Dynamics of an Urban Turkey Vulture Roost in Sacramento, California

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The Turkey Vulture (*Catharus aura*) is common and widespread in much of California and the West. The Central Valley and surrounding foothills apparently host both a resident, year-round population and migrants moving to and from breeding and wintering areas elsewhere (Kirk and Mossman 1998). Large scale migration has been documented in the fall in the southern Sierra Nevada (Rowe and Gallion 1996, http://www.natureali.org/TV_daily_Stats.htm), Tehachapi Mountains (Moore and Moore, no date), and Mojave Desert (Rosenberg et al. 1991), and was reported recently in the central Sierra Nevada (D. Ross, pers. comm.).

Both resident and migrant Turkey Vultures make extensive use of communal roosting sites, but roost use patterns, roost site characteristics, and ecology in non-breeding areas have not been well-documented (Kirk and Mossman 1998, Evans and Sordahl 2009). Vultures populations also have been suggested as indicators of environmental health, based on sensitivity to pesticides and lead contamination (Kirk and Mossman 1998).

Observation of a Turkey Vulture roost site in urban Sacramento provided an opportunity to document numbers, patterns of use, roost habitat characteristics, and local movements to and from the roost.

STUDY AREA

I studied Turkey Vultures at a roosting area in and adjacent to William Land Park (hereafter Land Park), in Sacramento, California. The 67-ha park was established in 1926 and supports many large, old ornamental trees. The roosting site consists of two subareas on the north side of the park along 11th and 13th Avenues, and extends into the adjacent older Land Park residential neighborhood. The main use area at 13th Avenue encompasses about 26 ha. The 11th Avenue use area encompasses 4.5 ha and is separated by 250 m from the 13th Avenue roost. Overstory trees in both roost areas include: Deodora cedar (*Cedrus deodara*), Atlas cedar (*Cedrus atlantica*), Italian stone pine (*Pinus pinea*); London plane (*Plantanus acerifolia*); coast redwood (*Sequoia sempervirens*), red-gum eucalyptus (*Eucalyptus camaldulensis*), and other species. Areas beneath roost trees include including a popular walking trail, roads, and residential yards. The 13th Avenue area also includes a pond and borders a golf course.

METHODS

I conducted 99 systematic counts of all used areas over a 16 month period (26 September 2009 through 29 January 2011). I conducted surveys at 2 to 15 day intervals, with 4-8 surveys per month, except during September to November 2010, the period of peak fall migration (see Results), when 9-11 monthly surveys were conducted. I conducted most surveys during early morning hours (within 0.5-1.5 hrs of sunrise) when light was sufficient for viewing but before vultures began daily departure from the roost area. Several counts were conducted in the evening after vultures returned to the roost. I generally timed surveys to occur after most birds had left denser night roosting trees for morning post-roosting perches used to warm up before roost area departure (Evans and Sordahl 2009). I also conducted ten earlier morning and late evening surveys to document areas used for night roosting.

I counted vultures over a 30-70 minute period (depending on numbers of birds present) while walking a regular meandering transect that allowed viewing of all trees in areas where use had been observed. Vultures were relatively easy to view in winter when deciduous foliage was absent and they sought open areas exposed to the sun to warm up. During spring through fall, I likely missed a small number (estimated at no more than 15%) whose visibility was obstructed by denser foliage. I discontinued surveys and did not incorporate several counts when vultures were leaving the roost when I arrived or began leaving in large numbers before I completed counts.

I counted identifiable vultures in two general age classes based on head and bill color (Kirk and Mossman 1998): adult (after third year [ATY]) and subadult (<ATY) during August-November 2010. I also searched for individuals that had been marked in studies conducted elsewhere in the species' range. I also surveyed areas beneath roost trees and in adjacent areas for obviously ill or dead vultures, or signs of predation on vultures.

During 10 visits, I observed the timing, direction, and number of vultures departing from the roosting areas. I also recorded any reactions to human activities near roosting areas. I estimated distances from the roost site to potential foraging areas (areas of pasture and open grassland used for livestock grazing) using Google Earth (www.earth.google.com).

I recorded the number of night roost and post-roost trees of each species used during 78 visits. I distinguished night roosts from post-roosting trees by vulture presence during early morning sample periods, observed movements to post-roosting trees, and accumulations of feces. I measured tree diameters at breast height (dbh) using a diameter measuring tape.

I calculated estimates of the total number of different individuals that may be using the Land Park roost site annually during fall migration using two methods based on: 1) a 5-month period (mid-July – mid December) when abundance was higher than at other seasons at Land Park, and 2) the 30-day period of peak abundance, which corresponds to the general duration of migration passage at other California monitoring sites (i.e., Rowe and Gallion [1998] for the Kern

period of peak abundance, which corresponds to the general duration of migration passage at other California monitoring sites (i.e., Rowe and Gallion [1998] for the Kern River Valley, and Moore and Moore [no date] for Tehachapi Mountains). For both estimates, I subtracted the assumed average resident population of 40 (i.e., the average number during January-June). I then multiplied each total by 0.9, based on findings from the eastern U. S. that vultures migrate on an average of 90% of days (Mandel et al. 2008).

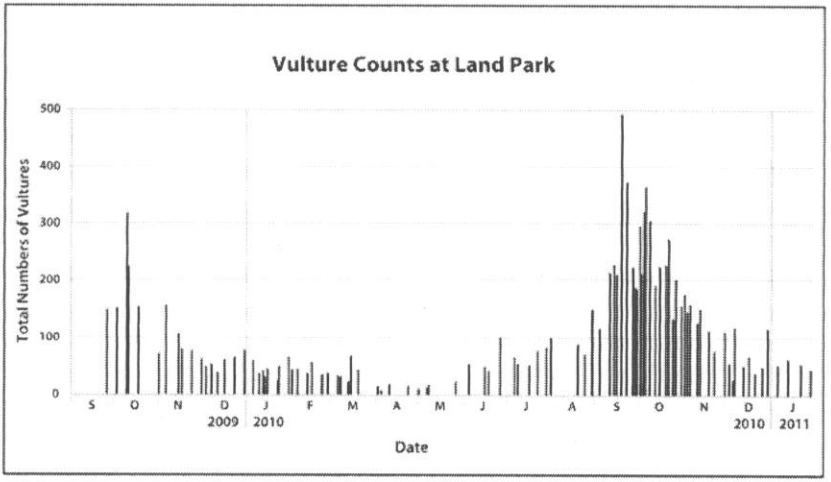

Figure 1. Numbers of Turkey Vultures counted at the roost site in William Land Park, Sacramento, September 2009 to January 2011.

RESULTS

Seasonal Abundance

Turkey Vultures occupied the roost site year-round. Numbers showed a strongly seasonal pattern of use, with monthly averages of 39-64 during December through March and 10-15 during April and May. Monthly averages gradual increased from 60 during June to 177 in September and peaked in October at 211 and 200 individuals in 2009 and 2010, respectively. Numbers then declined in November to averages of 97 and 131 in 2009 and 2010, respectively (Figure 1). The highest annual counts were 317 on 10 October in 2010 and 493 on 19 September in 2010. Totals exceeded 300 individuals on four other subsequent days through 9 October in 2010 (Figure 1). Notably, vulture numbers at the roost showed no increase during late winter and spring (Figure 1) when northward migration occurs. Also, not surprisingly numbers were low during late March to mid-June, presumably when local pairs were breeding away from the roost site.

vultures (84% of 9,965 vultures recorded on various dates) over the entire study period. Nearly all (>99%) of vultures at the 11th Avenue site were counted during August through October when the total roosting population was highest (Figure 1).

Daily vulture numbers fluctuated substantially during the presumed non-migratory period, with numbers on consecutive counts often varying by 30-50%. Most vultures were ATY age-class (94% of 1,350 vultures identified to age class).

I observed two different marked vultures, one each on 30 September and 2 October 2010, which had been trapped and marked in Orick, Humboldt County, California, 375 km northwest of Land Park, on 4 and 10 August 2009 (C. West, pers. comm.). These birds presumably had migrated to and from wintering areas to the south in 2009-2010, north to breeding areas in 2010, and were traveling south again. The co-occurrence of these two birds within 3 and 6 days of each other at two distant locations suggests coincident timing of migration.

Habitat Use and Behavior

Vultures roosting in Land Park regularly used both night roosting and pre- and post-roosting trees (Davis 1979, Kirk and Mossman 1998), although some individuals remained at night-roosting trees in mornings until they departed the roost area. The 16 trees used for night roosting were clearly some of the largest trees present (average = 113 + 21.5 cm dbh), including 14 Eucalyptus trees that were used year-round at 13th Avenue and two London planes at 11th Avenue used during late summer and fall when they supported dense foliage.

Most vultures regularly used other trees near the night roost trees as morning post-roost and evening as pre-roost perches. These perches tended to be exposed tops of large conifers, dead tops of live trees, and exposed branches of deciduous species. While certain trees were regularly used, the individual trees used and numbers of vultures occupying them varied substantially from day to day. In total, vultures used 80 trees of 14 different species during mornings, with 2 to 56 individual trees used on different days. Most post-roost use occurred in Deodora cedar (31% of trees used), Eucalyptus (28%; especially those with dead branches near the top), London plane (17%), Italian stone pine (9%), coast redwood (7%), and Atlas cedar (5%).

Vultures showed typical kettling behavior (Rowe and Gallion 1998) when departing the roost area, often circling to at least 100-200 m height and then departing in a straight line to daytime destinations. Most departures occurred to the southeast toward southeastern Sacramento County and southwest toward southern Yolo County. Approximate distances from the roost to major areas of uncultivated grassland habitat, where most available foraging resources for resident individuals were presumed to occur, are at least 24 km to the southeast and 16 km to the southwest.

Vultures generally showed no response to the low-intensity human

activities beneath and adjacent to roosting trees, including use of a walking and running trail and golf course, the feeding of ducks in the pond, and my monitoring. A few vultures seen on the ground or in low tree perches were flushed by pedestrians and moved to higher tree perches nearby. On several occasions, loud activities (dumping landscape materials, leaf blowing) within 50 m of a roost tree flushed roosting vultures, but they quickly settled at other trees. I found neither dead vultures, individuals showing signs of illness, nor any evidence of predation on vultures.

DISCUSSION

Seasonal Abundance and Daily Use Patterns

The seasonal pattern of use of the roost site by Turkey Vultures and the presence of several birds marked far north of the site confirms that it is used both by migrants and by resident or wintering birds. Numbers increased rapidly in late August to early September and reached a peak population in mid-September through mid-October that was nearly 7 times higher than the average December-July population (averages of 279 and 42, respectively).

The pattern of peak occurrence in Sacramento from early September 2010 through late October is broader than the late September to early October peak migration period observed in the Southern Sierra Nevada (Rowe and Gallion 1998) and late September to mid-October peak in the Tehachapi Mountains (Moore and Moore, no date). The overlap of the peak migration periods between Sacramento and both the Kern River Valley 430 km southwest and Tehachapi Mountains 460 km south-southwest is not surprising, based on information documenting daily movements of 80-385 km per day by individual Turkey Vultures through the Central Valley (http://www.frg.org/hms/HMS_TV.htm) and elsewhere (Kirk and Mossman 1998, Mandel et al. 2008).

Little information exists on the sizes of Turkey Vulture roosts in California other than a report of a roost that supported up to 500 per day near Porterville (Rowe and Gallion 1998). Range-wide, Turkey Vulture roosts "typically contain <100 individuals, but counts of up to 300 individuals are not rare" (Kirk and Mossman 1998). By this scale the Sacramento roost appears to be moderately important.

The pattern of occupancy of the 13th and 11th Avenue subareas indicates that the former subarea was the core roost used during every survey night, while the latter site appears to be an "overflow" area used only during the August-October peak period when migrants swelled the roosting population. Substantial fluctuations in numbers during the presumed non-migratory period is consistent with results from satellite tracking, which has shown that individuals shift use among multiple areas over the course of the season.

Turkey Vultures movements in Land Park between afternoon pre-roosting, night roosting, and morning post-roosting trees are typical for the species (Davis 1979, Evans and Sordahl 2009). Vultures showed only moderate fidel-

ity for individual trees, as much shifting of numbers was evident on different survey days.

Importance to the Migratory Population

The total number of vultures using the Land Park roost site over the season is unknown, because no information exists on turnover rate (i.e., replacement of departing migrants by arriving migrants). Although the Land Park roost population held only 200-500 individuals on any date during peak fall migration, its cumulative use by individuals may be substantial. The total number of migrant vultures using the Land Park roost site over the fall migration season was calculated as 6,507 using numbers over the peak 30-day period of migration observed in other California studies, and 15,120 using numbers from the 5-month period when the roosting population exceeded the presumed resident population.

As a basis for characterizing the importance of the Land Park roost, counts of Turkey Vultures at a major fall migration concentration area at the Kern Valley in the Southern Sierra Nevada averaged 26,329 (+4,879) over 1994-2005 (Rowe and Gallion 1998, http://www.natureali.org/TV_daily_Stats.htm). Annual fall migration counts during 3 years in the Tehachapi Mountains south of the Central Valley averaged 35,671 vultures (Moore and Moore no date). Therefore, based on the two estimation methods used to estimate migrants at Land Park, the area may have hosted roughly 18-60% of the number passing through each of these concentration areas. Peak nightly use of the Land Park roost by presumed migrant Turkey Vultures, however, was lower at nearly 500 (roughly 10%) of peak daily passages of more than 4,500 vulture in the Kern area and over 5,200 in the Tehachapis.

Possible Reasons for Use of an Urban Park Site

The question of why Turkey Vultures have selected the urban Land Park for roosting can be addressed at several scales. From a landscape perspective, the site is on a major migratory pathway, presumably because the hot climate and flat terrain of the Central Valley facilitates creation of thermals that allows efficient migration (Mandel et al. 2008).

The presence of a large number of tall trees likely encouraged Turkey Vultures' selection of Land Park as a roost, as vultures typically select tall trees (Kirk and Mossman 1998), presumably for security and to assist in arrival and departure. Turkey Vultures appear to select roost and post-roost trees within Land Park based on their size, insulation value, accessibility, and support for perching, consistent with other studies (Evans and Sordahl 2009). The fact that fewer trees were used for night roost than for post-roosting suggests that night roost trees may be more important for site selection. Alternatively, however, use of many more trees during post-roosting may suggest a need for birds to disperse to more trees to locate favorable positions for solar warming. There-

fore, the presence of more trees in the roost area to accommodate the pre- and post-roosting birds could be important in site selection.

Human disturbance at the site is relatively low, with only occasional mild human disturbance observed. It is doubtful that disturbance of the typically small roosts in rural areas (<300 birds; Kirk and Mossman 1998) has contributed to urban roosting by vultures, unlike a similar phenomenon suggested for much larger crow roosts (Gorenzel and Salmon 1992). Vulture use in the Land Park area creates only minor nuisance conflicts with neighbors (i.e., the mess due to feces and regurgitated pellets) only during peak migration season.

Why resident Turkey Vultures travel so far from the nearest suitable rural foraging areas to roost in an urban area, instead of roosting locally near foraging habitats, is particularly intriguing. The Land Park site and adjacent residential areas with extensive turf and ornamental plantings does not seem to trap heat that would reduce thermoregulatory energy load during cool time of year, as documented at sites with extensive paving, concrete, and buildings used by roosting crows (Gorenzel and Salmon 1995). Also, the vegetated conditions at the Land Park roost area also would not suggest advantages in producing early morning thermals to increase available time for foraging or migration movements. Perhaps given the relatively low energetic cost to vultures of long-distance flights, seemingly minor advantages of lower predation risk at an urban park site make it worth travelling to as a nightly roost.

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Review of the 111th Christmas Bird Count in the Central Valley of California: December 2010-January 2011

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INTRODUCTION

This is the fifth in an annual series reviewing the results of the Central Valley (CV) Christmas Bird Counts (CBC). This series notes high species counts of the CBC season and examines some of the interesting trends the data suggest.

Data used for this series come from 24 CBC circles within or overlapping the CV (Figure 1). Of these, 22 were conducted during Count Year (CY) 111. I used only data obtained from the actual CBC count day, omitting records reported as occurring within the 'Count Week'. Data were obtained from the National Audubon Society's online data base (http://www.audubon.org/bird/cbc/index.html) and supplemented with data from individual compilers when needed.

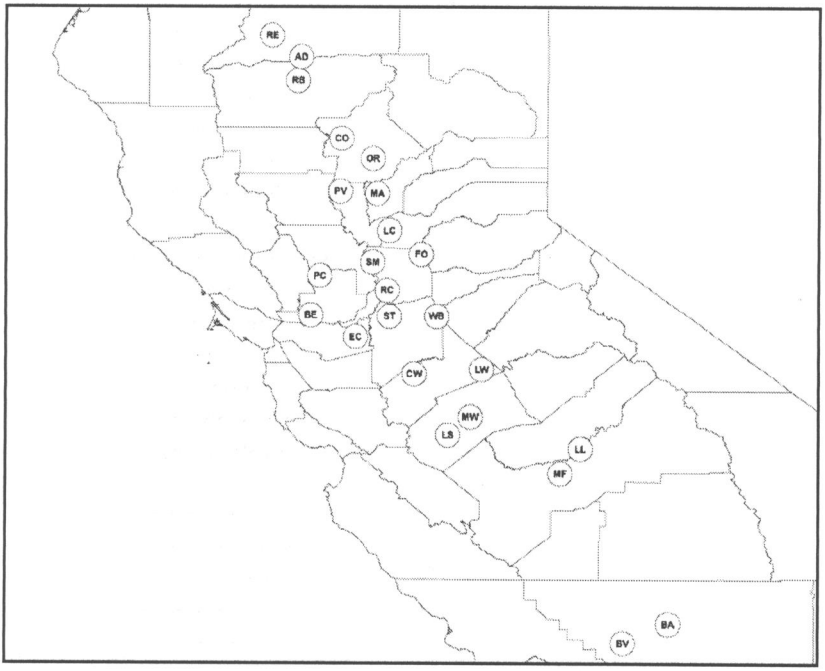
RESULTS AND DISCUSSION

High Species Counts

Among North America's 2000-plus CBCs, CV counts consistently record the highest numbers for many species. Categories where the CV tends to dominate in terms of total numbers include waterfowl, raptors, and species associated with oak woodlands and grasslands. While falling well short of last year, when CV counts led for 26 different species, this year our local counts led took top spots for only 15, the lowest total since I started keeping track in CY 107. Our generally poor weather for most of December may have contributed to this result.

After leading all counts for Ross's Goose (*Chen rossii*) every year since its inception (in CY 108), the Merced NWR's total of 7908 was less than half of last year and only good for 3rd place. Interestingly, the two leading counts for this species, Pine Bluff in Arkansas and Montrose Lake in Missouri, are both in the Mississippi flyway which has not recorded high counts for this species for several years. Marysville's total of over 31,000 Greater White-fronted Geese (*Anser albifrons*) was the top count with Rio Cosumnes and Sacramento taking 2nd and 4th. Caswell-Westley again came in 3rd for Cackling Goose (*Branta hutchinsii*). Marysville, Stockton, and Lincoln took 2nd, 3rd, and 4th spots for Tundra Swan (*Cygnus columbianus*) and Los Banos was 2nd highest for Gadwall (*Anas strepera*). Sacramento made it 13 in row, leading all counts

Figure 1. Map of the 24 CV CBC circles used. From north to south, they are: Redding, Anderson, Red Bluff, Chico, Oroville, Peace Valley, Marysville, Lincoln, Folsom, Sacramento, Putah Creek, Rio Cosumnes, Benicia, Stockton, Wallace-Bellota, East Contra Costa, Caswell-Westley, La Grange-Waterford, Merced NWR, Los Banos, Lost Lake-Fresno, Milburn-Fresno, Bakersfield, and Buena Vista-Kern.



Lincoln took 2nd, 3rd, and 4th spots for Tundra Swan (*Cygnus columbianus*) and Los Banos was 2nd highest for Gadwall (*Anas strepera*). Sacramento made it 13 in row, leading all counts again for Cinnamon Teal (*Anas cyanoptera*) with over 2700 birds, more than every other North American count combined. Benicia's 1276 Cinnamon Teal was good enough for 2nd place. Los Banos was 3rd for Northern Shoveler (*Anas clypeata*) and Caswell-Westley 4th. Northern Pintail (*Anas acuta*) numbers have been declining in the CV and only Marysville managed to break into the top 5 this year. CV counts took the top three places for Green-winged Teal (*Anas crecca*), with the Los Banos circle's total of over 16,000 ahead of Peace Valley and Merced NWR. Los Banos recorded 10,541 Ruddy Ducks (*Oxyura jamaicensis*), well under their all-time record of 28,000 last year and good for only 2nd spot this year. Sacramento took 4th place with 6400 Ruddys. Sacramento led all counts for Black-crowned Night-Heron (*Nycticorax nycticorax*) (1,303) for the 5th straight year and for the 9th of the past 13 years. Marysville took 3rd for White-faced Ibis (*Plegadis chihi*).

Benicia and Rio Cosumnes took 2nd and 4th spots, respectively, for White-tailed Kite (*Elanus leucurus*) and Benicia took 3rd for Northern

managed only a 4th place for Prairie Falcons (*Falco mexicanus*).

Kudos to counters in Los Banos for diligently recording nearly 36,000 American Coots (*Fulica americana*), good enough for 4th place. Benicia took first place for both Black (*Laterallus jamaicensis*) and Virginia rails (*Rallus limicola*) (11 and 138, respectively). Sacramento and Rio Cosumnes took 2nd and 3rd for Long-billed Curlew (*Numenius americanus*) while Los Banos and Rio Cosumnes were 2nd and 4th for Long-billed Dowitchers (*Limnodromus scolopaceus*). Sacramento squeaked into 5th place with just over 6000 California Gulls (*Larus californicus*).

It is somewhat unusual for the CV to see four good Lewis's Woodpecker (*Melanerpes lewis*) years in a row, but CY 111 was another good one. Red Bluff led all counts with 127 while Putah Creek and Folsom were 3rd and 4th. Folsom finished in 5th for Acorn Woodpecker (*Melanerpes formicivorus*) and 3rd for Northern Flicker (*Colaptes auratus*). Sacramento led all counts with 484 flickers. Putah Creek and Rio Cosumnes shared first place for Nuttall's Woodpeckers (*Picoides nuttallii*) with 152 birds and Sacramento took 5th.

Putah Creek found the 3rd-most Western Scrub-Jays (*Aphelocoma californica*) and, for the first time ever, took first place for Yellow-billed Magpies (*Pica nuttalli*) with 471. Sacramento was 2nd with a usually low count of 420 magpies and Anderson was 3rd. Folsom again took top spot in the country with 461 Oak Titmice (*Baeolophus inornatus*) and Benicia was 2nd for Marsh Wren (*Cistothorus palustris*). The Folsom count recorded the 2nd-most Western Bluebirds (*Sialia mexicana*) and Wallace-Bellota broke into the top five for the first time at number 4. The 350,000 European Starlings (*Sturnus vulgaris*) found on the Rio Cosumnes count was a distant 2nd to the 600,000 tallied on the Sooner Lake, Oklahoma, count. Benicia took 5th place for Yellow-rumped Warbler (*Dendroica coronata*). Wallace-Bellota and Putah Creek finished 3rd and 5th for Lark Sparrow (*Chondestes grammacus*). Wallace-Bellota also came in 3rd for White-crowned Sparrow (*Zonotrichia leucophrys*) with Rio Cosumnes in 5th. Rio Cosumnes reported the 3rd-highest total of Golden-crowned Sparrows (*Zonotrichia atricapilla*).

Once again a coastal count (Moss Landing, California) found the most Tricolored Blackbirds (*Agelaius tricolor*) (2125). Panoche Valley, California also bested all CV counts for this species, relegating Merced NWR and Los Banos to 3rd and 4th. As it has been four of the past five years, Rio Cosumnes was the top count for Brewer's Blackbirds (*Euphagus cyanocephalus*) with over 55,000. Lincoln was 3rd and Merced NWR 5th. The importance of the CV for Western Meadowlark (*Sturnella neglecta*) is probably under-appreciated. CV counts again dominated taking four of the top five spots and 10 of the top 13, with Lincoln again in first place (as in every year since CY 105) with 2700 birds. Benicia, Wallace-Bellota, and Rio Cosumnes finished 2nd through 4th. For only the 2nd time in past 14 years, a CV circle did not record the highest number of House Finches (*Carpodacus mexicanus*). That honor went to Panoche Valley with nearly 3700 birds while Stockton, Benicia, and Rio Cosumnes took 2nd through 4th. Lincoln fell to 2nd place for Lesser Goldfinch (*Spinus*

psaltria) and Folsom took 3rd.

Long-term Trends by Habitat Guild

I analyzed CBC data from CV counts for a large number of species over the period from 1976 (CY 107) through 2010 (CY 111) looking for population trends over this period. In each case I used linear regression and determined that a significant trend was shown when the p value was less than 0.05 based on a linear trend (without Bonferroni adjustment).

When one groups the species analyzed by their primary habitat association in the CV in winter, a very interesting pattern emerges. Species associated with wetland/water (Table 1) or riparian/woodland (Table 2) habitats, mostly showed positive population trends from CBC data. In stark contrast, species associated with grassland (Table 3) mostly showed negative trends. Of all waterbirds analyzed, over 60% showed positive trends and less than 10% showed negative trends. More than third of riparian/woodland birds had positive trends while less than 15% showed decreases. In contrast, half of all grassland birds showed negative trends and only one species showed a positive trend. The negative trends for grassland species are consistent with data from across North America that show long-term, highly significant population declines for most grassland species (Sauer et al. 2008, North American Bird Conservation Initiative 2011). Over these past decades, most of the conservation efforts in the CV have been focused on wetlands and riparian areas (Central Valley Joint Venture 2006), with almost no preservation efforts in grassland. In addition, grassland has been lost at a greater rate than other habitats to urbanization and conversion to intense agriculture such as vineyards and orchards (California Department of Conservation 2008, Volpe et al. 2010, R. Holland and J. Marty, unpublished data).

War between the Doves?

The rapid expansion and population explosion of the Eurasian Collared-Dove (*Streptopelia decaocto*) across North America (Romagosa and McEneaney 1999, Romagosa 2002) and through the CV (Hampton 2006, Pandolfino 2010) has been well-documented. They showed no signs of slowing this year with numbers from CV counts up 49% from the previous year. As the numbers become significant in many areas, it begs the question, "Are they having a negative impact on any other species?" One likely candidate is the Mourning Dove (*Zenaida macroura*) since the rural and rural/residential habitats used by the Eurasian Collared-Doves are also within the broad range of habitats used by Mourning Doves (Romagosa 2002, Otis et al. 2008). The trend of Mourning Dove numbers from CV CBCs for the 20 years prior to the appearance of the Collared-Doves (CY 106) was positive (Figure 2). For the five years since CY 106, Mourning Dove numbers have been below that trend line. It is still too early to draw any definite conclusions about impacts at this point, but these

Table 1. Significant trends from CBC data (1976-2010) for birds associated with wetlands and water[1].

WATERFOWL	Trend
Greater White-fronted Goose	Positive***
Wood Duck	Positive***
Gadwall	Positive*
American Wigeon	Positive*
Mallard	Negative*
Cinnamon Teal	Positive***
Northern Shoveler	Positive***
Northern Pintail	Negative***
Canvasback	Positive***
Lesser Scaup	Positive***
Bufflehead	Positive***
Hooded Merganser	Positive***
Common Merganser	Positive*
Ruddy Duck	Positive***
SHOREBIRDS	**Trend**
Black-necked Stilt	Positive***
American Avocet	Positive**
Greater Yellowlegs	Positive***
Dunlin	Positive**
Long-billed Dowitcher	Positive**
HERONS & OTHER WATERBIRDS	**Trend**
American Bittern	Negative***
Great Egret	Positive***
Snowy Egret	Positive***
Cattle Egret	Positive***
Black-crowned Night-Heron	Positive**
White-faced Ibis	Positive***
Eared Grebe	Positive***
American Coot	Positive*

1 = Other species analyzed but showing no significant trend: Snow Goose, Ross's Goose, Tundra Swan, Green-winged Teal, Ring-necked Duck, Long-billed Curlew, Least Sandpiper, Great Blue Heron, Green Heron, Pied-billed Grebe, and Western/Clark's Grebe.

*** $p<0.001$

** $p<0.01$

* $p<0.05$

Table 2. Significant trends from CBC data (1976-2010) for birds associated with riparian and other woodland habitats[1].

RIPARIAN/WOODLAND BIRDS	Trend
Cooper's Hawk	Positive***
Red-shouldered Hawk	Positive***
Nuttall's Woodpecker	Positive*
Hutton's Vireo	Positive***
Bushtit	Positive***
Bewick's Wren	Negative***
House Wren	Positive***
Yellow-rumped Warbler	Positive***
California Towhee	Negative*
Lincoln's Sparrow	Positive***
White-crowned Sparrow	Negative**

1 = Other species analyzed but showing no significant trend: Sharp-shinned Hawk, Downy Woodpecker, Northern Flicker, Oak Titmouse, White-breasted Nuthatch, Ruby-crowned Kinglet, Hermit Thrush, Spotted Towhee, Fox Sparrow, Song Sparrow, and Golden-crowned Sparrow.

*** $p<0.001$

** $p<0.01$

* $p<0.05$

Table 3. Significant trends from CBC data (1976-2010) for birds associated with grassland[1].

GRASSLAND BIRDS	Trend
Ferruginous Hawk	Positive***
Rough-legged Hawk	Negative***
American Kestrel	Negative***
Prairie Falcon	Negative*
Loggerhead Shrike	Negative*
American Pipit	Negative***
Lark Sparrow	Negative***
Western Meadowlark	Negative***

1 = Other species analyzed but showing no significant trend: Golden Eagle, Killdeer, Say's Phoebe, Horned Lark, Western Bluebird, and Savannah Sparrow.

*** $p<0.001$

** $p<0.01$

* $p<0.05$

"Are they having a negative impact on any other species?" One likely candidate is the Mourning Dove (*Zenaida macroura*) since the rural and rural/residential habitats used by the Eurasian Collared-Doves are also within the broad range of habitats used by Mourning Doves (Romagosa 2002, Otis et al. 2008). The trend of Mourning Dove numbers from CV CBCs for the 20 years prior to the appearance of the Collared-Doves (CY 106) was positive (Figure 2). For the five years since CY 106, Mourning Dove numbers have been below that trend line. It is still too early to draw any definite conclusions about impacts at this point, but these results are at least consistent with a negative impact. If Eurasian Collared-Doves are having an impact on Mourning Doves, we should see that impact most clearly in count circles where the ratio of Collared to Mourning doves is high. While Table 4 shows that the three counts with the highest ratios have negative Mourning Dove trends, this relationship is not consistent across counts (e.g., five of the six counts with the lowest ratios also have negative trends). This bears watching over time as Collared-Dove numbers continue to increase.

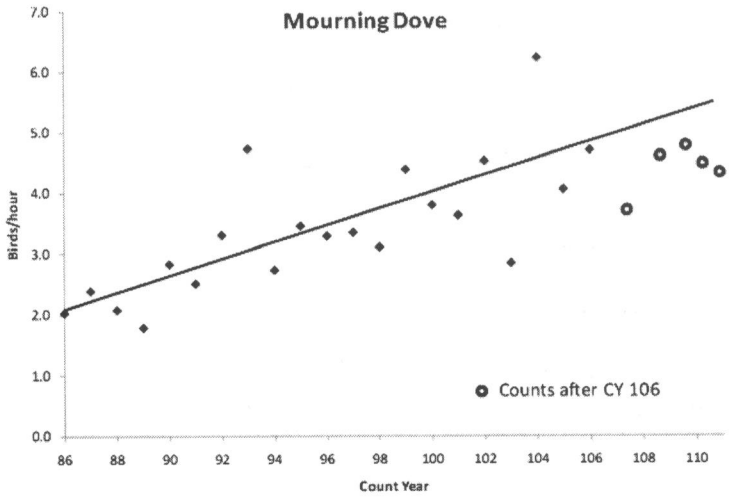


Figure 2. Abundance (birds per party hour) of Mourning Dove for Count Years 86-111 for all CV CBCs. Trendline is based on abundance data from Count Years 86-106. Open circles show abundance for the five years after Count Year 106.

Table 4. Relationship between the ratio of Eurasian Collared-Doves (ECDO) to Mourning Doves (MODO) on each count and the trend in Mourning Dove numbers on that count since CY 106. Trends were not tested for significance.

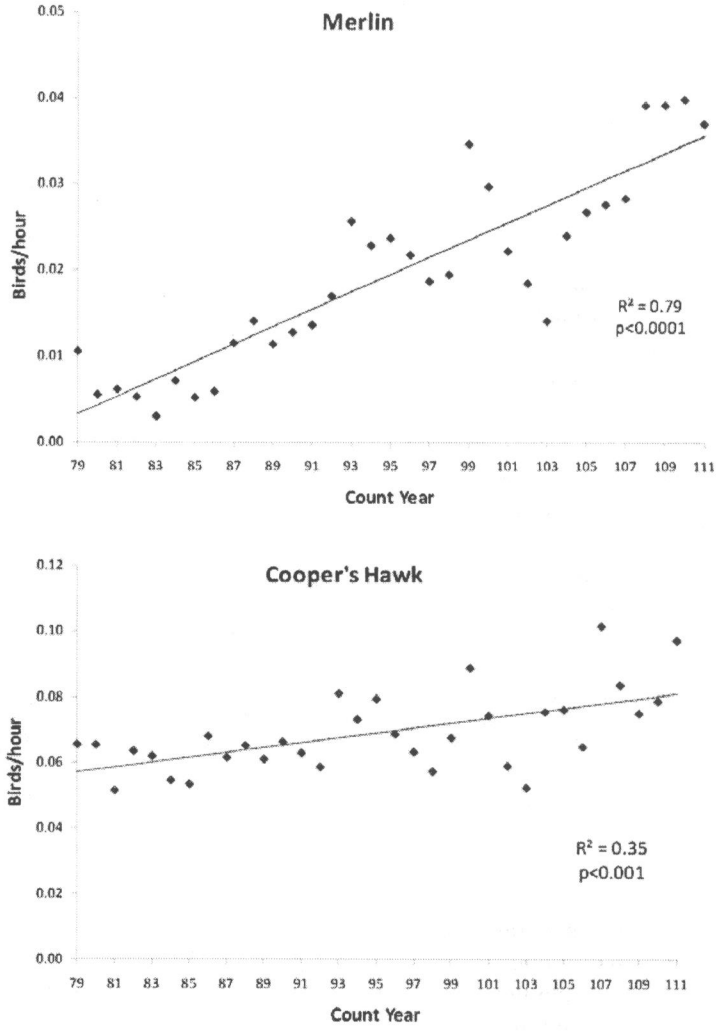
COUNT CIRCLE	RATIO ECDO:MODO	MODO trend (CY 106-111)
Red Bluff	1.155	Negative
Los Banos	0.628	Negative
Chico	0.382	Negative
Putah Creek	0.377	Positive
Redding	0.272	Positive
Stockton	0.244	Negative
East Contra Costa	0.241	Positive
Rio Cosumnes	0.190	Negative
Caswell-Westley	0.189	Positive
Oroville	0.162	Positive
Buena Vista-Kern	0.117	Positive
Lincoln	0.090	Positive
Anderson	0.087	Negative
Sacramento	0.044	Positive
Benicia	0.039	Positive
LeGrand-Waterford	0.031	Positive
Marysville	0.031	Positive
Merced NWR	0.030	Positive
Bakersfield	0.020	Negative
Lost Lake	0.012	Negative
Folsom	0.004	Positive
Milburn-Fresno	0.000	Negative
Peace Valley	0.000	Negative
Wallace-Bellota	0.000	Negative

al. 2006) in the breeding season and in winter. I examined trends for Merlins and for Cooper's Hawks in the CV (Figure 3). The increase in Merlins has been dramatic with numbers in the 2000s roughly six times those recorded in the 1980s. While the trend in Cooper's Hawks was positive, the increase was much less dramatic. Another potential issue with the data for Cooper's Hawk is the difficulty of identifying Accipiters to species. When I examined trends using all Accipiter data (Cooper's, Sharp-shinned and "Accipiter species" combined) I found a very slight, but non-significant positive trend.

Without having a breakdown of exactly what portion of each circle accounted for each observation, it is not possible to determine if increases in Merlins and Cooper's Hawks have occurred primarily in urbanized areas.

Please feel free to contact me by email with comments or suggestions about this series. Let me know if you have particular species you would like

Figure 3. Abundance (birds per party hour) of Merlin and Cooper's Hawk on CV CBCs from Count Years 879-111. Trendlines are based on linear regression.



in the CV (Figure 3). The increase in Merlins has been dramatic with numbers in the 2000s roughly six times those recorded in the 1980s. While the trend in Cooper's Hawks was positive, the increase was much less dramatic. Another potential issue with the data for Cooper's Hawk is the difficulty of identifying Accipiters to species. When I examined trends using all Accipiter data (Cooper's, Sharp-shinned and "Accipiter species" combined) I found a very slight, but non-significant positive trend.

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Flicker Dance

Phil Robertson, 2420 Blue Heron Loop, Lincoln, CA 95648

Finally, at the very end of the wettest March I can recall, the rains subsided and the sun broke through. It was time to throw off the vestiges of cabin fever with a walk along Canyon Oaks Trail here in Sun City Lincoln Hills in western Placer County.

The trail segment my wife and I walk runs east and west between Crescent Lane and Hidden Hills Lane, a distance of about one km. The gravel and dirt trail runs along an annual stream through riparian habitat consisting principally of Interior Live Oak, Blue Oak, and Valley Oak with a sprinkling of willows, cottonwoods and other trees. Complementing this mix along the creek are Himalayan Blackberry and cattail. The slopes of the narrow canyon are covered in grasses and flowering plants (e.g., vetch, filaree, etc.). The area is a treasure trove of birds and most (especially the Acorn Woodpeckers) felt as we did—emancipated.

About 300 m east of Hidden Hills Lane we spotted four or five active Northern Flickers (*Colaptes auratus*) in the grass. It seemed a little unusual to me as I more often see them in the trees in ones or twos. One or more of the flickers made short vocalizations I didn't recognize as characteristic of flickers.

A few moments later we saw a male flicker hopping from rock to rock angling toward us along a stone retaining wall on the south side of the trail. He ignored us as I started photographing him from about 15 m away. Suddenly, a second male flicker appeared, seemingly agitated, facing the calmer flicker. The agitated flicker began his "dance" leaning abruptly to the left and then to the right with his bill angled upward, flaring the underside of his tail feathers toward the other male each time, flicking his wings and moving closer to the other male. The passive flicker ceased his rock-hopping and seemingly "froze" with his nape feathers raised as the aggressive flicker moved closer and closer.

Finally, the apparent interloper appeared to defer to the more aggressive male which had moved to within a few inches. After a few moments, the passive flicker moved to a lower position below the aggressive flicker and then both flickers flew off. The whole incident took no longer than two or three minutes (see back cover).

Naturalists from at least Audubon's time have commented on this flicker "dance" (Bent 1939), which is considered an aggressive display used for territorial defense and/or mate selection and seen almost exclusively in early spring (Noble 1936, Wiebe and Moore 2008). This encounter can occur between two or more males or between two or more females, but is not generally observed between members of the opposite sex. Francis H. Allen's field notes from the early 1930s (Bent 1939) may describe it best:

> "Two birds face each other...and spread their tails and jerk their heads about in a sort of waving motion, frequently uttering a note that is peculiar to this performance, wick-up or week-up. The head motion is a series of backward jerks with the bill pointing up at an angle of perhaps 60° and the head at the same time swinging from side to side."

The bouts of dancing are generally brief with one bird finally surrendering the ground, but the encounters can go on for more than a half hour. Wiebe and Moore (2008) note that in the eastern subspecies, which has yellow shafted flight (wing and tail) feathers rather than the red of our western subspecies, birds frequently erect the red feathers on their nape during this display. My observation of the raised nape feathers is interesting as our western flickers lack the red color on the nape.

ACKNOWLEDGMENTS

I thank Ed Pandolfino for providing information, guidance and encouragement to write this field note. I had never heard of a "flicker dance" before Ed brought it to my attention!

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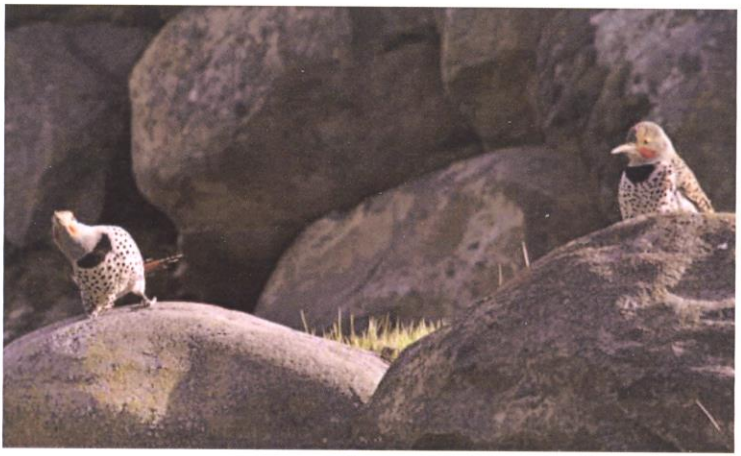

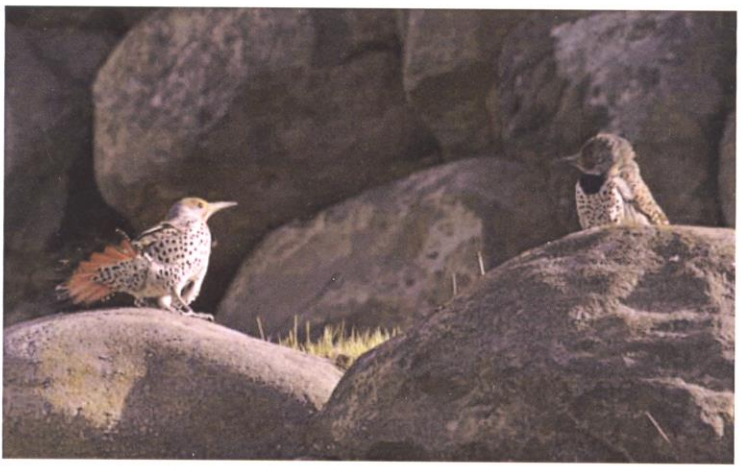

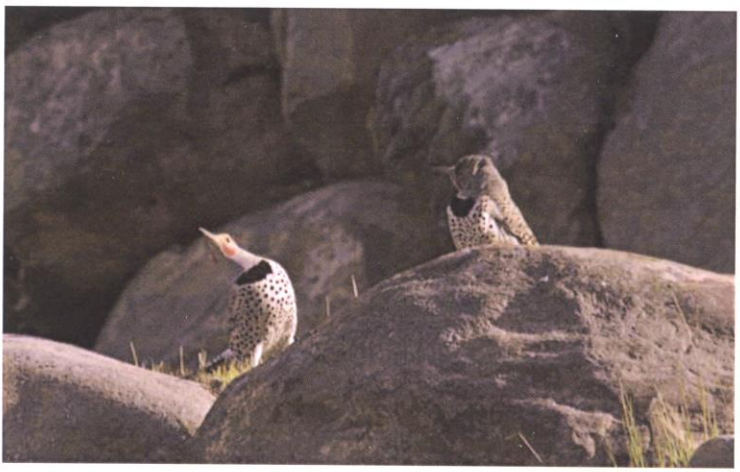

Central Valley Region Bird Highlights: August 2010 through November 2010

John Sterling, 26 Palm Avenue, Woodland, CA 95965

WATERBIRDS

A **Brant** feeding with **American Coots** at Lake Success in 20-22 October (SDS, AD, JLx) provided the first Tulare County record of this coastal species. Rare south of Merced County in the valley, a **Cackling Goose** was photographed in Bakersfield, Kern County. on 7 November (BB). A **Eurasian Green-winged (Common) Teal** was reported from the Vic Fazio Yolo Basin WA on 28 November (SHa). This subspecies and intergrades with the American subspecies are present each year in the Central Valley. Kutras Lake in Redding, Shasta County, was once again the site of late fall/winter scoters with two female **Surf Scoters** on 4 November (BED) and one was still present on 22 November (RBr), another female was photographed in Bakersfield on 8 November (BB), and another was at Folsom Lake in Placer County on 8 November (RP). Also on Folsom Lake was a female **Red-breasted Merganser** on 21 November (RP). Another was at the Winters WTP on 22-29 November (EH, JLD) for one of few Yolo County records. An adult male **Long-tailed Duck** was in Benicia, Solano County, on 29-30 November (EPi). A juvenile **Brown Pelican** and a **Pacific Loon** made a splash when present on Sherman Island in southern Sacramento County on 29-30 November (DW, KPa). An ailing **Common Loon** was at the Jersey Avenue Ponds on 25 November (MSt) for the second Kings County record. Twenty-eight **Cattle Egrets** along Coal Creek Road near Buena Vista on 25 August provided the first Amador County record and perhaps the first record for the Sierra Nevada foothills (DM). Five **White-faced Ibis** at Salt Springs Reservoir on 2 September (DMx) was a great find for Calaveras County, and 30+ were there on 3 September (JLx).

An **American Golden-Plover** at the Fresno WTP on 19-22 November (GaW, JND, JSy) was well photographed for the first Fresno County record. **Snowy Plovers** regularly breed in a few evaporation ponds in the Tulare Basin, but remain noteworthy elsewhere in the Central Valley. A juvenile was at the Lodi WTP, San Joaquin County, on 7 August (JRw) and the following day with a **Baird's Sandpiper** (SHo, EH). Another **Snowy Plover** was at the Modesto WTP on 14 August (EC) in Stanislaus County, one was along Pleasant Grove Road, Sutter County, on 27-28 August (JLg), and another was along Folsom Lake in Placer County on 6 September (RP). A **Willet** at the Lincoln WTP on 2 August (RP), with a **Marbled Godwit** there on 20 August (CA) and two more godwits on 1 September (DR) were rare finds for Placer County. The **Willet** flying above migrating **Sandhill Cranes** over Sacramento was a memorable sight on 3 October (CH) and an unusual record for the county. A

Figure 1. Baird's Sandpiper (*Calidris bairdii*) at the Lodi Wastewater Treatment Ponds, San Joaquin County, 9 August 2010.

Photo © 2011 Daniel Lee Brown

Lesser Yellowlegs at the Ione WTP on 15-16 September (DM, JLx) was one of few Amador County records. **Solitary Sandpipers** migrate through in small numbers each spring and fall, but are always worthy of note. This fall one was at the Tracy WTP on 1 August (SHu) in San Joaquin County, one at the Lincoln WTP on 1 August, two on Ben Hur Road on 17 August (KPa) for the second Mariposa County record, one at the Groveland WTP on 3 September (JR) for a nice Tuolumne county record, one at the Davis Wetlands, Yolo County, on 29 August (KGs), and another with a **Baird's Sandpiper** at the Chico WTP, Butte County, on 8 August (JSL). Three **Baird's** were at the Vic Fazio Yolo Basin WA on 14 August (KGs), one was at the Woodland WTP on 19 August (EP), followed by seven there on 23 August (ToEa), and two at the Jack Stone Ponds, Kings County, on 28 August (MSt). Additional **Marbled Godwits** were reported with six at the Lodi WTP (JRw) on 1 August, another at the Woodland WTP on 19 August (EP), three the following day (SHa), and one on 21 August (EP). The best shorebird find of fall was a juvenile **Hudsonian Godwit** at the Nevada Avenue Ponds in Kings County on 22 August (MSt) and perhaps a different one on 28 August (MSt). Few **Pectoral Sandpipers** arrive prior to September, so two adults at the Madera WTP on 2 August (LH) were noteworthy. One along Salt Spring Valley Reservoir on 16 September (JLx) provided only the second or third Calaveras County record. Its Siberian cousin, the **Sharp-tailed Sandpiper** was at the Vic Fazio Yolo Basin WA on 7-16 October (SHo, KT), providing the eleventh record for Yolo County, which has hosted the vast majority of the Central Valley records. As usual,

Figure 2. Sabine's Gull (*Xema sabini*) at the Woodland Wastewater Treatment Ponds, Yolo County, October 2010.

Photo © 2011 John Sterling

a few juvenile **Semipalmated Sandpipers** were found including one at the Jack Stone Ponds on 4-5 August (SDS) with an adult 5-8 August (DVP, LHa, MSt), one at the Woodland WTP on 20 August (SHa), two there on 23 August (ToEa), one at the Kent Avenue Ponds in Kings County on 28 August (MSt), and one along Pleasant Grove Road, Sutter County, on 30 August (JLg). **Stilt Sandpiper** is rare in the state away from the Salton Sea. One at the Madera WTP on 14-18 August (LH, SDS, KPa) was the first Madera County record, but singles at the Nevada Avenue Ponds on 14 August and 28 August (MSt) and Jack Stone Ponds 20 November (MSt) were in Kings County where there are numerous records, including records of wintering birds. Another was at the Davis Wetlands on 26-28 August (SHa, PA). The only reports of **Ruff** were from Utica Road in Kings County on 24 September (JLt), and Gun Club Road in Merced County from early October to 27 October (PJM, DMo). A **Sanderling** was also at the Madera WTP on 14 August (LH), with another at the Woodland WTP on 21-22 August (EP, KGs), one along Folsom Lake in Placer County on 6 September (RP), and one at Jack Stone Ponds on 6 September (MSt). Two others along the Sacramento River in Red Bluff on 18-19 September (BED) provided the second record for Tehama County. A **Long-billed Dowitcher** visited Lake-of-the-Pines WTP in the foothills in Nevada County on 9 September (RD), which provided one of the few records for the foothills and for Nevada County. Two **Red-necked Phalaropes** at the

Figure 3. White-winged Dove (*Zenaida asiatica*) in Citrus Heights, Sacramento County, 19 September 2010.

Photo by Mark Martucci

Ione WTP on 16 September (JLx) was one of few Amador County records.

A **Parasitic Jaeger** at the Modesto WTP on 26 September (HR, EC) was well-photographed to provide an excellent record for Stanislaus County. **Western Gulls** are now found annually in small numbers during winter in the Central Valley. However, an adult at the Tracy WTP in San Joaquin County was found on the very early date of 23 September (TR). A third cycle **Lesser Black-backed Gull** at the Davis WTP on 10 November (ToEa) added to the total in Yolo County since this species was first found there in 2009. **Sabine's Gulls** primarily migrate over the ocean, but a few are now found each fall at inland sites, including ponds and lakes in the Central Valley. One juvenile was at the Jack Stone Ponds on 13 September (JLt). An adult in alternate plumage was at the Woodland WTP on 6-8 October (JM) and replaced by a late juvenile from 22-28 October (SHa, MP, JCS, ToEa). A **Common Tern** was at the Madera WTP on 16-18 August (LH, SDS, KPa) and a second one was there on 9 September (LH). Three more were found at the Woodland WTP on 9 September (ToEa).

LANDBIRDS

Somewhat expected given the species recently expanding range, a **Common Ground-Dove** near Bogg's Slough on 12 September (RHa) provided the first Kings County record. There are now records in Tulare County and increasingly in Kern County. An amazing record of a **White-winged Dove** was of one photographed on 19 September (MM) in a backyard in Sacramento County. **Greater Roadrunner** is rare in some areas including Contra Costa County where one was seen on a golf course in Brentwood on 2 September (JC), which provided the first record in that county since 1986. A **Northern Saw-whet Owl** in Davis was found on 30 October (CDf) and seen for several days. This species' status on the valley floor is unclear due to its cryptic and nocturnal habits. Three **Black Swifts** flew over the Lake Solano Diversion Dam along Putah Creek on 19 September (RM), providing first fall records

Figure 4. Eastern Phoebe (*Sayornis phoebe*) at San Luis National Wildlife Refuge, Merced County, 10 December 2010.

Photo © 2011 Gary Woods

of this elusive species for Yolo and Solano counties.

We now expect **Eastern Phoebe** in late fall and winter in the Central Valley, and three were found this fall with one in Tar Canyon on 11 November (MSt) for one of few Kings County records, one at the San Luis NWR in Merced County on 24 November (MS), and another along Putah Creek on 19 November (MK) where there have been several previous records in the past decade. The only **Vermilion Flycatcher** report was of one at the Tule Elk State Park in Kern County on 28 November (DMo). An unexpected find was Yolo County's first **Cassin's Kingbird** near Winters (MP, SHa) that was found on 15 October and stayed for several weeks. This species is not known north of the southwestern corner of San Joaquin County. A bit more expected was Yolo County's first **Tropical Kingbird** found on 20 November (CDf) that remained into the winter and provided one of few Central Valley records. A **Bell's Vireo** at the Vic Fazio Yolo Basin W.A was last heard on 4 August (EW). Much rarer, a vagrant **Red-eyed Vireo** was along Babel Slough in southern Yolo

County on 14 September (GEw). Two migrant **Bank Swallows** at the Tracy WTP on 1 August (SHu) were a nice find in San Joaquin County where only one nesting colony persists. Rare on the valley floor in southern San Joaquin Valley, a **Pacific Wren** found on 3 November in Lemoore (MSt) wintered to establish one of few Kings County records. Sacramento hosted two montane species with a **Mountain Chickadee** at East Lawn Cemetery on 15 November (MBM) and a **Steller's Jay** in Curtis Park in on 29-30 November (DA). These were nice finds as these species are not annually found in the Central Valley. A **Sage Thrasher** was along Rock River Road in western Tuolumne County on 18 September (JTu), another was on the back side of Lake Success in Tulare County on 25 October (SDS), one was at Atwell Island in southwestern Tulare County on 30 September (SAL), and a fourth was along Little Panoche Road in Fresno County on 22 October (AD). This Great Basin species is a rare but regular fall migrant along the edges of the Central Valley. At the Vic Fazio Yolo Basin WA, a **Red-throated Pipit** was with American Pipits on 19 October (JCS). This is the second Yolo County record and perhaps only the third Central Valley record of this Siberian species. A **Northern Parula** was at the Cosumnes Preserve in Sacramento County on 22 August (PC, JTr) where there have been numerous previous records of this eastern vagrant warbler. Another found at Hart Park in Bakersfield on 30 November (BBa) was wintering. A **Chestnut-sided Warbler** hit a window in Fresno on 31 August (LH) and the specimen was sent to a museum for the first or second Fresno County record. A living **Chestnut-sided Warbler** was at Babel Slough on 3 October (ToEa, KGs), providing another record for Yolo County of this eastern warbler. The only report of a **Blackpoll Warbler** was from Babel Slough on 27 September (AE). A female **Rose-breasted Grosbeak** at Bogg's Slough on 6-7 September (MSt, JSL) was a second record for Kings County. A male visited East La Loma Park in Modesto on 9 October (EC) for one of few records for Stanislaus County. Hart Park in Bakersfield hosted a **Summer Tanager** 24-30 November (AS). Along the Tule River in Kings County, a female **Indigo Bunting** was found in a flock of **Lazuli Buntings** on 7 September (JSL). Unusual on the valley floor, a **Green-tailed Towhee** was along the American River Parkway in Sacramento County on 19-21 September (JeL, DJ), another was in the foothills in Camino, El Dorado County on 19-22 September (SSt), and one at the Yolo Grasslands Park on 10 October (ZS) was the second record for that vagrant trap. Rare in Yolo County, a **Brewer's Sparrow** was at the Vic Fazio Yolo Basin WA on 4 September (KGs, ToEa). Kings County's first **Swamp Sparrow** was at the Hanford WTP from 23-30 November (MSt, AD, JSL). An influx of **Evening Grosbeaks** into a few Sacramento and Yolo County neighborhoods began on 28 September (JeL) and extended through the winter. Others were seen at Dinosaur Point above San Luis Reservoir in Merced County with seven on 7 October (AD) and one on 23 October (KVV).

I greatly appreciate the summaries of bird sightings for Yolo County generously provided by Steve Hampton (SHa) and the Middle Pacific Coast Regional

Report provided by Ed Pandolfino (EP). Other observers: Chad Aakre, Dan Airola, Peter Armstrong, Bob Barnes (BBa), Ray Bruun (RBr), Blaine Burnette, Eric Caine, Jane Chinn, Paul Cordero, Rudy Darling, Jeff Davis (JND), Al DeMartini, Bruce Deuel (BED), Jon Dunn (JLD), Christopher Dunford (CDf), Todd Easterla (ToEa), Andy Engilis, Jr., Gil Ewing (GEw), Kevin Guse (KGs), Lauren Harter (LHa), Rob Hansen (RHa), Ed Harper, Cliff Hawley, Lynn Heminck, Scott Hoppe (SHo), Steve Huckabone (SHu), Dave Johnson, Manfred Kusch, Jeri Langham (JeL), Jim Laughlin (JLg), Steve Laymon (SAL), John Lockhart (JLt), Jim Lomax (JLx), John Luther (JSL), Jeff Mangum, Don Marsh, Mark Martucci, Dan Maxwell (DMx), Ron Melcer, Mary Beth Metcalf, Peter Metropulos (PJM), Dominic Mosur (DMo), Ed Pandolfino, Kathy Parker (KPa), Michael Perrone, Eric Pillotte (EPi), Ron Pozzi, Harold Reeve, Jeanne Ridgley, Terry Ronnenberg, Deren Ross, Jim Rowoth (JRw), Jeff Seay (JSy), Alison Sheehey, Zach Smith, Mark Stacey (MSt), John Sterling (JCS), Marie Stewart, Stefanie Stewart (SSt), Steve Summers (SDS), Kevin Thomas, John Trochet (JTr), John Turner (JTu), Kent Van Vuren, David Vander Pluym (DVP), Ed Whisler, Dan Williams, and Gary Woods (GaW). Abbreviations used: W.A.= State Wildlife Area, WTP=Wastewater Treatment Plant; CBRC= California Bird Records Committee; NWR=National Wildlife Refuge.

ERRATUM: In reference to a prior northern California sighting of **Mexican Whip-poor-will** in this column, (CVBC Bulletin, Vol. 13[4]: 84) the county in question was Humboldt County, not Trinity County.