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Date: May 5, 2009

To: Marin Audubon Society, P.O. Box 599, Mill Valley, CA 94942

Re: Comments on the San Rafael Airport Recreational Facility—Draft EIR

Scope

Avocet Research Associates (ARA) was asked by Marin Audubon Society (MAS) to comment on the Draft EIR for the San Rafael Airport Recreational Facility (March 2009) with special attention to Chapter 7, "Biological Resources" and the supporting "Biological Resource Analysis" prepared by Monk & Associates, April 14, 2008 (Appendix E).

Qualifications

Jules Evens, Principal of ARA, has been conducting protocol-level rail surveys of the tidal wetlands associated with the Gallinas Creek drainage system intermittently since the early 1990s (Evens and Collins 1992, Collins *et al.* 1994.) Since 2004, ARA, in co-operation with Point Reyes Bird Observatory Conservation Science (PRBO) and the Invasive San Francisco Bay *Spartina* Project (ISP), has been conducting comprehensive surveys of the entire San Francisco Bay estuary to monitor distribution and abundance of the California Clapper Rail (CCR); Gallinas Creek is one of the sites that we have focused on. In prior years, our efforts were focused on the north branch of Gallinas Creek, the Santa Venetia wetland parcel, and Santa Margarita Island (ARA 2004). In 2009, ARA was contracted by Winzler and Kelly, Inc. to conduct comprehensive surveys of CCR in the Gallinas Creek system to address U.S. Fish and Wildlife Service requirements associated with a proposed dredging project (ARA 2009).

General comments on the DEIR and California Clapper Rail.

My primary focus in this review of the DEIR is with references to the federal- and state-endagered California Clapper Rail (CCR) with some comments on the state-threatened California Black Rail (CBR).

The entire population of CCR is confined to the tidal marshes of San Francisco Bay (Alberton and Evens 2000). Numbers of *CCR were* estimated at 4,000–6,000 birds in mid-1970s, 1,000 in mid-1980s, <700 by 1988, <500 by 1991, and by 1996 <300 (U.S. Dept. of the Interior 1991). More recent data suggests that the population has rebounded somewhat over the last decade in response to active predator control, improved habitat mangement, effective wetland restoration, and "best management practivces" employed by federal, state, and municipal agencies. The most recent estimates suggest that approximately 1500 California Clapper Rails remain in the San Francisco estuary with about one-third of the population in San Pablo Bay and two-thirds in the Central and South bays, combined (Albertson and Evens 2000, ARA 2004, USFWS unpubl. data). The recent invasion of the San Francisco Estuary by an aggressive non-native cordgrass (*Spartina alterniflora*) has had a dramatic effect on the distribution of the CCR populations in the Central and South bays and the long-term impacts of this alteration of the primary habitat on CCR viability throughout much of its range is as yet uncertain (Evens *et al.* In press). Because the non-native cordgrass invasion is limited so far to Central and South bays, the value of San Pablo Bay has increased as it is the only intact habitat refuge remaining for the CCR (Evens *et al.* In press.) It is also relevant that the Gallinas Creek tidelands and the associated bayshore marshes, south to China Camp and north to Hamilton Field, support the highest numbers of CCRs in San Pablo Bay (ARA 2004).

When dealing with such a criticaly endangered species in such diminished habitat, it is incumbant upon regulatory agencies to employ the "precautionary

principle" (Kriebel *et al.* 2001), that is, to rely on the most recent data available and to make only the most conservative assumptions about population viability, vulnerability, and the potential for impacts.

The DEIR does not exercise precaution, rather it makes assertions about rail distribution (locations within the system) based on dated data and makes assumptions about impacts that are supported only by subjective opinion.

The Invasive Spartina Project (ISP), an ongoing effort to control an invasive cordgrass and protect the CCR, produced a valuable and peer-reviewed white paper entitled "Best Management Practices for the Avoidance and Minimization of Indirect Impacts from *Spartina* Control Program Activities on the Endangered California Clapper Rail".[1] As that paper asserts, "Many direct and indirect impacts of Spartina Control Program activities on clapper rails . . . can be minimized or avoided by altering the location or timing of control activities subsequent to early detection of clapper rail presence in project areas." Such conservative measures should be applied to this proposed project to ensure protection of the CCR.

Relevance of the CCR distribution data used in the DEIR.

The DEIR draws on data collected in 2005 (ARA 2006) and the 2007 surveys by Monk & Associates and draws very site-specific conclusions about rail distribution based on observations from those earlier studies. ARA's more recent surveys provide more accurate distributional data (ARA 2009, attached). The 2009 surveys were more recent, more intensive (20 stations covered on six dates) than either of the field earlier efforts, and covered a broader ranger of dates (January 17-March 13) during the protocol period. CCR populations are highly dynamic, numbers tend to exhibit fluctuations year-to-year, and rail vocalizations (the primary means of detection) can vary widely within a given survey season (Ferringo 1966, Gill 1979, Collins *et al.* 1994). Therefore, it is

misleading to assume that results of a single year's observations and locations give an accurate account of habitat use. The lack of detections within a given habitat patch, or along a given section of a marshland, does not mean that CCRs are not using that area or that that area is of less importance to their reproductive success than areas where nesting activity is observed or inferred. CCRs tend to be highly furtive in the vicinity of a nest site; rail activity (either visual or aural detections) noted by field observers indicates locations within the adult rail's territory or home range, but does not advertise a nest location. Indeed, one would expect less observable activity in the immediate vicinity of the nest than elsewhere within the territory.

The DEIR contains the following statement on page 7-39:

> *Two pairs of clapper rails were observed or heard in the North Fork of Gallinas Creek near the project site during the survey . . . In March, the activity of these two pairs were mostly confined or centered on two areas on the north bank of the North Fork of Gallinas Creek on the opposite side of the creek from the Project site . . . the rails likely selected these areas for nesting* [emphasis added] *because the band of marsh habitat on the north side of the creek at the two locations is uncharacteristically wide, approximately 100 feet in width.*

Detection does not necessarily indicate nesting location (indeed, it probably does not), however, it does indicate occupied territory. Furthermore, in our 2009 study, ARA had detection (double clatter, March 3, 2009) on the south side of the north branch, very near Station 3 in the M&A surveys (Figure 2.) Incidentally, the marsh on the south side of the creek at the location plotted in Figure 2 is 78 feet in width. The DEIR inference that the north bank is more suitable habitat is specious. There is no reason to assume that CCRs do not use both sides of the channel; rather, they incorporate all available habitat into their home range.

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[1] http://www.spartina.org/Spartina_Draft_EIR/html/Appendix_G.htm

The primary point of the foregoing discussion is that detections, even multiple detections in a given year, do not allow us to delineate the rail's habitat use within a confined portion of the tidal marsh. In fact, CCRs use all potions of emergent marshes depending on tidal levels, time of day, season, disturbance, predation pressure and a host of other variables. Linear marsh areas are important as foraging areas and connectivity corridors. Adjacent upland provides important refugial habitat during high water periods.

Exceptional numbers of CCRs were detected in the Gallinas Creek system during the 2009 survey period, with a minimum of 13-22 pairs estimated, a higher number of detections in the upstream reaches of the system (both the north and south branches) than in our previous experience (ARA 2009; Figure 1 & Appendix A). CCRs were detected on both the north and south shores of the north branch, and birds were seen swimming from one side of the slough to the other, indicating that territories are not confined to one side or the other, but encompass both shorelines.

Clarification of statements attributed to Jules Evens (p 7-39).

"Dr. Evens" should be changed to "Mr. Evens," as I have a MA, not a PhD. I did meet with Mr. Monk and Ms. Anderson on April 10, 2007 but would like to provide some clarification to the opinions attributed to me. I may have concurred that rails occur in the tidal prism of the creek, but not that they are "confined" to that habitat. In several papers and reports I (and others) have emphasized that one of the habitat requirements of viable CCR habitat is a dense cover of transitional habitat between the marsh and the upland, a fringing buffer zone of dense halophytes and upland vegetation to provide refuge during periods of high water (Collins *et al.* 1994, Albertson and Evens 2000, Evens *et al.* In press). Transitional buffer zones are also a critical component of the state-threatened California Black Rail (CBR)

in April 2007, but I would add that that judgment is relevant only for that year of surveys. As I've stated above, and as is exemplified by our 2009 survey work (ARA 2009), rail populations are dynamic with shifting densities and distributions among years and seasons. Again, it is important to emphasize that the entire tidal marsh system and its adjacent habitat (i.e. buffer zone) is critical to maintaining viable habitat and that a single snapshot in time (one year, one set of surveys) should not be used to delimit CCR habitat use within the system.

The statement (page 7-39) "Dr. Evens further stated that clapper rails that live in areas with heavy disturbances (similar to the conditions surrounding the project site) tend to become habituated and less elusive, such as the Clapper rails are in the vicinity of the Project site" requires explanation and context. It is not an accurate portrayal of my opinion, but was off-the-cuff speculation. What I believe I expressed, or meant to express to Mr. Monk and Ms. Anderson, was my impression that at *some sites* where there is consistent human foot traffic, rails *seem* to be habituated to humans and are therefore easier to see. (Examples are Arrowhead Marsh, Muzzi Marsh, Paol Alto Baylands.) This does not mean that habituation to human presence is beneficial to rail populations. It may be that human presence is concentrated in more urban areas where there are fewer red fox, an aggressive predator of CCRs (Albertson and Evens 2000); in the absence of foxes, *perhaps* CCRs can afford to be less furtive. Again, these thoughts are speculative musings, not facts that mitigate potential impacts to the CCR. There are no available studies evaluating the reproductive success of rails in marshes adjacent to human foot traffic and we know very little about

CCR reproductive success in general. We do know that the decline in the rail population around San Francisco Bay has coincided with increased urbanization of the estuary (Gill 1979, Albertson and Evens 2000, etc.), that the population is critically endangered and experiencing ongoing threats (Eddleman and Conway 1998, Albertson and Evens 2000, Hertzog *et al.* 2005, Evens *et al.* In press.) Based on this knowledge and the taxon's endangered status, there is a critical requirement to exercise precaution and employ best management practices.

Assumptions regarding impacts from the proposed project

The assertion that "the proposed project will not impact marsh habitats along Gallinas Creek" (p. 7-40) needs substantiation. The question of impacts should consider buffer zone requirements to protect CCRs from disturbance. The USFWS has two distance requirements it assigns to projects proximate to occupied CCR habitat:

1) For construction that occurs during the nesting season, potential disturbance should be 700' from the "center of a territory" (defined as the central point in clusters of observations). This distance was determined by the USFWS based on telemetry studies (Albertson 1995) that estimated the average area of a CCR home range equivalent to a circle with a 450' radius; the Service then added a 250' buffer zone to that distance to arrive at 700 ft.
2) For construction adjacent to occupied habitat, especially construction that involves percussive noise or high decibel (>60 dBA) activity, a set back of 250 feet has been the standard set back required by the Service. (This buffer distance is site specific, and may be reduced if topographic features, or sound barrier curtains are used to attenuate noise.

An alternative mitigation would be to relocate the project site so it was farther from the occupied tidal marsh area. Changing the location of the proposed structure to increase distances from sensitive habitat.

California Black Rail account: outdated information.

The information on the distribution of CBR provided on page 7-41 of the DEIR is outdated. During 2009 survey, we had territorial calling 0.48 miles CBRs upstream from project site and 0.49 miles downstream (Figure 1 & Appendix A).

Impact analysis

Page 7-64; paragraph 1:

1) Based on the results of ARAs surveys in 2009, and the locations of CCR detections, the distance of occupied habitat to the proposed Project site should be 131 feet to territorial birds and 76 feet to occupied habitat (modify Figure 7-4 in DEIR).
2) The sentence "The nest sites were situated in areas where there is a significantly wider band of tidal marsh vegetation" is in error. Nests were not detected during the M&A surveys, rather their position was inferred from vocalization data. As discussed above, the location of the nest may have been some distance from the detected rails.
3) The implication that CCRs that were only using habitat on the north side of the creek is no longer relevant. The 2009 study found birds associated with the habitat on the south bank, closer to the proposed project site.
4) The statement "They [CCRs] were never observed on the top of the levee or the outboard side of the levee on the Project site" is irrelevant and misleading. Irrelevant because CCRs have since been observed on the outboard side of the levee (ARA 2009). Misleading because M&A surveys were conducted on tides <4.5', as per the protocol requirements. Levee flanks, tops and other habitat adjacent

to tidal marsh habitats is used by CCRs when the marsh plain is inundated, i.e. >4.5'.

Page 7-64: paragraph 3:

The statement "The distance between the proposed recreational facility . . . and the top of the levee along the North Fork of Gallinas Creek will be 100 feet or greater, as shown in the Project site plan (see Figure 7-4)" is in error. Figure 7-4 is not to the proper scale to measure the distance. Figure 7-5 does provide a measurable scale. Using that figure superimposed on Google Earth provides a measurement from the Project Boundary (red line) to the levee top of 75 to 80 feet. The assumption that the levee will provide "additional buffering effect" will not protect CCR (or other marsh-dependent vertebrates) when the marsh plain is flooded and the levee top is used as refugial habitat. As discussed above (p. 7), a more appropriate buffer zone to protect CCR from both construction and operational activity would be 250 feet, as prescribed by USFWS.

Page 7-65: paragraph 2:

Percussive noises associated with pile driving are likely to have an impact to nesting rails. Timing of construction activity, if approved, should restrict the generation of percussive noises to the non-nesting season (September 1-February 1) as per USFWS guidelines.

Page 7-65: paragraph 3:

The contention that noise impacts generated by the project "are not expected to adversely affect" CCRs is a subjective judgment without substantiating data. The DEIR accepts the fact that human activity levels generated by the proposed project will increase over existing levels. Whether or not the "rails living in the area have already become accustomed to heavy human disturbances," there is no way to determine if these disturbances are affecting reproductive success, what the threshold

of disturbance is, and whether future recruits to the population will be impacted. Again, a precautionary approach would be appropriate.

Noise impacts

The DEIR states: "Indirect impacts [to rails] could result from noise generated during project construction . . . [and that] unless mitigated, these impacts would be *potentially significant*." (p. 2-8). Recommended mitigation measures (Table 2-1) in the DEIR provide an "avoidance window" so that "Construction activity shall not commence until July 1st when the rails can be expected, in most cases to have fledged young" (p. 2-11). This avoidance window does not conform to the window prescribed by USFWS; the Service designates the nesting season as February 1 to August 31 (J. Browning, USFWS Office of Endangered Species, pers. comm. May 5, 2009). The DEIR mitigation in Table 2-1 should state: "Construction activity shall not commence until September 1 . . . "

Section12 addresses noise impacts and reports "that ambient noise levels on the Project site ... are relatively low (35 to 45 dBA L_{eq}) most of the time" (p-12-2). The noise study in the DEIR estimates "construction activities would produce typical hourly average noise levels of 65 to 70 dBA at the shoreline trail, 63 to 68 dBA." (Chapter 12). However, in Table 2-1 it recommends limiting "high decibel construction equipment (70-90 dBA) to areas at least 200 feet from the North Fork of Gallinas Creek. This set back distance is not precautionary enough to avoid impacts, as is illustrated by the following case study.

Construction noise for a wetland restoration was identified as a potential stressor to the endangered Light-footed Clapper Rail (the same species as CCR) in Southern California.[2]

The Proposed Project would result in a significant noise impact if

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[2] Kimley-Horn and Associates. 2005. Noise Impact analysis. Tijuana River Valley Regional Park Trails and Habitat Enhancement Project. Prepared for Environmental Services Unit.San Diego Department of Public Works http://www.sdcounty.ca.gov/reusable_components/images/parks/doc/HTJ_River_Noise_Technical_Report.pdf

habitat restoration and/or the construction and closing of trails occur within 300 feet of least Bell's vireo, California gnatcatcher, or Light-footed clapper rail habitat during the breeding season (February 15 through August 30). If equipment such as a loader, grader or tractor is required during the breeding season, a site-specific mitigation plan should be developed to identify noise control measures that should be implemented. These measures could include noise barriers and/or time constraints for equipment use.

Analysis determined that if construction noise above 60 dBA Leq(h) within 300 feet of occupied habitat would result in significant impact to rails (and two other listed avian species). That study concluded: "The impact can be mitigated by working outside of the breeding season or by using hand tools." In the case of the CCR, the breeding season extends from February 1 to August 31 (USFWS, op. cit.). An avoidance window of September 1-January 31 should be required of this project.

The Noise Section of DEIR (Section 12), thoroughly discusses impacts to nearby residents, but does not adequately address potential noise impacts to the endangered CCR. The following estimate of construction noise is cause for concern given the proximity of the construction site to occupied rail habitat: "It is expected that the project would require the driving of up to 100 piles to provide a foundation for the proposed building. A diesel-powered pile driving hammer would be used to seat piles . . . [that] generate noise levels of 100 dBa at 100 feet during each blow" (p 12-23). The DEIR does not provide mitigation measures that would reduce potential impacts on CCR and other wildlife species in the tidal wetlands.

Operational Impacts

The foregoing discussion focuses mostly on project location and construction impacts. If and when the project is approved and built, daily

activities, especially outdoor sporting events, also pose potential sources of disturbance to CCRs. Those operational impacts most likely to disturb or disrupt CCR reproductive efforts are listed, below.

- Outdoor soccer area setbacks (118-173 feet): Insufficient buffer.
- Night lighting: increased vulnerability of CCR to nocturnal predation, especially by house cats. (Of utmost concern is the lighting along the northern edge of the soccer field closest to Gallinas Creek (p 3-16)
- Intrusion into the habitat by errant soccer balls.

Best Management Practices (adapted or taken *verbatim* from ISP 2003): emphasis (underlined text, added).

Proximity

If a project site includes suitable clapper rail habitat, and lies within a cluster of recent (ca. 5- to 10-year) recorded locations of clapper rails, clapper rails are presumed to be potentially present. In this case, the [project site and areas which may be affected by its activities] must be surveyed for clapper rails by a qualified biologist during the same breeding season in which activities are proposed. The survey zone would presumably include all marsh within approximately 700 feet of the proposed project site boundaries.

Construction window (timing)

If clapper rails are determined to be present at a proposed project . . .most or all [construction] activities may be restricted to the non-breeding season of the clapper rail, as determined by the U.S. Fish and Wildlife Service. The non-breeding season (lack of nesting, brooding) most recently has been interpreted as a relatively short period between September and February. [September 1 to January 1—USFWS pers. comm..]

On-site monitoring

Activities of field crews [or construction crews] will require variable degrees of on-site field biologist supervision, depending on the degree of residual risk of

clapper rail impacts.

Pre-project implementation protocols

Site-specific project plans will be adapted to updated field conditions and most recent field survey information regarding clapper rails before construction equipment and crews are mobilized to the project site. Access routes for equipment and field crews will be staked out and described. Clearly visible flags, either set or approved by field biologists with expertise in clapper rail biology, will mark restricted areas and buffer zones for activities. Flags will be removed whenever operations are inactive to avoid providing scent-cues for foraging predators, especially red fox. Configuration of flagged restricted areas will be based on field survey data, and interpretation of rail behavior and habitat structure. Written site-specific precautions for work crews will be prepared by, or in consultation with, clapper rail expert biologists. These precautions will be distributed and explained to work crews by on-site biological supervisors.

Post-project monitoring and reporting

Marsh areas adjacent to the project area will be re-surveyed for clapper rails, covering an area equal to or greater than the approximate estimated or known size of clapper rail home ranges in the region. The survey zone would be presumed to include areas within approximately 700 feet of the project site, but may vary with specific habitat configuration. Any relevant information regarding potential rail movements from treated areas to adjacent or neighboring areas obtained during surveys will be reported and mapped. Any rail nest locations detected will be recorded with GPS data and photographed. All post-treatment survey data collected by authorized clapper rail biologists will be reported to the U.S. Fish and Wildlife Service.

Conclusions

1. Project site. The location of the project site so close to occupied CCR habitat that poses unwarranted risks to this endangered population and

the construction and operations are likely to cause both temporal (construction) cumulative (operations) impacts and to diminish the value of the tidal marsh habitat along the north branch of Gallinas Creek.

2. "Best Management Practices," as per ISP 2003 (above), should be employed in this area to insure protection of the resident rail population.
3. Night lighting should be eliminated from the project to reduce risk of increased predation pressure by mesopredators.
4. A buffer zone of 250 feet from tidal marsh habitat should be established during the construction phase of the proposed project. Post-construction operations should be regulated to maintain a 150 foot buffer between human activity and tidal marsh habitat with wildlife-friendly fencing that would prevent human caused disturbance (e.g. errant soccer balls) from intruding into the marsh.
5. Native, perennial, woody vegetation along the upland edge of the south shore of the North Branch of Gallinas Creek should be required to increase the availability of high-tide refugia and to create an impediment to human intrusion into the marsh.

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Permits

U.S. Fish and Wildlife Permit TE786723-3
California Department of Fish and Game Special Collecting Permit #6708

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3 http://www.sdcounty.ca.gov/reusable_components/images/parks/doc/HTJ_River_Noise_Technical_Report.pdf

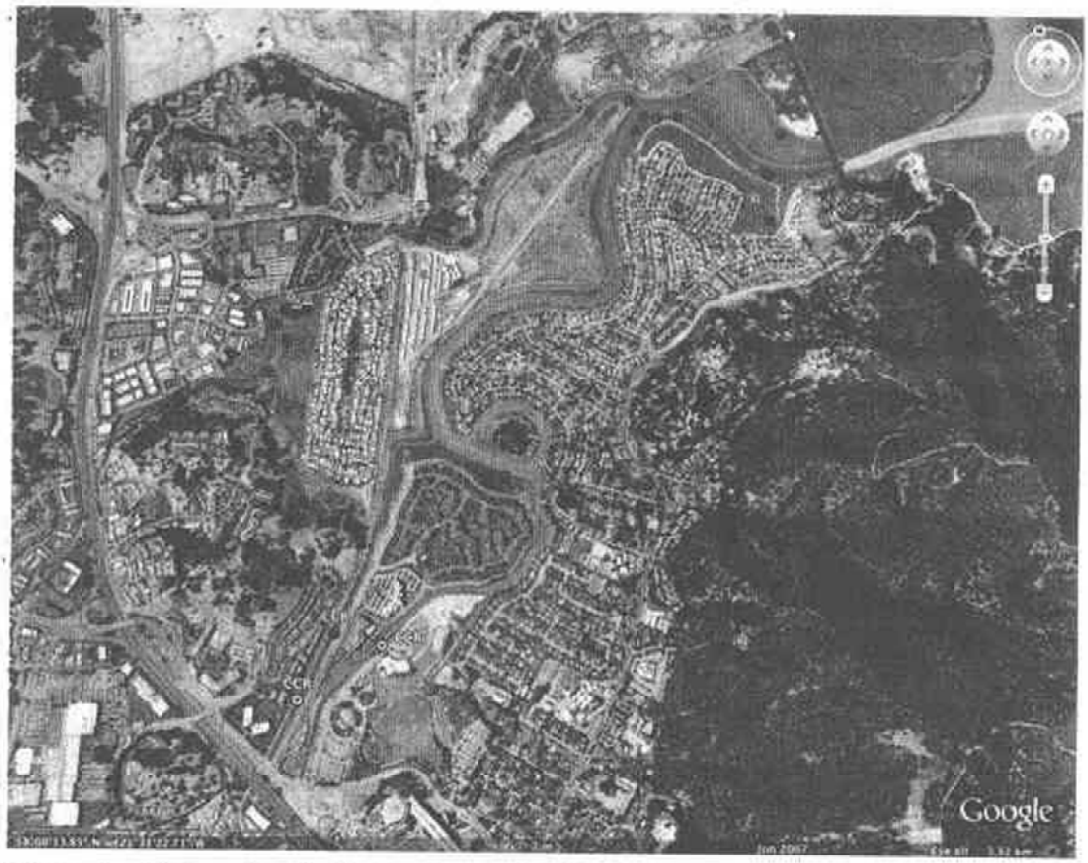

Figure 1. Gallinas Creek, Marin County, California.

The blue bar near the mouth of the creek indicates the downstream limits of coverage by this census effort. (A large population of clapper rails is known to reside in the broader marshes along the San Pablo Bayshore, downstream and outboard from the blue bar—ARA 2004).

- Green markers indicate locations of 20 listening stations distributed at approximately 200 meter intervals along the banks of both branches of Gallinas Creek.
- Red circles indicate locations of clapper rail detections. Each circle represents at least one individual rail, although thirteen of the circles represent "duetting" birds.
- Yellow circles indicate locations of clapper rails detected in earlier surveys (ARA field data, 2007) upstream from detections in the 2009 surveys.
- Yellow triangles represent locations of California Black Rails detected during the 2009 surveys.

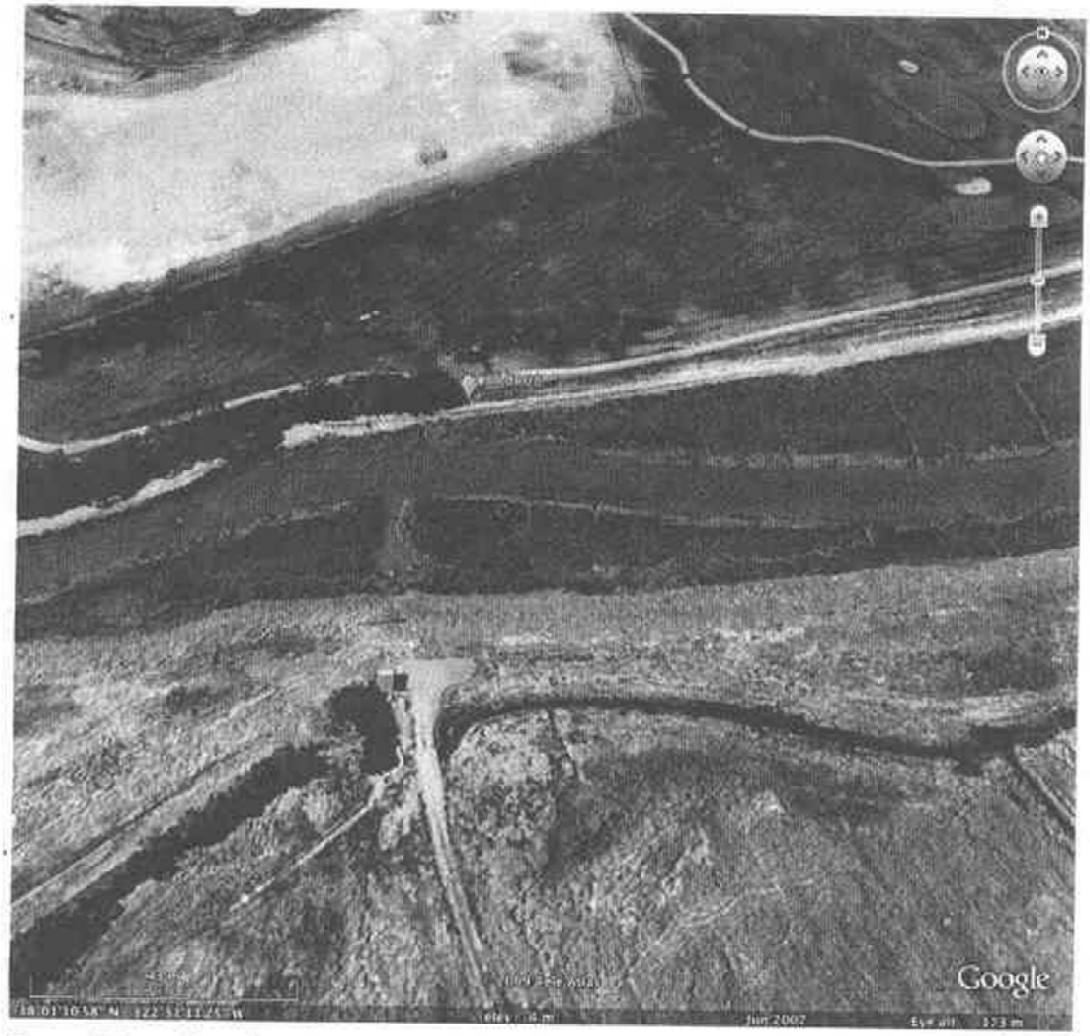

Figure 2. Location of survey point GACR08 (green marker) and duetting pair of CACRs (red circle) detected on March 3, 2009.

APPENDIX A.

PROTOCOL SURVEYS FOR CALIFORNIA CLAPPER RAIL (*RALLUS LONGIROSTRIS OBSOLETUS*) AT GALLINAS CREEK, MARIN COUNTY, CALIFORNIA 2009

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March 20, 2009

I. Introduction

Under agreement with Winzler and Kelly, Inc. (January 29, 2009) Avocet Research initiated a study of the federally endangered California Clapper Rail (*Rallus longirostris obsoletus*) in the tidal marshlands of the Gallinas Creek complex, Marin County, California. This report: (1) summarizes the results of protocol-level surveys conducted in these marshlands during the 2009 survey period; (2) identifies and delineates occupied habitat and buffer zones; (3) summarizes our knowledge of distribution and abundance in these marshlands; and, (4) discusses the regional importance of the Gallinas Creek marshlands to the species.

II. Methods

Protocol-level surveys

Survey methods conformed to the protocols prescribed by the U.S. Fish and Wildlife Service (USFWS 2000; Appendix A). Listening stations (census points) were distributed along the reaches of Gallinas Creek where dredging activities are proposed (Fig. 1; Tables 1 & 2).

Each survey was "passive," that is, the observer simply stood at the station and relied on spontaneous vocalizations to detect rails. An "active survey," involves broadcasting rail vocalizations with a tape recorder to elicit responses. Active surveys are permitted only when no detections have been made using passive methods on three previous census efforts (USFWS 2000). Each listening station was occupied for a minimum of 30 minutes during twilight hours, the period of maximum vocal activity by clapper rails (Eddleman and Conway 1998). Because rails were detected on each of the passive surveys, it was not necessary to conduct active surveys following the suite of passive surveys.

UTM coordinates of each listening station are given in Table 1, below. Dates and times of the surveys are provided in Table 2, below.

Table 1. GPS coordinates of listening stations at Gallinas Creek (UTM 10S-NAD83) "GACR" indicates locations on north branch; "GACS" indicates locations on south branch.

Station code	easting	northing
GACR05	5413567	4207886
GACR06	541597	4207887
GACR07	542346	4208197
GACR08	542125	4208126
GACR09	541867	4207939
GACR10	541049	4207759
GACR11	540920	4207576
GACR12	542535	4208277
GACS01	542522	4207975
GACS02	542692	4208083
GACS03	542825	4207936
GACS04	542937	4207769
GACS05	542999	4207581
GACS06	541804	4206889
GACS07	541642	4207017
GACS08	541798	4207050
GACS09	541351	4206977
GACS10	541244	4206799
GACS11	541120	4206639
GACS12	540977	4206466

Table 2. Dates, times, and tidal level of clapper rail surveys at Gallinas Creek, 2009. Tidal level: high = >3.0'; mod = 3.0'-1.0'; low = <1.0'

Date	Time (hrs)	Survey type	Tide
Jan 17	1618-1740	passive	high
Jan 28	0630-0810	passive	mod
Feb 18	1620-1815	passive	mod
Mar 4	1655-1845	passive	high
Mar 7	1730-1915	passive	low
Mar 13	0545-0730	passive	low

III. Findings

Results of our 2009 protocol-level surveys documented California Clapper Rails distributed along both the northern and southern reaches of Gallinas Creek (Fig 1). A total of 29 detections, representing and estimated 41 individual clapper rails were recorded during approximately 10.3 hrs of observation (Table 1). After eliminating redundant detections and accounting for duetting pairs and vocalizations of single birds, we estimate these vocalizations represent a minimum of 13 to 22 pair of clapper rails along Gallinas Creek upstream from the broad marshlands associated with the mouth of the watercourse. Approximately one-half of the detections were associated with the North Branch (2.3 km) and one-half with the South Branch (5.1 km).

Gallinas Creek, especially the marshes near the mouth at its confluence with San Pablo Bay, has long been recognized as a population center for this species in the North Bay (Collins *et al.* 1994, Albertson and Evens 2000, ARA 2004). In fact, we suspect that the name of the watercourse ("gallina" is Spanish for "chicken") derives from this fact. In the late 1800s clapper rails were called "marsh hens," and were hunted for sale in the San Francisco markets (Grinnell *et al.* 1918). Avocet Research (in cooperation with CDFG, Point Reyes Bird Observatory Conservation Science and the Invasive Spartina Project) has conducted surveys intermittently in the Gallinas Creek marshes over the last two decades as part of a baywide population monitoring effort. High densities of rails have been consistent in the extensive bayside, outboard marshlands; densities have been lower in the linear marshes of the Gallinas Creek shoreline. However, the 2009 results found the highest number of clapper rails in Gallinas Creek to date. Whether this is the result of more thorough coverage in 2009 (usually only three surveys are conducted each year) or a recent population increase is unknown.

Figure 1. Gallinas Creek, Marin County, California.

The blue bar near the mouth of the creek indicates the downstream limits of coverage by this census effort. (A large population of clapper rails is known to reside in the broader marshes along the San Pablo Bayshore, downstream and outboard from the blue bar—ARA 2004).

- Green markers indicate locations of 20 listening stations distributed at approximately 200 meter intervals along the banks of both branches of Gallinas Creek.
- Red circles indicate locations of clapper rail detections. Each circle represents at least one individual rail, although thirteen of the circles represent "duetting" birds.
- Yellow circles indicate locations of clapper rails detected in earlier surveys (ARA field data, 2007) upstream from detections in the 2009 surveys.
- Yellow triangles represent locations of California Black Rails detected during the 2009 surveys.

IV. Other sensitive species associated with Gallinas Creek

Several species detected in the course of this study are recognized as "Birds of Conservation Concern" (Shuford and Gardeli 2008) or are included in the California Department of Fish and Game's list of "Special Animals" (CDFG 2009).

*(1) California Black Rail (*Laterallus jamaicensis coturniculus*), a California threatened species, was detected along the mid-reach of Gallinas Creek and upstream in the broader marsh at the east end of Mitchell Blvd. Black rail also occurs in the higher elevation tidal marsh habitat near the mouth of Gallinas Creek (Evens and Nur 2002). The black rail occurs in the highest tidal marsh habitat and depends on vegetative cover between the tidal marsh and the upland for its survival (Evens* et al. *1991). Buffer zone protection for clapper rails will also benefit black rails.*

(2) Common Yellowthroat (*Geothylypis trichas*) was detected on several surveys. The local subspecies, the "San Francisco" Common Yellowthroat (G.t. *sinuosa*) is a California Bird of Conservation Concern (BSCC) that is associated with fresh, brackish, and saline wetlands around the periphery of San Pablo Bay. Whether the individuals along Gallinas Creek represent local nesters or over-wintering individuals is unknown, however any activity that disturbs the vegetative community that fringes the tidal marsh is likely to affect yellowthroat habitat.

(3) "Samuel's" Song Sparrow (*Melospiza melodia samuelis*), also a BSCC species, nests in the tidal marsh and transitional upland vegetation at Gallinas Creek. Song Sparrow was detected on every census and, like the yellowthroat, is susceptible to disturbance of its habitat. Quoting from the BCCS account: "Protect existing habitat and restore additional large contiguous areas to tidal action in San Pablo Bay. Restoration projects underway in the Napa-Sonoma marshes and in Marin County are critical" (Shuford and Gardali 2008).

(4) River Otter (*Lontra canadensis*) was seen on two of six surveys. River otters are a California Special Concern Species (CDFG 2008). Otters have been increasing in the Marin County tidal marshlands over the last decade (ARA unpublished field notes).

(5) Salt Marsh harvest Mouse (*Reithrodonomys raviventris*), federal and state endangered, was not detected on this set of surveys, but is known to occur in the Gallinas Creek marshes (SFEI 2009). Like the black rail, SMHM is a cover-dependent species that relies on thick cover of native halophytes of the tidal marsh environment.

V. Recommendations to avoid disturbance.

The following recommendations are provided to inform management practices and to avoid disturbance to this federally endangered California Clapper rail. These measures will also serve to protect other tidal-marsh dependent species.

1) Avoid removal or disturbance of emergent tidal marsh vegetation at any time.
2) Avoid removal or disturbance of vegetative cover at the tidal marsh/upland interface, providing a buffer of regugial habitat within as wide a swath as possible (3 meter minimum) from the Mean Higher High Water (MHHW) line.
3) Buffer zones of 250 feet from occupied rail habitat should be established during the course of construction. Any activity within that buffer zone that has potential to disturb rails (i.e. high-decibel construction, pumping, use of heavy machinery, etc.) should be conducted outside the nesting season. USFWS defines the rail nesting season as February 1-August 31, therefore potentially disruptive activity should be conducted only from September 1 until January 31 in a given year.
4) If construction or dredging activity does intrude into tidal marsh habitat a permitted biologist should survey the area prior to construction to determine presence/absence of rails.
5) Training sessions should be given to workers to inform them of protective measures and instruct them in identification of sensitive habitat.

VI. Conclusions

Six protocol-level clapper rail surveys were conducted along both branches of Gallinas Creek during the 2009 survey period. Rails were detected throughout the emergent tidal wetlands we an estimated minimum population of 13-22 pair present. Although densities of rails have been consistently high in the outboard marshes at the mouth of Gallinas Creek Rail, the 2009 results found greater numbers associated with the linear marshlands along the middle and upper reaches of the creek than previously detected. Rails were fairly evenly distributed between the north and south branches of the watercourse.

Recommendations for avoiding disturbance to this at-risk species are provided. Measures used to protect clapper rails will also serve to protect other sensitive species.

VII. References

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VIII. Permits (Jules Evens, Avocet Research Associates)

Federal Fish and Wildlife Permit TE786728-3
CDFG-SCP #801037-02