

## Report #72-12

Segment Final Report  
Accelerated Research on Shore and  
Upland Migratory Game Birds  
Contract No. 14-16-0008-586  
Period: July 1971 - June 1972

### CALIFORNIA SHOREBIRD STUDY, 1971-72

#### SUMMARY

Shorebird research was continued in California during 1971-72 under two ongoing programs: California Shorebird Survey and Statewide Shorebird Banding Program. At 42 shorebird census sites throughout the state, censusers conducted 750 shorebird counts. Revised shorebird census instruction sheets and reporting forms were distributed to observers in December 1971. Computer processing of three years of survey data was completed in June 1972.

At four banding localities in California, 629 shorebirds were banded, measured and color marked. In addition, two banded shorebirds were recaptured from previous years. Trapping was conducted with mist nets and drift traps. Color marking was implemented in accordance with a revised coding schedule. Reports were received on 122 sightings of color marked shorebirds.

#### BACKGROUND

Wetlands in California provide important feeding and resting areas for large numbers of migrant and resident shorebirds. Economic development of wetland areas, especially in coastal estuaries, has resulted in an alarming reduction in shorebird habitat. Urgently needed is current knowledge of habitat needs, populations, movements and migration of shorebirds in California. Such information is necessary for the preservation and management of this resource.

Statewide shorebird research in California was initiated in July 1968. Funding was provided in fiscal years 1968-69 and 1969-70 by Federal Aid in Wildlife Restoration Project W-54-R, "Special Wildlife Investigations." Contracts were made with Point Reyes Bird Observatory and San Diego Natural History Museum to conduct shorebird research. Seasonal aids were hired by the Department to conduct shorebird studies at Humboldt Bay and Woodland Sugar Ponds near Sacramento.

Beginning July 1, 1970, continued shorebird research in California has been federally funded by Accelerated Research on Shore and Upland Migratory Game Birds. Funding for the program, the California Shorebird Study, is provided through fiscal year 1972-73.

Shorebird studies are conducted in two phases. These consist of the California Shorebird Survey and the Statewide Shorebird Banding Program. The shorebird survey program is a statewide network of shorebird census sites wherein competent observers periodically conduct shorebird counts. The program was initiated in July 1968. Reporting forms and guidelines for censusing were developed for distribution to censusers. Survey sites were established and censusers, most of whom were competent bird watchers from local areas, were enlisted to conduct

periodic counts. Censusing began in July 1969. During the period July 1969-June 1970, 76 observers conducted 463 counts at 34 census sites. During the 1970-71 period, 54 observers conducted 446 counts at 24 sites.

Results of the first two years of the survey program are contained in the reports, "California Shorebird Survey, 1969-1970" and "California Shorebird Survey, 1970-71," by R. M. Jurek, California Department of Fish and Game.

Shorebird banding program was initiated in August 1968. Trapping and banding were conducted by contract personnel and by Department employees. Trapping devices have included mist nets, rocket nets, portable spot lights and drift traps. From August 1968 through June 1971, 9,843 shorebirds were banded (Table 2).

TABLE 2

Shorebird Banding Totals, August 1968-June 1971

Area	Aug. 1968-June 1969	July 1969-June 1970	July 1970-June 1971	Total
Humboldt Bay	1,585	2,381	364	4,330
Point Reyes Peninsula & San Francisco Bay	378	1,527	520	2,425
San Diego Bay & Anaheim Bay	-	1,603	311	1,914
Central Valley	-	790	384	1,174
Total	1,963	6,301	1,579	9,843

OBJECTIVES

California Shorebird Survey, 1971-72, is a continuation of a statewide census program that began July 1969. Objectives are to obtain current information on shorebird occurrence and abundance in selected habitats throughout the state.

Statewide Shorebird Banding Program, 1971-72, is a continuation of banding efforts that began in August 1968. Efforts were made to band, color mark and take measurements on 2,000 shorebirds between July 1971 and June 1972.

PROCEDURES

California Shorebird Survey

Forty-two shorebird census sites were established statewide for the 1971-72 survey period. Included were 13 sites which had been censused continually since the program began in 1969. Fourteen other sites were initiated in 1971-72, including a special census route in Carrizo Plain, San Luis Obispo County, to survey mountain plovers.

Observers were provided with census instructions and reporting forms. Most censusers included volunteer bird watchers from local communities. Many of these people had participated in shorebird counts in previous years.

In December 1971 revised survey instruction sheets and census forms were sent to censusers. Revisions in the instruction sheet were made to clarify portions of the original instructions and to aid censusers in filling out revised census forms. Census forms were revised in order to simplify the recording process, to minimize recording and transposition errors and to obtain more detailed information on tidal and nontidal water levels. Revised instruction sheets and forms, and special instructions for the Carrizo Plain Survey Route are appended.

Agreement was made with Fisheries Statistics, Ocean Resources Branch, California Department of Fish and Game, to program shorebird survey data for computer processing and tabulation.

#### Statewide Shorebird Banding Program

Shorebird trapping was conducted by the author; by a Departmental Seasonal Aid, Dean Greenberg; and by three volunteer banders. Concurrent with the banding program of the Department, an intensive trapping, banding and color marking program was conducted by Point Reyes Bird Observatory at Bolinas Lagoon from April 1971 through June 1972.

#### Trapping

Trapping devices included mist nets and drift traps. Black nylon mist nets of 36 mm and 61 mm mesh sizes were used. Nets measured 12 meters long. Standard four-tier and modified one and two-tier nets were employed.

A drift trap method for capturing shorebirds was tested at Woodland Sugar Ponds from April 13 to April 27, 1972. Two of the wire mesh traps were built and tested according to description by the designer, the late Irl Rogers. <sup>1/</sup>

Captured birds were placed in holding bags made from army surplus insect head nets. Birds were then transferred to wooden holding boxes until they were banded.

#### Banding, Color Marking and Measuring

Breast feathers of captured shorebirds were dyed yellow with picric acid. Colored plastic tape (Scotch Brand, 3M) was placed over aluminum leg bands, including a Fish and Wildlife Service numbered band in accordance with the color marking schedule appended to this report. Color codes were coordinated with the Point Reyes Bird Observatory marking program.

Measurements of captured birds included wing length, bill length, weight, fat deposition, molt condition, age and sex. Length of the tarso-metatarsus was recorded for dowitchers. Field data were recorded on Department of Fish and Game Banding Form, FG 858, which is appended.

<sup>1/</sup> Rogers, I. 1946. News from Bird Banders. W.B.B.A. 21:15-17.

## RESULTS

### California Shorebird Survey

Censusers conducted 750 shorebird counts at 42 census sites during the period July 1971 - June 1972.

Census data from July 1969 through June 1972 were key punched on IBM cards. Final printouts were completed in June 1972. For each of the three fiscal years of the survey program, census data were tabulated in two formats: the first, a listing for each site showing the abundance of shorebird species throughout the census period; the second, a listing for each species showing the abundance of individuals at each site throughout the year.

### Statewide Shorebird Banding Program

During 1971-72, 629 shorebirds were banded. Two banded shorebirds were recaptured from previous years. Banding results at Woodland Sugar Ponds are listed in Table 3. Results from other areas of the state are shown in Table 4.

TABLE 3

#### SHOREBIRDS BANDED AT WOODLAND SUGAR PONDS September 1971 through April 1972 <sup>1/</sup>

	<u>Sept.</u>	<u>Oct.</u>	<u>Nov.</u>	<u>Apr.</u>	<u>Total</u>
Killdeer	2	2		8	12
Least sandpiper	16	37	34(1)	6	93(1)
Dunlin		1	1	3	5
Western sandpiper	41			208	249
Long-billed dowitcher				1	1
Lesser yellowlegs	1				1
Northern phalarope	<u>1</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>1</u>
Total	61	40	35(1)	226	362(1)

<sup>1/</sup> Recaptured birds are recorded in parentheses.

TABLE 4

SHOREBIRDS BANDED AT IMPERIAL BEACH, SAN FRANCISCO BAY AND HUMBOLDT BAY,  
October 1971 through April 1972 <sup>1/</sup>

	Imperial Beach	San Francisco Bay				Humboldt Bay			Total
	Nov.	Nov.	Dec.	Jan.	Apr.	Oct.	Dec.	Apr.	
Semipalmated plover		4	1						5
Black-bellied plover		1							1
Least sandpiper	1	17	58	2		27(1)			105(1)
Dunlin	1	5	1			3	6		16
Western sandpiper	9	12	64	4	10	17	8	13	137
Dowitcher species				1					1
Long-billed dowitcher	—	1	—	—	—	—	—	—	2
	11	40	124	7	10	47(1)	14	13	267(1)

<sup>1/</sup> Recaptured birds are recorded in parentheses.

Most shorebirds were captured using mist nets. Two drift traps caught 142 shorebirds in 12 days of trapping (April 1 -27) at Woodland Sugar Ponds. These traps selectively captured small species of shorebirds. Captured were six least sandpipers and 133 of the more numerous western sandpipers. Also caught were two dunlin and one long-billed dowitcher. Drift traps successfully captured birds during high winds when mist nets could not be used.

Reports were received on 122 sightings of color marked shorebirds. Most sightings were of birds banded and color marked during 1971-72 at Woodland Sugar Ponds and near Palo Alto, at the south end of San Francisco Bay.

A listing of recoveries of shorebirds banded in California was obtained from the Migratory Bird Populations Station in July 1971. It was discovered that most recoveries were of birds originally banded at Modesto, California by the late Irl Rogers. From 1937 through 1947, Mr. Rogers banded 5,569 shorebirds using the drift trap method discussed above. His original field data was obtained and summarized. Tentative plans have been made to publish his results in the Project Final Report, since Mr. Rogers published little of his findings.

#### RECOMMENDATIONS

1. Continue California Shorebird Survey during 1972-73 at only half the number of sites censused in 1971-72.

2. Initiate a trapping and banding program to capture the larger species of shorebirds by rocket netting in San Francisco Bay. Discontinue shorebird trapping efforts in other parts of the state.

Prepared by Ronald M. Jurek Date August 11, 1972  
Ronald M. Jurek  
Junior Wildlife Manager-Biologist

Approved by Howard R. Leach Approved by E. G. Hunt  
Howard R. Leach E. G. Hunt, Chief  
Wildlife Management Supervisor Wildlife Management Branch

CALIFORNIA DEPARTMENT OF FISH AND GAME  
California Shorebird Research  
Color Marking Schedule, July 1971-June 1973

Each shorebird is banded with one Fish and Wildlife Service numbered band and one or two unnumbered aluminum bands. Two bands are wrapped with colored plastic tape. Breast feathers are dyed yellow with picric acid dye.

I. UPPER color band:

Color band placed above the heel denotes season of banding in accordance with the following table:

<u>Time of year</u>	<u>Band Color</u>				
	<u>White</u>	<u>Yellow</u>	<u>Blue</u>	<u>Green</u>	<u>Red</u>
Jul-Aug	R				
Sep		R			
Oct			R		
Nov				R	
Dec					R
Jan					L
Feb 1-Mar 15				L	
Mar 16-Apr 15			L		
Apr 16-May 15		L			
May 16-June 30	L				

R - right leg

L - left leg

II. LOWER color band:

Color band placed below the heel denotes area and year of banding in accordance with the following schedule:

<u>Band Color</u>	<u>Area</u>
Green	Central Valley
Red	Humboldt Bay area
Yellow	San Francisco Bay area
Blue	Southern California Coast

<u>Leg Banded</u>	<u>Year</u>
Right	July 1971 - June 1972
Left	July 1972 - June 1973

III. Uncolored (aluminum) band:

A third band (unnumbered aluminum band not wrapped with tape) is placed on birds of known age in accordance with the following schedule between July 1 and November 30

<u>Position</u>	<u>Age</u>
<u>Above</u> the heel opposite the leg with "season" color band	More than 1 year old
<u>Below</u> the heel opposite the leg with "area-year" color band	Less than 1 year old
No band	Unknown



## SPECIAL WILDLIFE INVESTIGATION

[illegible]



California Department of Fish and Game  
Special Wildlife Investigations  
1416 Ninth Street  
Sacramento, California 95814

REQUEST FOR INFORMATION ON BANDED  
AND COLOR MARKED SHOREBIRDS

Since September 1968, California Department of Fish and Game and other organizations have cooperated in a statewide program of banding and color marking shorebirds. Approximately 12,000 shorebirds, mostly western sandpipers, least sandpipers and dunlins, have been banded to date.

Reports of color marked shorebirds assist us in determining shorebird migration patterns and local movements. Such information is needed to assess the importance of California's wetland areas to migrating and wintering populations.

Marked birds may carry from one to three leg bands. Yellow dye on breast feathers may be noticed on some of the birds.

If you see a banded shorebird, note the following information:

1. Species
2. Area
3. Date
4. Time
5. Breast color
6. Color or colors on each band and position of bands on legs
7. Name and address of observer
8. Other information

Report sightings to:

Special Wildlife Investigations  
California Department of Fish and Game  
1416 Ninth Street  
Sacramento, California 95814

CALIFORNIA DEPARTMENT OF FISH AND GAME  
SPECIAL WILDLIFE INVESTIGATIONS

CALIFORNIA SHOREBIRD SURVEY

Introduction

The California Shorebird Survey is designed to provide current information on the status of shorebirds in the State. The survey, begun in 1969, is a statewide reporting system wherein competent observers at selected census sites periodically count shorebirds throughout the year. The censuses provide information used in determining seasonal occurrence, population indices and movement patterns of shorebirds. This information is necessary for the management and protection of this important international resource.

Concurrent with this survey is an extensive program of trapping, banding and color marking shorebirds at selected areas in the State. The survey provides a means of reporting sightings of banded and color marked shorebirds.

How the Survey is Conducted

You have been assigned a specific area to census shorebirds and other selected bird species. A set of instructions has been provided together with a number of census forms.

Enclosed are directions for filling out census forms. Please follow the instructions carefully and double check your reports before mailing them. The Department will edit the forms and send them to a computer center where data will be entered into a computer program. Findings will be published annually. All contributors to the survey program will be acknowledged and provided with the findings.

At least two censuses should be conducted at each site from August through May, and at least once each month in June and July.

Once you are familiar with the census area and bird movements, you will be able to determine the time of day or tidal cycle when you feel you can get the best count. Do not conduct a census when winds are in excess of 24 mph or under rainy or heavy fog conditions.

We suggest that you do not spend long hours attempting to get a "complete count," but be content with a reasonably accurate estimate for the time you spend at the site. Use your judgment as to how much time is needed. Completed forms should be forwarded immediately to the Special Wildlife Investigations section of the Department of Fish and Game.

CALIFORNIA DEPARTMENT OF FISH AND GAME  
SPECIAL WILDLIFE INVESTIGATIONS  
1416 Ninth St., Sacramento, CA 95814

California Shorebird Survey  
Instructions For Filling Out Census Form Rev. FG883 - 11/71

SITE

Your census site is \_\_\_\_\_.

OBSERVER and MAILING ADDRESS

Record the name and address of the individual who actually conducted the census. When more than one individual is involved in a census, fill in the name of the leader of the group on the front of the sheet and list additional censusers on the back.

TIME

Time recorded is the actual time spent at the site counting birds. Use the 24-hour clock system, e.g., 2:30 p.m. is recorded 

1	4	3	0
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DATE

Use six digits to record the date of the census. Example: August 11, 1971 is recorded 

0	8	1	1	7	1
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Month Day Year

WIND

Record the appropriate Beaufort Number for wind speed from the following code:

<u>Beaufort Number</u>	<u>Wind Speed MPH</u>	<u>Indicators of Wind Speed</u>
0	Less than 1	Smoke rises vertically.
1	1 to 3	Wind direction shown by smoke drift.
2	4 to 7	Wind felt on face; leaves rustle.
3	8 to 12	Leaves and small twigs in constant motion; wind extends light flag.
4	13 to 18	Raises dust and loose paper; small branches are moved.
5	19 to 24	Small trees in leaf begin to sway; crested wavelets form on inland waters.

SKY

Record the appropriate sky condition number from the following code:

0	Clear or a few clouds.
1	Partly cloudy (scattered) or variable sky.
2	Cloudy (broken) or overcast.
4	Fog or smoke.
5	Drizzle.
8	Rain.

### Water Level Codes

Record both tidal and nontidal water levels using the number codes below. At some sites, such as a coastal lagoon cut off from tidal water by a sandbar, abundance of birds may be influenced both by tidal and nontidal water levels.

Record appropriate code numbers in both TIDAL and NONTIDAL boxes.

#### TIDAL

<u>Code</u>	<u>Location</u>	<u>Condition</u>
0	Inland sites.	No tidal action in the vicinity.
1	Coastal site where water levels are not affected by tidal action.	High tide in surrounding tidal areas.
2	Same as 1.	Low tide in surrounding tidal areas.
3	Coastal site where water levels are affected by tidal action.	Near high tide, <u>incoming</u> water. Upper levels of mudflat or beach are exposed.
4	Same as 3.	Near high tide, <u>outgoing</u> water. Upper levels of mudflat or beach are exposed.
5	Same as 3.	Full high tide. Mudflats are not exposed.
6	Same as 3.	Low tide, tide more than half way out. Birds on tidal mudflats may be too far away from the shore to census adequately.

#### NONTIDAL

<u>Code</u>	<u>Location</u>	<u>Condition</u>
0	Tidal habitat.	Water levels at site are affected by tidal action only.
1	Inland or coastal locations where water levels are not affected by tidal action.	Water level extremely high.
2	Same as 1.	Water level intermediate.
3	Same as 1.	Water level extremely low.

Leave blank the series of boxes labeled "DEPT. USE ONLY" and the series of boxes above the date.

## SPECIES

Listed are most of the shorebirds found in California. Extra space is provided to record the less common shorebird species. Difficulties are expected in separating short-billed dowitchers and long-billed dowitchers. Also, situations may arise when dunlins, western sandpipers and least sandpipers cannot be separated because of great distances, large populations or poor visibility. Two categories, "Dowitcher-Unid." and "Sandpiper-Unid." are provided for recording these identification difficulties.

Eight species of special interest to the Department are included at the bottom of the form. You may wish to report on other species (e.g., gulls, terns, grebes) not covered on the survey form. Record these at the bottom of the form under "NOTES" or on the back of the census sheet.

## HABITAT

Record numbers of each species under the appropriate habitat column.

1. Water - Record only the shorebirds actually afloat on the water. Normally these include only the phalaropes.
2. Mud - Includes tidal mudflats or large mudflat areas among inland marshes. Shorebirds standing or feeding in shallow water on a mud substrate are included in this category. Channels and small ponds with mud bottoms that occur in marshes should more properly be considered "Marsh" habitat.
3. Marsh - A salt or freshwater marsh with emergent vegetation and shallow water.
4. Sand - A beach, sand flat or dune area. May include beaches along the coast or sandy areas along freshwater stream courses.
5. Rock - Includes rocky shoreline fronting the ocean or bordering a water-course. Birds standing or feeding on sand in a rocky area are included in the "Rock" habitat.
6. Other - The sixth column is used when birds are in a habitat different from those described above. Shorebirds flying overhead and not actually feeding or resting at the census site should be included here.

## TOTAL

The total count of birds of each species is to be listed in the last column and the grand total entered below.

Completed forms should be forwarded immediately to Special Wildlife Investigations.

### Special Instructions for Censusing the Small Sandpiper Species

Many shorebird censusers are faced with the problem of not always being able to identify the small species of sandpipers: dunlins, western sandpipers and least sandpipers. Difficulties arise because of poor visibility, or when birds are too far away or are in large populations. The category "Sandpiper-Unid." is provided on the reporting form for recording these identification difficulties.

When conditions do not allow adequate censusing of all the small sandpipers at the site, shorebird censusers are encouraged to make sample counts. For example, there may be approximately 2,000 small sandpipers at your site, most of which are too far away to distinguish as to species. You may be able to accurately census 50, 100 or 200 of them. The sample count will provide us with information on the relative abundance of each species in the total population. If your sample size was 200, of which 100 were least sandpipers, 50 were western sandpipers and 50 were dunlins, your census form should show these count figures on the appropriate lines, including 1,800 "Sandpiper-Unid." In addition, a note should be made at the bottom of the form indicating the size of your sample.

## SHOREBIRD SURVEY

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DATE 

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Month      Day      Year

Water Level: DEPT. USE ONLY

NONTIDAL 

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HABITAT

Gr. blue heron	194	Common egret	196	Clapper rail	210
Blk.-crnd. ni. heron	202	Snowy egret	197	Amer. bittern	190

NOTES:



Special Instructions for Censusing Carrizo Plain  
Shorebird Survey Route (Tentative)

Censuses begin at intersection of Soda Lake Road and road leading to Painted Rock Ranch. Route continues southeast for 25 miles to the area of Elkhorn Hills.

Census procedure entails stopping every half-mile along Soda Lake Road and scanning the surrounding area for mountain plovers, other shorebirds and species of special interest, such as condors, eagles and falcons.

Times at start and finish are recorded using the 24-hour clock system, i.e., 2:00 p.m. is recorded 1400.

Recorded at each stop are mileage, wind speed and habitat type. Sky conditions are recorded at stop numbers 1, 10, 20, 30, 40 and 50.

Code numbers are listed below.

Wind Speed

<u>Beaufort Number</u>	<u>Wind Speed MPH</u>	<u>Indicators of Wind Speed</u>
0	Less than 1	Smoke rises vertically.
1	1 to 3	Wind direction shown by smoke drift.
2	4 to 7	Wind felt on face; leaves rustle.
3	8 to 12	Leaves and small twigs in constant motion; wind extends light flag.
4	13 to 18	Raises dust and loose paper; small branches are moved.
5	19 to 24	Small trees in leaf begin to sway; crested wavelets form on inland waters.

Sky Conditions

0	Clear or a few clouds.	4	Fog or smoke.
1	Partly cloudy (scattered) or variable sky.	5	Drizzle.
2	Cloudy (broken) or overcast.	8	Rain.

Habitat\*

- |   |  |
|---|--|
| 1 | Shortgrass.  |
| 2 | Nearly barren soil with sparse growth of shortgrass. |
| 3 | Newly plowed field.                                  |
| 4 | Cultivated field.                                    |
| 5 | Brush field.   |

\*When a stop is located where two habitats meet, record both, i.e. 4&5.  
If plovers are observed at such a site, indicate under "Notes" which habitat the birds were using.