and another to 16 July (1970). The 29 visitants occurred from 5 January (1975) to 21 February (1971) with 24 visiting in

February. The winter high count of 11 birds was recorded 3 February 1976. *Spring:* uncommon visitant. The 40 individuals occurred from 12 March (1969) to 6 July (1974) with a pronounced peak during early to mid-May. Single individuals present 9 June 1968 and 6 July 1974 were the only ones later than 18–20 May (1970). The high count of five birds was recorded 4 April and 14 May 1970.

SURF SCOTER—*Melanitta perspicillata.* This species occurred in waters adjacent to the island from mid-October to mid-May in numbers that appeared to vary radically from day to day. This variation partially resulted from the difficulty of accurately censusing the whole population, since individuals spent time off the inaccessible parts of the island. Peak numbers generally occurred from late November through December and again in April or early May, indicating that fall and spring transients and winter residents were represented; larger numbers occurred during spring than fall. Numbers presented below are rough and probably are underestimates.

Fall: common visitant. The 402 individuals (one banded) occurred from 5 September (1974) to 10 January (1974) (latest arrival: 5 January 1975). Only 12 birds occurred during September. There appeared to be three arrival peaks: primarily transients in late October, transients and winter residents during mid- to late November, and primarily transients again in mid-December. The high count of 90 was recorded 13 December 1968; the highest number of transients was 67 on 27 October 1973. *Winter:* common resident and visitant. The 252 individuals (one banded) can be divided into 197 residents and 55 visitants. Most residents arrived in mid-November; the remainder from 19 October (1973) to 21 February (1971). The majority departed in April; a few departed earlier and some later (latest: 23 May 1975). The visitants arrived during mid- to late January and remained into early February. The high count of 70 was recorded 30–31 January 1976. Bryant (1888) reported "a few seen feeding near the island" but gave no date. *Spring:* common visitant. The 610 individuals arrived between 2 March (1976) and 23 May (1975) with a few lingering until 22 July (1974). Numbers tended to build up until mid-April or even early May; after that they declined abruptly. The spring of 1974 was unusual in that large numbers of Surf Scoters remained later; 55 were seen on 8 June and some stayed until July. The high count of 185 recorded 18 April 1975 was thought to include about seven winter residents.

In addition, a total of 465 unidentified scoters was recorded on four occasions: 31 August 1968 (12 birds, the earliest scoter record for the island), 6 October 1975 (one bird), 5 November 1970 (450 birds flying south), and 11–14 November 1968 (two birds). Most, if not all, of these birds were probably Surf Scoters.

BLACK SCOTER—*Melanitta nigra. Fall:* very rare visitant. The six individuals were present 12 October, 1 (three birds) and 1–4 December 1971, and 9 December 1970. *Winter:* very rare visitant. Two birds were present 2 January 1972 and three were present 21 February 1971. Interestingly, these were winters following the only falls when the species was recorded.

RUDDY DUCK—*Oxyura jamaicensis. Fall:* rare visitant. The 19 individuals occurred on eight occasions as follows: 27 September 1974, 13–25, 14–25, 17–25 (12 birds), and 19–25 October 1970, 7 November 1969, 8 November 1970, and 7 December 1969. *Winter:* extremely rare visitant. Single individuals were present 26 January 1973 and 14 February 1976.

RED-BREASTED MERGANSER—*Mergus serrator. Fall:* very rare visitant. The eight individuals occurred as follows: 23 (four birds) and 23–24 (two birds) November 1973, and 2 and 2–4 December 1971. The high count of 10, recorded 23 November 1973, included four winter residents. *Winter:* uncommon resident and visitant. The 45 individuals can be divided into 38 residents and seven visitants. Most residents (27) arrived between 7 November and 9 December each year; the remainder straggled in by 13 January, although one arrived 14 February 1971. Residents departed from January to as late as 14 May (1974) and 17 May (1976) but a peak in departures occurred in March. The seven visitants occurred from 10 January (1973) to 14 March (1971) with three in January and two each in February and March. The winter high count of nine was recorded 16 January 1973. Bryant (1888) reported that a specimen was taken by Ruggs but gave no date. *Spring:* extremely rare visitant. A single individual was seen flying north on 6 May 1972.

WHITE-TAILED KITE—*Elanus leucurus. Fall:* extremely rare visitant. Single individuals were present 29 September 1974, 19 October 1969, and 27 October 1974. *Winter:* No recent records. Bryant (1888), however, reported that several were seen by Ruggs in the winter of 1886–87.

SHARP-SHINNED HAWK—*Accipiter striatus. Fall:* uncommon visitant. The 34 individuals (one banded) occurred from 20 September (1971) to 8 November (1974) with a flat but definite peak from late

September to mid-October. Only two birds occurred after 21 October, one of which was in November. The high count of three birds was recorded 13 October 1975.

COOPER'S HAWK—*Accipiter cooperii*. *Fall:* rare visitant. The 13 individuals (one banded) occurred from 12 September (1969) to 11 October (1969) with a sharp peak from very late September to early October. The high count of three was recorded 29 September 1974. Bryant (1888) reported a specimen collected in 1886 but gave no date.

RED-TAILED HAWK—*Buteo jamaicensis*. *Fall:* extremely rare visitant. Single individuals were present 26 October 1974, 6–26 November 1968, and 11 November 1971. *Winter:* extremely rare visitant. A single individual was present 28 December 1968 to 14 January 1969. *Spring:* No recent records. However, Bryant (1888) regarded it as a common spring migrant during April and May and mentioned 28 shot in May 1885 and 17 shot in 1887. The lighthouse keepers said they fed on murres.

ROUGH-LEGGED HAWK—*Buteo lagopus*. *Fall:* sporadic rare visitant. Of 20 individuals, 19 occurred during 1973. These arrived in two waves, the first during late October (13 birds) and the second in late November and early December (six birds, plus one that remained through the winter). The latest fall individual occurred 5–10 December. The only other individual was present 3–4 October 1974. *Winter:* extremely rare resident. A single individual was present from 17 November 1973 to 25 February 1974.

GOLDEN EAGLE—*Aquila chrysaetos*. *Fall:* Extremely rare visitant. An immature was present 28 October 1971, the only record for the island.

MARSH HAWK—*Circus cyaneus*. *Fall:* rare visitant. Of the 13 individuals, 12 occurred from 27 September (1973) to 19 November (1975), with five from late September to early October and seven from late October to mid-November. An exceptionally early bird occurred 28 July 1972. The high count of two birds occurred 29 September and 27 October 1972, and 30 October 1973. *Spring:* no recent records. However, Bryant (1888) reported an individual seen in May 1885.

OSPREY—*Pandion haliaetus*. *Fall:* Extremely rare visitant. Single individuals were present 2–3 September 1968, and 18 September and 20 November 1975. Gruber (1884) reported that the lighthouse keeper collected one, and Bryant (1888) reported one collected on 15 December 1886.

PRAIRIE FALCON—*Falco mexicanus*. No recent records (but see Addenda). Heermann (1859) collected one in the 1850s, and Bryant (1888) reported a male shot on 18 December 1886.

PEREGRINE FALCON—*Falco peregrinus*. *Fall:* rare visitant. The actual numerical status was difficult to determine since Peregrines tended to occur around the more inaccessible parts of the island and, in addition, were thought to commute freely back and forth between the island and the mainland and between the south and north islands. Such behavior would tend to inflate counts. Characteristics of individual birds indicated that a few transients occurred primarily in late September and early October. Ten of the 14 fall individuals occurred between 22 September (1973) and 10 October (1969); the remainder included very early single birds on 25 August and 6–8 September 1968, and late single birds on 18 October 1969 and 26–27 November 1970. An individual was also observed by PRBO on 24 September 1967, and Craig and Cogswell (1956) saw one on 14 October 1956. *Winter:* rare resident and visitant. The 24 resident individuals occurred as follows: one in 1969–1970, two in 1968–1969 and 1970–1971, three in 1971–1972, and four in each of the last four years. On 18 January 1976, a fifth bird was present, apparently the only winter visitant. Plumage, size, and molt characteristics indicated that some of these birds returned year after year. Many, but not all, were thought to be of *F. p. pealei*. Most arrived in mid- to late October; only three arrived in November (two immatures included) and a very late bird arrived 17 February 1975 (it probably had arrived earlier). Individuals departed as early as 6 January (1973) but generally remained until March or April (latest: 30 April 1975, 1976). *Spring:* extremely rare visitant. An unusual occurrence was a bird present 29 June 1973. This individual could have been a summer visitor from the mainland. An unidentified falcon, probably a Peregrine, was seen 9 July 1968, perhaps also a visitor from a mainland location.

In past years, Gruber (1884) and Bryant (1888) both reported this species, Bryant mentioning a specimen shot 15 December 1886. Smith (1934) reported three in August 1933. The lighthouse keeper reported to him that in 1932 a pair nested on the cliffs below the lighthouse and successfully raised two young (C. S. Smith, in letter to Banding Laboratory, Patuxent).

MERLIN—*Falco columbarius*. *Fall:* very rare visitant. The seven single individuals were present 29 September 1972, 2–4 October 1972, 6 October 1969, 8 October 1975, 10 October 1971, 18 October 1973, and 25 October 1971. One was also seen by PRBO biologists on 24 September 1967. In addition, an unidentified falcon, probably a Merlin, was seen 19 October 1972.

AMERICAN KESTREL—*Falco sparverius*. *Fall:* fairly common visitant. The 126 individuals (10 banded; specimen: PRBO 254) occurred from the exceptionally early date of 24 July (1972), the only one for that month, to 11 December (1975), although one individual lingered to 16 December (1969). There were two sharp peaks: the first, primarily of transients, in late September, and the second, associated with the arrival of winter residents, in late October. The high count of four birds was recorded several times. Tenaza (1967) collected one 18 July 1965 and saw another 7 August 1965. PRBO reported this species in September 1967. *Winter:* rare resident. The 12 individuals (three banded) occurred as follows: none in 1971–72, one each in 1970–71, 1972–73, and 1973–74, two in 1968–69, 1969–70, and 1975–76, and three in 1974–75. An adult ♂ banded 16 November 1968 was recaptured on 27 November 1969, thus wintering during two consecutive years. Similarly, a ♀ banded in 1972–73 spent the succeeding three winters on the Farallones. Arrivals extended from 23 October (1975) to 23 December (1974) with the peak in late October and early November. There were one January, three February, one March, and seven April departures (latest: 17 April 1973). Returning individuals were generally among the earliest to arrive and the last to depart. Thoresen (1960) reported one present in January 1960.

CALIFORNIA QUAIL—*Lophortyx californicus*. Introduced; no longer present. Ray (1904) reported that resident lighthouse keepers kept them on the island for several years and that the birds nested among the grasses on the flat.

CLAPPER RAIL—*Rallus longirostris*. No recent records. A ♀ was collected 18 November 1886 (Bryant 1888) and was discussed by Grinnell and Miller (1944).

VIRGINIA RAIL—*Rallus limicola*. *Fall:* extremely rare visitant. One was banded on 2 September 1968 and another was seen 21 September 1971.

SORA—*Porzana carolina*. *Fall:* No recent records. Blankinship and Keeler (1892) reported one shot in August 1890. *Spring:* extremely rare visitant. An individual was banded on 26 May 1970 and was present the next day.

BLACK RAIL—*Laterallus jamaicensis*. No recent records. The subspecies *L. j. coturniculus* was described from an undated specimen collected on the Farallones (Ridgway 1890); Grinnell and Miller (1944) discussed this specimen and listed two others, one collected in June 1905 and one in December 1909.

COMMON GALLINULE—*Gallinula chloropus*. *Spring:* extremely rare visitant. A single individual was present 6 June 1975, the only record for the island.

AMERICAN COOT—*Fulica americana*. *Fall:* very rare visitant. The six individuals occurred as follows: 12–14 September 1973 (banded), 22–23 September (became weak and died) and 27 September–24 October 1974, 2 October 1975, 4–6 October 1968 (banded but, being weak, was held in captivity and taken to the mainland on 9 October), and 13 October 1970. In addition, one was found dead by PRBO on 20 September 1967. *Spring:* extremely rare visitant. A single individual was present 11–20 May 1970. Bryant (1888) reported one caught in the spring of 1884 and said that they were common around the island during fall, but in the latter case he was probably referring to scoters (?).

BLACK OYSTERCATCHER—*Haematopus bachmani*. *Year-round:* common resident and breeder. The population at present is about 60 birds, including approximately 20 breeding pairs. Apparently because feeding territories cannot be compressed further, the breeding population has reached a maximum. Eggs are usually laid from late May to late June. One individual, color-banded as a chick in August 1971, was seen often and regularly on the island until 30 March 1974. On 23 April 1974 it was seen at Agate Beach, Bolinas (Marin Co.), but by 29 July it had returned to the Farallones. Another bird, color-banded as a chick in July 1974, remained on the island until at least 4 October. Between 31 January 1975 and 4 January 1977 it was reported four times at Point Lobos (Monterey Co.), but by 16 March 1977 it had returned to the Farallones. About 35 chicks and one adult have been banded.

This species re-established a breeding population during the mid-1950s after an absence of several decades (Ainley and Lewis 1974). Only Kaeding (1903), of the early writers, previously reported this species.

SEMIPALMATED PLOVER—*Charadrius semipalmatus*. *Fall:* rare to uncommon visitant. The 53 individuals occurred from 28 July (1973) to 25 September (1970) with this latest individual remaining until 8 October (1970). All occurrences were of single birds except for two birds on 13 September 1973 and 30 on 21 August 1975. The peak occurred from late August to early or mid-September. Tenaza (1967) saw one individual on 4 September and collected one on 7 September 1965; PRBO also recorded two on 24 September 1967.

KILLDEER—*Charadrius vociferus*. *Fall:* fairly common visitant. The 114 individuals occurred from 26–27 August (1971), the only August occurrence, to 23 December (1974) with one individual remaining as late as 28 December (1968). The rather pronounced peak occurred from late September to mid-October and the high count of 16 occurred on 14 October 1970. The species was also recorded by PRBO in September 1967 and by Bryant (1888) who reported that it was common at times during the fall. *Winter:* rare resident and visitant. The 16 winter individuals can be divided into eight residents and eight visitants. Interestingly, 11, including all eight residents, occurred during the winter of 1975–76. The earliest of these residents arrived on 20 November; three each arrived on 25 November and 31 December; and the last arrived on 15 January. All eight departed in early to mid-February, the latest staying until 19 February. The eight winter visitants occurred as follows: 2–3 and 3 January 1975, 5 January 1972 (two birds), 21 January–8 February 1976, 22 January 1975, and 6 February 1976 (two birds). The four early January birds could be considered to be late fall migrants. The winter high count of 11 occurred on 6 February 1976. Thoresen (1960) also recorded two in January 1960. *Spring:* very rare visitant. The nine single individuals occurred as follows: 16 March 1974, 29 April 1973, 9 and 9–11 May 1968, 25–26 May 1972, 31 May 1975, 2 June 1969, 16 June 1975, and 12–13 July 1970. This last occurrence could be considered to be an extremely early fall visitant. The next earliest fall individual, however, was not until 26–27 August (1971).

DOTTEREL—*Eudromias morinellus*. *Fall:* extremely rare visitant. A single individual was present, and was well photographed, 12–20 September 1974. This represents the only record for California and one of very few in North America outside of Alaska (Henderson 1979).

AMERICAN GOLDEN PLOVER—*Pluvialis dominica*. *Fall:* uncommon visitant. The 44 individuals occurred from 26 August (1973) to 31 December (1975) with a major peak in mid-October and a possible minor peak in early September. The two extreme dates were the only ones from those respective months. The next latest occurrences were 15 November (1970) and 15–18 November (1974). The high count of five was recorded on 10 September and 23 and 30 October 1973. Individuals often remained for several days, even up to a month or more, on the island. *P. d. dominica* was the usual form but *P. d. fulva* was also recorded. *Spring:* extremely rare visitant. The only positively identified individual was a single bird on 29 April 1974. An unidentified plover, probably of this species, however, was present 10–12 May 1973.

BLACK-BELLIED PLOVER—*Pluvialis squatarola*. *Fall:* fairly common visitant. The 94 individuals occurred from 22 August (1975) to 23–24 December (1974). This last individual was the only December visitant and possibly represented a winter visitant. The next latest fall visitant arrived 30 November (1971) but a fall visitant remained as late as 9 December (1969). There appeared to be two sharp peaks, the first in late September and early October, and the second, coinciding with the major arrival of winter residents, in late October. The fall high count of 10 on 1 October 1974 probably included three winter residents. Individuals often remained for extended periods on the island. *Winter:* rare resident and visitant. The 19 winter individuals can be divided into 16 residents and three visitants. Arrival dates of the 16 residents were scattered between 8 September (1975) and 30 December (1971) with a peak in late October and early November. The main exodus of winter residents occurred in late January and early February but individuals disappeared as early as 2 January (1970) and remained as late as 6 April (1976). The three winter visitants occurred 1 January 1972, and 6 and 6–8 February 1970. The winter high count of eight residents occurred in 1975–76. *Spring:* extremely rare visitant. The two spring occurrences were single individuals on 1 May 1968 and 11 May 1969.

SURFBIRD—*Aphriza virgata*. *Fall:* rare to uncommon visitant. The 64 individuals arrived on only 17 dates between 20 July (1972) and 4 October (1968). Six occurred during July, 40 during August, 17

during September, and only one in October. Before early September, individuals usually arrived in flocks; 19 on 8 August 1968 was the high count. After early September, however, occurrences were of singles or very small groups. *Winter:* very rare resident and visitant. The four individuals occurred as follows: single residents, 5 October 1972–31 March 1973 and 9 January–10 April 1974; and single visitants, 30–31 December 1972 and 17 February–3 March 1976. *Spring:* extremely rare visitant. A single individual was present on 21 March 1969. It could possibly be considered to be an extremely late winter visitant. Heermann (1859) and Kaeding (1903) reported this species during June.

RUDDY TURNSTONE—*Arenaria interpes*. *Fall:* uncommon visitant. Actual numbers of this species were extremely difficult to interpret, since individuals, often mixed in with flocks of Black Turnstones, frequented the inaccessible rocky shores of the island and remained undetected for several days in succession. The 46 individuals (probably an underestimate of actual numbers) occurred between 13 July (1970) and 19 December (1971), the only December visitant occurrence. A rather prolonged flat peak occurred from late August to late September. The high count of eight on 25 September 1975 probably included two winter residents. Six were also recorded on 1 September 1968. The seven visitants recorded during November (latest, 25 November 1975) may, to some extent, be an inflated estimate. One was found dead by PRBO in September 1967. *Winter:* very rare resident and visitant. The five residents occurred as follows: 19 September 1973–28 March 1974, 12 September 1974–29 March 1975, 16 October 1974–4 April 1975, 5 August 1975–11 April 1976, and 12 September 1975–28 March 1976. They probably represented the same two individuals returning for two or three years in succession. The single winter visitant occurred 18 January 1976. *Spring:* very rare visitant. The four occurrences were single individuals on 2 April 1970, 22 April 1971, 17 May 1969, and 5–8 June 1971. Bryant (1888) listed a specimen collected 7 May 1887.

BLACK TURNSTONE—*Arenaria melanocephala*. *Fall:* common visitant. The actual number, timing, and extent of occurrence of fall visitant turnstones could not be determined accurately. Because the birds frequented the rocky intertidal periphery of the entire island, most of which is inaccessible, the census data were never complete. Furthermore, the actual amount of turnover during the latter part of the fall, when the large wintering population had already arrived, was impossible to determine since day-to-day variation in numbers may have represented movement from other parts of the island rather than actual migratory movement. Nevertheless, several lines of evidence indicate that substantial numbers of fall visitants did occur and, in fact, occurred comparatively late into the fall. First, peak numbers each year generally occurred between late September and late December, with the eight-year maximum in late November. Second, none of seven banded in September 1969 was ever seen again on the island. The estimate of 490 fall visitants (seven banded; specimens: PRBO 247, 722) is felt to be reasonable. Arrival dates of fall visitants occurred between 26 June (1974), the only June fall occurrence, and 30 December (1974) with a pronounced peak in late September. A minor peak that appeared to exist in late November may or may not have been an artifact of the censusing technique. The high count of 106 occurred twice: 25 September 1975 and 22 December 1969. The former date represented the high count of fall visitants, 71. This species was also reported in fall by Bryant (1888), Loomis (1896), Smith (1934), and by PRBO in September 1967. *Winter:* common resident. The 466 individuals (one banded) arrived between 10 July (1970) and 30 December (1974) with a sharp peak of arrivals in late August and a possible minor peak in late October. Winter residents began disappearing in mid-January (earliest: 12 January 1976) and departed at a fairly constant rate until early May (latest: 18 May 1973). The major exodus, however, occurred during April. One distinctively marked individual wintered successfully for six straight years from 1968–69 to 1973–74, suggesting that the winter population consisted of many of the same birds returning year after year. The peak winter for this species was 1969–70 with 78 birds, followed closely by 1971–72 and 1972–73 with 75 and 76, respectively. The last three winters, 1973–74 to 1975–76, have seen fewer winter residents with 42, 42, and 35 birds, respectively. *Spring:* uncommon visitant. The 38 individuals occurred from 29 April (1974) to 10 June (1973) with a sharp peak in early to mid-May. The high count of 21 on 1 May 1973 probably included nine winter residents. The only other June occurrence was 5 June (1971). This species, however, was reported in May and June 1887 by Bryant (1888), in early June 1903 by Kaeding (1903), and in late May 1911 by Dawson (1911b).

COMMON SNIPE—*Capella gallinago*. *Fall:* uncommon visitant. The 31 individuals occurred from 5 September (1970) to 11 December (1975) with a rather flat peak in mid-October. The single December individual was the only occurrence after 20 November (1975). The high count of three birds was

recorded on 13 October 1970. PRBO also recorded this species in September 1967. *Spring:* extremely rare visitant. A single individual was present on 1–2 May 1968.

LONG-BILLED CURLEW—*Numenius americanus*. *Fall:* very rare visitant. The five single individuals occurred as follows: 18–20 July 1970, 29 July 1973, 8 August–26 November 1970, and 30 August and 7–11 September 1972. Bryant (1888) reported that stragglers occurred during migration but gave no dates.

WHIMBREL—*Numenius phaeopus*. *Fall:* uncommon visitant. The 72 individuals occurred from 6 July (1975) to 5 November (1972, 1975) with one individual remaining until 23 November (1972). There appeared to be two or even three peaks: the first, rather sharp and very early, occurred in late July; the second, a very sharp major peak coinciding with the main arrival of winter residents, occurred in early September; the third, a possible minor peak, occurred in late October and early November. The high count of 11 on 8 September 1975 probably included four winter residents. Loomis (1896) reported one on 16 July 1896. *Winter:* rare resident. Fifteen of the 17 individuals arrived between 6 August (1975) and late September; the two remaining individuals arrived 29 October (1972) and 7 November (1969). Winter residents departed as early as 14 February (1975) and remained as late as 4 May (1972), but the major exodus occurred in March and April. It is likely that the same individuals wintered for several years. Winter numbers have increased in recent years with three birds in 1973–74 and five each in 1974–75 and 1975–76. *Spring:* rare visitant. The 12 occurrences, all of single individuals, were distributed as follows: one, extremely early, on 31 March 1970, three in early May, one in mid-May, two in late May, three in early June, and two late individuals, 19–27 June 1972 and 25 June 1973.

UPLAND SANDPIPER—*Bartramia longicauda*. *Fall:* extremely rare visitant. A single individual was present 22–24 August 1968. An Upland Sandpiper's wing was found 31 August 1968; presumably, it belonged to the above individual. *Spring:* extremely rare visitant. A single individual was present on 23 May 1969.

SPOTTED SANDPIPER—*Actitis macularia*. *Fall:* uncommon visitant. The 44 individuals occurred from 9 August (1973) to 15 November (1971), but only four were later than 9 October (1971): 25–31 October 1971, 3 November 1972, and 8 and 15 November 1971. A well-defined peak occurred in mid-September and the high count of four was recorded on 13 September 1975. *Spring:* extremely rare visitant. Single individuals were present 1 May 1971, 11 May 1969, and 13 May 1971.

WANDERING TATTLER—*Heteroscelus incanus*. *Fall:* common visitant. The actual number of fall visitants was difficult to determine with any accuracy since individuals regularly frequented the entire rocky periphery of the island, most of which is inaccessible. The estimated 320 individuals (six banded) occurred from 24 June (1971, 1973) to 30 December (1971) with a very sharp major peak in late September and a possible minor peak, associated with the first major arrival of winter residents, in late July and early August. The high count of 35 occurred on 25 September 1971 but probably involved only 24 fall visitants. Thirty were recorded 22 October 1968 and probably included 28 fall visitants. Bryant (1888), Loomis (1896), and Smith (1934) reported this species in fall, as did PRBO in September 1967. *Winter:* fairly common resident and visitant. The 103 individuals included 95 residents and eight winter visitants. Arrival dates of winter residents occurred from 16 June (1973), the only June arrival of a winter resident, to 17 January (1973) and occurred in two peaks, the first in late July and the second in early September. There were only 26 arrivals after September; they were well distributed from early October to mid-January. Winter residents disappeared as early as 3 January (1975) and remained as late as 14 June (1975). The major exodus occurred from early March to early April, but in most years a few remained into May or even early June. The eight winter visitants occurred as follows: 29 December 1975–2 January 1976 (two birds), 17 January 1973, and 5 February 1970 (five birds). The winter high count of 17 occurred on 5 February 1970. Sixteen were resident during 1973–74 and 1974–75. *Spring:* fairly common visitant. The 105 individuals occurred from 17 April (1969) to 4–11 June (1971) with a very sharp peak in mid-May. There were only 15 arrivals in April and four in June. The high count of 21 on 16 May 1974 included 19 spring visitants. Nineteen spring visitants were also recorded on 17 May 1969. Bryant (1888) and Dawson (1911b) reported this species in May and June, and a single individual was recorded by PRBO in early June 1967.

WILLET—*Catoptrophorus semipalmatus*. *Fall:* fairly common visitant. The actual number of individuals that visited the island during the fall, like most species that frequented the rocky intertidal and wintered in substantial numbers, was difficult to determine. The occurrences of the estimated 91 individuals were very widely scattered from 19 June (1972) to 30 December (1971) with no pronounced peak. There were an estimated 17 in June, 10 in July, 12 in August, 15 in September, 20 in October, 12 in November, and five in December. The high count of 25 on 17 October 1974 probably included only seven fall visitants. The high count of fall visitants was 14 on 29 June 1974. The species was also recorded by PRBO in September 1967. *Winter:* fairly common resident and visitant. The 98 individuals included 94 residents and only four visitants. Arrival dates of winter residents occurred from 24 June (1973), the only June arrival (although one winter resident arrived in spring and summered on the island), to 30 December (1971) with a pronounced peak in late August and early September. There were only eight arrivals each in July and October, seven in November, and four in December. Winter residents disappeared as early as 10 January (1975) and a single individual remained as late as 3 June (1974). The major exodus, however, occurred from mid-March to early April although a few birds remained each year until late April or early May. The four winter visitants occurred 10 January 1975, 27 January 1973, and 18 February 1976 (two birds). The number of wintering individuals increased steadily from two in 1968–69 to 20 in both 1974–75 and 1975–76. *Spring:* very rare visitant. The eight individuals occurred as follows: 5–6 and 6–7 (two birds) April 1970, and 13 (three birds) and 25 (two birds) May 1974. One of the latter summered on the island and remained throughout the subsequent winter.

GREATER YELLOWLEGS—*Tringa melanoleuca*. *Fall:* rare visitant. The 11 individuals occurred from 31 August (1972) to 23 October (1972) with a pronounced peak in late September. The high count of two was recorded 22 September 1974. *Spring:* extremely rare visitant. A single bird was present 29 April 1968.

LESSER YELLOWLEGS—*Tringa flavipes*. *Fall:* very rare to rare visitant. The seven positively identified individuals occurred as follows: 10–13 and 12 July 1970, 16–19 July 1972, 12–15 August 1973, 15 August 1974, 4 September 1968, and 10 September 1975. This species thus tended to occur earlier than the Greater Yellowlegs. *Spring:* extremely rare visitant. A single individual was present 3 May 1971.

In addition, seven unidentified yellowlegs occurred during the fall as follows: 15 August 1975 (five birds), and 19–24 and 22 August 1968. All of these were thought to be Lesser Yellowlegs and, indeed, their dates of occurrence certainly suggest this to be so.

RED KNOT—*Calidris canutus*. *Fall:* extremely rare visitant. Single individuals were present 12 September 1975, 26 September 1970, and 3 October 1972.

ROCK SANDPIPER—*Calidris ptilocnemis*. *Fall:* very rare visitant. Single individuals were present 19 and 26 October 1971, 8–27 November 1972, and 5–8 December 1968. *Winter:* very rare resident and visitant. There were four resident individuals that occurred as follows: 20 November 1969–3 March 1970, 7 November 1970–16 January 1971, 13 November 1971–20 February 1972, and 4 November 1972–23 February 1973. The relative consistancy in arrival dates during the four consecutive winters suggests that the same individual was involved. Two additional individuals visited during the winter: one on 21 January 1969, the other on 17 February 1973. The species was not recorded during the last three winters.

PECTORAL SANDPIPER—*Calidris melanotus*. *Fall:* uncommon visitant. The 54 individuals (one banded; specimens PRBO 718, 719, 723) occurred from 26 August (1973), the only August occurrence, to 23 October (1973) with two somewhat distinct peaks: a major peak in early to mid-September and a minor peak in early October. The high count of nine occurred 9 September 1975. Individuals occasionally remained for two or three weeks. PRBO also recorded this species in September 1967. *Spring:* extremely rare visitant. A single individual was present 4 May 1968.

BAIRD'S SANDPIPER—*Calidris bairdii*. *Fall:* fairly common visitant. The 88 individuals (three banded) occurred from 3 August (1974) to 11 October (1972) with one individual remaining to 15 October (1972). The peak occurred in early September and only 13 individuals arrived after 10 September. The high count of 10, however, occurred on 11 August 1968. Individuals generally arrived singly or in very small groups and often remained for several days or even several weeks. Individuals of this

species frequented the marine terrace rather than the rocky shoreline or tidepools which were preferred by most other shorebirds. *Spring:* extremely rare visitant. A single individual was present 11 May 1969.

LEAST SANDPIPER—*Calidris minutilla*. *Fall:* uncommon to fairly common visitant. The 77 individuals (six banded) occurred from 10 July (1970) to 8–9 October (1970) with a sharp peak in late August and early September. The two individuals on 10 July (one of which remained to 11 July) were the only July occurrences. The next earliest was 4 August (1968, 1975). Only four individuals occurred in October. The high count of six occurred on 26 August 1971 and 5–6 September 1969. Bryant (1888) reported this species as occurring in flocks but gave no dates. It was also recorded by PRBO in September 1967. *Spring:* extremely rare visitant. A single individual was present 10–11 May 1969.

DUNLIN—*Calidris alpina*. *Fall:* rare to uncommon visitant. The 28 individuals (one banded) occurred from 29 August (1975) to 9 December (1975) with a very sharp peak in mid-October. In fact, there was only one individual in August, two in September (14 September 1971 and 17–19 September 1972), none in November, and one in December. The high count of 10 occurred 16 October 1970. Bryant (1888) reported flocks of this species during the fall in the 1880s. *Winter:* extremely rare visitant. A single individual was present on 3 February 1976. The December individual might also have been a winter visitant. *Spring:* extremely rare visitant. A single individual was present 20 May 1971.

SEMIPALMATED SANDPIPER—*Calidris pusillus*. *Fall:* extremely rare visitant. A single individual was banded and photographed 4–9 August 1968, the only record for the island.

WESTERN SANDPIPER—*Calidris mauri*. *Fall:* fairly common visitant. The 144 individuals (10 banded; specimen: PRBO 232) occurred from 8 July (1968) to 13 October (1970) with a pronounced peak in mid-September and a very minor peak in mid-July. Most birds, 110 in all, occurred during September. The high count of 31 occurred 25 September 1974. The species was also recorded by PRBO in September 1967. *Winter:* extremely rare visitant. A single flock of six occurred on 3 February 1976. One individual remained to 4 February.

In addition, 43 sandpipers, identified only as "peeps," occurred between 10 July (1970) and 3–5 October (1975). The major peak occurred in late August and early September, coinciding with the peak for Least Sandpipers. However, a minor peak in mid-July coincided with the minor peak of Western Sandpipers.

SANDERLING—*Calidris alba*. *Fall:* uncommon visitant. The 91 individuals occurred from 6 July (1972) to 12–15 October (1972) with the peak during mid- to late September. A minor peak occurred in July but was comprised primarily of 1972 occurrences. On about half of the 30 arrival dates, individuals of this species arrived in small but coherent flocks, including three flocks of 13 birds each. The high count of 14 occurred on 17 September 1975.

DOWITCHER—*Limnodromus* spp. Because of the difficulty of distinguishing between species of *Limnodromus*, it seems best to first consider both species together along with all unidentified dowitchers. *Fall:* fairly common visitant. A total of 187 individuals, including 64 identified only as dowitcher (spp.), occurred from 10 July (1970) to 29 November (1975). This last date represented a very late bird; the next latest individual occurred 29 October–5 November (1970). Two distinct peaks were evident, one in late August, probably comprised mostly of Short-billed Dowitchers, and the other in early October, probably comprised mostly of Long-billeds. The July arrivals were puzzling; 15 of the 22 were recorded as "dowitcher spp." but the remainder were called Long-billeds. There may, in fact, have been an early movement of Long-billeds. The high counts of dowitchers were 26 on 30 August 1973, and 22 on 7 October and 20 on 15 October 1972. *Spring:* extremely rare visitant. Two dowitchers were present on the very early date of 4 March 1975 and one was seen on 29–30 April 1971. All three were unidentified as to species.

In addition, 35 medium-sized shorebirds (spp.) occurred in fall as follows: four on 28 July and two on 27 August 1973, and 29 on 8 September 1975. It is likely that most were dowitchers but the flock of 29 (flying by the island) were thought possibly to have been Pectoral Sandpipers. Finally, four single individuals, simply recorded as shorebird (spp.), occurred 2 August 1969, 25 September 1968, 13 October 1974, and 17 October 1968.

SHORT-BILLED DOWITCHER—*Limnodromus griseus*. *Fall:* uncommon to fairly common visitant. The 62 individuals (one banded) identified as this species occurred from 11 August (1973) to 7 October

(1972) with one individual remaining until 11 October (1974). The peak occurred in late August and the high count of 26 was recorded 30 August 1973. The species, however, also occurred in numbers in mid-September and early October. This species was also identified by PRBO in September 1967.

LONG-BILLED DOWITCHER—*Limnodromus scolopaceus*. *Fall:* uncommon to fairly common visitant. The 61 individuals (including one bird picked up dead) identified as this species occurred from 18 July (1973) to 29 November (1975) with a sharp major peak in early October and a minor peak in July. The high counts were 20 on 15 October and 19 on 7 October 1972. It is likely that most, if not all, dowitchers after early October were of this species.

MARBLED GODWIT—*Limosa fedoa*. *Fall:* uncommon to fairly common visitant. The 142 individuals occurred from 8 July (1970) to 18 October (1973) with a single individual remaining as late as 26 October (1974). Many of these arrived in fairly large coherent flocks (high count: 27 on 14 August 1975), which often merely flew by or over the island without stopping. There were only 27 arrival dates in all. The peak occurred in mid- and late September although the largest flocks often occurred in mid-August. *Spring:* extremely rare to very rare visitant. The three individuals occurred as follows: one on the early date of 16 March 1976 and two on 27 April 1971.

In addition, 238 unidentified large shorebirds (spp.) have occurred in the fall as follows: two on 28 July 1973, one on 27 August 1971, and 35 on 12 October and 200 on 5 November 1970. All of these birds were flying past the island and most, if not all, were probably Marbled Godwits. Finally, a flock of 30 unidentified large shorebirds passed by the island on 30 April 1973. They were most likely either Marbled Godwits or Whimbrels.

AMERICAN AVOCET—*Recurvirostra americana*. *Fall:* extremely rare visitant. An individual was present 31 August 1968 and another was present 28 July to 11 August 1973.

RED PHALAROPE—*Phalaropus fulicarius*. *Fall:* sporadic abundant visitant. The approximately 65,451 individuals (one banded; specimens: PRBO 305, 306, 335, 751) occurred from 14 July (1972) to 9 January (1974). Most individuals were seen in large flocks flying south past the island or in the water along current lines; oiled or weak individuals sometimes spent nights on the island. There was great year-to-year variation in both numbers and timing. At least 50,091 occurred in 1971 and only two and seven, respectively, occurred in 1970 and 1975. Numbers ranged from about 1000 to 6000 in the other five falls. In 1968, the species occurred almost entirely during August with the peak late in that month; in 1969 they occurred from late September to late December with the peak in late November; in 1971 they occurred from mid-August to mid-November with the massive peak in late August (high count 20,000 on 22 August 1971) and another very large peak in mid-September; in 1972 they occurred from mid-July to early January with the peak in mid-October; in 1973 they occurred from late October to early January with the peak in mid-November; in 1974 they occurred from late July to late September with the peak in early August. It would be most interesting to know the age and sex composition of the flights each year. *Winter:* extremely rare visitant. A single individual was present 15 February 1976. *Spring:* sporadic abundant visitant. The approximately 1252 individuals occurred from 4 May (1971) to 3–4 June (1974) with peak numbers throughout May but more often in early May. The species was absent in the springs of 1968, 1969, 1970, 1973, and 1975; 1095 birds occurred in 1971, 100 in 1972, and 57 in 1974. The high count of 300 was recorded on 6, 12, and 26 May 1971. Loomis (1896) reported a mummy in spring plumage found in mid-July 1896. Kaeding (1903) reported this species as not uncommon in early June 1903, and Dawson (1911b) reported good sized flocks in late May 1911.

WILSON'S PHALAROPE—*Steganopus tricolor*. *Fall:* extremely rare visitant. A single individual was present 28 July–9 August 1973, the only record for the island.

NORTHERN PHALAROPE—*Lobipes lobatus*. *Fall:* sporadic abundant visitant. The approximately 31,851 individuals occurred from 23 July (1968) to 28 November–6 December (1969) with peak numbers occurring consistently from early August to mid-September and actual maximum numbers in late August (high count 19,500 on 22 August 1968). The majority of the individuals, 24,078 in all, occurred in 1968; numbers in other years ranged from 32 and 68, respectively, in 1970 and 1973, to about 2000 in 1971 and 1974. This species was thus generally less abundant but more consistent in timing of occurrence than the Red Phalarope; unlike the latter, it showed no late fall peaks. In general, however, the "flight years" and years of early peaks coincided nicely for the two species. Bryant (1888)

recorded this species in the fall as did Smith (1934) in August 1934. *Winter:* extremely rare visitant. The only winter occurrence was of a slightly oiled individual on 23 February 1976. *Spring:* sporadic abundant visitant. The approximately 12,572 individuals occurred from 27 April (1971) to 28 May (1971) with a sharp peak during early May. Like the Red Phalarope, this species was absent during the springs of 1968, 1969, 1970, 1973, and 1975. However, 11,750 occurred in 1971, 350 in 1972, and 472 in 1974. The high count of 3000 was recorded on 2–3, 6–12, and 23 May 1971. Kaeding (1903) reported this species in June 1903 and Dawson (1911b) reported great flocks in late May 1911.

In addition, 833 unidentified phalaropes occurred between 19 July (1968) and 23 November (1974) and undoubtedly included individuals of both species. Three unidentified phalaropes were also recorded in spring, interestingly, all in non-flight years. One occurred on 13 April 1968 (the earliest date for any phalarope) and two occurred on 15 May 1970; they were probably Northerns.

POMARINE JAEGER—*Stercorarius pomarinus*. *Fall:* very rare visitant. The five individuals occurred 15 September 1971, 21 September 1970, 27 September 1974 (two birds), and 13 November 1973. This species, like the next, occurred regularly in nearby waters but was rarely observed from the island itself. *Winter:* extremely rare visitant. A single bird was observed on 7 January 1972.

Five unidentified jaegers, most likely this or the next species, were observed from the island in fall as follows: 4 (two birds) and 4–5 September 1971, and 18 and 27 September 1972. The 18 September bird was thought to be a Pomarine. The three jaegers on 4 September 1971 were the most seen from the island on any given day. In addition, two unidentified jaegers were seen on 8 March 1975. They probably were winter visitants, but could have been very early spring visitants. They were most likely Pomarine Jaegers.

PARASITIC JAEGER—*Stercorarius parasiticus*. *Fall:* very rare visitant. The four individuals occurred 15 September 1971, 19 September 1973, 3 October 1972, and 28 October 1975. PRBO biologists also observed an individual on 23 September 1967.

LONG-TAILED JAEGER—*Stercorarius longicaudus*. *Spring:* extremely rare visitant. A single bird was seen flying north, 1 km west of the island, on 29 April 1971.

SOUTH POLAR SKUA—*Catharacta maccormicki*. *Fall:* extremely rare visitant. Single individuals were present 22 September to 1 October 1974 and 29 October 1971. The first mentioned bird resided on Mussel Flat at the island's southwest corner and regularly harrassed gulls and shorebirds. It was photographed and was considered by J. R. Jehl to be *C. maccormicki* as was a specimen collected by H. R. Cogswell "near the Farallones" on 3 October 1954. The specimen (♂) was prepared as a skeleton (MVZ 133404).

GLAUCOUS GULL—*Larus hyperboreus*. *Winter:* very rare visitant. Single individuals were present 14 January 1969, 24 January 1976, 9 February 1970, and 18 and 24 February 1976. *Spring:* extremely rare visitant. The three single individuals were present 14 March 1971, 31 March 1974, and 16 May 1969. In addition the carcass of a large gull found 26 July 1970 was thought possibly to be a Glaucous Gull. Bowman (1961) found one dead in June 1958; Cooper (1873) also reported one, apparently the first record for California.

GLAUCOUS-WINGED GULL—*Larus glaucescens*. *Fall:* common visitant. The 370 individuals occurred from 12 September (1972) to 22–24 December (1975) with a pronounced peak in late November. There were only three occurrences in September and only 18 in early and mid-October. The fall high count of 50 occurred on 23 November 1969. Individuals of this and other visiting large gulls were often difficult to census among the huge numbers of Western Gulls that frequented the rocky flats in late fall and winter; as a result, their numbers were probably somewhat underestimated. *Winter:* abundant resident and visitant. The 1290 individuals (specimen: PRBO 526) can be divided into 728 residents and 562 visitants. Numbers of winter residents varied from 300 in 1968–69 to only 15 in 1971–72. Residents arrived as early as 1 December (1973) and as late as 28 January (1971) but the sharp peak in arrivals occurred in mid-December. Residents generally began departing in very late January and early February but the major exodus occurred from late February through the first half of March. Most residents departed by late March but in two years (1969, 1970) a few individuals remained into April (latest: 15 April 1970). Winter visitants arrived between 9 January (1972) and 2 February (1971) with a very sharp peak in late January. Winter high counts (maximum: 500 from 21 January to 7 February 1969) therefore occurred in late January and early February. *Spring:* common visitant. The

252 individuals (one banded) occurred from 9 March (1974) to 23–24 May (1969) with a pronounced peak in late March (high count: 44 on 31 March 1970). There were only four May occurrences, only one of which was after 9 May (1975). Bryant (1888) reported that a few were seen about the island as late as May.

WESTERN GULL—*Larus occidentalis*. *Year-round:* abundant resident and breeder. A portion of the 25,000 individuals (15,807 banded, mostly chicks; 26 specimens) were present year-round. About 20–22,000 of these birds were breeders; the remainder were adults in excess because of a lack of nesting areas (Ainley and Lewis 1974). Numbers were lowest, perhaps a few thousand birds, during early fall. They began to increase during November and reached maximum numbers during early spring (Ainley et al. 1974). The first eggs were laid within a day or two of 24 April each year, with peak laying occurring about two weeks later. Numerous band recoveries exist, stretching from British Columbia to San Diego; almost all were from coastal localities. Most accounts of the island avifauna mentioned this species.

HERRING GULL—*Larus argentatus*. *Fall:* common visitant. The 318 individuals occurred widely between 15 September (1971) and 29 December (1968, 1971). They appeared to occur in three separate peaks as follows: first, a minor peak in late October; second, a sharp peak in late November which coincided with the peak of fall visitant Glaucous-wingeds; and third, a sharp peak in late December associated with the major arrival of winter residents. This peak, however, only occurred in 1968 and 1971 when the high count was also recorded (55 on 29 December 1971). There were only 20 occurrences in September but one was also recorded by PRBO in September 1967. *Winter:* common resident and visitant. The 277 individuals (specimen: PRBO 482) can be divided into 120 residents and 157 visitants. Numbers of winter residents varied from 30 in 1974–75 to only five in 1972–73. They arrived as early as 8 December (1969) and as late as 27 January (1973), but the sharp peak of arrivals occurred in late December. Winter residents generally began departing in early to mid-February and the main exodus occurred from mid-February to mid-March (latest: 31 March 1969). Winter visitants arrived between 27 December (1969) and 24 February (1972) with a sharp peak in late January. Winter high counts, therefore, generally occurred in mid- and late January (maximum: 65 on 27 January 1974 and 1 February 1976). *Spring:* fairly common visitant. The 219 individuals occurred from 11 March (1973) to 31 May (1974) with a very sharp peak in late March and a minor peak in late April. The high count of 47 occurred on 28 March 1973. There were only three May individuals: two on 13 May 1971 and one on 31 May 1974. McCaskie and Stallcup (1959) recorded this species on 12 April 1959.

THAYER'S GULL—*Larus thayeri*. *Fall:* very rare visitant. The eight individuals occurred as follows: 7 October 1968, 22 and 29 (four birds) October 1971, 5 November 1968, and 7 December 1974. *Winter:* extremely rare visitant. A single individual was found dead on 15 January 1971. *Spring:* extremely rare visitant. A single bird was present 14 April 1970 and two were present 29 April 1972.

CALIFORNIA GULL—*Larus californicus*. *Fall:* sporadic abundant visitant. The 6152 individuals occurred widely from 28 July (1973) to 24 December (1973) with individuals remaining as late as 29 December (1974). Numbers varied greatly from year to year from only 54 in 1970 to 1288 in 1968 and 3530 in 1974. The first major influx generally occurred each year in late September and the peak usually occurred in late October. The major flight of 1974, however, showed two peaks, the first in mid- to late November (high count: 1200 on 17–18 and 27 November 1974), and the second in mid-December, both at times when the species was usually scarce. Interestingly, 1968 also showed two peaks, a normal one in late October and an early one in early October. Excluding 1974, there were only 20 individuals recorded in December. Gruber (1884) listed their presence and Bryant (1888) regarded them as common during the fall. PRBO also recorded them in September 1967. *Winter:* sporadic fairly common visitant and resident. The 197 individuals occurred from 2 January (1975, 1976) to 22 February (1975). Fully 183 of these birds, however, occurred during the winter of 1974–75 (thus the high numbers during fall 1974 continued on into winter). Furthermore, the species was not recorded during the winters of 1969–70, 1972–73, and 1973–74. Two major flights occurred in 1974–75, the first in early January, and the second, a larger flight, in early February (high count: 120 on 4 February 1975). Most individuals remained only a few days but one bird apparently stayed from 2 January to 24 February 1976 and thus was considered a winter resident. *Spring:* rare visitant. The 10 individuals occurred 24–26 March 1971, 27 March 1973 (two birds), 2 April 1976 (two birds, one

of which remained until 4 April), 18 April 1973 (two birds), 18 May 1973, 3 June 1974, and 7 June 1973.

RING-BILLED GULL—*Larus delawarensis*. *Fall:* uncommon visitant. A total of 46 of the 49 individuals occurred widely between 13 September (1971) and 22 December (1974) with two almost equal peaks, the first in early October (high count: 10 on 3 October 1968), and the second in early December. Three very early individuals occurred 30 July–2 August 1969, and 10 and 15 August 1975. The species was also observed by PRBO in September 1967. *Spring:* extremely rare visitant. Single individuals were present on 9 and 16–18 March 1974. McCaskie and Stallcup (1959) also recorded this species on 12 April 1959.

In addition, 10 individual unidentified large *Larus* (spp.) gulls occurred during the fall as follows: three on 13 August 1970, two on 28 August 1968, and one on 9 September 1970 could all have been juvenile Ring-billeds; one on 19–21 August 1970 could have been a Herring; one on 23 September 1968 could have been a Thayer's; one on 4 October 1970 was probably either a Herring or a Thayer's; and one on 16–17 September 1975 was an albinistic individual. Finally, three unidentified large gulls were recorded in spring: an albinistic individual on 3 April 1972 and two "light-backed" individuals on 4 May 1972.

MEW GULL—*Larus canus*. *Fall:* fairly common visitant. The 152 individuals occurred widely between 3 October (1971, 1975) and 27 December (1969), but nearly half of them arrived on only two days: 44 on 14 October 1970 and 30 on 28 October 1971. The high count of 50 occurred on 14 October 1970. The remaining individuals showed no distinct peak. *Winter:* rare resident and visitant. Fully 15 of the 20 individuals occurred during the winter of 1975–76. There have been only three winter residents: 4 December 1969–11 January 1970, 29 December 1975–23 February 1976, and 29 December 1975–8 March 1976. The 17 visitants occurred from 27 December (1969) to 22 February (1975) and 23 February (1976) with a sharp peak in early January indicating that most could perhaps be considered late fall visitants. *Spring:* very rare visitant. The four individuals occurred 12 March (one bird found dead) and 24 March (two birds) 1971, and 2 April 1976. McCaskie and Stallcup (1959) also observed this species on 12 April 1959.

BONAPARTE'S GULL—*Larus philadelphia*. *Fall:* sporadic fairly common visitant. The 137 individuals occurred from 28 September (1974) to 29 December (1975) with the peak from late October to mid-November. The high count of 39 occurred on 12 November 1973. Numbers varied greatly from year to year from one or two individuals in 1968, 1969, and 1974 to 68 in 1973. The peak was primarily caused by three major flights, one of 30 birds on 21 October 1972, and flights of 30 and 31, respectively, on 10 and 12 November 1973. Only six individuals were recorded in December. *Winter:* rare visitant. The 11 individuals, all in 1976, occurred as follows: one on 2 January, nine between 1 and 5 February (high count: nine on 2 February), and one on 14 February. *Spring:* sporadic abundant visitant. The approximately 32,231 individuals occurred from 12 March (1975) to 23 May (1973) with the peak during April, sometimes early and sometimes late in the month. Fully 31,540 individuals occurred in 1970 (high count: 30,000 on 26 April 1970); during other years, numbers varied from two or less in 1969, 1972, 1973, and 1974, to 290 in 1971. McCaskie and Stallcup also recorded this species on 12 April 1959.

HEERMANN'S GULL—*Larus heermanni*. *Fall:* abundant visitant. The 2023 individuals occurred widely between 23 June (1972) and 29–30 December (1971). Except for an unusually massive flight in mid- to late August 1970 (high count: 700 on 21 August 1970), only small numbers occurred before September (one individual in June, 11 in July, and 17 in August). Numbers decreased rapidly after early November. There were only 15 December occurrences. Gruber (1884) recorded the presence of this species, and Bryant (1888) mentioned that it was occasionally seen but gave no dates. PRBO also observed it in September 1967. *Winter:* rare resident and visitant. Only one of the 12 individuals was a winter resident. It was present 18 February–29 April 1972. The remaining 11 visitants occurred from 6 January (1971) to 24 February (1972) with six in January and five in February. The high count of three occurred on 17 January 1972 and 5 February 1970. *Spring:* very rare visitant. The eight individuals occurred in only two years as follows: 8–11 April (two birds), 25–26 April, and 24 May 1968, and 27–29 April (three birds) and 6 May 1972. They perhaps represented a northward movement of individuals that wintered north of their Mexican breeding grounds and thus occurred earlier than the normal northward movement, which was generally first detected on the Farallones in late June or July. Dawson (1911b) also saw one in May 1911.

BLACK-LEGGED KITTIWAKE—*Rissa tridactyla*. *Fall:* sporadic common visitant. The 614 individuals (specimen: PRBO 316) occurred from 12 September (1970) to 31 December (1975) with a very sharp peak in early and mid-November (high counts: 450 on 19 November 1970 and 100 on 8 November 1973). Numbers varied greatly from year to year from none in 1968 and two in 1972 and 1974 to 463 in 1970. A minor peak in late December perhaps represented an influx of winter visitants. Single individuals on 12 and 21 September 1970 were the only ones before mid-October, but PRBO found a dead individual 22 September 1967. On rare occassions, individuals roosted on the island at night. *Winter:* sporadic abundant visitant. The 1786 individuals (specimens: PRBO 474, 475) occurred from 2 January (1976) to 2 March (1976) with a peak in early and mid-February. Numbers varied greatly from year to year; in most winters there were fewer than 10 individuals, but 208 were recorded in 1970–71 and 1556 were recorded in 1975–76 (high count: 1500 on 2 February 1976). *Spring:* sporadic abundant visitant. The approximately 6833 individuals occurred from 4 March (1976) to 27 May (1970); however, only nine occurred during May. Numbers varied greatly from year to year but seemed to show an increasing trend from one in 1968 to 4706 in 1976. The peak occurred from early March in some years to early April in others. The high count of 4000 birds occurred 4 March 1976. Tenaza (1967) found the remains of two birds in May 1965.

SABINE'S GULL—*Xema sabini*. *Fall:* very rare visitant. The five individuals occurred as follows: 20 August 1972, 15 September 1971, 23 October 1974 (two birds), and 11 November 1971. In addition, an individual gull, thought to be an immature of this species, occurred on the very late date of 2 January 1976.

COMMON TERN—*Sterna hirundo*. *Fall:* extremely rare to rare visitant. The only positively identified individuals were three that roosted overnight on 8 September 1969; one was captured and banded.

ARCTIC TERN—*Sterna paradisaea*. *Fall:* extremely rare to rare visitant. Only three individuals were positively identified: two observed on 15 September 1971 and a dead individual found 2 and 4 October 1968 (the head was found one day and the wings were found the other day; presumably a raptor kill).

In addition, 89 unidentified *Sterna* (spp.) were recorded as follows: 46 between 7 and 15 September 1971 with a high count of 15 on 13 September; 40 on 14 September 1974; and three on 26 November 1975. These individuals could have been of either or both of the above species, *S. paradisaea* perhaps being more likely.

ELEGANT TERN—*Sterna elegans*. *Fall:* extremely rare visitant. A flock of 14 flying southeast past the island on 21 October 1971 constituted the only island record.

CASPIAN TERN—*Sterna caspia*. *Fall:* extremely rare visitant. Single individuals were present 28 July 1971, and 2 and 26 September 1975. *Spring:* very rare visitant. The four individuals occurred 26 May (two birds) and 13 June 1970, and 4 July 1975. This last individual could possibly have been an extremely early fall visitant.

COMMON MURRE—*Uria aalge*. *Year-round:* abundant resident and breeder. The approximately 35,000 individuals (355 banded; specimens: PRBO 476–481) began to arrive on nesting ledges in October and all departed by mid-August of the following calendar year; during the fall they did not visit the ledges but often remained in waters near the island. Numbers of murres in the vicinity of the Farallones were swelled to an unknown extent during some years in fall and winter by wintering birds from more northerly populations (Smail et al. 1972). These murres were very difficult to detect among the local ones. Farallon breeding murres have been increasing in number by about 10–15% each year, beginning with a population low of about 6000 during the mid-1960s. The population is thus recovering rapidly from earlier decimation (an egging industry and oil pollution), but still has a long way to go to equal original numbers (Ainley and Lewis 1974). Eggs were laid beginning in late April or, more usually, early May and ending in late May. Most accounts of the Farallon bird life mentioned this species.

PIGEON GUILLEMOT—*Cepphus columba*. *Winter:* very rare resident and visitant. The four winter occurrences, all in 1975–76, were 22 October–26 January, 10 December–23 January, 29 December–11 January, and 11 January. *Spring and summer:* abundant resident and breeder. The approximately 2000 individuals (about 1022 banded, mostly chicks; specimens: PRBO 521–524, 562, 724–726) arrived rather abruptly during mid-March, although some individuals arrived as early as 28 February (1976). Most departed by early August although some adults fed chicks as late as early September, and individuals, possibly fall visitants, were recorded as late as December. The population appears to

have reached its maximum unless birds begin to use suboptimal nesting cavities (Ainley and Lewis 1974). Banded birds have been recovered mostly toward the north; recoveries extend from Monterey (130 km south of the island) to British Columbia. Most reports of the Farallon bird life mentioned this species.

XANTUS' MURRELET—*Endomychura hypoleuca*. *Fall:* extremely rare visitant. Single individuals were observed within a few meters of shore 17 July 1973 and 29 July 1974. The latter bird (presumably) was found dead on 6 August 1974; it had flown up onto the island. These records may well represent summering birds in the vicinity of (or at) the island, rather than fall transients. *Spring:* extremely rare visitant. An individual was found dead 19 May 1971, having died at least a month earlier. The bird had crawled into a cavity beneath the East Landing winch housing, where it became stuck in a pool of grease. This species occurred a bit more frequently in waters around the island than these few observations indicate.

ANCIENT MURRELET—*Synthliboramphus antiquus*. *Fall:* sporadic fairly common visitant. The 140 individuals occurred from 12 October (1975) to 29 December (1975) with four remaining to 31 December (1973). There appeared to be two major peaks, the first in late November and early December and the second in late December. The 54 individuals involved in this latter peak could be considered to be winter visitants. The high count of 34 was recorded 29 December 1975 and included 32 "fall" visitants. Thirty individuals were also recorded 11 December 1975, and 19 were present 25 November 1973. There were only four October occurrences. Numbers varied greatly from 86 in 1975 and 38 in 1973 to none in 1968, 1970, and 1972. *Winter:* uncommon visitant. The 38 individuals occurred from 24 December (1973) to 2–5 March (1976) and 5 March (1970). Twenty-two of these occurred in late December and early January and could well be considered to be late fall visitants. The remaining 16 occurred after 3 February (1976) but with a peak in early February. The high count of 12 was recorded 9 January 1974. Most winter individuals occurred subsequent to the major fall flights: 15 in 1973–74 and 12 in 1975–76. *Spring:* extremely rare visitant. The three single individuals were present 14 April 1970, 26 May–10 June 1970, and 23 July 1968, the last possibly a summering bird.

CASSIN'S AUKLET—*Ptychoramphus aleuticus*. *Year-round:* abundant resident and breeder. The Farallones are a major breeding locality of this species; the population numbered about 100,000 birds (Manuwal 1974). Some individuals visited the island in all months but fewest did so from late August to early September. Eggs were laid from early March to July, although mostly during the early part of the period. About 8555 individuals were banded (32 specimens) but very few have been recovered elsewhere, mostly from the Monterey Bay area. Most accounts of the island bird life discussed this species.

RHINOCEROS AUKLET—*Cerorhinca monocerata*. *Fall:* uncommon visitant. The exact status of nonbreeding individuals around the island was difficult to establish. The 33 individuals occurred from 16 September (1973) to 19 December (1969) with a slight peak during early to mid-October. The high count of five occurred on 6 and 19 October 1973. *Winter:* uncommon resident and visitant. The 30 individuals, no doubt an underestimate of actual numbers in the vicinity of the island, can be divided into seven residents and 23 visitants. Most residents arrived from late November to early January and departed during February. Ten visitants occurred during late December and early January, 11 in late January and early February, and two in mid-February. Winter numbers increased during the last three winters. The high count of 15 was recorded 26 January to 3 February 1976. Peterson (1957) and McCaskie and Stallcup (1959) recorded wintering birds. *Spring and summer:* rare visitant and uncommon resident and breeder. Seventeen is only a rough estimate of the actual number of spring visitants. It was difficult to distinguish visitants from breeders; 16 of the 17 individuals occurred from 29 February (1972) to 26 April (1973) with a peak during mid-April. A single late individual seen 5 June 1971 was thought to be an immature bird. The high count of two was recorded on numerous occasions.

The species recently re-established a breeding population after an absence of about 100 years (Ainley and Lewis 1974); the first breeding during recent years was confirmed in 1974. During the summers of 1968 and 1970, two individuals were seen on occasion flying over the island. Displaying individuals (up to five) were observed between early May and late August during 1971, 1972, and 1973. In 1974, individuals were observed entering burrows between 10 March and 15 August, with a high count of nine. Adults were observed carrying fish into three burrows. During 1975, a population of 44 birds was estimated; fish were brought to at least 10 burrows by adults feeding chicks. Burrows

were concentrated at North Landing but individuals were known to frequent East Landing and were observed on the West End. The population reached an estimated 60 birds in 1976; birds carried fish to at least 11 burrows. The rapid increase in occupied burrows during the last two years was related partly to the removal of rabbits. At least five burrows that were used definitely had been rabbit warrens. Four adults were banded in the last two years. Heermann (1859), Gruber (1884), Grinnell (1926), and Swarth (1926) documented the breeding of this species in the 1850s and 1860s (literature summarized by Ainley and Lewis 1974). Specimens from that period are in the Academy of Natural Sciences, Philadelphia, and the Zoology Museum, Tring, England.

HORNED PUFFIN—*Fratercula corniculata*. *Fall:* very rare visitant. The seven individuals occurred 26 September–23 October 1974; 2, 8 (different plumaged bird), 24–31, and 25 (two birds) October and 22 November 1975. *Spring:* extremely rare visitant. A single individual was observed 2 June 1973.

TUFTED PUFFIN—*Lunda cirrhata*. *Spring and summer:* common resident and breeder. The approximately 100 individuals (16 banded; specimens: PRBO 716, plus many from the 1800s at CAS and MVZ) were present from mid-March to early September. Eggs were laid during very early May. Present numbers are a mere shadow of those earlier this century and, for the most part, have remained at the present level for a few decades (Ainley and Lewis 1974). A few pairs have occupied recently vacated rabbit burrows; at least a slight population increase should thus occur in the next several years. Most accounts of the island bird life mentioned this species.

BAND-TAILED PIGEON—*Columba fasciata*. *Fall:* fairly common visitant. The 89 individuals were recorded between 14 July (1973) and 24 December (1973). Occurrences were very widely scattered from mid-July to late October with no obvious peak, although maximum numbers were recorded in late August. Thereafter only four individuals occurred, one in November and three in December. The high count of four was recorded on 21 October 1972. Four birds were also recorded by PRBO on 25 September 1967. *Winter:* no recent records but, according to Bryant (1888), "a number . . . visited the island in the winter of 1884–85." *Spring:* fairly common visitant. The 89 individuals (one banded) occurred from 24 March (1969) to 17 July (1970) with a slight peak in early to mid-June and another very minor peak in late April and early May. The high count was six on 7 July 1970. Occurrences thus continued throughout the summer, making it difficult to separate spring and fall records. Most individuals arrived singly and spent a relatively short time on the island, often in the cypress trees. Bryant (1888) reported an individual on 25 March 1886. PRBO biologists also observed one bird in June 1967.

ROCK DOVE—*Columba livia*. *Fall:* rare visitant. The 29 individuals occurred from 15 July (1970) to 27 November (1973). Most arrivals were scattered throughout September and October. The high count was a flock of 12 that circled the lighthouse on 14 September 1975; all other occurrences were of single birds. Tenaza (1967) recorded one 18–27 July 1965. *Winter:* very rare visitant. The four records were of single individuals: 20–22 January 1971, 30 January 1974, 1 February 1976, and 16 February 1971. *Spring:* uncommon visitant. The occurrences of 32 individuals were spread from 5 March (1976) to 13 July (1974), although two individuals remained beyond these dates during extended visits: 30 May–11 October 1969 and 13 July–9 August 1974. Otherwise, the next latest spring individual departed 20 June (1975). A fairly noticeable peak of arrivals occurred in mid-May (the high count of three was reached four times during May). Several individuals were domestic birds possessing racing-club bands on their legs. Many Rock Doves spent a prolonged time and often died on the island. The species was also seen by PRBO in June 1967.

WHITE-WINGED DOVE—*Zenaida asiatica*. *Fall:* extremely rare visitant. The three records of single birds were 4–11 October 1970 (banded), 13 October 1969, and 28–29 October 1973.

MOURNING DOVE—*Zenaida macroura*. *Fall:* common visitant. The 287 individuals (three banded) occurred from 22 July (1972) to 21 November (1975). The peak occurred in early to mid-September (high count of 20 on 3 September 1972); only three occurred after October, all in November 1975. PRBO biologists observed the species in September 1967, as did Tenaza (1967) in September 1965. Bryant (1888) reported it in August 1887. *Spring:* fairly common visitant. The 103 individuals (two banded) occurred from 29 March (1976) to 10 July (1970) with a period of peak arrival in early May. There was but one March occurrence; the next earliest was 17 April (1970). The high count of 14 was on 29 April 1968. Bryant (1888) reported the species in May 1887, Dawson (1911b) reported it in May 1911, and Tenaza (1967) reported it in June 1964 and May 1965.

YELLOW-BILLED CUCKOO—*Coccyzus americanus*. *Fall:* extremely rare visitant. The two occurrences were of single birds on 15–16 August 1970 and 24 September 1974. Both were banded. Complete measurements of the latter bird indicate that it was of the eastern race (*C. a. americanus*). *Spring:* extremely rare visitant. The two occurrences were on 14 June and 4 July, both in 1975. The 14 June bird was banded but racial identification was uncertain. Tenaza (1967) reported seeing one on 8 July 1965.

BARN OWL—*Tyto alba*. *Fall:* extremely rare visitant. One was seen on 13 July 1973.

GREAT HORNED OWL—*Bubo virginianus*. *Fall:* extremely rare visitant. One was seen 21 November 1970. Another was seen by PRBO biologists on 24 September 1967.

BURROWING OWL—*Athene cunicularia*. *Fall:* uncommon visitant. The approximately 50 fall individuals (one banded; specimen: PRBO 369) occurred from 31 August (1968) to 26 November–9 December (1969) with a peak during late September and early October. The high count of six occurred on 1 October 1968. Because of secretive and nocturnal habits, actual numbers were difficult to determine. The species was also recorded by PRBO in September 1967. *Winter:* rare resident. From one to three individuals wintered on the island for each of the eight years making a total of 15 birds (four banded). In 1971, 1972, 1973, and 1975, at least one of the wintering birds died by early spring. Most individuals disappeared by March or April and only two remained until May: one until 7 May 1971 (found dead 19 May) and the other until 26 May 1970. The high count of three occurred in the winter of 1970–71.

Bryant (1888) recorded two in spring 1887. Bowman (1961) and Tenaza (1967) both reported finding the feathered remains of Burrowing Owls, in June 1958, June 1964, and May 1965. Dawson (1911b) was the only person to list it as breeding: "A single individual, a sole survivor, we were informed, of a former breeding colony. . . ." There are no other reports of breeding, and thus the birds must have nested for only a few years. However, in 1971 A. Waterhouse of Bolinas donated to PRBO several bird eggs collected on the Farallones by her mother in the spring of 1911. Included was one Burrowing Owl egg.

LONG-EARED OWL—*Asio otus*. *Fall:* rare visitant. The 21 individuals (specimens: PRBO 715) occurred from 7 July (1974) to 28 October (1970) with one bird remaining to 7 November (1972), and appeared to fall into two groups. Fifteen birds occurred from late August to late October with a slight peak in early October. The remaining six occurred in July and early to mid-August of three years (1968, 1973 and 1974) and often remained for several days (even up to a month). It would be most interesting to know the geographical origin of these birds. Were they from nearby mainland points or from much farther away? The high count of three was recorded 29 July–5 August 1974. *Spring:* extremely rare visitant. One individual was present on 21–22 May 1969. The species was also reported by Gruber (1884) but no date was given.

SHORT-EARED OWL—*Asio flammeus*. *Fall:* uncommon visitant. The 66 individuals occurred from 8 September (1968) to 23 November (1970) with the peak in mid-October. The high count of 10 birds was recorded on 21 October 1972. Individuals often remained for several days. PRBO biologists recorded an individual in September 1967. *Spring:* extremely rare visitant. One individual was present 5–8 July 1974. Bryant (1888) reported one in the spring of 1885 and another in May 1887.

SAW-WHET OWL—*Aegolius acadicus*. *Fall:* very rare visitant. The five single individuals were recorded 15–18 October 1973, 18 October 1975, 23–26 October and 18 November 1972, and 28 December 1973.

POOR-WILL—*Phalaenoptilus nuttallii*. *Fall:* extremely rare visitant. Single individuals were present on 4 October 1973 and 24 October 1972. Both were banded.

COMMON NIGHTHAWK—*Chordeiles minor*. *Fall:* extremely rare visitant. The only positive occurrence of this species was an individual present 8–14 September 1975. In addition, a bird present 5 September 1968 was thought to be of this species.

LESSER NIGHTHAWK—*Chordeiles acutipennis*. *Fall:* extremely rare visitant. The only positive occurrence was one on 9 August 1973. Two other nighthawks, one each on 13 and 18 August 1970, were thought to be of this species. *Spring:* rare visitant. The 24 individuals (three banded) occurred from 18 May (1973) to 8 July (1968) with a peak in early June. The high count was two birds on 5 and 7 June 1970 and 8 July 1968. Tenaza (1967) recorded four birds in June and July 1965 and Medina

collected two 24 May 1963 (MVZ 160091, -92). An unidentified large caprimulgid, thought possibly not to be a nighthawk, was seen 12 May 1971.

BLACK SWIFT—*Cypseloides niger*. *Fall:* extremely rare visitant. Two individuals were present 8 September 1972. *Spring:* very rare visitant. Two individuals were present on 9 June 1970 and three were present on 11 June 1975.

CHIMNEY SWIFT—*Chaetura pelagica*. *Spring:* very rare to rare visitant. The seven individuals positively identified were present as follows: 26 May 1970 (collected: a ♀ CAS 68598); 3 June 1971; 11 June 1975, four birds, one of which stayed until 12 June; and 15 June 1975.

In addition to the above records, eight swifts (*Chaetura* sp.) were noted as follows: 1 June 1975 (four birds), 7–9 June 1972, 13 June 1972, and 8 July 1970 and 1974. Most or all were probably Chimney Swifts.

VAUX'S SWIFT—*Chaetura vauxi*. *Fall:* uncommon visitant. The 212 individuals occurred from 4 September (1968) to 8–9 October (1972) with a peak from mid-September to early October. The species often occurred in flocks of substantial size; the high count of 70 was recorded 18 September 1974. However, a flock of 150, seen by PRBO biologists on 22 September 1967, established the actual high count for the island. *Spring:* very rare visitant. Four individuals were positively identified in the spring: one on 4 May 1974, two (one banded) on 12 May 1970, and one on 31 May 1975.

WHITE-THROATED SWIFT—*Aeronautes saxatalis*. *Fall:* extremely rare visitant. The three individuals occurred as follows: two on 17 October and one on 25 October 1969.

COSTA'S HUMMINGBIRD—*Calypte costae*. *Spring:* extremely rare visitant. Single individuals were present 20 April 1972 (collected: a ♂ PRBO 714) and 26 April 1973 (♂).

A female or immature hummingbird, either Ruby-throated (*Archilochus colubris*), Black-chinned (*Archilochus alexandri*), or Costa's was present 26 August 1974.

ANNA'S HUMMINGBIRD—*Calypte anna*. *Fall:* rare to uncommon visitant. The 11 individuals occurred singly from 16–17 August (1975) to 22 November (1975); nine of these occurred between mid-September and late October with no pronounced peak. An additional 25 unidentified hummingbirds were recorded; most were probably this species. Twenty-four of these birds occurred between 15 August (1970) and 25 October (1975) with a slight peak in late September. The remaining bird occurred 20 November 1972. The high count of two occurred on 3 September 1969. *Spring:* very rare to rare visitant. The nine individuals occurred as follows: two on 4 February 1976; two on 24 March 1974, one of which stayed until 28 March; one on 26–27 April 1973; two on 28 April 1968, one of which stayed until the next day; one on 8 May 1969; and one on 14–15 June 1975. In addition, 11 other spring hummingbirds that were probably Anna's occurred between 5 March (1976) and 8 July (1970). Four of these occurred in March, three in April, two in May, and one each in June and July. While considered spring migrants, most of the spring Anna's Hummingbirds probably represented post-breeding dispersants. Bryant (1888) reported a single Anna's Hummingbird but gave no date.

RUFOUS HUMMINGBIRD—*Selasphorus rufus*. *Fall:* very rare to uncommon visitant. The seven individuals, adult ♂♂ or birds examined in the hand, were present from 17 August (1969) to 21 September (1975) with a slight peak (considering the *Selasphorus* spp. described below) in late August. The high count was two birds on 16 September 1975. *Spring:* uncommon visitant. The 32 individuals (specimen: PRBO 757) occurred from 23–24 February (1976) to 14–15 May (1969) with a slight peak in late March but a much greater one during late April. There was but one February record; the next earliest was 8 March (1972). The high count was seven on 29 April 1973. Other possible records are discussed below.

ALLEN'S HUMMINGBIRD—*Selasphorus sasin*. *Fall:* extremely rare to rare visitant. The only certain fall record was an individual presumably present 12–16 September 1975; it was captured and measured on the 15th. This is an extremely late record for this species. Tenaza (1967), however, collected single birds on 22 June and 7 July 1965. In addition, 58 *Selasphorus* hummingbirds were recorded between 13 July (1975) and 22 September (1975). Rufous probably greatly outnumbered Allen's, but possibly not as greatly as the 7:1 Rufous:Allen's ratio for known individuals. Peak numbers of *Selasphorus* hummingbirds (including known Rufous and Allen's) occurred in late August. The high count reached eight birds on 14 August and 12 September 1975. An unidentified *Selasphorus* hummingbird was also

recorded by Bryant (1888) on 15 August 1886. *Spring:* very rare to uncommon visitant. The nine individuals positively identified occurred from 11 March (1969) to 13–21 May (1975) with a slight peak in late March and a lesser one in mid-May. This latter peak may represent southbound birds as all were adult ♂♂. The high count of two individuals was recorded on 24 March 1974 and 13 May 1975. An additional 29 individuals of this genus were recorded between 3 February (1976) and 4 June (1973) and showed a late April peak suggesting that most were probably Rufous Hummingbirds. The February individual was extremely early; the next earliest was 24 March (1974). The high count of unidentified *Selasphorus* (spp.) was seven on 26 April 1973. The high count for the genus was 12 on that date. Bryant (1888) also recorded unidentified *Selasphorus* hummingbirds in spring.

CALLIOPE HUMMINGBIRD—*Stellula calliope. Spring:* extremely rare visitant. The three records, all of single birds, were 26–27 April 1973, 8 May 1969, and 8–9 May 1971 (caught and released).

BELTED KINGFISHER—*Megaceryle alcyon. Fall:* uncommon visitant. The approximately 37 individuals (two banded) occurred from 25 June (1975) to 16 November (1974) with a slight peak in late August. Occurrences were distributed as follows: one in June, four in July, 15 in August, 10 in September, six in October, and one in November. The high count of four was recorded on 15 September 1974 but included one winter resident. Three fall visitants were also recorded on 26 August 1970. Because this species frequented the inaccessible periphery of the island, exact numbers were difficult to obtain. The species was also seen by PRBO biologists in September 1967, and Bryant (1888) reported one in August 1887. *Winter:* rare resident. One or two individuals wintered on the island for each of the eight years for a total of 13 occurrences (two banded). The relatively small number of wintering and even transient individuals was possibly the result of the aggressive nature of this species. Although a few birds arrived as late as 23 December (1974), most wintering individuals apparently arrived in September, the earliest being 4 September (1968, 1975), and departed in March or early April, the latest being 14 April (1975). Thoresen (1960) recorded one in January 1960. *Spring:* very rare visitant. The six spring occurrences, all of single birds, were recorded between 26 April (1969, 1975) and 10–11 May (1971). Tenaza (1967) reported one on 4–5 June 1964.

COMMON FLICKER, Yellow-shafted form—*Colaptes auratus, auratus* group. *Fall:* rare to uncommon visitant. The 24 individuals (two banded) occurred from 1 October (1972) to 27 November–9 December (1969) with a peak in early to mid-October. The high count of five was recorded on 8 October 1972. In addition, 24 phenotypic "intermediates" between this and the red-shafted form were recorded from 26 September (1974) to 5 December (1974) with a peak during mid-October. The high count of three intermediates was recorded on 15 October 1972. PRBO biologists also observed an intermediate on 23 September 1967. *Winter:* extremely rare resident and visitant. The single visitant was a ♂ present 6–11 January 1971. An intermediate individual ("yellow-winged") was resident from 27 November 1972 to 13 February 1973. Bryant (1888) reported an intermediate collected by Ruggs. It was probably taken in winter. *Spring:* extremely rare to very rare visitant. The two spring records were of single individuals present 8–9 April (banded) and 25–30 April 1973. Four single intermediate individuals occurred 30 March, 4 April, 15–18 April (banded), and 23 April, all in 1973.

COMMON FLICKER, Red-shafted form—*Colaptes auratus, cafer* group. *Fall:* fairly common visitant. The 144 individuals (20 banded) occurred from 17 September (1970) to 25 December (1973) with one bird remaining to 30 December (1972). The pronounced peak occurred in early to mid-October and the high count of 14 was recorded on 5 October 1972. This form was also observed in September 1967 by PRBO biologists. *Winter:* rare resident and visitant. Sixteen individuals (four banded) occurred during five of the eight winters, the species being absent during the winters of 1971–72, 1973–74, and 1975–76. Fourteen of the 16 birds were winter residents and arrived between 1 October (1970) and 11 January (1971), eight of them from late November to late December. Winter residents departed as early as 7 January (1969) and remained as late as 30 April (1970). Most, however, departed in March and April. The two winter visitants occurred 31 January 1971 and 7–8 February 1969. The winter high count of six birds was recorded on 31 January 1971. Bryant (1888) reported that this form was occasionally seen in winter. Thoresen (1960) also recorded this form in January 1960. *Spring:* uncommon visitant. The 36 individuals (six banded) occurred from 17 March (1976) to 6 June (1975) with a peak in late March. Only four individuals occurred in May, the latest being 13 May (1975), and only one occurred in June. The high count of seven birds was recorded on 4 April 1973.

ACORN WOODPECKER—*Melanerpes formicivorus*. *Fall:* extremely rare visitant. Single individuals were present 18–19 September 1971, 26 September 1973, and 5 October 1972. *Winter:* extremely rare visitant. A single individual was present on 26 January 1973.

LEWIS' WOODPECKER—*Melanerpes lewis*. *Fall:* extremely rare visitant. Single individuals were present 24–25 September 1968 and 27 September 1973. *Spring:* extremely rare visitant. Two birds were present 29–30 April and a third was present 2–4 May, all in 1968.

YELLOW-BELLIED SAPSUCKER, Red-naped form—*Sphyrapicus varius nuchalis*. *Fall:* extremely rare visitant. A single individual of this form was banded on 13 October 1970, the only fall occurrence on the island. *Spring:* extremely rare visitant. The only spring occurrence of this form was one present and banded 18–20 June 1974.

YELLOW-BELLIED SAPSUCKER, Red-breasted form—*Sphyrapicus varius ruber* and/or *S. v. daggetti*. *Fall:* rare visitant. The 13 individuals (six banded) occurred from 1 October (1975) to 2 November (1968) with a peak during early October. The high count of four was recorded 2 October 1968. The species did not occur during the four falls, 1971–1974. One individual was also observed by PRBO biologists on 25 September 1967. *Spring:* extremely rare visitant. The only spring occurrence of this form was a single bird banded 25 March 1970.

EASTERN KINGBIRD—*Tyrannus tyrannus*. *Fall:* very rare visitant. The seven fall individuals occurred as follows: 10 August 1968, 5 September 1969 (two birds, one of which stayed until 6 September), 13 September 1969, 15 September 1973 (two birds), and 16 September 1969. In addition, an unidentified kingbird on 14 September 1975 was thought possibly to be of this species. *Spring:* extremely rare visitant. The three individuals occurred on 12–14 May 1973, 31 May–3 June 1975, and 26–27 June 1968 (banded). An individual was also seen by PRBO biologists 12–14 June 1967.

TROPICAL KINGBIRD—*Tyrannus melancholicus*. *Fall:* very rare visitant. The five individuals occurred as follows: 7 August 1973, 18–25 August 1973 (collected: PRBO 713), 1–4 October 1968 (banded), 5 October 1970 (banded), and 20 October 1971. The two August records were unusually early for California.

WESTERN KINGBIRD—*Tyrannus verticalis*. *Fall:* uncommon visitant. The 35 individuals (three banded) occurred from 29 July (1968) to 19 October (1969) with the peak in early September. The high count of five was recorded 19 October 1969. In addition, an unidentified kingbird on 11 September 1969 was probably this species. *Spring:* rare visitant. The 18 individuals (two banded) occurred from 28 April (1968) to 7 July (1975) with a peak in early to mid-May. Only four occurred in June and one in July. The high count of two was recorded on 8–9 May 1969, 14–15 and 17–18 May 1975, and 22 June 1972. Bryant (1888), Barlow (1897), and Tenaza (1967) all reported spring records.

SCISSOR-TAILED FLYCATCHER—*Muscivora forficata*. *Spring:* extremely rare visitant. The only record was of a ♀ present 18–19 May 1973; it was banded.

GREAT CRESTED FLYCATCHER—*Myiarchus crinitus*. *Fall:* very rare visitant. The four individuals occurred as follows: 18 September 1971, 27 September 1974, 4 October 1970 (banded and photographed; see Peterson 1971), and 13 October 1970. Two were also recorded by PRBO on 25 September 1967: one banded and another found dead (MVZ 158780). These were the first records for California.

ASH-THROATED FLYCATCHER—*Myiarchus cinerascens*. *Fall:* uncommon visitant. The 53 individuals (31 banded; specimens: PRBO 460, 711, 712, and 744) occurred from 16 July (1973) to 21 December (1968) with a peak in early September. In fact, only five individuals occurred after September: three in October and one each in November and December. The high count of five was recorded on 1 September 1968. Tenaza (1967) also recorded this species in fall. *Spring:* uncommon visitant. The 35 individuals (20 banded) occurred from 2 May (1971) to 10–11 July (1969) with a peak in early June. The high count of six was recorded on 12 June 1975. No clear separation existed between spring and fall occurrences but many of the individuals banded on and after 16 July were immatures. Dawson (1911b) and Tenaza (1967) both recorded this species in June. Medina collected one 27 May 1963 (MVZ 160093). It was seen by PRBO in June 1967, as well.

EASTERN PHOEBE—*Sayornis phoebe*. *Fall:* extremely rare visitant. Two individuals (one banded) occurred on 6 November 1972. *Spring:* extremely rare visitant. Single individuals occurred 18 May 1968 and 6–8 June 1975; both were banded.

BLACK PHOEBE—*Sayornis nigricans*. *Fall:* uncommon visitant. The 50 individuals (nine banded) occurred from 8–9 August (1968) to 24 November (1974) with a sharp peak in early October. There was only one August occurrence. The next earliest was 3–5 September (1968). The high count of 10 was recorded 4 October 1968. The species did not occur in the fall of 1973. It was also seen by PRBO biologists in September 1967. *Winter:* rare resident and visitant. Eleven of the 13 individuals (seven banded) were winter residents. They arrived between 14 September (1975) and 24 December (1974) with most arriving in October. Winter residents generally departed by late February; one remained until 2 March (1971), one to 14 March (1976), and another until 1 April (1975). The winter high count occurred in 1971–72 with three resident individuals but no residents occurred in 1972–73 nor 1973–74. In addition, single winter visitants occurred on 9 February 1970 and 25 February 1974. *Spring:* very rare visitant. The four individuals occurred 16 March 1973, 25–26 March 1969, and 8 May 1975 (two birds). Bowman (1961) reported one on 18 May 1958, and Tenaza (1967) reported one on 4–5 June 1964.

SAY'S PHOEBE—*Sayornis saya*. *Fall:* uncommon visitant. The 64 individuals (eight banded; specimen: PRBO 610) occurred from 1 September (1968) to 19 October (1972) with a peak in late September. The high count of 10 was recorded on 29 September 1968. Tenaza (1967) recorded seven in September 1965, and PRBO recorded it in September 1967. *Winter:* extremely rare resident. The only winter individual was one resident from 20 October 1970 to 1 April 1971. *Spring:* very rare visitant. The five individuals occurred 20 March 1970, 4 April 1973, 4 and 12 May 1971, and 14 May 1970.

WILLOW FLYCATCHER—*Empidonax traillii*. *Fall:* uncommon to fairly common visitant. The 78 individuals (57 banded; specimens: PRBO 195, 449, 456, 658) occurred from 20 July (1973) to 17 October (1974) with a peak in late September. There was only one July occurrence; the next earliest was 18 August (1969). The high count of four was recorded on 26 August 1970 and 27 September 1974. Tenaza (1967) collected one on 31 August 1965. *Spring:* uncommon to fairly common visitant. The 71 individuals (64 banded; specimen: PRBO 416) occurred from 4 May (1972) to 21–24 June (1972) with a very sharp peak in early June. The high count of 20 was recorded on 5 June 1969. Dawson (1911b) listed seeing one on 29 May 1911. Grinnell and Miller (1944) cited a specimen in the California Academy of Sciences (CAS 18077) collected that date but incorrectly identified by Dawson as a Western Flycatcher. Tenaza (1967) also collected one on 23 June 1965.

LEAST FLYCATCHER—*Empidonax minimus*. *Fall:* rare visitant. The 23 individuals (12 banded; specimens: CAS 68502 (♂), 68503 (♀), 68504 (♂), all immatures) occurred from 30–31 August (1969) to 22–23 November (1971) with a sharp peak in early October. Except for the single August bird and single individuals on 3 November 1975 and 22–23 November 1971, all occurred in September and October. The high count of three was recorded on 5 October 1970. *Spring:* very rare visitant. The four individuals occurred 2–3 June 1971 (banded), 3–7 June 1971, 6 June 1975 (banded), and 8 July 1968 (collected: adult ♂, CAS 68478).

HAMMOND'S FLYCATCHER—*Empidonax hammondii*. *Fall:* rare visitant. The eight positively identified individuals (five banded) occurred singly from 30 August (1973, 1974) to 17 October (1972). Two occurred in August, four in September, and two in October. In addition, 34 unidentified *Empidonax* spp. were recorded in fall. It is likely that many, perhaps half, of these birds were Hammond's. Most of the remainder were probably Dusky. However, it is probable that a few were Willow, Least, Gray, or even Western Flycatchers. Occurrences of these 34 birds were scattered from 1 August (1970) to 9 October (1973) and 9–11 October (1974) with most occurring between late August and late September. The high count of five unidentified *Empidonax* spp. occurred on 4 September 1968. Unidentified *Empidonax* were also recorded by PRBO in September 1967. *Spring:* uncommon to fairly common visitant. The 50 individuals (47 banded; specimen: PRBO 202) occurred from 8 April (1969) to 17 June (1969) with a peak in early May. Of these 50, only six occurred in April and two in June. The high count of seven birds was recorded on 9 May 1971. In addition, 85 unidentified *Empidonax* spp. (one banded; specimen: PRBO 659) were recorded in spring. It is likely that many, perhaps more than half, of these birds were Hammond's. The remainder were probably mostly Dusky Flycatchers. Occurrences of these 85 birds extended from 22 April (1969) to 8–9 June (1972) with a peak in early May. Seventeen occurred in late April and only two in June. The high count of 50 unidentified *Empidonax* spp. occurred on 9 May 1969. An unidentified *Empidonax* was also recorded by PRBO in June 1967.

DUSKY FLYCATCHER—*Empidonax oberholseri*. *Fall:* rare visitant. The six positively identified individuals occurred as follows: 28 August 1974, 14 September 1972, 17 September 1972 (banded), 21–22 September 1974 (banded), 24 September 1971 (banded), and 27 September 1969 (banded). It is likely that quite a few of the 34 unidentified fall *Empidonax* were this species (see Hammond's Flycatcher). *Spring:* uncommon visitant. The 34 individuals (31 banded; specimens: PRBO 200, 201) occurred from 14 April (1968) to 5–6 June (1975). Twenty-three of these occurred in May with a peak early that month; only eight occurred in April and three in June. The high count of eight occurred on 9 May 1969. It is probable that quite a few of the 85 unidentified spring *Empidonax* were this species (see Hammond's Flycatcher).

GRAY FLYCATCHER—*Empidonax wrightii*. *Fall:* extremely rare to very rare visitant. Only three individuals have been positively identified: 27 August 1971, 2 October 1972, and 15–20 October 1975 (banded). It is likely that very few of the unidentified fall *Empidonax* were of this species. *Spring:* uncommon visitant. The 41 individuals (29 banded; specimens: PRBO 198, 452) occurred from 22 April (1969) to 26 May (1975) with a peak in early to mid-May. In fact, only eight occurred in April. The high count of four was recorded on 9 May 1969. Tenaza (1967) collected one on 27 May 1965. It is likely that very few of the unidentified spring *Empidonax* were this species.

WESTERN FLYCATCHER—*Empidonax difficilis*. *Fall:* common visitant. The 326 individuals (224 banded) occurred from 12 July (1973) to 16 October (1972) with a sharp peak in mid-September. Only four fall individuals occurred in July; the earliest for the period usually arrived in August, often in late August. The high count of 50 was recorded 18 September 1971. PRBO also recorded this species in September 1967. Tenaza (1967) recorded it in fall 1965 and estimated "several hundred" present on 5 September 1965. *Spring:* fairly common visitant. The 132 individuals (106 banded; specimen: PRBO 437) occurred from 22 April (1969) to 10 July (1970) with a very sharp peak in early June. Only eight arrived in April and only three arrived in July. The high count of 50 was recorded 4–5 June 1969. Dawson (1911b), Bowman (1961), and Tenaza (1967) all recorded this species in spring; Medina collected three (MVZ 160094–160096) in spring 1963; and PRBO recorded it in June 1967. Bryant (1888) reported one specimen taken but gave no date.

EASTERN WOOD PEWEE—*Contopus virens*. *Spring:* extremely rare visitant. The only record was an individual banded and photographed on 15 June 1975.

WESTERN WOOD PEWEE—*Contopus sordidulus*. *Fall:* fairly common visitant. The 155 individuals (90 banded; specimen: PRBO 192) occurred from 16 July (1973) to 19 November (1972) with a peak in mid-September. Only four, possibly very late spring visitants, arrived in July. The next earliest arrival was 11 August (1975); the species generally arrived in numbers in late August. In addition, only five occurred in October, the latest being 14 October (1971), and only one occurred in November. The high count of 15 was recorded 16 September 1972. PRBO also recorded this species in September 1967, as did Tenaza (1967) in September 1965. *Spring:* common visitant. The 544 individuals (431 banded; specimens: PRBO 191, 414, 415, 732) occurred from 27 April (1973) to 12 July (1974), with a peak in late May and early June. The high count of 50 was recorded 4–5 June 1969. Bryant (1888), Dawson (1911b), and Tenaza (1967) all reported this species in spring, and Medina collected three (MVZ 160097–160099) in May 1963. PRBO also recorded it during June 1967.

OLIVE-SIDED FLYCATCHER—*Nuttallornis borealis*. *Fall:* uncommon visitant. The 44 individuals (17 banded) occurred from 16 July (1973) to 27 October (1973) with a peak from late August to mid-September. Except for two individuals banded in July (16 and 18–19 July 1973) and one in October, all records fell between 12 August (1973) and 30 September (1973). The high count of five was recorded on 8 and 15 September 1972. This species was also recorded by PRBO in September 1967 and by Tenaza (1967) in fall 1965. *Spring:* uncommon visitant. The 70 individuals (43 banded) occurred from 22 April (1969) to 14 June (1974, 1975) with a peak in late May. The high count of 10 was recorded 26–27 May 1970. The species was previously recorded in spring by Dawson (1911b), Bowman (1961), and Tenaza (1967); Medina also collected one (MVZ 160100) 25 May 1963.

HORNED LARK—*Eremophila alpestris*. *Fall:* rare visitant. The 26 individuals occurred from 18 September (1975) to 19 November (1975) with a peak in late October. The high count of nine was recorded 2–3 October 1972, but individuals usually arrived singly or in very small flocks. PRBO biologists saw one on 25 September 1967. *Spring:* very rare visitant. The five individuals occurred as follows: 16

May 1969, 19 May 1975 (two birds), and 12 and 21 June 1968. Bowman (1961) saw one on 18 May 1954.

VIOLET-GREEN SWALLOW—*Tachycineta thalassina*. *Fall:* uncommon to fairly common visitant. The 98 individuals occurred from 12 August (1973) to 3 December (1972) with the peak during early to mid-October. Only four birds occurred during August and in most years early arrivals were in late September or even early October. The December record was exceptionally late in that the next latest record was 27 October (1969, 1972). The high count of 34 was recorded 13 October 1975, but the species usually occurred singly or in flocks of two to five. PRBO recorded this species in September 1967. *Spring:* rare visitant. The 12 individuals were scattered from 3 February (1976) to 11 July (1970). Only one occurred in February; the next earliest record was 2–3 March (1975). Three individuals that occurred in June and July could have been extremely early fall migrants but considering the schedules of other swallows, they are best treated here. The high count of three was recorded 18 March 1974. Dawson (1911b) reported one for 1 June 1911.

TREE SWALLOW—*Iridoprocne bicolor*. *Fall:* very rare to rare visitant. The eight individuals occurred as follows: 20 July 1972, 29 July 1974, 31 July–2 August 1969 (banded), 4 August 1969, 2 October 1968, 5 October 1972, and 19 and 22 October 1973. The distinct separation in groupings of dates suggests the occurrence of two different populations. *Spring:* rare to uncommon visitant. The 25 individuals occurred from 2 March (1975) to 10 June (1974) with a slight peak during March. The high count of nine was recorded 9 March 1972. In addition, 21 unidentified swallows occurred between 5 March (1975) and 5 June (1975). Of these, 15 occurred in March or April and most likely were Tree or Violet-green Swallows. The remainder could have been any of the other species.

BANK SWALLOW—*Riparia riparia*. *Fall:* very rare visitant. The four individuals occurred as follows: 5–6 September 1969, 18 September 1974, 20 September 1974, and 3 October 1968. *Spring:* very rare to rare visitant. The nine individuals occurred as follows: 3 May 1972, 9 May 1968, 12 May 1969, 14 and 16 May 1975, 26 May 1970 (two birds), 31 May–3 June 1975, and 15 June 1975.

ROUGH-WINGED SWALLOW—*Stelgidopteryx ruficollis*. *Fall:* uncommon to fairly common visitant. The 99 individuals occurred from 4 August (1975) to 20 September (1974) with the peak in late August. They generally arrived in small groups; a high count of 15 was recorded 8 September 1972. In addition, records of 15 unidentified swallows were scattered from 27 August (1973) to 6 October (1972). Most were probably Violet-green or Rough-winged Swallows. Tenaza (1967) collected one and counted up to 25 on 4 and 7 September 1965. *Spring:* rare visitant. The 16 individuals (one banded) occurred from 3 May (1974) to 19 June (1974) with one peak in early to mid-May and another in early to mid-June. The high count of four was recorded 12 June 1974. Medina collected one on 25 May 1963 (MVZ 160101).

BARN SWALLOW—*Hirundo rustica*. *Fall:* uncommon to fairly common visitant. The 88 individuals (one banded) occurred from 21 July (1974) to 28 October (1975) with a peak in mid- to late September. The single July bird was extremely early; only four occurred in August, the earliest being 15 August (1971). The 28 October bird was the only one recorded after 13 October (1975). The high count of 10 was recorded 17 September 1972. Tenaza (1967) also recorded this species in fall. *Spring:* uncommon visitant. The 68 individuals occurred from 5 April (1973) to 7 July (1975) with a peak in early May. The vast majority arrived singly; the high count of five was recorded 8 May 1974. One pair was present for an extended period during May 1974. Bryant (1888) reported two present from 21 May to 2 June 1887; Tenaza (1967) also collected one on 16 June 1964.

CLIFF SWALLOW—*Petrochelidon pyrrhonota*. *Fall:* uncommon visitant. The 30 individuals occurred from 29 July (1968) to 24–25 October (1969) with a peak in early to mid-September. The first fall arrivals were usually in early September and thus the individuals present 29 July 1968 and 31 July 1971 were extremely early. The latest occurrence, 24–25 October 1969, was extremely late and also involved six birds, the high count. Most late arrivals were in late September, the next latest being 1 October 1968. *Spring:* rare visitant. The 11 individuals occurred from 8 May (1968) to 22 June (1970) with five arriving in early June. The high count of three was recorded 9 June 1970. Tenaza collected two on 24 June 1965.

PURPLE MARTIN—*Progne subis*. *Fall:* very rare visitant. Four individuals occurred as follows: 11 August 1970, 26 August 1971, 18 September 1975, and 4–5 October 1972. One was also seen by PRBO

biologists on 24 September 1967. *Spring:* very rare visitant. Five individuals occurred as follows: 28 May 1974, 4 June 1969, 15 June 1970 and 1975, and 17 June 1970.

COMMON RAVEN—*Corvus corax. Spring:* extremely rare visitant. One individual was present on 18 April 1972. A pair of ravens, raised in captivity, was introduced on 31 October 1973. One remained until 5 November, the other until 29 November.

Gruber (1884) listed ravens as present prior to 1884. Barlow (1897) reported that they nested for many years and that a nest was destroyed by humans on 9 June 1895 just after the young had hatched. He included a photograph of the young and a description of the nest. Bryant (1888) reported them as formerly breeding on the island. Blankinship and Keeler (1892) recorded them as rare and thought they bred. Kaeding (1903) found them nesting in 1903 but reported that the lighthouse keeper later shot the pair. Ray (1904) confirmed the shooting and reported that none had been seen since. Dawson (1911b) reported that a nest was destroyed twice in 1911 and that the birds departed the island. Most writers mentioned that the ravens nested on the West End, and that they were harassed because they ate the keeper's chickens. The breeding status of this species is further treated in the Discussion.

CLARK'S NUTCRACKER—*Nucifraga columbiana. Fall:* extremely rare visitant. The two individuals both occurred in fall 1972, a period remarkable for the number of montane species that visited. The dates were 5–8 and 27 October.

WHITE-BREASTED NUTHATCH—*Sitta carolinensis. Fall:* extremely rare visitant. The only record was an individual present 10–11 October 1969.

RED-BREASTED NUTHATCH—*Sitta canadensis. Fall:* sporadic common visitant. The 579 individuals (448 banded; specimens: PRBO 170–172) occurred from 30 July (1972) to 6 December (1972). These included only one individual in July, 37 in August, 14 in November, and only one in December; the remainder occurred in September and October. There were two distinct peaks of arrival, the first in mid-September and a second slightly smaller one in mid-October. Numbers varied greatly from year to year from highs of 330 birds in 1969 and 172 birds in 1972 to none in 1968 and 1971. The high count of 75 was recorded on 15 September 1969. The species was also recorded in September 1885 by Bryant (1888), in September 1965 by Tenaza (1967), and in September 1967 by PRBO. *Spring:* rare visitant. The 11 individuals (eight banded) occurred from 4 May (1968) to 19 June (1968) with one remaining as late as 17 July (1970). The high count of two was recorded 4 May 1968 and 6–11 June 1973. The highest number of spring arrivals (three birds) occurred in the springs of 1970 and 1973 following the falls of "flight years." Bowman (1961) saw one on 15 June 1958 and Tenaza (1967) collected one on 12 June 1964.

One individual, banded 17 August 1969, was recovered in Davis, California, on 16 March 1970.

PYGMY NUTHATCH—*Sitta pygmaea. Fall:* extremely rare visitant. One individual was banded on 6 August 1969.

BROWN CREEPER—*Certhia familiaris. Fall:* uncommon visitant. The 43 individuals (10 banded) occurred from 27 September (1973) to 15 November (1974) with one individual remaining until 24 November (1968). The very sharp peak occurred in late October. The high count of eight was recorded 26 October 1972. Twenty-two of the 43 individuals were recorded in 1972, an apparent "flight year." *Spring:* extremely rare visitant. The single record was of an individual banded on 13 June 1975; it remained until the following day.

HOUSE WREN—*Troglodytes aedon. Fall:* uncommon visitant. Of the 40 individuals (17 banded), 37 occurred from 18 August (1970) to 19 October (1974) with slight peaks in late August and mid-September. Three early individuals, 12 July–12 August 1972 (banded), 19–24 July 1973, and 30 July 1969 (banded), could have been extremely late spring migrants but, since the two banded birds were immatures, they are all considered early fall migrants. The high count of four was recorded on 18 October 1972. Tenaza (1967) collected one on 7 September 1965 and PRBO recorded one in September 1967. *Spring:* very rare visitant. The four individuals included two timed "normally," 22 April 1969 (banded) and 5–10 May 1970, and two very late birds, 24 June–18 July 1968 and 24 June–13 July 1970. Both of the late birds were banded and were adults.

WINTER WREN—*Troglodytes troglodytes. Fall:* uncommon visitant. About 43 individuals (two banded) occurred from 24 August (1970, 1974) to 25 November (1973) with a peak mid-September to early

October. There were only three November occurrences. Because of its secretive nature and tendency to live in cavities, exact numbers were difficult to obtain. The high count of three birds was recorded 21 October 1972. Tenaza (1967) collected one of two present 5 September, and saw four on 6 September 1965. An unidentified wren, probably of this or the previous species, was seen 12 October 1974. *Winter:* extremely rare visitant. Single birds were present 21 December 1973–5 January 1974 and 15–23 January 1971. *Spring:* very rare visitant. The eight individuals occurred as follows: 23 March 1974, 28 March 1975 (banded), 6 April 1973, 20 April 1968 (found dead), 26 April (banded) and 29 April–1 May 1971, 29 May 1973, and 20 June 1970.

LONG-BILLED MARSH WREN—*Cistothorus palustris*. *Fall:* very rare visitant. Four individuals occurred as follows: 26–29 September (banded) and 29 September 1974, 1 October 1968, and 2 October 1975. PRBO biologists also recorded one 23–24 September 1967 (banded).

ROCK WREN—*Salpinctes obsoletus*. *Fall:* uncommon visitant. The 49 individuals (eight banded) arrived between 21 August (1970) and 10 November (1972). Individuals often remained for long periods, even into December, the latest until 29 December (1968). A pronounced peak in arrivals occurred in late September and early October. The high count of 12 was recorded 13 October 1968 and 10–11 November 1972, but included, respectively, two and four winter residents. PRBO also recorded the species in September 1967. *Winter:* rare resident. The 27 winter individuals (five banded) actually included only 24 different birds since three wintered for two consecutive years. Arrival dates extended from 19 August (1973) to 12 October (1974). Most arrived in mid- to late September and, if they did not remain to nest, departed during early to mid-April. A few, however, departed earlier and four remained into May, the latest until 26 May (1975). The species occurred in each of the eight winters; the high count of seven birds wintered in 1974–75. Two additional birds, present during the spring of 1968, probably also wintered. *Spring:* extremely rare visitant. A single bird was present 26–29 June 1970. *Summer:* rare resident and breeder. At least one pair (both adults banded) successfully fledged four young (one banded) during 1968. The last of these, however, disappeared on 27 June 1968. In 1969, the last wintering individuals left 8 and 17 April without attempting to breed. In 1970, the lone individual left 8 April. In 1971, three individuals remained through the summer and into the next winter. A pair of these fledged at least 10 young from three different broods; a total of eight young was banded. In 1972, this same color-banded pair began to build a nest but disappeared during April; the (ex-) island cat was the suspected cause. In 1973, two pairs were present, at least one of which built a nest, but all four birds vanished during April. In 1974, three were present into April but all were possibly ♂♂. No nesting was attempted; the last individual was seen fleeing from a Burrowing Owl. In 1975, six remained into April with three remaining into May. All eventually disappeared with no evidence of breeding. A total of 23 birds were banded.

Taylor (1887), Bryant (1888), Osgood (1894), Kaeding (1903), Ray (1904), Dawson (1911b), Allen (1922), and Smith (1934) reported breeding populations of this species. The indication is that at least several pairs usually bred in those earlier years, although Taylor estimated a spring population of 100 birds in 1886. They also reported that at least two and sometimes three broods were raised. In more recent years, Thoresen (1960) and Bowman (1961) listed their presence but not necessarily as breeders. Tenaza (1967) saw them feeding young in both 1964 and 1965. PRBO recorded a single individual in June 1967 but found no evidence of breeding that year. The breeding status of this species is further treated in the Discussion.

MOCKINGBIRD—*Mimus polyglottos*. *Fall:* uncommon visitant. The 49 individuals (31 banded) occurred from 15 July (1973) to 3 November (1968) with two slight peaks, the first in August and the second in late September. Individuals often remained for extended periods, the longest of which lasted 33 days. The high count of four was recorded 10 August 1974. *Spring:* rare visitant. The 25 individuals (13 banded) occurred from 3 April (1968) to 9–11 July (1971) with a peak in late May and early June. A second slight peak (five individuals) occurred in early July and may represent summer wanderers. Individuals often remained several days. The high count of two was recorded 22 May, and 2–3 and 9–11 July 1971. Tenaza (1967) reported one in May 1965 and PRBO recorded one in June 1967.

A mockingbird, banded 20 September 1971, was recovered in Fairfield, California, on 8 June 1972.

GRAY CATBIRD—*Dumetella carolinensis*. *Fall:* extremely rare visitant. An individual was banded on 15 October 1974. The first recorded in California was collected on the Farallones by Townsend (1885) on 4 September 1884 (USNM 100202).

BROWN THRASHER—*Toxostoma rufum. Fall:* extremely rare visitant. Individuals occurred 9 October (banded) and 9–11 October 1974, and 25 October 1971 (banded). Characteristics of the tail of the 1971 bird indicated it to be of the western race (*T. r. longicauda*). *Spring:* very rare visitant. The five individuals (all banded) occurred 1–7 May 1973, 23 May 1968, 18 June 1969, 21–22 June 1974, and 2 July 1969.

BENDIRE'S THRASHER—*Toxostoma bendirei. Fall:* extremely rare visitant. The two occurrences were 14 July 1975 and 2–5 September 1973. The former was very early for a fall visitant but, in light of the fact that an individual of this species returned to winter for the second consecutive year in the Sacramento Valley on 8 August 1976 (Winter and Erickson 1977), it is here considered to represent a fall rather than spring occurrence.

SAGE THRASHER—*Oreoscoptes montanus. Fall:* rare visitant. The 16 individuals (three banded) occurred from 8 September (1972) to 10–12 November (1973) with no pronounced peak. The high count of two was recorded on 5 October 1972. However, PRBO recorded three on 24–25 September 1967. *Spring:* extremely rare visitant. The two individuals (both banded) occurred 16 May 1968 and 7–10 June 1970.

AMERICAN ROBIN—*Turdus migratorius. Fall:* fairly common visitant. The 233 individuals (22 banded) occurred from 19 September (1971) to 31 December (1974) with three rather distinct peaks: late October, mid-November, and early to mid-December. The high count of 20 was recorded 17 December 1968. *Winter:* uncommon resident and visitant. The 68 individuals (four banded) occurred from 9 December (1972) to 13 February (1969, 1976) with one individual remaining until 15 February (1969). Only three individuals remained for three weeks or more: 9 December 1972–4 January 1973, 10 December 1972–5 January 1973, and 19 December 1970–11 January 1971. These birds could have been late fall migrants as could the peak of 23 winter visitants that occurred from extremely late December through early January. It is also possible that a second peak of 17 in early February represents an early spring movement. The high count of eight was recorded 7 January 1971. Bryant (1888) listed this species as a winter straggler; Thoresen (1960) saw 10–12 in January 1960. *Spring:* fairly common visitant. The 130 individuals (18 banded) occurred from 14 February (1973) to 25 July (1973). Although three February occurrences are considered to represent definite spring migration, the first major spring movement occurred each year during the first half of March. The peak occurred from mid-March to early April. Only seven robins occurred in May and only three in June, the latest being 23 June (1969). The 25 July 1973 record was quite unexpected but is here considered to represent an extremely late spring visitant. The high count of 40 was recorded 4 April 1973. Medina collected one on 26 May 1963 (MVZ 160102).

VARIED THRUSH—*Ixoreus naevius. Fall:* uncommon to fairly common visitant. The 86 individuals (eight banded) occurred from 2 October (1972) to 28 December (1974) with a peak in mid-October. Three of the five December individuals occurred very late in the month and may represent early winter visitants. The high count of 30 was recorded 20 October 1972. *Winter:* very rare visitant. This species occurred only during the winter of 1973–74 when eight (two banded) visited between 7 January and 11 February–3 March. As noted above, three other birds in late December 1969 and 1974 could also have been winter visitants. The high count of three occurred 7 January 1974. Bryant (1888) reported several during the winter of 1886–87, one of which was collected. *Spring:* uncommon visitant. The 65 individuals (24 banded) occurred from 7 March (1974) to 29 April–1 May (1975) with a peak from late March to early April. The high count of 22 was recorded 4 April 1973.

HERMIT THRUSH—*Catharus guttatus. Fall:* abundant visitant. The 909 individuals (186 banded; specimens: PRBO 337, 338, 368) occurred from 3 September (1972) to 29 December (1974) with the peak in early October. Nearly half (398) of the birds visited during the spectacular fall migration of 1972. Only six occurred during November, the latest being 19 November (1971). The 11 birds occurring in December, primarily late December 1968, may represent winter visitors. The high count of 350 birds was recorded 2 October 1972. PRBO recorded this species in September 1967. *Winter:* very rare to rare visitant. Nine birds (four banded) visited between 9 January (1971) and 26 February (1970), with at least one occurring in each winter except 1968–69. All remained but a single day. Nine birds in December 1968 and two in 1972 may also represent winter visitants. An unidentified thrush present 14 January 1975 was likely of this species as it fits into the pattern of winter visits. The high count of three was recorded 19 January 1973. Bryant (1888) also listed a winter record for 1886–87. *Spring:*

fairly common visitant. The 161 individuals (98 banded) occurred from 16 March (1976) to 28 May (1971, 1974) with a peak from late April to early May. The high count of 25 was recorded 9–11 May 1971.

SWAINSON'S THRUSH—*Catharus ustulatus*. *Fall:* common visitant. The 266 individuals (114 banded; specimens: PRBO 685, 686) occurred from 27 August (1973) to 24 November (1975) with a peak during mid- to late September. Only one bird visited in August and only three visited after mid-October, two in late October and one in November. The high count of 60 was recorded 22 September 1971. Tenaza (1967) reported at least 20 in September 1965 and PRBO reported the species in September 1967. In addition, five unidentified *Catharus* thrushes recorded between 20 September (1975) and 14–16 October (1972) were probably Swainson's or Hermits. *Spring:* fairly common visitant. The 122 individuals (89 banded) occurred from 22 April (1975) to 2 July (1968) with a very sharp peak in late May. The two extreme dates were the only occurrences for those months. The high count of 35 was recorded 28 May 1971. Dawson (1911b), Bowman (1961), and Tenaza (1967) reported this species in spring; Medina collected two (MVZ 160103, –04) on 22 May 1963; and PRBO recorded it in June 1967. In addition, two unidentified *Catharus* spp. on 18 June 1968 were most likely of this species as they fit its migration schedule.

GRAY-CHEEKED THRUSH—*Catharus minimus*. *Fall:* very rare visitant. The five occurrences were as follows: 12–14 September (banded) and 18 September 1975, 25 September 1974 (banded), and 3 October 1970. Two birds occurred on this last date, one of which was collected (CAS 68501). The specimen was an immature ♂ of the nominate race (*C. m. minimus*; R. Laybourne pers. comm.), and represented the first record of this species for California. The skull was unossified, the testes minute, and it had no molt; the bird weighed 29 g, having moderately heavy fat deposits. Some measurements were: wing = 99 mm, tail = 66, tarsus = 28.3, culmen = 12.3. *Spring:* extremely rare visitant. An individual banded 28 May 1971 was recaptured on 8 June (it was held in captivity by DeSante until 24 June when it was released at Stanford University). Another individual was banded on 11 June 1975.

VEERY—*Catharus fuscescens*. *Fall:* extremely rare visitant. A single individual present 20 October 1973 was the first valid record for California.

MOUNTAIN BLUEBIRD—*Sialia currucoides*. *Fall:* extremely rare visitant. The only fall occurrence was a bird present 21–22 October and found dead on 24 October 1972. *Winter:* no recent records. Bryant (1888), however, reported that in former times flocks appeared during the winter and remained for a few days. *Spring:* very rare visitant. Single individuals were present 3 April 1973, 12–13 April 1975, 29 April–2 May 1973, and 16 June 1974. The three April birds were ♂♂.

WHEATEAR—*Oenanthe oenanthe*. *Spring:* extremely rare visitant. The first record for California and one of the very few for the contiguous United States was a ♂ collected 11 June 1971 (CAS 68566; Manuwal and Lewis 1972).

TOWNSEND'S SOLITAIRE—*Myadestes townsendi*. *Fall:* very rare visitant. Single individuals were present 22–23 September 1968, 2–4 and 25–26 October 1972, and 30 October 1973. *Winter:* extremely rare visitant. A single bird was present 29 December 1968–3 January 1969 (banded). *Spring:* extremely rare visitant. A single bird was banded on 26 April 1973.

BLUE-GRAY GNATCATCHER—*Polioptila caerulea*. *Fall:* very rare visitant. The five individuals occurred 8 September 1972 (two birds), 26–29 September 1974, 1 October 1970, and 4 October 1971. *Spring:* extremely rare visitant. Single individuals were present 17–19 April 1974 (banded), and 30 April and 2–3 May (banded) 1971.

GOLDEN-CROWNED KINGLET—*Regulus satrapa*. *Fall:* fairly common visitant. The 200 individuals (70 banded) occurred from 26 September (1974) to 20 November (1973) with an individual remaining until 26 November (1974). The peak occurred in mid- to late October. The vast majority of the birds, in fact, occurred in October; only nine occurred in September and eight in November. The high count of 30 was recorded 21–22 October 1972. PRBO biologists also recorded three on 25 September 1967, the earliest record for the island. *Spring:* uncommon visitant. The 30 individuals (15 banded) occurred from 16 March (1974) to 9 May (1969). Twenty-one of these, however, occurred during 1974, with the high count of 18 recorded on 16 March 1974. Otherwise, occurrences were scattered from late March to early May.

RUBY-CROWNED KINGLET—*Regulus calendula*. *Fall:* common visitant. The 510 individuals (188 banded) occurred from 12 September (1973, 1974) to 18–23 December (1975) with the peak from late September to early October. The majority visited during October, there being only 17 birds in November and three in December. The latter could, but probably did not, represent winter visitants. The high count of 150 was recorded 29 September 1968. PRBO also recorded the species in September 1967. *Winter:* extremely rare visitant. The two winter occurrences, both of single birds, were 1–3 and 6 January 1976, and were probably extremely late fall migrants. Interestingly, the latest fall individual visited 18–23 December 1975. *Spring:* common spring visitant. The 365 individuals (164 banded) occurred from 8 March (1972) to 4–7 June (1975) with two distinct peaks, the first in early April and the second in early May. The high count of 100 was recorded 9 May 1969, but numbers varied considerably from year to year. Bryant (1888) listed a single specimen but did not give a date and Medina collected two (MVZ 160105, –06) in May 1963.

WHITE WAGTAIL—*Motacilla alba*. *Fall:* extremely rare visitant. The only island record was a single individual photographed on 10 October 1974.

WATER PIPIT—*Anthus spinoletta*. *Fall:* common visitant. The 844 individuals (four banded; specimen: PRBO 403) occurred from 12 September (1972, 1974) to 13 December (1972) with an extended peak throughout October. The high count of 100 was recorded 4 October 1972. The species often arrived in small but coherent flocks of 2–30 birds that circled the island but did not land. Few individuals spent much time on the island. The three December individuals, two on 11 December and one on 13 December 1972, could well have been winter visitants. The species regularly occurred until late November. It was also recorded by PRBO in September 1967. *Winter:* extremely rare visitant. A single bird was present 19 January 1976. *Spring:* very rare visitant. The eight spring individuals occurred 4 and 21 April (two birds) 1973, 24 April 1970, 4 and 7 May 1974, 10 May 1968, and 3–4 July 1974. This last record was most unusual. Medina collected one on 27 May 1963 (MVZ 160107).

RED-THROATED PIPIT—*Anthus cervinus*. *Fall:* extremely rare visitant. One was banded and photographed on 3 November 1968, the only island record.

BOHEMIAN WAXWING—*Bombycilla garrula*. *Fall:* extremely rare visitant. One was seen 28 November 1968, the only island record.

CEDAR WAXWING—*Bombycilla cedrorum*. *Fall:* fairly common visitant. The 196 individuals (73 banded) occurred from 16 July (1973) to 10 December (1975) with a peak in early October. The 16–19 July 1973 record was difficult to classify, but in view of six individuals scattered through August, is best treated as an early fall migrant. The species regularly arrived in numbers in mid-September. Two December records, 6 December 1970 and 10 December 1975, may represent winter visitants as the species last occurred regularly in mid-November. PRBO recorded it in September 1967. *Winter:* extremely rare visitant. The three winter occurrences were 2 January 1973, 9 January 1971 (found dead on 20 January 1971; specimen: PRBO 468), and 30 January 1970; all were of single birds. *Spring:* uncommon visitant. The 48 individuals (12 banded; specimen: PRBO 144) occurred from 4 May (1968) to 19 June (1968, 1972) with a sharp peak in late May. The high count of eight was recorded 27 May 1971. Dawson (1911b) reported one for May and Tenaza (1967) saw one in May and one in June 1965. Medina collected one on 25 May 1963 (MVZ 160108).

PHAINOPEPLA—*Phainopepla nitens*. *Fall:* extremely rare visitant. A single bird was banded 10 September 1973, the only island record.

NORTHERN SHRIKE—*Lanius excubitor*. *Fall:* extremely rare visitant. A single individual was banded 29 October 1971, the only island record.

LOGGERHEAD SHRIKE—*Lanius ludovicianus*. *Fall:* extremely rare visitant. The only positively identified fall individual was one present 24–26 August 1972. An unidentified shrike present 26–27 July 1972 was, without much doubt, also this species. *Spring:* extremely rare visitant. Single individuals were present 3 April 1973 and 24–26 May 1971 (banded). Bryant (1888) reported one present for several days in 1886 but gave no date.

STARLING—*Sturnus vulgaris*. *Fall:* abundant visitant. The approximately 7818 individuals (21 banded) occurred from 9 September (1974) to 31 December (1974, 1975) with a peak in early November. Early flocks, those that arrived in late September and early October, spent little time on the island; often

they only circled overhead. As the season advanced, however, they tended to become more and more resident. Because of the large number of winter residents, late migration dates were difficult to ascertain but apparently occurred until late December or possibly early January. The high count of 620 was recorded 5 November 1972, but included some 75 winter residents. *Winter:* abundant resident and visitant. The 813 individuals (three banded) arrived from about 28 October (1973) to 11 March (1973). Most wintering individuals apparently arrived during November but considerable numbers did so in December, January, and even February. Most departed by late March, the latest staying until 5 April (1976). The high count each winter gradually increased from 12 in 1968–69 to 200 in 1975–76. *Spring:* uncommon visitant. The 37 individuals occurred from 27 March (1975) to 20 May (1974) with a peak arrival in early April. Spring occurrences have been recorded only since 1973 and have increased each year. Only four birds were recorded as arriving in May. The high count of 20 was recorded 1 April 1975. *Summer:* rare resident, visitant, and breeder. Two individuals that apparently arrived on 11 and 21 April 1974 successfully nested and fledged two young on 11 June 1974. The last member of the family group departed 4 July 1974 (see Discussion). Five additional birds visited the island between 11 July and 5 August 1974 and five more visited between 30 June and 10 August 1975. These 10 visitants were difficult to classify as late spring or early fall occurrences and are best placed here as obviously this is a recent phenomenon. The latest "normal" spring and earliest "normal" fall records were 20 May (1974) and 9 September (1974), respectively.

WHITE-EYED VIREO—*Vireo griseus. Spring:* extremely rare visitant. The only record for the island and the first for California was a bird banded and photographed on 4 June 1969 and still present the next day (Robert 1971b).

HUTTON'S VIREO—*Vireo huttoni. Fall:* rare visitant. The 12 individuals (eight banded) occurred from 4 August (1972) to 21 October (1968, 1972) with a slight peak in late September and early October. All records were of single individuals. An unidentified vireo having a noticeable eye ring occurred 11 October 1969 and was probably either a Hutton's or Solitary Vireo. *Spring:* extremely rare visitant. Single individuals were present 30 April 1971, and 9 and 13–17 May 1975.

YELLOW-THROATED VIREO—*Vireo flavifrons. Spring:* extremely rare visitant. A single individual was present 12–13 June 1969, and was banded on the 12th; it was the only island record.

SOLITARY VIREO—*Vireo solitarius. Fall:* uncommon fall visitant. The 47 individuals (35 banded; specimen: PRBO 665) occurred from 4 August (1972) to 22 October (1969) with a peak in late August. The high count of seven was recorded 22 August 1970. Included among the 47 were two individuals of the brightly colored eastern race (*V. s. solitarius*) positively identified (one banded) 25–28 and 27 September 1974. Most, if not all, of the remainder were *V. s. cassinii*. The species was also recorded by PRBO in September 1967. *Spring:* rare visitant. Thirteen of the 14 individuals (nine banded) occurred from 22 March (1974) to 10 May (1969) with a pronounced peak in early May. A late individual occurred 5 July 1972, and was quite possibly of the eastern blue-headed race (*V. s. solitarius*). The high count of two was recorded 17 April 1974 and 30 April 1968. Medina collected one on 26 May 1963 (MVZ 160109).

RED-EYED VIREO—*Vireo olivaceus. Fall:* very rare visitant. The eight individuals occurred as follows: 28 August 1974, 8 September 1972 (two birds, banded), 13 September 1975, 15 September 1972, and 18 (banded), 27–28 (banded), and 28 September 1975. *Spring:* rare visitant. The 24 individuals (20 banded) occurred from 23 May (1969, 1971) to 2 July (1972) with a pronounced peak in early to mid-June. There were only three May and one July records. The high count of two was recorded on several dates in 1969, 1972, 1974, and 1975. Bowman (1961) collected one 16 June 1958; the species was also observed by PRBO in June 1967. In addition, an unidentified *Vireo* was present 27 June 1972.

PHILADELPHIA VIREO—*Vireo philadelphicus. Fall:* extremely rare visitant. A single individual was collected 14 September 1969 (CAS 68462). *Spring:* extremely rare visitant. The only spring record for the island and the first spring record for California was a bird present 12 June 1975.

WARBLING VIREO—*Vireo gilvus. Fall:* fairly common visitant. The 161 individuals (124 banded; specimens: PRBO 112, 114) occurred from 21 July (1972) to 12 October (1975) with a peak in early to mid-September. Only five birds were recorded before 26 August and only 14 occurred in October. The high count of 25 was recorded 18 September 1971. Tenaza (1967) recorded this species in September

1965 and PRBO recorded it in September 1967. *Spring:* uncommon visitant. The 68 individuals (45 banded) occurred from 22 March (1974) to 5 June (1975) with a major peak in late April and early May and a second, smaller peak in late May. The March bird was the only one before late April and there was only one June occurrence. The high count of 12 was recorded 25 May 1970. Bryant (1888) recorded two specimens of *V. belli* collected 28 May 1887 but they were misidentified individuals of this species (see Grinnell and Miller 1944:389). Tenaza (1967) recorded this species in spring 1965 and Medina collected two (MVZ 160110, -11) in May 1963.

BLACK-AND-WHITE WARBLER—*Mniotilta varia. Fall:* rare visitant. The 15 individuals (five banded) occurred from 26 August (1975) to 5–6 October (1968) with a peak from late September to early October. The high count of two birds was recorded 27 September and 1–2 October 1975. *Spring:* rare visitant. The 20 individuals (14 banded; specimen PRBO: 467) occurred from 3 May (1968) to 7–18 July (1975) with a sharp peak in early June and a minor peak in early May. The only occurrence after 18 June was a bird present 7–18 July 1975. The high count of five was recorded 6 June 1975. Bryant (1888) reported a ♂ taken on 28 May 1887, the first record for California. Tenaza (1967) saw one 29–31 May 1965 and Medina collected two ♂♂ (MVZ 160112, -13) on 23 May 1963.

WORM-EATING WARBLER—*Helmitheros vermivorus. Spring:* extremely rare visitant. Single individuals were present 4–5 and 5–6 June 1973 and 20 June 1974. All three were banded. Tenaza (1967) collected one on 5 July 1965.

GOLDEN-WINGED WARBLER—*Vermivora chrysoptera. Fall:* extremely rare visitant. An adult ♂ was banded on 14 September and found dead on 16 September 1974. *Spring:* extremely rare visitant. A single bird was present 5 July 1972. Medina collected an adult ♂ 26 May 1963 (MVZ 160114).

TENNESSEE WARBLER—*Vermivora pergrina. Fall:* uncommon visitant. The 57 individuals (40 banded) occurred from 2 September (1972) to 4–5 December (1974) with a peak during mid- to late September. Extremely late were the single individuals present 5–7 November 1974, 15 November 1969, and 4–5 December 1974. The high count of five was recorded 29 September 1974. PRBO also banded three in September 1967. *Spring:* uncommon visitant. The 43 individuals (34 banded) occurred from 30 April (1968) to 7 July (1970) with a very sharp peak in early June. There were but one April and four May occurrences, and only one bird visited after 21 June. The high count of five was recorded 15 June 1975. Tenaza (1967) collected one on 22 June 1965 and Medina collected single individuals on 24 and 26 May 1963 (MVZ 160115, -16).

ORANGE-CROWNED WARBLER—*Vermivora celata. Fall:* fairly common visitant. The 157 individuals (101 banded; specimens: PRBO 133, 433) occurred from 3–5 July (1972) to 22–24 November (1970) with a peak during mid- to late September. The 3–5 July 1972 record was exceptionally early but was of a hatching year bird; there were only two other July occurrences. There were also but two records for November. The high count of 12 was recorded 16 and 18 September 1974. PRBO biologists also recorded the species in September 1967. *Spring:* common visitant. The 688 individuals (440 banded; specimen: PRBO 135) occurred from 26 February (1970) to 19 June (1972) with a small peak in late March and early April and a major peak from late April to early May. The single individuals present 26 February 1970 and 9 March 1972 were exceptionally early. Only five birds occurred in June. The high count of 175 was recorded 30 April 1971. Bryant (1888) reported one in May 1887, Tenaza (1967) collected one on 23 June 1965, and Medina collected one 25 May 1963 (MVZ 160117).

NASHVILLE WARBLER—*Vermivora ruficapilla. Fall:* uncommon visitant. The 45 individuals (27 banded) occurred from 31 July (1968) to 6 December (1970) with a slight peak in early to mid-October. There were only one July, four August, three November, and one December occurrences. The high count of three was recorded 2 October 1975, 4 October 1968, and 26 October 1974. Tenaza (1967) collected one on 3 August 1965; this species was also recorded by PRBO in September 1967. *Spring:* rare visitant. The 27 individuals (21 banded) occurred from 10 April (1973) to 20–24 June (1972) with a peak from late April to early May. Only one bird occurred before late April and only two were recorded after 1 June: 19 June 1969 and 20–24 June 1972. The high count of three was recorded 28 April 1968. Tenaza (1967) also collected one on 28 May 1965.

VIRGINIA'S WARBLER—*Vermivora virginiae. Fall:* rare visitant. The 10 individuals (four banded) occurred from 16 August (1974) to 8 October (1972). One occurred in August, four in early and mid-

September, and five in early October. The high count of three was recorded 1 October 1968. *Spring:* extremely rare visitant. The two individuals, both banded, were present 13 and 13–18 May 1975.

NORTHERN PARULA—*Parula americana. Fall:* extremely rare visitant. A single bird was present, and was banded, 29–30 September 1968. A single bird was also seen and banded by PRBO 24–25 September 1967. *Spring:* very rare visitant. The eight individuals occurred as follows: 29 April 1968 (two birds), 14–16 May 1969, 26 May 1970 (specimen: PRBO 465), 4 June and 4–5 June (two birds) 1973, and 6 June 1975. All but the 1968 birds were banded.

YELLOW WARBLER—*Dendroica petechia. Fall:* common visitant. The 446 individuals (359 banded) occurred from 17 July (1975) to 9 November (1969) with a pronounced peak in mid-September. Only five birds occurred during July and only one after 21 October. The high count of 40 was recorded 22 September 1971. Tenaza (1967) collected this species in fall 1965 and it was recorded by PRBO in September 1967. *Spring:* fairly common visitant. The 147 individuals (116 banded; specimen PRBO 431) occurred from 14 April (1972) to 27 June (1970) with a sharp peak in late May. Only one bird occurred before 28 April and only three occurred after 9 June. The high count of 30 was recorded 27 May 1971. Bryant (1888) and Dawson (1911b) recorded this species in spring; Medina collected one individual 23 May 1963 (MVZ 160118).

MAGNOLIA WARBLER—*Dendroica magnolia. Fall:* uncommon visitant. The 34 individuals (22 banded) occurred from 27 August (1972) to 23–27 October (1974) with a peak during mid- to late September. Only one bird occurred during August; the next earliest record was 12 September (1974). The high count of three was recorded 27 September 1974 and 28 September 1975. Tenaza (1967) collected one on 4 September 1965 and PRBO banded two in September 1967. *Spring:* uncommon visitant. The 37 individuals (26 banded; specimen: PRBO 434) occurred from 12 May (1973) to 4 July (1975) with a pronounced peak during early to mid-June. There were but four May and one July occurrences. The high count of eight was recorded 11–12 June 1975. Dawson (1911b) recorded at least four birds (two specimens taken) in May and June 1911, and Tenaza (1967) recorded four in June and two in July 1965, the latest being one seen 18 July 1965.

CAPE MAY WARBLER—*Dendroica tigrina. Fall:* very rare visitant. The eight birds occurred as follows: 9–12 September 1973, 15 September 1969 (banded), 17 September 1972, 17–19 September 1975 (banded), 30 September 1973, 4 (specimen: CAS 68477) and 4–6 (banded) October 1968, and 31 October 1975 (banded). *Spring:* rare visitant. The 13 individuals (12 banded) occurred from 30 May (1973) to 30 June–2 July (1971) with a peak (10 of the 13) during early to mid-June. The high count of three was recorded 14–15 June 1975.

BLACK-THROATED BLUE WARBLER—*Dendroica caerulescens. Fall:* rare visitant. The 22 individuals (14 banded; specimen: CAS 68479) occurred from 17 September (1971) to 24–27 October (1974) with a peak in mid-October. It thus occurred later than most "eastern" warblers. The high count of two birds was recorded 13 October 1970. Bryant (1888) reported that one spent three weeks on the island in 1886 and died on 17 November, the first recorded in California.

An immature ♂ wearing a fresh band was present at Rodeo Lagoon, Marin Co., California, 1–2 October 1973. An immature ♂ was banded on the Farallones 30 September 1973 but was gone the next day. It is highly probable that both records represented the same individual.

YELLOW-RUMPED WARBLER, Myrtle form—*Dendroica coronata, coronata* group. *Fall:* common visitant. The 365 individuals (145 banded; specimens: PRBO 308, 356, 357) occurred from 18 September (1971) to 16–30 December (1968) with a sharp peak during mid- and late October. The high count of 60 was recorded 12 October 1970. Only four birds occurred in December, some of which could have been winter visitants. PRBO also recorded this form in September 1967. *Winter:* very rare visitant. The four individuals all occurred during the winter of 1968–69 as follows: 29 December–4 January (banded), 4 February (two birds banded), and 13–19 February. *Spring:* fairly common visitant. Of the 90 individuals (31 banded), 88 occurred from 13 March (1974) to 15 June (1975) with a peak in very late April. There were only five occurrences before 21 April and only six in June. Two extremely late individuals occurred 13 July 1973 and 15 July–10 August 1971. The high count of 45 was recorded 30 April 1971. Medina collected one 23 May 1963 (MVZ 160119) and PRBO banded one in June 1967.

YELLOW-RUMPED WARBLER, Audubon's form—*Dendroica coronata, auduboni* group. *Fall:* abundant visitant. The 825 individuals (192 banded; specimens: PRBO 336, 358–361, 593) occurred from 6 September (1973) to 31 December (1972) with a pronounced peak in early and mid-October. Four late December occurrences were possibly winter visitants. The high count of 68 birds was recorded 3 October 1968. PRBO also recorded this form in September 1967. In addition to these birds, 20 *coronata* × *auduboni* individuals (19 banded) were recorded between 21 September (1971) and 29–30 December (1968). This latter bird could be considered to be a winter visitant. Eighteen of the 20 individuals occurred from late September to late October, none occurred in November, and only two occurred in December, the remaining bird being present 3–5 December 1972. The high count of two was recorded 26 September 1974, 2 October 1970, 2–3 October 1968, and 25 October 1971. Finally, seven Yellow-rumped Warblers, unidentified as to type, occurred from 24 November (1975) to 26 December (1975). Since known Audubon's outnumbered Myrtles by 5:2 that late in the fall, most of these were probably Audubon's. *Winter:* rare resident and visitant. The 11 positively identified individuals (four banded) occurred from 31 December (1971) to 10 February (1972) with one individual remaining as late as 25 February (1972). The peak occurred in early January. Most remained for only a few days on the island but two birds were present for over three weeks in January 1971. In addition, 12 Yellow-rumped Warblers, unidentified as to type, occurred between 7 January and 16 February 1974. Five arrived in early January, one in late January, five in early February, and one in mid-February. Most stayed only a few days but two became resident and stayed until 6 and 15 March. The high count of six occurred 2 February 1974. It is likely that most, if not all, of these were Audubon's since that form is more numerous in winter. Yellow-rumped Warblers did not occur during the winters of 1969–70 and 1974–75. *Spring:* common visitant. Some 601 of the 605 individuals (268 banded; specimens: PRBO 124, 126) occurred from 21 February (1975) to 22 June (1970) with a pronounced peak in late March and early April and an even larger peak in late April. Only 12 birds occurred in February and early March, only 10 in mid- and late May, and only five occurred in June. Four puzzling mid-summer occurrences, 13, 15–16, 16–17, and 16–22 July 1973 (last three banded) are here treated as late spring visitants. The high count of 250 was recorded 30 April 1971. In addition, six *coronata* × *auduboni* individuals (all banded) were recorded 24–26, 25–26 (two birds), and 26 March 1969, 8 April 1969, and 28 May 1972. Finally, 15 Yellow-rumped Warblers, unidentified as to type, occurred from 24 February (1974) to 22–23 May (1975); four were in late February, three in March, and four each in April and May.

Only one Audubon's Warbler banded on the Farallones has so far been recaptured elsewhere: a bird banded 24 October 1969 was recovered in Santa Barbara, California, on 8 January 1971.

BLACK-THROATED GRAY WARBLER—*Dendroica nigrescens. Fall:* fairly common visitant. The 100 individuals (60 banded; specimen: PRBO 515) occurred from 2 August (1968) to 28 November (1968) with a peak during early to mid-September and a possible minor peak in early October. Only 14 birds visited in August, 22 in October, and three in November. The high count of eight was recorded 17 September 1974. Tenaza (1967) collected one and saw another in September 1965 and PRBO recorded the species in September 1967. *Spring:* rare visitant. The 13 individuals (five banded) occurred from 22 March (1974) to 9 May (1968) and 9–12 May (1971) with the peak in early May. The March record was exceptional; the next earliest arrival was 25 April (1972). The high count of four was recorded 9 May 1971. Barlow (1897) saw an individual of this species in June 1895.

TOWNSEND'S WARBLER—*Dendroica townsendi. Fall:* common visitant. The 252 individuals (169 banded) occurred from 6 August (1973) to 11–12 December (1975) with a peak during early to mid-September. Single birds on 17 November 1968, 6–9 December 1970, and 11–12 December 1975 were the only occurrences after October. The high count of 24 was recorded 5 September 1969. Tenaza (1967) reported this species in August and September 1965 and claimed that about 100 individuals were present on 5 September 1965. This species was also recorded by PRBO in September 1967. *Spring:* common visitant. The 477 individuals (280 banded) occurred from 4 April (1973) to 8 June (1972) with one individual remaining until 11 June (1975). The peak occurred in early May but large numbers arrived until late May. Only one occurrence was before 22 April (1969) and only seven occurrences were in June. The high count of 75 was recorded 8 May 1969. Bryant (1888), Dawson (1911b), and Tenaza (1967) all recorded this species in spring; Medina collected two (MVZ 160120, -21) in May 1963.

BLACK-THROATED GREEN WARBLER—*Dendroica virens. Fall:* very rare visitant. Six individuals occurred as follows: 12 September 1975 (banded), 17 September 1972 (banded), 29 September 1974, 12

October 1970, 25 October 1974, and 23–27 November 1973 (banded). *Spring:* very rare visitant. Six individuals occurred as follows: 9 May 1968; 2–3, 5–6, 6, and 12 June 1975 (the latter three banded); and 13–18 June 1969 (banded). Dawson (1911a,b) collected the first record for California at the Farallones on 29 May and saw another on 1 June 1911. Tenaza (1967) collected one on 22 June 1965 and Medina collected one (MVZ 160122) on 23 May 1963.

GOLDEN-CHEEKED WARBLER—*Dendroica chrysoparia. Fall:* extremely rare visitant. An individual collected 9 September 1971 (CAS 68546) provided the only record for California and only the second for North America outside of Texas (Lewis et al. 1974).

HERMIT WARBLER—*Dendroica occidentalis. Fall:* fairly common visitant. The 86 individuals (56 banded; specimen: PRBO 435) occurred from 31 July (1968) to 20 November (1968) with the extended flat peak from early August to early September. There was one record in July, only five in October, and one in November. The high count of eight was recorded 8–9 August 1973. The species was also recorded by PRBO in September 1967. *Spring:* rare visitant. The 22 individuals (13 banded) occurred from 26 April (1971) to 27 May (1971) with individuals remaining until 28 May (1971, 1972). The peak occurred in early May. The high count of three was recorded 8 May 1969 and 13 May 1975.

A ♂ Hermit × Townsend's Warbler hybrid was banded and photographed on 17 April 1974. A Hermit Warbler banded on 14 August 1975, and present until 17 August, was recaptured at Bolinas, California, the next day.

BLACKBURNIAN WARBLER—*Dendroica fusca. Fall:* rare visitant. The 19 individuals (10 banded; specimen PRBO 463) occurred from 3 September (1972) to 30 October–1 November (1974) with no pronounced peak. The high count of two was recorded on 5 September 1969, and 15 and 18 October 1973. *Spring:* extremely rare visitant. Individuals were present 1 June 1975 (banded), 18 June 1972, and 9 July 1969 (banded). Tenaza (1967) collected one on 31 May 1965.

YELLOW-THROATED WARBLER—*Dendroica dominica. Fall:* extremely rare visitant. A single individual was present 16–19 September 1974. It was of the white-lored race, *D. d. albilora*. *Spring:* extremely rare visitant. An adult of unknown sex was banded and photographed (Fig. 2) on 8 July 1969. This individual, the first record for California, was also referable to *D. d. albilora*. The bird had no fat, weighed 9.7 g, and had no molt. Some measurements were: wing = 60 mm, culmen = 12.5 mm. Craig (1972) mentioned this specimen briefly.

CHESTNUT-SIDED WARBLER—*Dendroica pensylvanica. Fall:* uncommon visitant. The 42 individuals (23 banded) occurred from 10 September (1975) to 3–5 November (1968) with a peak in mid-September. The single November record was the only one later than 19 October (1974). The high count of five was recorded 18 September 1974. PRBO also banded an individual of this species during September 1967. *Spring:* rare visitant. The 13 individuals (10 banded; specimen: PRBO 466) occurred from 1 May (1975) to 3–4 July (1972); 11 of the birds occurred between 1 and 19–20 June with the peak in early June. The high count of three birds was recorded 1 June 1974. Bowman (1961) collected one on 17 June 1958 and Tenaza (1967) collected one on 7 July 1965.

BAY-BREASTED WARBLER—*Dendroica castanea. Fall:* rare visitant. The 10 individuals (two banded) occurred from 18 September (1974) to 24 October (1974) with a sharp peak in late September. The next latest record was 2 October (1968). The high count of two was recorded 24–25 and 27 September 1974. *Spring:* rare visitant. The 13 individuals (10 banded; specimens: PRBO 464, MVZ 159235) occurred from 28 May (1972) to 21–22 June (1970) with the peak in early June. The high count of two was recorded 1–3 and 18–20 June 1974.

BLACKPOLL WARBLER—*Dendroica striata. Fall:* fairly common visitant. The 220 individuals (184 banded; specimens PRBO 661, 662) occurred from 1 August (1969) to 16 November (1968) with a peak during mid- to late September. The two November records, 12 November 1974 and 16 November 1968, were rather late; the next latest record was 28 October 1968. Two early August records were puzzling but are treated here: a breeding plumaged adult ♀ present 1–16 August 1969 (banded) and another adult ♀ in light body molt present 8–12 August 1973 (banded). These could have been late spring visitants. The next earliest record was 31 August (1968). The high count of 23 was recorded 27 September 1974. Tenaza collected a Blackpoll in September 1965 and 12 were banded by PRBO in September 1967. *Spring:* rare visitant. The 20 individuals (12 banded) occurred from 22 May (1969) to 3 July (1968, 1974) with the sharp peak in early June. The high count of two was recorded 15 June

FIGURE 2. The adult Yellow-throated Warbler captured and banded on Southeast Farallon Island 8 July 1969. First California occurrence. Photograph by Henry Robert.

1975 and 25 June and 1 July 1968. Tenaza (1967) collected four in June and July 1965, the latest being one on 3 July 1965.

PINE WARBLER—*Dendroica pinus*. *Fall:* extremely rare visitant. Single individuals were present 21 September 1973 and 19 October 1974. The latter bird was photographed.

PRAIRIE WARBLER—*Dendroica discolor*. *Fall:* very rare visitant. The eight individuals occurred as follows: 30 August 1968, 16–18 and 20–24 (banded) September 1974, 28 September 1972, 12 October 1969, 27 October (banded) and 6 November 1972, and 22 November 1971 (specimen: PRBO 733). Two individuals recorded by PRBO in 1967, one banded 24 September and the other present 24–25 September, established the high count.

PALM WARBLER—*Dendroica palmarum*. *Fall:* fairly common visitant. The 208 individuals (99 banded; specimens: PRBO 365, 366, 734) occurred from 11 September (1973) to 9 December (1974) with a peak during mid- to late October. The species regularly occurred until mid-November; the December bird was the only later individual. The high count of 15 was recorded 25 October 1974. A single individual was also seen by PRBO in September 1967. *Spring:* rare visitant. The 11 individuals (nine banded) occurred from 14 April (1968) to 3–5 July (1975) with the slight peak in early June. There were four May and five June occurrences. The single April individual and another on 12 May 1973 (both banded) were thought to have been of the eastern race, *D. p. hypochrysea*. Tenaza (1967) collected one individual of this species and saw another in May 1965; two individuals were also observed by PRBO in June 1967 (one banded).

OVENBIRD—*Seiurus aurocapillus*. *Fall:* uncommon visitant. The 38 individuals (23 banded) occurred widely from 29 August (1972) to 5 November (1972) with a peak in mid-September. The high count of three was recorded 13 September 1975. *Spring:* uncommon visitant. The 57 individuals (41 banded; specimen PRBO 436) occurred from 26 May (1970) to 10–13 July (1969) with most records (40) during early and mid-June. The high count of five was recorded 6 and 11–12 June 1975. Dawson (1911a,b) collected an Ovenbird on 29 May 1911 and saw another 29 May–3 June 1911; these were the

first records for California. Bowman (1961) collected one in June 1958; Tenaza (1967) collected six in June 1965; Medina collected one 25 May and another 26 May 1963 (MVZ 160123, –24); and PRBO banded one in June 1967.

NORTHERN WATERTHRUSH—*Seiurus noveboracensis*. *Fall:* rare visitant. The 22 individuals (11 banded) occurred from 16 August (1975) to 17 October (1974) with a shallow peak from late August to mid-September. The high count of two was recorded 17 September 1972 and 4 October 1968. The two also recorded by PRBO, 24–25 and 25 September 1967 (both banded), tied the high count. *Spring:* extremely rare visitant. Single individuals were present 20 May and 2 June 1969. Both were banded. Another was found dead by PRBO on 8 June 1967.

KENTUCKY WARBLER—*Oporornis formosus*. *Spring:* very rare visitant. Single individuals were present 1–3 June 1974 (banded), 2 June 1969, 16 June 1975 (banded), and 3 July 1972 (specimen CAS 68647).

CONNECTICUT WARBLER—*Oporornis agilis*. *Fall:* very rare visitant. Seven individuals occurred as follows: 11 September 1974, 13 September 1968 (banded), 23 (two birds, one banded) and 23–29 September (banded) 1974, 29–30 September 1975, and 4 October 1968. *Spring:* extremely rare visitant. A single individual was present and banded 18 June 1969. Bowman (1961) collected one on 16 June 1958, the first record for California; Tenaza (1967) collected two on 22 June and saw another on 28–30 May 1965.

MOURNING WARBLER—*Oporornis philadelphia*. *Fall:* very rare visitant. Five individuals were present in 1974: 17–18, 25 (three birds), and 26 September. The last four were banded.

MACGILLIVRAY'S WARBLER—*Oporornis tolmiei*. *Fall:* fairly common visitant. The 119 individuals (77 banded; specimen: PRBO 367) occurred from 3 August (1968) to 12 October (1969) with the peak in early September. The high count of six was recorded 8 September 1972. Tenaza (1967) collected this species in fall 1965 and PRBO recorded it in September 1967. *Spring:* uncommon visitant. The 47 individuals (33 banded) occurred from 28 April (1968) to 15 June (1970) with the peak in early May. Only three birds visited in April and only five in June. The high count of 10 was recorded 8–9 May 1969. Tenaza (1967) collected one on 13 June 1964.

In addition to these individuals, an unidentified Mourning or MacGillivray's Warbler (or hybird) was present on 10 September 1975.

COMMON YELLOWTHROAT—*Geothlypis trichas*. *Fall:* fairly common visitant. The 113 individuals (69 banded; specimens: PRBO 362–364) occurred from 31 July (1969) to 3 November (1968) with the peak during late September. Single birds present 31 July–4 September 1969 and 5 August 1972 were exceptionally early; the species usually arrived in late August or early September. Only three occurred after mid-October. The high count of eight was recorded 26 September 1974. Tenaza (1967) collected this species in fall 1965 and PRBO recorded it in September 1967. *Spring:* fairly common visitant. The 109 individuals (76 banded; specimen: PRBO 432) occurred from 25 March (1973) to 7 July (1970, 1971) with a minor peak in early April, a larger peak in late April and early May, and a major peak in early June. Only one visited in March and only three occurred in July. The high count of five was recorded 1 May 1970. Both Bowman (1961) and Tenaza (1967) recorded this species in spring; Medina collected three (MVZ 160125–160127) in May 1963.

YELLOW-BREASTED CHAT—*Icteria virens*. *Fall:* rare visitant. The 15 individuals (11 banded) occurred from 12 August (1975) to 1 October (1968) with a peak in early September. The extreme dates were the only visits for those months. The high count of two was recorded 4–6 September 1968. Two were also banded by PRBO in September 1967: one 22–23 and the other 23–24 September. *Spring:* rare visitant. The 15 individuals (13 banded) occurred from 22 April (1969) to 22–23 June (1969) with a peak in mid-May. A single individual on 11–12 June 1969 was the only other June record; the next latest bird occurred 21 May (1975). The high count of two was recorded 4 May 1970, 9 May 1968, 14 May 1975, and 15 May 1970.

HOODED WARBLER—*Wilsonia citrina*. *Fall:* extremely rare visitant. A single individual was killed by a kestrel on 29 September 1968 (SDNHM 36939). *Spring:* very rare visitant. Five individuals occurred as follows: 22–23 May 1969 (banded), 5 June 1975, 6 June 1970, 8 June 1975 (banded), and 20 June 1970 (banded).

WILSON'S WARBLER—*Wilsonia pusilla. Fall:* common visitant. The 364 individuals (289 banded) occurred from 21 July (1973) to 23 October (1971) with a peak from late August to mid-September. Only five visited in July and only 14 occurred in October. The high count of 20 was recorded 27 August 1973 and 12–14 September 1975. Tenaza (1967) reported this species in August and September 1965 and estimated that 200–300 birds were present on 5 September 1965; PRBO also recorded it in September 1967. Bryant (1888) reported one collected in September 1886. *Spring:* abundant visitant. The 2078 individuals (1245 banded; specimens: PRBO 103, 426–430) occurred from 22 March (1974) to 21 June (1975) with sharp peaks in both early and late May. Only 11 visited before 22 April and only one occurred after 9–10 June (1969). The high count of 500 was recorded 8 May 1969. Bryant (1888), Dawson (1911b), and Tenaza (1967) all reported this species during May; Medina also collected three (MVZ 160128, -30) in May 1963.

A Wilson's Warbler, banded on the Farallones 9 May 1971, was recovered in Stinson Beach, Marin Co., California, the next day.

CANADA WARBLER—*Wilsonia canadensis. Fall:* rare visitant. The nine "normal" individuals (three banded) occurred from 1 September (1972) to 25–27 October (1974) with the peak in early to mid-September. The last was the only October record. The high count of two was recorded 1 September 1972 and 11 September 1975. In addition, an adult ♂ in moderately heavy body molt was banded on 8 August 1973. Considering the early trend of this species' visits, it is here considered as an early fall migrant. Interestingly, it arrived the same day as an adult ♀ Blackpoll, also in body molt. *Spring:* extremely rare visitant. Single individuals were present 5 June 1969, and 12–13 and 14–16 June 1975. All three were banded.

AMERICAN REDSTART—*Setophaga ruticilla. Fall:* fairly common visitant. The 133 individuals (90 banded; specimen CAS 68481) occurred from 16 August (1975) to 3 November (1973) with the peak in mid-September. Only one bird visited in November; the next latest arrival was 24 October (1969). The high count of 15 was recorded 15 September 1975. Tenaza (1967) collected three in fall 1965 and PRBO banded three in September 1967. *Spring:* uncommon visitant. The 32 individuals (27 banded) occurred from 29 May (1972) to 7 July (1970) with a peak in early June. There were but one May and two July records. The high count of three was recorded 13 June 1975. Dawson (1911b), Bowman (1961), and Tenaza (1967) all reported June sightings or specimens; Medina collected one 23 May 1963 (MVZ 160131); and PRBO recorded one in June 1967.

WARBLER spp.—Several unidentified warblers were recorded, all in the fall. A warbler with white in the tail (possibly a Hermit) was seen flying on 25 July 1970. Another *Dendroica,* thought possibly to be a Blackpoll, was present 17 September 1975. A warbler (possibly the Pine of 19 October) was seen 21 October 1974, and a possible Orange-crowned and an unidentified warbler were seen 9 and 17 November 1974, respectively.

HOUSE SPARROW—*Passer domesticus. Fall:* extremely rare visitant. Single individuals were present 29 September 1973 and 7 October 1972. *Spring:* uncommon to fairly common visitant. The 80–83 individuals (35 banded) occurred from 24 March (1969, 1970) to 30 May (1974) with peaks in early and late April. The high count was nine on 7 April 1969. Accurate data on this species were not kept during the spring of 1968; up to eight were present during May and the species nested during August, but it is not clear whether the nesting birds were present during the spring or arrived later in June and July. *Summer:* very rare resident, visitant, and breeder. Three individuals summered in 1968, including a pair which successfully fledged two young on 19 August. The first of these five departed on 9 October and the last two vanished 8 November. Four of these were banded. The species has not attempted to breed since; however, a single individual was seen on 16 July 1972 and is treated as a summer visitant.

Dawson (1911b) was the first to report the species but stated that they had not nested. Swarth (1922) reported several flocks of up to 30 birds in August 1922. Smith (1934) listed it as a resident. Bowman (1961) saw one feeding young on 15 June 1958 and Tenaza (1967) reported them feeding young in 1964 and 1965. The species was recorded in both June and September 1967 by PRBO, and probably bred that year. The breeding status of this species is further treated in the Discussion.

An individual banded on 4 April 1973 was recovered in San Francisco on 8 March 1974.

BOBOLINK—*Dolichonyx oryzivorus. Fall:* uncommon visitant. The 41 individuals (six banded) occurred from 28 August (1973) to 23 October (1973) with a peak during mid- to late September and a

possible minor peak in mid-October. The high count of six was recorded 19 and 24 September 1974. Tenaza (1967) collected one on 6 September 1965 and PRBO recorded four in September 1967. *Spring:* very rare visitant. The five single individuals were present 26–30 May 1970, 30 May–1 June 1975, 31 May 1973, 8–9 June 1974, and 4 July 1972.

WESTERN MEADOWLARK—*Sturnella neglecta. Fall:* abundant visitant. The 793 individuals (30 banded) occurred from 23–25 July (1972) to 29 December (1970) with the peak during early October. There were but one July, two August, and eight December visitants. Some of the last could have been winter visitants. The high count of 125 was recorded 3–4 October 1972. The species was also recorded by PRBO in September 1967. *Winter:* uncommon resident and visitant. Of the 52 winter individuals (15 banded), only four (two on 6–7 February and two more on 7 February 1970) were visitants. The 48 winter residents arrived between 4 October (1969) and 21 December (1974). Most arrived in October (about 24), and lesser numbers arrived in November (about 17) and December (about seven). Most residents departed in March and April, the latest remaining until 26 April (1970). The species did not occur during the winters of 1971–72, 1973–74, or 1975–76. Twenty birds were resident during 1969–70 and the winter high count of 24 occurred on 7 February 1970. Bryant (1888) reported that stragglers occurred during the winter; Gruber (1884) included them on his list of island birds but gave no dates; Thoresen (1960) recorded seven present in January 1960. *Spring:* rare visitant. The 21 individuals occurred widely from 10 March (1976) to 5 July (1972) with a slight peak during late March and early April. The high count of two was recorded 8–10 April 1970.

YELLOW-HEADED BLACKBIRD—*Xanthocephalus xanthocephalus. Fall:* rare visitant. The 19 individuals (one banded) occurred from 10 August (1975) to 21 October (1974) with two slight peaks, the first in late August and early September, and the second in early October. The high count of two was recorded 21 October 1974. *Spring:* rare visitant. The 14 individuals occurred from 27 April (1968) to 12 June (1969) with a sharp peak during mid-May. There was only one June occurrence; the next latest was 25 May (1975). The high count of three was recorded 12 May 1973 and 13 May 1975.

RED-WINGED BLACKBIRD—*Agelaius phoeniceus. Fall:* fairly common to common visitant. The 254 individuals (11 banded) occurred from 31 July (1968) to 9 November (1969) with a peak during late September and early October. Visits were made by only 12 birds in August and but one each in July and November. The species usually arrived singly or in small flocks, but flocks of 50 and 62 were recorded. The high count of 65 occurred 30 September 1968. Bryant (1888), Tenaza (1967), and PRBO, in September 1967, all recorded this species during fall. Gruber (1884) included it on his list of island birds but gave no date. In addition, single unidentified *Agelaius* were recorded 29 July 1972 (probably a Red-winged) and 2–8 October 1970 (possibly a Tricolored). *Spring:* very rare to rare visitant. The nine positively identified individuals occurred in two groups. The first included singles present 13–14 March 1970, 29 March 1975, and 31 March 1970; the second included birds present 4–8 May 1974, 7–8 May 1971 (three individuals), 9 May 1968, and 9 May 1969. In addition, unidentified *Agelaius* (probably all Red-wingeds) were present 4 April (three birds) and 21 April 1973 and 24 May 1970.

TRICOLORED BLACKBIRD—*Agelaius tricolor. Fall:* very rare visitant. Individuals were present 21–27 September 1974 (two birds), 2–4 October 1972, 14–18 October 1975 (banded), and 30 October–2 November 1974. *Spring:* extremely rare visitant. Two individuals were present 11–12 June 1975.

ORCHARD ORIOLE—*Icterus spurius. Fall:* rare visitant. The 13 individuals (11 banded) occurred from 1 September (1972) to 25–26 October (1972) and 25–31 October (1974) with a sharp peak in early to mid-September. Only two visited after 1 October. The high count of three was recorded 15–16 September 1972. PRBO also recorded two (one banded) 21–22 September 1967.

HOODED ORIOLE—*Icterus cucullatus. Fall:* extremely rare visitant. A single individual was present 2–3 September 1972, the only island record.

NORTHERN ORIOLE, Baltimore form—*Icterus galbula galbula. Fall:* very rare visitant. The seven individuals were present as follows: 22 September 1973, 28 September 1971, 2 October 1971, 5 October 1970, 17 October 1971, 26 October 1974, and 30 November 1969. Only the first and last two were not banded. In addition, intermediates between this and the Bullock's form were present and banded 20–22 September 1974 and 22 September 1971. Two additional orioles, probably Baltimores or intermediate forms of the Northern Oriole, were present 15 August 1974 (banded) and 15 October 1975. *Spring:* very rare visitant. The five individuals were present as follows: 26 May 1970 (two birds: one

banded; one specimen PRBO 738), 1 June 1975 (banded), 4–5 June 1968, and 7–8 June 1970 (banded). In addition, an apparent intermediate was seen 4 June 1970. Tenaza (1967) collected a Baltimore Oriole on 20 June 1965.

NORTHERN ORIOLE, Bullock's form—*Icterus galbula bullockii*. *Fall:* fairly common visitant. The 190 individuals (134 banded; specimen: PRBO 737) occurred from 3 July (1972) (an immature, banded) to 1 November (1972). This form, a very early migrant, generally arrived in mid- to late July, peaked in early to mid-August, and last occurred in numbers in early September. Individuals visited only 12 times in September after the 10th, only six times in October, and only once in November. The high count of 15 was recorded 9 August 1973. Tenaza (1967) reported this form in fall and PRBO recorded it in September 1967. *Spring:* uncommon visitant. The 42 individuals (32 banded) occurred from 26 March (1969) to 20 June (1969) with the peak in late April and early May. Individuals visited only once in March, only three times in April before the 22nd, and only twice after 16 May: 27–28 May 1971 and 20 June 1969. The high count of four was recorded 9 May 1969 and 15–16 May 1970. Two unidentified orioles present 14–15 May 1969 were probably this form of the Northern Oriole. Tenaza (1967) collected a Bullock's Oriole that was present 19–23 June 1965, Medina collected one 25 May 1963 (MVZ 160135), and PRBO banded one on 8 June 1967.

RUSTY BLACKBIRD—*Euphagus carolinus*. *Fall:* extremely rare visitant. A ♂ in fall plumage was present 20 October and a ♀ was present 22 October 1972. *Spring:* extremely rare visitant. A ♂ was present 22 April 1973.

BREWER'S BLACKBIRD—*Euphagus cyanocephalus*. *Fall:* common visitant. The 350 individuals (one banded) occurred from 17 July (1972) to 6 November (1968) with the peak in early October. Only 12 were recorded earlier than 21 September, 11 of which occurred in 1972. The species often arrived in small flocks (although flocks of up to 50 occurred) and many of these just briefly circled the island without landing. The high count of 50 was recorded 3 October 1972. In addition, eight records exist of 1–130 unidentified blackbirds (total 223) seen on, or usually flying over, the island. Most occurred in mid- or late October but records extended from 24 September (1971) to 10 November (1970); the high count of 130 occurred 31 October 1972. Most were probably Brewer's Blackbirds but some were suspected of being Red-wingeds. PRBO also recorded Brewer's Blackbirds in September 1967. *Winter:* extremely rare visitant. A single Brewer's Blackbird visited on 8 February 1976. An unidentified blackbird was present 16 January 1976. Bryant (1888) reported that large flocks of Brewer's Blackbirds occurred during the winter. Gruber (1884) included it on his list of island birds but gave no dates. *Spring:* uncommon visitant. The 62 individuals occurred from 25 March (1970) to 30 June (1974) with the peak in late April. Only 10 birds visited after 10 May (including four in June). The high count of 20 was recorded 27 April 1971.

BROWN-HEADED COWBIRD—*Molothrus ater*. *Fall:* common visitant. The 701 individuals (91 banded; specimen: PRBO 099) occurred from 11 July (1975) to 1–12 November (1974) with the peak, surprisingly early, during mid- to late August. They generally arrived singly or in very small groups rather than in large coherent flocks. The high count of 53 was recorded 16 August 1975. Numbers were noticeably greater in the last four than in the first four falls. Tenaza (1967) reported this species during August and September 1965 and PRBO recorded it in September 1967. *Spring:* fairly common visitant. The 175 individuals (10 banded) occurred from 12 April (1970) to 26–30 June (1975) with a pronounced peak during late April and early May. Only four visited during June. The high count of 13 was recorded 26 April 1971. Dawson (1911b) and Bowman (1961) each reported one in June, and Tenaza (1967) reported two in late May; Medina also collected one 24 May 1963 (MVZ 160133).

WESTERN TANAGER—*Piranga ludoviciana*. *Fall:* fairly common visitant. The 161 individuals (118 banded; specimen: PRBO 094) occurred from 18 July (1972) to 25 October (1974) with a peak in early September. There were only three July occurrences (all in 1972), nine in August before the 23rd, and five in October after the 6th. The high count of 12 was recorded 8 September 1972. Bryant (1888) reported a specimen taken from a flock of "nearly a dozen" on 13 September 1886. Tenaza (1967) also reported it in September and noted about 12 on 6 September 1965; PRBO also reported it in September 1967. *Spring:* fairly common visitant. The 107 individuals (70 banded) occurred from 28 April (1968) to 20–21 June (1972) with sharp peaks in both early and late May. Only one bird visited after 8 June but the species regularly occurred into early June. The high count of 30 was recorded 8

May 1969. Dawson (1911b) reported one in June and Tenaza (1967) reported one in May. Medina collected two (MVZ 160132, -34) 23 May 1963; PRBO also recorded it in June 1967.

SCARLET TANAGER—*Piranga olivacea*. *Fall:* extremely rare visitant. A single individual was banded 29 September 1975 and remained until 2 October; this was the only island record. An unidentified tanager, possibly of this species but otherwise a Western, was observed flying over the island on 4 October 1969.

SUMMER TANAGER—*Piranga rubra*. *Fall:* extremely rare visitant. A single bird was banded 28 October 1975. *Spring:* very rare visitant. Five individuals were present as follows: 25–26 May 1969, 28 May 1972, 4 June 1969, 21 June 1972, and 24 June 1968. All but the last were banded.

ROSE-BREASTED GROSBEAK—*Pheucticus ludovicianus*. *Fall:* rare visitant. The 27 individuals (13 banded) occurred from 26 August (1972, 1974) to 5 November (1975) with a peak in mid-September. There were only eight October and one November occurrences. The high count of three was recorded 10–14 September and 2 October 1975. PRBO also recorded two in September 1967. *Spring:* uncommon visitant. The 48 individuals (43 banded) occurred from 13 May (1969) to 27 June (1970) with one individual remaining until 29 June (1972). The pronounced peak occurred in mid-June. Only seven occurred in May and only five occurred after 19 June. The high count of six was recorded 12 and 15–16 June 1975. Tenaza (1967) collected four in May and June 1965.

BLACK-HEADED GROSBEAK—*Pheucticus melanocephalus*. *Fall:* uncommon visitant. The 53 individuals (24 banded) occurred from 4–5 July (1968) to 26 October (1974) with the peak from late August to early September. The bird present 4–5 July (banded) was an immature and was the earliest by three weeks. Only two occurred after 2 October. The high count of three was recorded 22 August 1968, 10 September 1973, and 22 September 1971. In addition, two *ludovicianus* × *melanocephalus* individuals were banded: 18 September 1971 and 26 September 1974. Tenaza (1967) reported Black-headed Grosbeaks in August and September 1965. *Spring:* uncommon visitant. The 56 individuals (38 banded) occurred from 22 April (1969) to 30 June–17 July (1971) with a sharp peak during early to mid-May. Only seven occurred in April and only three arrived after 8 June. The high count of 10 was recorded 8–9 May 1969. A third *ludovicianus* × *melanocephalus* individual was banded 8 June 1970. The species was previously reported in May 1887 by Bryant (1888). Medina collected one 26 May 1963 (MVZ 160136).

BLUE GROSBEAK—*Guiraca caerulea*. *Fall:* rare visitant. The 12 individuals (six banded) occurred from 22 August (1968) to 6–15 October (1972). This latter bird was the only one after 16 September (1975). The peak occurred during early to mid-September and the high count of two was recorded 12 September 1975. Tenaza collected one on 5 September 1965. *Spring:* very rare visitant. Individuals were present 9–10 and 13–14 May 1969, 8 June 1973, and 18–20 June 1969. All but the first were banded.

INDIGO BUNTING—*Passerina cyanea*. *Fall:* very rare visitant. Single individuals were present 2 August 1968 (banded), 7–15 August 1973 (banded), 26 August 1975, 27 September 1974, and 9 November 1969 (banded). *Spring:* rare visitant. The 19 individuals (12 banded) occurred from 16 May (1973) to 21–27 June (1972) with a sharp peak in early June. Only one bird visited in May. The high count of three was recorded on 19 June 1972.

LAZULI BUNTING—*Passerina amoena*. *Fall:* fairly common visitant. The 119 individuals (71 banded) occurred from 31 July (1968) to 24–25 October (1969) with a peak in mid-September. Individuals visited only once in July and three times in October. The high count of 20 was recorded 18 September 1971. Also, the remains of an unidentified bunting were found 31 July 1970. Tenaza (1967) collected this species in September 1965 and PRBO recorded it in September 1967. *Spring:* uncommon visitant. The 39 individuals (16 banded) occurred from 27 April (1971) to 1 July (1968) with a broad peak from late April to mid-May. The July visitor was the only arrival later than 17 June (1969). The high count of four was recorded 29 April 1968, 30 April 1971, and 11 May 1969. Dawson (1911b) previously recorded this species in June and Medina collected one on 25 May 1963 (MVZ 160137).

PAINTED BUNTING—*Passerina ciris*. *Fall:* extremely rare visitant. An individual was banded 10 September 1975, the only record for the island.

DICKCISSEL—*Spiza americana*. *Fall:* extremely rare visitant. Single birds were present 17–18 September 1975 and 14–16 October 1974. An individual was also seen by PRBO on 20 September 1967. *Spring:* extremely rare visitant. Single individuals were present 13–14 May 1969 (banded), 2–4 June 1974, and 3 June 1971.

EVENING GROSBEAK—*Hesperiphona vespertina*. *Fall:* extremely rare visitant. Single birds were banded on 3–4 and 8 October 1972. *Spring:* extremely rare visitant. A single bird was present 27 May 1974.

PURPLE FINCH—*Carpodacus purpureus*. *Fall:* sporadic common visitant. The 401 individuals (142 banded) occurred from 18 August (1972) to 20 December (1968) with a sharp peak during early to mid-October. The August visitant was the only one before 11 September; individuals on 24 November 1974, 6 December 1970, and 20 December 1968 (two birds) were the only ones after early November. The high count of 250 was recorded 4 October 1972. The presence of this species was extremely variable, from none in 1971 to 279 in 1972. *Winter:* extremely rare resident and visitant. Single individuals occurred 5–8 January 1969, and 8 February–21 March 1971. Both were banded. *Spring:* uncommon visitant. The 36 individuals (23 banded) occurred from 22 March (1974) to 28 May (1971) with the peak in early May. The high count of four was recorded 24 March 1974.

CASSIN'S FINCH—*Carpodacus cassinii*. *Fall:* extremely rare visitant. Single individuals were present 5 October (banded) and 18 October 1972. *Spring:* extremely rare visitant. A ♂ was collected 14–15 June 1970 (CAS 68521).

HOUSE FINCH—*Carpodacus mexicanus*. *Fall:* fairly common visitant. The 95 individuals (14 banded; specimen: PRBO 332) occurred from 8 August (1968) to 18 November (1970) with peaks during late September to early October and late October. Only eight birds visited during August. The high count of 12 was recorded 23–24 and 26 October 1972. In addition, single unidentified *Carpodacus* finches were present 10 September 1973, and 3 October and 10 December 1975. *Winter:* extremely rare visitant. The only recent occurrence was a single individual on 25 February 1975. Bryant (1888) reported, however, that the species occurred at times during the winter. *Spring:* fairly common visitant. The 153 individuals (30 banded) occurred from 16 March (1974) to 19–21 June (1972) with slight peaks during late March and mid- to late April. The species regularly occurred into early June but only two visited after 9 June. The high count of 15 was recorded 3 April 1973. In addition, unidentified *Carpodacus* finches were present as follows: one on 24 March 1971 (probably Purple or Cassin's) and two on 12 June 1970 (probably House Finches).

Bryant (1888) reported a young of the year on 26 May 1887, Ray (1904) found two nests with eggs in late May 1904, and Dawson (1911b) recorded "several" broods being fed in late May 1911. Smith (1934) recorded them in August 1933 but Swarth (1922) found none in August 1922. Bowman (1961) saw five on 11 June 1958 and Tenaza (1967) found adults feeding young in 1964 and 1965. On 29 May 1970 and 2 and 8 June 1974 we captured females with active incubation patches, but to our knowledge the individuals were not breeding on the island.

PINE SISKIN—*Carduelis pinus*. *Fall:* sporadic common visitant. The 685 individuals (95 banded; specimens PRBO 333, 334) occurred from 5 August (1972) to 20 November (1975) with a peak during early October and a possible minor peak in late October. Individuals visited only twice in August and 10 times in November. Numbers varied greatly from year to year, from none in 1968 to 466 in 1972; the high count of 400 was recorded 3 October 1972. *Winter:* rare visitant. The 18 individuals occurred from 9 January (1974) to 9–10 February (1970). These occurred during 1969 (one bird), 1970 (14 birds), and 1974 (three birds). The high count of 11 was recorded 6 February 1970. *Spring:* rare visitant. The 23 individuals (six banded) occurred from 7 March (1976) to 16–20 July (1968) with no discernible peak. The four July birds could have been early fall migrants but, because the two banded birds among them were adults, we include them here. The high count of eight was recorded 17 April 1974. Bowman (1961) recorded this species on 18 May 1958 and Tenaza (1967) collected an adult on 7 July 1965.

AMERICAN GOLDFINCH—*Carduelis tristis*. *Fall:* uncommon visitant. The 31 individuals (two banded) occurred from 21 August (1970) to 31 October–3 November (1975) with no pronounced peak, although maximum numbers occurred in mid-October. The high count of four was recorded 21 August 1970, 11 October 1972, and 23–24 October 1974. *Spring:* rare visitant. The 19 individuals (eight banded) occurred from 16 April (1973) to 9–13 June (1975) with the peak in mid-May. There were only three

April and four June occurrences. The high count of five was recorded 13–15 May 1975. Tenaza (1967) collected two on 31 May 1965.

LESSER GOLDFINCH—*Carduelis psaltria*. *Fall:* common visitant. The 253 individuals (63 banded) occurred from 2 August (1968) to 11 December (1975) with one individual remaining until 12 December (1972). The peak occurred during mid- and late September. Individuals visited only 10 times in November and December. The high count of 48 was recorded 18 September 1974. This species was also observed by PRBO in September 1967. *Winter:* no recent records. Bryant (1888), however, reported that small flocks appeared at intervals during the winter. *Spring:* rare visitant. The 16 individuals (seven banded) occurred from 23 March (1974) to 11–13 July (1970) and 8–17 July (1968) with no discernible peak. The three July individuals could have been early fall migrants but, since the two that were banded proved to be adults, we treat them here. The high count of two was recorded 26 March 1969 and 24 and 28 March 1974. Bowman (1961) saw one on 11 June 1958.

In addition, *Carduelis* (spp.) were recorded several times in both fall and spring. There were seven records of from one to nine individuals each in fall; 12 occurred in September and 11 in October for a total of 23. Three birds also occurred on 8 May 1971 and one was seen on 10 May 1973. Most were probably Pine Siskins or Lesser Goldfinches.

LAWRENCE'S GOLDFINCH—*Carduelis lawrencei*. *Fall:* rare visitant. The 10 individuals occurred as follows: 29 September–1 October, 30 September–1 October, and 1 October (four birds) 1974, 3 October 1968, 13–15 and 15–16 October 1970 (both banded), and 18–22 October 1974 (banded). *Spring:* extremely rare visitant. Single individuals were present 9 May 1975 and 26–27 May 1970 (banded).

RED GROSSBILL—*Loxia curvirostra*. *Winter:* extremely rare visitant. A single individual was banded 8 February 1971; this was the only island record.

GREEN-TAILED TOWHEE—*Pipilo chlorurus*. *Fall:* very rare visitant. The seven individuals occurred as follows: 29 August 1970, 30–31 August 1973, 13–27 September 1974, 17 September 1972, 25 September–5 October 1970, 1–4 October 1974, and 3–6 October 1972. All but the second and fourth were banded. It was also recorded by PRBO on 24 September 1967. *Spring:* very rare visitant. The five single individuals occurred 3–4 May 1968, 9 May 1969, 16 May 1970, 27 May 1972, and 14–16 June 1975. All but the second were banded.

RUFOUS-SIDED TOWHEE—*Pipilo erythrophthalmus*. *Fall:* common visitant. The 263 individuals (30 banded) occurred from 4 September (1973) to 24 November (1975) with a peak in early October. Only two visited in November, the other being on 3 November 1971. The high count of 125 was recorded 2–4 October 1972. The species was also recorded by PRBO in September 1967. *Spring:* rare visitant. The 10 individuals (two banded) occurred from 21 March (1974) to 4 May (1968) with a sharp peak in early April. The high count of four was recorded 4 April 1973.

LARK BUNTING—*Calamospiza melanocorys*. *Fall:* rare visitant. The 17 individuals (one banded) occurred from 26 August (1973) to 5–11 October (1974) with a peak in late September. The high count of two was recorded 27 August 1973, and 12–13 September and 5–8 October 1974.

SAVANNAH SPARROW—*Passerculus sandwichensis*. *Fall:* abundant visitant. The 4374 individuals (518 banded; specimens: PRBO 048–052, 650–654, 660) occurred from 17 July (1971) to 12 December (1970) with the peak from late September to early October. The species was recorded but once in July, five times in August before the 15th, four times in November after the 9th, and only twice in December. The high count of 1500 was recorded 29 September 1968. Swarth (1922) saw one on 18 August 1922, Tenaza (1967) reported several and collected two in September 1965, and PRBO recorded the species in September 1967. *Spring:* fairly common visitant. The 84 individuals (seven banded) occurred from 5 March (1975) to 16 June (1975) with two poorly defined peaks, the first in late March and early April, the second from late April to mid-May. Individuals visited only twice in May after the 20th, and only five times in June. The high count of 15 was recorded 4 April 1973. Medina collected one on 27 May 1963 (MVZ 160138).

GRASSHOPPER SPARROW—*Ammodramus savannarum*. *Fall:* rare visitant. The 10 individuals (one banded) occurred from 31 July (1968) to 5 November (1975) with a slight peak in early October. The July record was the only one before 21 September (1971) and the November record was the only one after 21–25 October (1974). The high count of two birds was recorded 1 October 1975. *Spring:* very

rare visitant. The seven individuals occurred as follows: 28 April and 8–9 May 1968, 2 June 1969 and 1975, 7 June 1970 (specimen: PRBO 417), 14–19 June 1975, and 2 July 1968 (banded).

BAIRD'S SPARROW—*Ammodramus bairdii. Fall:* extremely rare visitant. The only record for the island and for California was a bird collected 28 September 1969 (CAS 69476). It was an immature that could not be sexed, had light fat, and weighed 15.9 g. Some measurements were: length = 133 mm, wing = 67, tail = 50, tarsus = 21.4, culmen = 12.1.

LECONTE'S SPARROW—*Ammospiza leconteii. Fall:* extremely rare visitant. The only record for the island, and the first for California, was an immature collected 13 October 1970 (CAS 68505). McCaskie (1975) presented details on this specimen and discussed three other individuals reported for California.

VESPER SPARROW—*Pooecetes gramineus. Fall:* uncommon visitant. The 76 individuals (nine banded) occurred from 5 September (1968) to 29 October–6 November (1970) with a pronounced peak in early October. The high count of seven was recorded 6 October 1972. The species was also observed by PRBO during September 1967. *Spring:* very rare visitant. The five single individuals were present 4 April 1973, 17 April 1974, 2 May 1973, and 18 and 21 May 1975.

LARK SPARROW—*Chondestes grammacus. Fall:* fairly common visitant. The 117 individuals (33 banded) occurred from 29 July (1968) to 13 December (1972) with a pronounced peak during early and mid-September. The next earliest individual was present 7 August; there was only one record each for November and December. The high count of eight was recorded 1 October 1974. The species was also recorded by Tenaza (1967) in September 1965 and by PRBO during September 1967. *Winter:* extremely rare visitant. A single bird was present 7–24 January 1969. The December record could also have been a winter bird. *Spring:* rare visitant. The 11 single individuals occurred from 24 March (1973) to 28 June–17 July (1973). These occurrences were distributed as follows: one in March, two in early April, two in early May, five in late May, and one in June.

CASSIN'S SPARROW—*Aimophila cassinii. Fall:* extremely rare visitant. An immature ♀ was collected 22–23 September 1969 (CAS 68475). The skull was partially ossified, it had no developed ova, and had moderate fat. The bird weighed 15.3 g. Some measurements were: length = 51 mm, wing = 56.5, tail = 65, tarsus = 19.2. Another fall individual was seen by PRBO on 25 September 1967. *Spring:* extremely rare visitant. Single individuals were present 2–4 June 1970 (specimen: CAS 68520), 12 June 1975 (banded), and 11–12 July 1969 (banded). The specimen was an adult ♀ with its largest ovum measuring 1 mm. It had no molt, a trace of fat, and weighed 14.6 g. Some measurements were: wing = 62.5 mm, tarsus = 20.2. These were the first records of this species in California.

BLACK-THROATED SPARROW—*Amphispiza bilineata. Fall:* very rare visitant. The seven individuals occurred as follows: 18 August 1972, 29 August 1968, 31 August 1974, 3–8 and 14–17 September 1972, 16 September–5 October 1974, and 24–26 September 1970. All but the second, third, and last were banded. An individual was also seen by PRBO on 20 September 1967. *Spring:* extremely rare visitant. Single individuals were present 17 April 1974 and 18–19 June 1968. Both were banded.

SAGE SPARROW—*Amphispiza belli. Spring:* extremely rare visitant. An individual was banded 17 April 1970; this was the only island record.

DARK-EYED JUNCO, Slate-colored form—*Junco hyemalis, hyemalis* group. *Fall:* rare visitant. Thirteen of 16 individuals (three banded) occurred from 24–25 September (1974) to 3–5 November (1968) with a peak in early to mid-October. The three December records, 8–9 December 1974 and 13–18 and 18 December 1972, could represent winter visitants. The high count of two was recorded 5 October 1972, 9–10 October 1970, 23–24 October and 18 December 1972. One was banded by PRBO on 24 September 1967. *Spring:* rare visitant. The 11 individuals (three banded) occurred from 3–4 April (1973) to 11–23 June (1975) with no discernible peak. Three occurred in early April (all in 1973), one in mid-April, two in early May, one in mid-May, three in late May, and one in June. The high count of two was recorded 4 April 1973. In addition, four birds (two banded) intermediate between this and the following form were present 4 April 1973, and one, unidentified to type, occurred 8 May 1974.

DARK-EYED JUNCO, Oregon form—*Junco hyemalis, oreganus* group. *Fall:* abundant visitant. The 1603 individuals (429 banded; specimens: PRBO 328, 329, 739–741) occurred from 25 June (1972) to 19 December (1971) with a peak during early and mid-October. Included in these were 10 individuals that occurred between 25 June (1972) and 17 August (1970); most, if not all, of these were juveniles.

The next earliest occurrence was 10 September (1975). Only six visited during December. The high count of 700 was recorded 2–3 October 1972, the year when about half of the Oregon Juncos occurred. Two individuals present 26–28 September 1974 were thought to be the "pink-sided" form (*J. h. mearnsi*) but are included in the total. In addition, a single Dark-eyed Junco, unidentified as to type, occurred 11 November 1974. Oregon Juncos were also collected by Tenaza (1967) in September 1965 and were recorded by PRBO in September 1967. *Winter:* very rare visitant. Single individuals were present 17–23 January 1975, 19–23 January 1976 (banded), and 4 and 15–19 February 1969 (both banded). Bryant (1888), however, reported them as having frequently occurred in large flocks in winter. *Spring:* common visitant. The 717 individuals (197 banded) occurred from 5 March (1972, 1976) to 1–3 June (1975) with the peak from mid-March to early April. Only 23 occurred in May and only one occurred in June. The high count of 420 was recorded 4 April 1973. A single individual, probably referable to *J. h. mearnsi*, was present 21–22 April 1973 and is included in the total above. An Oregon Junco was also collected by Medina 27 May 1963 (MVZ 160139).

TREE SPARROW—*Spizella arborea*. *Fall:* rare visitant. The 13 individuals (five banded; specimen: PRBO 461) occurred from 3 October (1970, 1972) to 17 November (1970) with peaks in early October and mid-November. The high count of two birds was recorded 5 October 1972. *Spring:* very rare visitant. The eight individuals, all astonishingly late, occurred as follows: 4–7 May 1971, 16 May 1968, 23–26 May 1971, 4 and 6 June 1975, 14 June 1969, and 20–22 and 28–29 June 1972. All eight were banded. A Tree Sparrow was also collected by Medina 23 May 1963 (MVZ 160141).

CHIPPING SPARROW—*Spizella passerina*. *Fall:* common visitant. The 624 individuals (355 banded; specimen: PRBO 418) occurred from 22 July (1972) to 30 November (1975) with a broad peak from mid-September to early October. Only four visited during November. The high count of 50 was recorded 2 October 1972. Tenaza (1967) recorded this species in fall 1965 and PRBO recorded it in September 1967. *Spring:* fairly common visitant. The 144 individuals (45 banded) occurred from 16 March (1974) to 3–4 July (1975) with peaks during late April and late May. Only two individuals occurred during March, both in 1974, 11 occurred in April before the 22nd, four occurred in June after the 8th, and only one occurred as a spring migrant in July. The high count of 55 was recorded 30 April 1971. Bryant (1888), Dawson (1911b), and Tenaza (1967) all recorded this species. Medina collected one 25 May 1963 (MVZ 160140).

CLAY-COLORED SPARROW—*Spizella pallida*. *Fall:* uncommon visitant. The 56 individuals (29 banded) occurred from 27 August (1972) to 5 November (1975) with the major peak from mid-September to early October and a possible minor peak in late October. Only one individual each arrived during August and November. The high count of three was recorded eight times between 15 September (1973) and 30 October (1974). PRBO also recorded an individual on 23 September 1967. *Spring:* rare visitant. The 12 individuals (seven banded) occurred from 4–5 May (1974) to 12–13 June (1975) with a pronounced peak during early June. The high count of three was recorded 31 May 1975. Tenaza (1967) collected an individual on 12 June 1964.

BREWER'S SPARROW—*Spizella breweri*. *Fall:* uncommon visitant. The 34 individuals (17 banded) occurred from 30 August (1972) to 30 October–1 November (1974) with a sharp peak in late September. Other than single individuals present (and banded) 26 October, 30 October, and 30 October–1 November (all 1974), the latest individual occurred 9–10 October (1974). The high count of eight was recorded 28–29 September 1974. *Spring:* rare visitant. The 11 individuals (six banded) occurred from 9 May (1968) to 27 June (1973) with a peak in late May. There were six May and five June occurrences, all of single birds. Tenaza (1967) collected one on 11 June 1964.

In addition, there were 24 individual *Spizella* (spp.) recorded during fall. Three that occurred between 21 July (1973), the earliest date for any spizellid, and 10 August (1968) were almost certainly Chipping Sparrows. Twenty that occurred between 20 August (1971) and 13–14 September (1974) were probably mostly Chipping but could have included Clay-colored and Brewer's as well. One found dead 22 October (1968) was either a Clay-colored or a Brewer's. There were also two unidentified spizellids in spring. One, on 25 May 1970, was thought to be a Brewer's; the other, on 4 June 1971, was possibly a Clay-colored.

FIELD SPARROW—*Spizella pusilla*. *Spring:* extremely rare visitant. The only record for the island, and for California, was an individual present (and banded) 17 June–9 July 1969 (Robert 1971a).

BLACK-CHINNED SPARROW—*Spizella atrogularis*. *Fall:* extremely rare visitant. A single individual was present 30 August–5 September 1972, the only record for the island.

HARRIS' SPARROW—*Zonotrichia querula*. *Fall:* very rare visitant. The five single individuals, all quite late, were present 24–28 October 1971, 26 October 1972, 30 October–9 November 1974, 3–5 November 1968, and 16 November–21 December 1974. All but the second and fifth were banded. *Spring:* extremely rare visitant. Single birds were present 2 May 1973 and 16 May 1969 (banded).

WHITE-CROWNED SPARROW—*Zonotrichia leucophrys*. *Fall:* abundant visitant. The 5113 individuals (973 banded; specimen: PRBO 325) occurred from 27 August (1973) to 21 December (1969) with a peak in early October. Fully 60% of the total, however, occurred during the massive invasion of 1972, with the high count of 3000 being recorded on 3 October 1972. Only one bird visited before 8 September; only 12 visited in November later than the 10th; and only 10 visited in December. Only two black-lored individuals, *Z. l. leucophrys* or *Z. l. oriantha*, were seen: one was banded 7–9 October 1970 and another was present 2–6 October 1974. Of the remaining 972 banded, 496 were *Z. l. gambelii*, 461 were *Z. l. pugetensis*, and 15 were undesignated as to race. Except for the 1972 invasion, dominated by *gambelii*, *pugetensis* generally slightly outnumbered the other. The arrival schedules of the two races largely coincided, except that *pugetensis* occurred slightly earlier and in slightly higher numbers during September, while *gambelii* accounted for most November and December records. The species was also recorded by PRBO in September 1967. Bryant (1888) reported it in flocks, but did not specify any dates. *Winter:* rare resident and visitant. Eight of 13 winter occurrences represented residents. These birds apparently arrived between 30 October (1973) and 12 December (1974) and generally remained into April, although two departed in early January and one remained until 2 May (1975). Of the five residents banded, two were *gambelii*, two were *pugetensis*, and one was undesignated as to subspecies. There were also five visitants, four in mid- to late January 1975 and one on 18–20 February 1973. This species has only occurred during three winters: 1972–73, 1973–74, and 1974–75. The high count of eight occurred 17 January 1975. *Spring:* common visitant. The 419 individuals (159 banded) occurred from 10 March (1971) to 1 July (1968) with two peaks. The first peak, in early April, was comprised almost entirely of *pugetensis*, while in the second, during late April, *gambelii* outnumbered *pugetensis* by about two to one. Only five visited after 12 May: two black-lored individuals (*Z. l. leucophrys* or *oriantha*), one banded 31 May 1973 and the other collected 1 July 1968, the only spring visits by black-lored birds; one *gambelii* seen 8 June 1974; and two *pugetensis*, banded 7–15 June 1968 and 25–28 June 1972. Of the remaining banded individuals, 64 were *gambelii*, 75 were *pugetensis*, and 17 were undesignated. A *gambelii*, banded by PRBO on 13 June 1967, was the latest bird of this race.

A White-crowned Sparrow banded on 5 October 1969 was recovered in San Francisco on 28 March 1970; one banded 22 September 1970 was recovered in Goleta, California, 3 April 1971; another banded 6 October 1972 was recovered in Stinson Beach, California, 9 January 1973; and one banded 28 September 1972 was recovered in Whalley, British Columbia, on 28 April 1975. All four were *pugetensis*.

GOLDEN-CROWNED SPARROW—*Zonotrichia atricapilla*. *Fall:* abundant visitant. The 6221 individuals (1207 banded; specimens: PRBO 326, 327) occurred from 12 September (1972) to 6 December (1970) with the peak during early October. About 60% of the total occurred during 1972, with the high count of 3500 on 2 October 1972. Only three fall birds visited after 12 November, two in late November and one in December. The species was also recorded by PRBO in September 1967. Bryant (1888) reported it in flocks and mentioned a specimen taken in September 1886. *Winter:* uncommon resident and visitant. Some 26 of 30 individuals (18 banded) represented winter residents. These arrived throughout the fall and early winter from 7 October (1974) to 30 January (1970); eight arrived in October, nine in November, seven in December, and two in late January. Although four disappeared in January or February, the majority remained as late as early to mid-April. Four individuals remained into early May; the latest stayed until the 9th (1973). The four visitants occurred in late January and early February 1975. Peak winters for this species were 1972–73 and 1974–75, with 10 and 12 residents, respectively. The high count of 16 was recorded 2 February 1975. None occurred during the winters of 1968–69, 1971–72, and 1973–74. *Spring:* fairly common visitant. The 216 individuals (81 banded) occurred from 25 March (1973) to 12 June (1972) with the peak during late April. Except for 32 individuals in late March and early April 1973, only two occurred before 14 April. In addition, only

three birds occurred after mid-May, two in late May and one in June. The high count of 65 was recorded 1 May 1971. Dawson (1911b) reported one on 2 June 1911.

A single individual captured 28–30 April 1971, was banded at San Pedro, California, on 5 October 1970. This represents the only island recovery of a landbird banded elsewhere. An individual banded on the Farallones 5 October 1972 was recovered in Carmel Valley, California, 2 April 1974.

WHITE-THROATED SPARROW—*Zonotrichia albicollis*. *Fall:* uncommon visitant. The 59 individuals (29 banded) occurred from 24 September (1974) to 19 November (1971). Maximum numbers occurred throughout October (19 early, 17 mid-, and 16 late). Individuals visited only three times in September and only four times in November. The high count of three was recorded four times between 2–4 October (1970) and 26 October (1972). PRBO previously recorded an individual on 23–25 September 1967. *Spring:* extremely rare visitant. Single individuals, all banded, were present 22–24 April 1969, 16–25 May 1973, and 7 July 1970. Tenaza (1967) also collected one on 13 June 1964.

FOX SPARROW—*Passerella iliaca*. *Fall:* abundant visitant. The 955 individuals (146 banded) occurred from 11 September (1975) to 20 December (1968) with the peak during early October. Except for a wave of 14 during early and mid-November 1970, only two visited during November and only three in December. The high count of 200 was recorded 3 October 1972. Included in these records were two individuals of the rusty "eastern" form, *P. i. iliaca*, one on 23–25 September 1971 and the other on 12 October 1975. Another, possibly of this race, occurred on 22 October 1975. Tenaza (1967) collected a Fox Sparrow on 5 September 1965. *Winter:* rare resident. Ten of 11 individuals were banded and ascertained to be residents. Arrival dates for these birds extended from 6 October (1974) to 7 December (1975) with two arrivals in October, five in November, and three in early December. These individuals remained well into the spring with three leaving in March, five in April, and two in May, the latest on 11 May 1975. Six wintered in 1974–75, two in 1973–74, and one each in 1972–73 and 1975–76. A single individual seen on the West End, 23 January 1971, was probably also a resident. *Spring:* uncommon visitant. The 30 individuals (10 banded) occurred from 26 March (1971) to 16–17 May (1971) with the peak during early May. Only one bird visited during March and only one visited after 9 May. The high count of six was recorded 4 April 1973. Dawson (1911b) collected one on 31 May 1911 and saw several between then and 3 June. Grinnell and Miller (1944:531) re-identified the subspecies of Dawson's specimen.

LINCOLN'S SPARROW—*Melospiza lincolnii*. *Fall:* common visitant. The 666 individuals (144 banded) occurred from 4 September (1973) to 25 October (1971, 1972) with individuals remaining until 27 October (1972, 1974). The peak occurred during early October. About two-thirds visited during the 1972 invasion; the high count of 450 was recorded 3 October 1972. The species was recorded previously by PRBO in September 1967. *Spring:* fairly common visitant. The 113 individuals (90 banded; specimen: PRBO 743) occurred from 27 March (1969) to 4 June (1968, 1974) with individuals present until 5 June (1970, 1971). The peak occurred during early May. Individuals visited only three times in March and only four times after mid-May (one in late May and three in early June).

SWAMP SPARROW—*Melospiza georgiana*. *Fall:* rare visitant. The 10 individuals (five banded) occurred from 2 October (1975) to 16 November (1974) with a slight peak during mid-October. The high count of two was recorded 18 October 1974. *Spring:* extremely rare visitant. Single individuals, both banded, were present 28–29 April 1968 and 25 June 1970.

SONG SPARROW—*Melospiza melodia*. *Fall:* rare visitant. The 17 individuals (three banded; specimens: PRBO 330, 331) occurred from 15 September (1973) to 12 November (1972) with a pronounced peak during mid-October. Most of these birds were of the large, rusty forms from the northwest coastal areas. Two birds, one banded 16 October 1970 and the other seen 23–24 October 1972, were of an even larger, gray Alaskan form, *M. m.* cf. *caurina*. *Winter:* extremely rare resident. A single individual of an Alaskan race was present from 3 November 1974 to 5 March 1975. *Spring:* very rare visitant. Single individuals were present 16 April 1970 (banded), 27 April 1972, 28 April–9 May 1970 (banded), 29 April 1971, and 18 May 1970.

SPARROW (spp.). *Fall:* Twenty-two unidentified sparrows occurred between 8 August (1973) and 2 November (1969). Ten from early August to early September 1968, 1970, and 1973, were probably either Savannah or juvenile Chipping Sparrows. One on 18 September 1975 was possibly a Tree Sparrow. Eleven others between 30 October and 2 November 1969 were unidentified *Zonotrichia*. There were also two unidentified passerines: 18 September 1970 and 16 September 1971. *Spring:*

Eight unidentified sparrows occurred between 9 March (1972) and 3 July (1972). A bird on 3 June 1971 was thought to be a Song Sparrow, one on 13 June 1971 was possibly a Cassin's Sparrow, and the remaining were recorded as sparrow (spp.). Also, an unidentified passerine was recorded 11 March 1971.

LAPLAND LONGSPUR—*Calcarius lapponicus*. *Fall:* uncommon visitant. The 62 individuals (one banded; specimen: CAS 68480) occurred from 3–5 September (1973) to 6–7 December (1975) with peaks during late September and late October. Only two occurred before 24 September, only two in November, and only one in December. The high count of eight was recorded 27 September 1974. Two were also recorded by PRBO on 23–24 September 1967.

CHESTNUT-COLLARED LONGSPUR—*Calcarius ornatus*. *Fall:* rare visitant. The 14 individuals (two banded) occurred from 26 September (1974) to 22 October (1973); this latter bird was captured in a weakened condition, banded, and held in captivity until 27 October when it was released healthy. The peak (seven birds) occurred in mid-October. The high count of four was recorded 29 September 1974. *Spring:* extremely rare visitant. A single bird was present 26–27 June 1975.

SNOW BUNTING—*Plectrophenax nivalis*. *Fall:* very rare visitant. The six individuals occurred as follows: 26 October 1972; 29, 29–30 October, and 29 October–10 November 1974; and 11 and 17 November 1975.

HYPOTHETICAL LIST

We have withheld the following eight[1] species from the main text of the annotated list because details of their actual presence on the island are at present obscure. Some or all records may be valid but we feel it best to designate them as hypothetical.

WHITE PELICAN—*Pelecanus erythrorhynchos*. Recorded once by Gruber (1884). The lack of printed or tangible evidence and possible confusion with the Brown Pelican warrant its removal from the main list. Grinnell and Miller (1944) do not include any Farallon reference.

SNOW GOOSE—*Chen caerulescens*. See Addenda. A single flock of four birds was reported to us by a U.S. Coast Guardsman on 12 October 1970; they had supposedly flown by the island. In view of the fact that there was only a single observer, that no specimen, photograph, or written description exists, and that the possibility of Ross' Goose (*Chen rossii*) was not totally eliminated, we feel that this record, although probably accurate, should be relegated to hypothetical status. Interestingly, the period 12–14 October 1970 included visits by a number of unusual waterbirds, for instance, Blue-winged Teal and American Bittern.

FERRUGINOUS HAWK—*Buteo regalis*. Bryant (1888) reported "one specimen shot"; that is all. Bryant reported for several people at the island. It is not known who shot this bird, how it was identified, or if the specimen was preserved. Grinnell and Miller (1944) do mention this record.

BALD EAGLE—*Haliaeetus leucocephalus*. See Addenda. Gruber (1884) reported that the lighthouse keeper collected one for him. It is not known who shot this bird, who examined it, or if a specimen exists. Grinnell and Miller (1944) do not include the record.

MARBLED MURRELET—*Brachyramphus marmoratus*. Peterson (1957) reported five birds within 2 km of the island 7 April 1957. We know of no record of this species anywhere farther than a few kilometers from the mainland shore (see, for instance, Wahl 1975). No written description of these birds is available. In the absence of substantiating evidence, we consider this occurrence as hypothetical.

SCRUB JAY—*Aphelocoma coerulescens*. Gruber (1884) included this species on his list of island birds but there has been no substantiation. Grinnell and Miller (1944) do refer to this sight record. Pitelka (1951) discussed the record and considered it the result of accidental transportation to the island, perhaps by ship. If the record is correct, this is a likely explanation, or possibly it was the escaped pet of human residents.

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[1] Verified occurrences of two of the eight species, Snow Goose and Bald Eagle, were obtained subsequent to 2 April 1976 and are included in the Addenda.

COMMON CROW—*Corvus brachyrhynchos*. Bryant (1888) listed the only records: two pairs seen in June 1885 and one pair seen in May 1887. We do not know exactly whose records these were. We suspect them to be incorrect in view of the fact that ravens were present on the island in most of those early years, but, interestingly, were not recorded for 1885 or 1887. Grinnell and Miller (1944) refer to these records and note "but from no other island."

WESTERN BLUEBIRD—*Sialia mexicana*. Bryant (1888) reported that "a few were seen occasionally" but there is no further evidence. Grinnell and Miller (1944) in reference to this record say "probably in winter."

DISCUSSION

The Farallon occurrences of 331 species of birds are documented to 2 April 1976 in the Species Accounts. Fifteen additional species occurred in the subsequent 42-month period, to 2 October 1979, and are documented in the Addenda. Of the 331 species, only 20 (12 seabirds and eight landbirds) are known to have bred. At least two of the breeding seabirds, Common Murre and Rhinoceros Auklet, and seven of the breeding landbirds also occur as visitants. These nine species, along with the 311 that have occurred only as visitants or nonbreeding residents, are the subject of the sections on visitants, and are discussed according to their ecological and seasonal distribution on mainland northern California, the nearest continental landmass. Species known to have occurred in northern California (see McCaskie et al. 1979) but not on the Farallones are also briefly mentioned.

BREEDING SEABIRDS

Few islands can compare with the Farallones in the variety and number of birds per unit area. To be sure, few other areas have received the concentrated, sustained attention given these islands. As the preceding pages amply document, such attention has been deserved; the Farallon bird life is truly remarkable.

The Farallon populations of breeding seabirds are among the largest in western North America south of the Aleutians. The world's largest breeding populations of Ashy Storm-Petrel, Brandt's Cormorant, and Western Gull occur on the Farallones. In fact, Farallon nesting populations account for about two-thirds of the marine birds breeding in California, and a substantial proportion of the individuals breeding on the US West Coast (Ainley and Whitt 1973). During fall and winter these Farallon birds disperse along the coast from British Columbia to Baja California. Olson (1977) recently remarked that a vast area of the Atlantic Ocean had been voided of birds by the rendering of Ascension Island into a site unsuitable for nesting seabirds. Considering that the Farallon populations contribute so heavily to the West Coast marine bird fauna, and perhaps not too long ago contributed even more heavily (see Ainley and Lewis 1974), one cannot help wondering how the West Coast marine bird populations would fare without them.

In addition, few sites along the West Coast exceed the Farallones in the number of breeding species. Of the 17 seabird species that breed on the Pacific Coast of California, 12 have populations on these islands. Besides the three species mentioned above, Leach's Storm-Petrel, Pelagic Cormorant, Common Murre, Pigeon Guillemot, and Cassin's Auklet are abundant breeders; Double-crested Cormorant, Black Oystercatcher, and Tufted Puffin are common breeders; and Rhinoceros Auklet is an uncommon breeder. Most of these species have subarctic affinities. Three of the five California breeding species not represented by nesting populations, Black

Storm-Petrel (*Oceanodroma melania*), Brown Pelican, and Xantus' Murrelet, breed to the south on islands in warmer waters; a fourth, Fork-tailed Storm-Petrel, breeds farther north; the fifth, Marbled Murrelet, requires a rather unusual habitat for a seabird—forests—not available on the Farallones.

Visitant Waterbirds

As of 2 April 1976, 122 species of waterbirds had occurred. Eleven were present only as breeding species or (as in the case of Common Murre) were so abundant as breeders that visitation rates of nonbreeding individuals could not be determined. These species will not be discussed further. The remaining total of 111 species, however, is truly remarkable when one considers the small size of the island, its distance from the mainland, and its virtual lack of estuarine or freshwater habitat. Although some species are represented by large nonbreeding seasonally resident populations, most are represented only by visitants during the migration periods. We further categorize these 111 species into four major groups: pelagic, neritic, estuarine and freshwater, and shorebird species.

Group 1: Pelagic seabirds

A number of seabirds occur off northern California in offshore marine waters. They rarely occur close inshore or in the larger, deep-water bays and, hence, are known as "pelagic." Occurrences of the 26 species known to have visited within 2 km of the Farallones are summarized in Table 1.

The most abundant pelagic seabird off the northern California coast, and off the Farallones, is the Sooty Shearwater (see Ainley 1976). This Southern Hemisphere breeder is sometimes present in immense numbers during the summer months and is the only nonbreeding summer resident to occur at the island. The flocks, occasionally numbering in the hundreds of thousands, are often observed passing the island in seemingly unending lines. Occasionally, when food is abundant, they may congregate in massive feeding flocks nearby and are often joined by large numbers of breeding cormorants, gulls, and murres. They generally remain exceedingly abundant during the fall but are less abundant during the spring. There appear to be no winter occurrences.

Fall.—Other than the Sooty Shearwater, the most abundant fall visitants are the Red and Northern Phalaropes which are extremely sporadic, being nearly absent in some years and exceedingly abundant in others. Surprisingly, Buller's Shearwater, once considered rare in California waters, is the next most common fall visitant but is also very sporadic. The Black-legged Kittiwake, Northern Fulmar, Ancient Murrelet, and Bonaparte's Gull are sporadically common or fairly common. The irregular nature of the occurrences of these and the remaining less abundant species is due, at least in part, to fluctuations in oceanographic climate (see Ainley 1976).

Winter.—The two predominate species, Black-legged Kittiwake and Northern Fulmar, are highly sporadic in occurrence. The remaining eight species are much less abundant.

Spring.—Other than the Sooty Shearwater, four species are abundant near the Farallones: Red and Northern Phalaropes, Bonaparte's Gull, and Black-legged Kittiwake. All are sporadic and generally are observed flying north past the island. Eight additional species are rare to extremely rare.

TABLE 1
FARALLON OCCURRENCES OF PELAGIC SEABIRDS (3 APRIL 1968 TO 2 APRIL 1976)[a]

	Fall			Winter		Spring	
Sooty Shearwater[b]	A	201,880		—	—	A	4896
Red Phalarope	Sp A	65,451+		ER	1	Sp A	1252
Northern Phalarope	Sp A	31,851+		ER	1	Sp A	12,572+
Buller's Shearwater	Sp C-A	842+		—	—	—	—
Black-legged Kittiwake	Sp C	614		Sp A	1786	Sp A	6833
Northern Fulmar	Sp C	272		Sp FC	134	—	—
Ancient Murrelet	Sp FC	140		U	38	ER	3
Bonaparte's Gull	Sp FC	137		R	11	Sp A	32,231
Pink-footed Shearwater	FC	105		—	—	VR	5
Rhinoceros Auklet[c]	U	33		U	30	R	17
Common Tern	ER-R	3	+89*	—	—	—	—
Arctic Tern	ER-R	3		—	—	—	—
Horned Puffin	VR	7		—	—	ER	1
Pomarine Jaeger	VR	5	+5	ER	1+	—	—
Parasitic Jaeger	VR	4		—	—	—	—
Sabine's Gull	VR	5+		—	—	—	—
Black-footed Albatross	VR	4		ER	1	VR	5
Manx Shearwater	ER	3		—	—	—	—
Red-footed Booby	ER	2		—	—	—	—
South Polar Skua	ER	2		—	—	—	—
Xantus' Murrelet	ER	2		—	—	ER	1
Short-tailed Albatross	NRR			NRR		NRR	
Magnificent Frigatebird	NRR			—	—	—	—
Short-tailed Shearwater	—	—		ER	1	—	—
Fork-tailed Storm-Petrel	—	—		—	—	ER	1
Long-tailed Jaeger	—	—		—	—	ER	1

[a] Species are arranged in order of their fall abundance. Numbers are total individuals per season, cumulative for eight years. Letter designations of abundance values are: A—abundant, C—common, FC—fairly common, U—uncommon, R—rare, VR—very rare, ER—extremely rare, NRR—no recent record. The prefix Sp designates sporadic occurrence.

[b] Also sporadically abundant as a nonbreeding summer resident near the Farallones. A total of 511,596 summer occurrences have been recorded.

[c] Also breeds on the Farallones.

* Numbers are inflated because of the occurrence of coherent flocks. The abundance code, therefore, is accordingly reduced.

Two pelagic species, Flesh-footed Shearwater (*Puffinus carneipes*) and Black Storm-Petrel, occur regularly as nonvagrants in central California waters but have never been recorded from the island. Fifteen additional species have occurred as vagrants in these waters but also have yet to be recorded from the Farallones.

Group 2: Neritic seabirds

A number of seabird species occur off central California as inhabitants of marine waters near the coast and within the larger deep-water bays. These generally occur in waters overlying the continental shelf and, hence, are known as "neritic" seabirds (Table 2). Inshore neritic species occur in waters shallow enough for birds to take food from the bottom; offshore neritic species occur in waters too deep for birds to exploit the bottom (see Ainley and Sanger 1979). We further divided neritic species into two subgroups based primarily on the manner in which they search for food. In Subgroup A, species rely heavily upon flight for finding food and include the Brown Pelican and all gulls and terns except five pelagic

TABLE 2
FARALLON OCCURRENCES OF NERITIC SEABIRDS (3 APRIL 1968 TO 2 APRIL 1976)[a]

	Fall		Winter		Spring	
Subgroup A: Species that search for food by flight and that occur in both inshore and offshore neritic habitats						
Brown Pelican	A	13,952+	R	12	—	—
California Gull	Sp A	6152+	Sp FC	197	R	10
Heermann's Gull	A	2023	R	12	VR	8
Glaucous-winged Gull	C	370	A	1290	C	252
Herring Gull	C	318+	C	277	FC	219+
Mew Gull	FC	152	R	20	VR	4
Ring-billed Gull	U	49+	—	—	ER	2
Thayer's Gull	VR	8+	ER	1+	ER	3
Elegant Tern	ER	14*	—	—	—	—
Caspian Tern	ER	3	—	—	VR	4
Glaucous Gull	—	—	VR	5	ER	3
Subgroup B: Species that search for food by swimming and diving and that usually occur only in inshore neritic habitats						
Surf Scoter	C	402+	C	252	C	610
Eared Grebe	FC	118	A	3120	—	—
Arctic Loon	FC	117+	U	38+	FC	196+
White-winged Scoter	U	98*	U	43	U	40
Western Grebe	U	80	ER	3	R	23
Red-throated Loon	R–U	28	VR	6	R	20
Common Loon	R	21	ER	1	VR	5
Oldsquaw	R	11	VR	5	ER	2
Red-breasted Merganser	VR	8	U	45	ER	1
Horned Grebe	VR	7	VR	8	ER	1
Black Scoter	VR	6	VR	5	—	—
Red-necked Grebe	VR	5	R	16	—	—
Harlequin Duck	ER	1	ER	3	—	—

[a] Species are arranged in order of their fall abundance. Numbers are total individuals per season, cumulative for eight years. Letter designations of abundance values are: A—abundant, C—common, FC—fairly common, U—uncommon, R—rare, VR—very rare, ER—extremely rare, NRR—no recent record. The prefix Sp designates sporadic occurrence.

* Numbers are inflated because of the occurrence of coherent flocks. The abundance code, therefore, is accordingly reduced.

species treated in the previous group. In Subgroup B, species rely primarily upon swimming and diving to find food, and are typical of inshore neritic habitats. They include loons and grebes, except for the primarily freshwater Pied-billed Grebe, and various sea ducks. These two subgroups are treated separately below.

The Farallon Islands offer considerable excellent habitat for both neritic subgroups. As a result, certain of these species occur commonly or abundantly, both as fall and spring visitants and as winter residents. Large numbers of pelicans and gulls roost nightly on the island during the nonbreeding season and join the large feeding flocks of Sooty Shearwaters and resident Western Gulls, cormorants, and murres during the day. These flocks are a common sight when food is abundant. The various loons, grebes, and sea ducks occur singly or in large rafts, diving for food in the rich inshore waters. Some, such as the Surf Scoter, reach maximum numbers during the spring and fall migratory periods, while others, such as the Eared Grebe, build up to maximum numbers in mid-winter.

Subgroup A: Species that rely on flight to find food

Fall.—Three species occur abundantly: the Brown Pelican and Heermann's Gull as postbreeding residents or visitants from northern Mexico, and the California Gull as a sporadic visitant from interior western North America. Three northerly species, the Glaucous-winged, Herring, and Mew Gulls, are common or fairly common. Surprisingly, the Ring-billed Gull, generally considered least likely of the large gulls to occur in offshore waters, is an uncommon visitant. Although only eight Thayer's Gulls have been positively identified in fall, immatures of this species have probably been overlooked among the masses of large gulls that frequent the island.

Winter.—Except for the ubiquitous resident Western Gull, the Glaucous-winged is the principal gull around the Farallones; it becomes abundant in midwinter. Herring Gulls also remain common around the island. Large *Larus* gulls are not generally considered to be pelagic. However, the tendency for individuals of these two species to occur far from land in the eastern North Pacific has been noted by Sanger (1973). It is thus not surprising that they should occur as abundantly as they do on this offshore island. The California Gull, so abundant in fall, often does not winter at the Farallones, but is a sporadic fairly common visitant. Mew Gulls become rare around the island as do both the Brown Pelican and Heermann's Gull. Most individuals of the latter two species return to Mexico to breed at this time.

Spring.—Most species of this subgroup are less common as spring visitants than as fall visitants or winter residents. Only the Glaucous-winged and Herring Gulls are common or fairly common. There exist no "spring" occurrences of the Brown Pelican although fall postbreeding pelicans arrive at the Farallones as early as May in warm water years.

Subgroup B: Species that rely on swimming and diving to find food

Fall.—The Surf Scoter is the only common visitant of this subgroup, although the Arctic Loon, Eared and Western Grebes, and White-winged Scoter are uncommon or fairly common. The remaining species are, at best, rare to uncommon.

Winter.—Populations of these diving species differ considerably from the fall populations. A few, such as Red-necked and Eared Grebes, and Red-breasted Merganser, reach peak annual populations at this time. Huge rafts of Eared Grebes build up around the island during late fall, so that by winter the species is abundant. This is remarkable in that the Eared Grebe is often considered to be more of an estuarine or freshwater species than most other grebes. Surf Scoters remain common and White-winged Scoters remain uncommon but numbers of both species are reduced from fall. Similarly, numbers of all three loons and the Western Grebe are greatly reduced. The very rare or extremely rare Horned Grebe, Oldsquaw, Harlequin Duck, and Black Scoter, however, occur in numbers similar to those in the fall.

Spring.—Pronounced influxes of Arctic Loons and Surf Scoters occur, both of which are more common than in fall or winter. Many of these occurrences, however, involve birds merely flying north past the island. Similar but less pronounced influxes also occur for the Common and Red-throated Loons, Western Grebe, and White-winged Scoter. The remaining species show no pronounced

influx. No occurrences have been recorded for the Eared Grebe, Red-necked Grebe, Harlequin Duck, or Black Scoter. Interestingly, the latter three species are near the southern limits of their winter ranges at the Farallones.

Only three species of neritic seabirds known to occur regularly as nonvagrants in northern California have not occurred on the Farallones. Two, the Forster's and Least Terns (*Sterna forsteri* and *S. albifrons*), are at or near the northern limits of their coastal breeding ranges and generally tend to prefer somewhat estuarine habitats. The third, the Marbled Murrelet, apparently rarely strays out over the open ocean.

In addition, nine neritic species have occurred as vagrants in northern California but, as of 2 April 1976, had not been recorded on the Farallones. One of these, the Laughing Gull (*Larus atricilla*), has since occurred (see Addenda).

Group 3: Estuarine and freshwater birds: non-Charadrii

Many species occurring in northern California are primarily limited to estuarine and/or freshwater habitats; these, except for the Charadrii which will be treated separately, are included in a single group (Table 3). The virtual absence of estuarine or freshwater habitat on the Farallones (except for a few generally stagnant high water tide pools and a single artificial freshwater seepage) probably limits the number of occurrences and length of stay for species in this group.

Fall.—Only a single estuarine species, the Pintail, is common but most records of even this species consist of flocks which merely fly by without stopping. Many of the Pintails that actually stop on the island appear to be weak or exhausted. Not a single other species is even fairly common and only two are uncommon. The remaining 21 species are all quite rare.

Winter.—Very few estuarine or freshwater species have occurred on the Farallones in winter. A good deal of suitable winter habitat exists for them in central California. Because of this and the fact that they apparently do not move long distances during this period, their absence on the island is not surprising.

Spring.—Species of this group are nearly as rare in spring as in winter. This is perhaps related to the fact that movement during spring involves more of an inland component than in fall. The Cinnamon Teal and Common Goldeneye are very rare and 10 others are extremely rare.

Fully 17 estuarine or freshwater species occur regularly as nonvagrants in northern California, but, as of 2 April 1976, had not been recorded on the Farallones. They include the White Pelican, Least Bittern (*Ixobrychus exilis*), Whistling Swan (*Olor columbianus*), Snow Goose, Ross' Goose, Fulvous Whistling-Duck (*Dendrocygna bicolor*), Eurasian Wigeon (*Anas penelope*), Wood Duck (*Aix sponsa*), Redhead (*Aythya americana*), Ring-necked Duck (*A. collaris*), Canvasback (*A. valisineria*), Barrow's Goldeneye (*Bucephala islandica*), Bufflehead (*Bucephala albeola*), Hooded Merganser (*Lophodytes cucullatus*), Common Merganser (*Mergus merganser*), Sandhill Crane (*Grus canadensis*), and Black Tern (*Chlidonias niger*). Four of these, Whistling Swan, Snow Goose, Barrow's Goldeneye, and Bufflehead, have since been added to the list (see Addenda).

The absence of the rest of these species, many of which are abundant on the adjacent mainland estuaries, indicates their reluctance to fly out over the open ocean. It is especially interesting that dabbling ducks appear to fly out over the open ocean more often than most estuarine or freshwater diving ducks. In ad-

TABLE 3
FARALLON OCCURRENCES OF ESTUARINE AND FRESHWATER BIRDS: NON-CHARADRII (3 APRIL 1968 TO 2 APRIL 1976)[a]

	Fall		Winter		Spring	
Pintail	C	1252+*	ER	1	ER	1
Great Blue Heron	U	30	NRR		ER	2
Green-winged Teal	R–U	26+	ER	1	—	—
Brant	R	532*	—	—	ER	5*
Ruddy Duck	R	19	ER	2	—	—
American Wigeon	R	14	—	—	—	—
Blue-winged Teal	ER–R	1 } +22	—	—	—	—
Cinnamon Teal	ER–R	1 }	—	—	VR	10+*
Cattle Egret	VR	8	—	—	—	—
Mallard	VR	8	—	—	ER	1
Great Egret	VR	6	—	—	ER	2
Lesser Scaup	VR	6	—	—	—	—
American Coot	VR	6	—	—	ER	1
Snowy Egret	VR	5	—	—	—	—
Pied-billed Grebe	VR	4	—	—	—	—
Canada Goose	ER	18*	ER	1	—	—
Northern Shoveler	ER	3	—	—	—	—
Green Heron	ER	2	—	—	ER	2
White-fronted Goose	ER	2	—	—	ER	1
Gadwall	ER	2	—	—	—	—
Virginia Rail	ER	2	—	—	—	—
Black-crowned Night Heron	ER	1	—	—	—	—
American Bittern	ER	1	—	—	—	—
Greater Scaup	ER	1	—	—	—	—
Clapper Rail	NRR		—	—	—	—
Sora	NRR		—	—	ER	1
Black Rail	NRR		—	—	NRR	
White-faced Ibis	—	—	—	—	NRR	
Common Goldeneye	—	—	ER	1	VR	4
Common Gallinule	—	—	—	—	ER	1
Scaup (spp.)	—	—	ER	2	—	—

[a] Species are arranged in order of their fall abundance. Numbers are total individuals per season, cumulative for eight years. Letter designations of abundance values are: A—abundant, C—common, FC—fairly common, U—uncommon, R—rare, VR—very rare, ER—extremely rare, NRR—no recent record. The prefix Sp designates sporadic occurrence.
* Numbers are inflated because of the occurrence of coherent flocks. The abundance code, therefore, is accordingly reduced.

dition, 12 estuarine or freshwater species have occurred as vagrants in northern California but have not yet been recorded on the island.

Group 4: Estuarine and freshwater birds: Charadrii (shorebirds)

Shorebirds that regularly occur in numbers in central California prefer one or more of six rather closely related habitats: rocky intertidal coasts, open beaches, tidal mud flats, salt marshes, freshwater marshes, and wet meadows. Because of these fairly narrow habitat requirements, all shorebirds on the Farallones (with the exception of the Red and Northern Phalaropes and the Black Oystercatcher) are treated as a single group (Table 4).

The Farallones offer excellent, perhaps unexcelled, habitat for those species preferring rocky intertidal coasts. The rocky flats and magnificent tidepools are

TABLE 4
FARALLON OCCURRENCES OF ESTUARINE AND FRESHWATER BIRDS: CHARADRII (SHOREBIRDS) (3 APRIL 1968 TO 2 APRIL 1976)[a]

	Fall		Winter		Spring	
Black Turnstone	C	490	C	466	U	38
Wandering Tattler	C	320	FC	103	FC	105
Western Sandpiper	FC	144+	ER	6*	—	—
Killdeer	FC	114	R	16	VR	9
Black-bellied Plover	FC	94	R	19	ER	2
Willet	FC	91	FC	98	VR	8
Baird's Sandpiper	FC	88	—	—	ER	1
Marbled Godwit	U–FC	142+*	—	—	ER–VR	3+
Short-billed Dowitcher	U–FC	62 } +64*	—	—	— } ER	— } 3
Long-billed Dowitcher	U–FC	61 }	—	—	— }	— }
Least Sandpiper	U–FC	77+	—	—	ER	1
Sanderling	U	91*	—	—	—	—
Whimbrel	U	72	R	17	R	12
Pectoral Sandpiper	U	54	—	—	ER	1
Ruddy Turnstone	U	46	VR	6	VR	4
American Golden Plover	U	44	—	—	ER	1+
Spotted Sandpiper	U	44	—	—	ER	3
Common Snipe	U	31	—	—	ER	1
Surfbird	R–U	64*	VR	4	ER	1
Semipalmated Plover	R–U	53*	—	—	—	—
Dunlin	R–U	28*	ER	1	ER	1
Greater Yellowlegs	R	11	—	—	ER	1
Lesser Yellowlegs	VR–R	7+	—	—	ER	1
Long-billed Curlew	VR	5	—	—	—	—
Rock Sandpiper	VR	4	VR	6	—	—
Red Knot	ER	3	—	—	—	—
American Avocet	ER	2	—	—	—	—
Dotterel	ER	1	—	—	—	—
Upland Sandpiper	ER	1	—	—	ER	1
Semipalmated Sandpiper	ER	1	—	—	—	—
Wilson's Phalarope	ER	1	—	—	—	—

[a] Species are arranged in order of their fall abundance. Numbers are total individuals per season, cumulative for eight years. Letter designations of abundance values are: A—abundant, C—common, FC—fairly common, UC—uncommon, R—rare, VR—very rare, ER—extremely rare, NRR—no recent record. The prefix Sp designates sporadic occurrence.

* Numbers are inflated because of the occurrence of coherent flocks. The abundance code, therefore, is accordingly reduced.

renowned for the density and diversity of intertidal invertebrates they support. As expected, the most common visitant and winter resident shorebirds prefer just this habitat. With the exception of a few generally stagnant high water tide pools and a single artificial freshwater seepage, no open beach, mud flat, salt marsh, freshwater marsh, or wet meadow habitat exists. As a result, species preferring these habitats are generally rare or, at best, fairly common. It seems likely that many shorebirds, being very strong flyers, pass by without stopping. The Marbled Godwit, a large noticeable species, has often been recorded doing exactly this. Many of the smaller, less noticeable species may fly by undetected.

Fall.—All species that have occurred have done so during fall migration. In addition, all except the Upland Sandpiper (which has occurred but once in fall and once in spring) are considerably more common in fall than in spring. Only

two, however, Black Turnstone and Wandering Tattler, are truly common fall visitants. Both show distinct preferences for rocky intertidal coasts and appear to be very much at home. Five species are fairly common. Two of these, Black-bellied Plover and Willet, show at least a partial preference for rocky intertidal coasts; on the Farallones they generally frequent the rocky intertidal of Mussel Flat, often associating with turnstones and tattlers. Two others, Western Sandpiper and Killdeer, are abundant on the adjacent mainland where they demonstrate a wide range of habitat preferences. Killdeer, in addition, often prefer dry upland habitats and, when on the Farallones, generally prefer the grassy marine terrace. The fifth species, Baird's Sandpiper, presents somewhat of an enigma. It is far more common in fall than would be expected considering its relative scarcity on the mainland. This may be explained partially by its preference for the drier more upland flats; on the Farallones it invariably occurs on the grassy marine terrace rather than in the tidepools or rocky intertidal. Jehl (1979) has suggested that most Baird's Sandpipers in California are vagrant, immature individuals; their high frequency of occurrence on the island tends to support this. In addition, the fact that individuals often remain for extended visits and accumulate large quantities of fat indicates that they are about to undertake long flights. The direction and ultimate fate of these flights would be most interesting to ascertain.

The four uncommon to fairly common species, Marbled Godwit, Short- and Long-billed Dowitchers, and Least Sandpiper, generally prefer the small stagnant tidepools. Seven other species rank as uncommon. Four of these, Sanderling, Whimbrel, Ruddy Turnstone, and Spotted Sandpiper, are known to occur regularly on mainland rocky intertidal coasts and choose this habitat on the island. Two others, Pectoral Sandpiper and American Golden Plover, like Baird's Sandpiper, occur in surprisingly large numbers in relation to many species that are much more abundant on the mainland. They too may be represented by a high percentage of vagrants undertaking long flights and, like Baird's Sandpiper, tend to remain for extended visits. The seventh uncommon species, Common Snipe, prefers grassy freshwater habitats on the mainland and often occurs in the grass of the island's marine terrace.

Three species, Surfbird, Semipalmated Plover, and Dunlin, are rare to uncommon. Most of the Surfbird occurrences are of flocks early in the fall and may represent long-distance migrants bound for the southern hemisphere. Dunlin are surprisingly scarce considering their abundance on the adjacent mainland and their at least occasional preference for rocky intertidal coasts. This may indicate that most Dunlin in California are winter residents rather than passage migrants.

The remaining 10 species are rare, very rare or extremely rare. Five of these, Greater and Lesser Yellowlegs, Long-billed Curlew, American Avocet, and Wilson's Phalarope, at least partially prefer freshwater habitats. The Rock Sandpiper, a rocky intertidal species, appears to be at the southern extremity of its range on the Farallones. The Red Knot is both local and rather scarce on the adjacent mainland. The remaining three species are known only as vagrants in northern California, the Upland and Semipalmated Sandpipers originating from more eastern North America, and the Dotterel originating from Eurasia. Interestingly, both the Upland Sandpiper and Dotterel prefer upland habitats, and, when on the island, spent all of their time on the grassy marine terrace.

Winter.—Nearly all wintering species tolerate, or actually prefer, rocky intertidal habitats. Several, including Black Turnstone, Wandering Tattler, and Willet, are common or fairly common. The Killdeer prefers the grassy marine terrace for its winter visits. In addition, single winter records exist for Western Sandpiper (flock of six) and Dunlin, two species that prefer muddy or sandy substrates on the mainland.

Spring.—Of the spring visitants, only the Wandering Tattler, Black Turnstone, Whimbrel, and possibly Killdeer, Willet, and Ruddy Turnstone, occur somewhat regularly. All seem to find the available island habitats to their liking. The remaining 14 species are extremely rare. One, the Upland Sandpiper, occurs in California only as a vagrant. Three others, American Golden Plover, and Baird's and Pectoral Sandpiper, could also be considered spring vagrants in coastal northern California. It seems incredible that such abundant mainland species as Western Sandpiper, Sanderling, and Semipalmated Plover have never been recorded on the Farallones in spring.

Only four species of shorebirds that regularly occur as nonvagrants in northern California had not been recorded as of 2 April 1976: Snowy Plover (*Charadrius alexandrinus*), Mountain Plover (*C. montanus*), Solitary Sandpiper (*Tringa solitaria*), and Black-necked Stilt (*Himantopus mexicanus*). The Snowy Plover, however, has since been added to the list (see Addenda). In addition, 11 species of vagrant shorebirds have occurred in northern California but had not yet been recorded on the Farallones as of 2 April 1976. Since then the Buff-breasted Sandpiper (*Tryngites subruficollis*) has occurred (see Addenda).

Visitant Landbirds

A total of 209 landbird species is known to have occurred on the Farallones as of 2 April 1976. One of these, the California Quail, was introduced and was later extirpated. It is not known to have visited the island under its own power and is not included in this discussion. The remainder have all occurred as visitants, either during fall or spring migration or in winter. A few have also been present as winter residents. Those seven of the 208 that have bred on the island are additionally discussed in a later section.

The relative abundance of visitant species varies greatly. Some occur in astonishing numbers, but others are extremely rare, and several are represented by only a single occurrence. Most species, with several noteworthy exceptions, occur more commonly during fall than spring migration. We have divided the species into five major groups based on the proximity of their breeding or wintering ranges to the Farallones. The groups include species characteristic of (regularly breeding or wintering in numbers in): (1) coastal central California, (2) interior lowland central California, (3) montane central California, and (4) the Great Basin region of central California. The last group (5) includes species that occur only as vagrants in central California. Complete summaries of the Farallon occurrences of these groups are presented in Tables 6 through 10, respectively. In addition, a summary of the mean number of Farallon occurrences, per species, for each of these groups is presented, with the mean fall-to-spring ratio, in Table 5.

The South Farallon Islands offer a limited number of suitable habitats for nonbreeding landbirds. Such habitat considerations appear to be very important in determining the abundance of winter residents; most wintering species are those

TABLE 5

A QUANTITATIVE SUMMARY OF FARALLON OCCURRENCE RATES OF GROUPS OF LANDBIRD SPECIES (3 APRIL 1968 TO 2 APRIL 1976)

Landbird group[a]	No. of species	Occurrence rates[b] Fall	Winter	Spring	Fall-to-spring ratio
Coastal species					
A. Primarily winter residents	34[c]	974.0 ± 1911.7 (A)[b]	31.9 ± 138.8 (U)	108.4 ± 186.3 (FC)	8.98
B. Primarily summer residents	20	150.9 ± 185.2 (FC)	0.0	212.1 ± 475.2 (FC)	0.71
C. More or less permanent residents	27	112.5 ± 167.4 (FC)	2.0 ± 4.7 (ER)	28.6 ± 42.0 (U)	3.93
Interior lowland species					
A. Primarily winter residents	5	24.0 ± 30.6 (R)	0.2 ± 0.4 (ER)	2.6 ± 2.1 (ER)	9.23
B. Primarily summer residents	18	34.7 ± 53.6 (U)	0.1 ± 0.2 (ER)	11.9 ± 14.2 (R)	2.91
C. More or less permanent residents	8	18.9 ± 25.2 (R)	5.3 ± 10.2 (VR)	3.4 ± 8.7 (VR)	5.59
Montane species					
A. More or less permanent residents	5	2.0 ± 1.4 (ER)	0.4 ± 0.5 (ER)	0.6 ± 0.5 (ER)	3.33
B. Summer residents	16	93.9 ± 155.2 (FC)	0.0	36.1 ± 40.7 (U)	2.60
Great Basin species					
A. Winter residents	4	19.3 ± 29.1 (R)	0.0	2.0 ± 4.0 (ER)	9.63
B. Summer residents	6[c]	11.8 ± 12.1 (R)	0.0	9.8 ± 15.7 (R)	1.20
Vagrant species					
A. Northern species	41[d]	29.1 ± 48.8 (U)	0.0 ± 0.2 (ER)	9.9 ± 14.3 (R)	2.94
B. Southeastern species	20	2.1 ± 3.3 (ER)	0.0	3.0 ± 4.5 (ER)	0.68
C. Southwestern species	6	2.0 ± 1.8 (ER)	0.0	0.7 ± 1.2 (ER)	3.00
D. Palearctic species	3	0.7 ± 0.6 (ER)	0.0	0.3 ± 0.6 (ER)	2.00

[a] See text and Tables 6–10 for details and discussions of groups.

[b] Given in each column are the mean number of individuals per species in each landbird group, occurring in that season over the eight-year period of this study, followed by the standard deviation, and a letter designating the abundance code (A—abundant, C—common, FC—fairly common, U—uncommon, R—rare, VR—very rare, ER—extremely rare).

[c] Includes one additional well-marked form.

[d] Includes three additional well-marked forms.

that normally tolerate or prefer open, fairly treeless, and quite rocky habitats. To the contrary, habitat considerations appear to be virtually inconsequential in determining the abundance of fall and spring visitants. The vast majority of these probably find themselves, at dawn, over the open ocean. Indeed, nocturnal migrants are far more common on the Farallones than are diurnal migrants. A strong indication exists that most of these individuals are in the process of returning to the mainland when they sight the Farallones. DeSante (1973) showed that the "vanishing" directions of landbirds leaving or flying over the island during September and October mornings (1969, 1970, and 1971) lay almost entirely in the northeast quadrant, whether or not the mainland was visible. The mean of these flight directions, for 70 departures of 15 species (158 individuals), was 36° (true north = 0°). Similar reverse diurnal migrations have been recorded during the fall on Nantucket and Block Islands off the New England coast and elsewhere off the Atlantic Coast (Baird and Nisbet 1960); as expected, the direction of these movements was NW, also toward the mainland.

The number of landbirds arriving on any given day during the migration periods appears to be related to two, perhaps interdependent, factors: the number of landbird migrants that are aloft along or off the coast of central California, and the "gathering" area of the island. The gathering area is basically the area of the ocean over which the island, rather than the mainland, first becomes visible to a landbird returning toward the mainland from sea. This area is greatly reduced when the island is shrouded in fog or when the mainland is clearly visible from a great distance. The number of arriving landbirds is generally low under either of those conditions. Optimal conditions for arrival are usually low overcast skies with a visibility from the island of greater than 15 km, but less than 30 km. The proximate meteorological factors producing these conditions as well as the proximate and ultimate weather factors accounting for large numbers of migrants aloft over coastal central California are presently under investigation and will be the subject of future reports.

The ultimate fate of the landbirds that do visit the Farallones is of interest. The above data indicate that many individuals probably return to the mainland, and thus do not perish at sea. To test this hypothesis we can compare the recovery rates (banded birds recovered away from the banding station) from the Farallones with those from PRBO's mainland Palomarin station, approximately 32 km northeast near Bolinas (Fig. 1). Discounting all waterbirds and all totally sedentary species (e.g., Nuttall's White-crowned Sparrow, Wrentit, etc.), only 11 of 14,052 landbirds banded on the Farallones between 3 April 1968 and 2 April 1976 were recovered on the mainland. In comparison, 45 of 23,919 landbirds banded at Palomarin during the same period were recovered elsewhere on the mainland. The recovery rates are, thus, 0.2% for mainland-banded birds and 0.1% for island-banded birds. These rates are close, but in fact are statistically different (t_s = 26.73, $P < 0.01$; Sokal and Rohlf 1969:608). This difference may be attributed to a higher mortality rate of island-banded birds, either on the island, where small but substantial numbers of landbirds are known to die, or in the ocean. Care must be exercised in this interpretation, however, since it is possible that island-banded birds originate from breeding areas or are bound for wintering areas farther removed from human population centers than mainland-banded birds. This would bias the recovery rates in favor of the mainland station.

It should also be pointed out that nine of the 11 island-banded recoveries involve species that regularly breed or winter in coastal central California (Group 1 species; see below). Many, if not most, individuals of these species probably return to the mainland. One of the two remaining island-banded recoveries, a Mockingbird, also returned to its normal range in the interior lowland region of central California. The other, a Hermit Warbler, was recovered at Palomarin the day after it was last seen on the island. The same perhaps is true of a banded ♂ Black-throated Blue Warbler (not included in the figures above) observed at Rodeo Lagoon, Marin County, the day after one was banded on the Farallones. While these data indicate that some montane and possibly even vagrant individuals successfully return to the mainland, they provide no information as to their subsequent fate. It seems likely that many, if not most, vagrant individuals and perhaps even some montane and Great Basin birds, after returning to the mainland and accumulating a substantial quantity of fat, continue their somewhat westerly migration and embark on a long overwater flight. Such individuals, therefore, are doomed to perish in the ocean.

Group 1: Landbirds regularly breeding or wintering in coastal central California

The species included in this group comprise an integral part of the avifauna of coastal central California. This area is often included in the "Oregonian Biotic Province" and lies primarily in the "Transition Life Zone." It extends from the coast inland to the eastern edge of the summer fog belt on the lower eastern slopes of the Outer Coast Ranges, and is characterized by mild, wet winters and cool summers dampened by considerable coastal fog. Of the 208 landbird species that have visited the Farallones, 80 regularly breed or winter in this area. A summary of their occurrences is presented in Table 6.

We further classified these 80 species into three subgroups based upon their seasonal occurrence on the mainland. Subgroup A includes 33 species (and one additional well-marked form, the Yellow-rumped "Myrtle" Warbler) that are present in maximum numbers in coastal central California during the winter. A few, such as Golden-crowned and Fox Sparrow, occur there only as winter residents or passage migrants. Most, however, such as White-crowned and Savannah Sparrows, breed in this area, although their summer numbers are greatly augmented or actually replaced by winter individuals. Subgroup B includes 20 species that occur in coastal central California only as summer residents, although a few winter occurrences have been recorded for most of them. Subgroup C includes 27 species that occur in nearly equal numbers in coastal central California in both summer and winter. Some, such as Hutton's Vireo and House Sparrow, are generally thought to be represented in this area by permanent resident populations; others, such as Mourning Dove and Band-tailed Pigeon, may be represented by totally different populations in summer and winter; and still others may be represented by some combination of these two extremes. The seasonal occurrences on the Farallones of species in this subgroup may shed considerable light on their seasonal status on the mainland.

In many respects coastal central California is, for landbirds, a more favorable area for wintering than for breeding. The varied habitats, mild climate, and generally abundant moisture no doubt contribute to this. Hordes of landbirds begin

TABLE 6

FARALLON OCCURRENCES OF LANDBIRDS REGULARLY BREEDING OR WINTERING IN COASTAL CENTRAL CALIFORNIA (3 APRIL 1968 TO 2 APRIL 1976)[a]

	Fall		Winter		Spring	
Subgroup A: Species that occur in maximum numbers in coastal central California in winter						
Starling[b]	A	7818	A	813	U	37
Golden-crowned Sparrow	A	6221+	U	30	FC	216
White-crowned Sparrow	A	5113+	R	13	C	419
Savannah Sparrow	A	4374+	—	—	FC	84
Dark-eyed (Oregon) Junco	A	1603+	VR	4	C	717+
Fox Sparrow	A	955	R	11	U	30
Hermit Thrush	A	909+	VR–R	9+	FC	161
Yellow-rumped (Audubon's) Warbler	A	825+	R	11+	C	605+
Western Meadowlark	A	793	U	52	R	21
Water Pipit	C	844*	ER	1	VR	8
Lincoln's Sparrow	C	666	—	—	FC	113
Red-breasted Nuthatch	SpC	579	—	—	R	11
Ruby-crowned Kinglet	C	510	ER	2	C	365
Yellow-rumped (Myrtle) Warbler	C	365+	VR	4	FC	90+
Townsend's Warbler	C	252	—	—	C	477
American Robin	FC	233	U	68	FC	130
Golden-crowned Kinglet	FC	200	—	—	U	30
Cedar Waxwing	FC	196	ER	3	U	48
Common (Red-shafted) Flicker	FC	144+	R	16	U	36+
American Kestrel	FC	126	R	12	—	—
Varied Thrush	U–FC	86*	VR	8	U	65
Short-eared Owl	U	66	—	—	ER	1
Say's Phoebe	U	64	ER	1	VR	5
Winter Wren	U	43	ER	2	VR	8
Sharp-shinned Hawk	U	34	—	—	—	—
Horned Lark	R	26	—	—	VR	5
Peregrine Falcon[b]	R	14	R	25	ER	1+
Cooper's Hawk	R	13	—	—	—	—
Marsh Hawk	R	13	—	—	NRR	
Yellow-bellied (Red-breasted) Sapsucker	R	13	—	—	ER	1
Merlin	VR	7+	—	—	—	—
Tricolored Blackbird	VR	5+	—	—	ER	2
White-tailed Kite	ER	3	NRR		—	—
Red-tailed Hawk	ER	3	ER	1	NRR	
Subgroup B: Species that occur in maximum numbers in coastal central California in summer						
Brown-headed Cowbird	C	701	—	—	FC	175
Yellow Warbler	C	446	—	—	FC	147
Wilson's Warbler	C	364	—	—	A	2078
Western Flycatcher	C	326+	—	—	FC	132+
Swainson's Thrush	C	266+	—	—	FC	122+
Warbling Vireo	FC	161	—	—	U	68
Orange-crowned Warbler	FC	157	—	—	C	688
Western Wood Pewee	FC	155	—	—	C	544
Rough-winged Swallow	U–FC	99+*	—	—	R	16+
Violet-green Swallow	U–FC	98+*	—	—	R	12+

TABLE 6 (CONTINUED)

	Fall		Winter		Spring	
Barn Swallow	U–FC	88*	—	—	U	68
Black-headed Grosbeak	U	53	—	—	U	56
Olive-sided Flycatcher	U	44	—	—	U	70
Cliff Swallow	U	30+	—	—	R	11+
Grasshopper Sparrow	R	10	—	—	VR	7
Tree Swallow	VR–R	8+	—	—	R–U	25+
Allen's Hummingbird	ER–R	1+	—	—	VR–U	9+
Bank Swallow	VR	4+	—	—	VR–R	9+
Purple Martin	VR	4	—	—	VR	5
Osprey	ER	3	—	—	—	—
Subgroup C: Species that are more or less resident in coastal central California						
Pine Siskin	SpC	685+	R	18	R	23+
Purple Finch	SpC	401+	ER	2	U	36+
Brewer's Blackbird	C	350+	ER	1+	U	62
Mourning Dove	C	287	—	—	FC	103
Rufous-sided Towhee	C	263	—	—	R	10
Lesser Goldfinch	C	253+	NRR		R	16+
Red-winged Blackbird	FC–C	254+*	—	—	VR–R	9+
Common Yellowthroat	FC	113	—	—	FC	109
House Finch[b]	FC	95+	ER	1	FC	153+
Band-tailed Pigeon	FC	89	NRR		FC	89
Black Phoebe	U	50	R	13	VR	4
Brown Creeper	U	43	—	—	ER	1
Belted Kingfisher	U	37	R	13	VR	6
American Goldfinch	U	31	—	—	R	19
Anna's Hummingbird	R–U	11+	—	—	VR–R	9+
Rock Dove	R	29*	VR	4	U	32
Song Sparrow	R	17	ER	1	VR	5
Hutton's Vireo	R	12	—	—	ER	3
Saw-whet Owl	VR	5	—	—	—	—
Long-billed Marsh Wren	VR	4	—	—	—	—
Acorn Woodpecker	ER	3	ER	1	—	—
House Sparrow[b]	ER	2	—	—	U–FC	80+
Loggerhead Shrike	ER	1+	—	—	ER	2
Barn Owl	ER	1	—	—	—	—
Great-horned Owl	ER	1	—	—	—	—
Pygmy Nuthatch	ER	1	—	—	—	—
Common Raven[b]	NRR		NRR		ER	1

[a] Species are arranged in order of their fall abundance. Numbers are total individuals per season, cumulative for eight years. Letter designations of abundance values are: A—abundant, C—common, FC—fairly common, UC—uncommon, R—rare, VR—very rare, ER—extremely rare, NRR—no recent record. The prefix Sp designates sporadic occurrence.

[b] Has bred on the Farallones.

* Numbers are inflated because of the occurrence of coherent flocks. The abundance code, therefore, is accordingly reduced.

to arrive on their coastal wintering grounds in late September and October. It comes as no great surprise, therefore, that massive "waves" of landbirds also occur at that time on the Farallones. Daily counts of over 1000 landbirds were recorded in late September and early October in four of the eight years reported here. It was estimated that nearly 10,000 were present on 2 October 1972. The

vast majority of individuals comprising these massive fall "waves" were members of species included in Subgroup A.

Subgroup A: Species that occur in maximum numbers in coastal central California in winter

Fall.—The mean number of occurrences of the 34 forms was 974.0 (Table 5) corresponding to a classification of abundant. In fact, all landbird species that are abundant during fall belong to this subgroup (Table 6A). It is entirely possible that their abundance is directly proportional to their abundance on the adjacent mainland. It is both interesting and distressing that the Starling, an introduced species not recorded in central California before 1952, is the most abundant landbird on the Farallones. The remaining abundant species include coastal California's five most common native sparrows as well as Hermit Thrush, Yellow-rumped "Audubon's" Warbler, and Western Meadowlark. Most of the remaining nocturnally migrating species are common or fairly common. In contrast, all of the diurnally migrating raptors, with the single exception of the fairly common American Kestrel, are, at best, uncommon or rare. This is probably due to their general reluctance to undertake long overwater flights. Interestingly, falcons and accipiters occur more commonly than do harriers, buteos, or kites.

Winter.—Twenty of the 34 forms have occurred with a mean number of occurrences per species of 31.9, corresponding to a classification of uncommon (Tables 5 and 6A). The only abundant species is the Starling, which appears to be very much at home on the grassy marine terrace and whose numbers are increasing each winter. Uncommon landbirds include American Robin, which only visits for short periods, and Western Meadowlark and Golden-crowned Sparrow, which reside during most winters. A few Peregrine Falcons and American Kestrels winter regularly, while Common "Red-shafted" Flickers, Yellow-rumped "Audubon's" Warblers, and White-crowned and Fox Sparrows winter irregularly. An additional 10 forms are very rare or extremely rare residents or visitants.

Spring.—Virtually all the species are considerably less common as spring than as fall visitants (Table 6A). Their mean number of spring occurrences was 108.4, corresponding to a classification of fairly common (Table 5). The ratio of fall-to-spring occurrences was 8.98. This seems logical since their fall migration tends to take many individuals south toward wintering areas along the coast, while their spring migration takes most individuals north away from the coast. The single exception is Townsend's Warbler, which is nearly twice as common in spring as in fall. Townsend's Warblers have an interesting winter distribution with two disjunct ranges, one in coastal Oregon and California, and the other in montane western Mexico and Guatemala. Possibly most fall visitant Townsend's Warblers are bound for the nearby winter range, while most spring visitants are coming from the distant one.

Except for Townsend's Warbler, only four other species, Dark-eyed "Oregon" Junco, Yellow-rumped "Audubon's" Warbler, White-crowned Sparrow, and Ruby-crowned Kinglet, are common. All remaining nocturnally migrating species have occurred in numbers ranging from only fairly common to extremely rare. It is noteworthy that several abundant or common fall visitants, such as Starling,

Fox Sparrow, Western Meadowlark, Water Pipit, and Red-breasted Nuthatch, are uncommon or rare in spring. Even more striking is the virtual absence of diurnally migrating raptors, except for the Peregrine Falcon, which has been recorded once or twice in early summer. The latter individuals, however, were probably from the adjacent mainland rather than true spring visitants.

Only a single nonvagrant landbird species that regularly occurs in coastal central California with maximum numbers in winter, the Bald Eagle, had not been definitively recorded as of 2 April 1976. This species, however, has since been added to the island list (see Addenda).

Subgroup B: Species that occur in maximum numbers in coastal central California in summer

Fall.—None of these 20 species occurs abundantly (Table 6B). Their mean number of occurrences per species was 150.9 (fairly common, Table 5), much less than the average occurrence rate for species of Subgroup A. Nocturnally migrating species such as warblers, flycatchers, and thrushes are generally much more common than diurnally migrating species such as swallows, hummingbirds, and the Osprey.

Winter.—As perhaps expected, none of these species has occurred.

Spring.—All species, with the exception of the Osprey, have been recorded in spring. The mean number of occurrences was 212.1 (fairly common, Table 5), a figure higher than that for species in Subgroup A. In striking contrast to the latter, nearly half of Subgroup B species (including all three abundant or common species) occur more commonly in spring than fall. The fall-to-spring ratio, 0.71, was very different from that for Subgroup A. This is logical since many individuals of Subgroup B tend to migrate northward to breeding areas on the California coast and beyond, thus toward the Farallones in spring, and southward, away from the coast, in fall. Wilson's Warblers, along with Orange-crowned and Townsend's Warblers, and Western Wood Pewees, comprise the bulk of the major landbird "waves" that occur in both early and late May. These waves have occasionally approached 1000 birds.

Only one species in this group, the Turkey Vulture (*Cathartes aura*), had not, as of 2 April 1976, been recorded from the island. It has since, however, been added to the list (see Addenda). This diurnal migrant must be extremely reluctant to fly over large expanses of water as it is very common on the immediately adjacent mainland.

Subgroup C: Species that are more or less resident in coastal central California

Occurrences of these 27 species are summarized in Table 6C. Their mean numbers (112.5, fairly common, in fall; 28.6, uncommon, in spring) were, as perhaps expected, smaller than those for Subgroups A and B (Table 5). Interestingly, their fall-to-spring ratio (3.93) was intermediate between the two other subgroups.

These data reveal several other patterns as well. First, are those 13 species that occur much more commonly on the island in fall than in spring. Eight of these species, Brewer's and Red-winged Blackbirds, Rufous-sided Towhee, Brown Creeper, Purple Finch, Pine Siskin, and both Lesser and American Gold-

finches, are common to uncommon on the island in fall, but occur in much reduced numbers in spring, indicating that substantial movement into coastal central California occurs during fall but less occurs during spring. Fall movements of the latter five of these eight species may, in addition, be somewhat associated with food shortages elsewhere. Only three of these species have occurred in winter. Two other species, Black Phoebe and Belted Kingfisher, also occur much more frequently in fall than in spring, but, in addition, winter regularly on the island. This indicates that a winter influx may occur into coastal central California. Three additional species, Anna's Hummingbird, Song Sparrow, and Hutton's Vireo, although rare at any time on the island, also occur more frequently in fall than in spring. This again suggests a minor fall influx from the north. Indeed, most Song Sparrows on the island, including the single winter resident, were strongly suspected of belonging to north coastal or Alaskan races.

A second pattern is shown by four species, Mourning Dove, Common Yellowthroat, House Finch, and Band-tailed Pigeon, that occur abundantly enough in both fall and spring to indicate that substantial movement into coastal central California occurs during both seasons. A third pattern of occurrence is shown by the House Sparrow and Rock Dove, which are more common in spring than in fall. This is extremely interesting in that both are well known for their excellent colonizing abilities. Perhaps a strategy of dispersal just prior to, rather than after, breeding aids their success at colonization. Finally, eight species are very rare or extremely rare in fall and extremely rare or unknown in spring, indicating that they may, indeed, be very nearly resident in coastal central California.

In contrast to Subgroups A and B, a large number of potential Subgroup C species have never been recorded on the Farallones. Nine may be partially migratory or at least subject to some seasonal dispersal, and thus may be expected eventually to show up: Red-shouldered Hawk (*Buteo lineatus*), Pygmy Owl (*Glaucidium gnoma*), Pileated Woodpecker (*Dryocopus pileatus*), Hairy Woodpecker (*Picoides villosus*), Steller's Jay (*Cyanocitta stelleri*), Common Crow, Dipper (*Cinclus mexicanus*), Bewick's Wren (*Thryomanes bewickii*), and Western Bluebird. Most, however, may migrate or disperse diurnally, which would further reduce their probability of occurring. Ten additional species, while generally common or even abundant on the immediately adjacent mainland, appear to be totally sedentary and, thus, are extremely unlikely ever to occur. These include California Quail (which was successfully introduced to the island and later extirpated), Ring-necked Pheasant (*Phasianus colchicus*), Screech Owl (*Otus asio*), Spotted Owl (*Strix occidentalis*), Downy Woodpecker (*Picoides pubescens*), Scrub Jay, Chestnut-backed Chickadee (*Parus rufescens*), Bushtit (*Psaltriparus minimus*), Wrentit (*Chamaea fasciata*), and Brown Towhee (*Pipilo fuscus*). Their absence is convincing evidence for their extremely sedentary nature, especially when considered in light of the multitude of Farallon occurrences of highly migratory species from areas as far distant as eastern United States.

Group 2: Landbirds regularly breeding or wintering in interior lowland central California

Included in this group are those species that comprise an integral part of California's interior lowland avifauna; they are much less frequently encountered or are absent as breeding or wintering species in the coastal region. The interior

lowland region is often included in the "California Biotic Province" and lies primarily in the "Lower Sonoran" and "Upper Sonoran Life Zones." It extends from the eastern edge of the coastal region, through the Inner Coast Ranges and Great Central Valley to (and including) the foothills and lower western slopes of the Sierra Nevada. (The higher parts of the Coast Ranges and Sierra Nevada, generally above snowline, are included in the montane region discussed later.) The area is characterized by fairly mild, rather wet winters and hot, dry summers. Of the 208 landbird species that have visited the Farallones, 31 regularly breed or winter in this area; their Farallon occurrences are summarized in Table 7. These 31 species are further categorized into three subgroups similar to those described above for the coastal region.

Subgroup A: Species that occur in maximum numbers in interior lowland central California in winter

In many respects, interior lowland central California, like the coastal region, is a more favorable area for wintering than for breeding populations of landbirds. Most, but not all, species wintering in coastal areas also winter in the interior lowland area. Table 7A includes only those five wintering species that are characteristic of this area and that do not winter regularly in numbers along the coast. These species are, as a group, quite rare on the Farallones in fall. Table 5 indicates that their mean number of fall occurrences was only 24.0 (rare). Only one, Rough-legged Hawk, has occurred in winter, and, as perhaps expected, all are, at best, very rare in spring. The mean number of spring occurrences was only 2.6 (extremely rare). Interestingly, the fall-to-spring ratio for this subgroup, 9.23, was very similar to that ratio for coastal wintering species (8.98). Only a single wintering interior lowland species, Ferruginous Hawk, has not yet been definitively recorded on the Farallones.

Subgroup B: Species that occur in maximum numbers in interior lowland central California in summer

Fall.—Considerably more Farallon species (18) are characteristic of interior lowland central California as summer residents and breeders than as winter residents (Table 7B). This is, perhaps, to be expected since this region differs climatically from the coastal region more in summer than in winter. Species in this subgroup are considerably less common in fall than are those in the corresponding coastal subgroup. Their mean number of occurrences was only 34.7 (uncommon; Table 5). Two factors may account for this. First, many of these species are typical of hot, fairly xeric climates and tend to avoid conditions of coastal fog. Thus, habitat characteristics may tend to restrict them, even in migration, to inland areas. Second, several, particularly those rarer on the Farallones, reach the northern limits of their breeding ranges in central California. As a result, most individuals may be vagrants on the Farallones.

Winter.—A few of these species, such as Lark Sparrow, Yellow-headed Blackbird, and White-throated Swift, winter regularly in reduced numbers in interior lowland central California and many of the others have been recorded. However, only one, the Lark Sparrow, has ever been recorded during this season on the island. It represents the only Farallon winter record for any landbird that occurs anywhere in central California primarily as a summer resident.

TABLE 7
FARALLON OCCURRENCES OF LANDBIRDS REGULARLY BREEDING OR WINTERING IN INTERIOR LOWLAND CENTRAL CALIFORNIA (3 APRIL 1968 TO 2 APRIL 1976)[a]

	Fall		Winter		Spring	
Subgroup A: Species that occur in maximum numbers in interior lowland central California in winter						
Vesper Sparrow	U	76	—	—	VR	5
Long-eared Owl	R	21	—	—	ER	1
Rough-legged Hawk	SpR	20	ER	1	—	—
Lewis' Woodpecker	ER	2	—	—	ER	3
Mountain Bluebird	ER	1	NRR		VR	4
Subgroup B: Species that occur in maximum numbers in interior lowland central California in summer						
Northern (Bullock's) Oriole	FC	190	—	—	U	42+
Lazuli Bunting	FC	119+	—	—	U	39
Lark Sparrow	FC	117	ER	1	R	11
Ash-throated Flycatcher	U	53	—	—	U	35
House Wren	U	40	—	—	VR	4
Western Kingbird	U	35+	—	—	R	18
Yellow-headed Blackbird	R	19	—	—	R	14
Yellow-breasted Chat	R	15	—	—	R	15
Blue Grosbeak	R	12	—	—	VR	4
Lawrences's Goldfinch	R	10	—	—	ER	2
Blue-gray Gnatcatcher	VR	5	—	—	ER	3
White-throated Swift	ER	3	—	—	—	—
Yellow-billed Cuckoo	ER	2	—	—	ER	2
Poor-will	ER	2	—	—	—	—
Lesser Nighthawk	ER	1+	—	—	R	24
Hooded Oriole	ER	1	—	—	—	—
Black-chinned Sparrow	ER	1	—	—	—	—
Costa's Hummingbird	—	—	—	—	ER	2
Subgroup C: Species that are more or less resident in interior lowland central California						
Burrowing Owl[b]	U	50	R	15	—	—
Rock Wren[b]	U	49	R	27	ER	1
Mockingbird	U	49	—	—	R	25
Golden Eagle	ER	1	—	—	—	—
White-breasted Nuthatch	ER	1	—	—	—	—
Phainopepla	ER	1	—	—	—	—
Prairie Falcon	NRR		—	—	—	—
Sage Sparrow	—	—	—	—	ER	1

[a] Species area arranged in order of their fall abundance. Numbers are total individuals per season, cumulative for eight years. Letter designations of abundance values are: A—abundant, C—common, FC—fairly common, U—uncommon, R—rare, VR—very rare, ER—extremely rare, NRR—no recent record. The prefix Sp designates sporadic occurrence.
[b] Has bred on the Farallones.

Spring.—Farallon species of this subgroup are much less common in spring than are summering coastal species. Table 5 shows that the mean number of occurrences for these subgroups were, respectively, 11.9 (rare) and 212.1 (fairly common). Furthermore, the fall-to-spring ratio for interior breeders (2.91) was considerably higher than that for coastal breeders (0.71) although, as expected, it was lower than that for wintering species of either the interior region (9.23) or the coast (8.98). In contrast to many coastal breeders, only two interior breeders, Lesser Nighthawk and Costa's Hummingbird, occur more commonly on the is-

land in spring than in fall. Thus we may conclude that most individuals of these species that occur on the island in spring are vagrants.

Only three summering interior lowland species, Swainson's Hawk (*Buteo swainsoni*), Black-chinned Hummingbird, and Cassin's Kingbird (*Tyrannus vociferans*), had not been recorded as of 2 April 1976. The Black-chinned Hummingbird, however, has since been added to the list (see Addenda). The Swainson's Hawk may be reluctant to undertake long overwater flights, but the Cassin's Kingbird remains as one of the outstanding missing species.

Subgroup C: Species that are more or less resident in interior lowland central California

Eight species have occurred (Table 7C). Table 5 shows that they are less common in fall than those in both other subgroups of interior species and considerably less common in fall than the more or less resident coastal species. Their mean number of fall occurrences was only 18.9 (rare). These species were also much less common in spring than in fall, with a mean number of occurrences of only 3.4 (very rare). The fall-to-spring ratio (5.59) was again intermediate between the two other subgroups of interior species but was somewhat higher than that for resident coastal species (3.93).

Two of these eight species, Burrowing Owl and Rock Wren, turn up surprisingly often in fall and, in addition, regularly winter. Furthermore, both have bred on the Farallones, which apparently provide nearly optimal habitat—burrows, mice, and rocks abound. The Mockingbird also occurs surprisingly often both in fall and spring. A high rate of dispersal, however, may be characteristic of this species, which has recently undergone considerable range expansion. The remaining five species are all extremely rare on the island and may, indeed, be very nearly resident species.

Twelve species characteristically resident in the interior lowlands have never been recorded on the Farallones. Of these, the California Condor (*Gymnogyps californianus*), Spotted Dove (*Streptopelia chinensis*), and LeConte's Thrasher (*Toxostoma lecontei*) have ranges that barely reach the southern part of central California and are unlikely ever to occur on the island, although the Spotted Dove is expanding its range. The Chukar (*Alectoris graeca*), Turkey (*Meleagris gallopavo*), Roadrunner (*Geococcyx californianus*), Yellow-billed Magpie (*Pica nuttalli*), Plain Titmouse (*Parus inornatus*), California Thrasher (*Toxostoma redivivum*), and Rufous-crowned Sparrow (*Aimophila ruficeps*) are thought to be totally sedentary and thus are also unlikely ever to occur on the island. The Nuttall's Woodpecker (*Picoides nuttalli*) and Cañon Wren (*Catherpes mexicanus*) are known to wander somewhat in winter and may, sometime, reach the island.

Group 3: Landbirds regularly breeding or wintering in montane central California

These species comprise an integral part of the avifauna of montane central California. This region includes the higher parts of the Coast Ranges and Sierra Nevada, including areas lying in the "Transition," "Canadian," "Hudsonian," and "Arctic-Alpine Life Zones," and is characterized by cold, rather wet winters with considerable snow, and warm, dry summers. Some 21 Farallon species are characteristic of this region (Table 8). They are further categorized into two

TABLE 8
FARALLON OCCURRENCES OF LANDBIRDS REGULARLY BREEDING OR WINTERING IN MONTANE CENTRAL CALIFORNIA (3 APRIL 1968 TO 2 APRIL 1976)[a]

	Fall		Winter		Spring	
Subgroup A: Species that occur in both winter and summer in montane central California						
Townsend's Solitaire	VR	4	ER	1	ER	1
Clark's Nutcracker	ER	2	—	—	—	—
Evening Grosbeak	ER	2	—	—	ER	1
Cassin's Finch	ER	2	—	—	ER	1
Red Crossbill	—	—	ER	1	—	—
Subgroup B: Species that occur only in summer in montane central California						
Chipping Sparrow	C	624+	—	—	FC	144
Western Tanager	FC	161	—	—	FC	107
MacGillivray's Warbler	FC	119	—	—	U	47
Black-throated Gray Warbler	FC	100	—	—	R	13
Hermit Warbler	FC	86	—	—	R	22
Willow Flycatcher	U–FC	78+	—	—	U–FC	71+
Vaux's Swift	U	212*	—	—	VR	4
Solitary Vireo	U	47	—	—	R	14
Nashville Warbler	U	45	—	—	R	27
Hammond's Flycatcher	R	8+	—	—	U–FC	50+
Rufous Hummingbird[b]	VR–U	7+	—	—	U	32+
Dusky Flycatcher	R	6+	—	—	U	34+
Green-tailed Towhee	VR	7	—	—	VR	5
Black Swift	ER	2	—	—	VR	5
Common Nighthawk	ER	1+	—	—	—	—
Calliope Hummingbird	—	—	—	—	ER	3

[a] Species are arranged in order of their fall abundance. Numbers are total individuals per season, cumulative for eight years. Letter designations of abundance values are: A—abundant, C—common, FC—fairly common, U—uncommon, R—rare, VR—very rare, ER—extremely rare, NRR—no recent record. The prefix Sp designates sporadic occurrence.
[b] Does not breed in montane central California but migrates through in midsummer.
* Numbers are inflated because of the occurrence of coherent flocks. The abundance code, therefore, is accordingly reduced.

subgroups. Subgroup A includes five species that occur in montane central California during both summer and winter although they may not, necessarily, be permanent residents; Subgroup B includes 16 species that only occur there during summer. As a result of the rather harsh winter climate, most species do, in fact, occur in the montane region only during summer.

Subgroup A: Species that occur in montane central California during both winter and summer

These five species are extremely rare on the Farallones (Table 8A). Their mean number of fall occurrences was only 2.0 (Table 5). Interestingly, all but two fall occurrences of the Townsend's Solitaire and all fall occurrences of the remaining species were in 1972. Only Townsend's Solitaire and Red Crossbill have occurred in winter. The single occurrence of the Red Crossbill was the only island record. Three of these species have also occurred once in spring. The fall-to-spring ratio for these species (3.33) probably does not mean much because of the small sample size (Table 5).

Eleven potential species of this subgroup have not been recorded on the Far-

allones: Goshawk (*Accipiter gentilis*), Blue Grouse (*Dendragapus obscurus*), White-tailed Ptarmigan (*Lagopus leucarus*), Mountain Quail (*Oreortyx pictus*), Great Gray Owl (*Strix nebulosa*), Williamson's Sapsucker (*Sphyrapicus thyroideus*), White-headed and Black-backed Three-toed Woodpeckers (*Picoides albolarvatus* and *P. arcticus*), Mountain Chickadee (*Parus gambeli*), Pine Grosbeak (*Pinicola enucleator*), and Gray-crowned Rosy Finch (*Leucosticte tephrocotis*). Most of these are sedentary in California and most likely will never occur.

Subgroup B: Species that occur in montane central California only in summer

Fall.—Many of these 16 species occur quite often (Table 8B); their mean number of occurrences (Table 5) was 93.9 (fairly common). They thus occur more commonly than the summering interior lowland species (34.7) but less commonly than the summering coastal species (150.9). This is reasonable as their distribution extends farther north than interior species but lies farther east than coastal species. The Chipping Sparrow is noteworthy in that it is the only noncoastal landbird species found commonly at any time.

Winter.—As expected, none of this subgroup has ever occurred in winter.

Spring.—The mean number of occurrences for these species was 36.1 (uncommon), and was also intermediate between the summering coastal (212.4) and the summering interior lowland species (11.9; Table 5). The fall-to-spring ratio (2.60), however, more closely resembled that for the interior species (2.91) than that for the coastal species (0.71). It is likely that many individuals of the summering montane species may also be vagrants on the Farallones. Only five are more common on the island in spring than in fall: Hammond's Flycatcher, Rufous Hummingbird, Dusky Flycatcher, Black Swift, and Calliope Hummingbird. These species apparently remain very much in the mountains during fall migration.

Only a single summering montane species typical of central California, the Flammulated Owl (*Otus flammeolus*), has not occurred on the Farallones.

Group 4: Landbirds regularly breeding or wintering in the Great Basin of central California

The landbird species included in this group comprise an integral part of the avifauna of the Great Basin region of central California east of the higher parts of the Sierra. This area, often included in the "Nevadan Biotic Province," lies primarily in the "Upper Sonoran" and "Transition Life Zones" and is characterized by rather cold, dry winters and warm, dry summers. Only nine Farallon species are characteristic of this area. Their occurrences are summarized in Table 9. These species are further categorized into two subgroups. Subgroup A includes four species that only winter in this area, while Subgroup B includes five species (and one additional well marked form, the Yellow-bellied "Red-naped" Sapsucker) that only summer in this area.

Subgroup A: Species that occur only in winter in the Great Basin of central California

The mean number of fall occurrences for these species was 19.3 (rare). They thus are less common than either coastal or interior lowland wintering species, but more common than montane wintering species (Table 5). Surprisingly, none

TABLE 9
FARALLON OCCURRENCES OF LANDBIRDS REGULARLY BREEDING OR WINTERING IN THE GREAT BASIN OF CENTRAL CALIFORNIA (3 APRIL 1968 TO 2 APRIL 1976)[a]

	Fall		Winter		Spring	
Subgroup A: Species that occur only in winter in the Great Basin in central California						
Lapland Longspur	U	62	—	—	—	—
Tree Sparrow[b]	R	13	—	—	VR	8
Bohemian Waxwing[b]	ER	1	—	—	—	—
Northern Shrike	ER	1	—	—	—	—
Subgroup B: Species that occur only in summer in the Great Basin in central California						
Brewer's Sparrow	U	34+	—	—	R	11+
Sage Thrasher	R	16	—	—	ER	2
Virginia's Warbler[b]	R	10	—	—	ER	2
Black-throated Sparrow	VR	7	—	—	ER	2
Gray Flycatcher	ER–VR	3+	—	—	U	41+
Yellow-bellied (Red-naped) Sapsucker	ER	1	—	—	ER	1

[a] Species are arranged in order of their fall abundance. Numbers are total individuals per season, cumulative for eight years. Letter designations of abundance values are: A—abundant, C—common, FC—fairly common, UC—uncommon, R—rare, VR—very rare, ER—extremely rare, NRR—no recent record. The prefix Sp designates sporadic occurrence.
[b] May not be regular in central California east of the Sierra but occurs throughout much of the Great Basin.

has been recorded in winter. Only one, Tree Sparrow, has ever occurred in spring. The lateness of its spring occurrences suggests that most individuals are vagrants, as most individuals of these species probably are, even in fall. The mean number of spring occurrences for this subgroup was 2.0 (extremely rare) and parallels the pattern of fall occurrences in comparison with the other species' subgroups. Moreover, the fall-to-spring ratio (9.63) was similar to that of other wintering subgroups.

Subgroup B: Species that occur only in summer in the Great Basin of central California

These six forms occur less frequently in fall than the summering species of any previous group. Their mean fall abundance was only 11.8 (rare; Table 5). All are apparently vagrants on the Farallones and none has been recorded in winter. Their mean number of spring occurrences was 9.8 (rare), also less than that of any other summering group. Their fall-to-spring ratio, however, was unexpectedly low, 1.20. This is due primarily to the surprisingly large number of spring Gray Flycatchers, the only species more common in spring than fall. No explanation is available for the anomalously high numbers of this species. It is also known, however, to occur regularly in spring in mainland western California.

Only four Great Basin species that are still extant in central California, Sage Grouse (*Centrocercus urophasianus*), Broad-tailed Hummingbird (*Selasphorus platycercus*), Black-billed Magpie (*Pica pica*), and Piñon Jay (*Gymnorhinus cyanocephalus*), have never occurred on the Farallones.

Group 5: Vagrant landbirds

The remaining 67 species of Farallon landbirds are basically vagrants, that is, misdirected, out-of-range migrants, in northern California. Five of these, Chim-

ney Swift, Eastern Kingbird, Northern Parula, American Redstart, and Bobolink, have bred on occasion in northern California. Several others, such as Black-and-white and Palm Warblers, and White-throated and Swamp Sparrows, appear to winter regularly there. Still, none comprises a truly integral part of the northern California avifauna. Three additional well marked forms, Common "Yellow-shafted" Flicker, Northern "Baltimore" Oriole, and Dark-eyed "Slate-colored" Junco, are also treated in this group. These species' Farallon occurrences are summarized in Table 10.

It is certainly a tribute to the phenomenal ability of the Farallones to concentrate vagrants that such an amazing array of out-of-range *species* should have occurred on such a small parcel of land. In fact, nearly all have been observed at one time or another in the same tree! Perhaps no other location on this continent could boast of species with such widely divergent geographical origins as Connecticut Warbler, Golden-cheeked Warbler, and Red-throated Pipit (not to mention waterbirds such as Upland Sandpiper, Dotterel, and Red-footed Booby). However, when one considers the staggering number of *individuals* involved (no fewer than 1723 individual vagrant landbirds have been recorded in the eight-year period considered here), it becomes a tribute to the phenomenal dispersal ability of migratory landbirds to occur so abundantly in such an unexpected location.

Only two decades ago, many of these 67 species were unrecorded in California or, for that matter, anywhere west of the Rocky Mountains. Those that had occurred in California had been described by the terms "casual" or "accidental" (AOU 1957). While these two words seem to denote different meanings in the Check-list, dictionary definitions show them to be synonymous. As pointed out by DeBenedictis (1971), the term "accidental" is misleading. The abundance patterns shown by these species on the Farallones, in terms of their total occurrences, yearly occurrences, and timing, do not suggest mere "accidents." These occurrences indicate a need for new terminology to describe this phenomenon. Perhaps the term "vagrant," as synonymous with "out-of-range," is the best choice. However, care must be exercised here. As mentioned above, many landbirds breeding or wintering inland from the California coast (and even some on the coast) may also be vagrants on the Farallones. Thus, as pointed out by DeSante (1973), the term vagrant can be rigorously applied only to individuals, not to populations or species. Only if all individuals of a given species that occur in a given geographical area must be vagrants, can the species be referred to as a vagrant species, and then only in the geographical area in question.

It should also be stressed that no positive data indicate the vagrant phenomenon on the Farallones to be a recent one. Nineteenth-century Farallon records exist for Gray Catbird, Black-and-white Warbler, and Black-throated Blue Warbler. Dawson (1911b) witnessed a "wave" of vagrant warblers on the island in the spring of 1911. His prediction that "practically every species of eastern *Mniotiltidae* [*Parulidae*] should report sooner or later at this inhospitable rock," has, according to Table 10, become a reality. Both DeBenedictis (1971) and DeSante (1973) suggested that the paucity of vagrants before the early 1960s was due to a paucity of observers in localities favored by vagrants such as coastal or desert "oases." Certainly the Farallones have proven to be the most spectacular coastal "oasis" yet discovered, at least on this continent.

TABLE 10
FARALLON OCCURRENCES OF VAGRANT LANDBIRDS (3 APRIL 1968 TO 2 APRIL 1976)[a]

	Fall		Winter		Spring	
Subgroup A: Northern species that breed primarily east of the Rocky Mountains and extensively or entirely in Canada						
Blackpoll Warbler	FC	220	—	—	R	20
Palm Warbler	FC	208	—	—	R	11
American Redstart	FC	133	—	—	U	32
White-throated Sparrow	U	59	—	—	ER	3
Tennessee Warbler	U	57	—	—	U	43
Clay-colored Sparrow	U	56+	—	—	R	12+
Chestnut-sided Warbler	U	42	—	—	R	13
Bobolink	U	41	—	—	VR	5
Ovenbird	U	38	—	—	U	57
Magnolia Warbler	U	34	—	—	U	37
Common (Yellow-shafted) Flicker	R–U	24+	ER	1+	ER–VR	2+
Rose-breasted Grosbeak	R	27	—	—	U	48
Least Flycatcher	R	23	—	—	VR	4
Black-throated Blue Warbler	R	22	—	—	—	—
Northern Waterthrush	R	22	—	—	ER	2
Blackburnian Warbler	R	19	—	—	ER	3
Lark Bunting	R	17	—	—	—	—
Dark-eyed (Slate-colored) Junco	R	16	—	—	R	11+
Black-and-white Warbler	R	15	—	—	R	20
Chestnut-collared Longspur	R	14	—	—	ER	1
Bay-breasted Warbler	R	10	—	—	R	13
Canada Warbler	R	10	—	—	ER	3
Swamp Sparrow	R	10	—	—	ER	2
Red-eyed Vireo	VR	8	—	—	R	24
Cape May Warbler	VR	8	—	—	R	13
Eastern Kingbird	VR	7+	—	—	ER	3
Northern (Baltimore) Oriole	VR	7+	—	—	VR	5+
Connecticut Warbler	VR	7	—	—	ER	1
Black-throated Green Warbler	VR	6	—	—	VR	6
Snow Bunting	VR	6	—	—	—	—
Gray-cheeked Thrush	VR	5	—	—	ER	2
Mourning Warbler	VR	5	—	—	—	—
Harris' Sparrow	VR	5	—	—	ER	2
Brown Thrasher	ER	3	—	—	VR	5
Eastern Phoebe	ER	2	—	—	ER	2
Rusty Blackbird	ER	2	—	—	ER	1
Gray Catbird	ER	1	—	—	—	—
Veery	ER	1	—	—	—	—
Philadelphia Vireo	ER	1	—	—	ER	1
Baird's Sparrow	ER	1	—	—	—	—
LeConte's Sparrow	ER	1	—	—	—	—

TABLE 10 (CONTINUED)

	Fall		Winter		Spring	
Subgroup B: Southeastern species that breed in eastern US and to a limited extent or not at all in Canada						
Orchard Oriole	R	13	—	—	—	—
Prairie Warbler	VR	8	—	—	—	—
Indigo Bunting	VR	5	—	—	R	19
Great Crested Flycatcher	VR	4	—	—	—	—
Pine Warbler	ER	2	—	—	—	—
Dickcissel	ER	2	—	—	ER	3
Golden-winged Warbler	ER	1	—	—	ER	1
Northern Parula	ER	1	—	—	VR	8
Yellow-throated Warbler	ER	1	—	—	ER	1
Hooded Warbler	ER	1	—	—	VR	5
Scarlet Tanager	ER	1	—	—	—	—
Summer Tanager[b]	ER	1	—	—	VR	5
Painted Bunting	ER	1	—	—	—	—
Chimney Swift	—	—	—	—	VR–R	7+
Eastern Wood Pewee	—	—	—	—	ER	1
White-eyed Vireo	—	—	—	—	ER	1
Yellow-throated Vireo	—	—	—	—	ER	1
Worm-eating Warbler	—	—	—	—	ER	3
Kentucky Warbler	—	—	—	—	VR	4
Field Sparrow	—	—	—	—	ER	1
Subgroup C: Southwestern species that breed in southwestern US and Mexico						
Tropical Kingbird	VR	5	—	—	—	—
White-winged Dove	ER	3	—	—	—	—
Bendire's Thrasher	ER	2	—	—	—	—
Golden-cheeked Warbler	ER	1	—	—	—	—
Cassin's Sparrow	ER	1	—	—	ER	3
Scissor-tailed Flycatcher	—	—	—	—	ER	1
Subgroup D: Palearctic species that breed in eastern Siberia and Alaska						
White Wagtail	ER	1	—	—	—	—
Red-throated Pipit	ER	1	—	—	—	—
Wheatear	—	—	—	—	ER	1

[a] Species are arranged in order of their fall abundance. Numbers are total individuals per season, cumulative for eight years. Letter designations of abundance values are: A—abundant, C—common, FC—fairly common, U—uncommon, R—rare, VR—very rare, ER—extremely rare, NRR—no recent record. The prefix Sp designates sporadic occurrence.

[b] Could be considered a southwestern species. All Farallon individuals, however, were thought to be of the eastern race, *P. r. rubra*.

For the purpose of this discussion, the 67 vagrant species have been further categorized into four subgroups based on the geographic location of their breeding ranges. Subgroup A includes 38 species (and three additional forms) breeding primarily east of the Rocky Mountains and extensively or entirely in Canada; these are referred to as "northern" species. Subgroup B includes 20 "southeastern" species breeding in eastern United States and to a limited extent or not at all in Canada. Subgroup C includes six "southwestern" species breeding in southwestern United States and possibly Mexico. Subgroup D includes three "palearctic" species breeding in eastern Siberia and possibly Alaska.

Subgroup A: Northern species

Fall.—Three species, Blackpoll and Palm Warblers and American Redstart, are fairly common (Table 10A). In fact, Blackpoll and Palm Warblers occur more commonly in fall than all nonvagrant landbirds that do not regularly breed or winter in coastal central California (Groups 2, 3, and 4) with the single exception of the Chipping Sparrow. The former two species thus occur about twice as commonly in fall as such typical montane species as MacGillivray's, Black-throated Gray, and Hermit Warblers! It does not seem unreasonable then to suggest that many Farallon individuals from Groups 2, 3, and 4 may well represent vagrants. The remaining species of northern vagrants range from uncommon to extremely rare. The mean number of fall occurrences for northern vagrants, 29.1 (uncommon; Table 5), was only slightly less than that for summering interior lowland species (34.7), and considerably more than that for summering Great Basin species (11.8).

Several trends are evident. The first, previously pointed out by DeBenedictis (1971) for vagrant vireos and warblers occurring in California as a whole, is that species with larger source populations, that is, species more common over their total range, are more common as vagrants. This, however, fails to explain many details of Table 10A. Certainly the Palm Warbler has a smaller source population than the American Redstart, Ovenbird, and Red-eyed Vireo, yet it occurs far more commonly on the Farallones than any of those species.

A second trend, first pointed out by DeSante (1973) for vagrant warblers occurring in California, is that species with more easterly, rather than southerly, migration routes occur more commonly. This, coupled with orientation cage data on Blackpoll Warblers, led DeSante (1973) to hypothesize that "mirror-image misorientation," the confusion or nondiscrimination of right and left in relating an inherited migration direction to a compass reference point, is responsible for most fall occurrences of immature vagrant warblers in California. Certainly the Blackpoll Warbler, in addition to having a large source population, also has a strong easterly component in its normal fall migration route. "Mirror-image misorientation" also provides an immediate explanation for DeBenedictis' (1971) "exceptionally numerous" species (Palm, Black-throated Blue, and Prairie Warblers), all of which have a strong easterly component in their normal migration routes.

A third trend is that nine-primaried passerines, particularly wood warblers, are proportionally more common as vagrants on the Farallones than 10-primaried passerines with similarly sized source populations and similar breeding ranges and migration routes. In fact, the mean number of fall occurrences for all 29 nine-primaried northern vagrant passerines (wood warblers, icterids, and finches) was 37.8 ± 55.8 (SD), much greater than that of the nine 10-primaried northern vagrant passerines (tyrant flycatchers, mimids, thrushes, and vireos), which was only 5.7 ± 7.0 (SD). This difference, furthermore, is statistically significant ($t = 1.710$, $df = 36$, $P < 0.05$, one-sided test). This result may have interesting evolutionary implications. Storer (1971) has pointed out that most recent classifications of the passerines have placed the nine-primaried species last because "they are believed to be undergoing a rapid and extensive adaptive radiation." A relatively high degree of vagrancy, that is, a relatively large number of misoriented migrants, in

these apparently recently evolved species may therefore not be unexpected. Rather, it may be an expected result of a high degree of genetic variability in their populations. Furthermore, by contributing to the establishment of new isolated populations, such vagrancy could, in fact, serve to enhance these species' rapid and extensive radiation.

Winter.—Only a single vagrant landbird, the Common "Yellow-shafted" Flicker, has ever been recorded in winter.

Spring.—Most northern vagrants are considerably less common in spring than in fall (Table 10A). Noteworthy exceptions include Ovenbird, Magnolia Warbler, Rose-breasted Grosbeak, Black-and-white Warbler, Bay-breasted Warbler, Red-eyed Vireo, Cape May Warbler, and Brown Thrasher. We cannot presently explain these exceptions. The mean number of occurrences was 9.9 (rare; Table 5), slightly less than that for summering interior lowland species (11.9) and about equal to that for summering Great Basin species (9.8). The fall-to-spring ratio for this group was 2.94, quite similar to that for interior lowland and montane summering species (2.91 and 2.60, respectively).

Subgroups B, C, D: Southeastern, southwestern, and palearctic species

Summaries of these species' occurrences are presented in Table 10B, C, and D, respectively. The mean numbers of occurrences for each of these subgroups was extremely low in both fall and spring (Table 5). Furthermore, both southwestern and palearctic species are more common in fall than in spring (fall-to-spring ratios were 3.00 and 2.00, respectively). However, southeastern species were more common in spring than in fall (fall-to-spring ratio was 0.68). We cannot presently explain this anomaly.

The Farallones are indeed remarkable in their ability to concentrate vagrant landbirds. It is interesting to note that, as of 2 April 1976, all vagrant landbird species known to have occurred in northern California had occurred on the Farallones with the exception of 11 northern, four southeastern, 17 southwestern, and two palearctic species. Since then, three of the southwestern species, Lucy's Warbler (*Vermivora luciae*), Scott's Oriole (*Icterus parisorum*), and Hepatic Tanager (*Piranga flava*), have occurred (see Addenda).

Breeding Landbirds

The breeding landbird community of the South Farallones has historically been a small one both in species and number of individuals (Table 11). All species that have nested, including introduced and alien ones (California Quail, House Sparrow, and Starling), are known to nest in the absence of trees. The native species, with the exception of the House Finch, actually prefer to nest in sparsely vegetated and rocky areas, and the House Finch is renowned for its great plasticity in nesting requirements (see Woods 1968). All species except the latter nest regularly in the absence of fresh water, and sufficient numbers of seepages and leaks in cisterns exist to provide water for the finch.

Several trends are evident in the history of the breeding populations. First, until the second decade of this century, the Common Raven was a fairly regular nesting species. On at least three occasions from 1895 to 1911, the ravens were shot, but replacements arrived soon after each extermination (see Common Raven account). Since 1911, however, only one raven has been recorded, an individual

TABLE 11

CHANGES IN THE COMMUNITY OF BREEDING LANDBIRDS ON THE FARALLONES FROM 1864 TO 1976

	Survey year[a]																	
	1864[b]	1888	1895	1903–04	1911	1922	1933	1958	1964–65	1968	1969	1970	1971	1972	1973	1974	1975	1976
Peregrine Falcon	o	o					x	o		o	o	o	o	o	o	o	o	o
California Quail[c]				x														
Burrowing Owl		o			x			o	o	o	o	o	o	o	o	o	o	o
Common Raven	x	o	x	x	x									o				
Rock Wren		x	x	x	x	x	x	o	x	x	o	o	x	x	x	o	o	o
Starling[c]										o	o	o	o	o	o	x	o	x
House Sparrow[c]					o	o	x	x	x	o	o	o	o	o	o	o	o	o
House Finch		x		x	x		o	o	x	o	o	o	o	o	o	o	o	o
Total breeding species[c]		2	2	3	4	1	2	0	2	1	0	0	1	1	1	0	0	0
% species turnover between successive surveys[d]			50	20	14	50	33	100	100							50		

[a] The symbol o denotes species present but not breeding; the symbol x, species definitely breeding.

[b] Census incomplete.

[c] Introduced and alien species not included in calculating total breeding species or turnover rates.

[d] Turnover rates were determined between adjacent surveys, introduced and alien species excluded, using the method by Diamond (1969). The mean species turnover was 51% per mean 11.6-year survey interval. (The ten-year interval, 1964–1974, was used to calculate this, with surveys between those years excluded.) In comparing turnover between 1911 and 1922, the Common Raven was not included (see text).

present on one day in 1972. This suggests that (1) the mainland population pool of ravens has been markedly reduced during this century; (2) the regular visitants were offspring of the breeding ravens, and that the three extirpations and the passage of time eliminated all of the regular visitants; (3) the island is not now suitable for either breeding or visitation by ravens; or (4) selection against visitation has taken place in the mainland population.

The island Rock Wren population exhibits a similar, although not as obvious, trend. During the late 1800s and early 1900s most accounts listed this species as a regular and common breeder. Some estimates went as high as 100 birds, but they seem to have been exaggerated. Ray (1904), however, located 20 nests, both "old" and "new." This may be compared with recent years when it has been difficult to find a single nest except by following a parent bird. In May 1887 Bryant (1888) collected five males, presumably a small portion of the population; May populations in recent years have rarely included more than two males. During the past several years the species has bred only sporadically, compared with formerly consistent year-to-year breeding. One factor contributing to this reduction of breeding Rock Wrens has perhaps been the increased gull population and resultant predation (Ainley and Lewis 1974). During recent years wrens have confined their activities to gull-free areas on the southern quarter of the island, and mainly on the southern slope of Lighthouse Hill. This area is the most xeric (dry, southern exposed talus slopes) and was the area favored by the wrens in former years (Bryant 1888). In the late 1800s and early 1900s the gull population, because of human activities, was almost nonexistent (Ainley and Lewis 1974) and more areas were open to wrens. A part of the southern quarter formerly named for them by virtue of their concentration, i.e., Rock Wren Path (see map in Emerson 1904), is now devoid of wrens except during the fall when gulls are absent. Whether or not other factors, such as declines in mainland population pools, also account for this decline, we cannot say (see above discussion on ravens). The suggestion is that changes in island populations of wrens and ravens are partly or entirely artifacts of direct or indirect interference by man.

An opposite trend is evident in the examples of the Starling and House Sparrow. Starlings were first reported in 1968 and have been present as winter residents ever since. Pairs bred in 1974, 1976, and 1977. The House Sparrow was first reported in 1911 and was first recorded breeding in 1932. That species has been present regularly ever since and has bred sporadically. Both species were introduced into North America during the last century and are apparently still expanding their ranges. By building structures and planting trees, man has likely aided them in colonizing the island, and has thus also figured prominently in the changed status of these two breeding landbirds on the South Farallones.

The Farallones support far fewer breeding landbird species (maximum of four during any given year; eight in all) than any of the Channel Islands (Table 12). The Channel Islands' breeding landbird avifauna has been summarized by Diamond (1969), Power (1972, 1976), and H. L. Jones and J. M. Diamond (unpubl. data). These studies suggest that we should look at degree of isolation, plant diversity, and island size as a starting point in explaining why so few species breed on the Farallones. The Farallones are farther off the coast than four of the Channel Islands, about the same distance as two others, and closer than the farthest two. The South Farallones are close to no other island except a few tiny

TABLE 12

SPECIES OF LANDBIRDS KNOWN TO HAVE BRED (X) OR SUSPECTED OF HAVING BRED (O) ON THE CALIFORNIA ISLANDS[a]

	San Miguel	Santa Rosa	Santa Cruz	Anacapa	San Nicholas	Santa Barbara	Santa Catalina	San Clemente	S. Farallones
Red-tailed Hawk		x	x	x			x	x	
Bald Eagle	x	x	x	x	x	x	x	x	
Osprey					x		x	x	
Peregrine Falcon		x	x	x		x	x	x	x
American Kestrel		x	x	x		x	x	x	
Mourning Dove		x	x	x			x	x	
Barn Owl	x	o	o	o		o	x		
Burrowing Owl		o	o		x	x	x	o	x
Long-eared Owl							x		
Saw-whet Owl			o						
Lesser Nighthawk						o			
White-throated Swift		o	o	o			o	x	
Costa's Hummingbird	o					x			
Anna's Hummingbird							o	x	
Allen's Hummingbird	x	x	x	x			x	x	
Belted Kingfisher			o						
Common Flicker			x				x		
Acorn Woodpecker			x				o		
Ash-throated Flycatcher			x						
Black Phoebe		x	x	x			o	x	
Western Flycatcher		x	x	x			x	o	
Horned Lark	x	x	x	x	x	x	o	x	
Barn Swallow	x	x	x	x			x	o	
Scrub Jay			x						
Common Raven	x	x	x	x	x	x	x	x	x
Bushtit			x				o		
Red-breasted Nuthatch			o						
Bewick's Wren		x	x	x			x	x	
Rock Wren	o	x	o	x	x	x	o	x	x
Mockingbird		x	o		x		o	x	
Blue-gray Gnatcatcher			x						
Loggerhead Shrike	x	x	x	x			x	x	
Starling	x	x	x	x	x	x	o	x	x
Hutton's Vireo		x	o	o			o		
Orange-crowned Warbler	x	x	x	x	x		x	x	
House Sparrow		o			x		x	x	x
Western Meadowlark	x	o	x	x	x	x	o	x	
Red-winged Blackbird			x						
Hooded Oriole							x		
Brewer's Blackbird					x				
Black-headed Grosbeak			x						
House Finch	x	x	x	o	x	x	x	x	x
Lesser Goldfinch		x	o				o		
Rufous-sided Towhee		x	x				x	o	
Lark Sparrow			o						
Rufous-crowned Sparrow			x	x					
Sage Sparrow								x	
Chipping Sparrow		x	o	x			x	x	
White-crowned Sparrow					x				
Song Sparrow	x	x	x			x		x	

[a] Data are from Power (1972), Lynch and Johnson (1974), and H. L. Jones and J. M. Diamond (unpubl. data). The introduced California Quail is not included.

rocks. Thus they are comparatively isolated, which theoretically (see Diamond 1969) should account for their depauperate avifauna. They do not want for potential immigrants, however, as is amply demonstrated in the Species Accounts.

Apparently more important than isolation is the Farallon plant community, which contains only 15 native members, 25 fewer than the most depauperate flora of any Channel Island (see Power 1972). The simplicity of the Farallon plant community must be critical; except for three isolated trees, and some thistles and mallows reaching 1 m in height, the dominant characteristic of the community is its low growth of herbaceous annuals (grasses, composites). Birds that breed on the Farallones, therefore, are those preferring dry areas of sparse vegetation. Another factor secondarily affecting the small landbird breeding community through its relationship to plant diversity (Power 1972, 1976) is the small area of the islands. Only 0.16 sq. miles in area, the South Farallones are one-sixth the size of the smallest Channel Island. Thus, the Farallon data are consistent with trends observed by others among the avifaunas of the Channel Islands: with a simpler flora and a smaller area, the Farallones should have a smaller breeding avifauna, and they do.

Diamond (1969), Hunt and Hunt (1974), Lynch and Johnson (1974), and H. L. Jones and J. M. Diamond (1976 and unpubl. data) have discussed the avifaunal turnover rates for the different Channel Islands. Their results suggest that bird species diversity and habitat complexity have important effects on rates of extinction and colonization in insular bird communities. If we compare turnover on the South Farallones—excluding introduced species, alien species, and the raven after 1911 (see Lynch and Johnson 1974)—between successive complete bird surveys, we find that results vary from 0 to 100% (Table 11). Part of this variation seems due to the number of years between surveys. Therefore, taking data from 1964 and 1974 and ignoring surveys between those years to give a 10-year interval or one comparable to survey-intervals of earlier years, the figures range from 14 to 100%. The mean of these turnover rates is 52% for mean 11.6-year periods. Using a "compound interest" method to figure yearly rates, if turnover rate is x, then

$$100\,(1 - x)^{11.6} = 48$$

$$\text{and } x = 0.0612, \text{ or } 6.12\%.$$

This rate compares with a 1% turnover measured over a similar time interval (about 10 years) at Anacapa Island (Jones and Diamond 1976). The more rapid rate on the South Farallones is expected, given the lesser complexity of their habitats. Ten-year intervals, however, were found to reduce the apparent rate on Anacapa by a factor of 10, compared with one-year census intervals. It is likely that the 6.12% turnover at the Farallones is also an underestimate.

On theoretical grounds, several authors (e.g., MacArthur and Wilson 1967; Diamond 1969) have suggested that island faunas and turnover rates achieve a state of dynamic equilibrium. At the Farallones this turnover rate fluctuates widely. We would expect variation in the Farallon rate to be less if the degree of habitat complexity and the resultant avifaunal diversity were greater. If removal of rabbits on Southeast Farallon results in increased habitat complexity, this hypothesis might be tested. Successive, careful annual surveys on the Channel Islands might also prove fruitful in this regard.

California Island Breeding Landbirds and the Immigrant Pool

A review of landbird species that nest on the Channel Islands compared with their status on the Farallones reveals some interesting trends. On the one hand, species that *have* bred on the Farallones (five, excluding aliens and introduced species) are among those few that have bred on all or almost all the Channel Islands (Table 12). A possible exception is the Burrowing Owl. Some authors, however, believe that this species has nested on all the islands (e.g., Power 1972), but since its breeding has been difficult to confirm, we cannot be certain of such a wide distribution (see below). In company with these species, the alien Starling, so far known to breed on seven of eight Channel Islands, also has bred on the Farallones. In contrast, a few species that have bred on all or almost all the Channel Islands *have not* been known to breed on the Farallones. One such species is the Bald Eagle. It seems odd that a species as ubiquitous on California islands as the Bald Eagle has not once bred on the Farallones; perhaps it did prior to year-round occupation by man (pre-1810). Other widespread insular species not breeding on the Farallones are the Horned Lark, Orange-crowned Warbler, and Western Meadowlark. Had it not been for the grasslands created a few hundred years ago by grazing livestock on most of the southern islands, and maintained in the same way on many to this day, perhaps the first and third of these species would not be so widespread.

Table 12, which summarizes the breeding avifaunas of the California islands, is important in the following discussions. Before proceeding further, some explanatory comments should be made concerning the table. Power (1972), Lynch and Johnson (1974), and H. L. Jones and J. M. Diamond (unpubl. data) compiled the records used in Table 12 from the literature and from their recent work, but we take responsibility for the way it is presented here. We distinguished between whether a species' supposed breeding on an island had been based on unequivocal direct evidence, or whether breeding was considered "probable" because only indirect evidence was available. Only those species for which direct evidence exists for each island are considered further in our analysis of the breeding avifaunas and the potential immigrant pool (Table 13; see below). While this conservative approach might overlook some cases where a species does indeed breed (or has bred) on a given island, we feel that for our purposes it puts us closer to the real pattern than would a more liberal definition of direct evidence. Extreme care and often much time are required to establish the breeding status of birds in little known areas, as recently discussed by Lynch and Johnson (1974). Reasons why we have not considered anything less than direct evidence of breeding (i.e., observations of nest, eggs, young, adults feeding young, or adults carrying nesting material or food consistently to a likely nesting spot) are based on our experience at the Farallones. Our data on bird occurrences amply show that a species is not necessarily breeding if present on an island during the nesting season. This is so even if many individuals of the species are observed or if researchers find the species on short successive visits even if several months elapse between them. Examples of this kind of evidence were used in the past to confirm breeding of Lesser Nighthawk on Santa Barbara (Willet 1912), Belted Kingfisher on Santa Cruz (Dawson 1924), and Lark Sparrow on Santa Cruz (Dickey and Van Rossem 1923). Lynch and Johnson (1974) agree with us on this and discuss these and other examples. At the Farallones we have also many times observed singing

TABLE 13
FARALLON OCCURRENCES OF LANDBIRD SPECIES KNOWN TO HAVE BRED ON THE CALIFORNIA ISLANDS[a]

	No. of Channel Islands[b]	Occurrence on the Farallones		
		Bred	Extended visits	Individuals per year
Red-tailed Hawk	5			0.5
Bald Eagle	8			0.0
Osprey	3			0.4
Peregrine Falcon	6	x	x	5.0
American Kestrel	6		x	17.3
Mourning Dove	5		x	48.7
Barn Owl	2			0.1
Burrowing Owl	3	x	x	8.1
Long-eared Owl	1		x	2.7
White-throated Swift	1			0.4
Costa's Hummingbird	1			0.3
Anna's Hummingbird	1			2.5
Allen's Hummingbird*	6			2.0
Common Flicker	2		x	24.5
Acorn Woodpecker	1			0.5
Ash-throated Flycatcher	1		x	11.0
Black Phoebe	4		x	8.4
Western Flycatcher*	4			57.3
Horned Lark*	7			3.9
Barn Swallow	5		x	19.5
Scrub Jay*	1			—
Common Raven	8	x		0.1
Bushtit	1			—
Bewick's Wren*	5			—
Rock Wren	5	x	x	9.6
Mockingbird	3		x	9.3
Blue-gray Gnatcatcher	1			1.0
Loggerhead Shrike*	6			0.4
Starling	7	x	x	1083.5
Hutton's Vireo	1			1.7
Orange-crowned Warbler*	7			105.6
House Sparrow	3	x	x	10.3
Western Meadowlark	6		x	108.3
Red-winged Blackbird	1			32.9
Hooded Oriole	1			0.1
Brewer's Blackbird	1			51.6
Black-headed Grosbeak	1			13.6
House Finch*	7	x	x	31.1
Lesser Goldfinch	1			33.6
Rufous-sided Towhee*	3			34.1
Rufous-crowned Sparrow*	2			—
Sage Sparrow*	1			0.1
Chipping Sparrow	4			96.0
White-crowned Sparrow	1		x	693.1
Song Sparrow*	5		x	2.9

[a] Feral and introduced species omitted. List taken from Table 12 (see text).
[b] Number of Channel Islands upon which the species breeds is indicated.
* Indicates endemic subspecies on the Channel Islands (Johnson 1972).

males, sometimes with females present, of species that have never bred there; for example, Western Wood Pewee, Cape May Warbler, Ovenbird, and Black-headed Grosbeak. We have also observed direct territorial defense, again with no indication of breeding, in, for example, Ash-throated Flycatcher, Black Phoebe, Western Wood Pewee, and Rock Wren. This kind of evidence has been used to confirm breeding in the Channel Islands of such species as the Western Meadowlark on Santa Rosa and Santa Catalina, Anna's Hummingbird on Santa Cruz, and Black Phoebe on Santa Catalina (H. L. Jones and J. M. Diamond, unpubl. data). Finally, on at least three occasions we have banded female House Finches and once a female Rose-breasted Grosbeak with well-developed incubation patches during the spring and summer but have no evidence that these individuals bred on the Farallones. Fortunately, the latter kind of evidence in the absence of other direct evidence has not yet been used to confirm a species' breeding status in the Channel Islands.

In comparing the Channel Island breeding avifaunas with the potential immigrant pool as measured at the Farallones (Table 13), there is evident a direct relationship between the number of Channel Islands upon which a species breeds and the number of individuals that visit offshore islands. On the one hand, 13 of 20 species (65%) that nest or have nested on only one or two of the eight Channel Islands rarely visited the Farallones; that is, on the average, one (usually no) individual of each species visited per year. The seven species that occurred more frequently (Common Flicker, Ash-throated Flycatcher, Red-winged Blackbird, Brewer's Blackbird, Black-headed Grosbeak, Lesser Goldfinch, and White-crowned Sparrow), have been known to breed on a single island during only one of several years during which surveys were made.

If the latter seven are so very abundant as potential colonists, why have they not established insular breeding populations more often? Our opinion is that colonization by these seven species comes under Jones and Diamond's (1976) classification of "Flukes," or species that are unlikely to colonize an island because of the absence of suitable habitat but nevertheless do breed during one year. Jones and Diamond, in fact, gave as three examples of this phenomenon, breeding by Brewer's Blackbird, Lesser Goldfinch, and White-crowned Sparrow on certain Channel Islands.

On the other hand, excluding the raven and the four largest raptors, 15 of 20 species (75%) that breed (or have bred) on three or more Channel Islands, visit the Farallones rather frequently, with approximately eight or more individuals per year. The raptors and raven were excluded because their mainland populations, and hence their potential visitant pool, are currently very small as compared with their populations earlier in this century when their island breeding was recorded (see Lynch and Johnson 1974). The other five, less frequently occurring, species (Allen's Hummingbird, Horned Lark, Bewick's Wren, Loggerhead Shrike, Song Sparrow) are all among species that have diverged phenetically in the Channel Islands and will be discussed below. This relationship, between visitation rate and number of islands colonized, quantifies and confirms what would be expected: the more potential colonists a species "sends forth," the more colonies will be established, given the existence of suitable habitat.

Let us next consider visitation rates of those species having endemic forms on the Channel Islands. Here we are fortunate to have the detailed study by Johnson

(1972). Discounting the California Quail, which was imported to Southeast Farallon and possibly to the Channel Islands, three of the 12 species having endemic forms have never been recorded on the Farallones: Scrub Jay, Bewick's Wren, and Rufous-crowned Sparrow. All occur on the adjacent central California coast and are known to be quite sedentary; we would thus be very surprised should they ever arrive on the Farallones by overwater flight. Two other such species, the Loggerhead Shrike and Sage Sparrow, are extremely rare on the Farallones. Their low incidence of occurrence must result from their being only slightly mobile species; coastal populations of the Sage Sparrow are, in fact, sedentary. The shrike breeds uncommonly north and south along the adjacent mainland coast, and the sparrow breeds uncommonly along the coast from Monterey south and slightly inland to the north (Grinnell and Miller 1944). Three other species, the Allen's Hummingbird, Horned Lark, and Song Sparrow, are extremely rare to rare at the Farallones, although they too breed uncommonly to commonly along the mainland coast (Grinnell and Miller 1944); and another, the Rufous-sided Towhee, is rare during the spring but common during the fall. This high abundance of the towhee is somewhat surprising since it has not been known locally as a particularly mobile species. Johnson (1972: Table 4) considered it to be within that group of California birds having the lowest tendency to disperse or migrate. To be sure, most individuals occurring on the Farallones seem referable to one or the other of the subspecies breeding in northeastern California or along the coast of Oregon and known for at least a small degree of movement (Grinnell and Miller 1944). The resident coastal central California form has rarely, if ever, been seen on the islands. Finally, three species having endemic Channel Island forms, the Western Flycatcher, Orange-crowned Warbler, and House Finch, are fairly common to common on the Farallones.

Eight of 12 species having endemic subspecies on California islands (quail excluded) thus have a restricted potential gene flow from mainland to island populations. As demonstrated by the Farallon data, rarely, if ever, did individuals of these species visit the island. In view of this fact, genetic and morphological differentiation in their insular populations is not surprising. On the other hand, the four remaining species send rather frequent potential immigrants to California islands but two of these show a tendency to diverge phenetically. The Orange-crowned Warbler and Rufous-sided Towhee are represented by three and six well-defined subspecies, respectively, on the California mainland (AOU 1957). The third, House Finch, is well known for great morphological variability between populations, and possible extensive subspeciation on the mainland has been suggested (see review by Woods 1968). Thus even the mild restriction of gene flow induced by habitation on an offshore island may be sufficient for differentiation in these latter species' island populations. For the last of the commonly immigrating species, the Western Flycatcher, we can make no comment. Of all these species, only the House Finch has also bred on the Farallones.

A review of the status on the South Farallon Islands for the remaining 33 Channel Island breeding species (those without endemic forms) is also interesting, especially in terms of the amount of time they spend on the Farallones. Six of these species have bred naturally on the Farallones (Peregrine Falcon, Burrowing Owl, Common Raven, Rock Wren, Starling, House Sparrow), and four (the falcon, owl, wren, and starling) winter there regularly. Ten other species also winter

or have spent long periods on the Farallones: American Kestrel, Mourning Dove, Long-eared Owl, Common "Red-shafted" Flicker, Ash-throated Flycatcher, Black Phoebe, Barn Swallow, Mockingbird, Western Meadowlark, and White-crowned Sparrow. All are regular in occurrence and range from uncommon to abundant. Conditions on the Farallones may be almost, but not quite, adequate for breeding for some of them. For instance, the swallow has been observed frequenting deserted buildings and may need only a little fine-grained mud for nest-building before it would breed. Five others (Red-winged Blackbird, Brewer's Blackbird, Black-headed Grosbeak, Lesser Goldfinch, and Chipping Sparrow) have occurred commonly to abundantly but most individuals have not remained for very long, indicating that conditions must not be as suitable as they are on the Channel Islands. According to Grinnell and Miller (1944), they prefer complex habitats not currently available on the Farallones. The Hutton's Vireo is rare on the Farallones but also requires more complex habitats, e.g., live oaks (Grinnell and Miller 1944).

The 11 Channel Island breeding species not yet discussed (the three large raptors, Barn Owl, White-throated Swift, Costa's and Anna's Hummingbirds, Acorn Woodpecker, Bushtit, Blue-gray Gnatcatcher, and Hooded Oriole) occur extremely to very rarely, if at all, on the Farallones (Anna's Hummingbird excepted—rare to uncommon), and spend very little time there. Of the preceding species the Barn Owl seems the most likely eventually to breed on the Farallones. Should a male and female ever occur together, the three critical requirements described by Grinnell and Miller (1944) for breeding seem to be present: (1) open hill sides productive of small mammals, (2) brush thickets or buildings for daytime roosting, and (3) cavities for nesting (e.g., holes in earth banks).

SUMMARY

The South Farallon Islands are a group of rocky islets, 0.41 km^2 in area, situated 32 km off the coast of Marin County in central California. Birds arriving on or near the island were censused every day, weather permitting, for eight years, from 3 April 1968 to 2 April 1976. Museum collections and the extensive Farallon literature, including about 70 sources dating back to the 1850s, were searched for other records of bird occurrences. In all, 331 species of birds, including 216 normally of land or freshwater habitats, were documented through 2 April 1976. Fifteen additional species, recorded through 2 October 1979, are mentioned in the Addenda. Thus 346 of the 496 species known to have occurred in northern California are documented from the Farallones. Details of first state records of four species are published for the first time. Eight other species are relegated to hypothetical status. For each species, seasonal status, total number of individuals that visited, high counts, timing of peak arrivals, and extreme arrival and departure dates are given. The breeding and residence history of each species, where appropriate, is also reviewed. The intensive census data, summarized for the eight recent years, provide a concise description of the migratory periods for each species' movements through central coastal California.

The greatest density and diversity of visitant species occurs during fall. Shorebirds, rocky intertidal species predominating, begin arriving in July and gradually increase to maximum visitation rates in September, when the generally rare estuarine and freshwater species also occur. Pelagic seabirds likewise reach max-

imum diversity during September although maximum numbers of Sooty Shearwaters often occur during summer, and phalaropes are often most abundant in August. The breeding seabirds, however, are mostly absent from the island during fall.

Landbird migrants, primarily species breeding in western North America and wintering in the tropics, begin arriving in early August and also reach maximum visitation rates in September. Nocturnal migrants greatly predominate. Vagrant landbirds, primarily from Canada and eastern North America, begin to appear in early September and occur in maximum numbers from mid-September to early October. The maximum diversity of visitants usually occurs at this time; 122 species were recorded on 27 September 1974. The maximum number of individuals visit in late September or early October, when the major arrival of landbirds wintering in coastal California occurs; nearly 10,000 visitants were estimated on 2 October 1972. Most were *Zonotrichia*. Landbird visitants decline during late October and dwindle to very low numbers by late November. Neritic seabirds, including those species inhabiting both inshore and offshore waters, begin arriving in very late September or October and reach maximum diversity during November, although fall resident nonbreeding Brown Pelicans are present in maximum numbers in October.

Besides the year-round resident breeding seabirds, substantial populations of neritic seabirds, particularly Eared Grebes, Surf Scoters, and large *Larus* gulls, frequent the waters around the island during winter. Rocky intertidal shorebirds also winter in some numbers, although other shorebirds, estuarine and freshwater species, and pelagic seabirds are generally very rare. Comparatively few landbirds, other than Starlings, winter on the island; those that do are species that prefer rather open, treeless habitats. Some individuals appear to return year after year to the island. Most arrive during the fall migration period, primarily October and November, and depart in March and April.

Early spring migrants may first appear in late February but usually arrive in March. Spring migration is generally quite sporadic and unpredictable, especially during March and April. At this time, however, the immense numbers of breeding seabirds begin their nesting activities. Nearly all waterbirds, including most pelagic and neritic seabirds and virtually all estuarine and freshwater species and shorebirds, are very rare during the spring migration. Large numbers of small gulls and phalaropes, however, sometimes pass by the island.

One and occasionally two major waves of visitant landbirds usually occur in early and/or late May. Different populations are probably involved in each of these flights but most are of species that breed in western North America and winter in the tropics; Wilson's Warbler is generally the most numerous species. Very few western landbirds visit after late May or very early June. Spring vagrant landbirds may first appear in mid-May but reach maximum diversity during the first half of June. There are times in early or mid-June when individuals of eastern species actually outnumber those of western species.

The breeding landbird community is small in numbers of species and individuals, probably because of the island's small size and depauperate, simple plant community. All naturally occurring, native, breeding landbirds are those that normally prefer rocky habitats having sparse vegetation and little fresh water. These species are among the few that also breed on all or most of the Channel

Islands farther south. The populations of four breeding landbirds (Common Raven, Rock Wren, Starling, and House Sparrow) have been changed by human interference during the last 70 years. Based on nine complete surveys made between 1888 and 1974, the species turnover has ranged from 14 to 100%, with a mean turnover of 52% per mean survey interval of 11.6 years, or 6.12% per year. Variation in turnover rate would probably lessen if the island had a more complex habitat and thus a more diverse avifauna.

Censuses of landbirds on the Farallones provide a measure of the immigrant pool potentially available for colonization of offshore California islands. The breeding species of the Channel Islands, islands much larger and more complex than the Farallones, are reviewed in terms of their rates of occurrence on the Farallones. Species that have endemic forms on the Channel Islands either occur infrequently or never on the Farallones, or have a high propensity to subspeciate in California. Several other species that breed on the Channel Islands occur frequently and remain for long periods on the Farallones, suggesting that conditions are nearly, but not exactly, right for breeding. Others that breed on the Channel Islands occur frequently on the Farallones but do not remain. These species prefer complex habitats. A few Channel Island breeding species, namely the Scrub Jay, Bewick's Wren, Bushtit, and Rufous-crowned Sparrow, are among a group of birds that have never been present naturally on the Farallones, and are among a subgrouping of species we expect will never arrive by overwater flight because of their sedentary habits.

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ADDENDA

Verified occurrences of the following 15 species have been obtained during the 42 months from 3 April 1976 to 2 October 1979. They bring the total number of species recorded on the South Farallon Islands to 346.

RED-TAILED TROPICBIRD—*Phaethon rubricauda*. A full-tailed adult flew around the island and headed off in a northerly direction on 3 July 1979. This constitutes the first record for both California and North America (excluding Baja California) and one of the very few records for the eastern Pacific Ocean.

WHISTLING SWAN—*Olor columbianus*. A group of 10 individuals flew over the island in a southerly direction on 11 November 1978.

SNOW GOOSE—*Chen caerulescens*. A white-phase immature was present on the island from 1 December 1976 to 20 January 1977.

BARROW'S GOLDENEYE—*Bucephala islandica*. A ♀ was carefully observed and well described on 1 January 1977.

BUFFLEHEAD—*Bucephala albeola*. A ♀ was present at the island 17–26 December 1978.

TURKEY VULTURE—*Cathartes aura*. Two individuals were seen flying low over the island in a southerly direction on 22 May 1979.

BALD EAGLE—*Haliaeetus leucocephalus*. An immature was present for a short time on 1 October 1976. Another immature was present on 6 November 1977.

SNOWY PLOVER—*Charadrius alexandrinus*. An individual was present on 5 October 1977.

BUFF-BREASTED SANDPIPER—*Tryngites subruficollis*. Two individuals were present on the island 29–31 August 1978. A major influx of this species into California was recorded at that time.

LAUGHING GULL—*Larus atricilla*. A second-year or subadult individual was carefully observed and well described on 3 August 1977.

BLACK-CHINNED HUMMINGBIRD—*Archilochus alexandri*. An immature ♂, captured and examined in the hand, was present 15–18 September 1976.

SPRAGUE'S PIPIT—*Anthus spragueii*. The first record for the Farallones and for northern California was of an individual well described on 1–2 October 1979.

LUCY'S WARBLER—*Vermivora luciae*. An individual, probably an adult ♀, was carefully observed and well described on 25 September 1977.

SCOTT'S ORIOLE—*Icterus parisorum*. A ♀ was banded on 12 September 1977.

HEPATIC TANAGER—*Piranga flava*. A ♀ was carefully observed and well described on 22 May 1977.

The first verified seasonal or recent occurrences for the following 26 species have been obtained during the 42 months from 3 April 1976 to 2 October 1979.

RED-NECKED GREBE—*Podiceps grisegena*. The first verified spring occurrences for the Farallones were three individuals on 13 April 1976, singles on 20–29 April 1977, 12 March 1978, and 7–31 May 1978, and two additional birds on 9 May 1978.

NORTHERN FULMAR—*Fulmarus glacialis*. The first spring occurrences were three seen on 26 June 1977 and a single bird seen 28 June 1978. They were probably all nonbreeding individuals.

BULLER'S SHEARWATER—*Puffinus bulleri*. The first spring occurrence was one seen on 19 April 1976.

FORK-TAILED STORM-PETREL—*Oceanodroma furcata*. The first dated spring occurrences from the island were a single bird seen on 5 May 1976, and hundreds (at least 200/hour) seen flying north past the island on 18 March 1977. The first fall occurrence for the island was an individual present 28 September 1978.

DOUBLE-CRESTED CORMORANT—*Phalacrocorax auritus*. The first winter occurrence for the island was an individual present on 2 January 1979.

MAGNIFICENT FRIGATEBIRD—*Fregata magnificens*. The first recent record from the island and the first dated occurrence was an individual seen circling the lighthouse on 20 July 1979.

CATTLE EGRET—*Bubulcus ibis*. The first winter occurrences were an individual present from 17 December 1978 to 6 January 1979 and another individual present from 21 December 1978 to 8 January 1979. This second bird was found dead on the last date. Both were probably late fall visitants.

CANADA GOOSE—*Branta canadensis*. The first spring occurrences for the island were a single individual present on 15 March 1977 and a group of five birds seen flying north past the island on 7 February 1979. The first-mentioned bird was thought to be the *aleutica* race.

HARLEQUIN DUCK—*Histrionicus histrionicus*. The first spring occurrences for the island were a ♂ present 23 April–12 May 1979 and another ♂ present 23 April–3 June 1979. This latter bird may have summered at the island as an eclipse-plumaged ♂ was seen on 27 July and 8 August and a ♂ with fully feathered wings was seen 4–5 and 9–10 September 1979.

RED-TAILED HAWK—*Buteo jamaicensis*. The first recent spring occurrence for the island was an individual present on 22 May 1979. Interestingly, this was the same day on which the only Turkey Vultures ever recorded on the Farallones were observed.

OSPREY—*Pandion haliaetus*. The first spring occurrence for the island was one on 24 May 1977.

PRAIRIE FALCON—*Falco mexicanus*. The first recent record for the island was a fall visitant present on 11 September 1979.

SORA—*Porzana carolina*. The first recent fall occurrences for the island were single immatures seen 11–14 September 1977 and 2–5 August 1978. The latter individual was banded.

AMERICAN AVOCET—*Recurvirostra americana*. The first winter occurrence was a single bird present on 2 February 1979.

JAEGER (sp.)—*Stercorarius* (sp.). The first spring jaeger occurrences from the Farallones (except for the single occurrence of the Long-tailed Jaeger) were individuals present on 15 and 18 May 1978. Both birds were thought to be Pomarine Jaegers, although the latter bird could possibly have been a skua.

GLAUCOUS GULL—*Larus hyperboreus*. The first fall occurrence from the island was an adult carefully observed on 23 December 1978. This is one of the very few occurrences of an adult Glaucous Gull in California.

SABINE'S GULL—*Xema sabini*. The first verified spring occurrences were as follows: six on 22 April 1976, one on 17 May 1976, three flying north past the island on 18 May 1977, and one flying east past the island on 22 April 1979.

TERN (sp.)—*Sterna* (sp.). The first Farallon spring occurrence of any *Sterna* other than late spring Caspian Terns was of a group of seven seen flying north past the island on 25 April 1979. They were thought to be Arctic Terns.

COMMON NIGHTHAWK—*Chordeiles minor*. The first verified spring occurrence, and only the second for the island, was one present and displaying on 16 June 1977.

WHITE-BREASTED NUTHATCH—*Sitta carolinensis*. The first spring occurrence, and only the second for the island, was of a single individual present on 15 May 1979.

LONG-BILLED MARSH WREN—*Cistothorus palustris*. The first spring record for the island was one present on 8 June 1979.

MOURNING WARBLER—*Oporornis philadelphia*. The first spring occurrence for the island, and one of very few for California, was an adult ♂ banded and photographed on 3 June 1978.

RED CROSSBILL—*Loxia curvirostra*. The first fall occurrence, and only the second for the island, was one present on 9 August 1977.

LARK BUNTING—*Calamospiza melanocorys*. The first spring occurrence was one banded on 24 May 1977.

SAGE SPARROW—*Amphispiza belli*. The first fall occurrence was an immature present 18–23 August 1978.

LAPLAND LONGSPUR—*Calcarius lapponicus*. The first spring occurrences for the island were an extremely late individual 20–27 July 1978 and a winter-plumaged tailless ♂ on 15 May 1979.

We have added the following species, first recorded during the 42-month period, 3 April 1976–2 October 1979, to the Hypothetical List.

YELLOW-BELLIED FLYCATCHER—*Empidonax flaviventris*. An individual, thought to be this species, was banded, measured, and photographed on 16 September 1976. This record is still under consideration by the California Bird Records Committee of the Western Field Ornithologists. If accepted, it will become the first record for California.