

***McNabney Marsh***  
***2016 Nesting Bird Surveys***



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## INTRODUCTION

In cooperation with the Peyton Slough Wetlands Advisory Committee (PSWAC), the Mt. View Sanitary District (MVSD or the District) requested that a nesting bird survey be conducted in McNabney Marsh (Marsh) during the 2016 breeding season. The survey was intended to collect data on nesting species (with a focus on ground nesting species) for comparison with data collected in 2002–2004 and 2011–2015. The 2016 survey is the sixth consecutive annual survey documenting nesting bird activity in the Marsh. Although the tide gate is operated by Eco Services (formerly Solvay Chemicals, formerly Rhodia Inc.), the management plan/operations schedule is a cooperative effort between MVSD, Eco Services, and the PSWAC, intended to better manage McNabney Marsh for nesting bird success.

Since the tide gates on Peyton Slough began operations in June 2009, the Marsh has experienced significant impediments to drainage. Stagnation is confounding the management of algae growth, water quality, nuisance odors, nesting bird reproduction, and other factors related to marsh health. One potential contributing factor in the poor drainage of the Marsh is a possible constriction on Peyton Slough at a Union Pacific Railroad (UPRR) bridge. Several engineering reports consider the bridge a contributing factor to the constriction, preventing free flow. A Draft Analysis Report was completed by HDR in September 2014 with more recent data being presented at the July 2016 PSWAC meeting. The general consensus is that a combination of factors is moderating flows into and out of the Marsh, including the constriction at the railroad bridge, and timing and degree of control of the tide gates in Peyton Slough. Whatever the cause(s), the pumped-up water levels create challenges for ground-nesting species that have depended on the Marsh for nesting habitat for decades.

The District is aware of these challenges and, in an effort to manage these undesirable effects on nesting birds, has constructed and installed nesting rafts to offset the loss of nesting habitat from tide gate operations. Eight 36" x 60" rafts were deployed in 2012<sup>1</sup>; twelve 16" x 30" rafts in 2013; eight 4' x 10' rafts in 2015, and eight additional 4' x 10' rafts, were deployed in 2016 (Figure 1). A variety of substrates (vegetation, gravel, and sand) were added to the rafts, as well as rocks of various sizes, turf grass (2015 only), branches, and other cover objects, in hopes of attracting a number of nesting waterfowl and shorebirds species.

Eco Services operates the tide gates on Peyton Slough with the primary goal of watering a downstream 22-acre pickleweed (*Salicornia* sp.) mitigation site (South Marsh) on the north side of Waterfront Road. As in 2013 and 2014, MVSD monitored water levels in McNabney Marsh daily from mid-March to early August and supplied the information to Eco Service to inform tide gate operations and reduce impacts to nesting birds in McNabney Marsh.

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<sup>1</sup> Over time, all of the rafts constructed and deployed in 2012 degraded to the extent that they are no longer usable.

**Figure 1. A large raft, comprised of four 4' x 10' single rafts and covered with sod, was moved into the south end of McNabney Marsh in February 2015. A single raft is towed behind to be deployed at a different site.**



During the 2016 nesting bird season, Eco Services and MVSD elected to maintain water levels at or below 2.5' with no mandated minimum water level (data were measured using the staff gauge at the East Channel tide gate). This was expected to help reduce the amount of gate manipulation required. It was noted, however, that water levels held below 1.8' for prolonged periods of time could attract birds to lower elevations for nest site selection in dry open areas surrounding the Marsh, possibly increasing the chances of nest flooding. It was determined that this condition should be avoided to the extent possible. It was also noted that water levels above 2.5' were equally undesirable, as such levels flooded islands that are used for nesting. Water levels above 2.8' have flooded infrastructure, including Waterfront Road.

Figure 2. Location of 3 transects and 4 observation points used to document migratory bird nesting in McNabney Marsh, Martinez, CA.



## METHODOLOGY

The Wildlife Project continued survey efforts during year six of a multi-year nesting bird survey in McNabney Marsh (Figure 2). This work included studying previous nesting bird data provided by MVSD (i.e., 2002–2004 and 2011–2015) and conducting field surveys for nesting activity throughout the Marsh in 2016. Visual encounter surveys included three pre-established transects and four pre-established observation points created as repeatable data-collection locations that could be compared over time. Transects were located along the northern, eastern, and southern shoreline borders of the Marsh (Figure 2). Observation points were located in appropriate areas for clear viewing, and a spotting scope was used to scan larger areas for nesting birds and for breeding and nesting behavior.

Current surveys began in mid-March 2016 and were conducted every other week through August 2, 2016. Transects and observation point surveys were organized in such a way that all data could be collected before noon each day. Surveyors typically walked transects while collecting data on birds observed, nests observed, nesting activity, chicks hatched, chicks fledged, etc. Counts at observation points were typically conducted in conjunction with the associated transects. All nesting birds observed were identified to species and mapped on aerial photos.

Although pre-existing islands continued to erode in the Marsh, it was hoped that most or all detected ground nests would be free from flooding and destruction if water levels did not exceed 2.5'. The staff gauge was checked once or twice on most days throughout the season by MVSD staff and reported to Eco Services via email and the Google Docs spreadsheet created in August 2013 for this purpose. If necessary, a recommendation for gate adjustment was offered. Note: the staff gauge numbers reported here have not been correlated to any known elevation metric and are simply treated as relative levels.

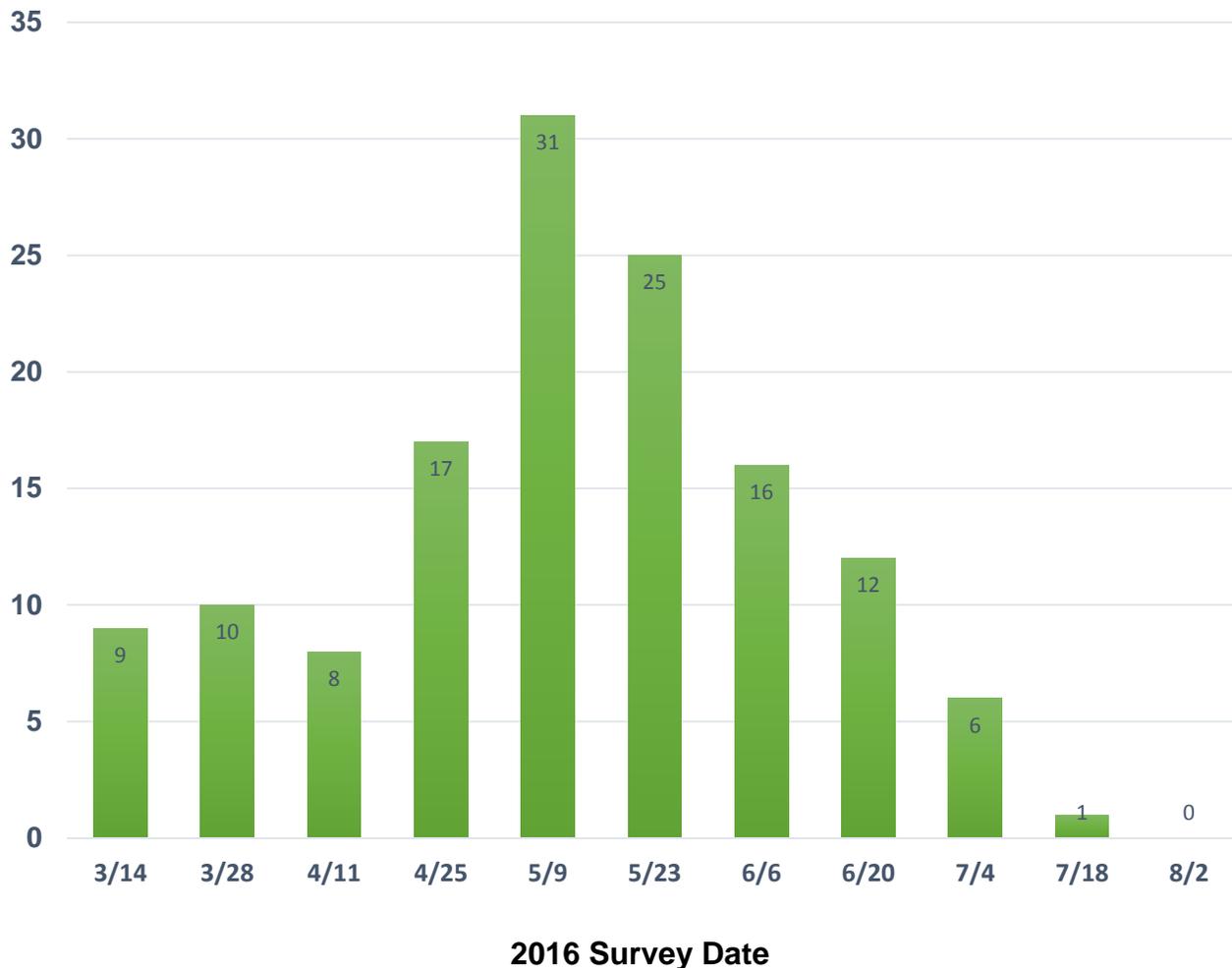
## RESULTS

Field surveys began after the first detected nest was reported. Transects surveys were conducted from March 14 to August 2, 2016, resulting in an average of 21 species observed per survey (range = 6–31). Total numbers of individual birds ranged from 181 to 799 (mean = 290/survey). This count was approximately 20 percent greater than the average number of birds observed in 2015.

Nesting was initially observed on March 14, 2016, with Canada Goose (*Branta canadensis*) and Mallard (*Anas platyrhynchos*) being the earliest nesting species documented. Nesting activity peaked in early May, approximately two weeks earlier than in 2015 and approximately the same week as in 2014 (Figure 3). It should be noted that the peak in detected nests has a high level of inter-annual variability and shows no real pattern of occurring earlier or later over time.

Eight ground-nesting species were observed nesting during the 2016 season: Canada Goose, Mallard, Blue-winged Teal (*Anas discors*), and Cinnamon Teal (*Anas cyanoptera*), Killdeer (*Charadrius vociferous*), Black-necked Stilt (*Himantopus mexicanus*), American Avocet (*Recurvirostra americana*), and Suisun Song

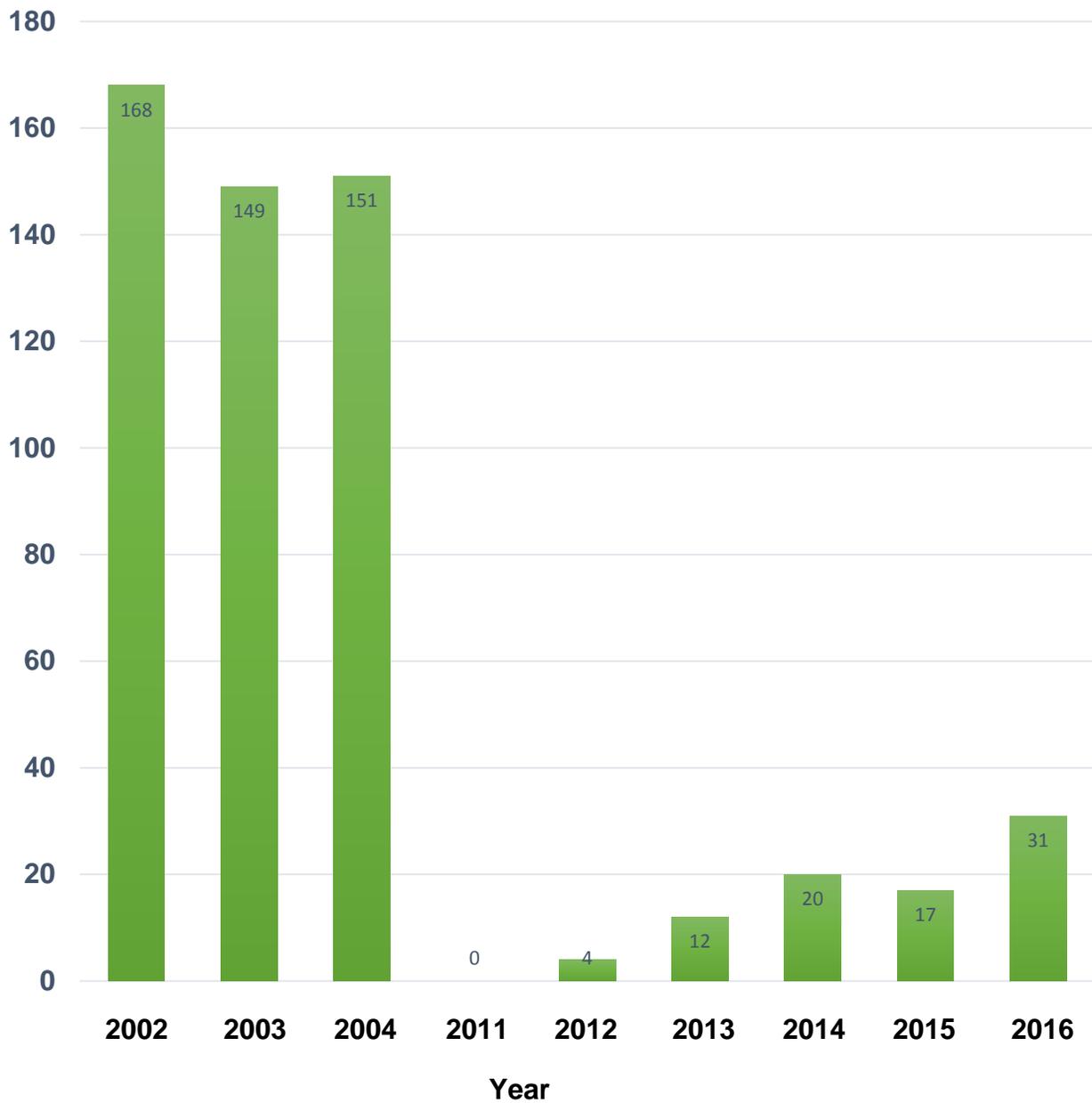
**Figure 3. Observations of active nests detected during surveys for nesting birds in McNabney Marsh, Martinez, CA, 2016.**



Sparrow (*Melospiza melodia maxillaris*). Six additional species that regularly nest in the Marsh were also observed: Barn Swallow (*Hirundo rustica*), Tree Swallow (*Tachycineta bicolor*), Marsh Wren (*Cistothorus palustris*), Black Phoebe (*Sayornis nigricans*), San Francisco Common Yellow-throat (*Geothlypis trichas sinuosa*), and Red-winged Blackbird (*Agelaius phoeniceus*).

The composition of nesting species in 2016 was similar to that in 2015, with the following two exceptions: a conspicuous decline in Great-tailed Grackle (*Quiscalus mexicanus*), which is a normally common nester in emergent vegetation in this Marsh; and a new nesting species—the Blue-winged Teal, which only rarely breeds in Contra Costa County.

**Figure 4. Number of observed fledglings in McNabney Marsh 2002–2004 and 2011–2016.**



The first observed chicks were recorded on May 9, 2016 (Black-necked Stilt), and the last chicks observed were during surveys on July 18, 2016 (American Avocet). At least 31 chicks reached the fledgling stage during the 2016 survey period (Figure 4).

## DISCUSSION

The 2016 nesting season for migratory birds in McNabney Marsh appeared to begin during the middle of March and extended into August—similar to 2013–2015, but approximately two weeks earlier than in the 2011 and 2012 nesting seasons.

Our surveys focused primarily on ground-nesting birds that might be impacted by hydrologic management changes. Water levels were reported to have exceeded 2.5' on 16 days (12 of which the high-water marks likely occurred during overnight high tides, judging by duckweed [*Lemna* sp.] and other debris found on the staff gauge the following morning). Six of the 16 days of higher than desired water levels reached or exceeded 2.6', and two days reached or exceeded 2.7'. At least four ground-nesting bird nests were flooded, including those of Canada Goose, Black-necked Stilt, and Killdeer.

We observed a significant decrease in two nesting species that we have monitored in the last six years: Great-tailed Grackle and Marsh Wren (although Marsh Wren is not a ground-nesting bird, and therefore not a bird for which nests were counted specifically). We noted a near-elimination of emergent vegetation along the fixed transects and a corresponding decrease in nesting habitat and nesting activity of these two species within our survey areas in McNabney Marsh. This is almost certainly due to changes in salinity that have transformed the Marsh into a less favorable site for most freshwater emergent vegetation (i.e., *Typha*, *Schoenoplectus*, etc.), and consequently is a habitat that has become less suitable for Marsh Wrens and Great-tailed Grackles. Nevertheless, anecdotal information suggests that common reed (*Phragmites* sp.) may be self-sustaining or possibly increasing. San Francisco Common Yellowthroat, a species that nests in emergent vegetation, still nests in McNabney Marsh but is restricted to areas in the northwest corner and along Peyton Slough. Red-winged-blackbirds, which once nested commonly within emergent vegetation along the eastern margin of the Marsh, have shifted their nesting into uplands, particularly within coyote bush (*Baccharis pilularis*).

Both Ridgway's (= Clapper) (*Rallus logirostris obsoletus*) and Black Rails (*Laterallus jamaicensis*) have been documented recently and/or historically as nesting in McNabney Marsh. The significant reduction in emergent vegetation in the Marsh is likely affecting their numbers in the survey area, and neither species was documented in 2016. If increases in emergent vegetation occur, both Ridgway's and Black Rails may again utilize the site. Presence of these species should be considered possible.

Based on surveys conducted in 2002–2004, the normal decline in nesting would be expected to occur approximately late June or early July; however, some inter-annual variability is expected. In 2015 nesting declined in mid-June and ended by late July, while in 2016 nesting declined in mid-July and ended by the beginning of August; a shift toward later in the year.

At least 31 fledglings were observed in McNabney Marsh in 2016—an increase from 2015 but no more than 20 percent of the numbers detected in the early 2000s, when surveys indicated that fledglings from eight species were observed during May and June (Canada Goose, Mallard, Northern Pintail, Cinnamon Teal, Gadwall, Killdeer, Black-necked Stilt, and American Avocet).

The 31 fledglings observed in 2016 represented five species: Canada Goose, Mallard, Cinnamon Teal, American Avocet, and Black-necked Stilt.

It is worth noting that in April 2016 biologists detected nesting activity by Black-necked Stilts and American Avocets on several of the large-scale floating nesting rafts. This observation is significant, because Black-necked Stilts have now used nesting rafts of various sizes for the last four years. American Avocets have not been reported to use the small nesting rafts, but several pairs did use the larger rafts in 2015 and 2016 (Figure 5 and 6). Artificial nesting substrate appears to be increasing the potential nesting sites for these two shorebird species, which would otherwise likely number at or near zero in McNabney Marsh (Table 1).

**Table 1. Usage and success on nesting rafts in McNabney Marsh 2013–2016. Not all rafts were used every year, and some were reused; only those used are listed below.**

Year of use	Raft size*	Species utilizing rafts	Result
2012	36" x 60"	Canada Goose	Nest & eggs, no fledglings
	36" x 60"	Canada Goose	Nest & eggs, no fledglings
	36" x 60"	Canada Goose	Nest & eggs, no fledglings
	36" x 60"	Canada Goose	Nest & eggs, no fledglings
	36" x 60"	Canada Goose	Nest & eggs, no fledglings
	36" x 60"	Canada Goose	Nest & eggs, no fledglings
2013	16" x 30"	Black-necked Stilt	Nest only
	36" x 60"	Canada Goose	Nest & eggs, no fledglings
	36" x 60"	Canada Goose	Nest & eggs, no fledglings
2014	36" x 60"	Black-necked Stilt	Nest, presumed fledgling
2015	4' x 10'	Black-necked Stilt	Nest, presumed fledgling
	4' x 10'	American Avocet	Nest, one fledgling
	4' x 10'	Black-necked Stilt	Nest presumed failed
	4' x 10'	Black-necked Stilt	Nest presumed failed
	4' x 10'	American Avocet	Nest presumed failed
	4' x 10'	American Avocet	Nest presumed failed
2016**	4' x 10'	Black-necked Stilt	Nest, presumed fledgling
		Black-necked Stilt	Nest
		American Avocet	Nest
	4' x 10'	American Avocet	Nest
		American Avocet	Nest, presumed fledgling
		American Avocet	Nest
		American Avocet	Nest
	4' x 10'	American Avocet	Nest
		Black-necked Stilt	Nest
		American Avocet	Nest
		American Avocet	Nest presumed failed
		American Avocet	Nest presumed failed
		American Avocet	Nest presumed failed
4' x 10'	American Avocet	Nest, presumed fledgling	
	American Avocet	Nest, two fledglings	

\* 36"x60" rafts have degraded and are no longer usable for nesting by birds in the marsh. 16"x30" rafts were used only once (2013), and although available, are not currently used by any species.

\*\* Some nesting platforms had multiple nest or multiple nest attempts with either one or two species.

**Figure 5. A 4' x 10' raft with sand substrate used by American Avocets in July 2016. Note that the egg is hatching, as evidenced by tiny cracks (see arrow).**



## **MANAGEMENT RECOMMENDATIONS**

All of the species documented as nesting in the Marsh are protected by the Migratory Bird Treaty Act, and thus afforded a level of protection that prohibits take of the individual birds, nests, eggs, or parts thereof. Understanding breeding behavior and nesting habitat requirements is critical for optimal breeding success of both common and special-status species occurring in McNabney Marsh. Studies such as this one provide information about the timing and extent of nesting activity on the Marsh, and should be considered when managing these wetlands for overall increased habitat function and value for wildlife.

Going forward, management actions, including tide gate operation, vegetation control, silt removal, and levee maintenance and repair, should fully consider the timing of nesting activity prior to any potentially harmful management action. To avoid non-compliance with the Migratory Bird Treaty Act, tide gate operations that would significantly change water levels in

McNabney Marsh and associated wetlands should be carefully controlled or avoided between early March and the end of July, in perpetuity. To best ensure the success of nesting birds in

McNabney Marsh, the following Management Recommendations are strongly suggested:

- Avoid anthropogenic flooding events in McNabney Marsh between March 1 and August 1.
- If tidal action is necessary during nesting season, develop a water regime that will protect nests without increasing stagnation in the Marsh (which might also increase algae growth and nuisance odors).
- Conduct monitoring of migratory bird nesting activity on an annual basis, following the methodology provided above. Data should be compared year-to-year. Annual monitoring may be concluded when data suggest fledgling rates no longer fluctuate significantly from one year to the next.
- Using the East Channel staff gauge or other acceptable means, conduct daily water-level monitoring in McNabney Marsh in conjunction with annual migratory nesting bird surveys.
- Continue to add numerous floating or stilted nesting platforms of various sizes and styles for nesting birds in the Marsh. Add nest boxes for Tree Swallow and other species, where appropriate.
- Work cooperatively with PSWAC and tide gate operators to manage the Marsh in a manner that promotes the fledging of migratory nesting birds.