

## JOB PROGRESS REPORT

State: California

Project Number: W-54-R-14 Project Title: Nongame Wildlife Investigations

Job Number: III-8.0 Job Title: Heronry Inventory

Period Covered: July 1, 1981 - June 30, 1982 Job Type: Survey and Inventory

### SUMMARY:

During spring and summer, 1982, surveys of heron and egret rookeries were conducted state-wide. This latest survey was the sixth conducted since the first one was run in 1969. Samples of rookeries surveyed ranged from a low of 97 in 1969 to a high of 253 in 1978; a total of 202 was surveyed in 1982. One hundred twenty-one of the 202 rookeries (60.0%) were found to have nesting activity occurring at the time of survey. The highest percentage (29.2%) of inactive rookeries and the lowest percentage (11.0%) of undetermined activity at rookeries was documented during 1982 compared to the previous 5 survey-years.

Survey effort varied slightly among the 5 Department Regions involved with Region 4 personnel conducting the most complete survey relative to known rookery sites and Region 5 the least complete survey relative to known number of sites.

Great Blue Herons (Ardea herodias) occupied the greatest percent (91.7%) of all rookeries known in the state but the Cattle Egret (Bubulcus ibis) was the dominant heron species in terms of numbers of active nests recorded with 3,400 of 9,656 (35.2%) total active nests for all species. In terms of active nests, Great Blue Herons were second to Cattle Egrets followed by Great Egrets, Black-crowned Night Herons, and Snowy Egrets.

Great Blue Herons appear to be the most widespread species, followed by Great Egrets and Black-crowned Night Herons. Snowy Egrets seem to be more concentrated in the San Francisco Bay Area and parts of the San Joaquin Valley. The Cattle Egret population is almost wholly confined to a few large rookeries in Southern California near the Salton Sea area.

The overall heron and egret population appears stable but there are local setbacks due to loss of habitat and abandonment due to human disturbance. Since land-use change that is potentially detrimental to herons and egrets and their habitats is continuing at an accelerating rate state-wide it is important that periodic monitoring of the type conducted during the past six surveys continue, and, in some identified problem areas, be intensified.

### BACKGROUND:

The Department's systematic inventory of heron and egret rookeries was initiated in 1969. Since that time there have been surveys conducted during the 1970, 1971, 1972, and 1978 breeding seasons. The survey was devised in order to inventory heron and egret rookeries, and to determine the population trends of the four major species of herons that nest in California: Great Blue Heron (Ardea herodias), Great Egret (Casmerodius albus), Snowy Egret (Egretta thula), and Black-crown Night Heron (Nycticorax nycticorax).

During the period from 1969-1978, coverage of rookeries ranged from low of 97 surveyed in 1969, increasing each survey-year, to a high of 253 rookeries checked in 1978. An average 59.9 percent of rookeries checked during that time period were active. The range was 57.8 to 61.9 percent.

#### OBJECTIVES:

The objectives are to maintain a state-wide inventory of heron and egret rookeries and to conduct investigations to determine population trends of the species involved. Assessment of land-use changes, human disturbance, and other factors that may be adverse to herons and egrets also is made during surveys.

#### PROCEDURES:

Department Regional personnel were requested in 1982 to report the current status of all known heron and egret rookeries in their Region. Standard reporting forms FG-881 were used during surveys (Figure 1). In addition to Regional personnel surveys, Nongame Wildlife staff and Audubon Society volunteers also conducted inventories of rookeries, state-wide. Rookeries that were newly discovered or lost due to destruction or disturbance also were reported. All information was sent to the Nongame Wildlife Section in Sacramento for compilation and analysis. These data may also be added to the Department's Natural Diversity Data Base.

An important part of a rookery report, in addition to information on nesting activity, numbers of adults and young, is information concerning instances of human disturbance, land-use changes and any other factors detrimental to heron and egret reproductive success.

#### FINDINGS:

The total number of rookeries surveyed increased each survey year between 1969 and 1978 but dropped back to the 1972 level of effort during 1982. However, throughout the six years of surveys the percentage of active rookeries (rookeries in which at least 1 pair of herons or egrets conducted nesting activities) remained remarkably similar (Table 1). This may indicate a certain amount of stability within the populations; however, since different samples of rookeries were surveyed each year not all variables could be held constant and as such it is probably premature to assume a trend with only six years of data. Further surveys with large samples (200 + rookeries checked) will be necessary before a certain population trend can be claimed.

Table 1. Active and inactive heron rookeries, state-wide heron rookery inventory, 1969-1982.

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
1978	150	59.3	64	25.3	39	15.4	253
1982	121	60.0	59	29.2	22	11.0	202

Figure 1. Heron and Egret Rookery Field Data Form.

EGRET AND HERON ROOKERY  
INVENTORY

ROOKERY NO. \_\_\_\_\_

ROOKERY DESCRIPTION

Species: ☐ Great Blue Heron ☐ Common Egret ☐ Snowy Egret  
☐ Black-Crowned Night Heron ☐ Others \_\_\_\_\_

General Location: \_\_\_\_\_  
(LOCATION IN RELATION TO NEAREST TOWN OR LANDMARK)

Specific Location: \_\_\_\_\_  
(RANGE, TOWNSHIP AND SECTION)

County \_\_\_\_\_ Region \_\_\_\_\_

Rookery Description: \_\_\_\_\_  
(GROUND COVER, LOCATION OF NESTS, ETC.)

Property Owner: \_\_\_\_\_  
(NAME AND ADDRESS)

CURRENT STATUS OF ROOKERY

Year \_\_\_\_\_

Active Rookery:

Species	Number of Adult Birds	Number of Active Nests
Great Blue Heron	_____	_____
Common Egret	_____	_____
Snowy Egret	_____	_____
Black-Crowned Night Heron	_____	_____
Others _____	_____	_____

Inactive Rookery:

Reason for Abandonment

☐ Land Use Change \_\_\_\_\_  
☐ Harassment \_\_\_\_\_  
☐ Other \_\_\_\_\_  
☐ Unknown \_\_\_\_\_

Observer: \_\_\_\_\_ Date: \_\_\_\_\_

NOTES

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Even though the percent of active rookeries compared favorably with previous years' surveys, the percentage of inactive rookeries was the highest reported since surveys were initiated in 1969. Also, the percent of rookeries at which activity was undetermined was the lowest ever recorded.

Rookery surveys in the past have contributed to a growing body of information on numbers and locations of rookeries within each Department Region. Each year this information base expands as new rookeries are discovered. However, at the same time, a number of rookeries may be abandoned for various reasons. Thus, a picture of the dynamics of heron and egret rookery status emerges (Table 2). In order to achieve some sort of balance or stability, the number of inactive or abandoned rookeries should approximate the number of new or newly discovered rookeries each survey year. Only in Region 1 and Region 5 was this sort of balance apparent. In Regions 2, 3, and 4 the number of inactive rookeries outnumbered the number of new rookeries discovered by about a 2 to 1 margin (Table 2).

Table 2. Rookery survey coverage by Fish and Game Region, 1982.

Dept. Region	No. Rooker- ies Known	No. Rooker- ies Checked	No. Rooker- ies Active	No. Rooker- ies Inactive	No. New Rookeries	No. Rookeries Undetermined
1	47	42	24	3	3	15
2	47	44	25	16	7	3
3	66	52	28	21	9	3
4	34	40	27	13	7	0
5	<u>46</u>	<u>24</u>	<u>17</u>	<u>6</u>	<u>8</u>	<u>1</u>
Totals	240	202	121	59	34	22

The relative effort put forth by each Region is evident by comparing the number of rookeries known within a particular Region with the number personnel within that Region actually surveyed. Region 4 personnel checked more rookeries than were known prior to survey and found 7 new rookeries (Table 2).

#### Rookery Use by Species

Great Blue Herons continue to be the species occupying the greatest percent of all rookeries known in the State (Table 3). However, on the basis of numbers of active nests, Cattle Egrets (Bubulcus ibis) are the dominant heron species in the State (Table 4). Cattle Egrets occupied only about 4% of all rookeries reported but accounted for about 36% of all active nests reported. Cattle Egrets were reported mainly from the southern California desert areas near the Salton Sea where, at a single rookery, about 3,000 active nests were recorded.

TABLE 4

Summary of Active Rookeries by Species, 1969-1982

Dept. Region	Great Blue Heron						Great Egret						Snowy Egret					
	1969	70	71	72	78	82	1969	70	71	72	78	82	1969	70	71	72	78	82
1	11	24	35	42	50	24	2	5	3	4	4	*	1	2	3	4	2	*
2	14	16	16	10	22	30	2	2	3	3	9	13	-	-	1	-	-	2
3	17	17	32	32	32	23	1	2	-	2	4	4	2	1	1	3	4	3
4	10	10	11	15	18	22	3	6	4	8	5	11	1	2	-	1	2	6
5	<u>4</u>	<u>9</u>	<u>10</u>	<u>12</u>	<u>11</u>	<u>12</u>	<u>3</u>	<u>5</u>	<u>3</u>	<u>4</u>	<u>8</u>	<u>6</u>	<u>-</u>	<u>-</u>	<u>1</u>	<u>-</u>	<u>4</u>	<u>4</u>
Total	56	76	104	112	133	111	11	20	13	21	30	34	4	5	6	8	12	15

Dept. Region	Black-crowned Night Heron						Cattle Egret						Total <sup>1/</sup> Rookeries					
	1969	70	71	72	78	82	1969	70	71	72	78	82	1969	70	71	72	78	82
1	5	7	6	5	3	*	-	-	-	-	1	-	12	28	38	43	52	24
2	1	-	1	-	2	1	-	-	-	-	-	-	15	16	17	10	25	25
3	2	2	2	3	4	3	-	-	-	-	1	-	17	17	32	33	35	28
4	1	2	-	1	1	6	-	-	-	-	2	3	11	12	11	16	20	13
5	<u>1</u>	<u>-</u>	<u>1</u>	<u>2</u>	<u>6</u>	<u>7</u>	<u>-</u>	<u>-</u>	<u>1</u>	<u>1</u>	<u>3</u>	<u>2</u>	<u>5</u>	<u>10</u>	<u>12</u>	<u>13</u>	<u>18</u>	<u>6</u>
Total	10	11	10	11	16	17	0	0	1	1	7	5	60	83	110	115	150	121

\*Although not reported, a significant population is known to exist at Indian Island Rookery, Humboldt Co. (see text for details)

<sup>1/</sup> Because several species may nest in one rookery, total figures will not balance.

Table 3. Rookery use by species, 1969-1978.

Year	No. Active Rookeries	Great Blue Heron		Great 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	115	112	97.4	21	18.3	8	7.0	11	9.6	1	0.9
1978	150	133	88.7	30	20.0	12	8.0	16	10.7	7	4.7
1982	<u>121</u>	<u>111</u>	<u>91.7</u>	<u>34</u>	<u>28.1</u>	<u>15</u>	<u>12.4</u>	<u>17</u>	<u>14.0</u>	<u>5</u>	<u>4.1</u>
Total	639	592	92.6	129	20.2	50	7.8	75	11.7	14	2.2

#### Heron and Egret Distribution

The distribution of heron species by geographic area of the State may be approximated by examining the results of rookery use by species in each Fish and Game Region (Tables 4 and 5). Great Blue Heron rookeries are found state-wide, Great Egret rookeries are found more often in the Central Valley, and, as mentioned above, Cattle Egrets are primarily found in southern California.

#### Rookery Size

Rookery size, as indicated by the average number of active nests per rookery, has fluctuated from a low of 38.5 in 1971 to a high of 107.8 in 1978 (Table 6). During 1982, the average size was 79.8 nests per rookery, slightly above the average of 67.4 for all 6 years of survey. This figure is biased high because of the large size of Cattle Egret rookeries. In addition, Cattle Egrets have been a significant population only since about 1978 (Table 3). If Cattle Egrets are excluded, the overall average rookery size drops to about 51 active nests per rookery.

#### Population Trends

Cattle Egrets have demonstrated the most dramatic increase in population in recent years compared to other species of herons and egrets. The population apparently peaked in the late 1970's and may have dropped back somewhat since then. Comparative survey efforts for each year must be taken into account relative to apparent trend, however.

TABLE 5

## Summary of Active Nests by Species, 1969-1982

Dept. Region	Great Blue Heron				Great Egret				Snowy Egret			
	1969	70	71	72	78	82	1969	70	71	72	78	82
1	124	293	475	705	763	510	73	203	237	325	196	*
2	500	462	367	285	822	905	45	42	101	21	276	734
3	273	299	413	471	542	451	115	152	-	182	163	347
4	780	1,086	659	895	815	759	73	91	40	131	83	147
5	60	158	90	197	123	234	95	106	54	66	135	17
Total	1,737	2,298	2,004	2,553	3,065	2,859	401	594	432	725	853	1,245

Dept. Region	Black-crowned Night Heron				Cattle Egret				Total Nests			
	1969	70	71	72	78	82	1969	70	71	72	78	82
1	327	377	270	290	243	*	-	-	-	-	2	-
2	6	-	140	-	117	131	-	-	-	-	-	-
3	436	28	623	520	359	80	-	-	-	-	17	-
4	50	700	-	100	145	534	-	-	-	-	6	109
5	3	-	192	125	75	447	-	-	50	100	7,587	3,400
Total	822	1,205	1,225	1,035	939	1,192	0	0	50	100	7,612	3,400

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TABLE 6

Average Number Per Rookery and Percent of Active Nests by Species  
1969-1978

Year	Number of Rookeries	Number of Nests	Average Number Nests/ Rookery	Great Blue Heron		Great 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	10.5	525	12.4	1,225	28.9	50	1.2
1972	115	5,398	46.9	2,553	47.3	725	13.4	985	18.2	1,035	19.2	100	1.9
1978	150	16,173	107.8	3,065	19.1	853	5.3	3,604	22.3	939	5.8	7,612	47.1
1982	121	9,656	79.8	2,859	29.6	1,245	12.9	851	8.9	1,192	12.4	3,509	36.5



Great Blue Herons continue to show a relatively stable and dominant position in terms of active nests compared to other species, excluding Cattle Egrets.

Great Egrets occupy a position second only to Great Blue Herons in terms of numbers and widespread distribution. However, the Central Valley is clearly the most important geographic region of the State for Great Egret breeding. There is an important rookery at Indian Island in Humboldt Bay where typically 150-250 pairs nest.

Black-crowned Night Herons, although not particularly abundant relative to Great Blue Herons, are about as widespread in distribution and occupy habitats that both Great Blue Herons and Great Egrets occupy. Normally about 50 pairs nest at the Indian Island rookery.

Snowy Egrets continue to be the least abundant and widespread of all the important Ardieds surveyed. The San Francisco Bay area, and the Central Valley appear to be the most important portions of their range.

Overall population trends of all herons and egrets appear stable; however, there are continual setbacks in the local populations of certain species due primarily to disturbance and habitat destruction. In some instances, governmental agencies condone or facilitate destruction of heron roosts or rookeries by allowing private landowners to remove nests or nest trees of birds deemed by them to be a "nuisance" because of noise or waste products (i.e. excrement, food fragments, and carcasses).

Housing developments, logging, and recreational activities constitute the most serious threats to heron and egret habitat. Sometimes weather factors (e.g. high winds) and the action of the birds' own excrement can lead to destruction or degradation of nest trees.

#### ANALYSIS:

Results seem to indicate a relatively stable heron and egret population state-wide. However, instances of habitat destruction and disturbance are ever present and increasing, thereby making it even more important to continue monitoring of population on a periodic basis. Perhaps a 3 or 4 year interval between monitoring would be the most efficient and cost-effective means to assess populations of herons and egrets state-wide. Large and important rookeries could be closely watched in intervening years especially if there are indications they will be threatened by some sort of habitat disturbance or destruction.

Policies of governmental agencies which allow destruction of heron and egret habitats, for whatever reason, need to be reviewed to determine if alternatives that are less detrimental to herons and egrets can be employed. The fact that a particular agency allows destruction of these habitats on the one hand while apparently trying to save them on the other sends confusing and potentially detrimental signals to the public regarding protection of wildlife and preservation of habitat.

#### RECOMMENDATIONS:

1. Continue to monitor heron and egret rookeries every 4 years, the next survey to be conducted during the breeding season of 1986.
2. Beginning in 1984, conduct studies of the breeding biology of all major heron and egret populations state-wide.

3. Conduct aerial monitoring of remote or difficult to access heron and egret rookeries.
4. Concurrent with reproductive studies, conduct research on the effects of chemical contaminants on nesting success of herons and egrets.
5. Monitor land-use changes that may affect heron and egret rookeries.
6. Determine the effects of various kinds of human disturbance at heron and egret rookeries.
7. Review regulations, policies, and procedures of governmental agencies whose actions are detrimental to herons and egrets.

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