4.9 MARIN CLAPPER RAIL REGION

The Marin Clapper Rail Region contains small, disparate sites scattered throughout the shoreline and marshes of Marin County. This region stretches from the Golden Gate Bridge in Sausalito to San Rafael in San Pablo Bay, including the large ISP complex of Corte Madera Creek (CMC). The shoreline is fairly well developed, with a variety of wetland habitat types, including several marinas, tidal lagoons, flood control channels, small fragmented patches of marsh vegetation, large restored marshes, invaded mudflats, and several creeks and sloughs.

This region consists of 29 ISP clapper rails sites, 20 of which were surveyed by ISP staff in 2010 (Table 12, Figure 26). Nine sites were evaluated for clapper rail habitat (Protocol F), only one of which, Brickyard Cove (23a), was deemed as potential habitat and then actively surveyed for three rounds. This brought the total of Protocol C surveys to eight: College of Marin (04b), Beach Drive (23b), Greenwood Beach (23g), Strawberry Point (23h), Strawberry Cove (23i), Starkweather Park (23l) and Triangle Marsh - Marin (23n). ISP biologists passively surveyed (Protocol A) four other sites: CMC - Upper (04h), CMC - Lower (04i), Pickleweed Park (09a) and San Rafael Canal Mouth North (23d).

Much of the Corte Madera Creek (CMC) complex, including the expansive marshes where the creek meets the bay, was surveyed by biologists with PRBO Conservation Science and Avocet Research Associates.

Table 12: Summary results from California clapper rail surveys at sites in the Marin Region.

<table>
<thead>
<tr>
<th>Site Name (ID)</th>
<th>Survey Type</th>
<th>Number of Rounds</th>
<th>Number of Visits (stations x rounds)</th>
<th>Number of Visits with Detections</th>
<th>Percent Occurrence</th>
<th>CLRA detected</th>
<th>Included in Five Year Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blackie’s Creek &amp; Mouth (03a &amp; 03b)</td>
<td>F</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>College of Marin (04b)</td>
<td>F - C</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>33%</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>Larkspur Ferry Landing Area (04e)</td>
<td>F</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Riviera Circle (04f)</td>
<td>F</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Corte Madera Creek - Upper (04h)</td>
<td>A</td>
<td>5</td>
<td>24</td>
<td>14</td>
<td>58%</td>
<td>4 - 6</td>
<td>-</td>
</tr>
<tr>
<td>Corte Madera Creek - Lower (04i)</td>
<td>A</td>
<td>3</td>
<td>6</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>Murphy Creek (04l)</td>
<td>F</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Pickleweed Park (09a)</td>
<td>A</td>
<td>3</td>
<td>9</td>
<td>6</td>
<td>67%</td>
<td>10</td>
<td>-</td>
</tr>
<tr>
<td>Brickyard Cove (23a)</td>
<td>F - C</td>
<td>3</td>
<td>3</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>Beach Drive (23b)</td>
<td>C</td>
<td>3</td>
<td>3</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>Loch Lomond Marina (23c)</td>
<td>F</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>San Rafael Canal Mouth (23d)</td>
<td>C - A</td>
<td>3</td>
<td>6</td>
<td>5</td>
<td>83%</td>
<td>2</td>
<td>-</td>
</tr>
<tr>
<td>Paradise Cay (23f)</td>
<td>F</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
### 4. 2010 Survey Results

<table>
<thead>
<tr>
<th>Site Name (ID)</th>
<th>Survey Type</th>
<th>Number of Rounds</th>
<th>Number of Visits (=stations x rounds)</th>
<th>Number of Visits with Detections</th>
<th>Percent Occurance</th>
<th>CLRA detected</th>
<th>Included in Five Year Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greenwood Beach (23g)</td>
<td>C</td>
<td>3</td>
<td>3</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>Strawberry Point (23h)</td>
<td>C</td>
<td>3</td>
<td>3</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>Strawberry Cove (23i)</td>
<td>C</td>
<td>3</td>
<td>3</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>Sausalito (23k)</td>
<td>F</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>Starkweather Park (23l)</td>
<td>C</td>
<td>3</td>
<td>3</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>Triangle Marsh - Marin (23n)</td>
<td>C</td>
<td>3</td>
<td>6</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td><strong>REGIONAL SUMMARY</strong></td>
<td>-</td>
<td><strong>38</strong></td>
<td><strong>72</strong></td>
<td><strong>26</strong></td>
<td><strong>20%</strong></td>
<td><strong>16 - 18</strong></td>
<td>-</td>
</tr>
</tbody>
</table>

1 The number of stations where CLRA were detected, expressed as a percentage of the total number of stations sampled during the season.
Figure 26. Map of 2010 clapper rail site boundaries in the Marin Region.
Blackie’s Creek (03a) and Mouth (03b)

Detected 0 clapper rails

Blackie’s Creek (Figures 27a and 28a) is a tidal channel adjacent to a public recreation field that feeds into the Northeastern reach of Richardson Bay. Until recently, this channel was heavily infested with hybrid Spartina and S. densiflora. The Spartina treatment efficacy has been very high. The channel and adjacent levee banks are now dominated by sediment, Sarcocornia pacifica, limited patches of remnant Spartina with primarily non-native grasses and other shrubs on the higher edges of the channel.

Blackie’s Creek Mouth is at the mouth of Blackie’s Creek as it enters Richardson Bay forming a small delta, as well as the shoreline east along the Tiburon Peninsula. Native Spartina and S. pacifica now dominate this area, previously infested with tall clonal patches of hybrid and S. densiflora. There is a thin band of high marsh S. pacifica habitat abutting the edges of the filled portions of the park. At the Southern end of this area is a small beach that is mostly inundated at high tide, and on the Northern end, the marsh is bordered by riprap and fill.

Blackie’s Creek and Creek Mouth have been surveyed every year since 2005 for clapper rails. Though no clapper rails have ever been detected during a survey, a foraging rail was photographed at this site in 2006.

Because Spartina eradication has been particularly successful at this site, Jude Stalker conducted a habitat assessment F-survey on December 30, 2009. The lack of vegetative structure and absence of clapper rails during previous surveys at the site led her to determine that the habitat at Blackie’s Creek and Creek Mouth was unsuitable for breeding clapper rails and that no further surveys were necessary.

Other bird species observed at Blackie’s Creek included: Western grebe, snowy egret, great egret, a scaup sp., mallard and Forster’s tern.

College of Marin (04b)

Detected 0 clapper rails

The small site at the College of Marin (Figures 27b and 28b) is hydrologically influenced by the upper extent of Corte Madera Creek’s tidal flux. It is a small creek inlet nestled in a predominantly residential area and is surrounded by pedestrian paths, backyards, a Ross Valley Sanitary District pumping station and the College of Marin Ecological Study Area. This site receives muted tidal action through aging culverts and diversions and is dominated by riparian habitat at the upper reaches. The vegetation at this site is composed of some tidal species, including the native Spartina foliosa, bulrush and sedge species, Distichlis spicata and Sarcocornia pacifica, as well as plant species typical of riparian areas. Although most of the Spartina densiflora infestation in this area has been removed, some still remains and manual treatment there continues.

The site was evaluated for clapper rail habitat on January 16, 2010 by Jude Stalker. Because the south east portion of this site has very suitable vegetative composition and
structure, adequate channel properties for clapper rail habitat and is in such close proximity to the Corte Madera Creek Complex (04h), she determined that further C protocol surveys should be conducted. The site was surveyed using Protocol C for a total of three rounds. Surveys were conducted on February 17, 2010 by Jeff Lewis, March 5, 2010 by Whitney Thornton, and March 23, 2010 by Jeff Lewis. The round one survey was conducted slightly outside of the standard survey time. Prerecorded vocalizations were played on all three rounds yet no clapper rails were detected at this site in 2010.

The close proximity to backyards and the high density of shrubs and trees along the banks of the channel create potential habitat for terrestrial predators, such as raccoons and domestic feral cats, plus perch sites for raptors.

Other documented bird species observed at this site included snowy egret, common goldeneye and song sparrow.

**Larkspur Ferry Landing (04e)**

*Detected 0 clapper rails*

The site called Larkspur Ferry Landing (Figures 27c and 28c) is a small strip marsh along the north bank of the ferry inlet. The marsh is less than ten meters at its widest and is dominated by two species of non-native *Spartina*: *S. densiflora* and *S. alterniflora x foliosa* hybrids. Sir Francis Drake Blvd. borders the site to the north while a short breakwater borders the bayward edge of the marsh. The ferry’s wake causes regular disturbance and erosion. Tall weeds along the upland edge provide habitat for predators such as feral cats, raccoons and Norway rats. Jude Stalker assessed the site for clapper rail habitat on January 15, 2010, determining that the site was inadequate as clapper rail habitat and that no further surveys were necessary.

**Riviera Circle (04f)**

*Detected 0 clapper rails*

Riviera Circle (now known as Larkspur Marina) is a housing development constructed on riprap and fill along the south side of Corte Madera Creek in the City of Larkspur (Figures 27d and 28d). A thin perimeter band of mixed marsh vegetation consisting of *Spartina densiflora*, *Sarcocornia pacifica* and *Grindelia stricta* is bordered directly by the yards, docks, and gardens of these residential properties. Pets and other predators can easily enter the creek from the upland.

The site was surveyed using Protocol F on January 16, 2010 by Jude Stalker, who determined that the site lacked suitable clapper rail habitat and no further surveys were needed.
Upper Corte Madera Creek (04h)

Detected 4-6 clapper rails

Marsh habitat on upper Corte Madera Creek (Figures 27e and 28e) is primarily a narrow strip marsh no more than 20 meters wide in most places that occupies both banks above Bon Air Road. Surrounding land use includes residential neighborhoods, schools, and parks. Marsh vegetation is predominately Sarcocornia pacifica with Spartina foliosa along two side channels. Spartina densiflora was wide-spread along the creek; however, removal efforts have lowered the population density significantly. Paved pedestrian paths line either side of the creek with the exception of the two side channels.

Five stations on upper Corte Madera Creek were surveyed using Protocol A for a total of five rounds. Surveys were conducted by Jeff Lewis on February 17, 2010; by Jeanne Hammond on March 5, 2010; by Jeff Lewis and Tobias Rohmer on March 23, 2010; by Jeanne Hammond on March 24, 2010; and by Jeff Lewis on April 14, 2010. Four to six clapper rails were detected at the site during the first round, one to two clapper rails during the second round, none during the third and fourth rounds and two clapper rails during the fifth round. Prerecorded vocalizations were played at one of five stations during the third round of surveys.

No avian predators were observed during surveys, however, the proximity of residences and the location of the paved path indicate that cats and off-leash dogs are present and have access to the marsh.

Other bird species observed at the site included: Western grebe, great egret, snowy egret, gadwall, Canada goose, greater scaup, American wigeon, bufflehead, mallard, white-tailed kite, American coot, killdeer, black-necked stilt, willet, California gull, Anna's hummingbird, Nuttall's woodpecker, black phoebe, American crow, violet-green swallow, barn swallow, bushtit, marsh wren, ruby-crowned kinglet, American robin, Northern mockingbird, cedar waxwing, white-crowned sparrow, song sparrow, California towhee and house finch.

Lower Corte Madera Creek (04i)

Estimated 0 clapper rails

The lower Corte Madera Creek site area (Figures 27f and 28f) runs from Bon Air Road east to the creek mouth and marsh habitat is restricted to a narrow band of habitat along the banks of the creek. The creek is sparsely vegetated with Sarcocornia pacifica and Spartina densiflora. Two areas along the lower section of the creek contain larger extents of marsh; Piper Park, which is surveyed by PRBO and the area just east of the Bon Air bridge on the south side of the creek. ISP’s survey efforts were focused on this area of potential habitat that averages 20m in width and is bordered by residential development.

No raptors or mammalian predators were recorded during surveys; however, a public trail runs along the upland edge of the marsh providing access to terrestrial predators such as cats, dogs, and raccoons.
The site was surveyed using Protocol A for a total of three rounds. Surveys were conducted on February 17, 2010 by Jeff Lewis; March 5, 2010 by Whitney Thornton; and on March 23, 2010 by Jeff Lewis. Pre-recorded vocalizations were played at two stations during the third round but no rails were detected.

Other bird species recorded at this site during surveys included greater scaup, bufflehead, Canada goose, mallard, American avocet, black-necked stilt, American crow and song sparrow.

Murphy Creek (04l)

*Detected 0 clapper rails*

Murphy Creek (Figures 27g and 28g) is a small tributary of Corte Madera Creek in the City of Kentfield west of the College of Marin (04b). The ISP defines this site as the 150-meter section of Murphy Creek that flows behind a small apartment building on Kent Avenue. The plant community at the site is dominated by riparian and other freshwater vegetation. Trees lining the channel create a closed canopy above the creek. There is little tidal marsh vegetation found here, though *Spartina densiflora* has been identified and removed from this site in the past. The surrounding landscape is fully developed with homes, apartments and parking lots.

The site was surveyed by Jude Stalker using Protocol F on January 16, 2010. She determined that the site lacked suitable clapper rail habitat and no further surveys were needed.

Pickleweed Park (09a)

*Detected 10 clapper rails*

Pickleweed Park (aka Tiscornia Marsh) is a four-hectare marsh at the mouth of the San Rafael Canal (Figures 27h and 28h). Vegetation is predominantly *Sarcocornia pacifica* with a great deal of *Spartina foliosa* also present along the bay fringe and within the channels. Small patches of invasive *Spartina densiflora* are also found in the marsh. One main channel runs half the length of the marsh with a few small channel offshoots. A recreational trail runs along the interior perimeter of the marsh, providing access for land-based mammalian predators. Despite exposure to these threats, the site is known to support at least three species of rail: California clapper rail, California black rail, and Virginia rail. This site is directly across the creek from ISP’s San Rafael Creek Mouth (23d) survey site. Surveys are intended to be conducted simultaneously to best assess rail population sizes here, though one round of surveys was completed independently.

Three rounds of survey were conducted at Pickleweed Park using protocol A. The first round was conducted by Jude Stalker on January 23, 2010 and detected five to eight clapper rails. The second round was conducted on February 18, 2010 by Whitney Thornton who detected six to eight clapper rails. The third round was conducted on March 18, 2010 by Jude Stalker who detected ten clapper rails. Tapes were not played at Pickleweed Park.
Public trails along one side of the park may provide easy access for predators and disturbance from recreational trail users. Peregrine falcons were observed to be using the nearby power towers as perches. American crows were also seen in the site.

All bird species observed include Western grebe, great egret, canvasback, surf scoter, bufflehead, mallard, peregrine falcon, American coot, Virginia rail, black-bellied plover, long-billed curlew, willet, Anna's hummingbird, American crow, marsh wren, white-crowned sparrow and song sparrow.

Brickyard Cove (23a)

Detected 0 clapper rails

Brickyard Cove (Figures 27i and 28i) is located in eastern San Rafael adjacent to McNear Brick & Block. Two non-native Spartina species (S. densiflora and S. alterniflora x foliosa hybrid) are present at the site along the sparsely vegetated rocky shoreline. A seasonal dry marsh lies inland and does not contain any non-native Spartina. A culvert under Point San Pedro Road feeds a Spartina and sedge-lined tidal channel in the residential neighborhood southwest of McNear Brick & Block. The edges of the marsh in this channel are dominated by Sarcocornia pacifica and Distichlis spicata.

Jude Stalker evaluated the site using Protocol F on December 30, 2009. She determined the muted marsh lacked habitat to support breeding clapper rail; however, due to positive indicators for potential clapper rail presence in the nearby tidal channel, she recommended that C-surveys be conducted there. Three rounds of Protocol C surveys were conducted on January 26, 2010 by Jeanne Hammond; on February 18, 2010 Jude Stalker; and on March 18, 2010 by Tobias Rohmer. Tapes were played on all three rounds; however no clapper rails were detected.

The high density of shrubs and trees along the banks of the channel create habitat for both terrestrial and avian predators. Additionally, the close proximity of the channel to the backyards of the residential development could allow domestic and feral cats access to the site.

Other bird species documented during the surveys include snowy egret, mallard, mourning dove, Anna's hummingbird, black phoebe, American crow, Northern mockingbird, European starling, red-winged blackbird and house finch were among the other birds detected at this site.

Beach Drive (23b)

Detected 0 clapper rails

Beach Drive (Figures 27j and 28j) is a small residential street in eastern San Rafael, intersecting two different marsh systems on either side. To the west, native and hybrid Spartina grow along a narrow tidal cove. Due to inadequate treatment efficacy in previous years, hybrid Spartina still has a large footprint in this portion of the site. Across the road to the east lies a one-hectare muted tidal marsh completely bounded by levees,
houses, and roads. The marsh vegetation is composed primarily of *Sarcocornia pacifica* and *Grindelia stricta* with native *Spartina* lining some channels. Two large ponds at the northern and eastern edge of the marsh are edged with hybrid *Spartina*. The nearest known clapper rail breeding sites are about 1.5 kilometers away, at the mouth of San Rafael Creek and in Pickleweed Park (Tiscornia Marsh).

Jude Stalker conducted the habitat assessment (F) survey on December 30, 2009 and determined that there was enough suitable habitat to support breeding clapper rail and that further surveys were warranted. The site was surveyed using Protocol C for a total of three rounds. Surveys were conducted on January 26, 2010 by Jeanne Hammond, February 18, 2010 by Jude Stalker and March 18, 2010 by Tobias Rohmer. Prerecorded vocalizations were played on all three rounds. No clapper rails were detected at the site during any of the three rounds.

Other bird species observed at this site included great egret, mallard, bufflehead, American coot, black-necked stilt, black phoebe, American crow, marsh wren, American robin, California towhee, song sparrow and Brewer's blackbird.

### Loch Lomand Marina (23c)

*Detected 0 clapper rails*

Loch Lomond Marina (Figures 27k and 28k) is located off Point San Pedro Road in San Rafael, with Beach Drive (23b) immediately to the east. This site consists of a narrow marsh fringe along a cove with an associated tidal channel to the west of the marina and vegetated rip-rap along the inside of the marina levee on the western, southern and eastern edges. These narrow strips of marsh vegetation contain patches of both native *Spartina foliosa* and hybrid clones. Most of the hybrid *Spartina* has been treated but some persists.

While conducting an 'F' habitat assessment survey on December 30, 2009 Jude Stalker determined that the minimal *Spartina* stands along the relatively steep and exposed rip rap levees, in addition to the large distance to other known clapper rail breeding locations, made the habitat here insufficient for clapper rails and that no further surveys were necessary.

### San Rafael Creek Mouth (23d)

*Detected 2 clapper rails*

San Rafael Canal Mouth (Figures 27l and 28l) is composed of two small pocket marshes separated by a residential marina on the north bank of San Rafael Creek as it meets the bay. The western section is predominantly mixed hybrid *Spartina* and *S. foliosa*, while the eastern section is mostly *Sarcocornia pacifica* plain. ISP began surveying this site first in 2010, prior to which it was surveyed by the U.S. Fish & Wildlife Service. This site is directly across the creek from another ISP clapper rail survey site, Pickleweed Park (09a), and surveys were conducted at these two sites simultaneously for rounds two and three to best discern rail numbers in the area.
San Rafael Creek Mouth was surveyed using Protocol C for the first round, switching to Protocol A for the remaining two surveys after birds were detected. Jeanne Hammond conducted the first survey on January 26, 2010 and detected one to two clapper rails after tape playback. Round two was conducted on February 18, 2010 by Jude Stalker who detected two rails. Round three was conducted on March 18, 2010 by Tobias Rohmer who also detected two rails.

No raptors were observed at this site, though potential nest predators - great egret, black-crowned night-heron and common raven - were present during round three. Dogs were present in and around the marsh for rounds two and three.

All bird species observed during the surveys included: great egret, black-crowned night-heron, mallard, American coot, common raven, bushtit, American robin, European starling, song sparrow and house finch.

**Paradise Cay (23f)**

*Detected 0 clapper rails*

Paradise Cay (Figures 27m and 28m) is a housing development and marina on the eastern shore of the Tiburon Peninsula. Yards and docks of the residential properties border the steep and sparsely vegetated shoreline. The northern end of the site is home to the Tiburon Yacht Club.

The narrow inlet in the southwest corner of the site had the densest *Spartina* invasion at the site, but successful control efforts have returned the *Spartina* meadow to mudflat. Trees and other tall structures surround the site, providing perches for raptors. Additionally, the narrow marsh is easily accessed by terrestrial predators and neighborhood pets.

Jude Stalker evaluated the site for clapper rail habitat on December 30, 2009 and determined that the site lacked the vegetative structure to support breeding clapper rails and that no further surveys were necessary.

**Greenwood Beach (23g)**

*Detected 0 clapper rails*

Greenwood Beach (Figures 27n and 28n) is a small tidal marsh located at the Northern most extent of Richardson Bay along a residentially developed shoreline. At the Western boundary, a leved pocket marsh is fed by a single channel from the mouth of an urban creek. The creek is dominated by *Sarcocornia pacifica*. The remainder of the site is largely unvegetated shoreline. This site has been heavily impacted by multiple non-native *Spartina* invasions (*S. alterniflora x foliosa* hybrid, *S. densiflora*, *S. densiflora x foliosa* hybrid), and some of each remain in 2010 despite recurring eradication efforts by ISP.

No predators were noted during surveys. However, cats, dogs and raccoons are locally abundant, benefiting from the surrounding residential neighborhood.
Greenwood Beach was actively surveyed using Protocol C by Jude Stalker on January 15, February 6 and March 18, 2010. Though prerecorded call tapes were played each round, no clapper rails were detected.

Other bird species documented here included: great blue heron, Canada goose, mallard, American avocet, black-necked stilt and common raven.

**Strawberry Point (23h)**

*Detected 0 clapper rails*

The Strawberry Point site (Figures 27o and 28o) is comprised of three islands in the northwest portion of Richardson Bay adjacent to the Strawberry Point residential area in Tiburon. The bay is shallow, forming extensive mudflats at low tide. The two small islands to the north are predominately vegetated by *Sarcocornia pacifica*. The third island, Aramburu, is mostly upland habitat fringed by small stands of marsh vegetation. *S. foliosa* grows along the edge and inlets of the island. *Sarcocornia pacifica*, *Grindelia stricta*, and *Distichlis spicata* occur along the northern end and within the northwestern cove. Scattered *Spartina densiflora* plants grow on all three islands.

A bird surveyor for the Richardson Bay Audubon Center noted the presence of a single clapper at the site on several occasions between July 2002 and November 2006. No other rails have been detected since (Kerry Wilcox, Richardson Bay Audubon Center, pers. comm.).

The site was surveyed using Protocol C for a total of three rounds. Surveys were conducted on January 15, February 6 and March 18, 2010 by Jude Stalker. Prerecorded vocalizations were played during all three rounds but no clapper rails were detected.

Other birds detected at this site were: great egret, snowy egret, Clark's grebe, Canada goose, mallard, lesser yellowlegs, marbled godwit and Western gull.

**Strawberry Cove (23i)**

*Detected 0 clapper rails*

Strawberry Cove (Figures 27p and 28p) is adjacent to Highway 101 in Richardson Bay. The relatively small marsh has a complex channel network allowing full tidal exchange through a wide breech in the outboard levee. The site has many ponds, covering about 30% of the site. Although a local bird surveyor spotted a clapper rail swimming at this marsh December 12, 2008, Strawberry Cove may be too low in tidal elevation to support breeding populations of clapper rails. The short form of native *Spartina foliosa* and *Sarcocornia pacifica* dominate the site and a few small patches of hybrid *Spartina* dot the periphery. Terrestrial predators can readily enter the marsh from the roads and pedestrian paths that encircle the site. Additionally, trees along the upland edge provide perching habitat for predatory birds.

Jude Stalker conducted the habitat assessment survey on January 15, 2010 and determined that there were enough characteristics to indicate the possibility of clapper
rail presence. She subsequently conducted Protocol C surveys for a total of three rounds on January 15, February 6 and March 18, 2010. Prerecorded vocalizations were played during all three rounds but no clapper rails were detected.

Other bird species observed at this marsh included mallard and potential predators great blue heron, great egret and snowy egret.

**Sausalito (23k)**

*Detected 0 clapper rails*

Sausalito (Figures 27q and 28q) is a narrow site along the marinas and docks of the town. This developed shoreline has small, fragmented pockets of remnant marshes scattered in between docks, light industry, office buildings, and small upland parks. A handful of non-native *Spartina* clones have invaded the fringing shoreline, which is dominated by *Sarcocornia pacifica*, *Carpobrotus* spp. and other upland weeds.

The site was surveyed for clapper rail habitat (Protocol F) on January 16, 2010 by Jude Stalker who determined that the highly developed site lacked the vegetative structure to support breeding clapper rails and no further surveys were needed.

**Starkweather Park (23l)**

*Detected 0 clapper rails*

Starkweather Marsh (Figures 27r and 28r) is a small, young restoration marsh lagoon in Marin. This marsh has a muted tidal flow and was highly invaded by *Spartina densiflora*. The *S. densiflora* invasion has significantly decreased and the marsh is currently predominantly vegetated with *Sarcocornia pacifica*. The southern edge of this marsh has narrow fringe of *S. foliosa*. This marsh is small and far removed from other marshes and thus in the past has not been viewed as likely Clapper Rail habitat. However, in 2009, a clapper rail was observed at this site, prompting further surveys for this marsh in 2010.

This site was actively surveyed (Protocol C) for a total of three rounds. Jude Stalker conducted the first survey on January 23, 2010; Whitney Thornton conducted round two on February 18, 2010; and Jude Stalker conducted the final round on March 18, 2010. Though tapes were played for all three rounds of survey, no clapper rails were detected at this site in 2010.

Other bird species observed included: double-crested cormorant, great egret, snowy egret, lesser scaup, canvasback, black-bellied plover, semipalmated plover, black-necked stilt, American avocet, long-billed curlew, Western sandpiper, willet, mourning dove, American crow and song sparrow.
Triangle Marsh Marin (23n)

 Detected 0 clapper rails

Triangle Marsh (Figures 27s and 28s) is a five-hectare remnant tidal marsh in the town of Corte Madera. Paradise Drive runs along its southern boundary. The east end of the site has undergone ecological restoration and the salt marsh has been colonized by native marsh plants. The upland berm is heavily vegetated with a combination of native and non-native plants. The west end of the marsh is dominated with Sarcocornia with native Spartina foliosa lining the well-established channels and Grindelia along the upland edges. The site boundary also includes a fringe marsh adjacent to Marin Country Day School and a small marsh parcel adjacent to Marin Montessori School. Both hybrid Spartina and S. densiflora species have been mapped and treated at this site.

Suitable habitat at Triangle Marsh Marin indicates the possibility of clapper rail presence. Jude Stalker conducted three rounds of 'C' protocol surveys, playing prerecorded vocalizations on each survey. The surveys were conducted on January 15, February 6 and March 18, 2010. No clapper rails were detected at this site.

Other birds detected at this site included: scaup sp., American coot, killdeer, black-necked stilt, marbled godwit and long-billed dowitcher.
4. 2010 Survey Results

Figure 27. Site maps of the Marin Region.

Figure 27a. Map of Blackie’s Creek (03a) and Mouth (03b) site boundaries evaluated for clapper rail habitat.
Figure 27b. Map of 2010 clapper rail survey results at College of Marin (04b).
Figure 27c. Map of Larkspur Ferry Landing Area (04e) site boundary evaluated for clapper rail habitat.
Figure 27d. Map of the Riviera Circle (04f) site boundary evaluated for clapper rail habitat.
Figure 27e. Map of 2010 clapper rail survey results at Corte Madera Creek - Upper (04h).
Figure 27f. Map of 2010 clapper rail survey results at Corte Madera Creek - Lower (04i).
4. 2010 Survey Results

Figure 27g. Map of the Murphy Creek (04l) site boundary evaluated for clapper rail habitat.
4. 2010 Survey Results

Figure 27h. Map of 2010 clapper rail survey results at Pickleweed Park (09a).
Figure 27i. Map of 2010 clapper rail survey results at Brickyard Cove (23a).
Figure 27j. Map of 2010 clapper rail survey results at Beach Drive (23b).
Figure 27k. Map of the Loch Lomond Marina (23c) site boundary evaluated for clapper rail habitat.
Figure 27l. Map of 2010 clapper rail survey results at San Rafael Canal Mouth (23d).
Figure 27m. Map of the Paradise Cay (23f) site boundary evaluated for clapper rail habitat.
4. 2010 Survey Results

Figure 27n. Map of 2010 clapper rail survey results at Greenwood Beach (23g).
4. 2010 Survey Results

Figure 27o. Map of 2010 clapper rail survey results at Strawberry Point (23h).
Figure 27p. Map of 2010 clapper rail survey results at Strawberry Cove (23i).
Figure 27q. Map of the Sausalito (23k) site boundary evaluated for clapper rail habitat.
4. 2010 Survey Results

Figure 27r. Map of 2010 clapper rail survey results at Starkweather Park (23I).
Figure 27s. Map of 2010 clapper rail survey results at Triangle Marsh - Marin (23n).
Figure 28. Site photos of the Marin Region.

Figure 28a. The minimal vegetative structure and lack of channels is evident looking west over Blackie's Creek Mouth.

Figure 28b. Facing north along the College of Marin channel located behind Berens Drive, this view shows marsh vegetation that offers suitable habitat for clapper rails.
4. 2010 Survey Results

Figure 28c. Facing east along the Larkspur Ferry Landing site on the southeastern side of the mouth of the ferry terminal.

Figure 28d. View of thin band of marsh vegetation that is representative of the Riviera Circle site (at Doherty Drive & Riviera Circle).
Figure 28e. View of upper Corte Madera Creek looking northwest across from Creekside Park.

Figure 28f. This view of lower Corte Madera Creek from its south bank shows a small pocket marsh nestled among the waterfront residential developments that line the watershed.
4. 2010 Survey Results

Figure 28g. Looking westward over Murphy’s Creek from Kent Avenue in Kentfield.

Figure 28h. The northern end of Tiscomia Marsh can be seen here from the levee at the north end of Pickleweed Park with the San Rafael Creek mouth and the Marin Islands in the distance.
4. 2010 Survey Results

Figure 28i. Looking northwest over the Brickyard Channel that is lined with *Spartina* and sedge.

Figure 28j. A view of the west side of Beach Drive, where hybrid *Spartina*-invaded mudflats provide potential habitat for clapper rails.
4. 2010 Survey Results

Figure 28k. Looking south down the east side of the jetty at the Loch Lomond boat launch. The site's narrow strip of minimal marsh vegetation is seen here.

Figure 28l. View of the western section of San Rafael Canal Mouth looking south towards Pickleweed Park. Native and hybrid *Spartina* mix here to create a small pocket marsh suitable for clapper rails.
4. 2010 Survey Results

Figure 28m. Looking south at one of the residential channels that dominate the Paradise Cay site.

Figure 28n. Looking northwest over the small marsh adjacent to the Strawberry Point School.
4. 2010 Survey Results

Figure 28o. A southwest facing view of Pickleweed Island; one of the three islands that make up the Strawberry Point site.

Figure 28p. This westward facing view of Strawberry Cove, taken from the southeastern end of the site, shows the extensive stands of *S. foliosa* and a portion of the primary channel that characterize this site.
4. 2010 Survey Results

Figure 28q. Westward facing view of a previously hybrid *Spartina*-infested cove at Marina Plaza along the Sausalito Shoreline.

Figure 28r. Taken from the central peninsula of Starkweather Pond, this southwestern facing photo shows the relatively extensive stands of native *S. foliosa* and *Sarcocornia pacifica* along the shoreline.
Figure 28s. Looking northwest across pickleweed plain at the west end of Triangle Marsh with Mount Tamalpais in the distance.
4.10 PETALUMA CLAPPER RAIL REGION

The Petaluma clapper rail region is located mostly along the Petaluma River watershed in Sonoma County, but also extends south to China Camp State Park including the marshes of Marin County that line the Western shore of San Pablo Bay. With major freshwater inputs from the Petaluma River, Novato Creek and Las Gallinas Creek, this region contains expansive freshwater and brackish marshes. Tidal saltmarsh is found only as these watersheds meet San Pablo Bay and then spread along most of San Pablo Bay’s Western shore. Marshes in the Petaluma clapper rail region support some high density populations of clapper rails as well as abundant Virginia rail, sora, and black rail. Hybrid *Spartina* presence in this region is nominal with only isolated clones being found at various sites.

This vast region is surveyed almost exclusively by biologists with PRBO Conservation Science with San Pablo Bay NWR biologists surveying the Sonoma Baylands area. In 2010, OEI biologists conducted passive call count (Protocol A) surveys for the first time at two sites: Petaluma River-Upper (24a) and Grey’s Field (24b), both of which are in the town of Petaluma (Table 13, Figure 29).

Table 13: Summary results from California clapper rail surveys at sites in the Petaluma Region.

<table>
<thead>
<tr>
<th>Site Name (ID)</th>
<th>Survey Type</th>
<th>Number of Rounds</th>
<th>Number of Visits (stations x rounds)</th>
<th>Number of Visits with Detections</th>
<th>Percent Occurrence</th>
<th>CLRA detected</th>
<th>Included in Five Year Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Petaluma River - Upper</td>
<td>A</td>
<td>3</td>
<td>12</td>
<td>3</td>
<td>25%</td>
<td>3 - 6</td>
<td>-</td>
</tr>
<tr>
<td>(24a)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grey's Field (24b)</td>
<td>A</td>
<td>3</td>
<td>9</td>
<td>2</td>
<td>22%</td>
<td>1 - 2</td>
<td>-</td>
</tr>
<tr>
<td>REGIONAL SUMMARY</td>
<td>-</td>
<td>6</td>
<td>21</td>
<td>5</td>
<td>47%</td>
<td>4 - 8</td>
<td>-</td>
</tr>
</tbody>
</table>

1 The number of stations where CLRA were detected, expressed as a percentage of the total number of stations sampled during the season.
Figure 29. Map of 2010 clapper rail site boundaries in the Petaluma Region.
Petaluma River – Upper (24a)

Detected 3-6 clapper rails

Petaluma River – Upper (Figures 30a and 31a) is adjacent to Shollenberger Park along the east bank of the Petaluma River, and is a mosaic of brackish tidal marsh, upland islands and managed holding ponds. The site receives brackish inflow via multiple channels off the river, and also receives freshwater input from two drainages that cut through the site. The tidally active portions are predominantly vegetated with dense sedge meadows, *Sarcocornia pacifica* plain and corridors of *Grindelia stricta* and *Spartina foliosa* along the well defined channels. This site was evaluated as marginal habitat in 2009 and ISP conducted its first survey of the marsh in 2010.

Petaluma River – Upper was surveyed using Protocol A for a total of three rounds. The first round was conducted on February 1, 2010 by Tobias Rohmer and Whitney Thornton who detected no clapper rails. The second round of surveys was conducted by Tobias Rohmer and Jude Stalker on February 16, 2010 when one to two clapper rails were detected. The third round of surveys was conducted by Tobias Rohmer and Jude Stalker on April 8, 2010 when three to six clapper rails were detected.

A Cooper's hawk flew through the site during round two, and other potential nest predators observed include great egret, American bittern, snowy egret, American crow and glaucous-winged gull.

Other birds noted during the survey included: great egret, American bittern, snowy egret, ruddy duck, Northern shoveler, mute swan, lesser scaup, mallard, Canada goose, greater white-fronted goose, common goldeneye, bufflehead, gadwall, American wigeon, white-tailed kite, Cooper's hawk, Virginia rail, sora, American coot, killdeer, black-necked stilt, American avocet, Western sandpiper, least sandpiper, short-billed dowitcher, greater yellowlegs, lesser yellowlegs, long-billed curlew, glaucous-winged gull, Caspian tern, Northern flicker, American crow, tree swallow, barn swallow, bushtit, marsh wren, European starling, yellow-rumped warbler, white-crowned sparrow, song sparrow, savannah sparrow, red-winged blackbird and house finch.

Grey’s Field (24b)

Detected 1-2 clapper rails

Grey's Field (Figures 30b and 31b) is located downstream of Shollenberger Park on the east side of the Petaluma River. It is a newly restored brackish wetland, with wide, shallow, unvegetated mudflats encompassing some 60 hectares. The vegetation that has established at this site is mostly confined to the marsh edges and comprised mainly of native *Spartina foliosa* and a mix of sedge species. The adjacent upland vegetation is composed primarily of thick stands of invasive *Lepidium latifolium* and other native and non-native plants that provide potential habitat and cover for predatory birds and mammals.
This site was surveyed using Protocol A for a total of three rounds. The first round was conducted on February 1, 2010 by Tobias Rohmer and Whitney Thornton. No clapper rails were detected during this survey. The second and third rounds were conducted on February 16 and April 8, 2010 by Jude Stalker and Tobias Rohmer. One to two clapper rails were detected at the site on the second round. Though no clapper rails were detected within the site boundary during the final round, one clapper rail was detected in the marsh to the south. This clapper rail was not included in the totals for Grey’s Field.

A Northern harrier was observed hunting over Grey's Field during the third survey round. All birds detected at this site include: American bittern, snowy egret, lesser scaup, Northern shoveler, greater white-fronted goose, mallard, ruddy duck, Canada goose, bufflehead, American wigeon, common goldeneye, white-tailed kite, Northern harrier, American coot, **black rail**, sora, Virginia rail, killdeer, American avocet, black-necked stilt, long-billed curlew, short-billed dowitcher, least sandpiper, glaucous-winged gull, Northern flicker, American crow, tree swallow, bushtit, marsh wren, European starling, white-crowned sparrow, song sparrow, savannah sparrow, red-winged blackbird and house finch.
4. 2010 Survey Results

Figure 30. Site maps of the Petaluma Region.

Figure 30a. Map of 2010 clapper rail survey results at Petaluma River – Upper (24a).
Figure 30b. Map of 2010 clapper rail survey results at Grey’s Field (24b).
Figure 31. Site photos of the Petaluma Region.

Figure 31a. This mixed plain of *Sarcocornia*, native *Spartina* and sedge patches at Petaluma River-Upper provides ideal habitat for multiple rail species, including clapper rails.

Figure 31b. This photo of the northeast corner of Grey's Field shows the sedges and native *Spartina* lining this new marsh's edge.
4.11 VALLEJO CLAPPER RAIL REGION

The Vallejo clapper rail region covers the freshwater, brackish and tidal salt marshes formed by Tolay Creek, Sonoma Creek and the Napa River as they flow into San Pablo Bay in Solano, Napa and Solano Counties. The bulk of wetlands in this region were created by diking and leveeing the mouth of the Napa River to create agricultural lands and salt production ponds. Restoration of over 10,000 ha of wetlands is either planned or underway in this region, the bulk of which is comprised of these leveed ponds. The high freshwater influence and the very “young” status of many of these sites cause them to not currently support high numbers of (or any) clapper rails, though they have considerable future potential for rail habitat. Hybrid Spartina invasion has had minimal to no impact on the majority of sites in this region.

Marshes in the western reaches of this region are surveyed by the biologists with San Pablo Bay NWR. Of the large expanse of restoration sites PRBO Conservation Science and Avocet Research Associates each surveyed single sites, leaving 23 sites unsurveyed in 2010. Biologists at OEI surveyed a single site using active survey protocol (Protocol C): San Pablo Bay NWR Shoreline/Mare Island (26b) (Table 14, Figure 32).

Table 14: Summary results from California clapper rail surveys at sites in the Vallejo Region.

<table>
<thead>
<tr>
<th>Site Name (ID)</th>
<th>Survey Type</th>
<th>Number of Rounds</th>
<th>Number of Visits (stations x rounds)</th>
<th>Number of Visits with Detections</th>
<th>Percent Occurrence¹</th>
<th>CLRA detected</th>
<th>Included in Five Year Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>San Pablo Bay NWR Shoreline (26b)</td>
<td>C</td>
<td>3</td>
<td>15</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>REGIONAL SUMMARY</td>
<td>-</td>
<td>3</td>
<td>15</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>-</td>
</tr>
</tbody>
</table>

¹ The number of stations where CLRA were detected, expressed as a percentage of the total number of stations sampled during the season.
Figure 32. Map of 2010 clapper rail site boundaries in the Vallejo Region.
San Pablo Bay NWR Shoreline (26b)

Detected 0 clapper rails

The San Pablo Bay National Wildlife Refuge (Figures 33 and 34) lies along the north shore of San Pablo Bay in Sonoma, Solano, and Napa Counties. The refuge includes open bay/tidal marsh, mud flats, and seasonal and managed wetland habitats. Mare Island is the site of the Mare Island Naval Shipyard, located to the west of the City of Vallejo. Both hybrid *Spartina alterniflora* and *S. densiflora* have colonized the southern shoreline of Mare Island. ISP focused its surveys on the narrow southern section of the site where the vegetation is predominantly a *Sarcocornia pacifica* monoculture edged with *Baccharis pilularis* and *Raphanus raphanistrum* along the bounding levees. Adjacent plots are a mix of holding ponds, overgrown fields and brackish marshlands, giving the area a generally high diversity in flora and fauna. Clapper rails were last recorded at the site in 1992 by Robin Leong with Napa-Solano Audubon (pers. comm.).

San Pablo Bay NWR Shoreline was surveyed using Protocol C for a total of three rounds by Tobias Rohmer on February 10, February 25 and April 7, 2010. Tapes were played during all three rounds of survey, but no clapper rails were detected at the site.

Actively hunting Northern harriers were abundant at this site and short-eared and great horned owls were also seen and heard. Potential nest predators, snowy egrets and great egrets, were also observed during the survey periods.

All bird species present included: snowy egret, great egret, American wigeon, mallard, gadwall, cinnamon teal, Canada goose, Northern harrier, white-tailed kite, ring-necked pheasant, sora, Virginia rail, American avocet, greater yellowlegs, short-eared owl, great horned owl, horned lark, bushtit, marsh wren, American pipit, song sparrow, savannah sparrow, Western meadowlark, brown-headed cowbird, Brewer's blackbird, house finch and American goldfinch.
Figure 33. Map of 2010 clapper rail survey results at San Pablo Bay NWR (26b).
Figure 34. Looking over San Pablo Bay NWR on the west side of Mare Island reveals an extensive plain of *Sarcocornia pacifica* that provides habitat for smaller rails, but does not have the structural complexity and channelization needed for clapper rails.