JOB FINAL REPORT

State: California		Rolf folk disco formation and	-
Project Number: E-1-1	Project Title:_	Endangered	Wildlife Program
Job Number: V-2.01 Job Title: A	naheim Bay Light-foo	ted Clapper	Rail Study, 1977
Period Covered: October 1, 1976-2	July 31, 1977 J	ob Type: Su	arvey & Inventory

SUMMARY:

Surveys were conducted at Anaheim Bay from May 1 to August 31, 1977, to identify nesting habitat requirements of light-footed clapper rails (<u>Rallus longirostris</u> <u>levipes</u>) in this marsh. Efforts were made to determine limiting environmental factors influencing nesting here and to identify actions needed to restore this breeding population to optimum size. Comparative studies were conducted at Upper Newport Bay. High tide counts in June yielded sightings of eight clapper rails at Anaheim Bay and 22 at Upper Newport Bay. No nests were found at Anaheim Bay, but 57 nests, including 12 active ones, were found at Upper Newport Bay. Tall cordgrass (<u>Spartina foliosa</u>) was preferred nesting habitat at Upper Newport Bay. This habitat was lacking at Anaheim Bay; this may limit nesting opportunity or success. In portions of Upper Newport Bay lacking tall cordgrass, clapper rails nested successfully in wind transported Russian thistles (<u>Salsola kali</u>) lying in the marsh. These bushes may function, presumably as does tall cordgrass, to secure nests during high spring tides. Findings at Upper Newport Bay provide the basis for management and study recommendations at Anaheim Bay.

BACKGROUND:

A thorough literature review and a compilation of general information on status, taxonomy, life history and habitat requirements of light-footed clapper rails have been published (Wilbur and Tomlinson, 1974). Recent surveys and life history studies have been conducted at Tijuana Estuary (Jorgensen, 1975) and Upper Newport Bay (Sexton, 1972). Short-term studies to determine occurrence or abundance of this subspecies have been conducted at other coastal wetland habitats.

The Light-footed Clapper Rail Recovery Team has recommended in a draft Recovery Plan that investigations be made at Anaheim Bay to determine why current population density is lower than for most other southern California marshes and to manage the area to correct habitat deficiencies. A substantial decline in the Anaheim Bay clapper rail population has occurred in recent decades. Estimates were 200 rails in 1959 and 100 or more in 1970 and 1971; only a few were found in a May and June 1975 study (Wilbur and Tomlinson, 1974), but 35 were counted in a winter 1976-1977 high tide census.

OBJECTIVES:

Determine clapper rail habitat requirements and limiting environmental factors at Anaheim Bay and recommend management actions needed to increase the carrying capacity of the marsh and to restore this clapper rail population.

PROCEDURES:

The study was conducted from May 1 to August 31, 1977. 1/ Upper Newport Bay was selected for study of clapper rail breeding habitat requirements for comparison with Anaheim Bay. Tape recorded calls of clapper rails were played in efforts to elicit call responses for locating and censusing rails at Anaheim Bay. "Clatter" calls were played in 10 to 15 second sequences from calling points along transects throughout the marsh. Calling points were approximately 50 meters apart along transects of varied lengths. Transects were travelled on foot. Twenty-eight transects were established to allow survey coverage of half of all marsh areas and were developed from a grid overlay on an aerial photograph. Selected habitats in the remaining parts of the marsh were also spot checked. Vegetation height was measured to the nearest decimeter (quarter of a foot). Observation stations, with good views of marsh areas for clapper rail observations, were established at Anaheim and Upper Newport bay study areas; observations of rails were made from dawn to 10:00 a.m. Censuses of clapper rails at each bay were conducted by seven observers during high spring tides in June 1977. Throughout the nesting season, marsh habitat was searched on foot for clapper rail nests; nest sites were marked nearby (approximately one meter away) with driftwood stakes to facilitate later location. Nest searches were conducted every two weeks at Anaheim Bay. Nest site monitoring and searches were conducted weekly at Upper Newport Bay. For each nest located, data were collected on nest construction material, surrounding vegetation, distance from channels, nest size and height above ground, evidence of occupancy and other descriptive information. Prior to the high spring tides at Upper Newport Bay, all nests were marked nearby with orange poles to facilitate nest surveillance during and after tidal inundation.

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Food habits, food availability and water quality investigations were not within the scope of this study.

Habitat Assessment

The predominant plant species in salt marshes in both bays are pickleweed (<u>Salicornia virginica</u>) and cordgrass. During the nesting season in 1977, <u>Spartina</u> reached, at maximum, a mean height of approximately 46 cm (1.5 ft.) at Anaheim Bay and 76 cm (2.5 ft.) at Upper Newport Bay. The +2.1 m (7 ft.) spring tides almost completely inundated Anaheim Bay salt marsh vegetation, except in high marsh north of Bolsa Avenue and east of Case Road; however, at Upper Newport Bay, inundation was not complete, and considerable vegetation remained dry providing protection for rails, nests and chicks.

Besides vegetation height differences, there seemed to be differences between these bays in the morphology of tidal channels, based on subjective observations. Anaheim Bay channel walls appeared, in most cases, to be severely undercut. The tidal channels of Upper Newport Bay were typically straight-sided or gradually sloping to mid-channel.

Censuses

During high tide censuses in June, eight clapper rails were counted at Anaheim Bay (Figure 1). Five of these (three adults and two possible juveniles) were located west of Oil Island. These observations compared well with observed tracks and sightings of birds prior to this count. Similar observations were made on follow-up checks. Use of tape recorded calls for censusing was discontinued early in the study after only one rail responded at Anaheim Bay.

^{1/} Field studies were conducted by Graduate Student Assistant Sharon Lockhart, Current location: California Department of Fish and Game, Region 5 office, Long Beach, California.

The June high tide census at Upper Newport Bay yielded a count of 22 clapper rail adults sighted, five adults heard and 10 chicks sighted. Incomplete inundation of some areas and the inadequate number of censusers participating made a complete count in the Bay impossible. Areas immediately south of and all areas north of the old saltworks levee were not included in the census.

Nest Survey

No nests were located at Anaheim Bay. Following the high tide census, special effort had been made to search for nests west of Oil Island where possible juveniles had been seen.

Fifty-seven nests were found at Upper Newport Bay. Searches were not made north of the saltworks levee nor in freshwater marshes adjacent to the Bay. Ten nests were found in May, 31 new nests in June, and 16 new nests in July. No new nests were found in August. Chicks were first observed in June.

Twelve of the 57 nests were active incubation nests; the remaining 45 were either brood nests or nests found after incubation.

Nests were built an average of 25 cm (10 in.) above the ground in the marsh vegetation. Nests were located an average of 4.3 m (14 ft.) from the nearest channel.

All nests were made of <u>Spartina</u>. Only one nest was found in <u>Salicornia</u>; the others were built in <u>Spartina</u> or Russian thistle in <u>Spartina</u> vegetation. Average height of <u>Spartina</u> vegetation where nests were found was 76 cm (2.5 ft.).

Nine nests were found in short (0.3 to 0.5 m, or 1.1 to 1.5 ft.) <u>Spartina</u> within the framework of dry, wind transported Russian thistles. No tall <u>Spartina</u> plants occurred in these areas. Ramps made of <u>Spartina</u> blades and other debris were built from each nest in Russian thistles to the ground (one-third of all nests located in Upper Newport Bay had such ramps associated with them). Russian thistles 1.2 m (4 ft.) or more in diameter were preferred, although 0.6 m (2 ft.) diameter bushes were also used. All nests among Russian thistles contained eggs, and hatching was successful in all of the nests.

ANALYSIS:

No data were collected on nesting habitat requirements of light-footed clapper rails at Anaheim Bay; no nests were located and only a few rails were seen. Censusing at Anaheim Bay by use of tape recorded calls was unsuccessful, possibly because efforts were made too late in the breeding season. Spring high tide survey was substituted as the census method. Comparative studies at Anaheim and Upper Newport bays suggest that the difference in breeding population size between Anaheim and Upper Newport bays is related to the lack at Anaheim Bay of tall cordgrass, which is the preferred nesting habitat of rails at Upper Newport Bay (this study) and Tijuana River (Jorgensen 1974). The height of the cordgrass may be important in preventing nests from being washed away at high spring tides. The reasons for the short growth of cordgrass at Anaheim Bay were not investigated, but they may be related to morphological characteristics of the marsh. The decline in the clapper rail population of Anaheim Bay since 1959 may, in turn, be related to changes in the morphology of the salt marsh, but this possibility was not investigated in this study. Successful use of uprooted Russian thistles for nesting in areas of Upper Newport Bay lacking tall cordgrass indicates that these bushes adequately secure nests at high spring tide inundation. This suggests a

management method for experimentally providing suitable nesting conditions at Anaheim Bay. Such a management technique may temporarily compensate for lack of suitable breeding habitat and allow the population to maintain itself until long-term habitat enhancement actions can be developed and implemented.

RECOMMENDATIONS:

- Experimentally place dead Russian thistles or similar objects approximately 3 m (10 ft.) from tidal channels at Anaheim Bay in March 1978 and monitor use by clapper rails during the breeding season.
- 2. Investigate factors inhibiting tall growth of <u>Spartina</u> <u>foliosa</u> in Anaheim Bay.
- 3. Expand clapper rail breeding habitat studies at Anaheim Bay to include investigations of food availability, water quality and predation.

LITERATURE CITED:

- Jorgensen, P. D. 1975. Habitat preference of the light-footed clapper rail in Tijuana Marsh, California. M. S. Thesis. Calif. State Univ., San Diego.
- Sexton, C. W. 1972. Clapper rails at Upper Newport Bay, California. Unpubl, M.S., Univ. of Calif., Irvine.
- Wilbur, S. W., and R. E. Tomlinson. 1976. The literature of the western clapper rails. Dept. of Interior, Fish and Wildl. Service, Spec. Sci. Rept. --Wildlife No. 194. Washington, D.C.

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