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**SAN JOSE PERMIT ASSISTANCE PROGRAM
CALIFORNIA CLAPPER RAIL
1990 WINTER PILOT SURVEY**

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EXECUTIVE SUMMARY

Surveys for California Clapper Rail (*Rallus longirostris obsoletus*) were carried out between January and March 1990 in eight South Bay marshes. Surveys were divided into two phases. The first phase was primarily a visual count of rails by boat within 7 marshes during a period of seasonal high tides. The second phase was an aural survey conducted on foot using call responses to determine locations of individual rails within three separate marshes.

A total of 23 rails was found within 8 marshes during both survey periods. Rails were detected in two brackish marshes where none had been found during a survey conducted the previous breeding season (Rigney et al. 1989). There was evidence of pre-breeding activity and pair bonding, which would indicate an earlier onset of breeding than previously recorded.

Recommendations are given for future winter surveys that would follow standardized protocol developed during the 1990 breeding season surveys.

INTRODUCTION

The California Clapper Rail was classified as an endangered species by the United States in 1970 and by the State of California in 1971. Since its listing as an endangered species, several researchers and personnel from the U.S. Fish and Wildlife Service and the California Department of Fish and Game have conducted periodic surveys of Clapper Rail populations in the San Francisco Bay. Survey techniques, timing of surveys, and marsh coverage have varied widely between these studies making comparisons of results difficult.

The majority of these previous surveys were conducted during winter high tide cycles. Relatively few studies have been conducted during the breeding season. In addition, most surveys, whether conducted in wintering or breeding season, were conducted in larger marshes while smaller, fringe marshes, such as those bordering Coyote Creek, Alviso and Guadalupe Slough, were examined sporadically or not at all.

Along Coyote Creek, marshes east of Drawbridge were also rarely surveyed. Foerster (1989) presented a summary of Clapper Rail winter censuses of marshes within the San Francisco Bay National Wildlife Refuge. Harvey (1988) described an overview of breeding censuses at major marshes within San Francisco Bay.

The California Clapper Rail Survey described in this report was conducted during the winter of 1990 to provide comparative data on rail numbers and distribution within some of the marshes surveyed intensively during the 1989 breeding season (Rigney et al. 1989).

METHODS

RECONNAISSANCE

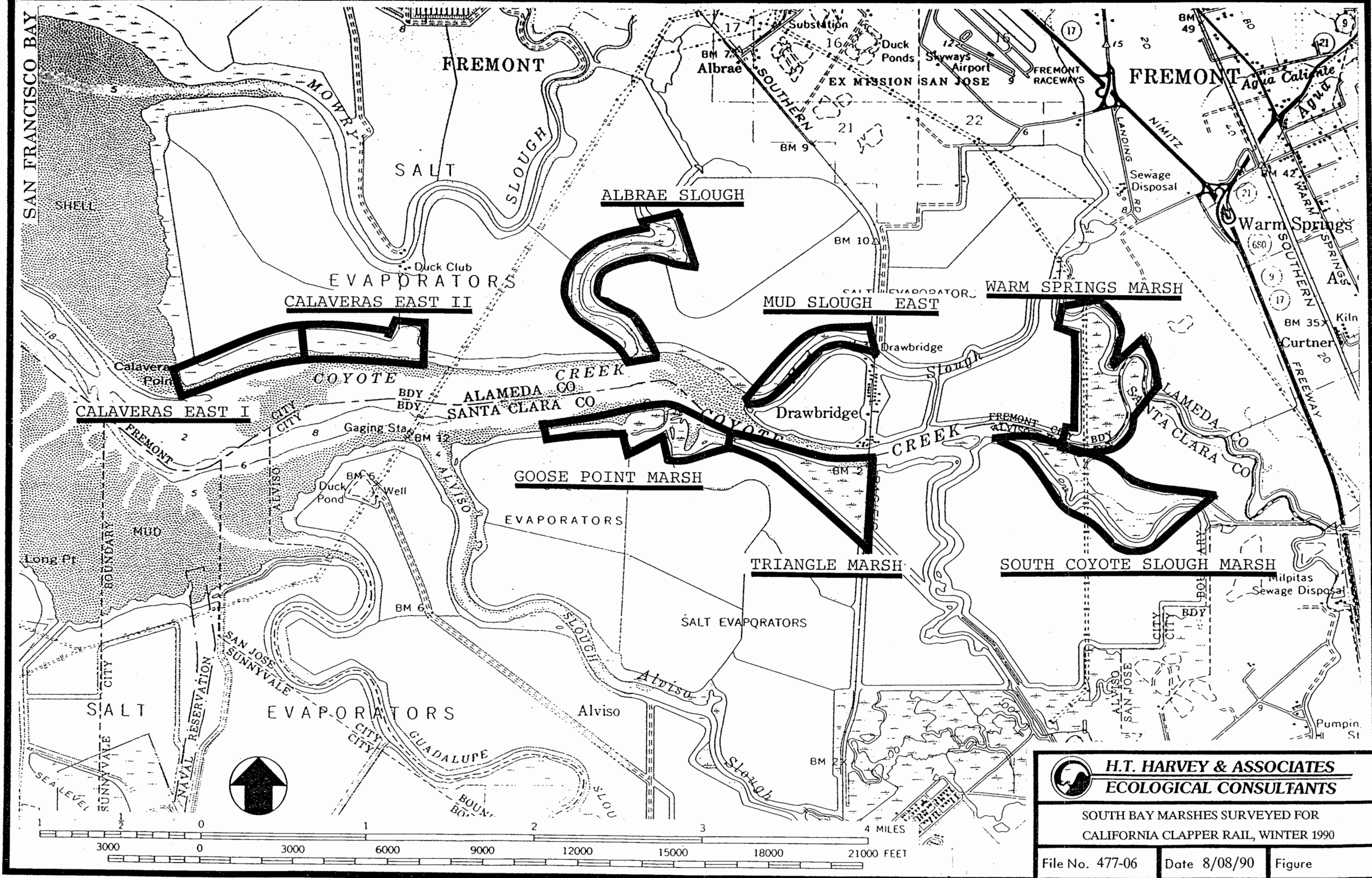
A brief reconnaissance was undertaken in the early afternoon of December 13. This survey consisted of two observers driving along a dike bordering the northwestern side of South Coyote Slough marsh while a second group of two observers walked along the southeastern side of the same marsh, playing taped calls of Clapper Rails and listening for responses.

PHASE 1: HIGH TIDE BOAT SURVEYS

Phase 1 surveys were performed on four consecutive days during the highest tides of January 1990. Survey methodology included boating slowly through large sloughs within marshes, recording visual and aural encounters of rails. Seven different marshes, (Albrae Slough, Calaveras East I and II, Mud Slough, Goose Point, South Coyote Slough Marsh, and Triangle Marsh) (Figure 1), were surveyed by boat between 8-11 February, 1990. Not all of the marshes surveyed during the 1989 census were surveyed during this study.

Two inflatable rubber boats were used; a Zodiac Mark II and an Avon Rover with two observers per boat making visual and auditory observations. Both groups motored or paddled slowly through different marshes during the same time period, about two hours prior to and one half hour after high tide. Each survey was completed in approximately two and one-half hours.

During the highest winter tides, rails are normally forced onto higher vegetation by the rising water, making them more visible. Since visual detection of Clapper Rails, even during high tides, is difficult, taped rail calls were used to elicit vocal responses by rails. A prerecorded cassette tape of various California Clapper Rail calls was played on a Realistic Amplified Speaker System, with one tape player and two Model 40-1303 speakers set at the highest volume possible. The tape was played at intervals and along various points within Triangle and Goose Point marshes. Responses by rails were recorded on maps traced from aerial photographs (1972, 1983) to determine approximate locations of birds. Where localization of calling pairs or individuals was possible, locations of calling rails were indicated on maps.



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SOUTH BAY MARSHES SURVEYED FOR
 CALIFORNIA CLAPPER RAIL, WINTER 1990

File No. 477-06	Date 8/08/90	Figure
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PHASE 2: LEVEE SURVEYS USING RECORDED CALLS

Phase 2 surveys were conducted on seven evenings from mid-February to early March and consisted of censuses on foot using prerecorded taped calls to provoke responses by rails in three selected marshes. Triangle Marsh and Warm Springs Marsh were each surveyed on two different nights, while South Coyote Slough Marsh was surveyed three different nights. Two observers, each covering a different portion of the marsh, walked slowly along a dike, catwalk or railroad track bordering a marsh, from sunset to up to two hours after sunset. At 100- to 200-foot intervals (marked by pre-measured flagging or pacing), the observer stopped and played a section of taped Clapper Rail calls on either a Sony Walkman Model WM-F31/F41/F42 stereo cassette player with Transcend Electronics Model TE-40 power-amplified speakers or a Realistic Amplified Speaker System, including a tape player equipped with two Model 40-1303 speakers.

Responses by rails were recorded on copies of the same maps used during the first survey period. In some instances, where obvious landmarks were not present or visible, compass bearings were taken and locations of calling rails estimated. Time, location and type of call were recorded on data sheets, along with weather conditions, temperature and wind speed before and after each census period. Call types followed Massey and Zembal (1987), and included the *clapper*, which is characteristic of a bird of either sex; the *duet* (alternating clapper calls), designating a mated pair; the *kek*, usually given by an unmated male; and the *kek-burr*, normally associated with an unmated female.

IDENTIFICATION OF INDIVIDUAL RAILS

For each marsh, results of all censuses were compiled and a minimum number of rails was determined. Where possible, identification of pairs and sex of individuals was determined by vocalizations, using Massey and Zembal's call criteria (1987) as a guide. Locations of rails were mapped using the following methods. If an individual or pair of rails were detected in the same general location during two separate censuses, the location was considered valid. If two or more rails called simultaneously within a marsh, each was rail considered a separate individual. Rails have been known to move some distance within a marsh in a short period of time, especially during the non-breeding season. For this reason, specific locations of rails could not be precisely plotted during this brief survey. Rail locations are shown in Figures 2 through 5. Multiple observations of rails in the same general locations are indicated on these maps as a symbol. Dashed lines around the symbol were drawn to indicate a range of movement of each rail or pair.

DETERMINATION OF NUMBERS OF RAILS AND CALCULATION OF DENSITY

This survey was a pilot study, with the main emphasis being placed on presence/absence and not minimum density of rails, therefore, results are presented in a qualitative, not quantitative manner. Previous breeding season studies consisted of three consecutive evening surveys in each marsh, therefore numbers and densities are not comparable to the winter data.

RESULTS

SUMMARY

A total of 23 Clapper Rails was counted in four different South Bay Marshes during Phase 1 and 2 survey periods, between 8 January and 7 March 1990 (Table 1). Four rails were counted in Goose Point Marsh, seven in South Coyote Slough Marsh, eight in Triangle Marsh, and four in Warm Springs Marsh (Figures 2 through 5).

RECONNAISSANCE SURVEYS

One and possibly two rails were detected during the reconnaissance survey in South Coyote Creek Marsh. These rails had responded to taped calls played back repeatedly during a 30- to 60-minute period.

PHASE 1: HIGH TIDE BOAT SURVEYS

During the first two days of the Phase 1 high tide boat surveys, no rails were observed. A possible squeak or "burr" call was heard along the western portion of South Coyote Slough Marsh, but the call was not definitively that of a California Clapper Rail.

Rails responded to taped calls at Goose Point Marsh on two consecutive days, 10 and 11 January. The maximum number of rails heard on one day in this marsh was two pairs, or four rails. The two pairs of rails were heard on 10 January, and a single pair was heard again on 11 January.

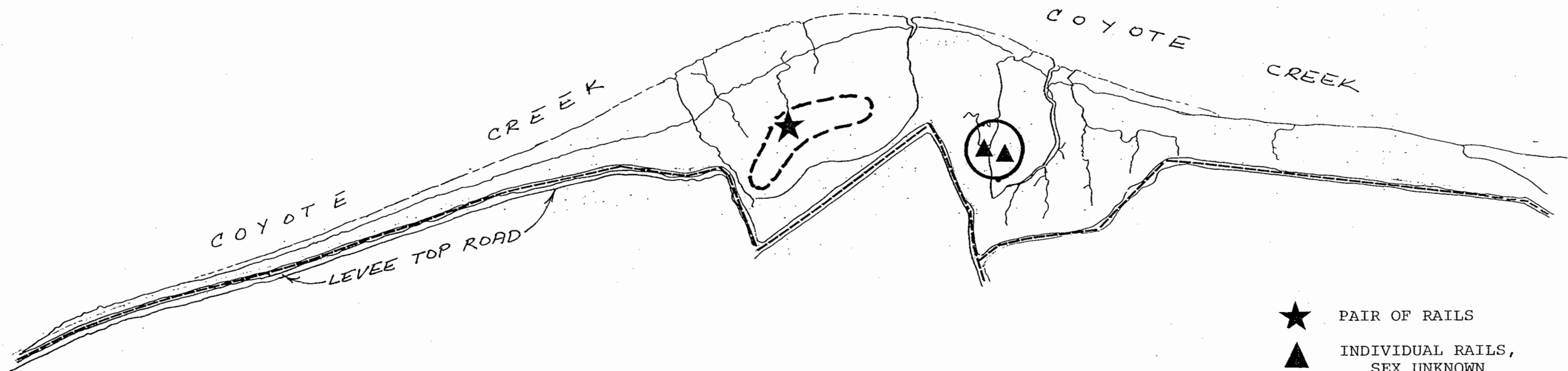
PHASE 2: LEVEE SURVEYS USING RECORDED CALLS

Eight rails were found in Triangle Marsh in Phase 2 surveys, whereas none had been observed there during Phase 1 surveys. One visual observation of a California Clapper Rail was made on 15 February in this marsh. This bird may have been associated with a second rail (possibly its mate) that subsequently called nearby. One male was distinguished by its characteristic "kek" call, advertising the male's unmated status, on 15 February. The presence of an advertising male probably indicated the onset of pre-breeding activity in this marsh.

TABLE 1. Summary of 1990 Winter Clapper Rail Surveys

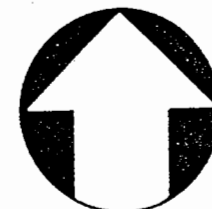
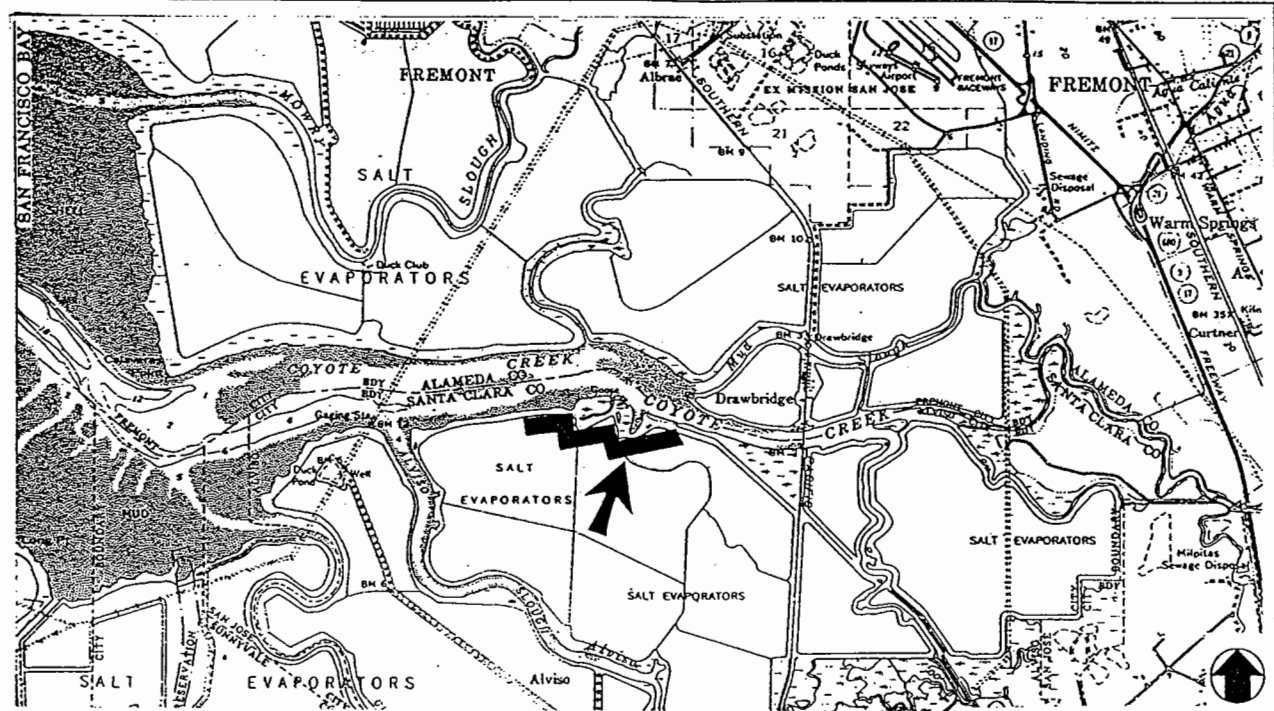
SITE	CENSUS PERIOD	NO. OF PAIRS	NO. *UNM. M	NO. *UNM. F	NO. UNK. SEX	TOTAL RAILS
Albrae Slough Marsh	1/11/90					0
Calaveras Pt. E I&II Marshes	1/8/90					0
Goose Point Marsh	1/10 - 1/11/90	2				4
South Coyote Slough Marsh	2/23, 2/26 & 3/7/90	1	3	2		7
Triangle Marsh	1/8 - 1/11/90 2/15 & 2/22/90				8	8
Warm Springs Marsh	2/12 & 2/14/90	1			2	4
TOTALS		4	3	2	10	23

*UNM = UNMATED



- ★ PAIR OF RAILS
- ▲ INDIVIDUAL RAILS, SEX UNKNOWN
- PROBABLE PAIR OF RAILS
- ⊖ POSSIBLE RANGE OF RAIL OR PAIR

LOCATION MAP



SCALE: 1" = 750'

MAP DRAWN FROM AERIAL PHOTO
DATE UNAVAILABLE

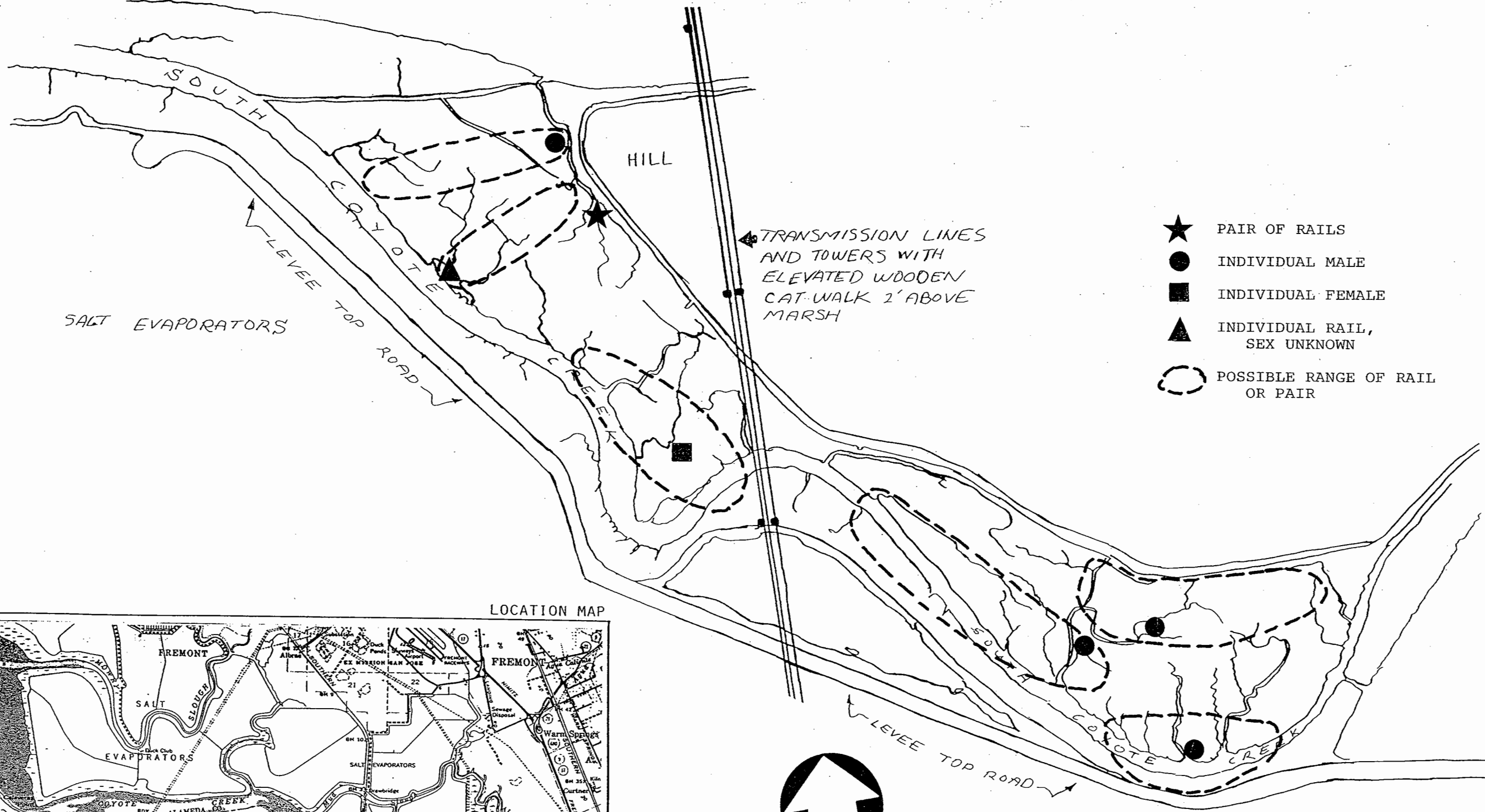
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LOCATIONS OF CALIFORNIA CLAPPER RAILS
IN WINTER 1990 IN GOOSE POINT MARSH

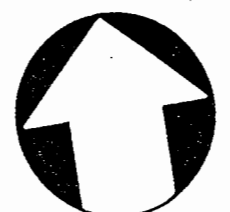
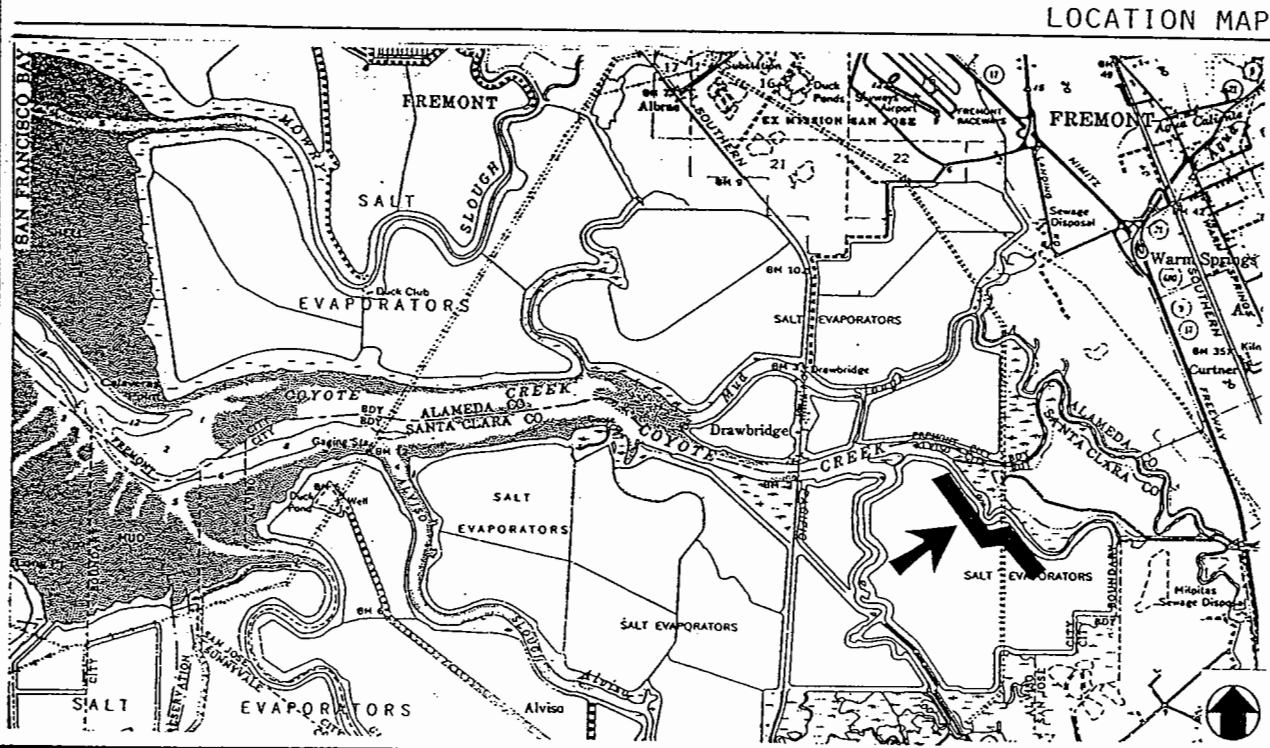
File No. 477-06

Date 8/08/90

Figure 2



- ★ PAIR OF RAILS
- INDIVIDUAL MALE
- INDIVIDUAL FEMALE
- ▲ INDIVIDUAL RAIL, SEX UNKNOWN
- POSSIBLE RANGE OF RAIL OR PAIR



SCALE: 1" = 500'

MAP DRAWN FROM AERIAL PHOTO DATED MAY 13, 1983

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LOCATIONS OF CALIFORNIA CLAPPER RAILS IN WINTER 1990 IN SOUTH COYOTE SLOUGH MARSH

File No. 477-06 Date 8/08/90 Figure 3

CREEK

MARSH

COYOTE

CREEK

MARSH

ROAD

SALT EVAPORATORS

LEVEE TOP ROAD

RAILROAD TRACK ON LEVEE TOP

SALT EVAPORATORS

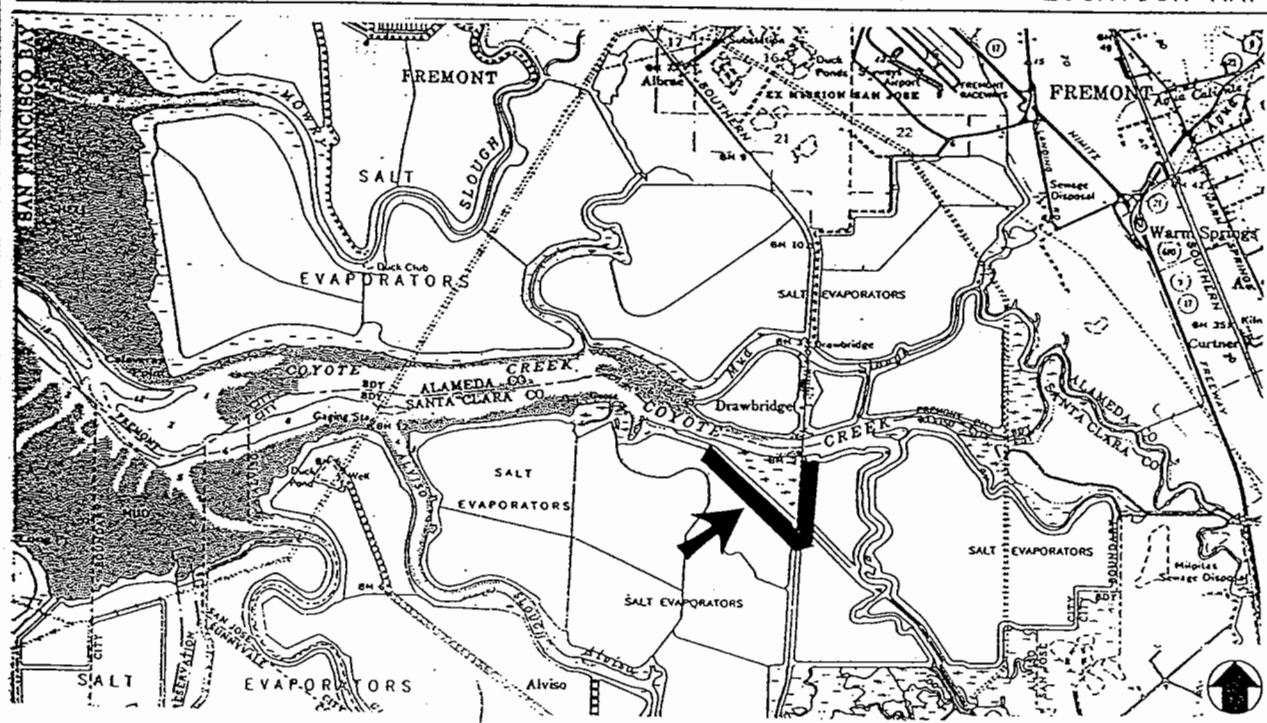
- INDIVIDUAL MALE
- ▲ INDIVIDUAL RAIL, UNKNOWN SEX
- PROBABLE PAIR OF RAILS
- POSSIBLE RANGE OF RAIL OR PAIR




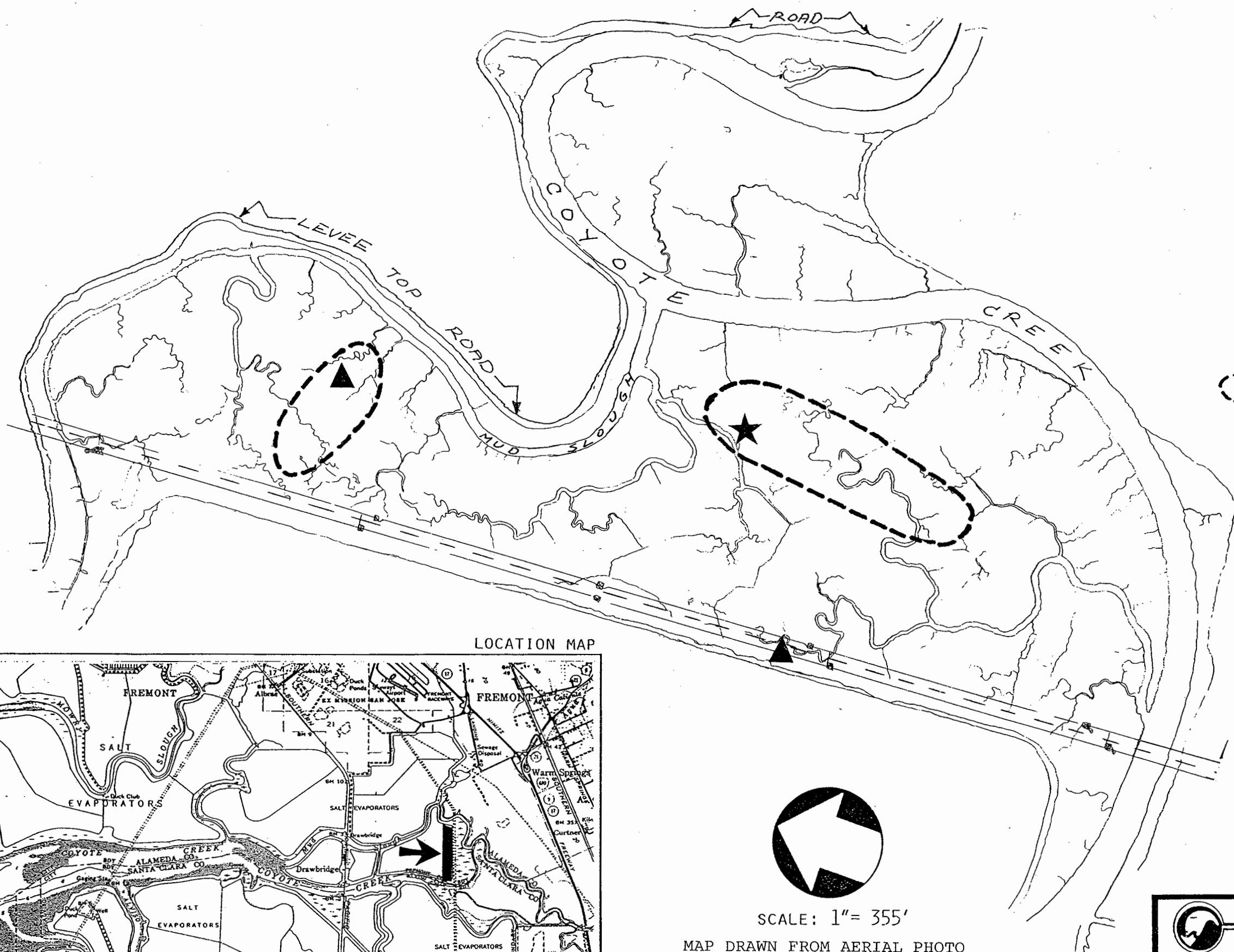
SCALE: 1" = 300'

MAP DRAWN FROM AERIAL PHOTO DATED DECEMBER 1972

LOCATION MAP

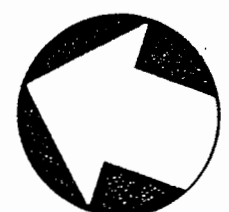
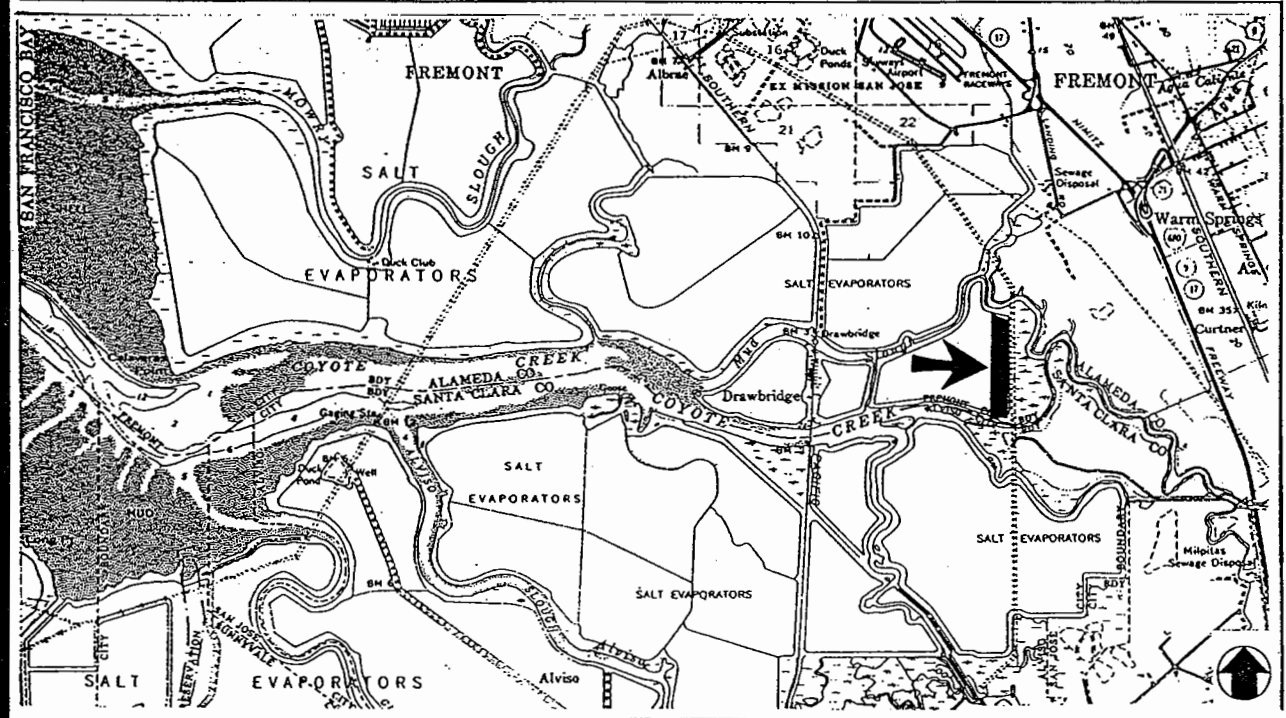


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LOCATIONS OF CALIFORNIA CLAPPER RAILS IN WINTER 1990 IN TRIANGLE MARSH		
File No. 477-06	Date 8/08/90	Figure 4




- ★ PAIR OF RAILS
- ▲ INDIVIDUAL RAIL, UNKNOWN SEX
- POSSIBLE RANGE OF RAIL OR PAIR

LOCATION MAP



SCALE: 1" = 355'

MAP DRAWN FROM AERIAL PHOTO DATED MAY 13, 1983

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LOCATIONS OF CALIFORNIA CLAPPER RAILS IN WINTER 1990 IN WARM SPRINGS MARSH		
File No. 477-06	Date 8/08/90	Figure 5

Seven rails were estimated to be present in South Coyote Slough Marsh, including one pair. Male advertising calls (kek) were heard as early as 26 February, and by 7 March, three males were using the "kek" call. Two females were heard giving their characteristic "kek-burr" advertising call on this date as well.

Four rails (one pair and two individuals) were found in Warm Springs Marsh. One pair of rails was heard "duetting", or giving simultaneous "clapper" calls, on 12 February, which may be somewhat early for the San Francisco Bay area. These rails were not very vocal, sometimes calling only once per night.

DETERMINATION OF NUMBERS OF RAILS AND CALCULATION OF DENSITY

Table 2 presents a compilation of results of the winter survey, as well as those of the 1989 breeding survey. As stated earlier, since the survey methods were not identical between the breeding and winter surveys, results cannot be compared quantitatively. Therefore, calculation of winter density figures was not appropriate.

Table 2. Comparison of results of Breeding and Winter Clapper Rail Surveys

SITE	Total Rails 1989 (1)	Total Rails 1990
Albrae Slough Marsh	6	0
Calaveras Pt. E I Marsh	11	0
Calaveras Pt. E II Marsh	14	0
Goose Point Marsh	19	4
Triangle Marsh	19	8
South Coyote Slough Marsh	0	7
Warm Springs Marsh	0	4
Totals	69	23

(1) 1989 Breeding Season Survey (Rigney et al. 1989)

(2) This Study

(3) Note: Survey effort was not equal between summer surveys and this pilot winter survey.

DISCUSSION

PRESENCE OF RAILS IN MARSHES IN WHICH NO RAILS WERE DETECTED DURING 1989 BREEDING SURVEY

It is notable that rails were found in two marshes during the winter survey where none had been detected during the 1989 Breeding Season Survey. These rails were detected in spite of the fact that sampling in the winter was not as extensive as in the summer. In the winter, evening call counts in each of three marshes were conducted on only two nights, none of which were consecutive. Evening call counts during the 1989 breeding season were conducted on three consecutive nights, which would allow for a greater probability of detecting rails.

A minimum of 7 rails were found in South Coyote Slough Marsh, and there may have been as many as 11 rails present. The minimum estimate took into account the total number of rails heard on any one night.

One explanation for the presence of rails in marshes where they had not been previously detected is that these rails may be juvenile birds which had dispersed from adjacent contiguous marshes following last year's (1989) breeding season. According to Massey and Zembal (1987) juveniles tend to move away from their natal territories in late summer and roam through the marsh. These juveniles may have found adequate food and cover resources within these two marshes to remain through the winter of 1989-1990.

Another explanation would be a temporary increase in total numbers of animals, leading to the use of marginal habitats. Since no thorough survey was completed, this hypothesis is not supported by current data.

Clapper rails may also move seasonally between marshes, so that rails which are present in relatively large numbers during the summer in certain marshes (such as Triangle and Goose Point Marshes) move to other habitats during the winter.

Such a shift could be in response to a variety of factors, but to date there is no evidence to suggest which factors may be involved, nor any substantive data to indicate that such shifts are occurring. However, there are a variety of factors which could be investigated, including differences in food abundance in the various marshes on a seasonal basis, or behavioral

adaptations which may cause rails to group more densely in the breeding season. A more thorough investigation of the winter distribution and the importance of various habitat and behavioral variables is warranted.

COMPARISON OF WINTER SURVEY RESULTS WITH USFWS WINTER SURVEYS IN SELECTED SOUTH BAY MARSHES

Personnel from the USFWS San Francisco Bay National Wildlife Refuge conducted winter high tide surveys from an airboat on 20 January. During these surveys they found no rails in Triangle Marsh and none in the marshes between Calaveras Point and Albrae Slough. They attributed the lack of sightings, in part, to lower than expected tidal levels during the survey period.

Although our high tide surveys yielded similar results in those marshes, our daytime and evening call count surveys revealed a total of 8 rails in Triangle Marsh and 4 rails in Goose Point Marsh (also called Grey Goose Marsh). This may indicate that the call count method is an effective way to determine comparative numbers of rails, even in the winter when Rails are generally thought to call less frequently than in the summer. However, pre-breeding activity may have enhanced the frequency of response to the taped calls.

POSSIBLE OVERLAP OF WINTER SURVEY INTO THE BREEDING SEASON

Apparently the 1990 breeding season began earlier than expected. During the high tide surveys, two pairs of rails were found in Goose Point Marsh on 10 January. These birds were thought to be pairs by virtue of their calling in unison, or "duetting". When evening call counts were conducted during February and March, one pair was detected in Warm Springs Marsh on 12 February, and another pair at South Coyote Slough Marsh on 26 February. In addition, one unmated male was found in Triangle Marsh on 15 February. Three unmated males were also found on 26 February in South Coyote Slough Marsh, and a survey on 7 March revealed both unmated males and two unmated females. The fact that evidence of courtship and pairing (detection of "advertising calls" and "duet") was found in four of the seven marshes during at least one of the survey nights indicates that breeding had commenced.

Harvey (1980) and Gill (1977) reported the nesting period of the California Clapper Rail as beginning in mid-April, though an earlier study found nesting to have begun in mid-March (De Groot, 1927). In an extensive study on the Clapper Rails of the Corte Madera Marsh, Evens and Page (1983) suggested that, given evidence of nesting beginning the first

week in March that pair bonding and nest building may have begun as early as February. In addition, the Corte Madera study found that pre-nesting activity may begin as early as December, as the highest number of vocalizations were recorded between December and March.

The 1989-90 Winter South Bay study also suggests that breeding activities may have been underway in February. This is borne out by the fact that two pairs of rails were found in Goose Point Marsh in January, and one pair in each of the South Coyote Slough and Warm Springs marshes in February.

COMPARISON OF RAIL NUMBERS IN TWO MARSHES DURING DIFFERENT SEASONS

The low numbers of rails found in Goose Point when compared with the breeding season may be attributable to a number of factors. The most likely explanation is that the winter and summer sampling were not conducted in a comparable manner. First, the Phase 1 surveys were carried out in the morning and a mid-day, when rails call least frequently. This marsh was not surveyed in the evening, so it is not known whether additional rails were present. Clapper Rails may also tend to vocalize more frequently during the breeding season than at other times of the year.

In Triangle Marsh, only eight rails were found in the winter survey, whereas 19 rails were found during the 1989 breeding season. This difference in numbers may also be due to rails calling less frequently during the winter than during the breeding season. However, the lower numbers of rails may, in fact, reflect a true biological phenomenon: Rail numbers in this marsh may be higher during the breeding season than during the winter.

The purpose of the Pilot Study was to gain general knowledge regarding the patterns of distribution and abundance, and recommend further studies, if warranted. The fact that rails were distributed in an entirely different pattern than in the summer suggests a series of surveys to better understand the ecology of Clapper Rails in the South Bay.

RECOMMENDATIONS FOR FUTURE CLAPPER RAIL WINTER SURVEYS

Since this year's winter survey was essentially a pilot study, survey methods were not standardized. It is recommended that future winter surveys in South Bay marshes use techniques similar to those used for breeding season surveys. This would allow for direct comparisons of the numbers detected in each marsh, and total numbers detected. With such surveys the

possible phenomena described above (juvenile dispersal, population peaks, shifts in prey abundance, seasonal shifts) could be detected. This more detailed knowledge of Rail ecology would be valuable in order to complete any assessment of possible effects of fresh-water effluent outfall from the San Jose/Santa Clara Water Treatment Facility.

Call counts should be made on at least three consecutive nights and follow a standard protocol. Transects of equal length should be set up along the levee edge of each marsh surveyed, with an equal number of census points per transect. Survey periods should begin at a set time each evening, for example, one-half hour before sunset, and continue for the same length of time.

Winter high tide counts should be conducted between December and January to exclude pre-breeding activity. These counts should be repeated at least twice for each marsh to allow for variability in weather, tide height, and other factors.

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