Focused Surveys for
Belding's Savannah Sparrow at the Ballona Wetlands, 2009

as part of the
Ballona Wetlands Biological Study

for the
U.S. Army Corps of Engineers
Post-Restoration Study
for the
Project Modifications for Improvement of the
Environment and Aquatic Ecosystem Restoration
at the Ballona Wetlands
Marina del Rey, CA

Final Report

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Introduction

This report summarizes the findings of five surveys conducted from April-March through June 2009 by Keane Biological Consulting (KBC) for the Belding's Savannah Sparrow (*Passerculus sandwichensis beldingi*[1]) at the Ballona Wetlands Study Area (Study Area) as part of the Ballona 1135 Restoration Project (BRP). The Belding's Savannah Sparrow (hereafter BSS) is listed as endangered under the California Endangered Species Act. KBC conducted surveys in the Study Area for the BSS in 2001 and 2004 for the U.S. Army Corps of Engineers, Los Angeles District (Corps), through the Corps contract with MEC Analytical Systems, Inc. – Weston Solutions, and in 2005, 2007 and 2008 as part of a contract with the City of Los Angeles Environmental Monitoring Division. The 2001 surveys were conducted prior to the installation of the self-regulating tide-gates, and the 2004, 2005, 2007 and 2008 surveys were conducted following the installation of the self-regulating tide-gates in spring 2003.

The goal of 2001 BSS surveys was to determine the number of breeding pairs and territories in the Study Area. Results of 2004, 2005, 2007 and 2008 surveys were compared with those of 2001 to ascertain whether the 1135 Restoration Project was successful in enhancing habitat for BSS. The estimated numbers of BSS territories were similar during 2001 (13-15), 2004 (12), 2005 (11), 2007 (12) and 2008 (14) surveys. However, because habitat changes in the Study Area are likely continuing with the enhanced tidal influence rendered by the BRP, the Ballona Wetlands 1135 Restoration Project Technical Advisory Committee (TAC) requested an additional year (2009) of post-restoration surveys be conducted by KBC through the City of Los Angeles Environmental Monitoring Division.

The Ballona 1135 Restoration Project (BRP) was implemented by the Corps in spring 2003 and included improvement of tide-gates between the Ballona Creek Channel and the Ballona Wetlands to increase tidal influence in the Study Area to a level of 1.1 m MLLW[2]. The BSS is known to nest in the Study Area in clumps of pickleweed (*Salicornia* sp.), a common plant of coastal salt marshes in California. The improved tidal flushing in the Study Area may beneficially affect the extent and health of pickleweed, which in turn may influence the Study Area's BSS population. Thus, the Corps requested BSS surveys to document effect of the BRP on BSS in the Study Area. As decided by the TAC after no apparent detrimental environmental impacts were shown by the available biological data and as described in the chosen inundation alternative (#5) of the Ecosystem Restoration Report (USACE 2000), another BRP tide-gate modification to 1.2 m MLLW was conducted August 29, 2007, but the tide-gates were soon returned 1.1 m MLLW after a malfunction was observed. No further modification was conducted; however, from June 2 through June 4, 2009, the tide-gates were wedged open due to a possible vandalism event, resulting in temporary flooding of a portion of the Study Area.

[1] Scientific names are provided only after the first mention of the common name in this document.

[2] m = meters; MLLW = Mean Lower Low Water, the average of the lower low water height of each tidal day recorded over a period called the National Tidal Datum Epoch.

The Study Area is located in Marina del Rey, California, and is bordered on the north by the Ballona Creek channel, on the south by the Southern California Gas (SCG) facility and adjacent bluff, on the west by the community of Playa del Rey, on the east by the SCG access road south of Culver Boulevard, and on the north by Culver Boulevard as it curves northeast (Figure 1).

Figure 1. Location of Study Area for Belding's Savannah Sparrow Surveys, 2009

Methods

Species Background

The savannah sparrow is a widespread and abundant species of North American open habitats south to northern El Salvador and Honduras. Seventeen subspecies are recognized, most of which are migratory, although several subspecies are year-round residents of coastal salt marshes. These include the large-billed savannah sparrow (*Passerculus sandwichensis rostratus*), which occurs along the east and west shores of the Gulf of California, and the BSS, which is found from Goleta Slough in Santa Barbara County to El Rosario, Baja California. The BSS is 5.5 inches long and is similar to other subspecies of savannah sparrows but is darker and heavily streaked on the back, breast, and sides (Wheelwright and Rising 1993).

The first statewide BSS survey was conducted in 1977, and statewide surveys have followed at five-year intervals. The 2001 statewide survey counted 2,902 territories, up 23.5% from the 1996 count of 2,350 pairs (Zembal and Hoffman 2001). The most recent statewide survey in 2006 estimated 3,139

BSS territories at 29 coastal salt marshes. This represents an 8.2% increase over 2001 surveys, primarily because of an increase at Mugu Lagoon, which supported 33.2% of the state's population (Zembal et al. 2006). Other populations are all under 300 territories, with the largest at Seal Beach National Wildlife Refuge (NWR) (289) and Tijuana Marsh NWR (274) (Zembal et al. 2006).

Savannah sparrows of other subspecies have likely benefited from human activity because of their preference for breeding in open habitats such as agricultural fields and grazing lands (Wheelwright and Rising 1993). However, the BSS, limited to coastal salt marshes, has declined in numbers over the past century due to destruction of suitable salt marsh habitat by filling for housing, industrial use and marina development (Garrett and Dunn 1981). Other factors affecting the population decline include loss of regular tidal connection with the ocean and inconsistent tidal influence on upper marsh habitat, disruptions in the natural drainage of coastal wetlands because of upstream development or flood control, human disturbance and exotic predators in marshes, especially feral and domestic cats and non-native red foxes (*Vulpes vulpes*). However, recent habitat protection and enhancement projects, such as those at Batiquitos Lagoon and the mouth of the Santa Ana River, have resulted in improvements in habitat conditions (CDFG 2000).

BSS-occupied habitat is dominated by pickleweed, sea-blite (*Suaeda* sp.), salt bush (*Atriplex* sp.), and salt grass. Although other subspecies subsist on a diet of insects during the summer and seeds during the winter, BSS eat crustaceans as well as pickleweed seeds. They may forage in nearby habitats including along rock jetties (Garrett and Dunn 1981) and are capable of drinking salt water. Nests are built low in pickleweed in middle to upper portions of salt marshes, or in non-tidal seepage areas dominated by pickleweed (Massey 1977). Other than cats and red foxes, BSS predators include several raptor species, clapper rail (*Rallus longirostris levipes*), striped skunk (*Mephites mephites*) and raccoon (*Procyon lotor*) (Wheelwright and Rising 1993).

Survey Methods

Suitable BSS habitat within the Study Area was surveyed in 2009 by Kathy Keane of KBC, focusing on pickleweed habitat east of the main channel (Eastside) and west of the main channel (Westside), three times in the spring (May 3, 15&17, and 25) to estimate the number of BSS territories, and twice in the summer (June 10 and June 29[3]) to estimate BSS productivity. Surveys were initiated between 6:00 a.m. and 6:30 a.m. and concluded by 11:00 a.m. No surveys were conducted in April since weather conditions were generally unseasonably cool, which likely delayed BSS nesting.

Spring survey methods followed those used by KBC during 2008 and previous BSS surveys, which are patterned after statewide censuses, as summarized in Zembal et al. (1988 and 2006). These methods entail walking slowly and stopping adjacent to all areas of suitable habitat and watching and listening for singing males and other breeding behavior (feeding young, carrying nesting material) to

[3] Family groups were also recorded when observed during the spring surveys May 3, May 15-17 and May 25.

estimate the number of breeding pairs or territories. Sightings of singing males, non-singing individuals or pairs, individuals carrying nesting material, and other pertinent observations were mapped on an aerial photograph of the Study Area. Field notes were recorded and included details on BSS behavior and evidence of potential BSS predators. GPS points were not recorded, as this would entail walking to the observed location, resulting in disturbance to BSS and possible damage to nests.

Methods for the summer surveys were similar to spring survey methods and entailed walking slowly and stopping adjacent to all areas of suitable BSS habitat. However, rather than searching for singing male BSS to census the approximate number of BSS territories, the summer surveys focused on estimating reproductive success by searching for BSS family groups (3 or more birds). The presence of a family group within a territory indicates that the BSS pair on that territory was successful that year at fledging (raised to flight stage) one or more young. Locations of family group sightings were mapped on the aerial photograph of the Study Area, and details of the sightings (number of birds and their behavior) were recorded on field notes.

In addition to field notes and observation maps, the survey route was drawn on an aerial photograph of the Study Area during each survey (Figure 2) and ensured that all areas of tidal and non-tidal salt marsh habitat dominated by pickleweed were visited. The direction of the survey route, and the order in which portions of the Study Area were surveyed, varied among survey dates so that portions of the Study Area were visited at different times of day. In addition, the routes were sometimes walked clockwise and other times counter-clockwise. This ensured that BSS territory holders that were more active at a particular time of the day were not missed. Finally, all birds observed during surveys were recorded on field notes; a list of birds observed during the 2009 surveys is provided in Appendix A of this report.

Figure 2. Map of Approximate Survey Route for 2009 Belding's Savannah Sparrow Surveys[4]

[4] Although the Study Area extends east of the survey route, no suitable BSS habitat is present further east.

Results

Spring Surveys

A summary of sightings for the three survey dates is provided in Appendix B. Sightings of territories within a similar area over the three spring 2009 surveys were inferred to be a single territory, the locations of which are shown in Figure 3, for a total estimate of 22 territories. BSS nests are very difficult to find, but a nest at territory 1 was observed May 25. Four family groups were also observed during spring surveys; these are depicted on Figure 4.

Figure 3. Approximate locations of Belding's Savannah Sparrow Territories, Spring 2009

Summer Surveys

Because parent BSS feed and remain with fledglings until they are a minimum of three weeks of age (Wheelright and Rising 1993), family group sightings were not counted as new if they were observed in the same area within a three- to five-week period. Family groups (FG) were observed during spring as well as summer surveys, and are numbered in Figure 4 according to the date they were first sighted. A total of 13 FGs were observed during 2009 surveys, as summarized below:

Four family groups were observed during the May surveys (FG-1 through FG-4—Figure 4):

- **FG-1** was observed during the first spring survey, on May 3. The FG-1 BSS pair may have successfully renested in the same area as **FG-12**.

- **FG-2** was also observed on May 3 as well as on May 17.
- **FG-3** was first observed May 25 and subsequently on June 10.
- **FG-4** was observed May 25 and was not seen again; see the discussion below.

Nine family groups were seen only during summer (June) surveys (FG-5 through FG-13)(Figure 4):

- **FG-5** was first observed June 10 and on June 29. A BSS nest was observed in this area May 25. **FG-6** and **FG-10** were also observed June 10 and 29.
- **FG-7**, **FG-8** and **FG-9** were only observed on one summer survey, June 10. If the young of these FGs survived, they may have migrated to areas of pickleweed within the Ballona Channel, or possibly to Ballona Area A north of the Ballona Creek, which has not been surveyed for BSS since 2001. If young did not survive, it is possible the parent BSS renested, as evidenced by territorial singing, and alarm calls suggesting the presence of a nest or young, throughout the Study Area during both summer surveys.
- **FG-11**, **FG-12** and **FG-13** were only observed on the last summer survey June 29. **FG-12** may be the result of a renest attempt by the BSS pair of **FG-1**.

The flooding event that extended from June 2 through early morning hours of June 5 may have resulted in inundation of some BSS nests, particularly those closest to the main channel. However, the majority of nesting occurs earlier (e.g., BSS statewide surveys by Zembal et al. [2006] were completed June 5, later than usual). Thus, the likelihood of damage to unhatched eggs or unfledged young was low. Young from the single BSS nest detected May 25 (see FG 5 below) may have fledged prior to the flooding event, as fledging occurs seven to nine days after hatching (Wheelright and Rising 1993). Nevertheless, the relatively dry soil observed in this area during the June 10 survey suggested that flooding did not extend to this far southeast of the tidegates.

Figure 4. Approximate locations of Belding's Savannah Sparrow family groups (FG), 2009

Conclusions and Recommendations

Comparison with Previous Surveys

Focused BSS surveys were conducted at Ballona from the late 1970's through the present, and BSS have been observed during all surveys (Table 1). Comparison among recent surveys suggests that the BSS population in the Study Area was fairly stable from 1998 through 2008 (Table 1). However, in 2009, estimated territory numbers increased by 57% to 22 (Table 1). This increase is believed to be due to increased tidal inundation following tide-gate modification in spring 2003. The increased tidal influence has resulted in improved habitat quality due to a reduction in the prevalence of non-native plant species in the pickleweed habitat of the Study Area. In addition, tracks of red foxes appear to be less prevalent than during previous years; thus, survival rates may be higher due to reduced predation.

Table 1. Estimated Belding's Savannah Sparrow Territories at Ballona Wetlands, 1977 to 2009

YEAR	ESTIMATED TERRITORIES	SURVEYS CONDUCTED BY
1977	37	Massey 1977
1979	21	Dock and Schreiber 1981
1980	18	Dock and Schreiber 1981
1981	13	Dock and Schreiber 1981
1982 – 1985	No data	--
1986	32	Zembal et al. 1988
1987	30	Massey 1987
1988	No data	--
1989	31	White and White 1989
1990	11-12	Corey and Massey 1990
1991	1 to 30 throughout the year	Corey 1991
1992 – 1993	No data	--
1994	10	Lockhart 1994
1995	21	Keane Biological Consulting 1996
1996	37[a]	John Konecny, USFWS
1997	No surveys	No surveys
1998	12 to 13	Keane Biological Consulting 1998
2001	13 to 15	Keane Biological Consulting 2001
2003	No estimate—construction monitoring only	Observations during tide gate construction by Russell Ruffing, City of Los Angeles
2004	12	Keane Biological Consulting 2004
2005	11	Keane Biological Consulting 2005
2006	12	Kathy Keane and Brad Henderson, for Zembal et al. 2006
2007	12	Keane Biological Consulting 2008a
2008	14	Keane Biological Consulting 2008b
2009	22	This study—Keane Biological Consulting

[a] this is likely an overestimate—see conclusions and recommendations

In addition to the increase in territories, one additional FG was observed in 2009 than in 2008 (Table 2). Thus, although suitable BSS habitat is limited, and the Study Area population is isolated from other BSS populations, BSS are managing, during years with adequate spring rainfall that results in abundant food (insects and pickleweed seeds), to successfully produce young sufficient to maintain or increase the BSS population in the Study Area.

Table 2. Estimated Belding's Savannah Sparrow Productivity at Ballona Wetlands, 2004 - 2009

YEAR	ESTIMATED FAMILY GROUPS
2004	2
2005	2
2006	No summer survey
2007	6
2008	12
2009	13

Similar to previous surveys, no BSS territories were detected in areas south of Culver Boulevard during the 2009 surveys. Some groundwater is present in this area that continues to nourish pickleweed, and areas without heavy growth of non-native species are present, but the pickleweed is dense and most of it lacks tidal influence. In addition, the area south of Culver lacks the berm that is present between Culver Boulevard and wetlands to the north, where the BSS population is located. This berm likely serves as a sound buffer for traffic noise, allowing BSS to communicate more effectively among individuals than they could south of Culver Boulevard. Finally, Culver Boulevard serves to some extent as a barrier for mammalian predators such as feral and domestic cats and ground squirrels (*Spermophilus beecheyi*) associated with residences of Playa del Rey south and west of the wetlands. Thus, BSS that attempt to nest south of Culver Boulevard may be more susceptible to predation from mammalian predators.

Recommendations

The BSS population at the Ballona Wetlands has been fairly stable from 1998 through 2008, followed by an increase in 2009. However, some parts of the Study Area appear to be converting from pickleweed species apparently more preferred by BSS (*Salicornia virginica*) to other salt marsh species including alkali weed (*Cressa truxilensis*) and jaumea (*Jaumea carnosa*). In addition, large portions of the Study Area, particularly the eastern portion not directly exposed to tidal inundation, remain dominated by non-native vegetation, as are berms and SCG service roads. Increased tidal inundation would enhance pickleweed habitat and minimize the prevalence of other salt marsh species, and the encroachment of non-native species, in BSS habitat. Manual removal of non-native habitat in the northeastern portion of the Study Area, followed by grading to tide level and tidal inundation, would greatly increase opportunities for BSS nesting and foraging.

Nevertheless, the fact that BSS territory numbers in 2009 were 57% higher than in 2008, and that the number of observed family groups in 2008 and 2009 doubled from previous years (Table 2), suggest that threats to BSS reproductive success in the Study Area are currently low. Further increases in the Study Area BSS population are possible but are likely to be moderate without habitat restoration.

Some of the alternatives proposed for the Ballona Wetlands Conceptual Restoration Plan (BWCRP) currently under study include replacing areas of non-native vegetation in the Study Area (as well as other areas of Ballona) with pickleweed. This would enhance habitat value for BSS, as would ongoing management of the red fox population. Alternative conceptual plans for restoration have been developed but are still under study as of the date of this report.

Increased tidal inundation to 1.2 m MLLW was initiated with tide-gate modification following KBC 2007 surveys, on August 29, 2007. However, the gates were soon returned to 1.1 m MLLW, their configuration following the first modification, due to an observed malfunction. A future tide-gate modification, again to 1.2 m MLLW, is expected but not yet scheduled. The additional modification is expected to enhance habitat value for BSS by eliminating some types of non-native vegetation that are not salt-tolerant. However, in the meantime, flooding events, such as that which occurred in early June 2009, should be prevented during the BSS breeding season. Installation of an alarm system that would signal a tide gate malfunction would be ideal; however, scheduled visual observations of tidal channel water levels during the BSS breeding season would serve a similar purpose.

The increased tidal influence is also expected to create suitable conditions for expansion of pickleweed suitable for BSS nesting into areas that are now barren mud flats. However, because BSS nests are generally on the ground or a few inches above the ground, and because much of the pickleweed currently inhabited by BSS is less than 10 inches tall, the inundation increase may flood some areas that support BSS nesting. This may result in a temporary loss of BSS nesting habitat until non-native vegetation is replaced with pickleweed, and until pickleweed can expand into new areas.

Thus, focused BSS surveys are recommended for a minimum of three years following future modification of tide-gates to document changes in the number of BSS territories in the Study Area. BSS surveys in Area A opposite Ballona Creek are also recommended for 2010. Focused BSS surveys have not been conducted at Area A since 2001. Although no longer tidally-influenced, areas of pickleweed are still present on Area A, and BSS nesting has been observed in areas of non-tidal pickleweed, such as at the Bolsa Chica Wetlands (James et al. 1998) prior to restoration. Thus, it is possible that BSS foraging, if not occasional nesting, may occur at Area A, particularly following the BSS population increase observed at the Study Area in 2009. Results of BSS surveys at Area A, along with those from continued surveys at the Study Area, will provide a comprehensive picture of BSS population dynamics within the overall Ballona Wetlands complex, which in turn will aid in understanding the Study Area population.

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APPENDIX A

LIST OF BIRD SPECIES OBSERVED AT THE

BALLONA WETLANDS STUDY AREA

2009

List of Birds Observed during Belding's Savannah Sparrow Surveys at Ballona Wetlands, 2009	
Family Pelecanidae	**Pelicans**
Pelecanus occidentalis	Brown Pelican (over Ballona Creek)
Family Phalacrocoracidae	**Cormorants**
Phalacrocorax auritus	Double-crested Cormorant
Family Ardeidae	**Herons and Egrets**
Ardea herodias	Great Blue Heron
Casmerodius albus	Great Egret
Egretta thula	Snowy Egret
Butorides virescens	Green Heron
Nycticorax nycticorax	Black-crowned Night-Heron
Family Anatidae	**Ducks and Geese**
Anas platyrhynchos	Mallard
Anas strepera	Gadwall
Family Accipitridae	**Hawks**
Accipiter cooperii	Cooper's Hawk [a]
Buteo jamaicensis	Red-tailed Hawk
Falco sparverius	American Kestrel
Family Charadriidae	**Plovers**
Pluvialis squatarola	Black-bellied Plover
Charadrius vociferus	Killdeer
Family Scolopacidae	**Sandpipers**
Tringa melanoleuca	Greater Yellowlegs
Catoptrophorus semipalmatus	Willet
Numenius phaeopus	Whimbrel
Numenius americanus	Long-billed Curlew
Limosa fedoa	Marbled Godwit
Family Laridae	**Gulls and Terns**
Larus occidentalis	Western Gull
Sterna caspia	Caspian Tern (over Ballona Creek)
Sterna antillarum	Least Tern
Sterna elegans	Elegant Tern[a] (over Ballona Creek)
Family Columbidae	**Pigeons and Doves**
Columba livia	Rock Dove
Zenaida macroura	Mourning Dove
Family Trocholidae	**Hummingbirds**
Calypte anna	Anna's Hummingbird
Selasphorus sasin	Allen's Hummingbird
Family Tyrannidae	**Tyrant Flycatchers**
Contopus sordidulus	Western Wood-pewee [a]
Sayornis nigricans	Black Phoebe
Myiarchus cinerascens	Ash-throated Flycatcher [a]
Tyrannus vociferans	Cassin's Kingbird [a]

List of Birds Observed during Belding's Savannah Sparrow Surveys at Ballona Wetlands, 2009	
continued	
Family Hirundinidae	**Swallows**
Tachycineta bicolor	Tree Swallow
Stelgidopteryx serripennis	Northern Rough-winged Swallow
Petrochelidon pyrrhonota	Cliff Swallow
Petrochelidon rustica	Barn Swallow
Family Corvidae	**Jays, Crows**
Aphelocoma californica	Western Scrub-Jay [a]
Corvus brachyrhynchos	American Crow
Corvux corax	Common Raven
Family Aegithalidae	**Bushtits**
Psaltriparus minimus	Bushtit
Family Mimidae	**Thrashers**
Mimus polyglottos	Northern Mockingbird
Family Sturnidae	**Starlings**
Sturnus vulgaris	European Starling
Family Parulidae	**Wood Warblers**
Geothlypis trichas	Common Yellowthroat
Vermivora ruficapilla	Nashville Warbler [a]
Wilsonia pusilla	Wilson's Warbler [a]
Family Emberizidae	**Sparrows and Towhees**
Pipilo crissalis	California Towhee
Passerculus sandwichensis	Savannah Sparrow
Melospiza melodia	Song Sparrow
Family Icteridae	**Meadowlarks, Blackbirds, Orioles**
Quiscalus mexicanus	Great-tailed Grackle [a]
Molothrus ater	Brown-headed Cowbird
Family Fringilidae	**Finches**
Carpodacus mexicanus	House Finch
Carduelis psaltria	Lesser Goldfinch
Family Passeridae	**Old World Sparrows**
Passer domesticus	House Sparrow

[a] not recorded during 2008 surveys

APPENDIX B

SUMMARY OF BELDING'S SAVANNAH SPARROW

TERRITORIES OBSERVED

DURING SPRING SURVEYS

AT THE

BALLONA WETLANDS STUDY AREA

2009

ID for composite map (Figure 3)	ID for May 3 survey (Figure B-1)	ID for May 15-17 survey (Figure B-2)	ID for May 25 survey (Figure B-3)	date family group observed	Pertinent Notes
EAST SIDE					
1	18	1	17		nest observed May 25, on the ground under 1-ft diameter patch of pickleweed; 3 newly-hatched chicks
2	1	21	1	3-May & 15-May	
3	16 & 17	2 & 3	not seen		Flushed as if from nest May 3
4	15	4&5	16		Singing from fennel May 3
5	2	19&20	4		Fledgling buzz heard May 25 but not seen
6	3	18	5&6	3-May	Singing from rebar May 15
7	4	16&17	7	25-May	Seen w food for young May 15
8	5&7	13	8&9		
9	13	14	13		
10	11	9	not seen	3-May	Singing from saltbush May 17
11	10&12	10&11	10&12	17-May	Seen w food for young May 17
12	8	12	11		
13	9	8	not seen		Territorial chase w May 17 #7
14	not seen	7	14		
15	not seen	6&11	15		
WEST SIDE[a]					
16	19	5 (west)	18		Flushed as if from nest May 17
17	21	4 (west)	20		
18	20	not seen	19		Fledgling buzz heard May 3 but not seen
19	6	6 (west)	not seen	3-May	
20	22	1 (west)	21	17-May	Territorial chase w May 3 #23
21	23	2 (west)	22	25-May	
22	24	3 (west)	not seen		

[a] on May 15-17, birds observed on the west side of the main channel were numbered 1 through 6 instead of continuing numbers from the east side as on May 3 and May 25. See Figure B-2.

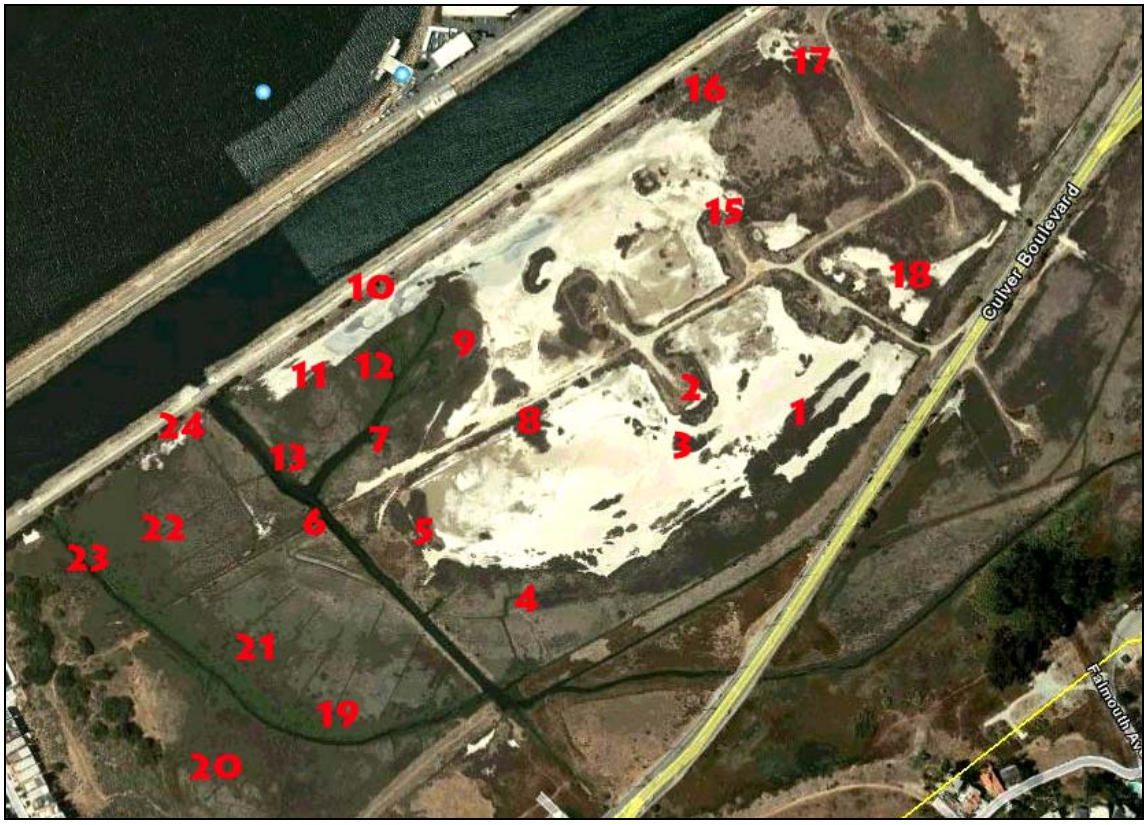

Figure B-1: Territories observed during May 3 survey

Figure B-2: Territories observed during May 15-17 survey
(numbers for the west side were not continued from the east side for this survey)

Figure B-3: Territories observed during May 25 survey