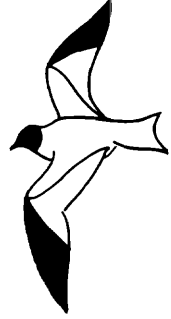


WESTERN BIRDS



Volume 14, Number 4, 1983

MARIN COUNTY CALIFORNIA HERON COLONIES: 1967-1981

HELEN M. PRATT, Point Reyes Bird Observatory, 4990 Shoreline Highway, Stinson Beach, California 94970

Like all birds dependent on freshwater and marine wetlands, members of the heron family are suffering progressive loss of essential habitat. In addition, agricultural and industrial pollution threatens their capacity to reproduce. Great Blue Herons (*Ardea herodias*) and Black-crowned Night-Herons (*Nycticorax nycticorax*) have declined in parts of their range and have been placed on the National Audubon Society's *Blue List* of species "which have recently given or are currently giving indications of non-cyclical population declines or range contractions either locally or widespread" (Tate 1981).

Most herons nest in conspicuous, often widely separated colonies. Some colony sites are used repeatedly for many consecutive nesting seasons; others are deserted after a few years and new colonies are established elsewhere. Sites are sometimes reoccupied after several years of inactivity and the number of birds may increase or decrease dramatically. Evaluation of population trends requires knowledge of both the history of active and inactive colonies within a region and the population changes in individual colonies.

This paper presents data on the location, population level, and history of 11 heron colonies known to have been occupied between 1967 and 1981 in Marin County, California (Figure 1). Its purpose is to provide a baseline for future comparisons by indicating current and past status.

Marin County lies between approximately latitudes $37^{\circ} 50'$ and $38^{\circ} 20'$ N, and longitudes $122^{\circ} 28'$ and $123^{\circ} 00'$ W. It borders the Pacific Ocean on the west and San Francisco Bay on the south and east. It is rich in tide flats and estuaries suitable for foraging herons and egrets. That Grinnell and Miller (1944) listed no Great Blue Heron colonies in Marin County as of 1943 is probably because ornithologists were not as familiar with the area as they are today. One Marin County heronry is known to have been occupied since at least 1941; the other sites are of more recent or intermittent occupancy.

MARIN COUNTY HERON COLONIES

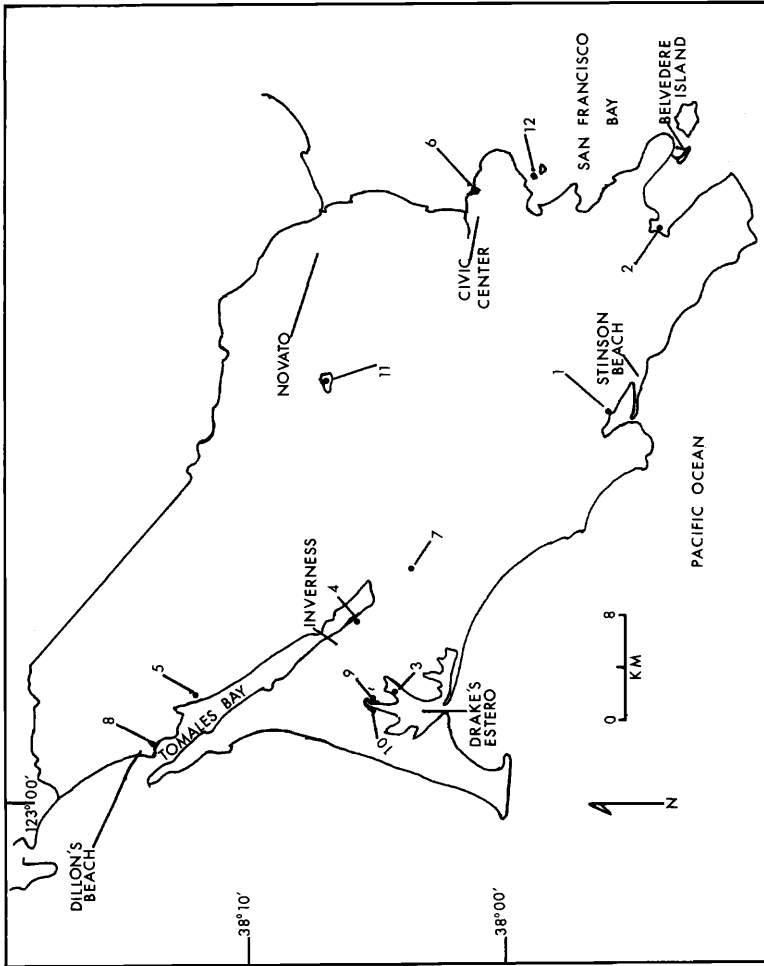


Figure 1. Locations of Marin County, California, heron colonies. 1. Audubon Canyon Ranch, 2. Da Silva Island, 3. Home Bay, 4. Inverness Park, 5. Nick's Cove, 6. North San Pedro Road, 7. Olema, 8. Sand Point, 9. Schooner Bay A, 10. Schooner Bay B, 11. Stafford Lake, 12. West Marin Island.

MARIN COUNTY HERON COLONIES

The species nesting in Marin County include the Great Blue Heron, Great Egret (*Casmerodius albus*), Snowy Egret (*Egretta thula*), and Black-crowned Night-Heron. Great Blue Herons nest at 10 colonies, Great Egrets 5 colonies, and Snowy Egrets and Black-crowned Night-Herons only 1 colony.

METHODS

Estimates for the number of breeding pairs at nine colonies were based on total active nests. Counts were made with binoculars and spotting scopes from hillsides near colonies where it was possible to determine whether or not nests were active. Nest counts were made by the author except as otherwise noted. I estimated the size of the Inverness Park colony from nest counts augmented by reports from other observers of the number of flying herons seen early in the season. At the West Marin Island Colony the estimates for 1965, 1979 and 1981 were of occupied nests. I also include counts from 1973 through 1981 of the maximum number of birds seen on or feeding near the island. These counts were made from shore with a spotting scope at a distance of approximately 1.2 km with only one side of the island visible. They may be compared with each other to indicate population trends but do not provide an estimate of the number of occupied nests.

COLONY DESCRIPTIONS AND HISTORIES

AUDUBON CANYON RANCH

Audubon Canyon Ranch (Figure 2) is a wildlife sanctuary and nature education center located on Shoreline Highway about 5.8 km north of Stinson Beach on the east side of Bolinas Lagoon (Figure 1). Great Blue Herons and Great Egrets nest here in Coast Redwoods (*Sequoia sempervirens*). In 1969 about five pairs of Snowy Egrets also nested in the colony.

It is impossible to date the establishment of this colony, but since the trees at Audubon Canyon Ranch were cut during heavy logging that started in western Marin County in 1849 (Mason and Barfield 1973) and the nests are in second growth, it probably does not predate the late 1800s. M. Galloway (pers. comm.), a former resident of the ranch, reports that the colony was well-established and active in 1941 and included both Great Blue Herons and Great Egrets. Although Great Egrets were known to breed in the San Joaquin Valley in the 1920s (Moffitt 1939), the first recorded observation of a Great Egret in the San Francisco Bay region between the time when they were almost extirpated by plume hunters in the 1880s and their reappearance after being protected, was in October 1924 (Stoner 1934). Stoner (1934) also reported an observation of seven Great Egrets at Bolinas on 7 May 1929. Bolinas is 5 km from Audubon Canyon Ranch on the opposite side of Bolinas Lagoon and egrets currently sighted there at that time of year are known to be from the Audubon Canyon Ranch breeding population. Because the Great Egret population is usually at its maximum during May, the egrets reported in 1929 probably were breeding at Audubon Canyon Ranch. Great Egrets have joined established Great Blue Heron colonies at other sites in Marin County (see below), and they might well have done the same here.

From 1967 through 1981 the Great Blue Heron population ranged from 27 to 62 breeding pairs with a declining trend since 1973 (Table 1). The Great

MARIN COUNTY HERON COLONIES

Egret population increased during the same period from 70 pairs to 148 (Table 2). Details of nesting success for 1967 through 1973 have been published previously (Pratt 1970, 1972a, 1972b, 1974).

DA SILVA ISLAND

The Da Silva Island colony is on the south side of a hill known as Da Silva Island, which borders Richardson Bay at the north end of the Richardson Bay bridge in Mill Valley (Figure 1). The hill is approximately 95 m from U.S. Highway 101, and though not an island now, may have been one before development of the area. It is privately owned and there are several dwellings close to the colony.

Great Blue Herons nest here in *Eucalyptus* sp. The colony was first occupied in 1979 by five pairs and was occupied again in 1980 and 1981 (Table 1).

HOME BAY

Great Blue Herons nested in live oaks (*Quercus* sp.) on the northwest side of the south finger of Home Bay, a branch of Drake's Estero in the Point Reyes National Seashore (Figure 1), in 1968 and 1969 (Table 1). There are no reports for 1970-1978. In 1979 there was an unverified report of two or three nests. I was unable to find nests there in 1980 but found one in 1981.

INVERNESS PARK

This colony is on private land in a clump of Douglas-fir (*Pseudotsuga menziesii*) (Figure 3) growing at the edge of Sir Francis Drake Boulevard 2 km south of Inverness (Figure 1). It was first reported occupied by Great Blue Herons in 1972 by the resident of a house opposite the colony. It may have been inactive in 1973 but was occupied again at least by 1975, the year that Great Egrets first nested there. Estimates of breeding pairs are highly tentative

Table 1. Numbers of breeding pairs of Great Blue Herons at Marin County colonies from 1967 through 1981. Dashes indicate known absence of birds. U = Nest counts unavailable; herons may or may not have been nesting.

	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
Audubon Canyon	50	62	55	50	44	46	58	48	45	40	41	43	35	33	27
Da Silva Island	—	—	—	—	—	—	—	—	—	—	—	—	5	5	3
Home Bay	U	2 ^a	3 ^a	U	U	U	U	U	U	U	U	U	U	—	1
Inverness Park	U	U	U	U	U	16	—	U	4	3	4	3	U	12	8
Nick's Cove	U	U	U	23 ^a	U	U	U	23	28	23	24	16 ^a	U	18	15
No. San Pedro Rd.	—	—	—	—	1	1	1	—	—	1	2	1	4	4	3
Olema	U	U	U	26 ^a	U	19 ^b	—	—	—	—	—	—	—	—	—
Sand Point	U	U	U	U	U	U	U	25	7	U	U	U	U	U	16
Schooner Bay A & B	U	U	U	U	U	U	15	15	12	9	—	7	7	7	3
Stafford Lake	8 ^a	U	U	5 ^a	U	U	5 ^c	14	21	U	21	19	16	27	23

^aCalifornia Dep. of Fish & Game, unpubl. data

^bRichard Brown (pers. comm.)

^cAlice Williams (pers. comm.)

MARIN COUNTY HERON COLONIES



Figure 2. Audubon Canyon Ranch. Egrets are visible occupying nests in trees behind the ranch house.

Photo by Clerin Zumwalt

MARIN COUNTY HERON COLONIES

because the nests are unusually difficult to find. The Great Blue Heron population has probably been as high as 16 pairs and as low as 4 (Table 1). There have been as many as 12 Great Egret pairs but usually fewer (Table 2).

NICK'S COVE

This colony is on private land in a eucalyptus grove about 0.5 km east of Nick's Cove on Tomales Bay (Figure 1). I have no records prior to 1970, when the colony contained 23 Great Blue Heron nests, but it had likely been occupied before that date. Great Egrets nested there in 1974, with five nests, probably for the first time. Their late arrival that year (early June compared with late April in 1975 and 1976) suggests that they moved to Nick's Cove after experiencing nesting failure at another colony. The Great Blue Heron population has remained fairly stable (Table 1). The Great Egret nest count has fluctuated between 5 and 15 (Table 2).

NORTH SAN PEDRO ROAD

The North San Pedro Road colony (Figure 4) is on private property at the edge of San Pablo Bay about 3 km southeast of the Marin County Civic Center (Figure 1). Great Blue Herons nest here in live oaks and Madrone (*Arbutus menziesii*). One heron pair nested here for the first time in 1971 (L. Boyd pers. comm.). Except for 1974 and 1975, when no herons returned, there were between one and four nests through 1981 (Table 1).

OLEMA

This colony was located in the Point Reyes National Seashore in Douglas-firs about 1.5 km northwest of the Seashore Headquarters at Olema (Figure 1). The colony had 26 Great Blue Heron nests in 1970 and 19 in 1972 but has been inactive since then.

SAND POINT

The Sand Point colony is on private land on the east side of Tomales Bay between Sand Point and Tom's Point about 2 km southeast of Dillon's Beach (Figure 1). Great Blue Herons and Great Egrets nest here in eucalyptus trees. Herons have occupied the colony since at least 1974 (Table 1) and the egrets joined them sometime between 1976 and 1981 (Table 2).

Table 2. Numbers of breeding pairs of Great Egrets at four Marin County colonies from 1967 through 1981. Dashes indicate known absence of birds. U = Nest counts unavailable; egrets may or may not have been nesting.

	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
Audubon Canyon	70	74	86	85	85	96	99	96	85	65	84	88	98	103	148
Inverness Park	—	—	—	—	—	—	—	—	3	4	12	2	U	1	—
Nick's Cove	U	U	U	—	U	U	U	5	15	13	6	12 ^a	U	6	5
Sand Point	U	U	U	U	U	U	U	—	—	U	U	U	U	U	6

^aCalifornia Dep. of Fish & Game, unpubl. data

MARIN COUNTY HERON COLONIES



Figure 3. Inverness Park heronry.

Photo by Helen M. Pratt



Figure 4. North San Pedro Road heronry. Nests were in the trees behind and to right of the large tree in left foreground.

Photo by Helen M. Pratt

MARIN COUNTY HERON COLONIES

SCHOONER BAY A AND B

The Schooner Bay A colony is about 0.5 km south of Sir Francis Drake Boulevard behind the dwellings at the Johnson Oyster Company on the northeast shore of Schooner Bay, a branch of Drake's Estero in the Point Reyes National Seashore (Figure 1). Great Blue Herons nest here in eucalyptus trees. This colony was first occupied in 1963 (C. Johnson pers. comm.) and except for 1977 has been active every year through 1981 (Table 1). The Schooner Bay B colony (Figure 5) was first reported to me in 1981 (D. Shuford pers. comm.). It is directly across the bay within 0.5 km of Schooner Bay A. Of the five nests in 1981, two were successful Great Blue Heron nests. The other three were unoccupied at the time of my 24 June visit and showed no signs of heron occupancy such as splash or eggshells on the ground. They may have failed early or were built the year before but not used in 1981. The Schooner Bay sites are so close together that I currently consider them to be one split colony.

STAFFORD LAKE

This colony (Figure 6) is on the island in Stafford Lake about 4.5 km west of Novato on South Novato Boulevard (Figure 1). The lake and island are owned by the North Marin Water District. Great Blue Herons nest here in live oak and California Bay (*Umbellularia californica*). They first nested here in 1962 (W.H. Melson pers. comm.) and the colony has become one of the three largest Great Blue Heron colonies in the county (Table 1).



Figure 5. Schooner Bay B. The heron nests were in the small grove of trees on the far side of the bay.

Photo by Helen M. Pratt

MARIN COUNTY HERON COLONIES



Figure 6. Stafford Lake heronry. The nests were concentrated in trees on the left third of the island.

Photo by Ian Tait



Figure 7. West Marin Island heronry.

Photo by Ian Tait

MARIN COUNTY HERON COLONIES

WEST MARIN ISLAND

West Marin Island (Figure 7) is one of a pair of small privately-owned islands in San Francisco Bay about 1.5 km offshore from Loch Lomond Yacht Harbor in San Rafael (Figure 1). Great Egrets, Snowy Egrets and Black-crowned Night-Herons nest here in California Buckeye (*Aesculus californica*), live oak and coastal scrub. This site was not mentioned by Grinnell and Miller (1944) but it was active in 1957 and had been "growing for many years" (Ralph and Ralph 1958).

Stoner (1934) reported occurrences in the early 1930s of Great Egrets on the southern and eastern shores of San Francisco Bay but none north of the Golden Gate. Judging by this report Great Egrets did not colonize West Marin Island until at least the late 1930s or early 1940s.

Snowy Egrets, like Great Egrets, were almost wiped out by plume hunters and were thought to be extinct in California by 1900, but by 1908 they were being recorded again and in 1943 were considered fairly common in suitable habitat (Grinnell and Miller 1944). They had been nesting on West Marin Island for at least 5 years in 1957 (Ralph and Ralph 1958). At that time it was the northernmost breeding site for Snowy Egrets in California.

Black-crowned Night-Herons could have been nesting unobserved on West Marin Island before either of the egrets arrived. Grinnell and Miller (1944) described them as "varyingly common almost throughout (the) state." There was a colony of Black-crowned Night-Herons on Belvedere Island in 1938 (Moffitt 1939) but development forced them to move. They may have gone to West Marin Island, perhaps joining an established colony.

In 1957 Ralph and Ralph (1958) estimated that there were 1000 Great Egrets, 400 Snowy Egrets and 600 Black-crowned Night-Herons on the island. Although not stated, this estimate probably included both adults and young. According to an unpublished California Department of Fish and

Table 3. Maximum numbers of individuals of Great Egrets, Snowy Egrets and Black-crowned Night-Herons seen on or feeding near West Marin Island from 1973 through 1981. Data provided by Rosamund Day.

	Great Egret	Snowy Egret	Black-crowned Night-Heron
1973	125	418	105
1974	148	674	30
1975	139	332	140
1976	116	369	125
1977	115	315	70
1978	136	874	67
1979	120	494	98
1980	135	570	90
1981	168	640	62

MARIN COUNTY HERON COLONIES

Game report (Anon. 1965), the colony contained 100 Great Egret, 25 Snowy Egret and 100 Black-crowned Night-Heron nests in 1965 but it had been inactive for several years prior to that date. My estimates made from a boat circling the island in May 1979 were 58 Great Egret, 262 Snowy Egret and 98 Black-crowned Night-Heron nests. On a similar survey on 20 June 1981, I estimated 75 Great Egret, 325 Snowy Egret and 109 Black-crowned Night-Heron nests.

Table 3 shows counts made from 1973 through 1981 of maximum numbers of individuals, including both adults and fledged young, seen on or feeding near the island. Counts for all three species varied during this period without showing clear trends.

An adult Little Blue Heron (*Egretta caerulea*) was seen on West Marin Island in August 1965 (Chase and Paxton 1966). Nesting was suspected but not confirmed. Dead young first identified as Little Blue Herons were later found to be Snowy Egrets (Unitt 1977). I know of no subsequent reports of Little Blue Herons nesting there.

On 4 July 1981 fire burned the nesting substrate over about 1.5 acres of the northwest slope of the island. An estimated 100 young Snowy Egrets and Black-crowned Night-Herons died. The Great Egret nests were apparently spared. At this writing the consequences for the 1982 nesting season are unknown.

DISCUSSION

Heron colonies are characterized by wide variations in population levels from year to year. (e.g. Thompson and Littlefield 1980). The fluctuations are far in excess of what could be explained by mortality or variations in breeding success and are probably the result of shifts of breeding birds from one colony to another. In addition, Marin County heron populations are not necessarily self-contained but probably intermingle with those of other nearby counties in the San Francisco Bay region. The counts in Marin County, therefore, may not be indicative of more generalized trends and should be interpreted with caution.

The largest Marin County Great Blue Heron colony, Audubon Canyon Ranch has shown a declining population trend since 1974. The Schooner Bay colony has also decreased in size but the Stafford Lake and Inverness Park colonies have increased (Table 1). Two small new colonies were established at North San Pedro Road and Da Silva Island. It is difficult to draw conclusions about Marin County Great Blue Heron population trends because accurate nest counts at Inverness Park and Sand Point were not available for most years, but there has been no general decline. The California Department of Fish and Game statewide surveys of heron colonies taken in 1969, 1970, 1971, 1972 and 1978 show a steady increase in active Great Blue Heron nests that is believed to be both the result of discovery of more colonies and an indication of population increase (Belluomini 1978).

The Great Egret breeding population increased at Audubon Canyon Ranch from 1967 through 1981 and the egrets appeared in three colonies where they had not nested previously (Table 2). Great Egrets have clearly declined on West Marin Island since the count of 1000 individuals in 1957 (Ralph and

MARIN COUNTY HERON COLONIES

Ralph 1958), and the nest estimates of 58 in 1979 and 75 in 1981 show a decline from the 1965 level of 100. Counts of egrets seen around the island since 1974 (Table 3) suggest that in spite of yearly fluctuations the population has recently been fairly stable. The California Fish and Game surveys show an increase statewide in the number of Great Egret nests from 401 in 1969 to 853 in 1978 (Belluomini 1978).

The Snowy Egret population on West Marin Island increased from 25 nests in 1965 to 325 in 1981. Comparing nest counts with the 1957 (Ralph and Ralph 1958) count of 400 individuals (adult and young) is risky, but assuming an average of two young/nest, the 1979 and 1981 counts would represent 524 and 650 young respectively augmented by an undetermined number of adults attending nests. Thus it would appear that Snowy Egrets have increased on West Marin Island over the 1957 levels as well. The statewide count of Snowy Egret nests increased from 227 in 1969 to 3704 in 1978 primarily because a new colony that contained 2500 nests was discovered at the north end of the Salton Sea in 1978 (Belluomini 1978).

Black-crowned Night-Herons have probably decreased in numbers on West Marin Island since 1957 when Ralph and Ralph (1958) estimated 600 birds (adults and young). The California Fish and Game estimate of 100 nests in 1965 and my estimates of 98 nests in 1979 and 109 in 1981 suggest a recently stable population. The statewide survey of nests shows a small decrease from a maximum of 1225 in 1971 to 939 in 1978 (Belluomini 1978).

Nests in four of the Marin County colonies are built in *Eucalyptus*, non-native trees introduced to California from Australia in the late 1800s. They grow to heights exceeding 100 m and occur in small groves where there are often no tall native trees. They thus afford suitable nest sites for herons in areas where native trees do not. One can only speculate about how the introduction of *Eucalyptus* may have affected the heron population and distribution of colonies. Perhaps colonies are more scattered, smaller and closer to certain estuarine feeding grounds. Perhaps *Eucalyptus* trees provide alternate sites for colonies that were displaced by logging in the past. The addition of *Eucalyptus* to the California flora seems unlikely to have been instrumental in increasing heron and egret populations.

Note that only three of the colonies active in 1981 — Audubon Canyon Ranch, Schooner Bay and Stafford Lake — are on land protected from development. The remainder including West Marin Island, the largest colony and currently the only known nesting site in Marin County for Snowy Egrets and Black-crowned Night-Herons, are privately owned. That the colonies on private land will remain undisturbed indefinitely cannot be assumed. Development is already planned for Da Silva Island, although the nest trees will not be cut. Herons and egrets are limited to nest sites that are near aquatic feeding grounds, such as estuaries or lakes, and that are in inaccessible locations, such as islands, marshes or high in tall trees, where they are protected from ground predators. When current sites become unsuitable through destruction or excessive disturbance, the presence of alternative sites becomes important. Periodic regional surveys of heron colonies should be continued to determine the status of populations and to assess the nesting and feeding resources for these birds as pressures from development increase.

MARIN COUNTY HERON COLONIES

ACKNOWLEDGMENTS

I thank the many people who helped during the nesting seasons at Audubon Canyon Ranch. Most have been acknowledged elsewhere. I also thank Elizabeth Meyers who helped at Schooner Bay, Pamela Williams who censused at Nick's Cove and Karen Schwartz who helped at Audubon Canyon Ranch. Philip Schaeffer, Jean Starkweather, Rosamund Day, Alan Ruppert, Meryl Sundove and David Holway assisted in the West Marin Island counts. David Shuford, David DeSante and Laurence Binford made constructive comments on an earlier draft of the manuscript. William Thomson provided unpublished California Department of Fish and Game reports. Guy McCaskie provided data on the Little Blue Heron record at West Marin Island. This is Point Reyes Bird Observatory Contribution 241.

LITERATURE CITED

- Anonymous. 1965. Unpublished. California Dep. Fish & Game, Sacramento.
- Belluomini, L.A. 1978. Statewide heron rookery inventory. California Dep. Fish & Game, Sacramento.
- Chase, T. & R.O. Paxton. 1966. The fall migration. Middle Pacific coast region. *Aud. Field Notes* 20:87-88.
- Grinnell, J. & A.H. Miller. 1944. The distribution of the birds of California. *Pac. Coast Avif.* 27.
- Mason, J. & T.J. Barfield. 1973. Last stage for Bolinas. North Shore Books, Inverness, CA.
- Moffitt, J. 1939. Notes on the distribution of herons in California. *Condor* 41:81-82.
- Pratt, H.M. 1970. Breeding biology of Great Blue Herons and Common Egrets in central California. *Condor* 72:407-416.
- 1972a. Nesting success of Common Egrets and Great Blue Herons in the San Francisco Bay region. *Condor* 74:447-453.
- 1972b. Nesting success of Great Blue Herons and Common Egrets at Audubon Canyon Ranch in 1971. *Am. Birds* 26:699-702.
- 1974. Breeding of Great Blue Herons and Great Egrets at Audubon Canyon Ranch, California, 1972-1973. *West. Birds* 5:127-136.
- Ralph, C.J. & C.L. Ralph. 1958. Notes on the nesting of egrets near San Rafael, California. *Condor* 60:70-71.
- Stoner, E.A. 1934. Recent occurrences of the American Egret in the San Francisco Bay region. *Condor* 36:57-59.
- Tate, J., Jr. 1981. The Blue List for 1981. *Am. Birds* 35:3-10.
- Thompson, S.P. & C.D. Littlefield. 1980. Historical review and status of colonially nesting birds on Malheur National Wildlife Refuge, Oregon. *Proc. 1979 Conf. Colonial Waterbird Group* 3:156-164.
- Unitt, P. 1977. The Little Blue Heron in California. *West. Birds* 8:151-154.

MARIN COUNTY HERON COLONIES

ADDENDUM

The fire on 4 July 1981 on West Marin Island apparently did not affect Great Egret or Snowy Egret breeding there in 1982. The Great Egret nests increased to 187 and the Snowy Egret nests increased to 500 in 1982. The Black-crowned Night-Heron nests, however, decreased to 80 in 1982 from 109 in 1981. It is possible, though not proven, that the fire discouraged some night-heron pairs from returning to the island in 1982.

In 1982 two previously unknown Great Blue Heron colonies were discovered in Marin County (D. Shuford pers. comm.). One containing six nests was in a fir tree on the south shore of Lake Nicasio. The other containing 11 nests was in *Eucalyptus* trees on the east side of Drake's Head, a promontory reaching into Limantour Estero, the estuary extending eastward from the mouth of Drake's Estero. People rarely pass near these colonies and they have probably been active but undetected for several years.

Accepted 25 March 1983



Great Egret

Sketch by Narca Moore-Craig

MARIN COUNTY HERON COLONIES



Great Egrets during pair formation.

Photo by Philip Greene

MARIN COUNTY HERON COLONIES



Great Blue Heron presenting a twig to its mate.

Photo by Philip Greene