Status and Management of the Least Bell's Vireo and Southwestern Willow Flycatcher in the Santa Ana River Watershed, 2014, and Summary Data by Site and Watershed-wide, 2000-2014

Prepared by
The Santa Ana Watershed Association

Prepared for
Orange County Water District
U.S. Fish and Wildlife Service

Principal Field Investigators
Susan M. Hoffman
Richard Zembal

Authors
Susan M. Hoffman
Richard Zembal
Nicole Housel

Co-Authors and Field Investigators
Melody Aimar
Maricela Paramo Archer
Talula Barbee
Allyson Beckman
Jill Coumoutso
Nicole Housel
Cameron Macbeth

December 2014

TABLE OF CONTENTS

LIST OF FIGURES

ABSTRACT

The 2014 monitoring effort for the Least Bell

INTRODUCTION

The Least Bell

METHODS

Both the monitoring effort and data analysis followed Pike et al. (1999). All potential habitats were carefully and slowly traversed along the edges and open trails. All vireos and other sensitive species encountered were noted as to location, behavior, reproductive status, etc. The primary purpose of this monitoring was to locate all vireos and flycatchers to determine their breeding status and enhance their breeding output through management. Surveys were conducted five days per week throughout the season. The surveys began in March and mostly ended in August (Table 2.1). Occasional visits to determine continued vireo presence occurred through September. Temescal Canyon was monitored by a different methodology in 2014. The canyon was partitioned into six sections and each section was assigned to a different biologist. Two to three visits were made during the season. Surveys were done during periods of clement weather. Nest visitation and monitoring during conditions of very high winds, extreme cold, or other climatic factors that could influence survey results or cause disturbance to nesting birds were avoided. No injuries or mortalities occurred in 2014.

In addition to the above intensive monitoring, abbreviated surveys were conducted of other riparian habitat in the watershed. Since 2005, biologists have identified habitat not regularly monitored. Fifty-eight sites were surveyed during the 2014 season, usually three times, mainly during the first weeks of May, June, and July. These surveys, called assessment surveys, were conducted by walking next to or through habitat along trails. Surveys began about 7 a.m. and usually ended by 1 p.m. Territories were marked by GPS and breeding status was assessed if possible on the brief visits. Some surveys took place outside of the scheduled dates due to conflicting schedules. While three surveys were done for most sites, some sites received only one or two visits (Tables 10 and 11).

Successful nesting is defined as fledging at least one bird. Pairs for which nests were not located, who were never observed nest building or were not seen with fledglings were considered non-breeding. Two estimates of fledgling production are given: the number of fledglings observed, which is the minimum total number fledged, and the projected number of fledglings estimated by determining the average number of fledglings produced by closely-tracked pairs and ascribing that productivity to all pairs. The closely-tracked pairs were those visited frequently enough to document all breeding attempts and their outcomes during the season. This usually meant an effort of at least five visits per nesting attempt, several of which were needed to check for fledglings. In areas subject to parasitism, nests were visited once every seven to eight days to check for cowbird eggs. Cowbird eggs and nestlings were removed from nests.

Over the years we have been reporting the percentage of nests which lose partial contents, eggs or chicks, as the depredation rate. As of 2008 we refer to this statistic as rate of missing/eggs/chicks from nests (Table 5, row K and Table 3, row G). Underdeveloped chicks or non-viable eggs are not included in this data set. The depredation rate is nest loss due to depredation (Table 5, row Mc).

No playbacks of taped vocalizations were used during any surveys for the Least Bell

The field biologists worked under the direction of the Principal Field Investigators and all surveys and nest manipulations were performed under, and in compliance with, all terms and conditions of Federal Endangered Species Permit #TE-839480-4 and a Memorandum of Understanding with the California Department of Fish and Wildlife (CDFW).

Forty-six cowbird traps were deployed in or near riparian habitat in drainages throughout the watershed. Traps were checked daily and native birds released. Trapped cowbirds were transferred to holding traps (closed traps) and the birds were picked up by a licensed falconer.

With the increasing vireo population in the watershed and funding limitations, a new survey strategy must be implemented. SAWA hopes to continue to monitor for detection of all territories throughout all historically monitored sites: San Jacinto, San Timoteo Canyon, Mockingbird Canyon, the Santa Ana River from Riverside Ave. to River Road, including Hidden Valley Wildlife Preserve and Norco, Temescal Canyon, and the Santa Ana Canyon.

In 2014, no nest monitoring was done at Temescal Canyon or Chino Hills; opportunistic nest monitoring was done at San Jacinto, Mockingbird Canyon, and Sycamore Canyon. SAWA's surveys in the peripheral sites took place as usual.

A minimum of 4,200 hours was spent in 2014 for the vireo management program, including 1,951 field hours on vireo monitoring and nest management and 382 field hours on the vireo assessment surveys. About 4,900 hours were spent on the Brown-headed Cowbird management program including 1,100 field hours for spring/summer cowbird trapping, and 760 field hours for winter cowbird trapping. Winter traps were closed in December due to lack of funding. SAWA usually runs traps throughout the winter. Due to staffing shortages, SAWA biologists were unable to support monitoring efforts for the Western Riverside Multi-Species Habitat Management Plan monitoring program.

No listed animals were injured or killed during this monitoring effort.

Appendices. Appendix A contains the GPS points for all survey sites. Shapefiles of the locations of all vireo territories are sent to USFWS and CDFW. Appendix B contains the annual totals for all statistics. Appendix C contains 2010-2014 annual data by site. Appendix D contains annual data by site for 2000-2009, now under separate cover and available on request.

Study Sites

The Santa Ana River was monitored from Riverside Avenue in Riverside downstream to the Santa Ana Canyon at Weir Canyon Road, excluding the Prado basin. For data from Prado Basin (from River Road downstream to the dam), see Pike et al. 2014, in progress. The following tributaries to the Santa Ana River were surveyed: San Timoteo Canyon, Meridian Conservation Area/former March SKR Preserve, Mockingbird Canyon, Sycamore Canyon, Harrison Reservoir (McAllister Creek), Temescal Canyon, Chino Hills-Butterfield Ranch environs and the San Jacinto watershed (Figure 1).

Study sites contained typical Southern Californian riparian vegetation including tall canopies of cottonwood, *Populus fremontii*, and black willow, *Salix gooddingii*, sub stories of arroyo and red willows, *Salix lasiolepis* and *Salix laevigata*, respectively, and mulefat, *Baccharis salicifolia*. Lush riparian habitat is abundant throughout the study sites, intermixed with invasive giant reed, *Arundo donax*, which is currently dominant in many locations only in the middle watershed. Non-native perennial pepperweed, *Lepidium latifolium*, is found at many sites mainly along paths and trails. Other dominant non-native vegetation includes castor bean, *Ricinus communis*, poison hemlock, *Conium maculatum* and Tamarisk, *Tamarix ramosissima.* Other than storm run-off, the river

Surrounding land use includes a golf course, agricultural land, retention basins for a local water district, private plant nursery, and residential. The San Jacinto Wildlife Area, east of Lake Perris and north of Ramona Expressway, was also monitored in 2014. This area is owned by the State of California and includes approximately 9,000 acres of restored wetlands, including ponds and marshes. It is currently surrounded by open fields, agricultural land, a seasonally dry lake bed, and a horse ranch.

San Timoteo Creek was surveyed from Cooper's Creek to approximately 15 miles (24 km) downstream. A program initiated by SAWA to restore riparian habitat has removed giant reed along the entire creek watershed. The canyon

and Nicole Housel. Sycamore Canyon was surveyed by Cameron Macbeth. Chino Hills was surveyed by Melody Aimar and Jill Coumoutso. San Jacinto was surveyed by Nicole Housel. Irvine Regional Park was surveyed by Talula Barbee and Maricela Paramo Archer. Temescal Canyon was monitored by Cameron MacBeth, Melody Aimar, Nicole Housel, Jill Coumoutso, Talula Barbee, Maricela Paramo Archer, and Henry Armijo.

Patch sizes of the assessment surveys ranged from long stretches of ravines such as Allesandro and Prenda Ravines to small patches in urban parks as found in Norco and Chino Hills.

RESULTS

Vireo Abundance

In 2014, vireo abundance remained stable with documentation of 1582 territories throughout the watershed including Prado. SAWA and cooperators documented a 4% increase in abundance from 1021 territories in 2013 to 1062 territories in 2014. Prado documented a 7% decreased from 561 in 2013 to 520 in 2014. In 2013, vireo abundance throughout the watershed, including Prado, increased 28% from 1,237 territories in 2012 to 1,582 territories in 2013 (Tables 1A and 1B).

SAWA and cooperators documented 481 pairs in 2014, an increase of 2% from the 471 documented in 2013. The number of documented fledglings decreased by 20%, from 682 in 2013 to 548 in 2014. This apparent decrease may be due to staffing limitations in 2014 although the consequences of the continuing drought and potential lack of food cannot be ignored. Reproductive success decreased by 0.8% in 2014 from 2013. The 2014 numbers do not include data from San Bernardino County which documented 30 territories in 2012.

About half of all managed sites showed an increase in abundance, the other half showed a decrease in abundance. Subpopulations at San Timoteo Canyon, Hidden Valley Wildlife Preserve, and Santa Ana Canyon at Green River Golf Course increased by 13 -18%, while Sycamore Canyon increased by 42%. Large decreases in vireo abundance were documented along the Santa Ana River (a 15% decrease), Mockingbird Canyon, a 26% decrease, San Jacinto, a 15% decrease, and the fragmented Chino Hills, a 23% decrease.

Abundance - Vireo Assessment Surveys

Two hundred- eight vireo territories were detected at 58 sites in the Santa Ana watershed during the 2014 assessment surveys (Tables 10 and 11). This is the highest count since the surveys started. These surveys began in 2005 and 2006 when 36 and 35 territories respectively were documented. There were large increases in numbers from 2007 to 2009 and from 2010 to 2012 the numbers stabilized between 146 and159. In 2013 the numbers increased to 197. These surveys were conducted in patches of riparian habitat isolated from the larger tracts of habitat where biologists manage vireos.

Some of these patches have developed sizable populations. Alessandro Arroyo in Riverside has doubled its population in 2014 to 19 documented territories. Poorman

Reservoir population increased from 2 in 2013 to 6 in 2014. There are now 20 territories documented at Lake Perris, 15 in Peter

Nesting Site Preferences

Nesting site preferences followed parameters previously documented by other observers (Pike et al. 1999). Nests were found mostly in riparian vegetation, near water, along dirt trails or roads, and on edges of rows of willows and other riparian vegetation.

Mulefat, *Baccharis salicifolia*, dominated the nest placement preference for vireos with 33% (57/174) of nests (Table 4). Five species of willow (*Salix spp.*) held 28% (49/174) of nests in 2014. Arroyo willow, *Salix lasiolepis*, was the most preferred of the willows holding 28 nests. Other nest-host species in 2014 included but not limited to: wild grape, *Vitis girdiana*; black elderberry, *Sambucus nigra*; Fremont cottonwood, *Populus fremontii*; mugwort, *Artemisia douglasiana*; toyon, *Hetermeles arbutifolia*; Poison oak, *Toxiocodendron diversilobum*; laurel sumac, *Malosma* laurina; Western sycamore, *Platanus racemosa*; and golden currant, *Ribes aureum*. Average nest height was 37

has also been observed eating a nestling vireo. These species occur at most sites throughout the watershed.

Feral hogs, *Sus scrofa*, are another potential predator. This species occurs in high numbers in San Timoteo Canyon and Hidden Valley. Isolated sightings have been made in other areas throughout the watershed. Feral hogs are extremely disruptive to habitat, by creating wallows, possibly trampling or knocking over nests, and eating a wide range of vegetation and animals.

Brown-headed Cowbird Parasitism

The parasitism rate was 5% in 2014. The rate has ranged from 2% to 5% in the last few years. Parasitism was documented at three sites in 2014: San Jacinto, San Timoteo Canyon, and Sycamore Canyon. Five nests were lost to parasitism in 2014. Previous nest losses due to parasitism have ranged between 1-3%. The criteria for judging nest failure being due to parasitism is the loss or abandonment of vireo eggs in the presence of a cowbird egg. In 2014, five nests were manipulated, two of which successfully fledged five young. Since SAWA began nest monitoring, SAWA has manipulated 10% of tracked nests and 196 vireos have fledged from those nests (Appendix B, Table B-3).

Repaired Vireo Nests

Three nests were repaired in 2014. All nests were located in the Santa Ana Canyon; one at Green River, and two at Featherly Park. Two of these three repaired nests successfully fledged five vireo young. Since SAWA has managed vireo nests in the watershed, 34 nests have been repaired and 70 young have fledged from those nests (Appendix B, Table B-3).

Site Summaries 2014

SAN JACINTO SUMMARY

In 2014, forty-five vireo territories were detected in San Jacinto, down from 53 in 2013, but up from 42 in 2012. Monitoring efforts were greatly reduced in 2014, compared to the previous year, which may account for the apparent decrease in vireo numbers at this site. Most of the vireos were clustered on the San Jacinto River, upstream of State Street adjacent to Soboba Road. Since 2004, this sub-population has increased steadily from 3 territories. Out of the 45 territories, 6 were located in the San Jacinto Wildlife Area. The section of riparian habitat between Sanderson Avenue and Bridge Street was not surveyed in 2014, but in 2013 and 2012 this section held 7 and 2 territories, respectively.

Nineteen known pairs and 12 fledglings were detected in 2014. Due to staffing limitation, this site was not surveyed with the intent of finding nests. As a result only two nests were found incidentally this year, and only one was considered

and the tracked nest was abandoned due to parasitism. In the last 10 years, depredation has been a major cause of nest loss, with 34 out of 91 (37%) tracked nests failing due to depredation. Since 2005, 250 vireo fledglings have been documented in San Jacinto. Measures of reproductive success have varied over the years due in part to low vireo numbers and differential monitoring efforts.

When SAWA began monitoring San Jacinto in 2003, no vireos were detected, but cowbirds were common in the habitat. SAWA initiated cowbird trapping in 2003 at several local dairies. Over 1,000 cowbirds were removed from San Jacinto in the first year of trapping. A trap was deployed in 2006 on a levee near the sub-population of vireos in the river with the assistance of the Eastern Municipal Water District. Overall, 19,189 cowbirds have been removed from San Jacinto during the vireo breeding season. Cowbird trapping has most likely played a large role in the increased vireo population size. Parasitism rates decreased from 50% in 2006 to 13% in 2007 and 0% in 2008. In 2009 the parasitism rate increased to 11%, but no parasitism was documented in 2010. In 2011 and 2012, parasitism was documented at 10% and 8%, respectively. In 2013 no parasitism occurred in well-tracked nests, but 2 vireos were observed feeding cowbird fledglings, while in 2014 the one well-tracked nest was parasitized and abandoned. This vireo was later found feeding a cowbird fledgling from a second nesting attempt. A second vireo was also observed feeding a cowbird fledgling. Both of these birds were located in the San Jacinto Wildlife Area. The last year cowbird traps were deployed in the wildlife area was in 2009. Since then, cowbirds have been observed in increasing numbers at this location. We recommend cowbird traps again be deployed in the wildlife area to help control cowbird numbers, and give the vireo, and other avian species, a chance for successful reproduction. Without cowbird traps, it is likely vireos will continue to be parasitized at this location.

Due to the early successional habitat in this portion of the San Jacinto River, vireos are limited to only a handful of plant species from which to choose for nesting sites, compared to other locations. Narrow-leaf willow (57%) and mulefat (35%) have been the primary plant species used for nest placement in San Jacinto since 2004 (n = 99 nests). Black willow held another 5% of nests. Only 3 of the 99 nests found from 2004-2014 were placed in non-native vegetation, two (2%) in tamarisk and one (1%) in black mustard.

SAN TIMOTEO SUMMARY

In 2014, 151 vireo territories were documented in San Timoteo, up 15% from the 131 documented in 2013. A possible reason for this increase could be that a more intense survey effort was undertaken in 2014. However, the population in San Timoteo has experienced an overall increase of over 2200% in the past 14 years. This increase can be attributed to the removal of invasive species and subsequent restoration of native vegetation, nest monitoring, and cowbird management. San Timoteo originally contained many invasive plant species, most notably arundo (*Arundo donax*) and tamarisk (*Tamarix* sp.). SAWA removed 239 acres of invasive plants from 1997 to 2001, and continues a maintenance program to control regrowth. Restoration of the native plant community through natural recruitment has taken place throughout the

canyon resulting in a healthy riparian under-story, effects of natural storm cycles notwithstanding.

One hundred thirty-five pairs and 206 fledglings were detected in 2014. Nesting success was 48%, down from 57% in 2013 and 64% in 2012. Nest losses were primarily due to predation (44%). Forty-eight well-monitored pairs had a 2.5 reproductive success rate, down from 3.6 in 2013. Nesting success is 57% over 14 years of monitoring (n=657 well-tracked nests), ranging from a low of 29% in 2004 (n=31 nests) to a high of 100% in 2001 (n=4 nests). Depredation has been the major cause of nest loss in the last 14 years; 35% of all nests have been lost due to depredation. Overall reproductive success based on productivity of well-tracked pairs in the last 14 years is 2.8 and has ranged from a low in 2004 of 0.8 to a high of 3.9 in 2009.

Cowbird trapping has occurred in San Timoteo since 2001, and a total of 2,219 cowbirds have been removed from San Timoteo Canyon during this time. In 2014, five of 88 well-tracked nests (6%) were parasitized by cowbirds; two nests successfully fledged vireo after nest manipulation, one nest failed due to predation after removal of the cowbird egg, and two were abandoned (one before nest manipulation and one after). In 2013, 2 of 76 well-tracked nests (3%) were parasitized however neither nest failed due to parasitism; one nest was successful after removal of a cowbird egg and the second failed due to predation after removal of the egg. In 2012, one of 45 well-tracked nests (2%) was parasitized and caused subsequent abandonment and nest failure. In 2011, no well-tracked nests were parasitized; this was the first time in eleven years parasitism had not been documented in San Timoteo. These low rates remain a marked decrease from a high of 75% in 2001. Although parasitism by cowbirds still occurs, at a rate of 17% over fourteen years (114 of 657 nests), only 4% of nests (28 of 657) have failed due to parasitism. This low failure rate is primarily a result of intensive nest monitoring efforts which include nest manipulation.

Mulefat (29%), arroyo willow (21%) and red willow (16%) have been the primary plant species used for nest placement in San Timoteo since 2001 (n= 719 nests). Black willow held another 9% of the nests. Only seven nests found from 2001-2014 were placed in non-native vegetation.

Although the riparian area is protected under existing laws, residential and utility development continues in San Timoteo Canyon. Current threats to the riparian habitat include removal of vegetation by landowners, human encroachment (i.e. paintball and all-terrain vehicle activities), and sheep and cattle grazing. During 2008, a new threat arose in the form of feral pig rooting. While it has long been known that feral pigs were present in the canyon, their growing presence and resulting habitat destruction has increased over the years.

Another potential threat to the habitat is the reduction in volume of surface water discharge into San Timoteo Creek. A local water district began the phased reduction of 3 million gallons per day (mgd) of tertiary-treated discharge to the creek in the Fall/Winter 2012. Hydrology and water use studies were conducted to identify the amount of discharge necessary to maintain existing riparian conditions in the creek and studies determined that discharge could be cut to 1.6 mgd. A Habitat Management Plan was established which calls for management (i.e. increasing discharge to the

creek) if a decline in native riparian cover or an increase in non-native invasive species is detected.

SYCAMORE CANYON SUMMARY

Sycamore Canyon has been occupied by Least Bell

Preserve. The MCA is located in the former March SKR Preserve and is under management by the Riverside Land Conservancy. Riparian habitat just south of Van Buren Boulevard previously surveyed by SAWA as an assessment site was also included in the MCA monitoring area in 2014. Since SAWA began monitoring in 2004, over 150 fledglings have been detected in the former March SKR Preserve.

Measures of reproductive success have varied over the years, due in part to differential monitoring efforts. In 2014, nesting success was 33% (n=3 nests). Two nests failed due to depredation. From 2011-2013, no nest monitoring took place at this site. From 2004 to 2010, nesting success was 77% (n=22 nests). Reproductive success of tracked pairs is 4.6 over 6 years of monitoring. Black willow has been the primary choice for nest placement at this site (38%), followed by arroyo willow (31%) and red willow (27%).

The Meridian Conservation Area is an important piece of the remaining, fragmented riparian habitat in Southern California. A full complement of riparian birds and wildlife occupies this site. Willow Flycatchers, *Empidonax traillii*, have been detected in the riparian habitat in previous years. Multiple sightings occurred in 2008 and one sighting in 2009, however breeding was not confirmed. In 2014, species listed on the Western Riverside County MSHCP found at the MCA included 10 Yellow Warbler territories, Horned Lark, granite spiny lizard, coyotes, and black-tailed jackrabbits.

Although the Meridian Conservation Area is currently protected, foraging opportunities in the upland habitat are severely limited by current development. The habitat patches currently protected are narrow ribbons of riparian vegetation which support the vireos and associated nesting birds in part because of the adjacent open space and surface water in creeks. Recent legal decisions have upheld that this upland habitat will be developed, leaving narrow riparian strips of habitat with little upland support and buffer.

SAWA biologists remain dedicated to contribute efforts to maintain the former SKR Preserve. In August of 2011, several scientists from different environmental agencies, including SAWA biologists, met to discuss information regarding existing habitat and species found in the preserve.

MOCKINGBIRD CANYON SUMMARY

In 2014, twenty-three vireo territories were detected in Mockingbird Canyon, down from 31 territories in 2013. Monitoring efforts were greatly reduced in 2014 compared to the previous year, which may account for the apparent decrease in vireo numbers at this site. Due to staffing limitations, only a portion of Mockingbird Canyon, the section from Markham Street upstream to Alder Avenue, was monitored throughout the breeding season. This section contained 6 territories. The remaining 17 territories were detected early in the season below Markham but were not followed. The Gage Canal Basin, below Van Buren Blvd, was not surveyed this year. Monitoring in Mockingbird Canyon began in 2003, with nine territories detected.

Seven pairs and 7 fledglings were detected in 2014. Four of these pairs and all fledglings were detected in the portion of this site that was monitored throughout the breeding season. Three nests were found incidentally in 2014 and two were well-

tracked. One of these tracked nests failed due to unknown reasons, the other was successful and fledged three young. Measures of reproductive success have varied over the years due in part to differential monitoring efforts. Overall success rate of tracked nests has been 53% (79 out of 148 nests) since 2003. Since 2003, 396 vireo fledglings have been documented in Mockingbird Canyon

In the last 11 years, depredation has been the major cause of nest loss, with 51 out of 148 (34%) tracked nests failing due to depredation. When monitoring began at this site, nest parasitism was high, with 8 out of 13 tracked nests parasitized and 4 of those nests failing as a result of parasitism. Beginning in 2004, an intensive cowbird management program was initiated. The parasitism rate decreased sharply after this management program began. Parasitism continues to occur episodically, but seems to be controlled. Several land owners have allowed traps on their property which has facilitated our program.

Red willow (31%) has been the primary choice for nest placement at this site, along with black willow (18%) and black elderberry (15%). Throughout the entire watershed, mulefat is a top choice for nest placement. In Mockingbird Canyon, mulefat has been documented for only 9% of nests found. Some nests have been placed in non-native vegetation, such as perennial pepperweed and Peruvian pepper trees. As of 2014, vireos at this site have nested in 23 different plant species or combination of species; 55% of nests have been placed in willow species or combinations with willow species.

Although the reservoir and basin are protected from development at this time, residential development continues throughout Mockingbird Canyon. Most of the adjacent upland habitat will soon be lost and the creek is becoming more fragmented by culverts and bridges. The riparian habitat throughout the entire site is continually threatened by ATV and paintball activities, as well as large amounts of trash dumping and other illegal activities. Additionally, because most of the property boundaries extend to the middle of the creek, landowners freely alter the vegetation structure on their property in the floodplain to make

Nineteen pairs and 15 fledglings were detected in 2014. Nesting success for 3 nests was 67% and the one loss was due to predation (33%). Five pairs were well monitored and reproductive success was 1.2 fledglings per pair. Over fourteen years the nesting success is 67% (n=99 well-tracked nests). This success rate is a limited data set due to the constraints of the survey site. While efforts are made to ensure all territories and pairs are accounted for, the dangers in some parts of the river, e.g. homeless camps, limit the number of sites that can be safely monitored due to staffing restrictions.

Brown-headed Cowbird trapping has occurred on private business and homeowner locations since 2002, and 624 cowbirds have been removed from the site during that time. Since trapping began, the rate of cowbird nest parasitism of well-tracked nests of Least Bell

North side of the river

Twenty-one territories were documented in 2014. This area was flooded during the winter of 2010-2011 and much of the acreage was scoured. However, habitat is coming back and the spraying of non-natives in some areas has helped the habitat as well. Nest monitoring was not done in 2012 or 2013, but began in 2014.

Fourteen pairs and 19 fledglings were detected in 2014. The number of territories between 2013 and 2014 were the same but there was an increase in the number of pairs from 2013 (2 in 2013) as well as fledglings (3 in 2013). These increases can be attributed to the greater monitoring effort. Two of the three nests tracked were successful. The one loss was due to predation from ants (33%). Of the 14 pairs, four pairs were considered well monitored with a reproductive success of 2 fledglings per pair.

The lack of cowbird trapping in this area as shown by Table 5 is somewhat misleading. One trap was placed on private property near Van Buren Blvd. at Riverdale St. Data for the six traps for this area are found under "SAR - Jurupa Park to Hidden Valley" and "SAR -Hidden Valley to River Rd."

South side of the river

The Hidden Valley vireo population on the south side of the river has increased almost 40% in the past 2 years. In 2012, 62 territories were detected. The population increased to 75 territories in 2013 and to 85 territories in 2014. In 2014, 85 territories, 32 pairs, and 28 fledglings were documented. Large increases in abundance (by at least 10 territories) took place between 2001-2002, 2007-2008 and 2009-2010 and now 2012-2014. In 2014, nest searching and monitoring was done by S. Hoffman with assistance from N. Housel.

No pairs were followed closely enough to obtain reproductive success data (# of fledglings per pair). In 2014, nesting success was 67% (3/4 nests). Nesting success in Hidden Valley is variable and has ranged from 41% to 88% in the last 5 years. Hidden Valley has a 65% nesting success rate over the last 15 years. Depredation remains the main cause of nest failure.

Willows, *Salix* spp., are the most common plant species used for nest placement. Fifty-eight percent of all nests found in the last 15 years were placed in willows, mainly arroyo willow, *Salix lasiolepis*, and black willow, *Salix gooddingii.* Mulefat, *Baccharis salicifolia*, has held 29% of all nests.

Management strategies at Hidden Valley include cowbird trapping as well as nest manipulation. Since 2000, 708 cowbirds have been removed from Hidden Valley over more than 6,200 trap days. A pilot program to control wild grape, *Vitis californica*, that is growing on and killing mature native trees was initiated in October 2013. Two sites were selected and grape at the base of large trees or growing in low carpets were sprayed with a mixture containing a 4% solution of roundup PROMAX and a 2% solution of Monterrey Super & surfactant. The SAWA Invasive Species Removal crew did the spraying with SAWA biologists monitoring the effort. Translocation of the herbicide up into the vines growing into the trees did not occur to any great extent. However, the lower lying vines were affected.

SAWA's Arundo Removal Project. In 2008, SAWA began a project to remove 475 acres of *Arundo donax* from the 728 acre Hidden Valley Wildlife Preserve. The project was halted in March 2008 due to the onset of the breeding season. At that time, 150 acres on the south side of the river, north of the former agricultural field, had been cleared. Removal of *Arundo* was expected to continue during the winter of 2008-2009 but state budget problems caused a postponement. The removal project began again in October 2009 and halted at the beginning of the 2010 season. A small amount of hand work cutting arundo began again in August 2010 and the final cutting was completed in November 2010. Herbicide applications will continue for at least the next five years. In 2011, additional habitat was put under contract for arundo removal. Removal took place during the winter of 2011-2012. Spraying continued through the early season 2012 and later in the 2013 season in the presence of biologists. With the completion of the project more habitat will be opened up for monitoring and increases in the extent of native habitat and vireo population are expected.

Opening up of the habitat at Hidden Valley has had other benefits. Illegal activities within the dense stands of arundo was stopped in 2008 and 2009. With more open habitat at Hidden Valley, it is hoped that illegal human activity can be lessened and the quality of the natural resources will be enhanced for the benefit of wildlife.

The river flows changed during the storms of 2010-2011. Large swaths of land were eroded from Hidden Valley and the adjacent river near the Department of Fish and Wildlife ponds was lowered 4 feet in some places (J. Vint, personal comm). The levee system that brings water to the ponds and creek system was washed out. The water flow to the ponds was maintained during the 2009 season but has not occurred since 2010. Riverside County Parks and Open Space has installed a well system that may eventually bring water back to the ponds and creeks. It

2004 to 110 territories in 2014. Cowbird trapping has removed 547 brown-headed cowbirds from the habitat.

The site has been subject to natural and manmade disturbances over the past few years. In the spring of 2010, riparian vegetation was removed illegally from the site at two vireo nest locations. In the winter of 2011, the site flooded, shifting the river flow in several places, and taking out vegetation in several vireo territories. Some regularly used horse trails were completely washed out. The rental horse stable located at Hamner Road became flooded, eventually causing the business to close. The flooding caused the construction of a dike to be built by the City of Norco, near the old stable location. The dike was built during the spring of 2011, during the vireo breeding season, causing noise disturbance and additional habitat destruction to the site. Again in the winter of 2011, habitat was illegally destroyed on the site. In the spring of 2012, vegetation in a known vireo territory was legally removed for the future widening of Hamner Rd.

This section of river slopes from northeast to the southwest and contains habitat-altering flows depending on precipitation. The surrounding land use includes former dairy land, residential, cattle grazing, agricultural, and a golf course. Open water and riparian habitat border the site to the south, southwest and southeast. Interstate 15 crosses the river and directly over vireo habitat.

In 2014, 110 territorial males were detected. Thirty-two of these males were paired and 36 fledglings were detected. This is the highest number of territorial males ever detected on site since monitoring began. Nesting success for 9 well-tracked nests was 44%. This is a 39% decrease from the 83% (n=29) success rate of 2013. It is likely the success rate would have been much higher with a larger sample size. In 2012 the nest success rate was 71% and 45% in 2011.

In 2014 and 2013, nest failures were due to depredation and abandonment, but not parasitism or reproductive failure. Twenty pairs monitored throughout the 2013 season had a productivity rate of 2.2. No pairs were well monitored in 2014 due to staffing limitations. Since monitoring began, at least 924 fledglings have been produced at this site.

The vireo population on the Santa Ana River in Corona-Norco almost doubled between 2004 and 2005 from 28 to 42 territories. In 2006 there was a decrease in vireo numbers, but a decrease in abundance was detected throughout the watershed. In 2007 and 2008, the population grew again to 45 and 65 respectively. Population has continued to increase each year (with the exception of 2012, showing a 9.5% decrease) and hit an all-time high this year with a total of 110 males.

Overall nesting success from 2001 through 2014 for the site is 67% (n= 272 nests, range= 33%-100%). Depredation has been the main cause of nest loss; 27% of all nests have been lost to depredation. In 2014, the depredation rate was 56%; up from 14% in 2013. In 2011, the depredation rate was 41%, and in 2012 the rate was 18%. In 2010, the depredation rate was only 11%, which is the lowest rate since 2005.

Cowbird trapping has occurred at Norco annually since 2004. Five hundred and forty-seven brown-headed cowbirds have been removed from Norco over 2,317 trap days. Parasitism has occurred on the site in seven out of the fourteen years surveyed. In 2006, the parasitism rate was 22% and mostly concentrated in the habitat adjacent to the Goose Creek Golf Club. A trap was placed in this area late in the season to alleviate

the parasitism with no success. In 2007, a trap was put out in the same location earlier in the season and it captured 68 cowbirds during the first three weeks it was open. There was no parasitism in the targeted area by the golf course; however, parasitism still occurred in other parts of the site at a rate of 16%. In 2008 and 2009, parasitism decreased again, to a rate of 7% (2/29 nests) and 2% (1/45 nests), respectively. In 2010, 2011, and 2012 no parasitism occurred on the site. In 2013, parasitism occurred at a rate of 7% (2/29 nests). No monitored nests were parasitized during the 2014 nesting season.

In regards to preferred vegetation for nest placement, mulefat has held 34% of nests, while arroyo willow has held 32% of all vireo nests (n=320) since 2001. Black willow has held 15%. The riparian vegetation over the entire survey area is greater than 50% native.

This area was originally monitored and reported by Pike et al. and encompassed the Santa Ana River only from River Road to Hamner Road. SAWA began to monitor the south side of the river from River Road to Hamner Road in 2000 and in 2004 began to monitor and report numbers on both sides of the river from River Road upstream to the Goose Creek Golf Club in Norco. The early surveys on the south side of the river from 2001-2003 show an increase in numbers from 8 to 12 territories.

TEMESCAL CANYON SUMMARY

SAWA has surveyed Temescal Canyon since 2001 when it began its arundo removal program. Habitat is surveyed along approximately 26 miles (42 km) of Temescal Canyon, including Lake Elsinore, from Railroad Canyon to approximately two miles upstream of the intersection of Magnolia Avenue and Temescal Wash. Temescal Wash is currently being managed for arundo regrowth and native vegetation is being allowed to reestablish. Unfortunately, tamarisk has now become a dominant exotic throughout the wash, especially in areas surrounding Lake Elsinore. Temescal Canyon is characterized by patchy, dense riparian vegetation. Privately owned sand and gravel mines operate downstream adjacent to the creek. A commercial fishing lake occurs near the middle section of the wash. Areas of complete channelization without riparian habitat occur downstream of Lake Elsinore and the most downstream section of the wash. Many sections of the wash are channelized by riprap and berms, but allow for good quality riparian habitat.

This site was not closely monitored for least Bell

years it was closely monitored, reaching its highest rate in 2007 (42%). Literature suggests that cowbirds have different regional dialects and female cowbirds tend to prefer older males that use local flight whistles, to younger males or older males that have a foreign dialect (O

development, human activity, cattle grazing and small fragmented habitat patches are additional factors that confront vireo and likely reduce productivity throughout the Chino Hills area.

SANTA ANA RIVER

were lost to reproductive failure (7%). No tracked nests were lost due to parasitism. Overall nesting success for the site from 2001 to 2014 is 58% (163 of 282 nests). The overall productivity rate of well-tracked pairs during the same time is 1.7. Ninety-two fledglings were documented in 2014, a decrease from the 97 detected in 2013. A total of 887 fledglings have been produced in SAC over the last 14 years.

Although overall nesting success in SAC was documented at 50% for 2014, early nesters appeared to have some resource-based difficulties. Many pairs delayed nest-building and egg-laying. For example, on 4/9 a pair was found finishing a nest, but delayed egg-laying for 3 weeks and then laid only 2 eggs. Both eggs hatched, but one nestling died in the nest and the other was underdeveloped and didn

since 2001 when the first vireos were detected on-site. Over 3,011 trap days, 664 cowbirds have been removed from the Upper Canyon. Parasitism has only been documented 2 of the 14 years surveyed and reached its highest rate in 2003 (18%). There has been no parasitism detected in the Upper Canyon since 2003 (Table C-3).

By the end of the 2014 season, the Reach 9 project appeared to be complete at this location, which will relieve pressure to nesting birds caused by the related human activities. Restoration activities have begun, which should expand available habitat for the vireo. Unfortunately, this site continues to be plagued by other human-generated impacts including fisherman intrusion, trash and branch-cutting, as well as large areas of invasive species infestation.

GREEN RIVER GOLF CLUB

Habitat at the Green River Golf Club has recovered well since the devastating Complex Fire that swept through the Santa Ana Canyon November 15, 2008. The Army Corp of Engineers Bank Stabilization project removed almost 16 acres of habitat occupied by 6 vireo that the fire missed. The next phase of the bank stabilization project started during the fall/winter 2011 with several more acres of riparian habitat removed that included mature willow and cottonwood trees that had been spared by the 2008 wildfire. This area supported an additional 13 vireo territories in 2011. The 2010 project phase was roughly 75% complete at the end of the 2012 season with some re-planting underway, but the net result for the 2012 season was still a large loss of habitat and much construction activity, which most likely contributed to the decline in vireo activity that season.

In 2014, no additional habitat was taken. However, construction continued adjacent to occupied habitat upstream of the railroad bridge in the beginning of the nesting season. On May 1st, a vireo nest was found within 100 feet of construction activities that were moving toward the nest. The Corps and USFWS were both notified immediately but work continued toward the nest. By the next week the nest was abandoned leaving 2 eggs. Subsequently, other vireo nests were found near construction activities and work eventually stopped in this area for the rest of the season.

In 2014, the vireo population at this location increased 15% (n=4) to 26 territories. This increase is mostly due to the 3 new territories that settled in the Corps restoration area at the western section of the site. The vireo population at Green River Golf Club has more than doubled since monitoring began in 2001 when only ten vireos were detected (Appendix D-1). Of the 26 males found, 19 were known to be paired and 29 fledglings produced in 2014. Nesting success for 8 well-tracked nests was 63%, as compared to only 25% (1 of 4) in 2013. Two of the 8 tracked nests (25%) were lost to depredation and the abandoned nest mentioned above was categorized as reproductive failure (13%). No tracked nests were lost due to parasitism.

Although overall nesting success was documented at 63%, with a productivity rate of 1.6 this year, early nesters appeared to have some resource-based difficulties. Many pairs delayed nest-building and egg-laying. For example, on 4/9 a pair was found finishing a nest, but delayed egg-laying for 3 weeks and then laid only 2 eggs. Both eggs hatched, but one nestling died in the nest and the other was underdeveloped and

didn

In 2014, 59 territorial least Bell's vireo males were detected in Featherly Park. Thirty-nine of these males were known to be paired and 35 fledglings were detected. This count represents a 8% decrease from the count of 64 territorial vireos in 2013 (Table C-1). This decrease is partially attributed to the project-related habitat removal where 5 vireo territories were affected. These numbers continue to emphasize that the vireo population recovery in Featherly Park is a success story over the last decade given that no vireos were detected in 2001, the first year of monitoring. The population

trees in 2013. Trees damaged by Imazapyr continue to suffer in 2014. The County of Orange is working to remedy the problem and strives toward restoration of the entire park, which should enhance the habitat for vireo and other native birds in the future. Ongoing disturbance from the multiple construction projects slated to continue for several years may challenge future vireo recovery in the impact areas. However, proposed mitigation should expand and enhance vireo habitat in the post-construction years.

IRVINE REGIONAL PARK SUMMARY

Twenty-seven territories, 9 pairs and 12 fledglings were detected in 2014. SAWA has monitored Irvine Regional Park for Least Bell

former March SKR Preserve. SAWA has not documented any breeding attempts at well monitored or assessment sites.

Sightings of Interest

Incidental sightings were made throughout the watershed during vireo monitoring. Emphasis was placed on sensitive species. See Table 12 for a listing of all sightings by species and site. These sightings have been reported to the California Natural Diversity Database (CNDDB).

BROWN-HEADED COWBIRDS TRAPPING RESULTS

BROWN-HEADED COWBIRD TRAPPING, MARCH - JULY 2014

Forty-six cowbird traps were deployed during the 2014 vireo season and 1,271 cowbirds were removed from all sites over 5,408 trap days (Table 6). The sex and ages of the cowbirds removed in 2014 were: 775 adult males, 383 adult females, and 113 juveniles. SAWA biologists and field assistants spent 2,724 hours servicing traps during the vireo season.

The areas trapped and the number of traps in each area are as follows: San Jacinto, eight; San Timoteo, nine; Meridian Conservation Area, two; Sycamore Canyon, one; Mockingbird Canyon, five; Santa Ana River from Jurupa Park to Hidden Valley, two; Hidden Valley, two; Santa Ana River in Norco, two; Temescal Canyon, nine; Santa Ana Canyon, four; Chino Hills, one; and one at Hawk

WINTER 2013-2014 BROWN-HEADED COWBIRD TRAPPING AND NON-TARGET CAPTURES

Cowbird trapping took place in San Jacinto and Temescal during the non-breeding season (i.e., winter) of 2013-2014. Seven traps were located in San Jacinto at dairies and were open between 8/5/2013 and 3/14/2014. A total of 4,072 cowbirds were removed (1,785 adult males, 1,385 adult females, and 902 juveniles) over 1,484 trap days (Table 8). The number of cowbirds trapped in San Jacinto increased 18% from the prior winter. This increase could be attributed to the addition of a trap at a dairy that has had a high capture rate since its initial opening in the middle of the winter of the 2012-2013 season. The capture rate per day was 2.7, up from 2.3 in the winter of 2012-2013. SAWA spent 977 field hours on winter trapping.

One trap was open at a dairy in Temescal during the non-breeding season, from 8/5/13-3/14/14. A total of 865 cowbirds were removed (272 adult males, 271 adult females, and 322 juveniles) over 162 trap days. The total removed represents a 4% decrease in captures from the previous winter.

Ten non-target species, consisting of 548 individual trapping occurrences, were captured in the 8 cowbird traps located in San Jacinto and Temescal (Table 9). The most common species were European Starling, House Sparrow, and Red-winged Blackbird. The mortality of non-targets over the winter averaged 0.9%, similar to the 1.0% in the winter of 2012-2013.

DISCUSSION

Vireo abundance increased by 4% in 2014 in the upper watershed, continuing the reversal of the downward trend from 2011 and 2012. For the second year, over 1,000 vireo territories were documented by SAWA biologists and cooperators in the upper watershed. Including Prado Basin, 1581 territories were documented in 2014 in the Santa Ana watershed. With the exception of a few years, the vireo abundance has increased since 2000. The dramatic increase over 14 years is illustrated for four sites in Figures 2 and 4. The two main causes of vireo decline, the lack of habitat and parasitism by the brown-headed cowbird, are being successfully managed and the vireos are responding to the point that SAWA biologists have detected vireos in backyards above Featherly Park.

SAWA has removed over 5,000 acres of invasive *Arundo donax* from the watershed. Tributaries which have been restored have had explosive growth in vireo numbers. San Timoteo Canyon increased its vireo population from five in 2000 to 151 in 2014. Temescal Canyon has shown similar increases with a vireo population increasing from seven in 2001 to 126 in 2014.

SAWA and OCWD Prado biologists have removed over 114,000 cowbirds from the watershed since 2000 and the parasitism rates are no longer in double-digit figures since the cowbird management programs were begun. The disappearance of dairies from the watershed should be an additional aid to the decline in parasitism.

Nesting success in 2014 was 48%, a decrease from 61% in 2013. This year was the first time since monitoring began that nesting success was below 50%. Possible causes of lower success include drought resulting in a lack of food and good nesting sites and disturbance from construction projects. Over fourteen years, the nesting success rate is 60% for 1966 nests. Depredation remains the main cause of nest failure. Nest loss due to depredation was 43%, a small increase from 2013. Nest loss from reproductive failure was 5%; examples of nest loss due to reproductive failure are egg abandonment, failure of all eggs to hatch, or failure of the vegetation to support the nest to a successful hatching. Only 3% of nests were lost to parasitism in 2014. The parasitism rates in the past have ranged between 2% to 5%. Parasitism is episodic throughout the watershed. It continues to be a problem in San Jacinto, San Timoteo, and Sycamore Canyon. Documentation of continued cowbird parasitism in the San Jacinto Wildlife Area, where cowbird traps are no longer placed, lends support for the continued need for cowbird trapping to bring the vireo to full recovery. Figure 5 compares nesting success, predation, and parasitism rates from 2003-2014.

The lack of documented nesting Southwestern Willow Flycatchers in the watershed is not surprising given the continuing low numbers throughout the watershed. No breeding activity was documented in 2014. The mountain canyons have held flycatcher territories in the past and should be under management and monitoring, but without funding such work is not possible.

MANAGEMENT RECOMMENDATIONS

This report documents SAWA

using the river. Too little of the riparian resources on the river are in public ownership. Setting aside and enhancing habitat does little good when that land is transformed for other uses by trespassers. Although existing laws should protect these resources, even on private land, the ability to enforce the laws and regulations is inadequate and untimely. As we continue to recover our natural resources, we will endeavor to confront this, perhaps our greatest challenge. We must strive to invest the public in these resources and identify effective ways to ensure that the floodplains are put only to appropriate human uses. We will attempt this through a combination of public education, public involvement thorough volunteerism, and partnerships with enforcement agencies and landowners.

The majority of the funding for the past three years has been provided by the Department of Water Resources through SAWPA

LITERATURE CITATIONS

Duffy, A.M., Jr., and McChrystal, R. 1992. Vocalizations and copulatory attempts in free-living brown-headed cowbirds. J. Field Ornithol. 63(1):16-25.

Garrett, Kimbal and Dunn, Jon. 1981. Birds of Southern California. Status and Distribution. Los Angeles Audubon Society. Los Angeles, California. 408 pp.

Hoffman, Susan M., Zembal, Richard, Kastner, Terese, Wiater, Talula, Rahe, Michael, Nash, Bonnie, Aimar, Melody, Reeser, Terry. 2004. Status and management of the least Bell

Pike, J., L. Hays, and R. Zembal, 2013. Least Bell

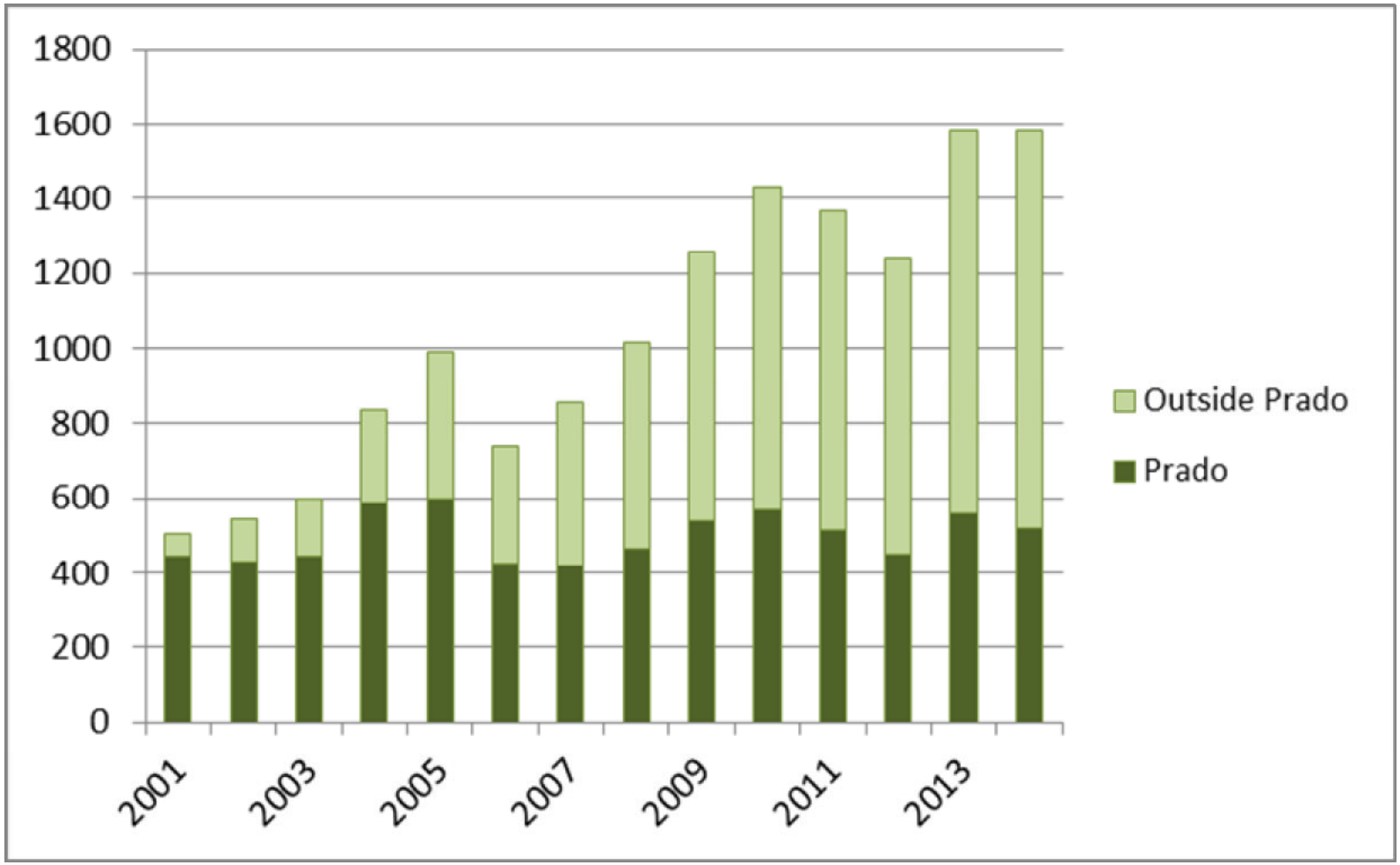
ACKNOWLEDGEMENTS

We heartily thank our field and cowbird assistants: Henry Armijo, Melanie Levato, Valeree Rae Pons, Jacob Lloyd Davies, Cynthia Lujan, Andrea Vallejo, Joseph Vu, Arsenio Hernandez, Edwin Madrid, and project manager James Law. We also wish to thank Gayle Holyoak, Vicki Long, Bonnie Johnson, Mandy Parkes, Jim Pike, and Kerwin Russell for their incredible dedication to natural resources and support of SAWA

the sensitive species. Allyson Beckman and Terry Reeser have been responsible for the brown-headed cowbird data and analysis. Mari Paramo Archer is responsible for the assessment survey data. Nicole Housel has pulled together the annual report over the past two years and dug through past data. Cameron MacBeth is trying to pull us into the 21st century data collection technology. Allyson Beckman, Jill Coumoutso, Talula Barbee, and Melody Aimar have excelled in nest monitoring. Bonnie Johnson of the Orange County Water District has provided much needed support at critical times. Dick Zembal has championed this effort and is an indispensable source of experience and knowledge.

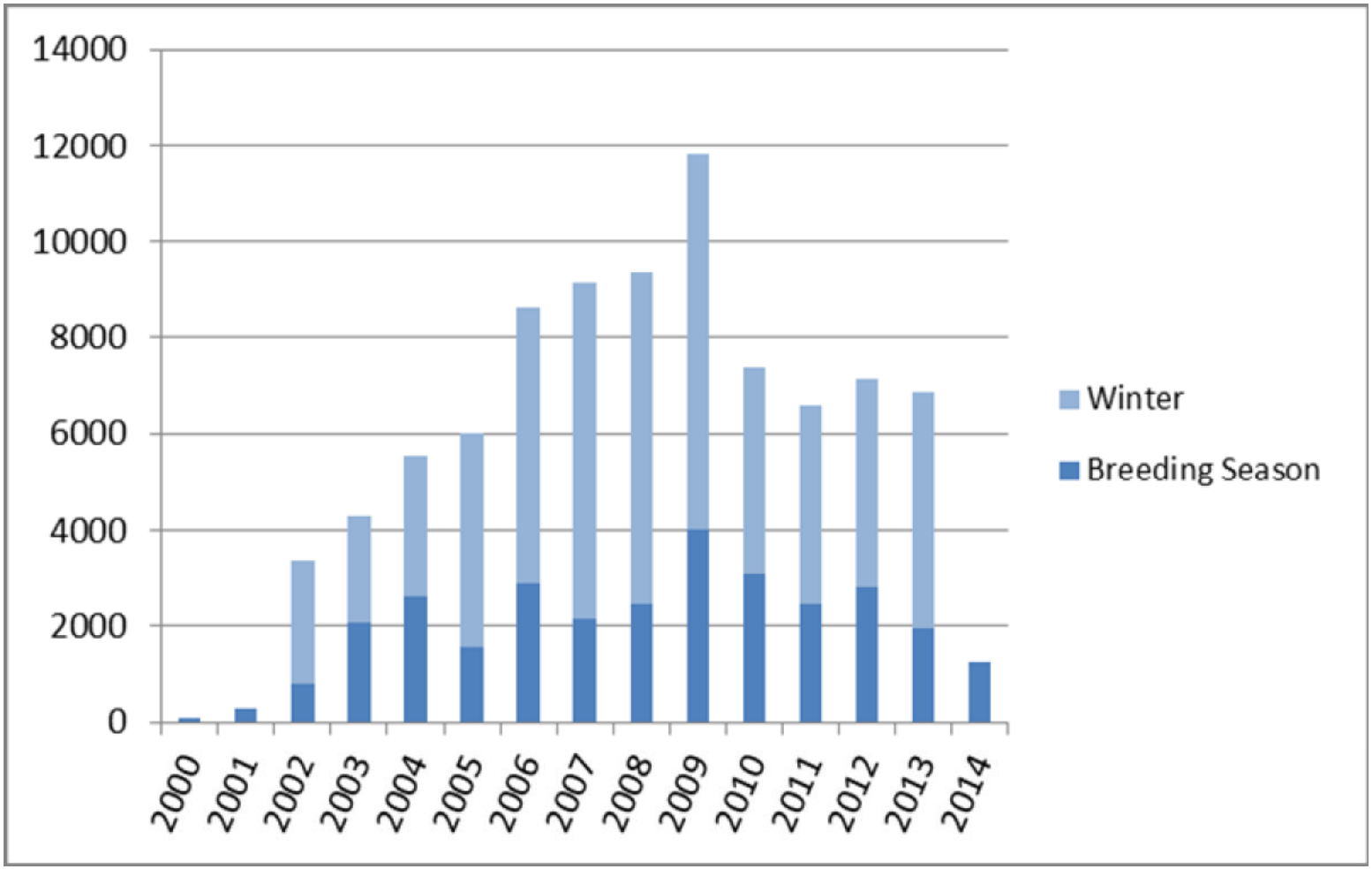
Figure 1: Least Bell

Figure 2: Vireo Abundance in the Watershed, Prado and Outside Prado, 2001-2014.



Source: Santa Ana Watershed Association

Figure 3: Number of Cowbirds Removed from SAWA Monitoring Sites in the Santa Ana Watershed, 2000-2014



Breeding season: 15 March

Figure 4: Number of Least Bell

Figure 5: Least Bell

Table 1A: Least Bell

Table 1A: Least Bell

Table 1A: Least Bell

Table 1A: Least Bell

(6) Reported by California State Parks
(7) Reported by Dave Telford
(8) AECOM. 2013b. 2013 Santa Ana River Flood Control Mitigation Plan Least Bell

Table 1B: Least Bell

Table 1B: Least Bell

Table 1B: Least Bell

Table 1B: Least Bell

Table 1B: Least Bell

Table 1B: Least Bell

Table 1B: Least Bell

Table 1B: Least Bell

Table 2.1: Least Bell

Table 2.2. Least Bell

Table 3: Least Bell

Table 4: Least Bell's Vireo nest placement preferences, monitored sites in the Santa Ana River Watershed, 2014

Host Plant Species (taxonomic order)	San Jacinto	San Timoteo	Meridian C.A. (former March SKR Presrve)	Sycamore Canyon	Mockingbird Canyon	SAR-Riverside Ave to Van Buren Blvd.	Hidden Valley (so side of SAR)	Hidden Valley (no side of SAR)	SAR- Goose Creek GC to River Rd	Temescal Canyon	Santa Ana Canyon			Chino Hills (Butterfield Ranch environs)	Irvine Regional Park	Total
											Upper Canyon	Green River Golf Course	Featherly Regional Park			
Western Sycamore (*Platanus racemosa*)													3			3
Golden Currant (*Ribes aureum*)		1														1
Wild Grape *(Vitis girdiana)*		18				1	1								1	21
Fremont Cottonwood *(Populus fremontii)*		5		1							1	1	1			9
Narrow-leaf Willow (*Salix exigua)*		4				2		1	1							8
Black Willow *(Salix gooddingii)*		2													1	3
Red Willow *(Salix laevigata)*		6	1				1									8
Arroyo Willow *(Salix lasiolepis)*		20	2	1			2		1			2				28
Yellow Willow *(Salix lucida spp. lasiandra)*		1														1
Dead Willow sp. (*Salix sp.*)									1							1
Toyon *(Heteromeles arbutifolia)*		4														4
White Mulberry (*Morus alba*)		1														1
Laurel Sumac (*Malosma laurina*)													2			2

Table 4: Least Bell's Vireo nest placement preferences, monitored sites in the Santa Ana River Watershed, 2014

Host Plant Species (taxonomic order)	San Jacinto	San Timoteo	Meridian C.A. (former March SKR Presrve)	Sycamore Canyor	Mockingbird Canyon	SAR-Riverside Ave to Van Buren Blvd.	Hidden Valley (so side of SAR)	Hidden Valley (no side of SAR)	SAR- Goose Creek GC to River Rd	Temescal Canyon	Santa Ana Canyon			Chino Hills (Butterfield Ranch environs)	Irvine Regional Park	Total
											Upper Canyon	Green River Golf Course	Featherly Regional Park			
Poison Oak (*Toxocodendron diversilobum*)												1	1			2
Tree of Heaven (*Ailanthus altissima*)		1														1
Black Sage (*Salvia mellifera*)													1			1
Mugwort (*Artemisia douglasiana*)		1										1				2
Coyote Bush (*Baccharis pilularis*)	1															1
Mulefat (Baccharis salicifolia)		26				2		2	10		7	2	4		4	57
Black Elderberry *(Sambucus nigra)*		4		2	1			1				2	5			15
Yerba Santa species (*Eriodictyon sp*)												1				1
Unknown	1				2								1			4
Total	2	94	3	4	3	5	4	4	13	n/a	8	10	18	n/a	6	174

Table 5: Least Bell

Table 5: Least Bell

Table 5: Least Bell

Table 6: Brown Headed Cowbird Trapping Results, March-August 2014

Monitored Site	Trap/Location	2014 Dates of Operation	Number of Trap Days	Cowbirds Removed				Daily Removed Averages	
				Total	Male	Female	Juveniles	Adults	All
San Jacinto									
	Scott Bros.	3/17-7/27	118	68	39	20	9	0.5	0.6
	R&J-Tuls 1	3/17-7/27	118	121	99	17	5	1.0	1.0
	R&J- Tuls 2	3/17-7/27	118	120	93	24	3	1.0	1.0
	Alessandro Ponds	3/17-7/28	119	16	7	5	4	0.1	0.1
	CBJ 2	3/17-7/27	118	54	35	17	2	0.4	0.5
	Vanderwoude	3/17-7/27	118	106	37	41	28	0.7	0.9
	Vanderwoude 2	3/17-7/27	118	192	128	46	18	1.5	1.6
	Oostdam	3/17-7/27	118	36	28	5	3	0.3	0.3
Subtotal			**945**	**713**	**466**	**175**	**72**	**0.7**	**0.8**
San Timoteo									
	I-18	3/18-7/27	128	8	6	1	1	0.1	0.1
	Bees	3/17-7/18	120	5	1	4	0	0.0	0.0
	English	3/17-7/4	106	11	8	3	0	0.1	0.1
	Headlee	3/17-7/27	129	57	30	18	9	0.4	0.4
	ESR	3/17-7/3	105	0	1	-2	1	0.0	0.0
	State Parks	3/18-7/4	105	-2	1	-3	0	0.0	0.0
	Fisherman's	3/17-7/27	129	28	20	6	2	0.2	0.2
	Younglove #1	3/18-7/7	108	3	2	1	0	0.0	0.0
	Younglove #3	3/18-7/27	128	33	17	15	1	0.3	0.3
Subtotal			**1058**	**143**	**86**	**43**	**14**	**0.1**	**0.1**
Meridian C.A.									
(former March SKR Preserve)	Meridian 1	4/28-7/25	89	1	0	1	0	0.0	0.0
	Meridian 2	4/28-7/25	89	0	0	0	0	0.0	0.0
Subtotal			**178**	**1**	**0**	**1**	**0**	**0.0**	**0.0**
Sycamore Canyon									
	Sycamore	5/12-7/25	**75**	**9**	**4**	**4**	**1**	**0.1**	**0.1**
Mockingbird Canyon									
	Reservoir	3/19-7/26	127	61	26	28	7	0.4	0.5
	MBC Estates	3/19-7/26	127	10	4	2	4	0.0	0.1
	Ungerer	3/19-7/21	122	1	0	1	0	0.0	0.0
	Markham	3/19-7/21	122	1	1	-1	1	0.0	0.0
	Harrison	4/7-7/21	105	-2	-1	-1	0	0.0	0.0
Subtotal			**603**	**71**	**30**	**29**	**12**	**0.1**	**0.1**
Santa Ana River–									
Jurupa Pk to Hidden Valley	Riverdale	3/17-7/25	129	19	12	7	0	0.1	0.1
	Jurupa Park	3/17-7/25	127	-2	-2	0	0	0.0	0.0
Subtotal			**256**	**17**	**10**	**7**	**0**	**0.1**	**0.1**
Hidden Valley									
	Bluff	3/17-7/22	126	4	1	1	2	0.0	0.0
	Dry River	3/17-7/22	126	-1	0	-1	0	0.0	0.0
Subtotal			**252**	**3**	**1**	**0**	**2**	**0.0**	**0.0**
Santa Ana River – Norco									
	GooseCreek 1	3/17-6/14	89	0	1	-1	0	0.0	0.0
	GooseCreek 2	3/17-7/25	129	4	3	1	0	0.0	0.0
Subtotal			**218**	**4**	**4**	**0**	**0**	**0.0**	**0.0**
Temescal									
	3M	3/19-7/25	125	1	0	1	0	0.0	0.0
	Pabco	3/19-7/24	90	2	1	1	0	0.0	0.0
	New Sump	3/19-7/24	123	14	11	3	0	0.1	0.1
	Rockery	3/19-7/25	125	5	0	4	1	0.0	0.0
	Baker St.	4/3-7/24	110	20	16	4	0	0.2	0.2
	Marina	3/18-7/25	127	-2	0	-2	0	0.0	0.0
	Salt Creek	3/18-7/24	126	12	6	5	1	0.1	0.1
	Railroad Cyn	3/18-7/24	124	2	1	1	0	0.0	0.0
	Dejong's Dairy	3/17-7/25	127	140	76	58	6	1.1	1.1
Subtotal			**1077**	**194**	**111**	**75**	**8**	**0.2**	**0.2**
Chino Hills									
	CH Water-tank	3/18-7/16	**119**	**4**	**0**	**4**	**0**	**0.0**	**0.0**
Santa Ana Canyon									
	Green River EQ Full	3/11-7/29	137	56	27	27	2	0.4	0.4
	G. C. Maintenance	3/18-7/29	131	15	8	7	0	0.1	0.1
	Featherly Park RV	3/21-7/28	126	7	3	4	0	0.1	0.1
	Yorba Reg. Park	4/4-7/28	115	34	25	7	2	0.3	0.3
Subtotal			**509**	**112**	**63**	**45**	**4**	**0.2**	**0.2**
Fullerton									
	Hawk's Pointe	3/19-7/18	**118**	**0**	**0**	**0**	**0**	**0.0**	**0.0**
GRAND TOTALS			**5408**	**1271**	**775**	**383**	**113**	**0.2**	**0.2**

Table 7: Non-target Avian Captures in Brown-headed Cowbird Traps, March-August 2014

Common Name	Scientific Name	caught	died	caught	died	caught	died	caught	died	caught	died	caught	died	caught	died	caught	died	caught	died	caught	died	caught	died	caught	died	caught	died
California Towhee	*Melozone crissalis*			340	1	8	0			68	0	3	0	1	0	7	0	37	0	3	0	114	5	1	0	**582**	**6**
House Sparrow	*Passer domesticus*	388	0	4	0					1	0	105	1					8	0			1	0			**507**	**1**
House Finch	*Carpodacus mexicanus*	60	3	4	0	11	2			11	0	2	0			1	0	148	1	98	1	20	0			**355**	**7**
European Starling	*Sturnus vulgaris*	196	0	2	0					2	0							11	0	4	0	23	0			**238**	**0**
Red-winged Blackbird	*Agelaius phoeniceus*	19	0	147	0	3	0			5	0							7	0			1	0			**182**	**0**
Song Sparrow	*Melospiza melodia*			4	0	1	0									1	0	120	1							**126**	**1**
Lark Sparrow	*Chondestes grammacus*			11	0	5	0	2	0									22	0							**40**	**0**
White-crowned Sparrow	*Zonotrichia leucophrys*			3	0																	36	0			**39**	**0**
Yellow-headed Blackbird	*Xanthocephalus xanthocephalus*	3	0	9	0													2	0							**14**	**0**
Brewer																											

Table 8: Brown-headed Cowbird Trapping Results, Winter 2013-2014

Monitored Site	Trap/Location	Dates of Operation	Number of Trap Days	Cowbirds Removed				Daily Removed Averages	
				Total	Male	Female	Juveniles	Adults	All
San Jacinto									
	Scott Bros.	8/5/13-3/14/14	212	427	143	126	158	1.3	2.0
	R&J-Tuls 1	8/5/13-3/14/14	212	783	455	304	24	3.6	3.7
	R&J- Tuls 2	8/5/13-3/14/14	212	839	559	242	38	3.8	4.0
	CBJ#2	8/5/13-3/14/14	212	253	113	101	39	1.0	1.2
	Vanderwoude	8/5/13-3/14/14	212	758	172	195	391	1.7	3.6
	Vanderwoude 2	8/5/13-3/14/14	212	932	336	376	220	3.4	4.4
	Oostdam	8/5/13-3/14/14	212	80	7	41	32	0.2	0.4
Subtotal			**1484**	**4072**	**1785**	**1385**	**902**	**2.1**	**2.7**
Temescal									
	Dejong's Dairy	8/5/13-3/14/14	**162**	**865**	**272**	**271**	**322**	**3.4**	**5.3**
GRAND TOTAL			**1646**	**4937**	**2057**	**1656**	**1224**	**2.3**	**3.0**

Table 9: Non-target Avian Captures in Brown-headed Cowbird Traps, Winter 2013-2014

Common Name	**Scientific Name**	**caught**	**died**	**caught**	**died**	**caught**	**died**
European Starling	*Sturnus vulgaris*	212	3	171	0	**383**	**3**
House Sparrow	*Passer domesticus*	65	0	1	0	**66**	**0**
Red-winged Blackbird	*Agelaius phoeniceus*	34	2	27	0	**61**	**2**
House Finch	*Carpodacus mexicanus*	12	0			**12**	**0**
Yellow-headed Blackbird	*Xanthocephalus xanthocephalus*	2	0	9	0	**11**	**0**
Brewer							

Table 10: Results of the Least Bell's Vireo Assessment Surveys in the Santa Ana Watershed, 2006-2014										
Site	**# LBVI Territories**									
	2005	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**
Alessandro Arroyo[b]	See Table 1	See Table 1	3	5	4	6	7	6	7	19
Arlington Falls	-	-	-	-	-	-	0	0	0	0
Box Springs	0	2	2	1	3	5	2	1	-	3
Cajalco Creek	1	1	1	See Temescal	See Temescal	See Temescal	3	1	0	0
Cajon Wash	-	0	0	0	0	0	0	-	0	-
Canyon Crest	-	0	-	-	-	0	0	-	0	1
Carbon Canyon (Chino Hills Pkwy)	0	0	1	0	0	0	0	-	-	-
Carbon Canyon (Western Hills Golf Club)	0	0	0	0	1	0	0	-	-	-
Carbon Canyon Regional Park	6	5	7	5	3	8	13	12	16	16
Castleview Park	1	0	1	0	0	0	0	0	-	-
Chino Hills (Bayberry Dr.)	-	-	-	0	0	0	0	-	-	-
Chino Hills (end of Eucalyptus)	0	0	0	0	0	0	0	-	-	-
Chino Hills (Eucalyptus/Del Monte)	3	1	1	0	1	2	0	0	0	0
Chino Hills (Eucalyptus/Rancho Hills)	1	0	1	1	1	1	2	1	2	2
Chino Hills (Soquel Canyon/Pipeline)	-	-	-	-	-	-	2	2	3	4
Chino Hills Community Park (Eucalyptus/Peyton)	-	-	-	5	8	10	9	3	7	4
Chino Hills State Park - Bane Canyon	-	-	5	5	6	7	5	5	11	-
Chino Hills State Park										

Table 10: Results of the Least Bell's Vireo Assessment Surveys in the Santa Ana Watershed, 2006-2014										
Site	**# LBVI Territories**									
	2005	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**
Conrock Basin FHQ	-	-	-	-	-	-	1	0	0	0
Corona St. @ Gilmore	0	0	0	0	0	0	0	-	0	3
Fontana Power Plant	-	-	-	-	-	-	-	-	1	0
Fresno Canyon	2	4	2	1	0	1	1	0	1	2
Gavilan Hills	0	0	0	0	0	0	0	-	0	0
Goldenstar	-	0	0	0	1	0	0	0	0	2
Harrison Reservoir (aka Mcallister Creek)	See Temescal	See Temescal	See Temescal	See Temescal	See Temescal	See Temescal	See Temescal	3	4	3
Hidden Valley Golf Club	-	-	-	-	-	3	4	6	6	8
La Sierra	-	-	1	2	2	3	3	2	4	5
Little Sand Basin (Highland)	-	-	-	-	-	2	3	3	-	0
Mead Valley (Cajalco/Aqueduct)	-	2	5	6	5	8	5	4	4	5
Menifee - Haun Rd.	0	0	0	0	-	0	-	-	-	-
Menifee - Paloma HS	0	0	0	0	-	0	-	-	-	-
Motte-Rimrock Preserve	-	-	0	-	-	-	-	-	-	-
Norco Hills Park Mitigation	2	0	0	0	0	0	0	0	0	0
Oak Glen Preserve	-	0	0	0	0	0	0	-	-	-
Plunge Creek (Highland)	-	-	-	-	-	1	1	1	-	3
Poorman Reservoir	0	1	1	1	2	6	4	1	2	6
Prenda Arroyo[b]	See Table 1	-	-	-	-	-	-	-	4	4
Promenade	-	0	0	0	3	2	2	2	1	2
Pyrite Channel	-	-	-	1	1	3	3	0	0	0
Quail Run	0	0	0	0	0	0	0	0	-	0
Riverwalk Park	-	-	-	-	-	-	-	-	-	0

Table 10: Results of the Least Bell's Vireo Assessment Surveys in the Santa Ana Watershed, 2006-2014										
Site	**# LBVI Territories**									
	2005	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**
Santa Rosa Mine Rd.	0	0	0	0	0	-	-	-	-	-
SAR (north side of Hidden Valley)	5	3	6	1	6	-	-	-	-	-
Steele Valley	0	0	0	0	0	0	-	-	-	-
Sun Canyon Park	0	0	0	0	0	0	0	-	0	-
Talbert Park	-	-	-	-	-	-	-	-	3	5
Tequesquite Arroyo	0	0	0	0	0	0	0	-	0	0
Van Buren Blvd. (Bountiful)	0	0	0	0	1	0	0	0	-	1
Van Buren Blvd. (Plummer Rd-south)	3	2	2	3	3	4	3	2	-	-[d]
Van Buren Blvd. (Porter Ave)	0	0	0	0	0	0	0	-	-	0
Woodcrest	-	0	0	0	0	0	0	0	0	1
Wyle Labs (El Paso only)	0	1	1	0	1	1	1	1	1	1
Yorba Linda (Mud Canyon)	-	-	-	-	-	-	-	-	0	-
Yorba Linda (San Antonio Rd.)	-	-	-	-	-	-	-	-	1	2
Yorba Linda (Starlight Dr)	1	0	0	0	-	2	1	2	4	4
Yorba Linda Lakebed Park	-					1	1	1	1	1
San Jacinto River Sub-Watershed										
Cottonwood Canyon	0	0	0	0	0	2	3	3	2	2
East of Canyon Lake	2	-	-	-	-	-	-	-	-	-
Kabian Park	2	4	4	3	4	3	3	1	3	7
Lake Perris	1	1	3	2	4	6	10	8	14	20
Menifee (Salt Creek)	-	-	-	-	-	-	-	1[a]	8	10
Santiago Creek Sub-Watershed										
Irvine Regional Park	See Table 1	See Table 1	14	19	29	See tables 1A&1B	See tables 1A&1B	29	29	See table 1A
Irvine Trust Management Area	-	-	-	-	1	1	1	1	1	1

Table 10: Results of the Least Bell's Vireo Assessment Surveys in the Santa Ana Watershed, 2006-2014										
Site	**# LBVI Territories**									
	2005	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**
Limestone Canyon	See Table 1	See Table 1	2	2	2	3	3	0	3	4
Peter's Canyon	4	4	5	5	8	14	16	12	16	15
Santiago Basin (Santiago Pitts)	-	-	-	-	-	-	2	1	1	1
Santiago Canyon Rd	-	-	0	0	0	0	0	0	-	-
Santiago Creek (above Irvine Lake)	0	-	0	4	4	6	5	4	10	13
Santiago Creek (Cambridge Rd)	-	1	0	0	0	0	0	-	0	0
Santiago Creek (Cannon Rd, incl. Smith Basin)[c]	2	3	4	2	3	1	3	0	2	2
Santiago Creek (Chapman Ave)	-	-	0	0	0	0	0	0	0	0
Santiago Oaks Regional Park	0	0	0	0	0	1	0	0	0	0
Silverado Canyon	0	0	0	0	0	0	0	0	0	0
S. Margarita Watershed - Murrieta Creek	-	-	1	3	-	-	-	-	-	-
Total number least Bell's vireos detected during Assessment Surveys	**36**	**35**	**93**	**103**	**139**	**159**	**156**	**146**	**197**	**208**

a) Reported by PCR consultants
b) Split Alessandro Arroyo and Prenda Arroyo into two separate sites in 2013
c) Added Smith Basin to existing site
d) Included in Meridian C.A. (former March SKR Preserve) as of 2014

Table 11: Results of the Least Bell's Vireo Assessment Surveys in the Santa Ana Watershed, 2014

	Site	SURVEY 1 4/28/14-5/9/14			SURVEY 2 6/9/14-6/20/14			SURVEY 3 6/30/14-7/11/14			TOTAL # VIREOS						
Surveyor	Santa Ana River & Tributaries	Terr	Pairs	Juv.	Terr.	Pairs	Juv.	Terr.	Pairs	Juv.	Terr.	Pairs	Juv.	# Visits	# Hours	Cow-birds Detected	Traps on site?
CM / AB	Alessandro Arroyo	13	1	0	12	0	0	11	3	5	19	4	5	4	16.75	Y	N
AB	Arlington Falls	0	0	0	0	0	0	0	0	0	0	0	0	3	6.5	N	N
MP	Box Springs	3	1	0	1	0	0	1	1	1	3	2	1	3	2	N	N
CM	Cajalco Creek	0	0	0	0	0	0	0	0	0	0	0	0	3	2.75	N	Y
HA	Canyon Crest	1	0	0	1	0	0	1	1	0	1	1	0	3	4.75	N	N
MP	Carbon Canyon Regional Park	12	2	0	11	0	0	13	5	5	16	6	5	3	13	Y	Y
CM	Chino Hills (Eucalyptus/Del Monte)	0	0	0	0	0	0	0	0	0	0	0	0	3	0.75	N	N
CM	Chino Hills (Eucalyptus/Rancho Hills)	2	0	0	2	0	0	1	0	0	2	0	0	3	1.25	Y	N
CM	Chino Hills (Soquel Canyon/Pipeline)	4	0	0	4	1	2	3	1	1	4	2	3	3	1.5	N	N
CM	Chino Hills Community Park (Eucaluptus/Peyton)	3	0	0	3	0	0	2	0	0	4	0	0	0	3.25	Y	N
TB	Chino Hills State Park - Easy Street Trail	0	0	0	0	0	0	0	0	0	0	0	0	3	1.5	N	N
MA / AB	Chino Hills State Park - Lower Aliso Creek	8	0	0	7	0	0	2	1	1	11	1	1	3	15	N	N
TB	Chino Hills State Park - Telegraph Canyon	4	1	0	4	1	0	3	1	0	4	1	0	3	11.5	Y	N
TB	Chino Hills State Park - Upper Aliso Creek	5	0	0	5	3	2	4	3	3	6	4	3	3	9.75	Y	Y
NH	City Creek (Highland)	0	0	0	4	0	0	0	0	0	4	0	0	3	10	Y	N
JC	Clearwater Pkwy @ Glen Helen	1	0	0	*	*	*	*	*	*	1	0	0	1	1	Y	N
DM	Conrock Basin FHQ	0	0	0	0	0	0	0	0	0	0	0	0	3	0.75	Y	N
HA	Corona Ave @ Gilmore	1	0	0	3	0	0	1	1	2	3	1	2	3	2.5	N	N
JC	Fontana Power Plant	0	0	0	*	*	*	*	*	*	0	0	0	1	1	Y	N
MP	Fresno Canyon	1	0	0	1	0	0	2	0	0	2	0	0	3	4.75	Y	N
NH	Gavilan Hills	0	0	0	0	0	0	0	0	0	0	0	0	3	6.75	N	N
NH	Goldenstar	2	1	0	1	0	0	0	0	0	2	1	0	3	8	N	N
MP	Harrison Reservoir (aka Mcallister Creek)	2	0	0	3	0	0	3	0	0	3	0	0	3	6.25	Y	Y
JC	Hidden Valley Golf Club	8	1	0	*	*	*	*	*	*	8	1	0	1	3.5	N	N
HA	La Sierra	4	0	0	2	1	1	2	0	0	5	1	1	3	9	N	N
NH	Little Sand Basin (Highland)	0	0	0	0	0	0	0	0	0	0	0	0	3	6.5	N	N
JL	Mead Valley (Cajalco/Aqueduct)	3	1	0	5	2	0	2	1	0	5	2	0	3	10.25	N	N
HA	Norco Hills Park Mitigation	0	0	0	0	0	0	0	0	0	0	0	0	3	1	N	N
NH	Plunge Creek (Highland)	1	1	0	3	0	0	1	0	0	3	1	0	3	6.5	Y	N
NH	Poorman Reservoir	6	0	0	6	2	2	5	1	0	6	3	2	3	7	Y	N

Table 11: Results of the Least Bell

Table 12: Observations of Sensitive Species by Location, 2014

Common Name	*Scientific Name*	San Timoteo Canyon	San Jacinto River	Mockingbird Canyon	March SKR Preserve	Sycamore Canyon	SAR (Riverside Rd-HV)	SAR (HV)	SAR (HV-north)	SAR (HV - River Rd)	Temescal	Chino Hills	SAC (Upper Cyn)	SAC (Green River)	SAC (Featherly Pk)	Santiago Cyn Irvine Park	Other*	Total
Mammal																		
Kangaroo Rat	*Dipodomys sp.*										Several							n/a
San Diego Black-tailed Jackra	*Lepus californicus bennettii*		Several	4	10						1						1	16
Long-tailed Weasel	*Mustela frenata*	2	1							1							1	5
Bobcat	*Lynx rufus*	1																1
Avian																		
Redhead	*Aythya americana*																1 family	0
American Bittern	*Botaurus lengtiginosus*																2	2
Least Bittern	*Ixobrychus exilis*																1	1
Osprey	*Pandion haliaetus*																1	1
White-tailed Kite	*Elanus leucurus*	1	1															2
Bald Eagle	*Haliaeetus leucocephalus*		1															1
Northern Harrier	*Circus cyaneus*		2		1													3
Cooper's Hawk	*Accipiter cooperii*	2		1			1 family			1						1 family	2 pair	4
Red-shouldered Hawk	*Buteo lineatus*														2 families			0
Ferruginous Hawk	*Buteo regalis*	1	2															3
Golden Eagle	*Aquila chrysaetos*		2														2	4
Burrowing Owl	*Athene cunicularia*																1	1
Downy Woodpecker	*Picoides pubescens*	2						2							2		1	7
Peregrine Falcon	*Falco peregrinus anatum*		1														1	2
Prarie Falcon	*Falco mexicanus*		1															1
Olive-sided Flycatcher	*Contopus cooperi*																1 pair	1
Willow Flycatcher	*Empidonax traillii*	2						4									2	8
Loggerhead Shrike	*Lanius ludovicianus*		9														1	10
Horned Lark	*Eremophila alpestris*			4														4
Tree Swallow	*Tachycineta bicolor*																16	16
Clark's Marsh Wren[i]	*Cistothorus palustris clarkae*																239	239
California Gnatcatcher	*Polioptila californica*										1 pr	1	3		3		1 family+1	10
Yellow Warbler	*Setophaga petechia*	162	52	8	10		17	155		116	81		19	11	42	15	135	823
Yellow-breasted Chat	*Icteria virens*	13	1			1	12	50		15	1		7	6	11	3	43	163
Rufous-crowned Sparrow	*Aimophila ruficeps canescens*																1	1
Bell's Sparrow	*Artemisiospiza belli*																3	3
Tri-colored Blackbird	*Agelaius tricolor*	3	13															16
Lawrence's Goldfinch	*Spinus lawrencei*			2													1	3
Amphibian																		
Western Spadefoot Toad	*Spea hammondii*																1	1
Reptiles																		
Blainvilles Horned Lizard	*Phrynosoma blainvillii*						1			1								2
Granite Spiny Lizard	*Sceloporus orcutti*				3						1						10	14
Orange-throated Whiptail	*Aspidoscelis hyperythra*	8		4							4						3	19
Western Whiptail	*Aspidoscelis tigris*		several	several											1		3	4+
Red Diamond Rattlesnake	*Crotalus ruber*	1															1	2
Western Pond Turtle	*Actinemys marmorata*						1											1
Fish																		
Santa Ana Speckled Dace	*Rhinichthys osculus ssp. 3*																20-30	20-30

[i] Marsh Wren counts from Prado Basin, where subspecific identity needs confirmation.

Other* - Includes all assessment areas and incidental sightings other than those within managed areas

Sensitive species are those that are listed as endangered, threatened, or species of concern by the resource agencies and those that are covered by the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP).

Observations are minimum numbers of territories and/or individuals observed. Detailed information is reported to the California Natural Diversity Database (CNDDB)

APPENDIX A: GPS POINTS ALL SURVEYED SITES

APPENDIX A

Assessment Locations (cont.)

Survey Site	Starting Coordinates	Ending Coordinates
Chino Hills (End of Eucalyptus)*	428612, 3759298	428291, 3759409
Chino Hills (Eucalyptus/Del Monte)	430160, 3760140	430259, 3760276
Chino Hills (Eucalyptus/Rancho Hills)	429001, 3759503	429108, 3759352
Chino Hills (Soquel Canyon/Pipeline)	433994, 3757719	433991, 3757231
Chino Hills Community Park (Euc/Peyton)	432645, 3761036	431720, 3761778
Chino Hills State Park (Bane Cyn)*	435061, 3757365	435376, 3753499
Chino Hills State Park (Easy Street Trail)	427838, 3752393	427876, 3752942
Chino Hills State Park (Lower Aliso Cyn)	435288, 3753302	438033, 3749528
Chino Hills State Park (Telegraph Cyn)	434818, 3753694	424101, 3753165
Chino Hills State Park (Upper Aliso Cyn)	435216, 3753358	433824, 3765039
City Creek (Highland)	482191, 3775640	482706, 3778340
Clearwater Pkwy @ Glen Helen	462009, 3784622	461556, 3783760
Conrock Basin (FHQ)	423314, 3746089	423465, 3746370
Corona St. at Gilmore	448093, 3750572	448406, 3750398
Fontana Power Plant	463472, 3779349	463819, 3779791
Fresno Canyon	439703, 3749067	440954, 3749370
Gavilan Hills	466730, 3741552	466846, 3740837
Goldenstar	465377, 3751436	467227, 3750525
Harrison Reservoir (aka McAllister Creek)	460376, 3748576	462484, 3746911
Hidden Valley Golf Club	451644, 3752551	452349, 3753225
La Sierra	457824, 3747117	457504, 3748808
Little Sand Basin	478157, 3779714	478805, 3780527
Mead Valley (Cajalco/aqueduct)	471763, 3744714	470180, 3744057
Menifee-Haun Rd*	483716, 3725045	483706, 3724364
Menifee-Paloma H. S.*	482515, 3725307	481557, 3724847
Motte Rimrock Preserve*	475973, 3740183	475893, 3739398
Norco Hills Park Mitigation	449570, 3751384	448340, 3751225
Oak Glen Preserve*	505148, 3766841	505153, 3766838
Plunge Creek	486861, 3774671	487048, 3775724
Poorman Reservoir	476434, 3758610	477243, 3757320
Prenda Arroyo	465354, 3752493	470270, 3750320
Promenade	451350, 3749618	451336, 3749919
Pyrite Channel	456496, 3762175	453872, 3759586
Quail Run	470673, 3757379	470399, 3757380
Riverwalk Park	454365, 3751010	454281, 3752276
Santa Rosa Mine Road*	471840, 3737819	471012, 3738146
Steele Valley*	471322, 3736485	471266, 3735608
Sun Canyon Park*	454614, 3749211	454788, 3749119
Talbert Park (Orange County)	411746, 3722974	411911, 3723740
Tequesquite Arroyo	467671, 3756303	467760, 3756586
Van Buren Blvd. (Bountiful)	469933, 3750024	469693, 3750007
Van Buren Blvd. (Plummer Rd-So.)***	471776, 3749514	473308, 3749439
Van Buren (Porter Road)	467009, 3749689	466508, 3749973

Wardlow Wash*	443306, 3747252	441873, 3749262
Woodcrest	465362, 3751501	465419, 3751271
Wyle Labs (at El Paso only)	450068, 3751818	450068, 3751818
Yorba Linda (Mud Canyon)*	431693, 3750752	431200, 3750802
Yorba Linda (San Antonio Rd)	429199, 3750653	429322, 3750942
Yorba Linda (Starlight Dr.)	431134, 3749819	430989, 3750218
Yorba Linda Lakebed Park	424530, 3748301	424909, 3749091
San Jacinto River Sub-watershed:		
Cottonwood Canyon	475633, 3725415	477503, 3724023
Kabian Park	475841, 3730880	476184, 3783238
Lake Perris	483092, 3744484	485461, 3748329
Menifee (Salt Creek)	478164, 3726524	479548, 3727246
Santiago Creek Sub-watershed:		
Irvine Trust Management Area	429845, 3738585	429845, 3738585
Limestone Canyon	434012, 3736548	434913, 3735769
Peter		

APPENDIX B: WATERSHED ANNUAL RESULTS 2010-2014

Table B-1: Least Bell

Table B-2. Least Bell

Table B-2. Least Bell

Table B-2. Least Bell

Table B-2. Least Bell

Table B-2. Least Bell

Table B-3. Least Bell

Table B-3. Least Bell

APPENDIX C: SUMMARY TABLES BY MANAGED SITE, FROM 2000-2014

Table C-1. Least Bell

Table C-1. Least Bell

Table C-1. Least Bell

Table C-1. Least Bell

Table C-1. Least Bell

Table C-1. Least Bell

Table C-1. Least Bell

Table C-1. Least Bell

Table C-2. Least Bell

Table C-2. Least Bell

Table C-2. Least Bell

Table C-2. Least Bell

Table C-2. Least Bell

Table C-2. Least Bell

Table C-2. Least Bell

Table C-2. Least Bell

Table C-2. Least Bell

Table C-3. Least Bell

Table C-3. Least Bell

Table C-3. Least Bell

Table C-3. Least Bell

Table C-3. Least Bell

Table C-3. Least Bell

Table C-3. Least Bell

Table C-3. Least Bell

Table C-3. Least Bell

Table C-3. Least Bell

Table C-3. Least Bell

Table C-3. Least Bell

Table C-3. Least Bell

Table C-3. Least Bell

Table C-3. Least Bell