

JOB PROGRESS REPORT

State: California
Cooperators: None
Project No.: W-54-R-4 Project Title: Special Wildlife Investigations
Job No.: III-5 Job Title: Statewide Heron Rookery Study
Period Covered: July 1, 1971 to July 31, 1972

SUMMARY:

The fourth heron rookery survey was conducted in 1972 by the Department of Fish and Game. Statewide inventory of 115 active rookeries revealed 5,398 active nests. The number of reported rookeries has increased from 60 active rookeries with 3,187 active nests in 1969. Comparable rookery data for 1969-1972 indicated that a decrease of great blue heron nesting may have occurred. Increase in common egret and snowy egret nesting was evident. Occurrence of a cattle egret rookery in Imperial County established it as a breeding species in California. Human disturbances were known to have caused 9 rookeries to be abandoned during 1969-1972.

BACKGROUND:

When the Heron Rookery Survey was initiated in 1969, information was unavailable concerning the status of heron populations. This survey was designed to provide a statewide inventory of heron rookeries as an index to population trends of four species of herons.

OBJECTIVES:

Maintain a statewide inventory of heron rookeries and conduct annual heronry surveys and studies to measure population trends and gather life history knowledge.

PROCEDURES:

Department regional personnel were requested in 1972 to report on the current status of all known heron rookeries in their region through standard reporting form FG-881. On-site inspections were made by Department field personnel and their findings submitted to Sacramento by June 30, 1972. Rookeries discovered for the first time in 1972 were also submitted for entry into the master inventory file maintained by the Department's Special Wildlife Investigations Section in Sacramento.

FINDINGS:

Rookery Status

Updating and correction of rookery and inventory data resulted in additions and deletions to 1969, 1970, and 1971 rookery data previously reported.

Table 1 gives the number of rookeries found and their status for 1969 through 1972.

TABLE 1
Statewide Heron Rookery Inventory, 1969-1972

Year	Rookery Status						Total
	Active		Inactive		Undetermined		
	No.	%	No.	%	No.	%	
1969	60	61.8	8	8.3	29	29.9	97
1970	83	61.9	23	17.2	28	20.9	134
1971	110	60.5	39	21.4	33	18.1	182
1972	115	57.8	36	18.1	48	24.1	199

The percentage of inactive nests has remained relatively stable the last three years, varying between 17.2 percent and 21.4 percent. Fewer reports of inactive rookeries were received in 1972; however, rookeries with undetermined status increased.

Eleven of 23 inactive rookeries in 1970 were active in 1969; ten of 39 inactive rookeries in 1971 were active in 1970; and seven of 36 inactive rookeries in 1972 were active in 1971. Reported causes of abandonment for the 28 rookeries were: land use change (3); human activity in the rookery area (2); removal of rookery tree (2); shooting (1); displaced by freeway construction (1); natural deterioration of rookery tree (1); and, high water and low water levels (2). Abandonment of active rookeries resulted in a loss of 108, 981 and 29 active nests in 1970, 1971, and 1972, respectively.

Three rookeries containing 150 active nests in 1971 were inactive in 1969 or 1970 from unknown causes. It is not fully understood why rookeries are abandoned or reactivated. Extended life history and behavior studies are needed to determine how long rookery sites are occupied and reasons for abandonment.

Active Nests

Thirty-four previously unreported rookeries were reported in 1970, 45 in 1971, and 15 in 1972.

Largest rookery in the state in 1969--581 active great blue heron and 45 common egret nests--was located in Merced County. This same rookery was the largest in 1970 with 821 great blue heron and 52 common egret nests. In 1971, it was exceeded in size by a San Mateo County rookery with 49 active great blue heron, 240 snowy egret and 563 black-crowned night heron nests. San Mateo County rookery was again the largest in 1972 with 32 active great blue heron, 320 snowy egret and 440 black-crowned night heron nests.

Table 2 summarizes the distribution of active rookeries by region and species utilization for the period 1969 to 1972. Table 3 provides a similar breakdown by active nests for species.

The 115 active rookeries in 1972 contained 5,398 nests occupied by nesting birds. This is in contrast to 4,236 nests in 110 rookeries in 1971, 4,400 nests in 83 rookeries in 1970, and 3,187 nests in 60 rookeries in 1969.

Rookery use by species is summarized in Table 4.

TABLE 4

Rookery Use by Species, 1969-1972

Year	No. Active Rookeries	Great Blue Heron		Common Egret		Snowy Egret		Black-crowned Night Heron		Cattle Egret	
		No.	%	No.	%	No.	%	No.	%	No.	%
1969	60	56	93.3	11	18.3	4	6.7	10	16.7	0	0.0
1970	83	76	92.8	20	22.9	5	6.0	11	13.3	0	0.0
1971	110	104	94.5	13	11.8	6	5.5	10	9.1	1	0.9
1972	<u>115</u>	<u>112</u>	<u>97.4</u>	<u>21</u>	<u>18.3</u>	<u>8</u>	<u>7.0</u>	<u>11</u>	<u>9.6</u>	<u>1</u>	<u>0.9</u>
TOTAL	368	348	94.6	65	17.7	23	6.3	42	11.4	2	0.5

Population Trends

Over the four year period, the great blue heron was reported to be the most abundant nesting species (Table 5). It was followed by black-crowned night heron, common egret, and snowy egret in order of their abundance. Small numbers of cattle egrets were reported nesting in 1971 and 1972 in Imperial County.

Average number of active nests per rookery (38.5) was appreciably lower in 1971 than in 1969, 1970 or 1972 (Table 5). The low figure in 1971 was the result of 10 or less active nests being found in 30 of 45 new rookeries reported.

Table 6 summarizes active nest data for comparable rookeries for the four years of study. Of the 83 rookeries active in 1970, 41 were comparable with rookeries in 1969. Of the 110 rookeries active in 1971, 55 were comparable with rookeries in 1970; and of the 114 rookeries active in 1972, 88 were comparable with rookeries in 1971, 34 were comparable with rookeries in 1969. Only 26 had a history of nesting activity over the four years. Data in Table 6 indicate variations in nesting activities for all four species. However, these data indicate a decrease in great blue heron nesting activities, and an increase in common and snowy egret nesting activities. Cattle egret rookery, established in 1971, showed an increase in nesting birds from 1971 to 1972.

TABLE 2
Summary of Active Rookeries by Species, 1969-1971

Dept. Region	Great Blue Heron				Common Egret				Snowy Egret				Black-crowned Night Heron				Cattle Egret				Total ^{1/} Rookeries			
	1969	1970	1971	1972	1969	1970	1971	1972	1969	1970	1971	1972	1969	1970	1971	1972	1969	1970	1971	1972	1969	1970	1971	1972
1	11	24	35	42	2	5	3	4	1	2	3	4	5	7	6	5	-	-	-	-	12	28	38	43
2	14	16	16	10	2	2	3	3	-	-	1	-	1	-	1	-	-	-	-	-	15	16	17	10
3	17	17	32	32	1	2	-	2	2	1	1	3	2	2	2	3	-	-	-	-	17	17	32	33
4	10	10	11	15	3	6	4	8	1	2	-	1	1	2	-	1	-	-	-	-	11	12	11	16
5	<u>4</u>	<u>9</u>	<u>10</u>	<u>12</u>	<u>3</u>	<u>5</u>	<u>3</u>	<u>4</u>	<u>-</u>	<u>-</u>	<u>1</u>	<u>-</u>	<u>1</u>	<u>-</u>	<u>1</u>	<u>2</u>	<u>-</u>	<u>-</u>	<u>1</u>	<u>1</u>	<u>5</u>	<u>10</u>	<u>12</u>	<u>13</u>
Total	56	76	104	112	11	20	13	21	4	5	6	8	10	11	10	11	0	0	1	1	60	83	110	115

^{1/} Because several species may nest in one rookery, total figures will not balance.

TABLE 3
Summary of Active Nests by Species, 1969-1971

Dept. Region	Great Blue Heron				Common Egret				Snowy Egret				Black-crowned Night Heron				Cattle Egret				Total Nests			
	1969	1970	1971	1972	1969	1970	1971	1972	1969	1970	1971	1972	1969	1970	1971	1972	1969	1970	1971	1972	1969	1970	1971	1972
1	124	293	475	705	73	203	237	325	25	78	85	64	327	377	270	290	-	-	-	-	549	951	1,067	1,384
2	500	462	367	285	45	42	101	21	-	-	100	-	6	-	140	-	-	-	-	-	551	504	708	306
3	273	299	413	471	115	152	-	182	152	100	240	421	436	128	623	520	-	-	-	-	976	679	1,276	1,594
4	780	1,086	659	895	73	91	40	131	50	125	-	500	50	700	-	100	-	-	-	-	953	2,002	699	1,626
5	<u>60</u>	<u>158</u>	<u>90</u>	<u>197</u>	<u>95</u>	<u>106</u>	<u>54</u>	<u>66</u>	<u>-</u>	<u>-</u>	<u>100</u>	<u>-</u>	<u>3</u>	<u>-</u>	<u>192</u>	<u>125</u>	<u>-</u>	<u>-</u>	<u>50</u>	<u>100</u>	<u>158</u>	<u>264</u>	<u>486</u>	<u>488</u>
Total	1,737	2,298	2,004	2,553	401	594	432	725	227	303	525	985	822	1,205	1,225	1,035	0	0	50	100	3,187	4,400	4,236	5,398

TABLE 5
Average Number Per Rookery and Percent of Active Nests by Species
1969-1972

Year	Number of Rookeries	Number of Nests	Average Number Nests/Rookery	Great Blue Heron		Common Egret		Snowy Egret		Black-Crowned Night Heron		Cattle Egret	
				No.	%	No.	%	No.	%	No.	%	No.	%
1969	60	3,187	53.1	1,737	54.5	401	12.6	227	7.1	822	25.8	0	0.0
1970	83	4,400	53.0	2,298	52.2	594	13.5	303	6.9	1,205	27.4	0	0.0
1971	110	4,236	38.5	2,004	47.3	432	10.2	525	12.4	1,225	28.9	50	1.2
1972	115	5,398	46.9	2,523	47.3	722	13.4	985	18.2	1,035	19.2	100	1.9
TOTAL	368	17,221	46.8	8,592	49.9	2,152	12.5	2,040	11.8	4,287	24.9	150	0.9

TABLE 6

Active Nest Data for Comparable Rookeries - 1969-1972

<u>Comparable Years</u>	<u>No. of Rookeries</u>	<u>Number of Active Nests</u>					<u>Total</u>
		<u>Great Blue Heron</u>	<u>Common Egret</u>	<u>Snowy Egret</u>	<u>Black- Crowned Night Heron</u>	<u>Cattle Egret</u>	
1969 to 1970	41	1,563	375	77	400		2,415
		1,718	331	95	327		2,471
<u>Percent Change</u>		+9.0	-11.7	+19.0	-18.3		+2.3
1970 to 1971	55	1,946	344	78	393		2,761
		1,436	375	85	320		2,216
<u>Percent Change</u>		-26.2	+9.0	+8.9	-18.6		-19.7
1971 to 1972	88	1,754	401	425	1,060	50	3,690
		2,049	462	385	927	100	3,923
<u>Percent Change</u>		+16.8	+15.2	-9.4	-12.6	+100.0	+6.3
1969 to 1971	51	2,192	333	175	783		3,483
		1,663	343	317	863		3,186
<u>Percent Change</u>		-24.1	+3.0	+81.1	+10.2		-8.5
1969 to 1970	33	1,260	260	25	347		1,892
1970 to 1971		1,517	214	70	223		2,077
1971		970	322	77	240		1,609
<u>Percent Change</u> 1969-1970		+20.4	-17.7	+180.0	-35.7		+9.8
1970-1971		-36.1	+50.5	+10.0	+7.6		-22.5
1969-1971		-23.0	+23.8	+208.0	-30.8		-15.0
1969 to 1972	34	1,276	378	177	726		2,557
		981	478	376	730		2,565
<u>Percent Change</u>		-30.1	+26.5	+112.4	+0.6		+0.3

TABLE 6 (Cont.)

Active Nest Data for Comparable Rookeries - 1969-1972

<u>Comparable Years</u>	<u>No. of Rookeries</u>	<u>Number of Active Nests</u>					<u>Total</u>
		<u>Great Blue Heron</u>	<u>Common Egret</u>	<u>Snowy Egret</u>	<u>Black- Crowned Night Heron</u>	<u>Cattle Egret</u>	
1969	26	1,120	237	25	310		1,692
to 1970		1,357	196	70	213		1,836
to 1971		816	291	77	225		1,409
to 1972		819	359	56	282		1,516
<u>Percent Change</u>							
1969-1970		+21.2	-17.3	+180.0	-31.3		+8.5
1970-1971		-39.9	+48.5	+10.0	+5.6		-23.3
1971-1972		+0.4	+23.4	-27.3	+25.3		+7.6
1969-1972		-26.9	+51.5	+124.0	-9.0		-10.4

Overall heron nesting activity seems to be remaining stable. Refinements of rookery evaluation and survey procedures are necessary to reduce obvious variables in data.

RECOMMENDATIONS:

1. The Heron Rookery Survey be modified to obtain more reliable data for comparison studies.
2. A select number of rookeries be surveyed each year with all other rookeries surveyed every other year to determine their status.
3. Those rookeries selected be visited a minimum of two times if the rookery contains nests of two species, and three times if the rookery contains nests of more than two species. Visits should be two to three weeks apart.
4. Snowy egret and black-crowned night heron nesting studies be conducted to determine their reproductive biology.

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