Status and Management of the Least Bell's Vireo and Southwestern Willow Flycatcher in the Santa Ana River Watershed, 2013, and Summary Data by Site and Watershed-wide, 2000-2013

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Prepared for
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March 2013

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ABSTRACT

The 2013 monitoring effort for the Least Bell's Vireo, *Vireo belli pusillus*, documented an increase in abundance after two years of declines. In 2013, vireo abundance throughout the watershed, including Prado, increased 28% from 1,237 territories in 2012 to 1582 territories in 2013. The 2013 numbers do not include data from San Bernardino County which documented 30 territories in 2012. Abundance also increased 28% in the SAWA-monitored areas (Table B1).

Fifteen hundred and eighty-two Least Bell's Vireos were documented throughout the watershed by SAWA , Prado, and cooperating agencies. The number of pairs increased by 9% to 666 pairs and fledgling count increased by 22% to 968.

In the upper watershed alone, at the SAWA monitored sites, and those cooperating agencies, Least Bell's Vireo abundance increased by 35%, from 756 territories to 1,021 territories. Documentation of pairs increased 10% to 471, and the fledgling count increased by 27% to 682.

Productivity based on SAWA's well-monitored pairs in 2013 was 3.0, an increase from 2.8 documented in 2012 and 2.9 in 2011. Nesting success was 61%. Nesting success has ranged between 56% and 65% in the last 4 years. The depredation rate was 32% in 2013. Depredation rates have ranged from 28% to 36% in the last 4 years.

SAWA's parasitism rate was 4% in 2013. Rates in the last 4 years are dramatically lower than the rates which ranged between 14 and 28% before 2009.

Eleven vireos fledged from six manipulated nests; one nest was repaired and fledged four young.

Forty-four per cent of nests were placed in five species of willow, *Salix spp*. and 27% were placed in mulefat, *Baccharis salicifolia*.

Brown-headed Cowbirds, *Molothrus ater*, were also managed throughout the watershed. Over 1,900 cowbirds were removed from 49 traps over 6,300 trap days between 3/18/12 and 8/4/13. An additional 4,336 cowbirds were removed from the watershed during the winter of 2012-2013 over 1,668 trap days. Over 61,000 Brown-headed Cowbirds have been removed from the Santa Ana Watershed since SAWA began its cowbird management program.

No breeding Southwestern Willow Flycatchers, *Empidonax trailli extimus*, or Yellow-billed Cuckoos, *Coccyzus americianus occidentalis*, were detected outside the Prado Basin in 2013. Incidental sightings of other sensitive birds were documented. A minimum of 699 Yellow Warblers, *Setophaga petechia*, and 165 Yellow-breasted Chats, *Icteria virens*, were detected throughout the watershed in 2013.

Since the Santa Ana Watershed Program began vireo and cowbird management, over 5,500 vireo fledglings have been produced. Presented here are summary watershed-wide totals and data by site for sites monitored by the Santa Ana Watershed Association since 2000.

INTRODUCTION

The Least Bell's Vireo (*Vireo bellii pusillus*) is a small, insectivorous bird that occupies riparian habitat in central and southern California and northern Baja. It is listed as endangered by both the State of California and the federal government due to the destruction of riparian habitat and brood parasitism by the Brown-headed Cowbird (*Molothrus ater*) (Pike et al. 1999).

The Southwestern Willow Flycatcher (*Empidonax traillii extimus*) occupies riparian habitat throughout the southwest. It too is listed as endangered by the federal government due to habitat destruction and alteration and cowbird parasitism. These two endangered species and several other sensitive species have been monitored and managed in the Prado Basin annually since 1986. From 19 pairs of vireo in 1986, the population increased to a high of 386 pairs and 600 territorial males in 2005 (Pike et al. 2005).

The work reported herein is an expansion upon the Prado Basin efforts into other portions of the watershed through the implementation of the Santa Ana River Watershed Program by the Santa Ana Watershed Association (SAWA) and the Orange County Water District (OCWD). The monitoring program was conducted during the breeding season to determine the number of Least Bell's Vireos and Southwestern Willow Flycatchers present, their breeding status, and nesting outcomes; cowbird trapping in or near riparian habitat was conducted concurrently.

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 ended in September and October (Table 2.1). Occasional visits to determine continued vireo presence occurred through October. 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 2013.

In addition to the above intensive monitoring, abbreviated surveys were made of other riparian habitat in the watershed. Since 2005, biologists have identified habitat not regularly monitored. Forty-nine sites were surveyed during the 2013 season, usually three times, mainly during the first weeks of April, May, and June (called assessment surveys). 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 mapped and reproductive 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 eggs and 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's Vireo. The search for Willow Flycatchers was done in conjunction with visual and auditory searches for vireos and other species. Additional surveys for the willow flycatcher involved visiting areas where the flycatcher had historically been detected and playing taped vocalizations.

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 Game.

Forty-nine 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, sampling procedures must be implemented, especially given funding limitations. SAWA will rotate nest monitoring throughout sites in the watershed. Monitoring for detection of all territories should continue throughout all historically monitored sites: San Timoteo Canyon, Mockingbird Canyon, the Santa Ana River from Mission to River Road, including Hidden Valley Wildlife Preserve and Norco, Temescal Canyon, and the Santa Ana Canyon. In 2013, no nest monitoring was done at the March SKR Preserve, Sycamore Canyon, the Santa Ana River upstream from Van Buren on the south side and upstream of Goose Creek Golf Club on the north side. SAWA's surveys in the peripheral sites took place as usual.

A minimum of 7,600 field hours was spent in 2013 for the vireo management program including 3,000 hours on vireo monitoring and nest management, 550 hours on the vireo assessment surveys, and 2,900 hours on the spring/summer cowbird trapping program and 1200 for winter cowbird trapping. Due to staffing shortages, SAWA biologists were unable to support monitoring efforts for the Western Riverside Multi-species Habitat 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 vireo territories are sent to USFWS and CDFW. Appendix B contains the annual totals for all statistics. Appendix C contains 2010-2013 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 Dr. 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. 2013. The following tributaries to the Santa Ana River were surveyed: San Timoteo Canyon, March SKR Preserve, Mockingbird 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*, that 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*, and poison hemlock, *Conium maculatum*. Other than storm run-off, the river's water flow is from discharged treated water, urban runoff, very limited natural springs and upwelling in the Prado Basin, and releases from Seven Oak's Dam. The river is subjected to heavy human impacts for recreation such as swimming, fishing, paintball gaming, unauthorized trails, and off-road vehicle use.

In addition to long stretches of riparian habitat on the Santa Ana River from Riverside to Norco, the Hidden Valley Wildlife Preserve was monitored. It is located along the Santa Ana River in western Riverside County and supports 1,300 acres (526 ha) of riparian habitat. The area monitored over the last decade is Hidden Valley, south side of the river, and currently refers to approximately 660 acres (267 ha) of riparian habitat on the south side of the river bounded roughly by the river on the north, Pedley St. on the west and Tyler St. to the east. The 25 acres patch of habitat on the south side of the river between Tyler St. and Van Buren Blvd. burned in 2009 and still contains no vireos. Historically these vireos were reported as Santa Ana River Mission-Van Buren birds but from now will be reported as Hidden Valley birds. Some of this habitat was inaccessible in 2005-2007 due to the 2005 flooding of the Santa Ana River and subsequent breaks in the levee diverting water to the Hidden Valley pond system. Horse trails and service roads exist throughout the site. There is an education center that provides tours and education programs for school districts. Since 2010, nest monitoring done on approximately 340 acres (138 ha) in Hidden Valley Wildlife Preserve on the north side of the river. These data are reported separately. Hidden Wildlife Valley Preserve is owned by the State of California and operated by the County of Riverside.

The Santa Ana Canyon was surveyed from Prado Dam to Weir Canyon Road, a distance of approximately nine miles (14 km). The width of the habitat is often less than 200 m. A public golf course covers approximately two miles (3.5 km) of the habitat and about 4.4 miles (7 km) in the County of Orange's Featherly Regional Park. Parts of the habitat are subject to heavy human disturbance. A heavily used interstate highway, the 91 freeway, is built along the entire length of the canyon. Because of the differences in the habitat throughout the canyon, it was divided into three sites for purpose of analysis: the upper canyon from Prado Dam to the beginning of the Green River Golf Club includes canopied habitat and open fields; the Green River Golf Club and Featherly Regional Park are characterized by narrow strips of riparian habitat. In 2013, all of Featherly Park was monitored by SAWA, including areas impacted by the SARI line project

The San Jacinto River above State Street was managed and several surveys were done at the Refuge and on the San Jacinto River between Sanderson and Bridge Street. This latter site was cleared of understory before the 2007 season but some habitat has recovered and Least Bell's Vireos are present.

Various public and private entities own the land along the river and in the four largest tributary study locations: San Timoteo Creek, Mockingbird Canyon, Temescal Canyon, and Santiago Creek.

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's immediate uplands contain citrus groves and remnants of over grazed coastal sage scrub and chaparral. A railroad and a two-lane road border the canyon. Development of portions of the uplands for homes and a utility substation is occurring.

Mockingbird Canyon was surveyed from Wood Road to the reservoir at Gage Canal. The canyon is characterized by willow species with an under story of mulefat, Yerba mansa, *Anemopsis californica*, and watercress, *Rorippa nasturtium-aquaticum*. Residential development is occurring immediately adjacent to the creek on Riversidian alluvial sage scrub. Gage Canal basin is characterized by a large seasonally dry streambed leading to the reservoir that contains native riparian vegetation, and exotics including *Arundo donax* and perennial pepperweed, which were removed in 2003 and are currently being monitored and re-treated as needed.

Habitat was surveyed along approximately 26 miles (42 km) of Temescal Canyon, from Railroad Canyon, around Lake Elsinore, to approximately two miles upstream of the intersection of Magnolia Avenue and Temescal Creek. Surveys at the Dos Lagos Golf Club site were done from the edge of the habitat but no nest monitoring was possible. Cottonwood Canyon was also surveyed. Temescal Canyon is characterized by patchy, dense riparian vegetation. Privately owned sand mines operate downstream in the northern section of the creek. There is recreational fishing in Lee Lake. A portion of the floodplain at Hwy 74 in Lake Elsinore is being restored by the U.S. Army Corps of Engineers. Residential development of the upland has occurred along portions of the creek.

Four fragments of riparian habitat were surveyed in Chino Hills: Butterfield Ranch Park; a ravine between Butterfield Ranch Road and Hwy 71 surrounded by pasture; a mitigation site at the base of Chino Hills State Park on Butterfield Ranch Road; and a mitigation site at Butterfield Ranch Road and Brookwood Lane. A fifth site was added in 2009.

San Timoteo Canyon was surveyed by Allyson Beckman. The Santa Ana River between Riverside Dr. and Van Buren Boulevard was surveyed by Maricela Paramo with assistance from Talula Barbee. Hidden Valley, south side, was surveyed by Sue Hoffman with assistance from Talula Barbee and Nicole Housel; Hidden Valley, north side was surveyed by Maricela Paramo, the Santa Ana River from River Road to Hidden Valley (Norco) was surveyed by Jill Coumoutso; the Santa Ana Canyon below Prado Dam was surveyed by Melody Aimar; Temescal Creek was surveyed by Cameron MacBeth with support from Henry Armijo; Mockingbird Canyon was surveyed by Jill Coumoutso and Maricela Paramo, March SKR Preserve was surveyed by Allyson Beckman, Chino Hills was surveyed by Melody Aimar; and San Jacinto was surveyed by Nicole Housel.

The summary of results from the assessment surveys (presence/absence surveys) are listed in Table 10. Results for each survey visit are listed in Table 11. Patch sizes 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. Irvine Regional Park was surveyed as an assessment site in 2013.

RESULTS

Vireo Abundance

The 2013 monitoring effort for the Least Bell's Vireo, *Vireo belli pusillus*, documented a 28% increase in abundance. In 2013, vireo abundance throughout the watershed, including Prado, increased 28% from 1,237 territories in 2012 to 1,582 territories in 2013. The 2013 numbers do not include data from San Bernardino County which documented 30 territories in 2012. (Tables 1A and 1B).

Fifteen hundred and eighty-two Least Bell's Vireos were documented throughout the watershed by SAWA , Prado, and cooperating agencies. The number of pairs increased by 9% to 666 pairs and fledgling count increased by 22% to 968. Since the inception of the vireo monitoring program, over 5,500 fledglings have been documented.

All managed sites showed an increase in abundance. Subpopulations at Temescal Canyon and Hidden Valley increased by 21% and 20% respectively. San Timoteo and the Santa Ana River at Norco increased by 11% and 14% respectively. The increase in abundance on the north side of the river in Hidden Valley upstream to Fairmount Park was probably mainly due to a greater monitoring effort.

Abundance - Vireo Assessment Surveys

One hundred ninety-seven vireo territories were detected at 32 sites in the Santa Ana watershed during the 2013 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 since 2010 the numbers had stablized between 153-159. These surveys were conducted in patches of riparian habitat isolated from the larger tracts of habitat where biologists manage vireos. Vireos were detected at 34 of the 55 sites for an occupation rate of 62% similar to the 2012 rate of 63%. Rates were 52% in 2011, 54% in 2010 and 53% in 2009. The higher rates the last two years are probably an artifact of the methodology; sites with little or no historical occupancy were excluded from the surveys the last two years due to staffing shortages. The vireo territory in a ravine off of Jamboree Rd. east of Peter's Canyon on land owned by the Irvine Company was again detected. A singing male was detected on a driveway of a home above Featherly Park where heavy equipment was operating. It is possible that this bird was being displaced. Three additional vireos were detected in a small riparian patch nearby. Brown-headed Cowbirds were observed at 34% (19/55) of the sites in 2013, the same rate as in 2012.

The following people participated in the surveys: Melody Aimar (MA), Talula Barbee (TB), Allyson Beckman (AB), Jill Coumoutso (JC), Sue Hoffman (SH), Cameron MacBeth (CM), David McMicheal (DM), Bonnie Nash Johnson (BJ), Nicole Housel (NH), Terry Reeser (TR), Maricela Paramo (MP), Richard Zembal (RZ), Henry Armijo (HA), and James Law (JL) with Arcenio Hernandez (AH), and Cory McGee (CMcg).

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Year	Number of Surveyors/Participants	Number of Territories Found	Number of Hours
2005	18	36	318
2006	16	35	328
2007	17	93*	405
2008	15	103*	471
2009	17	137	418
2010	17	159	515
2011	17	156	492
2012	14	146	465
2013	13	197	548

*includes Murrieta Creek (outside the SA watershed) **Murrieta Creek not surveyed after 2007.

Chronology of Breeding Activity

Surveys began throughout the watershed between 3/15 and 4/2 and ended between 6/26 and 9/16 (Table 2). The first vireo was detected 3/22 at Mockingbird Canyon. The earliest date for the arrival of 50% of the subpopulation at the larger population sites was 3/29 at Hidden Valley south. All larger subpopulations showed 50% occupancy by 4/19. The earliest date for 50% paired was 4/10 in the Santa Ana Canyon at the Green River Golf Club and Hidden Valley south. The first nest was found on 3/29 in Featherly Park; the last nest was found on 7/2 in Mockingbird Canyon. The first and last fledging occurred on the Santa Ana River at Norco on 5/2 and 7/17 at Mockingbird Canyon respectively.

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.

Willows (*Salix spp*.) dominated the nest placement preference for vireos (Table 4). Five species of willow held 44% of the nests (n=85/192) in 2013. Arroyo willow, *Salix lasiolepis*, was the most preferred of the willows holding 35 nests. Mulefat, *Baccharis salicifolia*, held 27% (52/192) of the all nests. Other nest-host species in 2013 included but not limited to: wild grape, *Vitis girdiana*; Blue elderberry, *Sambucus mexicana*; Fremont cottonwood, *Populus fremontii*; mugwort, *Artemisia douglasiana*; toyon, *Hetermeles arbutifolia*; Black Walnut, *Juglans californica*, Poison oak , *Toxiocodendron diversilobum*, Golden Current, *Ribes aureum*, and Thick-leaved Yerba Santa, *Eriodictyon crassifolium*.

Since 2000, 49% of all nests have been found in willow species with arroyo willow and black willow predominating. Mulefat has held 29%. Seven nests have been found in the black walnut, *Juglans californica*. Non-native vegetation used by vireos in the watershed include mustard, *Brassica* spp., Myoporum, *Myoporum luteum*, Yellowspine Thistle, *Cirsium ochrocentrum*, and pepperweed (Appendix B, Table B-2).

Average nest height was 40” (range 12”-164”) for 175 nests.

Reproductive Success

Reproductive success as measured by productivity of well-tracked pairs increased to 3.0 in 2013. This rate represents a slight increase from 2.8 in 2012 and 2.9 in 2011. The rate over the last three years has ranged from 2.7 to 2.9. (Appendix B-3). Nesting success was 61%, a slight increased 60% in 2012 but a 5% increase from 2011 when it was 56%. Nesting success has ranged between 56% to 65% in the last three years (See Appendix B for watershed-wide summary data.) Average clutch size was down from 3.6 in 2011 to 3.4 in 2012 and 2013. (See Appendix C, Site Summaries, for individual site data over time.).

Predation Rates

In 2013, the depredation rate (complete nest loss) was 32%. Rates varied among sites (Table 5, row M.c.). At sites with more than 5 nests monitored, rates varied between 13% and 54%. Historically, watershed-wide, nest loss due to depredation is 31% (Appendix B, Table B-3, row M.c.).

Most nest losses were due to unknown predators.

In 2011, nests with nestlings were lost to Argentine ants in Temescal and Mockingbird. A nest in Mockingbird Canyon was attacked by ants but two of the four nestlings successfully fledged, perhaps due to forced fledging. It may be that one dead nestling attracted the ants and caused the loss of the second nestling. Argentine ants caused nest failure in Mockingbird Canyon in 2007. Previous depredation by ants in Mockingbird Canyon occurred in 2005. In 2006, while no nests were lost due to ants in Mockingbird Canyon, one ravine was so thick with ants it could not be easily walked. Nest failure due to ants was documented in Chino Hills in 2006. In 2011, in Temescal, a California Kingsnake depredated a nest but forced the successful fledging of one nestling.

In 2011, San Timoteo Canyon continued to be plagued with habitat disturbances. Since 2007, sheep and cattle have caused much damage to the habitat. In 2011, feral pigs, *Sus scrofa*, continue to be observed frequently in the canyon. In 2007 sheep stripped all of the vegetation to a height of 3-4 feet from riparian shrubs in San Timoteo and affected 10-12 vireo territories. One nest was exposed and the eggs were subsequently missing. Grazing cattle in Chino Hills State Park got loose and spent many days grazing in the Santa Ana Canyon. They left swaths of trampled riparian vegetation as they moved through habitat. Coordination with state parks led to the successful removal of the cattle before the end of the season.

The most likely avian predator continues to be the Western Scrub Jay. On May 15, 2007 in Mockingbird Canyon, biologists observed a scrub jay enter the canopy and start squawking. Four different species of birds, including vireo, mobbed it and all birds left the immediate area. Then a second scrub jay came in behind and quietly looked all around for nests as if the two jays were working cooperatively. No depredations in the area were detected.

A likely predation event in San Timoteo turned out to be a successful hatch. On 8/2/07, when checking a nest post-hatch, looking for down to confirm successful hatching, the biologist found five to six nestling feathers with the lower ¼ of feather still

in sheath. Expecting to document an unsuccessful hatch due to predation, she found all fledglings in nearby habitat. This may be accelerated pre-basic molt; molting usually occurs 15 days out of the nest (J. Pike, pers. comm.)

In 2006, a pair of California Gnatcatchers, *Polioptila californica*, was observed chasing a scrub jay in Mockingbird Canyon. In 2002, in the Santa Ana Canyon, there were several sightings during a single day of scrub jays carrying eggs in their bills. In Temescal, a Yellow-breasted Chat, *Icteria virens*, was observed chasing a scrub jay with an egg in its bill. In Mockingbird Canyon, late in the 2003 season, a scolding vireo attracted a scrub jay into the area; the scrub jay looked around and left after the scolding stopped. In 2005, a Greater Roadrunner was observed near nests and a vireo was observed scolding a California Thrasher in marginal habitat at the Prado Dam. Snakes are also suspected given that many eggs disappear with nests left intact. In 2006, in the Santa Ana Canyon, a vireo pair and a House Wren were scolding a gopher snake, *Pituophis melanoleucus*, in a tree near a vireo nest. The gopher snake was relocated from the tree by the biologist. In 2004, in Mockingbird Canyon a vireo with offspring out of the nest was observed scolding a garter snake, *Thamnophis* sp. Other possible predators observed in 2005 were roadrunners, coachwhips, *Masticophis flagellum*, and raccoons, *Procyon lotor*. Feral hogs are present along the river and their foraging in the understory may disturb nesting vireos. During the winter storms of 2004-2005, the berm causing the diversion of water to the Hidden Valley ponds was lost. As a result, while the season started with water in the creek and ponds, during the season, most of the ponds dried up. Some persistent water remained in portions of the creek. The feral hogs were observed much more often in the dry fresh water reed ponds and in the willow riparian habitat because of the dry conditions and many acres of vegetation were trampled. However, there was no evidence that this activity led to the loss of a vireo nest. .

Brown-headed Cowbird Parasitism

The parasitism rate was 4% in 2013. The rate has ranged from 2% to 5% in the last few years.

Parasitism was documented at three sites in 2013: San Timoteo Canyon, Mockingbird Canyon, and the Santa Ana River at Norco.

SAWA biologists move traps into areas where parasitism occurs during the season. In 2009, most of the parasitism in Temescal occurred at newly monitored sites in Lake Elsinore. A cowbird trap deployed at a marina on the lake seemed to be helpful in preventing parasitism because the second nests of three pairs which had unsuccessful parasitized first nests were successful after the trap was put up.
No parasitism was detected in Hidden Valley or San Jacinto in 2008. Both sites had parasitism in 2007. The placement of traps at strategic locations near the vireo populations probably helped to prevent parasitism at these sites. At Hidden Valley a trap hidden on the west end of the preserve and a trap on a levee at the San Jacinto River next to the vireo population have been successful in catching cowbirds.
In 2007, all the parasitized nests (n=4) at Hidden Valley were located downstream of the equestrian parking lot. Traps in that location had been repeatedly vandalized and were shut down. It was later asked that two of these traps be removed from public view so as

not to detract from the atmosphere promoted by the development of the bike trail through Hidden Valley Wildlife Preserve. The successful trap in Hidden Valley was hidden from view of the public.

No nests were lost to parasitism in 2013. Previous nest losses due to parasitism have ranged between 2-7%. 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. One nest failed due to parasitism in San Timoteo in 2012. Historically, it has high rates and accounted for a substantial number of parasitized nests in the watershed. Its 2010 rate was 8%, down from past double-digit rates. The lower rates may be due to a change in methodology in cowbird trapping. Bait birds, usually from San Jacinto, were switched out with the local San Timoteo birds caught at the beginning of the season. There is evidence that local cowbirds respond more to a local dialect (See San Timoteo Site Summary).

In 2013, six nests were manipulated. Five of the six nests were successful and fledged 11 young. Since SAWA began nest monitoring 191 vireos have fledged from manipulated nests.

Repaired Vireo Nests

One nest was repaired in 2013. It was located in San Timoteo and successfully fledged 4 vireo young. Since SAWA has managed vireo nests in the watershed, 65 young have fledged after their nests were repaired.

Site Summaries 2013

SAN JACINTO SUMMARY

In 2013 fifty-three vireo territories were detected, up from 42 in 2012. Most of the vireos were clustered on the San Jacinto River upstream of State Street adjacent to Soboba Road. No vireos had been detected at this location prior to 2004. Since then this sub-population has increased steadily from 3 territories. Six territories were detected in the San Jacinto Wildlife Area, down from 7 territories in 2012. Riparian habitat along the river between Sanderson Road and Bridge Street had been removed many years ago but has since grown back and is now suitable for vireo. Seven territories were detected at this site in 2013; two territories were detected in 2012.

Twenty-nine known pairs and 39 fledglings were detected in 2013. Nesting success was 38%, down from 69% in 2012. Nest losses were due to predation (7 of 13 well-tracked nests) and reproductive failure (1 of 13 well-tracked nests). Measures of reproductive success have varied over the years due in part to low vireo numbers and differential monitoring efforts. Since 2004, nesting success is 54% based on 93 well-tracked nests. Depredation has been the major cause of nest loss in the last 9 years (34 of 90 nests, or 36%). Since 2005, 238 vireo fledglings have been documented in San Jacinto.

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, 18,341 cowbirds have been removed from San Jacinto during the vireo breeding seasons. 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% 2008, respectively. However, the parasitism rate increased to 11% in 2009. No parasitism was documented in 2010. Parasitism rates in 2011 and 2012 were 10% and 8%, respectively. No parasitism occurred in well-tracked nests in 2013, but two vireo were observed feeding cowbird fledglings.

Due to the early successional habitat in this portion of the San Jacinto River, vireo are limited to only a handful of plant species from which to choose for nesting sites, as 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= 98 nests). Black willow held another 5% of nests. Only 3 of the 98 nests found from 2004-2013 were placed in non-native vegetation, two (2%) in Tamarisk and one (1%) in Black mustard.

SAN TIMOTEO SUMMARY

In 2013, 131 vireo territories were documented in San Timoteo, up 11% from the 118 documented in 2012. (102 were known territories, 29 were estimated from historical locations). However, the population in San Timoteo has experienced an overall increase of over 2200% in the past 13 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.

Eighty pairs and 179 fledglings were detected in 2013. Nesting success was 57%, down from 64% in 2012. Nest losses were primarily due to predation (36%). Thirty-five well-monitored pairs had a 3.6 reproductive success rate, up from 2.8 in 2012. Eleven well-monitored pairs attempted a second nest after successfully fledging on the first attempt. Seven pairs had successful second clutches and produced a total of 41fledglings. Nesting success is 58% over thirteen years of monitoring (n=569 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 13 years; 33% of all nests have been lost due to depredation. Overall reproductive success based on productivity of well-tracked pairs in the last 13 years is 2.9 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 2,076 cowbirds have been removed from San Timoteo Canyon during this time. In 2013, two 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. In 2010, only 8% (3 out of 37 nests) were parasitized. These low rates remain a marked decrease from a high of 75% in 2001. Although parasitism by cowbirds still occurs, at a rate of 19% over thirteen years (109 of 569 nests), only 5% of nests (26 of 569) 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 (17%) have been the primary plant species used for nest placement in San Timoteo since 2001 (n= 626 nests). Black willow held another 10% of the nests. Only six nests found from 2001-2013 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 documented to support Least Bell's Vireo since monitoring by SAWA biologists began in 2003. It is a narrow canyon with riparian vegetation surrounded by upland coastal sage and non-native grasses. Vireos at this site are extremely secretive and because nest monitoring is very time-consuming and parasitism rates are low, SAWA biologists now confine monitoring efforts to multiple visits to determine territory numbers, breeding status and, toward the end of the season, fledgling observations.

Sycamore Canyon was not surveyed In 2013. However, based on historical data and knowledge that vireos were present in relatively large numbers throughout the watershed, 12 territories are assumed.

Nest monitoring was done in 2007 and 2008. Nesting success in 2008 was 50% (n=4 nests), down from 100% in 2007 (n=2 nests). Vireos have never been observed feeding cowbird fledglings.

No breeding data were gathered in 2003 or 2006. In 2004, three nests of two breeding pairs were monitored, producing an average of 2.0 fledglings/pair. One nest

was parasitized, however only one nest loss occurred due to depredation. No nest monitoring has occurred since 2009 and a total of 60 fledglings have been observed since 2003.

Cowbird trapping occurred in Sycamore Canyon from 2004-2009, and 81 cowbirds were removed from the canyon during this time (42 of these captures occurred in 2004). No cowbirds were removed from the area in 2009. Cowbird management ended due to vandalism at the trap, the lack of secure trap sites, and low parasitism rates. SAWA services 2 cowbird traps at the adjacent March SKR Preserve.

MARCH SKR PRESERVE SUMMARY

Fourteen vireo territories, twelve pairs, and sixteen fledglings were detected in March SKR Preserve in 2013. Since SAWA began monitoring in 2004, 7 to 16 vireo territories have been documented in March SKR Preserve annually and over 130 fledglings have been detected.

Measures of reproductive success have varied over the years, due in part to differential monitoring efforts. In 2013, no nest monitoring took place at the preserve. From 2004 to 2010, nesting success was 77%. Reproductive success of tracked pairs was 4.8 over 5 years. Black willow has been the primary choice for nest placement at this site in previous years (46%), followed by red willow and arroyo willow, each supporting 26% of nests.

March SKR Preserve is an important piece of the remaining, fragmented riparian habitat in Southern California. A full complement of riparian birds and wildlife occupies the Preserve. Willow Flycatchers, *Empidonax traillii*, have been detected in the riparian habitat at the March SKR Preserve in previous years. Multiple sightings occurred in 2008 and one sighting in 2009, however breeding was not confirmed. In 2013, species listed on the Western Riverside County MSHCP found at March SKR included seven Yellow Warbler territories, coyotes, and black-tailed jackrabbits.

Although the March SKR Preserve is currently protected, and under management by the Joint Powers Authority (JPA), it's ability to provide meaningful habitat is in doubt. The habitat patches currently occupied by vireos 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 which provide foraging opportunities. However, 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 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. Scientists also addressed possible biological approaches for reducing the size of the preserve in a less-invasive manner in order to conserve quality habitat for key species

MOCKINGBIRD CANYON SUMMARY

In 2013, 31 vireo territories, 24 pairs, and 40 fledglings were detected in Mockingbird Canyon. These numbers represent a 10% increase in territories and a 7% decrease in pairs from 2012. Numbers from 2011 to 2012 represented a 24% decrease in territories and 19% decrease in pairs. However, the vireo population in Mockingbird increased 378% from 2003 to 2010. In 2003, the first year vireos were monitored in Mockingbird Canyon; parasitism was 62% and caused nest failure in four of thirteen nests (31%). Beginning in 2004, an intensive cowbird management program was initiated. The parasitism rate decreased sharply after this management program began, and occurs episodically, but seems to be controlled. In 2013, three nests were parasitized (n= 20 nests). Several land owners have allowed traps on their property which has facilitated our program.

Nesting success has also increased over the years. In 2003, nesting success was a low 15%. In 2013, nesting success was 59%, the highest it has been since 2009. Over eleven years (2003-2013), nesting success has averaged 53%. Since 2003, 35% of all nests have been lost due to depredation, 7% to reproductive failure, and 4% to parasitism. Six pairs monitored throughout the 2013 season had a 1.8 productivity rate. Since monitoring began, at least 389 fledglings have been produced at this site.

Red willow (32%) has been the primary choice for nest placement at this site, along with black willow (18%) and Mexican elderberry (14%). However, some nests have been successfully placed in non-native vegetation, such as perennial pepperweed and Peruvian pepper trees. As of 2012 vireos at this site have nested in 21 different plant species or combination of species; 60% of nests have been placed in willow species or combinations with willow species. Only 9% have been placed in mulefat, one of the preferred vireo nesting substrates elsewhere.

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 “park-like” areas. This removal of understory vegetation eliminates valuable nesting habitat for the vireo and other songbird species. Mockingbird Canyon is a prime candidate for the development and implementation of an open space management plan. SAWA recently acquired an 11-acre easement in Mockingbird Canyon at Roosevelt and Markham, and will continue to work with local property owners to enhance the canyon’s natural resources.

SANTA ANA RIVER – RIVERSIDE AVE. TO VAN BUREN BOULEVARD SUMMARY

Seventy-eight vireo territories were documented along the Santa Ana River between Riverside Ave. and Hidden Valley in 2012, exclusive of Hidden Valley (See Appendix A). This year is the first year SAWA has surveyed upstream of Mission Ave.

This increased survey effort and the general increase in abundance seen throughout the watershed, documented an over 80% increase in vireo numbers along this section of the Santa Ana River.

No nest monitoring was done in 2013. During the 2012 season, 2 nests were discovered, but none were closely monitored.

In the winter of 2007-2008, the IERCD and SAWA removed 106 acres of Arundo from the Martha McLean Anza Narrows Park. Herbicide application, in the presence of monitors, has occurred during each following years, through the 2011 breeding and fall seasons.

The vireo population along this stretch of the Santa Ana River had been increasing since 2002 thorough 2010 when 68 territories were documented. The storms of the winter of 2010-11 scoured the floodplain lowering the river by an estimated 4 feet and taking away much of the riparian habitat. Construction work at the Van Buren Blvd. Bridge has restricted river flow and caused habitat disturbance

Nesting success has varied over the years. Nesting success is 66% over all years. Since monitoring began a minimum of 385 fledglings have been documented at this site. Cowbird trapping has occurred at private business and homeowner locations since 2002, and a total of 607 cowbirds have been removed from the site during that time. Since trapping began, the rate of cowbird nest parasitism on Least Bell's Vireo has decreased from 67% in 2002 to 0% from 2006 to 2010.

Arroyo willow (31%) and mulefat (29%) have been the primary choices for nest placement at this site. Some nests have been successfully placed in non-native vegetation, such as Tamarisk. To date, vireos at this site have nested in 17 different plant species or combination of species. Overall, 53% nests have been placed in willow species or combinations with willow species.

This section of the Santa Ana River is bordered by several land uses such as residential, public parks, and waste management facilities resulting in habitat disturbances in many areas along the river. The riparian habitat throughout the entire site is continually threatened and disturbed by homeless encampments, off-road use, horse trail management, and paintball activities.

SANTA ANA RIVER – HIDDEN VALLEY WILDLIFE PRESERVE SUMMARY

(south and north side of river)

SAWA has been monitoring Hidden Valley on the south side of the river between approximately Tyler St. and the Edison service road at the powerhouse for 14 years, since 2000. Data reported as "Hidden Valley" refers to this area. The north side of the river has been surveyed about three times each season since 2005 but in the last few years a greater monitoring effort has been made. With the initiation of the arundo removal project, the north side of the river at Hidden Valley Wildlife Preserve has been added to the nest monitoring schedule. Data are presented separately on the data tables for easier comparison to historical numbers. The Hidden Valley Wildlife Preserve also includes 25 acres adjacent to and downstream from Van Buren. This section of the preserve burned at the end of the 2009 breeding season and currently is used only for foraging by vireos nesting on the north side of the river.

North side of the river

Twenty-one territories were documented in 2013. This area was flooded during the 2010-2011 winter and much of the acreage was scoured. However, habitat is coming back and 21 vireo territories were detected in 2013. Nest monitoring was not done in 2012 or 2013. 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 increased 21% from 62 territories in 2012 to 75 territories in 2013.

In 2013, 75 territories, 42 pairs, and 66 fledglings were documented. Large increases in abundance (by at least 10 territories) took place between 2001-2002, 2007-2008 and 2009-2010 and now 2012-2013. The monitoring effort over the last five years has included a permitted biologist and a field assistant. In 2013, nest searching and monitoring was done by S. Hoffman and T. Barbee with assistance from N. Housel.

The productivity rate for 8 well-tracked pairs in 2013 was 2.6. The productivity rate for 82 pairs over 13 years is 2.6. Nesting success in Hidden Valley is variable. It increased from 41% in 2010 to 60% in 2011 and 63% in 2012. In 2013, nesting success was 88% (n= 7/8 nests). Hidden Valley has a 65% nesting success rate over the last 14 years. Depredation remains the main cause of nest failure.
Willows, *Salix* spp., are the most common plant species used for nest placement. Fifty-nine percent of all nests found in the last 14 years were placed in willows, mainly arroyo willow, *Salix lasiolepis*, and black willow, *Salix gooddingi.* Mulefat, *Baccharis salicifolia*, has held 30% of all nests.

Management strategies at Hidden Valley include cowbird trapping as well as nest manipulation. Since 2000, 705 cowbirds have been removed from Hidden Valley over more than 5,500 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 mixture containing a 4% solution of roundup PROMAX and a 2% solution of Monterrey Super 7 surfactant. 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.

The 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's first priority however is to maintain the pond used by the Nature Center for school programs.
Incidental surveys for other species of concern take place during vireo monitoring. In 2013, 167 Yellow Warbler*, Setophaga petechia*, and 49 Yellow-breasted Chat, *Icteria virens*, territories were detected. A decline in numbers of a common bird, the marsh wren*, Cistothorus palustris*, is due to the loss of cattails in dry and silted ponds. Only a few marsh wrens have been detected in the last several years. Before the 2005 flooding, 50 territories were estimated.

Vireos were again documented in habitat adjacent to Hidden Valley at Rancho La Sierra for the fourth year. In 2013, two pairs were documented, one pair had a fledgling. These territories are not included in the data for Hidden Valley Wildlife Preserve but are listed on Tables 1A and 1B under Miscellaneous Sightings.

SANTA ANA RIVER BETWEEN RIVER ROAD AND NORCO (GOOSE CREEK GOLF CLUB) SUMMARY

In 2002, this site on the Santa Ana River at Hwy 15 in Norco was heavily infested with the invasive *Arundo donax*. A fire in 2002 burned much of the biomass, and SAWA took advantage of the opportunity to begin spraying the remaining Arundo. Vireo nest monitoring and cowbird management began in 2004. Now in its tenth year of management by SAWA, the native vegetation at the site is successfully recolonizing; vireo abundance has increased from 28 territories in 2004 to 108 territories in 2013. Cowbird trapping has removed 543 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 Rd. 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.

In 2013, 108* territorial males were detected. Fifty-two of these males were paired and 109 fledglings were detected. This is the highest number of territorial males ever detected on site since monitoring began. Nesting success for 29 well-tracked nests was 83%. This is an increase from 45% in 2011 and 71% in 2012. In 2013, nest failures were due to depredation, and abandonment. There was no nest loss due to reproductive failure or parasitism. Twenty pairs monitored throughout the 2013 season had a 2.2 productivity rate. Since monitoring began, at least 888 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 territories to 42. 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 has hit its all time high this year with a total of 108 males.

Overall nesting success from 2001 through 2013 for the site is 67% (n= 263 nests, range= 33%-100%). Depredation has been the main cause of nest loss; 26% of all nests have been lost to depredation. In 2013, the depredation rate was 14%; down from 41% in 2011 and 18% in 2012. 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 twenty-five Brown-headed Cowbirds have been removed from Norco over 2099 trap days. Parasitism has occurred on the site in seven out of the thirteen 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, parasitism decreased again, to a rate of 7% (2/29 nests). In 2009, the rate dropped to 2% (1/45 nests). In 2010, 2011, and 2012 no parasitism occurred on the site. In 2013, parasitism occurred at a rate of 7% (2/29 nests).

Mulefat and Arroyo Willow have each held 33% of all vireo nests (n=307) since 2001. Black willow has held 15%. The riparian vegetation overall 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. *The Riverwalk Park area in Eastvale (from Soaring Bird Court to Grapewin St.) was not surveyed this year.

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 Creek. 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's vireo in 2013. Special care was taken to document an accurate territory count and as much reproductive status as time allowed. 131 territorial vireo males were detected. Fifty of these males were known to be paired and 48 fledglings were detected. This count represents a 20% increase from the count of 109 territorial vireos in 2012 and an increase of over 1,700% from the seven territorial males found in 2001.

Active nest searching was not conducted during the 2013 season due to limited availability of personnel. However, three incidental nests were detected and tracked. One of three nests successfully fledged and two were depredated. No tracked nests were parasitized, and no nests failed due to reproductive failure.

The nest that successfully fledged young was placed in Arroyo Willow and the other two nests that were depredated were placed in Mulefat and Black Willow.

In 2001, SAWA began removing the invasive *Arundo donax* from the entire canyon. 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. Cowbird trapping has occurred at Temescal annually since 2001. During 10,345 trap days, 2,634 brown-headed cowbirds have been removed from Temescal. Parasitism has been documented in Temescal in nine out of the 13 years surveyed, 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'Loghlen and Rothstein 1995 and O'Loghlen 1995). In 2013, as done in 2012, we stocked the traps with bait birds that were caught locally. We kept local, second-year male birds in the traps for the remainder of the season as they became available. This methodology was tested in San Timoteo beginning in 2007 and has shown promise with increased captures and decreased parasitism.

CHINO HILLS SUMMARY

The patchy riparian habitat in Chino Hills along Butterfield Ranch Road has been surveyed annually since 2003. These sites include two drainages on both sides of Butterfield Ranch Road, Slaughter Canyon Creek at Butterfield Park and a flood basin at Brookwood Lane. Another small ravine off Butterfield Ranch Road was added to the survey in 2009. In 2012, another riparian patch adjacent to Slate Dr. was added to the survey area. Most of these locations occur on private property for which access is restricted. Therefore, few territories can be closely monitored and monitoring does not occur every year. Several other riparian patches in Chino Hills to the northwest of this site have been surveyed as assessment areas since 2005. Results from assessment surveys can be found in Tables 10 and 11.

In 2013, 13 territorial least Bell's vireos were detected. Five of these males were known to be paired and 7 fledglings were detected. This count represents a 63% increase from the count of 8 territorial vireos in 2012. Nest monitoring was conducted, with only one nest found and one pair closely monitored. Therefore, nesting success and productivity analysis is calculated from a very small sample size. In 2013, nesting success for one well-tracked nest found in a coast live oak tree (*Quercus agrifolia*) was 100%. Overall nesting success for the site from 2002 to 2013 is 38%. The overall productivity rate of well-tracked pairs during the same time is 1.4. Seven fledglings were documented in 2013. A total of 70 fledglings have been produced over the last 11 years (Tables C1-3).

Cowbird trapping has occurred in Chino Hills since 2008 when a secure location was found with the assistance of the City of Chino Hills. During 714 trap days, 61 cowbirds have been removed from Chino Hills/Butterfield Ranch. Parasitism has ranged from 43% (3/7 nests) in 2004 to 60% (3/5 nests) in 2007. There has been no parasitism detected since 2008 when cowbird control began. Although little nest monitoring has been done at this site, no vireo have been found with cowbird fledglings and few juveniles (none in 2013) have been trapped. Because of the high parasitism rates in this part of Chino Hills before cowbird control was initiated, it is assumed parasitism may be a problem in the assessment areas of Chino Hills as well. Potential 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 — SANTA ANA CANYON SUMMARY

The Santa Ana Canyon (SAC) is located along the Santa Ana River, downstream of the Prado Dam to the Weir Canyon/Yorba Linda Blvd. bridge. The SAC is divided into 3 different sites referred here as the Upper Canyon, Green River Golf Club and Featherly Regional Park. This summary discusses the compiled data from these sites which are summarized individually below.

The Freeway Complex Fire of November 2008 destroyed habitat for an estimated 43 territories in SAC. However, this did not deter the vireo returning the following spring as much as expected with only moderate decreases in 2009 at the Upper Canyon and Featherly Park. The Army Corps of Engineers (ACOE) riverbank stabilization project (Reach 9) started in the winter of 2009/2010 near the western half of Green River Golf Club, removing over 16 acres of mature riparian habitat that survived the fire. This particular project directly affected six territories by the massive excavations that were needed to reconstruct the riverbed and banks in order to protect the 91 Freeway. There were additional riparian impacts in the fall/winter of 2011 as the next phase of the riverbank stabilization project got underway further upstream, removing several more acres of mature riparian habitat. Additional disturbances in SAC include the on-going County of Orange SARI-line project activities in Featherly Park and Green River Golf Club.

One hundred and fourteen vireo territories were detected in the Santa Ana Canyon in 2013, which is up 43% from the 65 territories detected in 2012. This dramatic-looking increase is primarily due to an increased effort to survey sections with difficult access due to the SARI-line project and the ACOE (Reach 9) project that hadn't been surveyed in prior years. In 2013, a different SAWA biologist made a concentrated effort to detect vireos in these areas that weren't visited in 2012, which resulted in several more territories. This is not to say the vireo numbers haven't increased at this site, as they have throughout the watershed this year, just not by such a dramatic number. Overall, SAWA has documented a 28% increase in vireo numbers in the watershed this year. Therefore it is expected that the SAC population experienced a similar increase as well. Although the construction activities do not appear be affecting vireos presence, it may affect the productivity of pairs that are close to the disturbance. For example, construction continued adjacent to occupied habitat upstream of the railroad bridge at Green River Golf Club during the nesting season with very high noise levels. In early June, as work progressed, noise subsided. Until that time only 2 of the 12 pairs adjacent to the work zone had successfully fledged young. The remaining six successful nests did not fledge young until after July 8.

In 2013, nesting success for 23 well-tracked nests in was 52%. Ten of the 23 tracked nests were lost to depredation (43%) and one was lost to reproductive failure (4%). No tracked nests were lost due to parasitism. Overall nesting success for the site from 2001 to 2013 is 59% (149 of 254 nests). The overall productivity rate of well-tracked pairs during the same time is 1.7. Ninety-seven fledglings were documented in 2013, an increase from the 29 detected in 2012. Again, this is mostly due to an increased effort in 2013. A minimum of 795 fledglings have been produced in SAC over the last 13 years.

SAWA cowbird trapping began in the Santa Ana Canyon in 2001 when parasitism was detected in 5 of 19 nests (26%). Parasitism was detected in one of 21 nests (5%) in 2009 after 5 years of no detections. SAWA deployed two traps within a mile of that location and no parasitism has been recorded since. In 2013, 114 cowbirds were removed over 521 trap days. Since 2001, 1932 cowbirds have been removed from the canyon over 9,697 trap days during the vireo's breeding season.
The County of Orange has initiated implementation of the Santa Ana River Canyon Habitat Management Plan. SAWA biologists sit on 2 subcommittees overseeing

implementation of the plan. Although both the Army Corps of Engineers riverbank stabilization (Reach 9) project and the SARI-line project are expected to continue for several years, it is hoped active management of the canyon will improve and maintain optimum conditions for its native species.

UPPER CANYON – DOWNSTREAM OF PRADO DAM TO ABOVE THE GREEN RIVER GOLF CLUB

This section of the Santa Ana Canyon, from Prado Dam downstream to the Green River Golf Club, has undergone native habitat removal, restoration, subsequent removal and a devastating fire in the last decade. Heavy construction around and just below Prado Dam occurred from 2005 to 2008. Due to this construction, habitat for 10 territories was removed in 2005. Some of the habitat that was restored after construction is now upland habitat and vireo have not used it, but other restored riparian habitat is maturing and is being used by the vireo. In November 2008 the Complex Fire destroyed a wide swath of habitat that had held six territories that were not detected in 2009 or 2010 (post-fire). These areas are now part of the most current phase of the riverbank stabilization project.

In 2013, this section held 28 vireo territories, which is almost 3 times the number from last year (Table C-1). This dramatic increase is primarily due to an increased effort to survey sections with difficult access due to the ongoing Army Corp of Engineers bank stabilization (Reach 9) project that hadn't been surveyed in prior years. In 2013, the SAWA biologist made a concerted effort to detect vireos in these areas that were not visited in 2012, which resulted in several more territories. Nesting success for 5 well-tracked nests was 80%. Four pairs closely monitored throughout the season had a 1.9 reproductive rate. One of the 5 tracked nests (20%) was lost to depredation. No tracked nests were lost due to parasitism. Overall nesting success for the site from 2001 to 2013 is 66%. The overall productivity rate of well-tracked pairs during the same time is 2.6. Twenty-three fledglings were documented in 2013. A total of 248 fledglings have been produced over the last 13 years (Table (C-3). Cowbird trapping has occurred in the Upper Canyon since 2001 when the first vireos were detected on-site. Over 2,874 trap days, 608 cowbirds have been removed from the Upper Canyon. Parasitism has only been documented 2 of the 13 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 2013 season, the Reach 9 project appeared to be winding down at this location, which will relieve pressure to nesting birds caused by the related human activities. 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 wildfire 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 2013, no additional habitat was taken. However, construction continued adjacent to occupied habitat upstream of the railroad bridge during the nesting season with very high noise levels. In early June, as work progressed noise subsided. Until that time only 2 of the 12 pairs adjacent to the work zone had successfully fledged young. The remaining six successful nests did not fledge young until after July 8.

In 2013, the vireo population at this location increased 16% (n=3) to 22. The 2013 count was the highest count recorded by SAWA since monitoring began at this site in 2001. 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). Due to noise constraints, only 2 pairs were closely monitored throughout the 2013 season. Nesting success for 4 well-tracked nests was 25%. Three of the 4 tracked nests (75%) were lost to depredation. No tracked nests were lost due to parasitism. Overall nesting success for the site from 2001 to 2013 is 64%. The overall productivity rate of well-tracked pairs during the same time is 2.4. Nineteen fledglings were documented in 2013. A total of 260 fledglings have been produced over the last 13 years (Table C-3).

Cowbird trapping has occurred at the golf club since 2001 when the first vireos were detected on-site. During 3,881 trap days, 957 cowbirds have been removed from the golf club. When SAWA began monitoring this site, the parasitism rate was 44%. There has been no parasitism detected since 2001 when cowbird trapping was initiated (Table C-1).

Management at the Green River Golf Club has continued its cooperative relationship with SAWA and is supportive of SAWA's efforts to control cowbirds, manage the vireo and other sensitive species and enhance habitat. In addition to the continued support of our program, Troy Thompson, Green River Golf Club Superintendent, has generously offered to allow SAWA to store over 50 cowbird traps in their maintenance yard this winter. We are incredibly grateful.

FEATHERLY REGIONAL PARK

Featherly Regional Park is located on the Santa Ana River between the Green River Golf Club and the Yorba Linda Blvd/Weir Canyon Rd. bridge. The park is managed by Orange County Parks. Public access is restricted but there is no fencing and the Santa Ana River Trail and Bikeway runs adjacent to the park. The wilderness area of the park is characterized by dense and patchy riparian vegetation, dominated by willow (*Salix spp.*) and cottonwood (*Populus spp.*) species, and associated upland habitat. The privately-run Canyon RV Park and some commercial orange groves are adjacent to the native habitat within park boundaries. Featherly Park is bordered by highway 91and multiple commercial and residential areas. The upstream portion of the

river where Green River Golf Club boarders Featherly Park has been impacted by the US Army Corps of Engineers reinforcement project. It is currently devoid of riparian vegetation and in the initial stages of restoration. The downstream portion of the river, below the Weir Canyon bridge, is channelized with a sandy bottom. This stretch of the river is normally maintained by Orange County Flood Control and vegetation is removed. In 2013, the riparian vegetation in the channel was allowed to regenerate until late May, when it was sprayed with herbicide. SAWA has suggested the County remove vegetation mechanically prior to each nesting season to discourage vireo and other nesting birds from using the channel.

In 2013, 64 territorial least Bell's vireo males were detected in Featherly Park. Forty-five of these males were known to be paired and 55 fledglings were detected. This count represents a 78% increase from the count of 36 territorial vireos in 2012. This dramatic increase is primarily due to an increased effort to survey sections with difficult access due to the SARI-line construction that hadn't been surveyed in prior years. In 2013, the SAWA biologist made a concerted effort to detect vireos in these areas that weren't visited in 2012, which resulted in several more territories. This prompted the project consultants (PCR) and their contracted biologists to closely monitor the vireo nearest to the active construction. SAWA would like to thank Florence Chan and Scott Holbrook of PCR for their cooperation and data-sharing in these areas. These numbers 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's first major increase came in 2004 when it quadrupled from six in 2003 to 24 (Appendix D).

Nesting success for 14 well-tracked nests was 50%. Ten pairs closely monitored throughout the season had a 1.7 reproductive rate. Six of the 14 tracked nests (43%) were lost to depredation. One of the 14 tracked nests (7%) was lost due to reproductive failure when the 7 day-old chicks were blown out of the nest by unusually high Santa Ana winds. No tracked nests were lost due to parasitism. Overall nesting success for the site from 2002 to 2013 is 48%. The overall productivity rate of well-tracked pairs during the same time is 1.9. Fifty-five fledglings were documented in 2013; the highest amount since monitoring began in 2002. A total of 287 fledglings have been observed over the last 13 years (Table C-3).

Cowbird trapping has occurred in Featherly Park since 2001 when the first vireos were detected on-site. Over 2,942 trap days, 367 cowbirds have been removed from Featherly Park. Parasitism has been documented 3 out of the 13 years surveyed, reaching its highest rate in 2002 (67%). There has been no parasitism detected in Featherly Park since 2009 (Table C-1).

In November 2008 the devastating Complex Fire roared through the canyon and destroyed up to 90% of the riparian habitat in Featherly Park. Thirty-four vireos, only 2 less than the 2008 season, returned the following season and remained in or near their former territories. Most of the breeding vireos found nest sites in unburned vegetation or the reemerging native vegetation although 4 pairs used non-native vegetation which included black mustard (*Brassica niger)*, cocklebur (*Xanithum strumarium),* wax leaf privet (*Ligustrum* sp.), and a small orange tree (C*itrus sinensis)* on the edge of a burned area. Of the 23 nests found in 2013 all were placed in native vegetation, with the highest number of nests (n=4) in poison oak (*Toxicodendron diversilobum*) (Table C-2).

The highly invasive *Arundo donax* (arundo) began re-sprouting two weeks after the vegetation burned. In an effort to take advantage of the arundo biomass removed by the fire, Orange County Parks management was able to get approval to spray herbicide on the rapid arundo regrowth before the following nesting season, which helped control a large amount of regrowth. Unfortunately, many patches have re-established since that time and most dead arundo biomass remains, hampering native plant regeneration. In 2013, the County sprayed herbicide along the levees during nesting season and some native vegetation was damaged. Additionally, the use of Imazapyr on arundo was found to be damaging nearby native trees. 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

This site is now surveyed three times a season and little to no nest searching is done. Twenty-nine territories were detected in 2013. Eight of these males were confirmed paired and ten fledglings were observed. The low numbers of pairs and fledglings with respect to the number of territories was the result of a lesser monitoring effort Irvine Park is scheduled for more intensive nest monitoring in 2014.

SAWA has monitored Irvine Regional Park for least Bell's vireo since 2003 in conjunction with an arundo removal project along Santiago Creek. The first year of monitoring in 2003 showed six male territories, followed by nine, eleven, and five for 2004-2006. Surveys after 2006 showed a significant increase in singing males from previous post Arundo visits. The highest male territory count was recorded in 2009 with 29 male territories.

Post Arundo restoration activities had greatly increased the biodiversity in plant species upstream of Villa Park Dam. Black willow with mulefat understory is abundant in the riparian zone and recent restoration efforts are improving upland coastal sage habitat.

Southwestern Willow Flycatcher

In 2013, four Willow Flycatchers territories and one breeding pair were documented within the watershed. One individual was observed in Mockingbird Canyon on 5/28. One singing male was detected on 5/29 in San Timoteo. One male was also detected singing in the habitat west of Highway 71 on 6/6. During SAWA's 2013 assessment surveys, one male was detected singing in Santiago Canyon on 5/20. The breeding pair was found at the Prado Basin by Jim Pike (Pike et al, 2013). Two nests were found and monitored for this pair and both were located in the same vicinity as nests found in previous years (2012, 2011, 2008 and 2006) for this species. Both 2013

nests were built in Tamarisk (Pike, pers.com). The first nest was possibly abandoned before eggs were laid. The second nest was successful, resulting in two fledglings.

In 2012, SAWA and Prado biologists detected four male willow flycatchers and one breedig pair within the watershed. One male was detected singing in the Hidden Valley Wildlife Area on 5/30. One male was also detected singing in San Timoteo on 5/31. During our 2012 assessment surveys, two counter-singing males were detected in Yorba Linda Lakebed Park.

The breeding pair was found at the Prado Basin by Jim Pike. Three nests were found and monitored for this pair and all were located in the same vicinity as nests found in previous years (2011, 2008 and 2006) for this species. All three nests were located in Tamarisk. The first nest was depredated, broken egg shells were found below the nest. The second nest seemed to be abandoned. The abandonment could have been due to Brown-headed Cowbirds detected in the nest area. The third nest was successful, resulting in two fledglings.

In 2011, SAWA biologists detected thirteen single willow flycatchers, and one breeding pair within the watershed. A special effort was made this year to survey specifically for Willow Flycatchers using playback. Regularly monitored sites that were surveyed include Norco Burn, Featherly Park, March SKR Reserve, Mockingbird Canyon and San Timoteo. None of these surveys resulted in any detections.
Birds detected in the Norco Burn area without playback were as follows: two males were seen and heard singing to each other on 5/25, and a third male was heard singing alone. An additional male was heard singing on 6/6. Two birds were detected on 6/2 at the San Jacinto Wildlife Area, one male singing and the other whitting in response. During our 2011 assessment surveys, six singing males were detected. Assessment sites were also surveyed using playback. These sites included Arlington Falls, Lake Perris, and the Cajon Pass. On 5/25 two males were seen and heard countersinging at Arlington Falls. No playback was used in this detection. On 5/26, four males were detected at Lake Perris. Three of these detections were in response to playback. The fourth bird was seen first, then playback was used to confirm species. The breeding pair was found at the Prado Basin by Jim Pike. (Pike et al. 2011). Two nests were found and monitored for this pair and were both located in the same vicinity as nests found in past years (2006 and 2008) for this species. The male was first detected on 5/23 and the female on 5/31. The first nest was found in the building stage on 6/22. When the nest was checked on 7/11, the only contents inside was a Brown-headed Cowbird egg with a large hole in it. A second nest containing three eggs was found on 7/11. On subsequent visits on 7/19 and 7/26, the nest still contained three eggs, but no activity was seen in or near the nest, which was presumed abandoned. The male was last detected on 7/27.

In 2010, SAWA biologists detected ten single willow flycatchers within the watershed. No breeding pairs were found. Two birds were seen and heard whitting to each other in the Norco Burn area on 5/5. Two males were heard singing about 40 yards apart in a ravine on the west side of the Hidden Valley Wildlife Area on 5/25. A single male was heard singing at the San Jacinto Wildlife Refuge on 6/17. During our 2010 assessment surveys, five singing males were detected. Locations include Lake Perris on 6/2, Carbon Canyon Regional Park (CCRP) on 6/3, two males heard at Kabian Park on 6/3, and Box Springs on 6/4. Additional visits were made using

playback to CCRP on 6/10 and to Box Springs on 6/11, but no birds were detected on these visits.

No breeding Southwestern Willow Flycatchers were documented in the watershed by SAWA biologists in 2009. We were unable to confirm a report of three to four possible Willow Flycatcher pair sightings in San Timoteo. We documented 10 single birds in the watershed. In San Timoteo, a minimum of two Willow Flycatchers were documented. There were four sightings and two males were heard on 6/8 and 6/11 in different locations. We documented six other single Willow Flycatchers within the watershed. There were two males singing and fighting on the Santa Ana River in Norco on 5/14 at the same location that a Willow Flycatcher has been detected in 2006, 2007, and 2008. Two more singing males were heard at March SKR Preserve on 5/27. Two willow flycatchers were detected at Goldenstar, in Riverside County, on 6/4. The birds were not detected on subsequent visits; however, the first Least Bell's Vireo heard at the site was documented on a follow-up visit.

In Prado Basin in 2009, only one Willow Flycatcher was documented. It was detected on 5/8 and occupied the same location as the breeding pair detected in 2008. It was last documented on 6/30 (Pike et al. 2008). In 2008, one breeding pair of Southwestern Willow Flycatchers was detected in the Prado Basin. The male was first seen on May 12, and was suspected of being paired by May 20. On July 4, three fledglings were seen (Pike et al. 2008). There were several other Willow Flycatcher sightings by SAWA biologists within the watershed in 2008, however no breeding pairs were found. There was a male heard singing on the river in Norco on May 19. It was seen and heard whitting on May 22 and May 30 in the same area. This is the same location that a Willow Flycatcher was detected in both 2006 and 2007. Another Willow Flycatcher was seen foraging in the Norco Burn area on May 30, and a third was seen and heard whitting on June 11. In San Timoteo, there were two sightings of a singing male on May 28 between East Side Ranch and the State Park's property which may have been the same bird. Another Willow Flycatcher was spotted on May 30 about 200 m east of the U.S. Army Corps of Engineers detention ponds. A Willow Flycatcher was detected multiple times in the same area at March SKR Reserve but no pairing was observed. A flycatcher was seen on 5/18 and two counter singing males were detected on May 29. One was also whitting and seen swiping its bill on a branch. A flycatcher was observed again on June 9 and June 11 at the same location but no breeding was documented. Three Willow Flycatchers were seen at Santiago Oaks Regional Park on May 15. Two of the birds were countersinging and appeared to be fighting. Another was seen in the Cajon pass area on June 6, which was detected by its response to playback. Additional visits were made to both of these sites, but no flycatchers were found.

Willow Flycatchers were detected during 2007 but no breeding was documented. Most of the sites where flycatchers were heard were visited multiple times during the season. On May 17 two flycatchers were countersinging in San Timoteo near Eastside Ranch; two were heard again in the same area on June 12. Both these dates are within the first survey period, ending June 22. A Willow Flycatcher was singing in Younglove Preserve on May 22. Two adults were observed at Goldenstar Ravine during the May assessment survey (May 24, 2007). One was observed at Temescal in the riparian area at the 3M plant on May 22. On the river, in Norco, a Willow Flycatcher was

detected on May 10 and June 10 in the same location. Whitting calls were heard on May 10 and June 7 and whitting and fitz-bews were heard on June 10. The bird was seen low in the shrubby riparian growth where it spent many minutes but no second bird was seen and no nest found. Many visits were made to the area during the remainder of the season but the bird was not detected again. A flycatcher was detected on June 11 at March SKR Preserve singing briefly in a riparian patch next to a cowbird trap; the bird was not detected again during follow up visits. Another Willow Flycatcher was heard on June 12 on the Santa Ana River at Anza Narrows.

In 2006, one pair of Southwestern Willow Flycatchers successfully bred in Prado; another single male was also present (Pike et al. 2006). No breeding Southwestern Willow Flycatchers were detected in the watershed by SAWA biologists in 2006. Eleven sightings of probable migratory Willow Flycatchers were made. Six of these sightings were in late May. All detections listed were by vocalization unless otherwise noted. All UTMs are WGS 84. During the assessment surveys three Willow Flycatchers were sighted. Two were observed on May 22 (UTM 0464712, 3751489) in the riparian patch at Woodcrest Dam. One was observed at Box Springs (0472391, 3757077) on May 23. Two willow flycatchers were detected on May 22 (with a second sighting of one on May 30 not vocalizing at the same site) in Mockingbird Canyon. A Willow Flycatcher was detected on the Santa Ana River in Norco, upstream of Hwy 15, on May 30. Two Willow Flycatchers were observed dueling at Hidden Valley on May 31 (0452641, 3758263). Three Willow Flycatchers were observed by L. Hays at Shipley Nature Center the week of September 26. One was singing (pers. comm.)

In 2005, SAWA biologists detected one pair of Southwestern Willow Flycatchers and four single willow flycatchers in the watershed. The pair was observed on May 31 at the Harrison Reservoir in willows upstream of the dam where a ravine comes in from the west. Although one member of the pair appeared to be pulling bark from a tree, the birds were not seen again on subsequent visits. Nine migratory Willow Flycatchers were detected on a single survey at Harrison Ravine by Jason Berkely (pers. comm.). A Willow Flycatcher was observed at Lake Perris (11S0485670, 3746377) on May 11. Two singing males were observed at March SKR Preserve on May 25. One Willow Flycatcher was detected on the Santa Ana River between Waterman Avenue and California Street on May 20 (0479017, 3772057).

In 2004, in San Timoteo, three Willow Flycatchers were detected visually and by vocalization at one site approximately 0.5 miles upstream of Eastside Ranch (33.98338546°, 117.1274108°) by several SAWA biologists. One of the historical sites of flycatcher sightings approximately 1.2 km upstream of the San Timoteo Canyon Road crossing in Redlands was destroyed in December of 2003 by the flood control project at the lower end of San Timoteo Canyon. The flycatcher was last detected at this site on May 29, 2003 and June 4, 2003.

No Willow Flycatchers were detected at Hidden Valley in 2005 whereas two were observed in 2004. In 2004, at Hidden Valley, two flycatchers were observed on May 27, 2004 within the gated Department of Fish and Game portion of the preserve (UTM 11 S 0454343 /3757847). Their identities were confirmed by vocalizations. At least one flycatcher remained at the site 0.5 hours later. On June 9, 2004 a flycatcher was observed approximately 50 m away perched on nettle growing on the berm of a pond. It

flew into willow and disappeared. No vocalization was given. While the first sightings on May 27, 2004 may have been migrating birds, the second observation increases the possibility that nesting was occurring. These flycatchers were in habitat that contained seven vireo pairs within 200 m and was under intensive monitoring but no flycatcher breeding activity was detected.

In 2004, one flycatcher was detected (by vocalization) by SAWA biologists in the Mockingbird basin near the reservoir but it was not re-sighted on subsequent visits. A flycatcher was detected (by sight only) in 2003 in the same area.

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 - AUGUST 2013

Forty-nine cowbird traps were deployed during the 2013 vireo season and 1,945 cowbirds were removed from all sites over 6,355 trap days (Table 6, Figure 1). The sex and ages of the cowbirds removed in 2013 were: 1,144 males, 614 females, and 187 juveniles. SAWA biologists and field assistants spent approximately 2,800 hours servicing traps during the vireo season and over 1,100 hours on winter trapping and data entry.

The areas trapped and the number of traps in each area are as follows: San Jacinto, eight; San Timoteo, nine; March SKR Preserve, two; Mockingbird Canyon, six; Santa Ana River from Jurupa Park to Hidden Valley, four; Hidden Valley, three; Santa Ana River in Norco, two; Temescal Canyon, ten; Santa Ana Canyon, four; and one in Chino Hills. All of the traps were opened by mid to late March and closed by 8/4. Traps at the San Jacinto dairies will remain open through the winter, as well as one dairy trap in Temescal Canyon. Trapping results in this report end with 8/4 data; results after 8/4/2013 will be reported in winter trapping results for 2014.

In 2013, SAWA managed four traps in the Prado Basin for the Santa Ana Watershed Project Authority. Those data are published in Pike et al 2013.

In 2013 cowbird captures decreased by 31% over 2012 captures (2,826). In 2012 captures had increased by 14% from 2011 (2,470). This year the biggest decrease was in the male and juvenile captures, both down 35% from the birds captured in 2012. Twenty percent fewer females were trapped in 2013 than in 2012. The decreased captures occurred despite an increase of one trap and 882 trap days. The overall capture rate decreased from 0.5 to 0.3 (# birds trapped per trap day).

In 2013 three traps were vandalized. One trap in Temescal Canyon was vandalized twice and lost three female cowbirds. The trap was initially repaired and put back in service but was closed for the season after it was vandalized for the second time two weeks later. One trap in Hidden Valley was vandalized in June and lost 5 cowbirds; it was subsequently closed for the season. San Timoteo Canyon had one trap vandalized early in the season. In late March, three male and four female cowbirds escaped after the trap was damaged. The trap was repaired and reopened the next week and no further vandalism occurred at this trap throughout the season.

NON-TARGET AVIAN SPECIES CAUGHT IN COWBIRD TRAPS, MARCH – AUGUST 2013

Thirty non-target species, consisting of 4,370 individual trapping occurrences, were captured in the 49 cowbird traps (Table 7). The most common species were California Towhee, *Melozone crissalis*, European Starling, *Sturnus vulgaris*, Red-winged Blackbird, *Agelaius phoeniceu*s, House Finch, *Carpodacus mexicanus,* and House Sparrow, *Passer domesticus.* The mortality of non-targets in 2013 averaged 0.7%, similar to the average of 0.6% in 2012.

WINTER 2012-2013 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 2012-2013. Eight traps were located in San Jacinto at dairies and were open between 8/6/2012 and 3/17/2013. A total of 3,438 cowbirds were removed (1,174 males, 1,260 females, and 1,004 juveniles) over 1,492 trap days (Table 8). The number of cowbirds trapped in San Jacinto declined 17% from the prior winter even though the number of trap days increased by 15%. The capture rate per day was 2.3, down from 3.2 in the winter of 2011-2012.

One trap was open at a dairy in Temescal during the non-breeding season, from 8/6/12-3/15/13. This is the first winter this trap has been in service. A total of 898 cowbirds were removed (294 males, 295 females, and 309 juveniles) over 176 trap days. The capture rate per day was 5.1.

Eleven non-target species, consisting of 867 individual trapping occurrences, were captured in the 9 cowbird traps located in San Jacinto and Temescal (Table 9). The most common species were European Starling, House Finch, House Sparrow, and Red-winged Blackbird. The mortality of non-targets over the winter averaged 1.0%, up from 0.5% in the winter of 2011-2012.

DISCUSSION

Vireo abundance increased 28% in the Santa Ana watershed in 2013, reversing the downward trend for the last two years. Despite the recent 2 year declines, the population has increased annually since 2000 except for the decline in 2006. A population of over 1,500 territories is currently documented in the Santa Ana watershed. This dramatic increase over 14 years is illustrated for four sites in Figure 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 3,500 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 126 in 2010 Temescal Canyon has shown similar increases with a vireo population increasing from seven in 2001 to 109 in 2012. The Santa Ana River in Norco, at Hwy 15, is also showing explosive growth. After a major Arundo burn in 2005, the population had increased to 101 territories in five years.

SAWA and Prado biologists have removed over 100,000 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 remains high with a rate of 61% in 2013. Over fourteen years, the nesting success rate is 61% for 1817 nests. Depredation remains the main cause of nest failure. Nest loss due to depredation was 31%, a slight decrease from 2012. Nest loss from reproductive failure was 4%; 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. No nests were lost to parasitism in 2013. The parasitism rates in the past have ranged between 2% to 5%. Parasitism is episodic throughout the watershed. It continues to be a problem along the Santa Ana River, San Jacinto, and Temescal. In 2007, the discovery of four parasitized nests in a section of Hidden Valley where the cowbird traps were non-functioning due to vandalism and placement issues, lends support for the continued need for cowbird trapping to recover the vireo fully. Figure 5 compares nesting success, predation, and parasitism rates from 2003-2013.

The lack of documented nesting Southwestern Willow Flycatchers in the watershed is not surprising given the continuing low numbers throughout the watershed. One breeding pair was detected in the Prado Basin in 2013 and nesting resulted in 2 fledglings (Pike et al, 2013). The mountain canyons have held flycatcher territories in the past and should be under management and monitoring by now but the resources to accomplish the additional work have not been forthcoming.

MANAGEMENT RECOMMENDATIONS

SAWA continues development of its vireo population assessment program that will provide accurate annual data on status and distribution of the vireo in the watershed. Intensive monitoring will be balanced with assessment sampling to free additional field time for sensitive species investigations during the breeding season. A sampling program for monitoring nesting success, predation and parasitism rates is being developed. SAWA will continue to coordinate with other agencies for a watershed-wide assessment of all potential vireo habitats. SAWA will continue to identify more locations to survey.

Restoration of riparian habitat through the removal of non-native invasives such as *Arundo donax*, tamarisk, and pepperweed continues to be important to the continued recovery of the vireo. The development of notification procedures to make natural resource agency managers aware of local infestations of exotics at an early stage may help to prevent future massive infestations. SAWA biologists and SAWA's habitat assessment coordinator notify SAWA project managers when infestations are detected and they are then managed in a timely fashion.

There is increasing awareness of the need to control feral pigs throughout the watershed. Some multi-organizational planning attempts have been publicized. SAWA and Prado are planning a pilot study to track feral pig populations in the Prado Basin. Along with restoration and procurement of new land, there needs to be increased protection of those lands for wildlife values. Specifically, there continues to be a need to enforce current laws, and perhaps promulgate new laws, to restrict the use of off-road vehicles in sensitive riparian areas. Local landscapes are scarred with off-highway vehicle (OHV) tracks and the activity is damaging habitat, willows and cottonwoods, in areas such as Mockingbird Canyon, San Timoteo Canyon, the San Jacinto River, and the Santa Ana River. The effect of rampant off-road vehicle use is the destruction of significant riparian resources. The lands with these high wildlife values are very limited in extent and cannot be meaningfully protected or restored in consort with OHV activity. SAWA is attempting to initiate a program of law enforcement in San Timoteo in conjunction with State Parks and the Department of Fish and Game.

Laws meant to prevent other human disturbances such as laws against streambed alteration must be enforced. There are too many examples of the devastating effects of the lack of enforcement. A positive development in this area is the County of Riverside's code enforcement program that targets illegal dumping. Enforcement of these laws is sorely needed to protect riparian habitat from degradation. SAWA has had unprecedented success in the scale of riparian habitat restoration that has been achieved on the Santa Ana River. The vireo is truly on the road to recovery in our watershed with ample habitat developing for occupation. However, we will not be ultimately successful without rallying more support from the people living next to and 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.

LITERATURE CITATIONS

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ACKNOWLEDGEMENTS

We heartily thank our field and cowbird assistants: Henry Armijo, Kellie Corber, Jim George, Sarah Hoemke, Daniel Paramo, Eric Peralta, Cassandra Read, Arsenio Hernandez, Alisha Kottwitz, Edwin Madrid, Cory McGee, Brett Mills, Aimee Roach, and project manager James Law. We also wish to thank Gayle Holyoak, Vicki Long, Bonnie Johnson, Mandy Parkes, Jim Pike, and Kerwin Russell.

We would also like to thank the following individuals and agencies for their continued assistance: Hidden Valley Golf Club, Lori Askew and Robin Shepard of the City of Norco, Madeline Bauer, Bill Bradberry, Brookfield Residential, Brian and Dana Busch and the staff at the Canyon RV Park, Sherry Chandler, California Department of Fish and Game environmental scientists: Jeff Brandt, Kim Freeburn-Marquez, and Joanna Gibson, California Department of Parks and Recreation ecologists: Alissa Ing and Ken Kietzer, City of Chino Hills Public Works Department, the staff at the City of Corona WRF #3, Mike Cravens, Herman DeJong and family at the DeJong Dairy, Lucia Diaz and the Inland Empire Utilities Agency, Eastern Municipal Water District, Dan Ebert, Gordon English, Euclid Dairy, Ross Fisher and the staff of the Goose Creek Golf Club, the staff at Fisherman's Retreat, Bob Fontaine and John Gericke of Prado Regional Park, Gage Canal, Johnny Garcia, Frank Garza and the City of Corona, Donna Hart, Dennis Hayes, Barbara Iyer, J and M Oostdam Dairy, KB Home, Pat Kilroy and the City of Lake Elsinore Parks and Recreation Department, Bob King, Linda Koki, Joe Lameli and the staff of the Metropolitan Water District, Ed Lotz, Adam Malisch and the MSHCP monitoring program, the staff at Canyon Lake Water Treatment Plant, Natural Resource Manager Dustin McLean and Natural Resource Specialist Elizabeth Dionne, Robert Williams, Ranger, of the Riverside County Regional Parks and Open-space District, and the staff at the Hidden Valley Wildlife Preserve, The Regional Conservation Authority, Beth Martinez of PCR Services Corporation, Northwestern Vector Control, Orange County Flood Control, Orange County Park Rangers Kelly Lewis and Joanette Willert, City of Riverside Public Works Department Water Quality Control Plant, Ramona Farms Dairy, Roberta Reed and the 3M Company, R & J Dairy, Riverside County Flood Control, Judy Saguchi and Troy Thompson and the staff at the Green River Golf Club, Scott Brothers Dairy, Scott Sewell, Theresa Sims of the San Bernardino County Flood Control, Lynn Staford, Gary Stockwell and the Elsinore Valley Municipal Water District, John Trotter and the City of Chino Hills, Vanderwoude Dairy, the Western Municipal Water District, and Kraig Williamson of the Temescal Canyon Rockery.

Special thanks go out to the following residents of Mockingbird Canyon, San Timoteo Canyon, and Lake Elsinore for their assistance in cowbird trap placement: Jim Fabozzi, Margarite and Jack Empson, Gordon and Peggy Headlee, Mark and Faith Kelsey, the Mendoza Family at Eastside Ranch, and Chris Ungerer.

Figure 1: Least Bell's Vireo Survey Sites in the Santa Ana Watershed

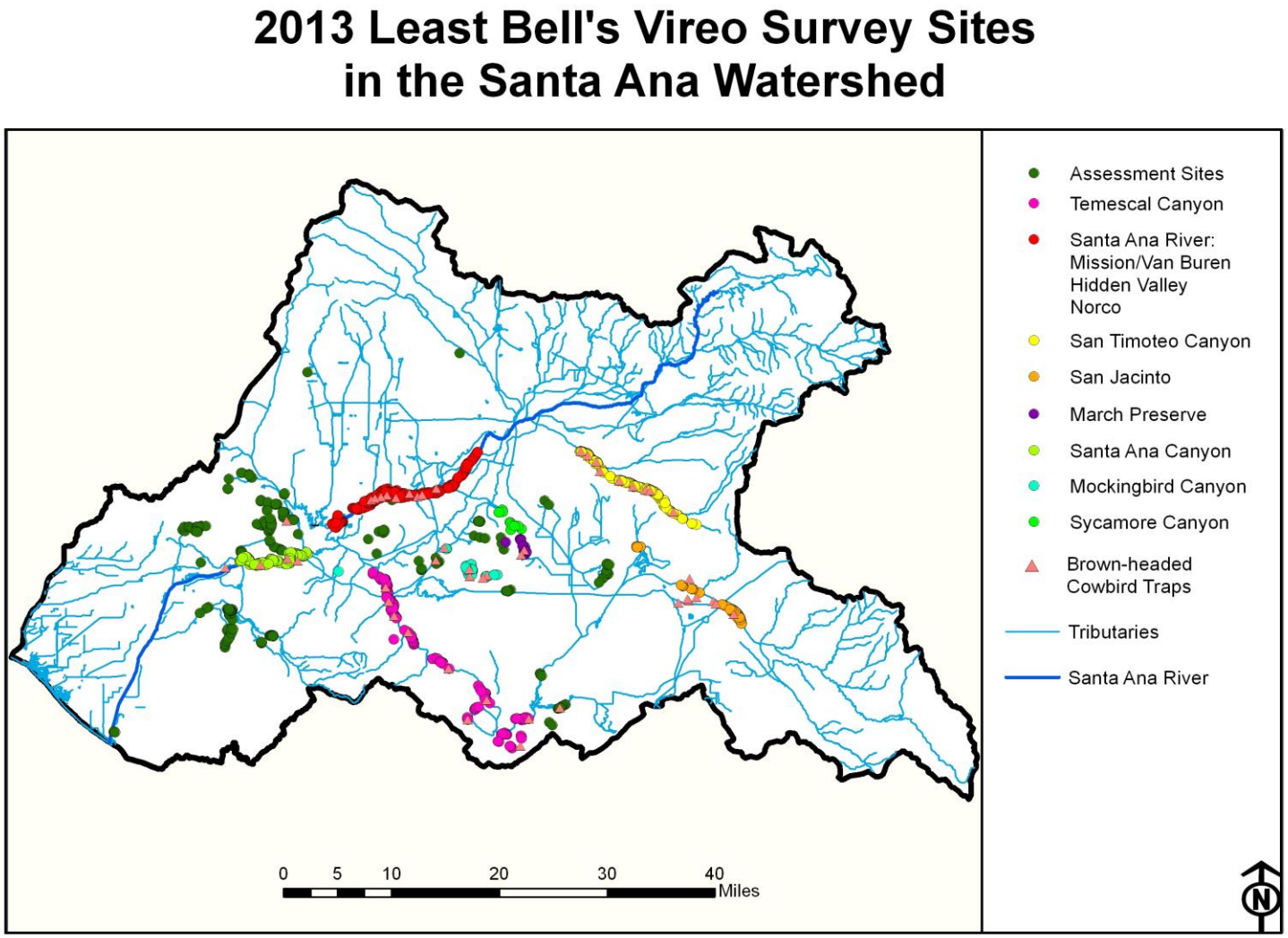
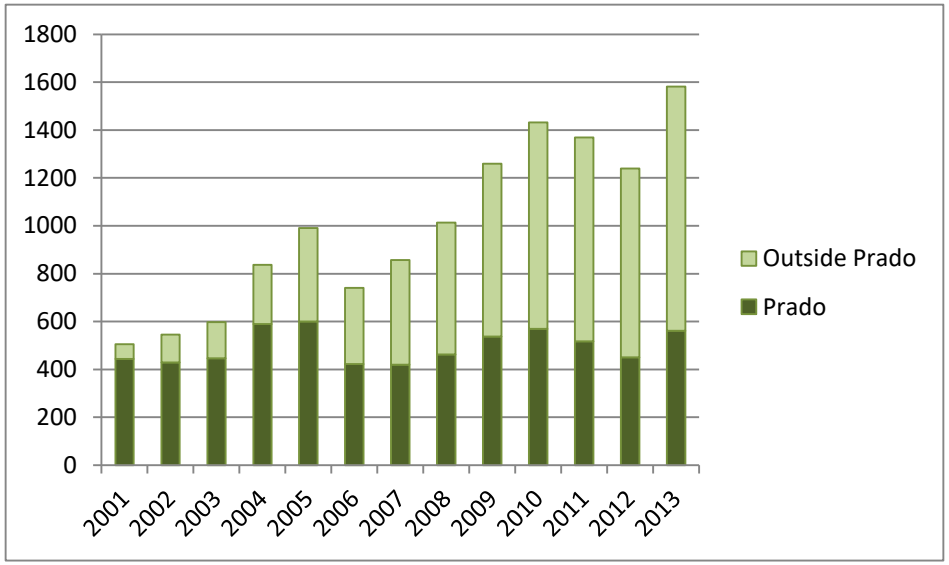
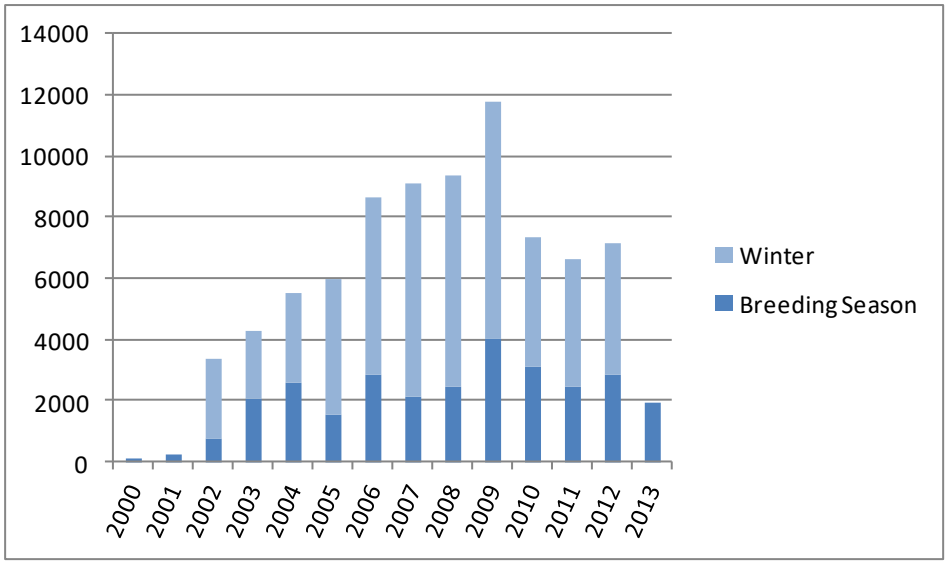


Figure 2: Vireo Abundance in the Watershed, Prado and Outside Prado, 2001-2013.



Source: Santa Ana Watershed Association

Figure 3: Number of Cowbirds Removed from SAWA Monitoring Sites in the Santa Ana Watershed, 2000-2013



Breeding season: 15 March – 31 July (about) (2013)
Winter: 1 Aug (about) – 14 March (2012-2013)
Dates approximate
Source: Santa Ana Watershed Association

Figure 4: Number of Least Bell's Vireo Territories at Four Sites in the Santa Ana Watershed, 2004-2013

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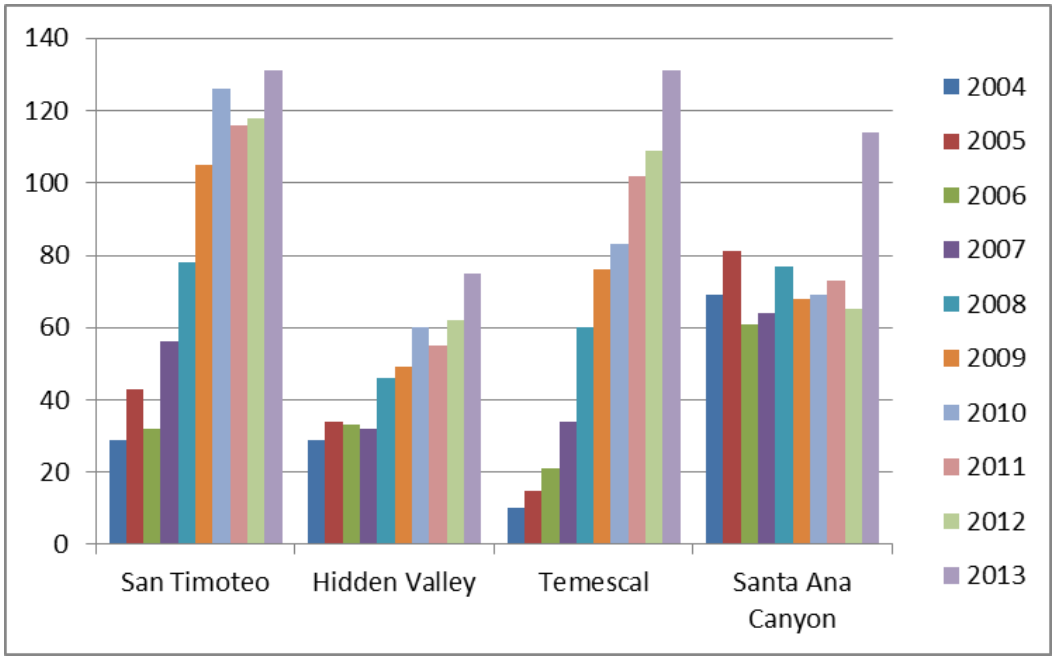
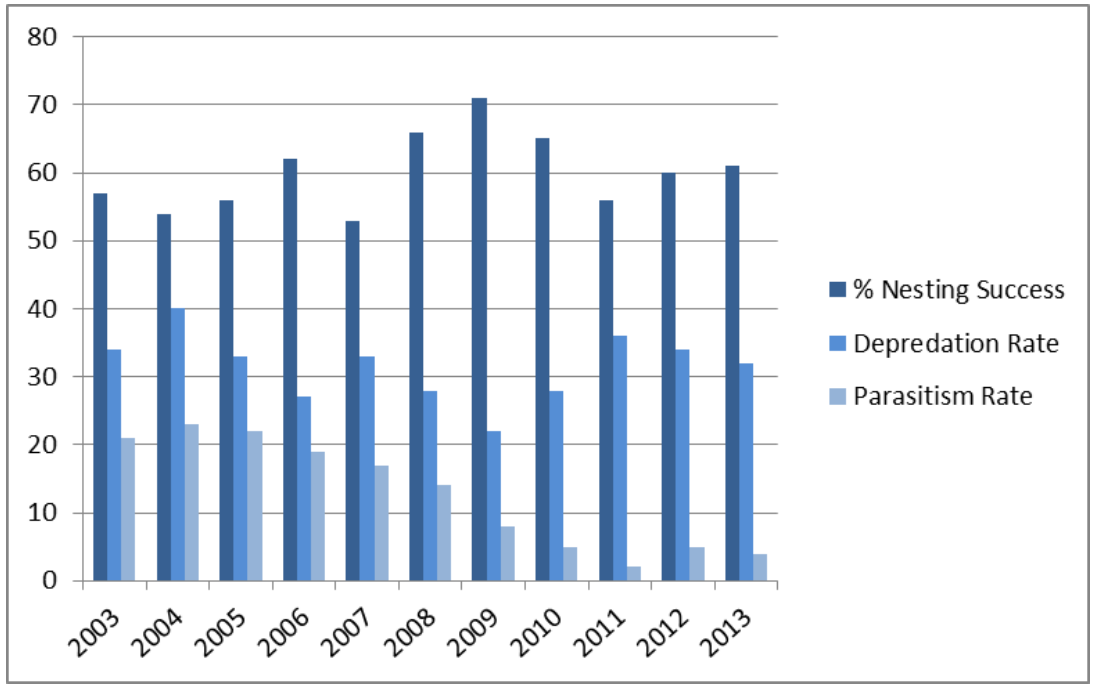


Source: Santa Ana Watershed Association

Figure 5: Least Bell's Vireo Nesting Success, Depredation Rates, Parasitism Rate in the Santa Ana Watershed, 2003-2013



Source: Santa Ana Watershed Association

Table 1A: Least Bell's Vireo status and distribution in the Santa Ana Watershed, 2010-2013

Table 1A: Least Bell's vireo status and distribution in the Santa Ana Watershed, 2010-2013.
Numbers of territories, pairs, and fledglings detected

SUBPOPULATION	2010	2011	2012	2013					
San Jacinto	22/18/28	41/25/18	42/36/49	53/29/39					
San Timoteo Canyon	126/95/137	116/101/196	118/102/153	131/80/179					
Sycamore Canyon	12/8/11	9/5/4	7/7/5	12/nd/nd					
March SKR Preserve (March ARB)	14/12/25	16/9/7	13/11/8	14/12/16					
Alessandro Arroyo	Assessment Survey	Assessment survey	Assessment survey	Assessment Survey					
Mockingbird Canyon	43/34/25	37/32/67	28/26/39	31/24/22					
Harrison Reservoir	1/0/0	Not surveyed	Assessment Survey	Assessment Survey					
La Sierra Blvd., Riverside County	Assessment Survey	Assessment survey	Assessment Survey	Assessment Survey					
Santa Ana River – U/S of Hidden Valley - Fairmount Park/Mission 2010-2012,Riverside Dr. 2013	68/50/58	49/23/32	41/11/7	78/--/7+					
Hidden Valley	60/43/53	55/36/41	62/37/45	75/42/66					
Hidden Valley (north side of river) (new area)	15/12/18	4/2/2	9/3/1	21/2+/3+					
Santa Ana River - (d/s of) Hidden Valley-Norco to River Rd.	101/64/113	105/59/91	95/51/86	108/52/109					
Temescal Canyon (from Railroad Canyon to approx. Cajalco Rd.)	83/49/73	102/65/113	109/63/71	131/50/48					
Chino Hills (Butterfield Ranch)	11/7/7	8/3/1	8/2/1	13/5/7					

Table 1A: Least Bell's vireo status and distribution in the Santa Ana Watershed, 2010-2013. Numbers of territories, pairs, and fledglings detected									
SUBPOPULATION	**2010**	**2011**	**2012**	**2013**					
Santa Ana Canyon Upper Canyon (River below Prado Dam to Green River Golf Club)	11/4/6	14/5/5	10/4/6	28/14/23					
Santa Ana Canyon - Green River Golf Club	24/17/19	26/14/19	19/11/11	22/19/19					
Santa Ana Canyon - Featherly Reg. Park	40/23/22	33/19/23	36/16/12	64/45/55					
Santiago Creek -Irvine Reg. Park	24/14/18	26/9/7	Assessment survey	Assessment Survey					
Santiago-Santiago Cyn Rd.	Assessment Survey	Assessment survey	Assessment Survey	Assessment Survey					
Santa Ana River mouth-Talbert Park	Not surveyed	1/0/0	2/0/0	Assessment Survey					
East Coyote Hills Preserve – Fullerton	(3/3/3)[10]	(4/0/0)[10]	(2/0/0)[10]	2/0/0[10]					
Misc. Sightings ---									
-- Shipley Nature Ctr, Huntington Beach	0/0/0[12]	0/0/0[12]	0/0/0[12]	0/0/0[12]					
-- Santa Ana River, Woolly star Preserve	Not surveyed	Not surveyed	0/0/0	Not surveyed					
Etiwanda Wildlife Preserve	1/0/0	Assessment survey	Not surveyed	Not surveyed					
Mt. Baldy	Not surveyed	Assessment survey	Not surveyed	Not surveyed					
Chino Creek Park at Inland Empire Utilities Agency	2/1/1	2/1/1	1/0/0	2/1/1					
Chula Vista, CA	1/0/0[10]	Not surveyed	Not surveyed	Not surveyed					
Protrero	2/0/0[5]	Not surveyed	Not surveyed	Not surveyed					

Table 1A: Least Bell's vireo status and distribution in the Santa Ana Watershed, 2010-2013.
Numbers of territories, pairs, and fledglings detected

SUBPOPULATION	2010	2011	2012	2013					
Rancho La Sierra West, Riverside	1/1/0	1/1/1	1/1/1	2/2/1					
Estelle Mountain Preserve	0/0/0[5]	1/0/0	Not surveyed	Not surveyed					
Yorba Dry Lake Bed Park	Assessment Survey	Assessment survey	Assessment Survey	Assessment Survey					
Black Gold Golf Club	Not available	2/0/0[11]	4/0/0[11]	3/0/0[11]					
Diemer Plant, Brea, CA				1/0/0[11]					
--Riverview Golf Club	Not surveyed	Not surveyed	Not surveyed	Not surveyed					
--Pulte Wetlands, adjacent to Chino Hills State Park CHSP)	Not available	2/0/0[11]	Not surveyed[11]	Not surveyed					
--Rim Crest Dr. & Blue Gum Dr., adjacent to CHSP	Not available	0/0/0[11]	Not surveyed[11]	Not surveyed					
Blue Mud Canyon	Not available	Not available	1/0/0[11]	Assessment survey					
South Coal Canyon (Santa Ana Canyon)	Not available	Not available	1/0/0[11]	1/0/0[11]					
Plunge Creek, San Bernardino	Assessment survey	Assessment survey	Assessment survey	Assessment Survey					
Santiago Pitts	Not surveyed	2/1/1	Assessment survey	Assessment Survey					
Conrock, Tustin	Not surveyed	1/0/0	0/0/0	0/0/0					
UCR	Not surveyed	1/0/0	0/0/0	Not surveyed					
Aberhill - Temescal	0/0/0	0/0/0	1/0/0[5]	Not surveyed					
Santa Ana River – Mission to Riverside Ave	Not available	Not available	2/0/0	See SAR-Van Buren to Riverside Dr.					

Table 1A: Least Bell's vireo status and distribution in the Santa Ana Watershed, 2010-2013.
Numbers of territories, pairs, and fledglings detected

SUBPOPULATION	2010	2011	2012	2013					
Colonies Crossroads Shopping Ctr Ponds, CIty				1/0/0					
Hwy 71, OCWD property				1/0/0					
Santa Ana River – AECom Flood Control Mitigation Project within SAR Norco to River Road				32/21/48(13)					
Subtotal # LBVI	662/ 452/ 614	654/ 410/ 629	610/ 381/ 495	824/ 396/ 643					
# LBVI from SAWA Assessment Sites	159/ 65/ 41	156/ 63/ 36	146/ 49/ 44	197/ 73/ 39					
Total # LBV for all sites	821/ 517/ 655	810/ 473/ 665	756/ 430/ 539	1021/ 471/ 682					
# LBV on Santa Ana River in San Bernardino County	42/ 26/ 24	42/ 23/ 30	30/ 22/ 25	Not reported					
# LBV Chino Hills State Park	(51/ 23/ 14)(6)	(42/ 17/ 7)(6)	(33/ 14/ 11)(6)	(36/ 15/ 6)(6)					
Total for Santa Ana Watershed- excl. Prado Basin	863/ 543/ 679	852/ 496/ 695	786/ 452/ 564	1021/ 471/ 682					
Prado Basin	569/ 286/ 479**(7)**	517/ 200/ 286**(7)**	**451**/ **158**/ **229(7)**	561/ 195/ 286(7)					
Total Number LBVI in Santa Ana Watershed	1432/ 829/ 1158	1369/ 696/ 981	1237/ 610/ 793	1582/ 666/ 968					

(a.) Entries correspond to numbers of territorial males/pairs/'known fledged young' for designated time and locale.
(b.) The "--" symbol indicates that no data were available.
(c.) The "+" symbol indicates that actual count may have been somewhat higher; field census efforts were started late or were otherwise deemed to be incomplete
(1) Reported by John Konecny
(2) Reported by biologists, San Bernardino County Flood Control
(3) Reported by biologists, California State Parks and Recreation
(4) Reported by Loren Hays, James Pike
(5) Reported by MSCHP biologists

(6) Chino Hills State Park surveyed as an assessment site and data are included in LBVI Assessment Totals.
(7) Data from Pike et al. 2007
(8) River surveyed from Van Buren Boulevard to Hidden Valley only, In 2003, survey area extended from Fairmount Park/Mission Boulevard to Hidden Valley.
(9) From 2000-2003 area surveyed included on south side of river from River Road to Hamner Road See Pike et al 2003 for north side surveys. Beginning in 2004, SAWA surveyed and reported both sides of river from River Rd to Norco/Hidden Valley
(10) Outside Santa Ana Watershed, not included in totals
(11) Reported by Alisa Ing, California State Parks.
(12) Reported by Dave Telford
(13) **AECOM. 2013b. 2013 Santa Ana River Flood Control Project Mitigation Plan Least Bell's Vireo 45-day Report, San Bernardino, California**

Table 1B: Least Bell's Vireo status and distribution in the Santa Ana Watershed, 2010-2013. Numbers of territories, pairs and fledglings detected. By Sub-watershed									
Santa Ana Watershed	**2010**	**2011**	**2012**	**2013**					
Santa Ana River and Tributaries									
Cajon Wash	0/0/0	0/0/0	Not surveyed	0/0/0					
Plunge Creek, Highland	1/1/0	1/0/0	1/1/1	Not surveyed					
City Creek, Highland	2/1/0	0/0/0	0/0/0	Not surveyed					
Little Sand Basin, Highland	2/0/0	3/2/1	3/2/0	Not surveyed					
Arlington Falls	Not surveyed	0/0/0	0/0/0	0/0/0					
Oak Glen Preserve	0/0/0	0/0/0	Not surveyed	Not surveyed					
San Timoteo Canyon	126/ 95/ 137	116/ 101/ 196	118/ 102/ 153	131/80/179					
Box Springs	5/2/1	2/1/0	1/1/1	Not surveyed					
Poorman Reservoir	6/1/0	4/1/1	1/1/2	2/0/0					
Quail Run	0/0/0	0/0/0	0/0/0	Not surveyed					
Sycamore Canyon	12/8/11	9/5/4	7/7/5	12/nd/nd					
March SKR Reserve	14/12/25	16/9/7	13/11/8	14/12/16					
Golden Star	0/0/0	0/0/0	0/0/0	0/0/0					
Woodcrest	0/0/0	0/0/0	0/0/0	0/0/0					
Mead Valley at Cajalco & Calif. Aqueduct	8/0/0	5/4/5	4/1/2	4/4/2					

Table 1B: Least Bell's Vireo status and distribution in the Santa Ana Watershed, 2010-2013. Numbers of territories, pairs and fledglings detected. By Sub-watershed									
Santa Ana Watershed	**2010**	**2011**	**2012**	**2013**					
Gavilan Hills	0/0/0	0/0/0	Not surveyed	0/0/0					
Menifee - Paloma Valley High School	0/0/0	Not surveyed	Not surveyed	Not surveyed					
Menifee - Huan Rd.	0/0/0	Not surveyed	Not surveyed	Not surveyed					
Steele Valley	0/0/0	Not surveyed	Not surveyed	Not surveyed					
Santa Rosa Mine Rd.	Not surveyed	Not surveyed	Not surveyed	Not surveyed					
Van Buren Blvd – Plummer Rd So.	4/3/2	3/2/3	2/1/1	Not surveyed					
Van Buren Blvd. at Bountiful	0/0/0	0/0/0	0/0/0	Not surveyed					
Van Buren Blvd @ Porter (end).	0/0/0	0/0/0	Not surveyed	Not surveyed					
Canyon Crest	0/0/0	0/0/0	Not surveyed	0/0/0					
Mockingbird Canyon	43/34/25	37/32/67	28/26/39	31/24/22					
Alessandro Arroyo	6/2/0	7/5/0	6/4/4	7/3/2					
Prenda Arroyo				4/2/0					
Conrock Basin FHQ	Not surveyed	1/0/0	0/0/0	0/0/0					
Castleview Park	0/0/0	0/0/0	0/0/0	Not surveyed					
Tequesquite Arroyo	0/0/0	0/0/0	Not surveyed	0/0/0					
Pyrite Ravine (environs of Van Buren/Limonite)	3/0/0	3/1/0	0/0/0	0/0/0					

Table 1B: Least Bell's Vireo status and distribution in the Santa Ana Watershed, 2010-2013. Numbers of territories, pairs and fledglings detected. By Sub-watershed									
Santa Ana Watershed	**2010**	**2011**	**2012**	**2013**					
SAR mainstem at Van Buren Blvd.	n/a	n/a	n/a	Not surveyed					
SAR Mainstem - Mission to Hidden Valley	68/50/58	49/23/32	41/11/7	78/--/7					
SAR Mainstem - North side at Hidden Valley	15/12/18	4/2/2	9/3/1	21/2/3					
SAR - Hidden Valley	60/43/53	55/36/41	62/37/45	75/42/66					
Hidden Valley Golf Club	3/0/0	4/0/0	6/0/0	6/3/1					
Wyle Labs at El Paso Rd.	1/1/2	1/0/0	1/1/1	1/0/0					
Norco Hills Park - mitigation area	0/0/0	0/0/0	0/0/0	0/0/0					
Promenade Ave, Norco	2/2/4	2/1/1	2/1/1	1/1/0					
Corona St./Gilmore, Norco	0/0/0	0/0/0	Not surveyed	0/0/0					
SAR Mainstem - Hidden Valley to River Rd., so. side	n/a	n/a	n/a	Not surveyed					
SAR Mainstem-Goose Creek Golf Course (Norco) to River Rd.	101/64/113	105/59/91	95/51/86	108/52/109					
Temescal Canyon	83/49/73	102/65/113	109/63/71	131/50/48					
Harrison Reservoir	1/0/0	Not surveyed	3/0/0	4/0/0					
La Sierra Ave./Lyon St.	3/0/0	3/2/3	2/1/1	4/2/3					
Cajalco Canyon	See Temescal	3/2/0	1/0/0	0/0/0					
Chino Hills - Butterfield Ranch	11/7/7	8/3/1	8/2/1	13/5/7					

Table 1B: Least Bell's Vireo status and distribution in the Santa Ana Watershed, 2010-2013. Numbers of territories, pairs and fledglings detected. By Sub-watershed									
Santa Ana Watershed	**2010**	**2011**	**2012**	**2013**					
Chino Hills - Eucalyptus at Rancho Hills	1/1/2	2/1/2	1/0/0	2/1/0					
Chino Hills - Eucalyptus at Del Monte	2/1/0	0/0/0	0/0/0	0/0/0					
Chino Hills - End of Eucalyptus (s/o Rancho Hills)	0/0/0	0/0/0	Not surveyed	Not surveyed					
Carbon Canyon Blvd. at Western Hills Golf Club	0/0/0	0/0/0	Not surveyed	Not surveyed					
Carbon Canyon Blvd at Chino Hills Pkwy.	0/0/0	0/0/0	Not surveyed	Not surveyed					
Chino Hills Community Park (Eucallyptus/Peyton)	10/4/1	9/3/1	3/1/0	7/0/0					
Bayberry Dr., Chino Hills	0/0/0	0/0/0	Not surveyed	Not surveyed					
Soquel Canyon Parkway at Pipeline	Not surveyed	2/0/0	2/1/1	3/2/0					
Carbon Canyon Regional Park & Carbon Canyon Rd.	8/6/3	13/7/5	12/7/7	16/9/1					
Clearwater Pkwy @ Glen Helen				0/0/0					
Fontana Power Plant				1/1/0					
Black Gold Golf Club, Yorba Linda	Not available	2/0/0[11]	4/0/0[11]	3/0/0[11]					
South Coal Canyon (Santa Ana Canyon)	Not available	Not available	1/0/0[11]	1/0/0[11]					
Blue Mud Canyon, Yorba Linda	Not available	Not available	1/0/0[11]	0/0/0					
San Antonio Rd (Yorba Linda)				1/0/0					

Table 1B: Least Bell's Vireo status and distribution in the Santa Ana Watershed, 2010-2013. Numbers of territories, pairs and fledglings detected. By Sub-watershed									
Santa Ana Watershed	**2010**	**2011**	**2012**	**2013**					
Sun Canyon Park	0/0/0	0/0/0	Not surveyed	0/0/0					
Wardlow Wash	0/0/0	0/0/0	Not surveyed	Not surveyed					
Fresno Canyon	1/0/0	1/1/1	0/0/0	1/1/0					
Santa Ana Canyon - Upper Canyon-Prado Dam to Green River Golf Club	11/4/6	14/5/5	10/4/6	28/14/23					
Santa Ana Canyon - Green River Golf Club	24/17/19	26/14/19	19/11/11	22/19/19					
Santa Ana Canyon - Featherly Park	40/23/22	33/19/23	36/16/12	64/45/55					
Starlight Dr. & Hidden Hills Rd., Yorba Linda	2/0/0	1/1/0	2/0/0	4/0/0					
Yorba Linda Dry Lake Bed Park	1/1/1	1/0/0	1/0/0	1/0/0					
Santa Ana River mouth - Talbert Park and environs+	Not surveyed	1/0/0	2/0/0	3/1/0					
Chino Hills State Park	51/23/14	42/17/7	33/14/11	36/15/6					
Pulte Wetlands, adjacent to Chino Hills State Park (CHSP)	Not available	2/0/0	Not Surveyed(11)	Not surveyed					
Rim Crest Dr & Blue Gum Dr, adjacent to CHSP	Not available	0/0/0	Not Surveyed(11)	Not surveyed					
SAR - Miscellaneous Sightings/Reporting									
Potrero	2/0/0[(5)]	Not surveyed	Not surveyed	Not surveyed					
SAR Mainstem at Woolly star Preserve	Not surveyed	Not surveyed	Not surveyed	Not surveyed					

Table 1B: Least Bell's Vireo status and distribution in the Santa Ana Watershed, 2010-2013. Numbers of territories, pairs and fledglings detected. By Sub-watershed									
Santa Ana Watershed	**2010**	**2011**	**2012**	**2013**					
Estelle Mountain Reserve	0/0/0[5]	1/0/0[5]	Not surveyed	Not surveyed					
Hwy 71, OCWD Property				1/0/0					
Shipley Nature Center	0/0/0[12]	0/0/0[12]	0/0/0[12]	0/0/0[12]					
Etiwanda Wildlife Preserve	1/0/0	0/0/0	Not surveyed	Not surveyed					
Mt. Baldy (Shinn Rd.)	Not surveyed	0/0/0	Not surveyed	Not surveyed					
Chino Creek Park at Inland Empire Utilities Agency	2/1/1	2/1/1	1/0/0	2/1/1					
Coyote Hills East Reserve (Fullerton)	(3/3/3)[10]	(4/0/0)[10]	(2/0/0)[10]	2/0/0[10]					
Rancho La Sierra West, Riverside	1/1/0	1/1/1	1/1/1	2/2/1					
(Chula Vista, CA)	(1/0/0)[10]	Not surveyed	Not surveyed	Not surveyed					
River View Golf Course, Santa Ana	Not surveyed	Not surveyed	Not surveyed	Not surveyed					
UCR	Not surveyed	1/0/0	0/0/0	Not surveyed					
Alberhill - Temescal	0/0/0	0/0/0	1/0/0	Not surveyed					
Santa Ana River – Mission to Riverside Ave	Not available	Not available	2/0/0	Not surveyed					
Colonies Crossroads Shopping Ctr Ponds, City				1/0/0					
Diemer Plant, Brea, CA				1/0/0[11]					
Santa Ana River – AECom Flood Control Mitigation Project within SAR Norco to River Road				32/21/48[13]					

Table 1B: Least Bell's Vireo status and distribution in the Santa Ana Watershed, 2010-2013. Numbers of territories, pairs and fledglings detected. By Sub-watershed									
Santa Ana Watershed	**2010**	**2011**	**2012**	**2013**					
San Jacinto Sub Watershed									
Kabian Park	3/3/0	3/1/0	1/0/0	3/3/0					
San Jacinto	22/18/28	41/25/18	42/36/49	53/29/39					
Lake Perris	6/4/4	10/6/3	8/4/4	14/5/1					
East of Canyon Lake	Not surveyed	Not surveyed	Not surveyed	Not surveyed					
Newport Rd/Canyon Lake (Menifee)				8/2/3					
Cottonwood Canyon	2/0/0	3/0/0	3/0/0	2/0/0					
Santiago Creek Sub Watershed									
Silverado Canyon	0/0/0	0/0/0	0/0/0	0/0/0					
Santiago Creek u/s of Irvine Lake	6/0/0	5/0/0	4/1/2	10/5/6					
Santiago Creek (unnamed tributary to Irvine Lake)	0/0/0	0/0/0	0/0/0	Not surveyed					
Limestone Canyon (including Old Haul Rd./Blue Diamond Rd.)	3/3/5	3/2/1	0/0/0	3/1/2					
Peter's Canyon	14/5/1	16/3/2	12/2/0	16/2/2					
Irvine Regional Park	24/14/18	26/9/7	29/5/5	29/8/10					
Irvine Trust Mgmt Area Irvine Company Land (across from Peter's Canyon)	1/0/0	1/0/0	1/0/0	1/0/0					
Santiago Oaks Regional Park	1/1/1	0/0/0	0/0/0	0/0/0					
Santiago Pitts	Not surveyed	2/1/1	1/0/0	1/0/0					
Santiago Creek at Cannon Rd. (includes reservoir)	1/0/0	3/0/0	0/0/0	2/2/0					

Table 1B: Least Bell's Vireo status and distribution in the Santa Ana Watershed, 2010-2013.
Numbers of territories, pairs and fledglings detected. By Sub-watershed

Santa Ana Watershed	**2010**	**2011**	**2012**	**2013**					
Santiago Creek at Chapman Ave.	0/0/0	0/0/0	0/0/0	0/0/0					
Santiago Creek at Cambridge Ave.	0/0/0	0/0/0	0/0/0	0/0/0					
SUBTOTAL	821/ 517/ 655	810/ 473/ 665	756/ 430/ 539	1021/ 471/ 682					
Santa Ana River - San Bernardino County	42/ 26/ 24(2)	42/ 23/ 30(2)	30/ 22/ 25(2)	Not reported					
TOTAL FOR SANTA ANA WATERSHED EXCLUDING PRADO BASIN	863/ 543/ 679	852/ 496/ 695	786/ 452/ 564	1021/ 471/ 682					
PRADO BASIN (Pike et al)	569/ 286/ 479	517/200/286	451/ 158/ 229	561/ 195/ 286 (7)					
TOTAL FOR SANTA ANA WATERSHED	1432/ 829/ 1158	1369/ 696/ 981	1237/ 610/ 793	1582/ 666/ 968					
Santa Marguerita Watershed - Murrieta Creek	Not surveyed	Not surveyed	Not surveyed	Not surveyed					

(a.) Entries correspond to numbers of territorial males/pairs/'known fledged young' for designated time and locale.
(b.) The "--" symbol indicates that no data were available.
(c.) The "+" symbol indicates that actual count may have been somewhat higher; field census efforts were started late or were otherwise deemed to be incomplete
(1) Reported by John Konecny
(2) Reported by biologists, San Bernardino County Flood Control
(3) Reported by biologists, California State Parks and Recreation
(4) Reported by Loren Hays, James Pike
(5) Reported by MSCHP biologists
(6) Chino Hills State Park surveyed as an assessment site and data are included in LBVI Assessment Totals.
(7) Data from Pike et al. 2007

(8) River surveyed from Van Buren Boulevard to Hidden Valley only, In 2003, survey area extended from Fairmount Park/Mission Boulevard to Hidden Valley.
(9) From 2000-2003 area surveyed included on south side of river from River Road to Hamner Road See Pike et al 2003 for north side surveys. Beginning in 2004, SAWA surveyed and reported both sides of river from River Rd to Norco/Hidden Valley
(10) Outside Santa Ana Watershed, not included in totals
(11) Reported by Alisa Ing, California State Parks.
(12) Reported by Dave Telford
(13) **AECOM. 2013b. 2013 Santa Ana River Flood Control Project Mitigation Plan Least Bell's Vireo 45-day Report, San Bernardino, California**

Table 2.1: Least Bell's Vireo, Survey Dates and Breeding Chronology, 2013

	Survey Start Date	Survey End Date	First Arrival Date	50% Arrived	50% Paired	Date Last Detected
Santa Ana River and Tributaries						
San Timoteo Canyon	3/18/13	9/4/13	3/20/13	4/2/13	4/24/13	9/4/13
Sycamore Canyon						
March SKR Reserve	3/20/13	8/5/13	3/25/13	4/5/13	5/17/13	8/5/13
Mockingbird Canyon	3/15/13	8/13/13	3/19/13	4/19/13	4/19/13	8/13/13
SAR mainstem: Riverside Dr. to U/S Hidden Valley	4/2/13	6/26/13	4/2/13	5/1/13	No data	6/26/13
SAR mainstem: Hidden Valley Wildlife Preserve						
Hidden Valley (area monitored since 2000, south side of river)	3/18/13	7/30/13	3/1913	3/29/13 (n=57)	4/10/13 (n=19)	8/12/13
North side of river in Hidden Valley Wildlife Preserve	4/2/13	6/26/13				
SAR mainstem: Norco: Goose Creek Golf Course to River Rd.	3/18/13	8/1/13	3/19/13	4/1/13	5/8/13	7/31/13
Temescal Canyon	3/19/13	9/16/13	3/19/13	4/12/13 (n=50)	5/22/13 (n=19)	8/26/13
Chino Hills (Butterfield Ranch environs)	3/27/13	7/30/13	3/27/13	4/5/13	4/23/13	7/31/13
Santa Ana River - Upper Canyon, Santa Ana Canyon	3/26/13	9/10/13	3/25/13	4/4/13	4/12/13	9/10/13
Santa Ana River - Green River Golf Course, Santa Ana Canyon	3/20/13	9/10/13	3/20/13	4/2/13	4/10/13	9/10/13
Santa Ana River - Featherly Park, Santa Ana Canyon	3/15/13	9/9/13	3/19/13	4/15/13	4/29/13	9/9/13
San Jacinto River Sub Watershed						
San Jacinto River & Wildlife Refuge	3/21/13	7/31/13	3/21/13	4/11/13	4/25/13	7/31/13

Table 2.2. Least Bell's Vireo, Survey Dates and Breeding Chronology

	50% Paired	First nest found	Last nest found	First Fledge Date	Last Fledge Date
Santa Ana River and Tributaries					
San Timoteo Canyon	5/17/13	4/4/13	6/18/13	5/4/13	7/14/13
Sycamore Canyon					
March SKR Reserve	5/17/13	No data	No data	No data	No data
Mockingbird Canyon	4/19/13	4/3/13	7/2/13	5/13/13	7/17/13
SAR mainstem (Mission Blvd. To Van Buren Blvd.)	5/1/13	No data	No data	No data	No data
SAR mainstem: Hidden Valley Wildlife Preserve					
Hidden Valley (area monitored since 2000, south side of river)	4/10/13 (n=19)	4/24/13	6/7/13	5/11/13	6/9/13
North side of river in Hidden Valley Wildlife Preserve					
SAR mainstem - Norco - Goose Creek Golf Course to River Rd.	5/8/13	4/1/13	6/11/13	5/2/13	7/4/13
Temescal Canyon	5/22/13 (n=19)	4/12/13	6/4/13	6/26/13	6/26/13
Chino Hills (Butterfield Ranch environs)	4/23/13	4/23/13	No data	5/30/13	No data
Santa Ana River - Upper Canyon, Santa Ana Canyon	4/12/13	4/4/13	5/30/13	4/27/13	5/26/13
Santa Ana River - Green River Golf Course, Santa Ana Canyon	4/10/13	4/2/13	6/21/13	5/4/13	No Data
Santa Ana River - Featherly Park, Santa Ana Canyon	4/29/13	3/29/13	6/18/13	5/8/13	7/2/13
San Jacinto River Sub Watershed					
San Jacinto River & Wildlife Refuge	4/25/13	4/8/13	5/22/13	5/7/13	6/17/13

Table 3: Least Bell's Vireo status and management and Brown-headed Cowbird management data, at closely monitored sites in the Santa Ana River Watershed, California, 2013.

As of 2006, page 1 of this table lists only those sites closely monitored; see Tables 1A & 1B for complete listings.

	Parameter	San Jacinto	San Timoteo	March SKR Preserve (ARB)	Sycamore Canyon	Mockingbird Canyon**	SAR-Riverside Ave to Hidden Valley	Hidden Valley (so side of SAR)	Hidden Valley (no side of SAR)	SAR- -Norco (River Rd to Hidden Valley)	Temescal Canyon	Santa Ana Canyon			Chino Hills (Butterfield Ranch environs)	**Total**
												Upper Canyon*	Green River Golf Club	Featherly Reg. Park		
A.	Number of territorial males	53	131	14	12	31	78	75	21	108	131	28	22	64	13	769
B.	Number of known pairs (breeding and non-breeding)	29	80	12		24	Unk	42	2	52	50	14	19	45	5	374
C.	Number of fledged young observed	39	179	16		40	7	66	3	109	48	23	19	55	7	611
D.	Projected total recruitment of vireo young (a)	38	288	n/a		79	n/a	109	n/a	177	0	42	0	77	20	830
E.	Average number of fledglings per pair (C/B)	1.3	2.2	n/a		1.7	n/a	1.6	n/a	2.1	1.0	1.6	1.0	1.2	1.4	1.6
F.	Projected number of fledglings per pair (D/B)	1.3	3.6	n/a		3.3	n/a	2.6	n/a	3.4	n/a	3.0	n/a	1.7	4.0	2.2
G.	Rate of missing eggs/chicks from nests (successful &unsuccessful	69% (9/13)	38% (29/76)	n/a		47% (8/17)	n/a	25% (2/8)	n/a	21% (6/29)	n/a	40% (2/5)	50% (2/4)	50% (7/14)	0% (0/1)	39% (65/167)
H.	Rate of cowbird nest parasitism	0% (0/13)	3% (2/76)	n/a	n/a	18% (3/17)	n/a	0% (0/8)	n/a	2/29	0	0/5	0/4	0/4	0/1	7/167
I.	Numbers of cowbirds removed from study area	1085	164	15	n/a	123	21	8	n/a	23	380	114			12	1945
K.	Number of trap days (1 operative trap in the field for one day = 1 trap day)	1065	1198	250	n/a	772	540	361	n/a	270	1246	521			132	6355

Table 3: Least Bell's Vireo status and management and Brown-headed Cowbird management data, at closely monitored sites in the Santa Ana River Watershed, California, 2013.

As of 2006, page 1 of this table lists only those sites closely monitored; see Tables 1A & 1B for complete listings.

	Parameter	San Jacinto	San Timoteo	March SKR Preserve (ARB)	Sycamore Canyon	Mockingbird Canyon**	SAR-Riverside Ave to Hidden Valley	Hidden Valley (so side of SAR)	Hidden Valley (no side of SAR)	SAR- -Norco (River Rd to Hidden Valley)	Temescal Canyon	Santa Ana Canyon			Chino Hills (Butterfield Ranch environs)	**Total**
												Upper Canyon*	Green River Golf Club	Featherly Reg. Park		
L.	Average number of cowbirds trapped per trap day (I/K)	1.0	0.1	0.1	n/a	0.2	.04	0.02	n/a	0.1	0.3	0.2			0.1	0.3
M.	Number of field hours – LBV (+)	154	752	59	n/a	389	149	305	26	256	420	73	107	216	36	2942
N.	Number of field hours – BHCO (+)	525	450	76	n/a	323	230	136	n/a	135	544	377			83	2879

[a] the number of young per well-monitored pairs x number of pairs: Table 5 (G x A)

n/d= no data (+) see text for total field hours for the vireo management program

* Includes horse stable traps at Green River Road and Hwy 91. **Harrison BHCO included in Mockingbird.

Table 4: Least Bell's Vireo nest placement preferences, monitored sites in the Santa Ana River Watershed, 2013

Host Plant Species	San Jacinto	San Timoteo	March SKR Preserve	Sycamore Canyon	Mockingbird Canyon	SAR-Riverside Ave to Hidden Valley	Hidden Valley (so side of SAR)	Hidden Valley (no side of SAR)	SAR- -Norco (River Rd to Hidden Valley)	Temescal Canyon	Santa Ana Canyon			Chino Hills	Total
											Upper Canyon	Green River Golf Course	Featherly Regional Park		
Black Willow *(Salix gooddingii)*		4			1		2			1			3		11
Arroyo Willow *(Salix lasiolepis)*		16			4		2		11	1	1				35
Red Willow *(Salix laevigata)*		17			2		2		2						23
Narrow-leaf Willow (*Salix exigua)*	9	2					1					1			13
Yellow Willow *(Salix lucida spp. lasiandra)*		2													2
Fremont Cottonwood *(Populus fremontii)*		3							1		1		2		7
Black Cottonwood *(Populus trichocarpa)*													1		1
Mulefat *(Baccharis salicifolia)*		26			4		3		10	1	3	1	3		51
Elderberry *(Sambucus mexicana)*		3			6						1	2	2		14
Wild Grape *(Vitis girdiana)*		2							5						7
Peruvian Pepper *(Schinus molle*)															
Black mustard *(Brassica nigra)*		1													1
Black Walnut *(Juglans californica)*									1				3		4
Tamarisk *(Tamarix ramosissima)*															
False Indigo (*Amorpha fruticosa*)															

Table 4: Least Bell's Vireo nest placement preferences, monitored sites in the Santa Ana River Watershed, 2013

Host Plant Species	San Jacinto	San Timoteo	March SKR Preserve	Sycamore Canyon	Mockingbird Canyon	SAR-Riverside Ave to Hidden Valley	Hidden Valley (so side of SAR)	Hidden Valley (no side of SAR)	SAR- -Norco (River Rd to Hidden Valley)	Temescal Canyon	Santa Ana Canyon			Chino Hills	Total
											Upper Canyon	Green River Golf Course	Featherly Regional Park		
Poison Oak (*Toxocodendron diversilobum*)													4		4
Thick-leaved Yerba Santa (*Eriodictyon crassifolium*)													1		1
Fiddleneck (*Amsinckia* sp.)													1		1
Golden Currant *(Ribes aureum)*		2													2
Fourwing Saltbush *(Atriplex canescens)*					1										1
Deadfall															
Dead Arroyo Willow															
Dead Willow sp. (*Salix sp.*)															
Dead Fremont Cottonwood (*Populus fremontii*)									1						1
Dead Narrow-leaf Willow *(Salix exigua)*	1														1
Brazilian Pepper Tree (*Schinus terebinthifolius*)															
Sugarbush (*Rhus ovata*)															
Coyote Bush (*Baccharis pilularis*)															
Mugwort (*Artemisia douglasiana*)		1													1
Sycamore (*Platanus racemosa*)															
Basketbush (*Rhus trilobata*)															

Table 4: Least Bell's Vireo nest placement preferences, monitored sites in the Santa Ana River Watershed, 2013

Host Plant Species	San Jacinto	San Timoteo	March SKR Preserve	Sycamore Canyon	Mockingbird Canyon	SAR-Riverside Ave to Hidden Valley	Hidden Valley (so side of SAR)	Hidden Valley (no side of SAR)	SAR- -Norco (River Rd to Hidden Valley)	Temescal Canyon	Santa Ana Canyon			Chino Hills	Total
											Upper Canyon	Green River Golf Course	Featherly Regional Park		
Holly-leafed Cherry (*Prunus ilicifolia*)															
Orange Tree (*Rutaceae citrus sinensis*)															
Blue Plumbago (*Plumbago auriculata*)												1			1
Toyon *(Heteromeles arbutifolia)*		1													1
Coast Live Oak *(Quercus agrifolia)*														1	1
Laural Sumac *(Malosma laurina)*													3		3
Mulefat (*B. salicifolia*) and Wild Grape (*V. girdiana*)															
Mulefat (*B. salicifolia*) and Castor Bean (*R. communis*)															
Pepperweed (*Lepidium latifolium*)															
Brittlebush (*Encelia farinosa*)															
California Blackberry (*Rubus ursinus*)															
Arrowweed (*Pluchea sericea*)					1										1
Mulefat (*B.salicifolia*) and Coyote Bush *(B.pilularis)*					1										1
Mulefat (*B. salicifolia*) and Poison Hemlock (*C.maculatum*)															
Unknown	3														3

Table 4: Least Bell's Vireo nest placement preferences, monitored sites in the Santa Ana River Watershed, 2013

Host Plant Species	San Jacinto	San Timoteo	March SKR Preserve	Sycamore Canyon	Mockingbird Canyon	SAR-Riverside Ave to Hidden Valley	Hidden Valley (so side of SAR)	Hidden Valley (no side of SAR)	SAR- -Norco (River Rd to Hidden Valley)	Temescal Canyon	Santa Ana Canyon			Chino Hills	Total
											Upper Canyon	Green River Golf Course	Featherly Regional Park		
Total	13	80			20		10		31	3	6	5	23	1	192

Table 5: Least Bell's Vireo reproductive success and breeding biology data, monitored sites in the Santa Ana River Watershed, 2013

		San Jacinto	San Timoteo	March SKR Preserve	Sycamore Canyon	Mockingbird Canyon	SAR-Riverside Ave to Hidden Valley	Hidden Valley (so side of SAR)	Hidden Valley (no side of SAR)	SAR- -Norco (River Rd to Hidden Valley)	Temescal	Santa Ana Canyon			Chino Hills-Butterfield Ranch environs	**Total**
												Upper Canyon	Green River Golf Club	Featherly Reg. Park		
A.	Number of known pairs	29	80	12	n/a	24	n/a	42	2	52	50	14	19	45	5	374
B.	Number of breeding (nesting) pairs	28	67	9	n/a	22	n/a	36	2	50	42	12	15	37	4	324
C.	Number of breeding pairs that were well-monitored throughout the breeding season	6	35	0	n/a	6	0	8	0	20	0	4	2	10	1	92
D.	Number of 'known fledged young' OBSERVED	39	179	16	n/a	40	7	66	3	109	48	23	19	55	7	611
E.	Number of known fledged young produced by pairs monitored throughout the breeding season	8	127	n/a	n/a	20	n/a	21	n/a	68	0	12	0	17	4	277
F.	Average number of fledglings produced per breeding pair (minimum; D/B = 'productivity or breeding success')	1.4	2.7	1.8	n/a	1.8	n/a	1.8	1.5	2.2	1.1	1.9	1.3	1.5	1.8	1.9
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)	1.3	3.6	n/a	n/a	3.3	n/a	2.6	n/a	3.4	n/a	3.0	0.0	1.7	4.0	3.0
H.	Number of nests that were discovered	17	80	0	0	20	0	10	0	31	3	6	5	23	1	196
I.	Number of nests that were regularly monitored or 'tracked'	13	76	n/a	n/a	17	0	8	0	29	0	5	4	14	1	167

Table 5: Least Bell's Vireo reproductive success and breeding biology data, monitored sites in the Santa Ana River Watershed, 2013

		San Jacinto	San Timoteo	March SKR Preserve	Sycamore Canyon	Mockingbird Canyon	SAR-Riverside Ave to Hidden Valley	Hidden Valley (so side of SAR)	Hidden Valley (no side of SAR)	SAR- -Norco (River Rd to Hidden Valley)	Temescal	Santa Ana Canyon			Chino Hills-Butterfield Ranch environs	**Total**
												Upper Canyon	Green River Golf Club	Featherly Reg. Park		
J.	Number of 'tracked' nests that were successful l (% = J/I x 100)	38% (5/13)	57% (43/76)	n/a	n/a	59% (10/17)	n/a	88% (7/8)	n/a	83% (24/29)	n/a	80% (4/5)	25% (1/4)	50% (7/14)	100 % (1/1)	61% (102/167)
K.	Rate of missing eggs/ chicks from nests (successful and unsuccessful) (%=K/I x100) (b)	69% (9/13)	36% (27/76)	n/a	n/a	47% (8/17)	n/a	25% (2/8)	n/a	21% (6/29)	n/a	40% (2/5)	50% (2/4)	50% (7/14)	0% (0/1)	38% (63/167)
L.	Number of 'tracked' nests that were parasitized by cowbirds (%=L/I x 100)	0% (0/13)	3% (2/76)	n/a	n/a	18% (3/17)	n/a	0% (0/8)	n/a	7% (2/29)	n/a	0% (0/5)	0% (0/4)	0% (0/14)	0% (0/1)	4% (7/167)
M.	A. Number of 'tracked' nests that failed as a result of reproductive failure	8% (1/13)	5% (4/76)	n/a	b/a	6% (1/17)	n/a	0% (0/8)	n/a	3% (1/29)	n/a	0% (0/5)	25% (1/4)	7% (1/14)	0% (0/1)	5% (9/167)
	B. Number of 'tracked" nests that failed as a result of parasitism	0% (0/13)	0% (0/76)	n/a	b/a	0% (0/13)	n/a	0% (0/8)	n/a	0% (0/29)	n/a	0% (0/5)	0% (0/4)	0% (0/14)	0% (0/1)	0% (0/167)
	C. Number of 'tracked' nests that failed as a result of predation-Predation Rate per to Vireo Working Group	54% (7/13)	36% (27/76)	n/a	n/a	35% (6/17)	n/a	13% (1/8)	n/a	14% (4/29)	n/a	20% (1/5)	50% (2/4)	43% (6/14)	0% (0/1)	32% (54/167)
	D. Number of 'tracked' nests that failed for unknown reasons	0% (0/13)	3% (2/76)	n/a	n/a	n/a	n/a	0	n/a	0% (0/29)	n/a	0% (0/5)	0% (0/4)	0% (0/14)	0% (0/1)	1% (2/167)
	Average clutch size	3.5	3.4	n/a	n/a	2.9	n/a	3.3	n/a	3.7	3.7	3.5	3.0	3.4	4.0	3.4
N	Number of eggs/Number of clutches	38/11	239/70	n/a	n/a	40/14	n/a	20/6	n/a	106/29	11/3	14/4	12/4	57/17	4/1	541/159

Table 5: Least Bell's Vireo reproductive success and breeding biology data, monitored sites in the Santa Ana River Watershed, 2013

		San Jacinto	San Timoteo	March SKR Preserve	Sycamore Canyon	Mockingbird Canyon	SAR-Riverside Ave to Hidden Valley	Hidden Valley (so side of SAR)	Hidden Valley (no side of SAR)	SAR- -Norco (River Rd to Hidden Valley)	Temescal	Santa Ana Canyon			Chino Hills-Butterfield Ranch environs	**Total**
												Upper Canyon	Green River Golf Club	Featherly Reg. Park		
O.	Number of cowbird eggs found in or near vireo nests	0	2	n/a	n/a	3	n/a	0	n/a	2	0	0	0	0	0	7
P.	Number of cowbird nestlings removed from 'tracked' nests	0	0	n/a	n/a	0	n/a	0	n/a	0	0	0	0	0	0	0
Q.	Number of cowbird young fledged by vireos	2	0	n/a	n/a	0	n/a	0	n/a	0	0	0	0	0	0	2
R.	Number of 'manipulated' parasitized nests	0	2	n/a	n/a	2	n/a	0	n/a	2	0	0	0	0	0	6
S.	Number of 'successful, manipulated' nests (%=S/R x100)	n/a	50% (1/2)	n/a	n/a	100% (2/2)	n/a	n/a	n/a	100% (2/2)	n/a	n/a	n/a	n/a	n/a	83% (5/6)
T.	Number of vireos fledged from "manipulated' parasitized nests	n/a	1	n/a	n/a	5	n/a	n/a	n/a	5	n/a	n/a	n/a	n/a	n/a	11
U.	Number of repaired nests	0	1	n/a	n/a	0	n/a	0	n/a	0	0	0	0	0	0	1
V.	% successful repaired nests	n/a	100% (1/1)	n/a	n/a	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	100% (1/1)
W.	Number of vireos fledged from repaired nests	n/a	4	n/a	n/a	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	4

(a) Survival rate of fledglings in well-tracked nests was applied to nests not visited as frequently by the function (ave. # fledglings produced by well-tracked pair x total number of pairs. These data represent minimum recruitment as defined by the Least Bell's Working Group "known fledged young." (b) includes successful and unsuccessful nest

Table 6: Brown Headed Cowbird Trapping Results, March-August 2013

Monitored Site	Trap/Location	2013 Dates of Operation	Number of Trap Days	Cowbirds Removed				Daily Removed Averages	
				Total	Male	Female	Juveniles	Adults	All
San Jacinto									
	Scott Bros.	3/18-8/4	135	81	40	21	20	0.5	0.6
	R&J-Tuls 1	3/18-8/4	135	123	79	31	13	0.8	0.9
	R&J- Tuls 2	3/18-8/4	135	76	38	30	8	0.5	0.6
	Alessandro Ponds	3/26-7/28	120	15	3	9	3	0.1	0.1
	CB#2	3/18-8/4	135	199	160	28	11	1.4	1.5
	Vanderwoude	3/18-8/4	135	221	133	49	39	1.3	1.6
	Vanderwoude 2	3/18-8/4	135	263	181	62	20	1.8	1.9
	Oostdam	3/18-8/4	135	107	67	28	12	0.7	0.8
Subtotal			**1065**	**1085**	**701**	**258**	**126**	**0.9**	**1.0**
San Timoteo									
	I-18	3/18-7/30	133	-2	1	-3	0	0.0	0.0
	Bees	4/5-7/30	117	9	5	4	0	0.1	0.1
	English	3/18-7/30	133	1	1	0	0	0.0	0.0
	Headlee	3/18-8/2	136	58	28	26	4	0.4	0.4
	ESR	3/18-8/1	136	3	1	2	0	0.0	0.0
	State Parks	3/18-8/1	136	17	6	8	3	0.1	0.1
	Fisherman's	3/19-8/1	135	10	3	4	3	0.1	0.1
	Younglove #1	3/19-8/2	136	27	12	13	2	0.2	0.2
	Younglove #3	3/19-8/2	136	41	18	20	3	0.3	0.3
Subtotal			**1198**	**164**	**75**	**74**	**15**	**0.1**	**0.1**
SKR Preserve	March SKR 1	3/23-7-31	125	3	3	0	0	0.0	0.0
	March SKR 2	3/23-7-31	125	12	6	3	3	0.1	0.1
Subtotal			**250**	**15**	**9**	**3**	**3**	**0.1**	**0.1**

Table 6: Brown Headed Cowbird Trapping Results, March-August 2013

Monitored Site	Trap/Location	2013 Dates of Operation	Number of Trap Days	Cowbirds Removed				Daily Removed Averages	
				Total	Male	Female	Juveniles	Adults	All
Mockingbird Canyon									
	Reservoir	3/18-8/2	132	84	34	35	15	0.5	0.6
	Fabozzi	3/23-8/1	126	12	5	7	0	0.1	0.1
	MBC Estates	3/18-8/2	132	11	4	7	0	0.1	0.1
	Ungerer	3/18-8/1	131	8	5	3	0	0.1	0.1
	Markham	3/23-8/1	126	7	2	4	1	0.0	0.1
	Harrison	3/23-7/31	125	1		1	0	0.0	0.0
Subtotal			**772**	**123**	**50**	**57**	**16**	**0.1**	**0.2**
Santa Ana River--	Jurupa Park	3/18-8/1	136	9	6	2	1	0.1	0.1
Jurupa Park to	Riverdale	3/18-8/1	136	7	4	3	0	0.1	0.1
Hidden Valley	Acorn 1	3/19-8/2	134	1	1	0	0	0.0	0.0
	Acorn 2	3/19-8/2	134	4	2	1	1	0.00	0.0
Subtotal			**540**	**21**	**13**	**6**	**2**	**0.0**	**0.0**
Hidden Valley									
	Bluff	3/18-8/1	136	3	1	1	1	0.0	0.0
	Phantom	3/18-6/16	90	-2	1	-3	0	0.0	0.0
	West Side	3/19-8/1	135	7	3	4	0	0.1	0.1
Subtotal			**361**	**8**	**5**	**2**	**1**	**0.0**	**0.0**
Santa Ana River – Norco	GooseCreek 1	3/19-8/2	135	12	4	5	3	0.1	0.1
	GooseCreek 2	3/19-8/2	135	11	3	8	0	0.1	0.1
Subtotal			**270**	**23**	**7**	**13**	**3**	**0.1**	**0.1**

Table 6: Brown Headed Cowbird Trapping Results, March-August 2013

Monitored Site	Trap/Location	2013 Dates of Operation	Number of Trap Days	Cowbirds Removed				Daily Removed Averages	
				Total	Male	Female	Juveniles	Adults	All
Temescal									
	3M AG	3/20-8/1	132	3	1	2	0	0.0	0.0
	WRF3	3/21-5/23	63	10	7	3	0	0.2	0.2
	Lee Lake	3/21-8/1	131	23	11	11	1	0.2	0.2
	New Sump	3/21-8/1	131	9	4	5	0	0.1	0.1
	Rockery	3/20-8/2	133	23	8	15	0	0.2	0.2
	Baker St.	3/21-8/1	131	27	13	14	0	0.2	0.2
	Marina	3/20-8/2	133	5	2	2	1	0.0	0.0
	Dejong's Dairy	3/18-8/2	135	262	149	101	12	1.9	1.9
	Railroad Cyn	3/21-8/2	132	1	0	1	0	0.0	0.0
	Menifee #1	3/28-8/2	125	17	10	5	2	0.1	0.1
Subtotal			**1246**	**380**	**205**	**159**	**16**	**0.3**	**0.3**
Santa Ana Canyon									
	Green River EQ Full	3/19-7/31	133	32	20	11	1	0.2	0.2
	Yorba Reg. Park #1	3/21-7/29	129	35	23	9	3	0.2	0.3
	Featherly Park RV#1	3/21-7/30	129	13	9	4	0	0.1	0.1
	G. C. Maintenance	3/21-7/30	130	34	19	14	1	0.3	0.3
	CH Water-tank	3/19-7/30	132	12	8	4	0	0.1	0.1
Subtotal			**653**	**126**	**79**	**42**	**5**	**0.2**	**0.2**
GRAND TOTALS			**6355**	**1945**	**1144**	**614**	**187**	**0.3**	**0.3**

Table 7: Non-target Avian Captures in Brown-headed Cowbird Traps, March-August 2013

2013 Non-Target Species		San Jacinto		San Timoteo		March SKR Preserve		Mockingbird Canyon		SAR-Jurupa to Hidden Valley		Hidden Valley		Santa Ana River-Norco		Temescal		Santa Ana Canyon		2013 Total	
Common Name	**Scientific Name**	**caught**	**died**	**caught**	**died**	**caught**	**died**	**caught**	**died**	**caught**	**died**	**caught**	**died**	**caught**	**died**	**caught**	**died**	**caught**	**died**	**caught**	**died**
California Towhee	*Melozone crissalis*	32		682	3	12	2	254	2	40		2		16		12		294	4	**1344**	**11**
European Starling	*Sturnus vulgaris*	1186	1	7				1								61		14		**1269**	**1**
Red-winged Blackbird	*Agelaius phoeniceus*	27		401	1	18		9		1		1				150	2	2		**609**	**3**
House Finch	*Carpodacus mexicanus*	23		6		2		22		4		4		17		350	6	14		**442**	**6**
House Sparrow	*Passer domesticus*	315	2	4		1		3		95		4				8		2		**432**	**2**
Song Sparrow	*Melospiza melodia*			2								1				74				**77**	**0**
Brewer's Blackbird	*Euphagus cyanocephalus*	40														1				**41**	**0**
Lark Sparrow	*Chondestes grammacus*	4		20		7						1				3				**35**	**0**
Yellow-headed Blackbird	*Xanthocephalus xanthocephalus*	7		1						1						15				**24**	**0**
Northern Mockingbird	*Mimus polyglottos*			1		1		3						1		10	1	5		**21**	**1**
Dark-eyed Junco	*Junco hyemalis*																	15		**15**	**0**
House Wren	*Troglodytes aedon*			1								2		1		6	1			**10**	**1**
Blue Grosbeak	*Passerina caerulea*					9														**9**	**0**
Tri-colored Blackbird	*Agelaius tricolor*	3		4																**7**	**0**
Bullocks's Oriole	*Icterus bullockii*							5	1											**5**	**1**
Eurasian Collared-Dove	*Streptopelia decaocto*	4																		**4**	**0**
Bewick's Wren	*Thryomanes bewickii*									1		1	1					2	2	**4**	**3**
Black-headed Grosbeak	*Pheucticus melanocephalus*			1														3		**4**	**0**
Hooded Oriole	*Icterus cucullatus*							1		1								2		**4**	**0**
Spotted Towhee	*Pipilo maculatus*			1												2				**3**	**0**
Lovebird	*Agapornis sp.*																	2		**2**	**0**
Cooper's Hawk	*Accipiter cooperii*															1				**1**	**0**
American Kestrel	*Falco sparverius*															1				**1**	**0**
Mourning Dove	*Zenaida macroura*					1														**1**	**0**
Say's Phoebe	*Sayornis saya*													1						**1**	**0**
California Thrasher	*Toxostoma redivivum*																	1		**1**	**0**
Phainopepla	*Phainopepla nitens*									1										**1**	**0**
Yellow-rumped Warbler	*Setophaga coronata*							1												**1**	**0**
White-crowned Sparrow	*Zonotrichia leucophrys*																	1		**1**	**0**
Budgerigar	*Melopsittacus undulatus*																	1		**1**	**0**
TOTALS		**1641**	**3**	**1131**	**4**	**51**	**2**	**299**	**3**	**144**	**0**	**16**	**1**	**36**	**0**	**694**	**10**	**358**	**6**	**4370**	**29**
#/trap day		1.5		0.9		0.2		0.4		0.3		0.0		0.1		0.6		0.5		**0.7**	
Mortality %			0.2%		0.4%		3.9%		1.0%		0.0%		6.3%		0		1.4%		1.7%		**0.7%**
# BHCO removed/ trap day		1.0		0.1		0.1		0.2		0.0		0.0		0.1		0.3		0.2		**0.3**	

** Number of dead cowbirds included in number caught

Table 8: Brown-headed Cowbird Trapping Results, Winter 2012-2013

Monitored Site	Trap/Location	Winter 2012-2013 Dates of Operation	Number of Trap Days	Cowbirds Removed				Daily Removed Averages	
				Total	Male	Female	Juveniles	Adults	All
San Jacinto									
	Scott Bros.	8/6/12-3/17/13	213	670	155	175	340	1.5	3.1
	R&J-Tuls 1	8/6/12-3/17/13	213	317	137	150	30	1.3	1.5
	R&J- Tuls 2	8/6/12-3/17/13	213	386	225	153	8	1.8	1.8
	CBJ#1	8/6/12-11/30/13	115	44	18	21	5	0.3	0.4
	CBJ#2	8/6/12-3/17/13	213	274	110	138	26	1.2	1.3
	Vanderwoude	8/6/12-3/17/13	213	1159	288	338	533	2.9	5.4
	Vanderwoude 2	11/30/12-3/17/13	99	424	220	204	0	4.3	4.3
	Oostdam	8/6/12-3/17/13	213	164	21	81	62	0.5	0.8
Subtotal			**1492**	**3438**	**1174**	**1260**	**1004**	**1.6**	**2.3**
Temescal									
	Dejong's Dairy	8/6/12-3/15/13	176	898	294	295	309	3.3	5.1
GRAND TOTAL			**1668**	**4336**	**1468**	**1555**	**1313**	**1.8**	**2.6**

Table 9: Non-target Avian Captures in Brown-headed Cowbird Traps, Winter 2012-2013

2012-2013 Winter Non-Target Species		San Jacinto		Temescal		Winter 2012-2013 Total	
Common Name	**Scientific Name**	**caught**	**died**	**caught**	**died**	**caught**	**died**
European Starling	*Sturnus vulgaris*	184	1	152		**336**	**1**
House Finch	*Carpodacus mexicanus*	175	4	1		**176**	**4**
House Sparrow	*Passer domesticus*	132	3	21		**153**	**3**
Red-winged Blackbird	*Agelaius phoeniceus*	78		98		**176**	
Brewer's Blackbird	*Euphagus cyanocephalus*	8				**8**	
Savannah Sparrow	*Passerculus sandwichensis*	4	1			**4**	**1**
Barn Owl	*Tyto alba*	3				**3**	
Yellow-headed Blackbird	*Xanthocephalus xanthocephalus*	2		6		**8**	
Black Phoebe	*Sayornis nigricans*	1				**1**	
Northern Mockingbird	*Sayornis nigricans*	1				**1**	
Lark Sparrow	*Chondestes grammacus*	1				**1**	
TOTALS		**589**	**9**	**278**	**0**	**867**	**9**
#/trap day		0.4		1.6		**0.5**	
Mortality %			1.5%		0.0%		**1.0%**
# BHCO removed/ trap day		2.3		5.1			

Table 10: Results of the Least Bell's Vireo Assessment Surveys in the Santa Ana Watershed, 2006-2013								
Site	**# LBVI Territories**							
	2006	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
Alessandro Arroyo**	See Table 1	3	5	4	6	7	6	7
Arlington Falls	-	-	-	-	-	0	0	0
Box Springs	2	2	1	3	5	2	1	-
Cajalco Creek	1	1	See Temescal	See Temescal	See Temescal	3	1	0
Cajon Wash	0	0	0	0	0	0	-	0
Canyon Crest	0	-	-	-	0	0	-	0
Carbon Canyon (Chino Hills Pkwy)	0	1	0	0	0	0	-	-
Carbon Canyon (Western Hills Golf Club)	0	0	0	1	0	0	-	-
Carbon Canyon Regional Park	5	7	5	3	8	13	12	16
Castleview Park	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	-	-
Chino Hills (Eucalyptus/Del Monte)	1	1	0	1	2	0	0	0
Chino Hills (Eucalyptus/Rancho Hills)	0	1	1	1	1	2	1	2
Chino Hills (Soquel Canyon/Pipeline)	-	-	-	-	-	2	2	3
Chino Hills Community Park	-	-	5	8	10	9	3	7
Chino Hills State Park - Bane Canyon	-	5	5	6	7	5	5	11
Chino Hills State Park – Easy Street Trail	-	-	-	-	-	-	-	0
Chino Hills State Park - Lower Aliso Creek	-	10	12	13	24	16	11	11
Chino Hills State Park - Telegraph Canyon	-	2	6	10	10	9	9	8
Chino Hills State Park - Upper Aliso Creek	-	7	8	6	10	12	8	6
City Creek (Highland)	-	-	-	-	2	0	0	-
Clearwater Pkwy @ Glen Helen	-	-	-	-	-	-	-	0
Conrock Basin FHQ	-	-	-	-	-	1	0	0
Corona St. @ Gilmore	0	0	0	0	0	0	-	0

Table 10: Results of the Least Bell's Vireo Assessment Surveys in the Santa Ana Watershed, 2006-2013								
Site	**# LBVI Territories**							
	2006	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
Fontana Power Plant	-	-	-	-	-	-	--	1
Fresno Canyon	4	2	1	0	1	1	0	1
Gavilan Hills	0	0	0	0	0	0	-	0
Goldenstar	0	0	0	1	0	0	0	0
Harrison Reservoir	See Temescal	See Temescal	See Temescal	See Temescal	See Temescal	See Temescal	3	4
Hidden Valley Golf Club	-	-	-	-	3	4	6	6
La Sierra/Lyon St.	-	1	2	2	3	3	2	4
Little Sand Basin (Highland)	-	-	-	-	2	3	3	-
Mead Valley (Cajalco/Aqueduct)	2	5	6	5	8	5	4	4
Menifee - Huan Rd.	0	0	0	-	0	-	-	-
Menifee - Paloma HS	0	0	0	-	0	-	-	-
Motte-Rimrock Preserve	-	0	-	-	-	-	-	-
Norco Hills Park Mitigation area	0	0	0	0	0	0	0	0
Oak Glen Preserve	0	0	0	0	0	0	-	-
Plunge Creek (Highland)	-	-	-	-	1	1	1	-
Poorman Reservoir	1	1	1	2	6	4	1	2
Porter Road (end)	0	0	0	0	0	0	-	-
Prenda Arroyo**	-	-	-	-	-	-	-	4
Promenade	0	0	0	3	2	2	2	1
Pyrite Channel	-	-	1	1	3	3	0	0
Quail Run	0	0	0	0	0	0	0	-
Riverwalk Park	-	-	-	-	-	-	7	-
Santa Rosa Mine Rd.	0	0	0	0	-	-	-	-
SAR (north side of Hidden Valley)	3	6	1	6	-	-	-	-
Starlight Dr (Yorba Linda)	0	0	0	-	2	1	2	4

Table 10: Results of the Least Bell's Vireo Assessment Surveys in the Santa Ana Watershed, 2006-2013								
Site	**# LBVI Territories**							
	2006	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
Steele Valley	0	0	0	0	0	-	-	-
Sun Canyon Park	0	0	0	0	0	0	-	0
Talbert Park	-	-	-	-	-	-	-	3
Tequesquite Arroyo	0	0	0	0	0	0	-	0
Van Buren Blvd. (Bountiful)	0	0	0	1	0	0	0	-
Van Buren Blvd. (Plummer Rd-south)	2	2	3	3	4	3	2	-
Wardlow Wash	0	1	0	0	0	0	-	-
Woodcrest	0	0	0	0	0	0	0	0
Wyle Labs (El Paso only)	1	1	0	1	1	1	1	1
Yorba Linda – Mud Canyon	-	-	-	-	-	-	-	0
Yorba Linda – San Antonio Rd.	-	-	-	-	-	-	-	1
Yorba Park Dry Lake Bed	-	-	0	1	1	1	1	1
San Jacinto River Sub-Watershed								
Cottonwood Canyon	0	0	0	0	2	3	3	2
East of Canyon Lake	-	-	-	-	-	-	-	-
Kabian Park	4	4	3	4	3	3	1	3
Lake Perris	1	3	2	4	6	10	8	14
Menifee – Newport Rd/Canyon Lake	-	-	-	-	-	-	1*	8
Santiago Creek Sub-Watershed								
Irvine Regional Park	See Table 1	14	19	29	See tables 1A&1B	See tables 1A&1B	29	29
Irvine Trust Management Area	-	-	-	1	1	1	1	1
Limestone Canyon (includes Old Haul Rd./Blue Diamond Rd.)	See Table 1	2	2	2	3	3	0	3
Peter's Canyon	4	5	5	8	14	16	12	16
Santiago Canyon Rd (unnamed trib to Irvine Lake	-	0	0	0	0	0	0	-

Table 10: Results of the Least Bell's Vireo Assessment Surveys in the Santa Ana Watershed, 2006-2013								
Site	**# LBVI Territories**							
	2006	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
Santiago Creek (u/s of Irvine Lake)	-	0	4	4	6	5	4	10
Santiago Creek at Cambridge Ave., City of Orange	1	0	0	0	0	0	-	0
Santiago Creek at Cannon Rd (including Smith Basin) ***	3	4	2	3	1	3	0	2
Santiago Creek at Chapman & Hwy 55, City of Orange	-	0	0	0	0	0	0	0
Santiago Oaks Regional Park (SORP)	0	0	0	0	1	0	0	0
Santiago Pitts	-	-	-	-	-	2	1	1
Silverado Canyon	0	0	0	0	0	0	0	0
S. Marguerita Watershed - Murrieta Creek	-	1	3	-	-	-	-	-
Total number least Bell's vireos detected during Assessment Surveys	**35**	**93**	**103**	**139**	**159**	**156**	**153**	**197**

*Reported by PCR consultants
**Split Alessandro Arroyo and Prenda Arroyo into two separate sites
*** Smith Basin formerly called OCWD Reservoir

Table 11: Results of the Least Bell's Vireo Assessment Surveys in the Santa Ana Watershed, 2006-2013

Surveyor	Site Santa Ana River & Tributaries	SURVEY 1 4/15/13-4/19/13			SURVEY 2 5/13/13-5/17/13			SURVEY 3 6/17/13-6/21/13			TOTAL # VIREOS			# Visits	# Hours	Cowb-birds Detected	Traps on site?
		Terr	Pairs	Juv.	Terr.	Pairs	Juv.	Terr.	Pairs	Juv.	Terr.	Pairs	Juv.				
CM	Alessandro Arroyo	4	1	0	4	1	0	5	1	2	7	3	2	3	15.75	Y	N
AB	Arlington Falls	0	0	0	0	0	0	0	0	0	0	0	0	3	7.5	N	N
CM / MA	Cajalco Creek	0	0	0	0	0	0	0	0	0	0	0	0	3	4.75	N	N
AB / JC	Cajon Wash	0	0	0	0	0	0	0	0	0	0	0	0	3	7.25	Y	N
HA	Canyon Crest	0	0	0	0	0	0	0	0	0	0	0	0	3	6	N	N
JC	Carbon Canyon Regional Park	14	7	0	12	7	0	8	6	1	16	9	1	3	17	Y	N
TR	Chino Hills (Eucalyptus/Del Monte)	0	0	0	0	0	0	0	0	0	0	0	0	3	2.5	N	N
TR	Chino Hills (Eucalyptus/Rancho Hills)	2	0	0	2	1	0	2	0	0	2	1	0	3	6	N	N
TR	Chino Hills (Soquel Canyon/Pipeline)	2	1	0	3	2	0	2	1	0	3	2	0	3	4.25	N	N
TR	Chino Hills Community Park (Eucaluptus/Peyton)	3	0	0	6	0	0	7	0	0	7	0	0	3	14	N	N
TB / CM / DW	Chino Hills State Park - Bane Canyon*	3	0	0	5	0	0	11	4	4	11	4	4	2	3.5	Y	N
TR	Chino Hills State Park - Easy Street Trail	0	0	0	0	0	0	0	0	0	0	0	0	3	4.75	N	N
MA / AB	Chino Hills State Park - Lower Aliso Creek	6	1	0	11	3	1	7	4	0	11	7	1	3	19.5	N	Y*
TB / CM	Chino Hills State Park - Telegraph Canyon	3	1	0	7	1	0	8	1	1	8	1	1	3	16.5	Y	N
TB / CM	Chino Hills State Park - Upper Aliso Creek	4	2	0	6	3	0	6	3	0	6	3	0	3	13	Y	Y
AB	Clearwater Pkwy @ Glen Helen	0	0	0	0	0	0	0	0	0	0	0	0	3	5.5	Y	N
DM	Conrock Basin FHQ	0	0	0	0	0	0	0	0	0	0	0	0	3	1	Y	N
HA	Corona Ave @ Gilmore	0	0	0	0	0	0	0	0	0	0	0	0	3	2	Y	N
JC	Fontana Power Plant	1	1	0	1	1	0	1	1	0	1	1	0	3	3.75	N	N
CM / MP	Fresno Canyon	0	0	0	1	1	0	1	1	0	1	1	0	3	8	N	N
NH	Gavilan Hills	0	0	0	0	0	0	0	0	0	0	0	0	3	4.25	N	N
NH	Goldenstar	0	0	0	0	0	0	0	0	0	0	0	0	3	2.25	N	N
SH / MP	Harrison Reservoir	2	0	0	2	0	0	3	0	0	4	0	0	3	17	N	Y
TR / SH / MA	Hidden Valley Golf Club	3	0	0	3	3	1	4	0	0	6	3	1	3	24	Y	N
HA	La Sierra/Lyon St.	2	0	0	4	1	0	2	2	3	4	2	3	3	7.75	Y	N
JL / AH / CMcg	Mead Valley (Cajalco/Aqueduct)	4	1	0	3	1	0	4	4	2	4	4	2	3	45	N	N
HA	Norco Hills Park-mitigation area	0	0	0	0	0	0	0	0	0	0	0	0	3	1.75	N	N

Table 11: Results of the Least Bell's Vireo Assessment Surveys in the Santa Ana Watershed, 2006-2013

Surveyor	Site Santa Ana River & Tributaries	SURVEY 1 4/15/13-4/19/13			SURVEY 2 5/13/13-5/17/13			SURVEY 3 6/17/13-6/21/13			TOTAL # VIREOS			# Visits	# Hours	Cowb-birds Detected	Traps on site?
		Terr	Pairs	Juv.	Terr.	Pairs	Juv.	Terr.	Pairs	Juv.	Terr.	Pairs	Juv.				
NH	Poorman Reservoir	0	0	0	2	0	0	0	0	0	2	0	0	3	4	Y	N
DZ	Prenda Arroyo	3	0	0	2	2	0	3	0	0	4	2	0	3	12.5	Y	N
HA	Promenade	1	0	0	1	1	0	0	0	0	1	1	0	3	3.75	N	N
JL / AH / CMcg	Pyrite Channel	0	0	0	0	0	0	0	0	0	0	0	0	3	33	N	N
SH	Starlight Dr. (Yorba Linda)	3	0	0	2	0	0	3	0	0	4	0	0	3	7	N	N
HA	Sun Canyon Park	0	0	0	0	0	0	0	0	0	0	0	0	3	2.5	N	N
SH	Talbert Park	1	0	0	3	1	0	2	0	0	3	1	0	3	7	N	N
HA	Tequesquite Arroyo	0	0	0	0	0	0	0	0	0	0	0	0	3	3	N	N
NH	Woodcrest	0	0	0	0	0	0	0	0	0	0	0	0	3	1.75	N	N
HA	Wyle Labs (El Paso only)	1	0	0	1	0	0	0	0	0	1	0	0	3	1.75	N	N
TR	Yorba Linda - Mud Canyon	0	0	0	0	0	0	0	0	0	0	0	0	3	6	N	N
TR	Yorba Linda - San Antonio Rd.	----	----	----	1	0	0	1	0	0	1	0	0	2	2	N	N
SH	Yorba Park Dry Lake Bed	1	0	0	0	0	0	0	0	0	1	0	0	3	8.75	N	N
San Jacinto River Sub-Watershed																	
CM	Cottonwood Canyon	2	0	0	1	0	0	1	0	0	2	0	0	3	6.5	N	N
MA / BJ	Kabian Park	1	1	0	3	2	0	2	0	0	3	3	0	3	29	Y	N
AB / JC	Lake Perris	12	2	0	10	3	0	12	4	1	14	5	1	3	22	Y	Y
CM / MA	Menifee -Newport Rd/Canyon Lake	4	0	0	7	2	3	7	0	0	8	2	3	3	5.75	N	Y
Santiago Creek Sub-Watershed																	
MA / BJ	Irvine Trust Management Area	1	0	0	1	0	0	1	0	0	1	0	0	3	1.25	N	NEARBY
TB	Limestone Canyon (includes Old Haul Rd./Blue Diamond Rd.)	3	0	0	3	0	0	3	1	2	3	1	2	3	12	Y	Y
MA / BJ	Peter's Canyon	10	1	0	7	0	0	10	1	2	16	2	2	3	22	N	Y
TB / MP	Santiago Canyon (Irvine Park)	23	7	0	29	7	0	29	8	10	29	8	10	3	45	Y	N
TB	Santiago Creek (u/s of Irvine Lake)	10	2	0	10	2	0	10	5	6	10	5	6	3	17.5	Y	N
DM	Santiago Creek (Cambridge Rd)	0	0	0	0	0	0	0	0	0	0	0	0	3	1.25	N	N
SH / DM	Santiago Creek (Cannon, INCL Smith Basin)	0	0	0	2	1	0	1	0	0	2	2	0	3	13.5	N	N

Table 11: Results of the Least Bell's Vireo Assessment Surveys in the Santa Ana Watershed, 2006-2013

		SURVEY 1 4/15/13-4/19/13			SURVEY 2 5/13/13-5/17/13			SURVEY 3 6/17/13-6/21/13			TOTAL # VIREOS						
Surveyor	**Site Santa Ana River & Tributaries**	Terr	Pairs	Juv.	Terr.	Pairs	Juv.	Terr.	Pairs	Juv.	Terr.	Pairs	Juv.	# Visits	# Hours	Cowb-birds Detected	Traps on site?
DM	Santiago Creek (Chapman Ave)	0	0	0	0	0	0	0	0	0	0	0	0	3	2.75	N	N
JC	Santiago Oaks Regional Park (SORP)	0	0	0	0	0	0	0	0	0	0	0	0	3	4.75	N	N
DM	Santiago Pitts	0	0	0	1	0	0	1	0	0	1	0	0	3	3.75	N	N
TB	Silverado Canyon	0	0	0	0	0	0	0	0	0	0	0	0	3	3	Y	Y
# Vireos Detected in Santa Ana Watershed		**129**	**28**	**0**	**156**	**46**	**5**	**157**	**47**	**34**	**197**	**73**	**39**	**163**	**547.5**	**0**	**0**
*Visit 3 data collected by Debbie Waldecker of CA State Parks																	
NH / MP	Control - Hidden Valley	7	0	0				----	----	----				2			
NH / MP	Control - Featherley Park				4	2	2	----	----	----				2			

Table 12: Observations of Sensitive Species by Location, 2013

Table 12 2013		San Jacinto		San Timoteo		Mockingbird		March		SAR-Riverside	
Common Name	**Scientific Name**	**# territory**	**# indiv.**	**# territory**	**# indiv.**	**# territory**	**# indiv.**	**# territory**	**# indiv.**	**# territory**	**# indiv.**
Avian											
Double-crested Cormorant	*Phalacrocorax auritus*										
Black-crowned Night-heron	*Nycticorax nycticorax*		17								
White-tailed Kite	*Elanus leucurus*										
Northern Harrier	*Circus cyaneus*		4								
Bald Eagle	*Haliaeetus leucocephalus*		1								
Golden Eagle	*Aquila chrysaetos*		4								
Black Skimmer	*Rynchops niger*										
Cooper's Hawk	*Accipiter cooperii*			2		3	3				
Swainson's Hawk	*Buteo swainsoni*				1						
Red-tailed Hawk	*Buteo jamaicensis*	1				1					
Ferruginous Hawk	*Buteo regalis*		5								
Merlin	*Falco columbarius*		1		1						
Prairie Falcon	*Falco mexicanus*		3								
Peregrine Falcon	*Falco peregrinus*		3		1						
Red-crowned Parrot	*Amazona viridigenalis*										
Burrowing Owl	*Athene cunicularia*										
Downy Woodpecker	*Picoides pubescens*			2	1	1					
Loggerhead Shrike	*Lanius ludovicianus*	6	4								
Horned Lark	*Eremophila alpestris*		5			5					
Tree Swallow	*Tachycineta bicolor*										
Coastal Cactus Wren	*Campylorhynchus brunneicapillus*										
California Gnatcatcher	*Polioptila californica*										
Yellow Warbler	*Setophaga petechia*	38		79		10		7			
Wilson's Warbler	*Cardellina pusilla*				2						
Yellow-breasted Chat	*Icteria virens*	2		8							
Rufous-crowned Sparrow	*Aimophila ruficeps canescens*										
Grasshopper Sparrow	Ammodramus savannarum										
Tri-colored Blackbird	*Agelaius tricolor*	1 colony	50 +								
Lawrence's Goldfinch	*Carduelis lawrencei*	1									
Reptiles											
Granite Spiny Lizard	*Sceloporus orcutti*						numerous				
Orangethroat Whiptail	*Aspidoscelis hyperythra*						1				
Coastal Western Whiptail	*Aspidoscelis tigris*						1				
Coast Horned Lizard	*Phrynosoma coronatum*		2								
Coast Range Newt	*Taricha torosa*										
Western Pond Turtle	*Actinemys marmorata*										1
Mammal											
Black-tailed Jackrabbit	*Lepus californicus bennettii*						9		5		
Long-tailed Weasel	*Mustela frenata*										
American Badger	*Taxidea taxus*		2								
Bobcat	*Lynx rufus*		1		2		1				
Fish											
Santa Ana Sucker	*Catostornus santaanae*										394
Arroyo Chub	*Gila arcuttii*										835

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 resourece agencies and those that are covered by the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP).
*Totals are minimum number of individuals and territories

Table 12: Observations of Sensitive Species by Location, 2013

Table 12 2013		Hidden Valley- No. side		SAR-Riverside Ave. to VB		SAR-Hidden Valley-So. Side		SAR-HV to River Rd.		Temescal	
Common Name	**Scientific Name**	**# territory**	**# indiv.**	**# territory**	**# indiv.**	**# territory**	**# indiv.**	**# territory**	**# indiv.**	**# territory**	**# indiv.**
Avian											
Double-crested Cormorant	*Phalacrocorax auritus*										
Black-crowned Night-heron	*Nycticorax nycticorax*										
White-tailed Kite	*Elanus leucurus*						1				
Northern Harrier	*Circus cyaneus*										
Bald Eagle	*Haliaeetus leucocephalus*										1
Golden Eagle	*Aquila chrysaetos*										1
Black Skimmer	*Rynchops niger*										
Cooper's Hawk	*Accipiter cooperii*	1	4	1	2		1	5			
Swainson's Hawk	*Buteo swainsoni*										
Red-tailed Hawk	*Buteo jamaicensis*					1					
Ferruginous Hawk	*Buteo regalis*										
Merlin	*Falco columbarius*										
Prairie Falcon	*Falco mexicanus*										
Peregrine Falcon	*Falco peregrinus*										
Red-crowned Parrot	*Amazona viridigenalis*										
Burrowing Owl	*Athene cunicularia*										
Downy Woodpecker	*Picoides pubescens*		3		4	4		5			
Loggerhead Shrike	*Lanius ludovicianus*										
Horned Lark	*Eremophila alpestris*										
Tree Swallow	*Tachycineta bicolor*		5		10						
Coastal Cactus Wren	*Campylorhynchus brunneicapillus*										
California Gnatcatcher	*Polioptila californica*										
Yellow Warbler	*Setophaga petechia*	7		15		167		59		81	
Wilson's Warbler	*Cardellina pusilla*										
Yellow-breasted Chat	*Icteria virens*	1		13		49		22		4	
Rufous-crowned Sparrow	*Aimophila ruficeps canescens*									1	
Grasshopper Sparrow	Ammodramus savannarum										
Tri-colored Blackbird	*Agelaius tricolor*										
Lawrence's Goldfinch	*Carduelis lawrencei*										
Reptiles											
Granite Spiny Lizard	*Sceloporus orcutti*										
Orangethroat Whiptail	*Aspidoscelis hyperythra*										1
Coastal Western Whiptail	*Aspidoscelis tigris*										
Coast Horned Lizard	*Phrynosoma coronatum*										
Coast Range Newt	*Taricha torosa*										
Western Pond Turtle	*Actinemys marmorata*										
Mammal											
Black-tailed Jackrabbit	*Lepus californicus bennettii*										
Long-tailed Weasel	*Mustela frenata*						1		3		
American Badger	*Taxidea taxus*										
Bobcat	*Lynx rufus*						1		1		
Fish											
Santa Ana Sucker	*Catostornus santaanae*										
Arroyo Chub	*Gila arcuttii*										

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 ot concern by the resourece agencies and those that are covered by the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP).
*Totals are minimum number of individuals and territories

Table 12: Observations of Sensitive Species by Location, 2013

Table 12 2013		SAC-Upper Cyn.		SAC-Green River		SAC-Featherly Park		Santa Rosa Plateau		Chino Hills	
Common Name	**Scientific Name**	**# territory**	**# indiv.**	**# territory**	**# indiv.**	**# territory**	**# indiv.**	**# territory**	**#indiv.**	**# territory**	**#indiv.**
Avian											
Double-crested Cormorant	*Phalacrocorax auritus*										
Black-crowned Night-heron	*Nycticorax nycticorax*										
White-tailed Kite	*Elanus leucurus*			1		1					
Northern Harrier	*Circus cyaneus*										
Bald Eagle	*Haliaeetus leucocephalus*										
Golden Eagle	*Aquila chrysaetos*										
Black Skimmer	*Rynchops niger*										
Cooper's Hawk	*Accipiter cooperii*										
Swainson's Hawk	*Buteo swainsoni*										
Red-tailed Hawk	*Buteo jamaicensis*					1	4				
Ferruginous Hawk	*Buteo regalis*										
Merlin	*Falco columbarius*										
Prairie Falcon	*Falco mexicanus*										
Peregrine Falcon	*Falco peregrinus*										
Red-crowned Parrot	*Amazona viridigenalis*										
Burrowing Owl	*Athene cunicularia*										
Downy Woodpecker	*Picoides pubescens*			1		1					
Loggerhead Shrike	*Lanius ludovicianus*										
Horned Lark	*Eremophila alpestris*										
Tree Swallow	*Tachycineta bicolor*	1				5					
Coastal Cactus Wren	*Campylorhynchus brunneicapillus*										
California Gnatcatcher	*Polioptila californica*					1					
Yellow Warbler	*Setophaga petechia*	7		16		42				3	
Wilson's Warbler	*Cardellina pusilla*				1						
Yellow-breasted Chat	*Icteria virens*	4		7		12					
Rufous-crowned Sparrow	*Aimophila ruficeps canescens*										
Grasshopper Sparrow	Ammodramus savannarum										
Tri-colored Blackbird	*Agelaius tricolor*										
Lawrence's Goldfinch	*Carduelis lawrencei*										
Reptiles											
Granite Spiny Lizard	*Sceloporus orcutti*										
Orangethroat Whiptail	*Aspidoscelis hyperythra*										
Coastal Western Whiptail	*Aspidoscelis tigris*										
Coast Horned Lizard	*Phrynosoma coronatum*										
Coast Range Newt	*Taricha torosa*								3		
Western Pond Turtle	*Actinemys marmorata*										
Mammal											
Black-tailed Jackrabbit	*Lepus californicus bennettii*										
Long-tailed Weasel	*Mustela frenata*										
American Badger	*Taxidea taxus*										
Bobcat	*Lynx rufus*										
Fish											
Santa Ana Sucker	*Catostornus santaanae*										
Arroyo Chub	*Gila arcuttii*										

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 resourece agencies and those that are covered by the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP).
*Totals are minimum number of individuals and territories

Table 12: Observations of Sensitive Species by Location, 2013

Table 12 2013		Chino Creek Park		Highway 71		Other*		Totals*	
Common Name	**Scientific Name**	**# territory**	**# indiv.**	**# territory**	**# indiv.**	**# territory**	**# indiv.**	**# territory**	**# indiv.**
Avian									
Double-crested Cormorant	*Phalacrocorax auritus*						192	**0**	**192**
Black-crowned Night-heron	*Nycticorax nycticorax*							**0**	**17**
White-tailed Kite	*Elanus leucurus*							**2**	**1**
Northern Harrier	*Circus cyaneus*							**0**	**4**
Bald Eagle	*Haliaeetus leucocephalus*							**0**	**2**
Golden Eagle	*Aquila chrysaetos*							**0**	**5**
Black Skimmer	*Rynchops niger*						50	**0**	**50**
Cooper's Hawk	*Accipiter cooperii*					3		**15**	**10**
Swainson's Hawk	*Buteo swainsoni*							**0**	**1**
Red-tailed Hawk	*Buteo jamaicensis*							**4**	**4**
Ferruginous Hawk	*Buteo regalis*							**0**	**5**
Merlin	*Falco columbarius*							**0**	**2**
Prairie Falcon	*Falco mexicanus*							**0**	**3**
Peregrine Falcon	*Falco peregrinus*							**0**	**4**
Red-crowned Parrot	*Amazona viridigenalis*						12	**0**	**12**
Burrowing Owl	*Athene cunicularia*					1		**1**	**0**
Downy Woodpecker	*Picoides pubescens*					8		**22**	**8**
Loggerhead Shrike	*Lanius ludovicianus*						2	**6**	**6**
Horned Lark	*Eremophila alpestris*							**5**	**5**
Tree Swallow	*Tachycineta bicolor*	18						**24**	**15**
Coastal Cactus Wren	*Campylorhynchus brunneicapillus*					4		**4**	**0**
California Gnatcatcher	*Polioptila californica*			5		11	6	**17**	**6**
Yellow Warbler	*Setophaga petechia*					168		**699**	**0**
Wilson's Warbler	*Cardellina pusilla*				1			**0**	**4**
Yellow-breasted Chat	*Icteria virens*					43		**165**	**0**
Rufous-crowned Sparrow	*Aimophila ruficeps canescens*			2		2		**5**	**0**
Grasshopper Sparrow	Ammodramus savannarum			4		1		**5**	**0**
Tri-colored Blackbird	*Agelaius tricolor*							**1 colony**	**50+**
Lawrence's Goldfinch	*Carduelis lawrencei*							**1**	**0**
Reptiles									
Granite Spiny Lizard	*Sceloporus orcutti*						8	**0**	**8**
Orangethroat Whiptail	*Aspidoscelis hyperythra*							**0**	**2**
Coastal Western Whiptail	*Aspidoscelis tigris*						1	**0**	**2**
Coast Horned Lizard	*Phrynosoma coronatum*							**0**	**2**
Coast Range Newt	*Taricha torosa*							**0**	**3**
Western Pond Turtle	*Actinemys marmorata*							**0**	**1**
Mammal									
Black-tailed Jackrabbit	*Lepus californicus bennettii*							**0**	**14**
Long-tailed Weasel	*Mustela frenata*						1	**0**	**5**
American Badger	*Taxidea taxus*							**0**	**2**
Bobcat	*Lynx rufus*							**0**	**6**
Fish									
Santa Ana Sucker	*Catostornus santaanae*							**0**	**394**
Arroyo Chub	*Gila arcuttii*							**0**	**835**

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 resourece agencies and those that are covered by the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP).
*Totals are minimum number of individuals and territories

APPENDIX A: GPS POINTS ALL SURVEYED SITES

APPENDIX A – SURVEY SITES, STARTING AND ENDING COORDINATES

(All coordinates – NAD83 (Zone 11S) except where noted otherwise)

Monitored Locations

Survey Site	Starting Coordinates	Ending Coordinates
Chino Hills (Butterfield Ranch)	438975, 3754612	435680, 3757858
March SKR Preserve	474060, 3749808	470485, 3752133
Mockingbird Canyon	461212, 3750319	469427, 3746409
San Jacinto	506079, 3738423	488063, 3745450
Santa Ana Canyon (SAC):		
-Upper Canyon	440677, 3749724	438736, 3749743
-Green River Golf Club	438736, 3749743	436675, 3748403
-Featherly Park	436613, 3748409	430885, 3748343
Santa Ana River (SAR):		
-Riverside Dr. to Hidden Valley	466416, 3765008	455523, 3757886
-Hidden Valley, north side of river	456941, 3758360	451564, 3758587
-Hidden Valley, south side of river	455523, 3757886	451482, 3757751
- Hidden Valley to River Rd.	448474, 3756090	444626, 3754049
-Talbert Park (Orange County)	411746, 3722974	411911, 3723740
San Timoteo:		
-Riverside County	484684, 3762635	500355, 3753595
-San Bernardino County	481616, 3764980	484684, 3762635
Sycamore Canyon	470287, 3756422	473519, 3753591
Temescal Canyon	471486, 3720612	450724, 3746925

Assessment Locations

Survey Site	Starting Coordinates	Ending Coordinates
Santa Ana River & Tributaries:		
Alessandro Arroyo	465058, 3754499	470462, 3751445
Arlington Falls	453856, 3748925	454753, 3748301
Box Springs*	472400, 3756419	471898, 3757199
Cajalco Creek	453805, 3742988	453767, 3743230
Cajon Wash	457350, 3795730	457285, 3791752
Canyon Crest	468569, 3757034	468569, 3757034
Carbon Canyon (Chino Hills Pkwy)*	431484, 3760317	430579, 3758914
Carbon Canyon (Western Hills Golf Club)*	429466, 3758320	429755, 3758496
Carbon Canyon Regional Park	425027, 3753806	425041, 3753777
Castleview Park*	468185, 3754936	468206, 3754970
Chino Hills (Bayberry Dr.)*	432335, 3758297	431780, 3758507

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	430710, 3761812
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)*	483528, 3777209	482595, 3777631
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	464626, 3751480	464853, 3751466
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*	478169, 3779701	478365, 3779815
Mead Valley (Cajalco/aqueduct)	471770, 3744691	469770, 3743963
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*	486209, 3774394	487048, 3775342
Poorman Reservoir	476434, 3758610	477243, 3757320
Porter Road (end)*	467009, 3749689	466170, 3745974
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
Starlight Dr. (Yorba Linda)	431134, 3749819	430989, 3750218
Steele Valley*	471322, 3736485	471266, 3735608
Sun Canyon Park	454614, 3749211	454788, 3749119
Tequesquite Arroyo	467671, 3756303	467760, 3756586
Van Buren Blvd. (Bountiful)*	469933, 3750024	469693, 3750007
Van Buren Blvd. (Plummer Rd-So.)*	471776, 3749514	473308, 3749439

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 Park Dry Lake Bed	424530, 3748301	424909, 3749091
San Jacinto River Sub-watershed:		
Cottonwood Canyon	475633, 3725415	477503, 3724023
Kabian Park	475841, 3730880	476070, 3732369
Lake Perris	483092, 3744484	485461, 3748329
Menifee (Salt Creek)	478306, 3726496	479550, 3727243
Santiago Creek Sub-watershed:		
Irvine Trust Management Area	429845, 3738585	429845, 3738585
Limestone Canyon	434012, 3736548	434913, 3735769
Peter's Canyon	429752, 3738563	428604, 3735584
Santiago Canyon (Irvine Park)	440662, 3755052	429119, 3741253
Santiago Canyon Rd*	434949, 3735740	431995, 3736775
Santiago Creek (above Irvine Lake)	437201, 3736263	435405, 3737556
Santiago Creek (Cambridge Road)	421793, 3737067	421619, 3737952
Santiago Creek (Cannon Road, incl. Smith Basin)	425540, 3741436	428079, 3742770
Santiago Creek (Chapman Ave.)	423116, 3738554	423740, 3739316
Santiago Oaks Regional Park	428069, 3742690	429133, 3742111
Santiago Basin	425344, 3740796	424678, 3740612
Silverado Canyon	437692, 3734768	438878, 3734047

Miscellaneous Locations

Survey Site	Starting Coordinates	Ending Coordinates
Chino Creek Wetlands	437620, 3758246	437395, 3758840
Colonies Crossroads Shopping Center Ponds	440853, 3776828	441146, 3776720
East Coyote Hills Preserve*	415417, 3750601	417337, 3751214
Etiwanda Preserve*	451769, 3780654	451186, 3787544
Highway 71	439523, 3753366	440002, 3751971
Mount Baldy (Shinn Rd)*	437794, 3781816	437765, 3782398
Murrieta Creek*	476609, 3716171	476299, 3715809
Rancho La Sierra West*	453521, 3757910	453547, 3757077
Santa Ana River (Market St to Mission St)**	464716, 3762626	463659, 3761240
University of California, Riverside*	470131, 3759262	470131, 3759262

*Denotes sites that were not surveyed this year.
**Site falls within the 2013 Monitored site SAR - Riverside Dr. to Hidden Valley

APPENDIX B: WATERSHED ANNUAL RESULTS 2010-2013

Table B-1: Least Bell's Vireo status and management and Brown-headed Cowbird management data, at closely monitored sites in the Santa Ana River Watershed, California, 2000-2013. (See Tables 1A and 1B for total abundance.)

	Parameter	2000-2009	2010	2011	2012	2013			Total
A.	Number of territorial males	n/a	654	641	599	769			n/a
B.	Number of pairs (breeding and non-breeding)	1,737	450	407	380	374			3,348
C.	Number of fledged young observed	3,203	613	626	494	611			5,547
D.	Projected total recruitment of vireo young (a)	4,584	1,065	1,080	982	830			8,541
E.	Average number of fledglings per pair (C/B)	1.8	1.4	1.5	1.3	1.6			1.7
F.	Projected number of fledglings per pair (D/B)	1.4	2.8	2.7	2.6	2.2			2.6
G.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests)	39% (467/1185)	43% (60/138)	40% (82/204)	39% (48/123)	39% (65/167)			40% (722/1817)
H.	Rate of cowbird nest parasitism	17% (204/1185)	5% (7/138)	2% (5/204)	4.9% (6/123)	7/167			13% (229/1817)
I.	Numbers of cowbirds removed from study area	18,590	3,093	2,444	2,823	1945			28,895
K.	Number of trap days (1 operative trap in the field for one day = 1 trap day)	41,691	6,992	6,333	5,190	6355			66,561
L.	Average number of cowbirds trapped per trap day (I/K)	0.45	0.44	0.39	0.54	0.3			0.43
M.	Number of field hours – LBV (+)		2,589	2,738	2,364	2942			
N.	Number of field hours – BHCO (+)	39,014	3,239	3,281	2,838	2879			61,884

(a) Survival rate of fledglings in well-tracked nests was applied to nests not visited as frequently by the function (average # fledglings produced by well-tracked pair x total number of pairs. Projected fledglings statistics in bold were calculated using observed fledglings/pr due to low number of well-tracked pairs.

Table B-2. Least Bell's Vireo nest placement preferences, monitored sites in the Santa Ana River watershed, 2000-2013.								
Host Plant Species	**2000-2009**	**2010**	**2011**	**2012**	**2013**			**Total**
Black Willow *(Salix gooddingii)*	224	12	20	10	11			277
Arroyo Willow *(Salix lasiolepis)*	291	27	39	31	35			423
Red Willow *(Salix laevigata)*	118	22	39	19	23			221
Narrow-leafed Willow *(Salix exigua)*	56	3	12	11	13			95
Yellow Willow *(Salix lucida spp. lasiandra)*	8	1	2		2			13
Willow species (*Salix spp.*)	6							6
Fremont Cottonwood *(Populus fremontii)*	49	6	12	6	7			80
Mulefat *(Baccharis salicifolia)*	418	66	56	29	51			620
Elderberry *(Sambucus mexicana)*	67	12	17	11	14			121
Black Walnut *(Juglans californica)*	5	2			4			11
Stinging Nettle (*Urtica dioica*)	1							1
Mugwort (*Artemisia douglasiana*)	18		1	1	1			21
Toyon (*Heteromeles arbutifolia*)	17		1	1	1			20
Poison Hemlock (*Conium maculatum*)	10							10
Wild Grape *(Vitis girdana)*	38	8	17	4	7			74
Wild Rose (*Rosa californica*)	5							5
Cockleburr (*Xanthium strumarium*)	2							2
Myoporum (*Myoporum luteum*)	1							1
Laurel Sumac (*Malosma laurina*)	6				3			9
Black mustard (*Brassica nigra*)	8	1		1	1			11
Peruvian Pepper Tree (*Schinus molle*)	5	3	1	1				10

Table B-2. Least Bell's Vireo nest placement preferences, monitored sites in the Santa Ana River watershed, 2000-2013.								
Host Plant Species	**2000-2009**	**2010**	**2011**	**2012**	**2013**			**Total**
Golden Current (*Ribes aureum*)	1				2			3
Yellowspine Thistle (*Cirsium ochrocentrum*)	2							2
Coast Live Oak (*Quercus agrifolia*)	1				1			2
Giant Reed (*Arundo donax*)	1							1
Milk Thistle (*Sylybum marianum*)	1							1
Arroweed (*Pluchea sp.*)	1			1	1			3
California Sagebrush (*Artemisia californica*)	1							1
Scrub Oak (*Quercus spp.*)	4							4
Poison Oak (*Toxicodendron diversilobum*)	9				4			13
Ash (*Fraxinus sp.*)	1							1
Coyote Bush (*Baccharis pilularis*)	5		2					7
Broom Baccharis (*Baccharis sarothroides*)	1							1
Black Willow (dead) (*Salix goodingii*)	1							1
Tamarisk (*Tamarix ramosissima*)	3	1	1	3				8
Willow species/Pepperweed (*Salix sp./Lepidium latifolium*)	1							1
Blackberry/Willow sp. (*Rubus ursinus/Salix sp.*)	1							1
Sycamore (*Plantanus racemosa*)	2		1					3
Pepperweed (*Lepidium latifolium*)	4			1				5
Four-winged Saltbrush (*Atriplex candescens*)	1				1			2
Castor bean (*Rincus communis*)	1							1

Table B-2. Least Bell's Vireo nest placement preferences, monitored sites in the Santa Ana River watershed, 2000-2013.

Host Plant Species	2000-2009	2010	2011	2012	2013			Total
Pepperweed (*L.latifolium*) and Black Willow (*S. goodingii*)	1							1
Common Sunflower (*Helianthus annus*)	1							1
Black Willow (*S. goodingii*) and Grape (*Vi. girdiana*)	1							1
Mulefat (*B. salicifolia)* and Black Mustard *(B. nigra*)	1							1
Black Willow (*S. goodingii)* and Poison Hemlock (*C. maculatum*)	1							1
Mulefat (*B. salicifolia) and* Wild Grape *(V. girdiana*)	2			1				3
Red Willow (*S. lasiolepsis*) and Wild Grape *(V. girdiana*)	1							1
Emory Baccharis (*Baccharis emoryii*)	3							3
Wild Celery (*Apium graveolens*)	1							1
Fig (*Ficus sp*)	1							1
White Alder (*Alnusrhombifolia*)	1							1
Box Elder (*Acer megundo*)	1							1
Red Willow (*S. lasiolepsis*) and dead Stinging Nettle *(U. dioica*)	1							1
Red Willow (*S. lasiolepsis*) and Fresh Water Reed (species)	1							1
Rose (*R. californicus*) and Wild Grape (*V. girdiana*)	1							1
Red Willow *(S. Lasiolepsis*) and Fennel (*F. vulgare*)	1							1
Orange Tree (*Citrus sinesnsi*)	1		1	1				3
Elderbery (*S. mexicanus*) and Wild Grape (*V. girdiana*)	1							1
Wax Leaf Pivet (*Ligustrum sp.*)	1							1

Table B-2. Least Bell's Vireo nest placement preferences, monitored sites in the Santa Ana River watershed, 2000-2013.								
Host Plant Species	**2000-2009**	**2010**	**2011**	**2012**	**2013**			**Total**
Dead Black Willow (*S. goodingii*) and Nettle (*U. dioica*)	1							1
Arroyo Willow (*S. lasiolepsis*) and Black Mustard (*B. nigra*)	1							1
Dead Black Willow (*S. goodingii*) covered with living Black Willow	1							1
Deadfall	2	1	1					4
Dead *Salix sp.*	2			1				3
Dead *L. latifolium*	1							1
Dead *B. salicifolia*	5							5
Dead *S. lasiolepsis*	0	1						1
Dead *P. fremontii*					1			1
Dead *S. exigua*					1			1
Sugarbush (*Rhus ovata)*	0	1	1					2
False Indigo (*Amorpha futicosa*)	0	1						1
Basketbush (*Rhus trilobata*)	0		1					1
Holly-leafed Cherry (*Prunus ilicifolia*)	0		1					1
Pepper Tree (*S. molle*) and Wild Grape (*V. girdiana*)	0		1					1
Tree Tobacco (*Nicotiana glauca*)	0		1					1
Black Willow (*S. goodingii*) and Elderberry (*S. Mexicana*)	0		1					1
Mulefat (*B. salicifolia*) and Poison Hemlock (*C. maculatum*)	0			1				1
Mulefat (*B. salicifolia*) and Castorbean (*R. communis*)	0			1				1
California Blackberry (*Rubus ursinus*)	0			1				1
Brittlebush (*Encelia farinosa*)	0			1				1
Dead Fremont Cottonwood	0			1				1
Brazilian Pepper Tree	0			1				1

Table B-2. Least Bell's Vireo nest placement preferences, monitored sites in the Santa Ana River watershed, 2000-2013.

Host Plant Species	2000-2009	2010	2011	2012	2013			Total
(*Schinus terebinthifolius*)								
Blue Plumbago (*Plubago auriculata*)	0			1	1			2
Black Cottonwood (*Populus trichocarpa)*					1			1
Thick-leaved Yerba Santa (*Eriodictyon crassifolium*)					1			1
Fiddleneck (*Amsinckia sp.*)					1			1
Mulefat (*B. salicifolia*) and Coyote Bush (*B. pilularis*)					1			1
Unknown	0		5		3			8
Total	**1,430***	**168**	**234**	140	192			**2,164***

*Includes corrected 2007 total value

Table B-3. Least Bell's Vireo reproductive success and breeding biology data, closely monitored sites in the Santa Ana River watershed, 2000- 2013. Please see Table 1 for total watershed numbers of territories, pairs, and fledglings observed.

Table B-3		2000-2009	2010	2011	2012	2013			Total
A.	Number of pairs	1748	450	407	376	374			n/a
B.	Number of breeding (nesting) pairs	1567	361	345	287	324			2884
C.	Number of breeding pairs that were well-monitored throughout the breeding season	702	87	105	74	92			1060
D.	Number of 'known fledged young' OBSERVED	3210	613	626	487	611			5547
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season	1895	239	308	207	277			2926
F.	Average number of fledglings produced per breeding pair (minimum; D/B = 'productivity or breeding success')	2.0	1.7	1.8	1.7	1.9			1.9
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)	2.7	2.7	2.9	2.8	3.0			2.8
H.	Number of nests that were discovered	1447	184	240	142	196			2209
I.	Number of nests that were regularly monitored or 'tracked'	1185	138	204	123	167			1817
J.	Number of 'tracked' nests that were successful	61% (720/1185)	65% (90/138)	56% (115/204)	60% (74/123)	61% (102/167)			61% (1101/1817)
K.	Rate of missing eggs/chicks from nests (includes successful and unsuccessful nests)	39% (467/1185)	43% (60/138)	40% (82/204)	39% (48/123)	38% (63/167)			40% (720/1817)
L.	Number of 'tracked' nests that were parasitized by cowbirds	17% (204/1185)	5% (7/138)	2% (5/204)	5% (6/123)	4% (7/167)			13% (229/1817)
M.	A. Number of 'tracked' nests that failed as a result of reproductive failure	4% (45/1185)	4% (6/138)	5% (10/204)	3% (4/123)	5% (9/167)			4% (74/1817)
	B. Number of 'tracked" nests that failed as a result of parasitism	5% (61/1185)	3% (4/138)	1% (3/204)	2% (3/123)	0% (0/167)			4% (71/1817)
	C. Number of 'tracked' nests that failed as a result of predation – Predation Rate according to Vireo Working Group	30% (358/1185)	28% (39/138)	36% (74/204)	34% (42/123)	32% (54/167)			31% (567/1817)
	D. Number of 'tracked' nests that failed for unknown reasons	0% (1/1185)	0% (0/138)	1% (2/204)	0% (0/123)	1% (2/167)			0% (5/1817)

Table B-3		2000-2009	2010	2011	2012	2013			Total
N.	Average clutch size	n/a	n/a	3.6	3.4	3.4			n/a
O.	Number of cowbird eggs found in or near vireo nests	248	11	6	9	7			281
P.	Number of cowbird nestlings removed from 'tracked' nests	15	0	0	0	0			15
Q.	Number of cowbird young fledged by vireos	8	1	1	0	2			12
R.	Number of 'manipulated' parasitized nests	169	5	3	4	6			187
S.	% 'successful, manipulated' nests	45% (76/169)	60% (3/5)	100% (2/2)*	100% (4/4)	83% (5/6)			48% (90/186)
T.	Number of vireos fledged from "manipulated' parasitized nests	158	8	4	10	11			191
U.	Number of repaired nests	19	2	7	2	1			31
V.	% successful repaired nests	72% (13/18)*	50% (1/2)	86% (6/7)	100% (2/2)	100% (1/1)			77% (23/30)
W.	Number of vireos fledged from repaired nests	37	2	16	6	4			65

*one outcome unknown

APPENDIX C: SUMMARY TABLES BY MANAGED SITE, FROM 2000-2013

Table C-1. Least Bell's Vireo status and management and Brown-headed Cowbird management data, at closely monitored sites in the Santa Ana River Watershed, California, BY MANAGED SITE

San Jacinto

	Parameter	2000-2009	2010	2011	2012	2013			Totals
A.	Number of territorial males	n/a	22	41	42	53			n/a
B.	Number of pairs (breeding and non-breeding)	43	18	25	36	29			151
C.	Number of fledged young observed	104	28	18	49	39			238
D.	Projected total of recruitment of vireo young (a)	122.1	n/a	n/a	104	3707			264*
E.	Average number of fledglings per pair (C/B)	2.4	1.6	0.72	1.4	1.3			1.6
F.	Projected number of fledglings per pair (D/B)	2.8	n/a	n/a	2.9	1.3			1.7*
G.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)	33.3% (18/54)	0% (0/3)	80% (8/10)	31% (4/13)	69% (9/13)			42% (39/93)
H.	Rate of cowbird nest parasitism	11.1% (6/54)	0	10% (1/10)	8% (1/13)	0% (0/13)			9% (8/93)
I.	Numbers of cowbirds removed from study area	11,622	2136	1797	1728	1085			18,368
K.	Number of trap days (1 operative trap in the field for one day = 1 trap day)	6,405	993	982	984	1058			10.422
L.	Average number of cowbirds trapped per trap day (I/K)	1.81	2.15	1.8	1.8	1.0			1.8
M.	Number of field hours -LBVI	4,425.2	79	129	161	154.5			7,224.75
N.	Number of field hours - BHCO		525	544	711	496.25			

*Excludes 2010 and 2011 data

SAN TIMOTEO

	Parameter	2000-2009	2010	2011	2012	2013			Totals
A.	Number of territorial males	n/a	126	116	118	87+			n/a
B.	Number of pairs (breeding and non-breeding)	323	95	101	102	80			701
C.	Number of fledged young observed	635	137	196	153	179			1,300
D.	Projected total of recruitment of vireo young (a)	918*	266	343	286	288			2,101
E.	Average number of fledglings per pair (C/B)	2.0	1.4	1.9	1.5	2.2			1.9
F.	Projected number of fledglings per pair (D/B)	2.8*	2.8	3.4	2.8	3.6			3.0
G.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)	44.4% (150/338)	65% (24/37)	30% (22/73)	42% (19/45)	41% (31/76)			43% (246/569)
H.	Rate of cowbird nest parasitism	30.5% (103/338)	8% (3/37)	0% (0/73)	2% (1/45)	3% (2/76)			19% (109/569)
I.	Numbers of cowbirds removed from study area	1,487	173	109	143	164			2,076
K.	Number of trap days (1 operative trap in the field for one day = 1 trap day)	6,463	1113	1191	982	1198			10,947
L.	Average number of cowbirds trapped per trap day (I/K)	0.23	0.16	0.09	0.15	0.1			0.19
M.	Number of field hours -LBVI	6,524.6	505	587	407	481			10,423
N.	Number of field hours - BHCO		503	564	326	525			

Table C-1. Least Bell's Vireo status and management and Brown-headed Cowbird management data, at closely monitored sites in the Santa Ana River Watershed, California, BY MANAGED SITE

MARCH SKR PRESERVE

	Parameter	2000-2009	2010	2011	2012	2013			Totals
A.	Number of territorial males	n/a	14	16	13	14			n/a
B.	Number of pairs (breeding and non-breeding)	33	12	9	11	12			77
C.	Number of fledged young observed	75	25	7	8	16			131
D.	Projected total of recruitment of vireo young (a)	120.5 (n=4 yrs)	75.6	n/a	n/a	n/a			196.1
E.	Average number of fledglings per pair (C/B)	2.3	2.1	0.8	0.7	1.3			1.7
F.	Projected number of fledglings per pair (D/B)	4.6* (n=4 yrs)	6.3	n/a	n/a	n/a			4.4*
G.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)	37.5% (6/16) (n=4 yrs)	0% (0/6)	n/a	n/a	n/a			27% (6/22) (n=5 yrs)
H.	Rate of cowbird nest parasitism	0.0% (0/16) (n=4 yrs)	0% (0/6)	n/a	n/a	n/a			0% (0/22) (n=5 yrs)
I.	Numbers of cowbirds removed from study area	151	13	12	16	15			207
K.	Number of trap days (1 operative trap in the field for one day = 1 trap day)	1,203	280	200	235	250			2,168
L.	Average number of cowbirds trapped per trap day (I/K)	0.13	0.05	0.06	0.07	0.06			0.10
M.	Number of field hours -LBVI	457	62	55	22	60			656
N.	Number of field hours - BHCO	504	153	45	60	85			847

*Excludes 2011-2013 data

SYCAMORE CANYON

	Parameter	2000-2009	2010	2011	2012	2013			Totals
A.	Number of territorial males	n/a	12	9	7	12			n/a
B.	Number of pairs (breeding and non-breeding)	35	8	5	7	n/a			55
C.	Number of fledged young observed	40	11	4	5	n/a			60
D.	Projected total of recruitment of vireo young (a)	39.6	n/a	n/a	n/a	n/a			39.6
E.	Average number of fledglings per pair (C/B)	1.1	1.4	0.8	0.7	n/a			1.1
F.	Projected number of fledglings per pair (D/B)	1.6* (39.6/25)	n/a	n/a	n/a	n/a			0.9*
G.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)	33.3% (3/9)	n/a	n/a	n/a	n/a			33% (3/9)
H.	Rate of cowbird nest parasitism	22.2% (2/9)	n/a	n/a	n/a	n/a			22% (2/9)
I.	Numbers of cowbirds removed from study area	81	n/a	n/a	n/a	n/a			81
K.	Number of trap days (1 operative trap in the field for one day = 1 trap day)	635	n/a	n/a	n/a	n/a			635
L.	Average number of cowbirds trapped per trap day (I/K)	0.13	n/a	n/a	n/a	n/a			0.13
M.	Number of field hours -LBVI	474	54	46	22	n/a			596
N.	Number of field hours - BHCO	469	n/a	n/a	n/a	n/a			469

*Excludes 2006 and 2008 data

Table C-1. Least Bell's Vireo status and management and Brown-headed Cowbird management data, at closely monitored sites in the Santa Ana River Watershed, California, BY MANAGED SITE

MOCKINGBIRD CANYON

	Parameter	2000-2009	2010	2011	2012	2013			Totals
A.	Number of territorial males	n/a	43	37	28	31			n/a
B.	Number of pairs (breeding and non-breeding)	120	34	32	26	24			236
C.	Number of fledged young observed	218	25	67	39	40			389
D.	Projected total of recruitment of vireo young (a)	417.7	n/a	93	78	79			668
E.	Average number of fledglings per pair (C/B)	1.8	0.7	2.1	1.5	1.7			1.6
F.	Projected number of fledglings per pair (D/B)	3.5	n/a	2.9	3	3.3			3.3*
G.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)	37.8% (31/82)	n/a	60% (18/30)	53% (9/17)	47% (8/17)			45% (66/146)
H.	Rate of cowbird nest parasitism	14.6% (12/82)	n/a	0% (0/30)	6% (1/17)	18% (3/17)			11% (16/146)
I.	Numbers of cowbirds removed from study area	1,258	149	111	140	123			1,781
K.	Number of trap days (1 operative trap in the field for one day = 1 trap day)	5,395	1028	908	495	772			8,598
L.	Average number of cowbirds trapped per trap day (I/K)	0.23	0.14	0.12	0.28	0.16			0.20
M.	Number of field hours -LBVI	3,661	96	302	203	389			5,677
N.	Number of field hours - BHCO		312	176	215	323			

*excludes 2010 data

Santa Ana River (Riverside Ave to Hidden Valley)

	Parameter	2000-2009	2010	2011	2012	2013			Totals
A.	Number of territorial males	n/a	68	49	43	77			n/a
B.	Number of pairs (breeding and non-breeding)	167	50	22	11	n/a			250
C.	Number of fledged young observed	283	58	32	7	7			380
D.	Projected total of recruitment of vireo young **(a)**	329.4 (n=5 yrs)	100	71	n/a	n/a			500
E.	Average number of fledglings per pair (C/B)	1.7	1.2	1.5	0.6	n/a			1.5
F.	Projected number of fledglings per pair (D/B)	2.7 (121/329))	2.0	3.2	n/a	n/a			2.6*
G.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)	32.0% (24/75) (n=7 yrs)	36% (4/11)	30% (3/10)	n/a	n/a			32% (31/96)
H.	Rate of cowbird nest parasitism	16.0% (12/75)	0% (0/11)	10% (1/10)	n/a	n/a			14% (13/96)
I.	Numbers of cowbirds removed from study area	461	58	30	37	21			586
K.	Number of trap days (1 operative trap in the field for one day = 1 trap day)	3,734	530	515	468	540			5,247
L.	Average number of cowbirds trapped per trap day (I/K)	0.12	0.11	0.06	0.08	0.04			0.11
M.	Number of field hours -LBVI	2,333	335	239	144	167			4,274
N.	Number of field hours - BHCO		277	315	234	230			

*excludes row B: 2002, 2003, 2008, 2012, n=167 becomes n=121, so D/B = (500/193 = 2.6)

Table C-1. Least Bell's Vireo status and management and Brown-headed Cowbird management data, at closely monitored sites in the Santa Ana River Watershed, California, BY MANAGED SITE

Santa Ana River (River Rd to Goose Creek Golf Course/Norco)

	Parameter	2000-2009	2010	2011	2012	2013			Totals
A.	Number of territorial males	n/a	101	105	95	108			n/a
B.	Number of pairs (breeding and non-breeding)	233	64	59	51	52			459
C.	Number of fledged young observed	489	113	91	86	109			888
D.	Projected total of recruitment of vireo young (a)	696.2	211.2	177	184	177			1445
E.	Average number of fledglings per pair (C/B)	2.1	1.8	1.5	1.7	2.1			1.9
F.	Projected number of fledglings per pair (D/B)	2.7	3.3	3.0	3.6	3.4			3.0
G.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)	41.2% (73/177)	28% (5/18)	45% (10/22)	0% (0/17)	26% (8/29)			37% (96/263)
H.	Rate of cowbird nest parasitism	8.5% (14/177)	0% (0/18)	0% (0/22)	0% (0/17)	7% (2/29)			6% (16/263)
I.	Numbers of cowbirds removed from study area	382	49	35	34	23			543
K.	Number of trap days (1 operative trap in the field for one day = 1 trap day)	1,102	269	228	230	270			2,099
L.	Average number of cowbirds trapped per trap day (I/K)	0.35	0.18	0.15	0.15	0.09			0.26
M.	Number of field hours -LBVI	2,337	183	197	232	256			3,205
N.	Number of field hours - BHCO	624	252	n/a	230	135			1,241

Hidden Valley (as of 2010, south side of river)

	Parameter	2000-2009	2010	2011	2012	2013			Totals
A.	Number of territorial males	n/a	60	55	62	75			n/a
B.	Number of pairs (breeding and non-breeding)	230	43	36	37	42			388
C.	Number of fledged young observed	407	53	41	45	66			612
D.	Projected total of recruitment of vireo young **(a)**	511.6 (n=9 yrs)	90.3	122	104	109			937 (13 yrs)
E.	Average number of fledglings per pair (C/B)	1.8	1.2	1.1	1.2	1.6			1.6
F.	Projected number of fledglings per pair (D/B)	2.4* (n=9 yrs)	2.1	3.4	2.8	2.6			2.4*
G.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)	36.4% (31/85)	64.7% (11/17)	30% (3/10)	50% (4/8)	25% (2/8)			40% (51/128)
H.	Rate of cowbird nest parasitism	7.0% (6/85)	5.8% (1/17)	20% (2/10)	0% (0/8)	0% (0/8)			7% (9/128)
I.	Numbers of cowbirds removed from study area	637	24	12	24	8			705
K.	Number of trap days (1 operative trap in the field for one day = 1 trap day)	4,298	252	257	348	362			5,517
L.	Average number of cowbirds trapped per trap day (I/K)	0.15	0.10	0.05	0.07	0.02			0.14
M.	Number of field hours -LBVI	4,156.7	330	193	261	305			5,935
N.	Number of field hours -BHCO		196	228	129	136			

* Calculation excludes 2003, row B= (212+ 43+36+37), Row F = 828/328 = 2.5

Table C-1. Least Bell's Vireo status and management and Brown-headed Cowbird management data, at closely monitored sites in the Santa Ana River Watershed, California, BY MANAGED SITE

Hidden Valley (north side)

	Parameter	2000-2009	2010	2011	2012	2013			Totals
A.	Number of territorial males	n/a	15	4	9	21			n/a
B.	Number of pairs (breeding and non-breeding)	n/a	12	2	3	2			19
C.	Number of fledged young observed	n/a	18	2	1	3			24
D.	Projected total of recruitment of vireo young (a)	n/a	27.6	n/a	n/a	n/a			27.6
E.	Average number of fledglings per pair (C/B)	n/a	1.5	1	0.3	n/a			1.2
F.	Projected number of fledglings per pair (D/B)	n/a	2.3	n/a	n/a	n/a			2.3
G.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)	n/a	11% (1/9)	n/a	n/a	n/a			11% (1/9)
H.	Rate of cowbird nest parasitism	n/a	33% (3/9)	n/a	n/a	n/a			33% (3/9)
I.	Numbers of cowbirds removed from study area	n/a	n/a	n/a	n/a	n/a			n/a
K.	Number of trap days (1 operative trap in the field for one day = 1 trap day)	n/a	n/a	n/a	n/a	n/a			n/a
L.	Average number of cowbirds trapped per trap day (I/K)	n/a	n/a	n/a	n/a	n/a			n/a
M.	Number of field hours -LBVI	n/a	210	8	12	26			256
N.	Number of field hours -BHCO	n/a	n/a	n/a	--	n/a			n/a

TEMESCAL CANYON

	Parameter	2000-2009	2010	2011	2012	2013			Totals
A.	Number of territorial males	n/a	83	102	109	131			n/a
B.	Number of pairs (breeding and non-breeding)	164	49	65	63	50			391
C.	Number of fledged young observed	339	73	113	71	48			644
D.	Projected total of recruitment of vireo young (a)	447.7	151.9	189	189	0			978
E.	Average number of fledglings per pair (C/B)	2.1	1.5	1.7	1.1	1.0			1.6
F.	Projected number of fledglings per pair (D/B)	2.7	3.1	2.9	3.0	n/a			2.5
G.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)	39.1% (52/133)	20% (3/15)	34% (11/32)	0% (0/12)	n/a			34% (66/192)
H.	Rate of cowbird nest parasitism	20.3% (27/133)	0% (0/15)	3% (1/32)	25% (3/12)	n/a			16% (31/192)
I.	Numbers of cowbirds removed from study area	1,350	134	204	566	380			2634
K.	Number of trap days (1 operative trap in the field for one day = 1 trap day)	5,812	1191	1245	851	1246			10,345
L.	Average number of cowbirds trapped per trap day (I/K)	0.23	0.11	0.16	0.52	0.30			0.25
M.	Number of field hours -LBVI	5,690	335	557	531	420			9,606
N.	Number of field hours - BHCO		467	685	377	544			

Table C-1. Least Bell's Vireo status and management and Brown-headed Cowbird management data, at closely monitored sites in the Santa Ana River Watershed, California, BY MANAGED SITE

SANTA ANA CANYON – UPPER CANYON BELOW PRADO DAM

	Parameter	2000-2009	2010	2011	2012	2013			Totals
A.	Number of territorial males	n/a	11	14	10	28			n/a
B.	Number of pairs (breeding and non-breeding)	126	4	5	4	14			153
C.	Number of fledged young observed	208	6	5	6	23			248
D.	Projected total of recruitment of vireo young (a)	309.1 (n=8 yrs)	n/a	n/a	12	42			363 (n=10 yrs)
E.	Average number of fledglings per pair (C/B)	1.7	1.5	1.0	1.5	1.6			1.6
F.	Projected number of fledglings per pair (D/B)	2.7* * (n=8 yrs)	n/a	n/a	3.0	3.0			2.4 (n=10 yrs)
G.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)	40.6% (26/64) (n=8 yrs)	0% (0/1)	n/a	0% (0/1)	40% (2/5)			39% (28/71) (n=11yrs)
H.	Rate of cowbird nest parasitism	6.3% (4/64) (n=8yrs)	0% (0/1)	n/a	0% (0/1)	0% (0/5)			6% (4/71) (n=11 yrs)
I.	Numbers of cowbirds removed from study area	301	165	48	62	32			608
K.	Number of trap days (1 operative trap in the field for one day = 1 trap day)	2,112	286	238	105	133			2,874
L.	Average number of cowbirds trapped per trap day (I/K)	0.14	0.58	0.20	0.59	0.24			0.21
M.	Number of field hours -LBVI	6,793	324*	350*	325*	396*			10,030
N.	Number of field hours - BHCO		425*	608*	432*	377*			

SANTA ANA CANYON - GREEN RIVER GOLF CLUB

	Parameter	2000-2009	2010	2011	2012	2013			Totals
A.	Number of territorial males	n/a	24	26	19	22			n/a
B.	Number of pairs (breeding and non-breeding)	101	17	14	11	19			162
C.	Number of fledged young observed	192	19	19	11	19			260
D.	Projected total of recruitment of vireo young (a)	279.3	30.6	29	25	0			364
E.	Average number of fledglings per pair (C/B)	1.9	1.2	1.4	1.0	1.0			1.6
F.	Projected number of fledglings per pair (D/B)	2.8	1.8	2.1	2.3	n/a			2.2
G.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)	26.2% (16/61)	71% (5/7)	55% (6/11)	20% (1/5)	50% (2/4)			34% (30/88)
H.	Rate of cowbird nest parasitism	6.6% (4/61)	0% (0/7)	0% (0/11)	0% (0/5)	0% (0/4)			5% (4/88)
I.	Numbers of cowbirds removed from study area	802	58	26	37	34			957
K.	Number of trap days (1 operative trap in the field for one day = 1 trap day)	3,101	407	119	124	130			3,881
L.	Average number of cowbirds trapped per trap day (I/K)	0.26	0.14	0.22	0.3	0.3			0.25
M.	Number of field hours -LBVI								
N.	Number of field hours - BHCO	*See Upper Canyon Summary Sheet for all Santa Ana Canyon hours							

Table C-1. Least Bell's Vireo status and management and Brown-headed Cowbird management data, at closely monitored sites in the Santa Ana River Watershed, California, BY MANAGED SITE

SANTA ANA CANYON – FEATHERLY PARK

	Parameter	2000-2009	2010	2011	2012	2013			Totals
A.	Number of territorial males	n/a	40	33	36	64			n/a
B.	Number of pairs (breeding and non-breeding)	131	23	19	16	45			234
C.	Number of fledged young observed	175	22	23	12	55			287
D.	Projected total of recruitment of vireo young (a)	307.1	46	38	--	77			468
E.	Average number of fledglings per pair (C/B)	1.3	1.0	1.21	0.75	1.2			1.2
F.	Projected number of fledglings per pair (D/B)	2.3	2.0	2.0	0	1.7			2.0
G.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)	47.7% (31/65)	71% (5/7)	20% (1/5)	100% (4/4)	50% (7/14)			51% (48/95)
H.	Rate of cowbird nest parasitism	7.7% (5/65)	0% (0/7)	0% (0/5)	0% (0/4)	0% (0/14)			5% (5/95)
I.	Numbers of cowbirds removed from study area	127	118	44	30	48			367
K.	Number of trap days (1 operative trap in the field for one day = 1 trap day)	1,591	514	335	244	258			2,942
L.	Average number of cowbirds trapped per trap day (I/K)	0.08	0.23	0.13	0.12	0.12			0.12
M.	Number of field hours –LBVI	See Upper Canyon Summary Sheet for all Santa Ana Canyon hours							
N.	Number of field hours - BHCO								

*Includes 2 traps at Yorba Linda Regional Park

CHINO HILLS

	Parameter	2000-2009	2010	2011	2012	2013			Totals
A.	Number of territorial males	n/a	11	8	8	13			n/a
B.	Number of pairs (breeding and non-breeding)	45	7	3	2	5			62
C.	Number of fledged young observed	54	7	1	1	7			70
D.	Projected total of recruitment of vireo young (a)	52.9 (n=4 yrs)	11.9	n/a	--	20			85 (n=6 yrs)
E.	Average number of fledglings per pair (C/B)	1.2	1.0	0.33	0.5	1.4			1.1 (n=8 yrs)
F.	Projected number of fledglings per pair (D/B)	1.8* (n=4 yrs)	1.7	n/a	0	4.0			1.4 (n=7 yrs)
G.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)	63.2% (12/19) (n= 4 yrs)	67% (2/3)	n/a	100% (1/1)	0			63% (15/24) (n=7 yrs)
H.	Rate of cowbird nest parasitism	31.6% (6/19) (n=4 yrs)	0% (0/3)	n/a	0% (0/1)	0			25% (6/24) (n=7 yrs)
I.	Numbers of cowbirds removed from study area	11	16	16	6	12			61
K.	Number of trap days (1 operative trap in the field for one day = 1 trap day)	214	129	115	124	132			714
L.	Average number of cowbirds trapped per trap day (I/K)	0.05	0.12	0.14	0.05	0.1			0.09
M.	Number of field hours -LBVI	388	59	54	44	36			581
N.	Number of field hours - BHCO	179	129	115	124	83			630

Table C-1. Least Bell's Vireo status and management and Brown-headed Cowbird management data, at closely monitored sites in the Santa Ana River Watershed, California, BY MANAGED SITE

Irvine Regional Park

Parameter		2000-2009	2010	2011	2012	2013			Totals
A.	Number of territorial males	n/a	24	26	29	n/a			n/a
B.	Number of pairs (breeding and non-breeding)	n/a	14	9	5	n/a			30
C.	Number of fledged young observed	n/a	18	7	5	n/a			30
D.	Projected total of recruitment of vireo young (a)	n/a	50	18	n/a	n/a			68
E.	Average number of fledglings per pair (C/B)	n/a	1.3	0.77	1.0	n/a			1.0
F.	Projected number of fledglings per pair (D/B)	n/a	3.6	9	n/a	n/a			3.0
G.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)	n/a	25% (1/4)	n/a	n/a	n/a			25% (1/4)
H.	Rate of cowbird nest parasitism	n/a	0	0	n/a	n/a			0
I.	Numbers of cowbirds removed from study area	n/a	n/a	n/a	n/a	n/a			n/a
K.	Number of trap days (1 operative trap in the field for one day = 1 trap day)	n/a	n/a	n/a	n/a	n/a			n/a
L.	Average number of cowbirds trapped per trap day (I/K)	n/a	n/a	n/a	n/a	n/a			n/a
M.	Number of field hours -LBVI	n/a	25	21	9.5	n/a			55.5
N.	Number of field hours - BHCO	n/a	n/a	n/a	n/a	n/a			n/a

Table C-2. Least Bell's Vireo nest placement preferences, monitored sites in the Santa Ana River Watershed, 2000-2013, BY MANAGED SITE

SAN JACINTO

Host Plant Species	2000-2009	2010	2011	2012	2013						Totals
Mulefat (*Baccharis salicifolia*)	26	4	1	3							34
Black Willow (*Salix goodingii*)	5										5
Narrow-leafed Willow (*Salix exigua*)	26	2	8	10	9						55
Narrow-leafed willow (*Salix exigua*) (dead)					1						1
Tamarisk (*Tamarix ramosissima*)	1	1									2
Black Mustard (*Brassica nigra*)	1										1
Unknown					3						3
Totals:	59	7	9	13	13						101

SAN TIMOTEO CANYON

Host Plant Species	2000-2009	2010	2011	2012	2013						Totals
Arroyo Willow (*Salix lasiolepis*)	76	4	17	17	16						130
Mulefat (*Baccharis salicifolia*)	101	15	25	12	26						179
Black Willow (*Salix gooddingii*)	52	4	1	1	4						62
Red Willow (*Salix laevigata*)	64	8	13	6	17						108
Mugwort (*Artemisia douglasiana*)	14		1	1	1						17
Elderberry (*Sambucus mexicana*)	12	2	3	5	3						25
Narrow-leaf Willow (*Salix exigua*)	13		1		2						16
Fremont Cottonwood (*Populus fremontii*)	16	1	4		3						24
Wild Grape (*Vitis girdiana*)	10	5	10	1	2						28
Toyon (*Heteromeles arbutifolia*)	8			1	1						10
Mustard (*Brassica sp.*)	3				1						4
Yellow Willow (*Salix lucida spp. lasiandra*)	3		2		2						7
Emory baccharis (*Baccharis emoryii*)	1										1
Black Mustard (*Brassica nigra*)	1										1
Golden Currant (*Ribes aureum*)	1				2						3
Four-wing Saltbush (*Atriplex candescens*)	1										1
Arroyo Willow *(S. lasiolepsis*) and Wild Grape (*V. girdiana*)	1										1
Box Elder *(Acer negundo*)	1										1
Arroyo Willow (*S. lasiolepis*) and Fennel (*F. vulgare*)	1										1
Black Walnut (*Juglans californica*)		1									1
Sycamore (*Platanus raemosa*)			1								1
Basketbush (*Rhus trilobata*)			1								1
Tamarisk (*Tamarix* sp.)				1							1
Dead Salix				1							1
Dead Cottonwood				1							1
Deadfall			1								1
Totals	379	40	80	47	80						626

Table C-2. Least Bell's Vireo nest placement preferences, monitored sites in the Santa Ana River Watershed, 2000-2013, BY MANAGED SITE

MARCH SKR PRESERVE

Host Plant Species	2000-2009	2010	2011	2012	2013						Totals
Black Willow (*Salix gooddingii*)	9	1									10
Arroyo Willow (*Salix lasiolepis*)	5	1									6
Red Willow (*Salix laevigata*)	3	3									6
Mulefat (*Baccharis salicifolia*)		1									1
Totals	17	6	0	0	0						23

MOCKINGBIRD CANYON

Host Plant Species	2000-2009	2010	2011	2012	2013						Totals
Black Willow (*Salix goodingii*)	26		3	1	1						31
Red Willow (*Salix laevigata*)	30	2	13	7	2						54
Elderberry (*Sambucus mexicana*)	13		3	2	6						24
Wild Grape (*Vitis girdiana*)	6		1								7
Mulefat (*Baccharis salicifolia*)	5	1	2	3	4						15
Peruvian Pepper Tree (*Schinus molle*)	2		1	1							4
Emory's Baccharis (*Baccharis emoryii*)	2										2
Pepperweed (*Lepidium latifolium*)	3										3
Willow species (*Salix* sp .) and Pepperweed (*L. latifolium*)	1										1
Arroyo Willow (*Salix lasiolepis*)	2		6	3	4						15
Willow species (*Salix* sp)	1										1
Sycamore (*Platanus racemosa*)	1										1
Wild Celery (*Apium graveolens*)	1										1
Pepperweed (*L. latifolium*) and Black Willow (*S. goodingii*)	1										1
Black Willow (*S. goodingii*) and Grape (*V. girdiana*)	1										1
Dead Salix sp.	1										1
Dead *L. latifolium*	1										1
Black Walnut (*Juglans californica*)	1										1
Holly-leafed Cherry (*Prunus ilicifolia*)			1								1
Arrowhead (*Pluchea sericea*)					1						1
Coyotebush(*B. pilularis*) and Mulefat *(B.salicifolia*)					1						1
Fourwing saltbush (*Atriplex canescens*)					1						1
Fremont Cottonwood (*Populus fremontii*)			1	1							2
Pepperweed (*Lepidium latifolium*)				1							1
Totals	98	3	31	19	20						171

Table C-2. Least Bell's Vireo nest placement preferences, monitored sites in the Santa Ana River Watershed, 2000-2013, BY MANAGED SITE

SANTA ANA RIVER – RIVERSIDE AVE TO HIDDEN VALLEY

Host Plant Species	2000-2009	2010	2011	2012	2013						Totals
Arroyo Willow (*Salix lasiolepis*)	28	4	5								37
Mulefat (*Baccharis salicifolia*)	26	7	1	1							35
Black Willow (*Salix goodingii*)	10			1							11
Fremont Cottonwood (*Populus fremontii*)	7		1								8
Elderberry (*Sambucus mexicana*)	3		1								4
Red Willow (*Salix laevigata*)	6	1	1								8
Scrub Oak (*Quercus* spp.)	2										2
Narrow-leafed Willow (*Salix exigua*)	2		1								3
Yellow Willow (*Salix lucida* spp. *lasiandra*)	1										1
Willow species (*Salix* spp.)	1										1
Stinging Nettle (*Utica dioica*)	1										1
Wild Rose (*Rosa californica*)	1										1
Black Willow (dead) (*Salix goodingii*)	1										1
Dead Black Willow (*S. goodingii*) and Nettle (*U. dioica*)	1										1
Tamarisk (*Tamarix ramosissima*)	1										1
Wild Grape (*Vitis girdiana*)		1	2								3
Tree Tobacco (*Nicotiana glauca*)			1								1
Totals	91	13	13	2	0						119

SANTA ANA RIVER – RIVER RD. TO HIDDEN VALLEY-NORCO

Host Plant Species	2000-2009	2010	2011	2012	2013						Totals
Arroyo Willow (*Salix lasiolepis*)	70	5	5	9	11						100
Black Willow (*Salix gooddingii*)	39	1	5	2							47
Mulefat (*Baccharis salicifolia*)	63	13	10	4	10						100
Wild Grape (*Vitis girdiana*)	9			1	5						15
Narrow-leafed Willow (*Salix exigua*)	8	1	1								10
Poison Hemlock (*Conium maculatum*)	4										4
Fremont Cottonwood (*Populus fremontii*)	11	1		1	1						14
Elderberry (*Sambucus mexicana*)	2		1								3
Ash (*Fraxinus* sp.)	1										1
Dead *B. salicifolia*	2										2
Black Willow (*S. goodingii*) and Poison Hemlock (*C. maculatum*)	1										1
Red Willow (*Salix laevigata*)				2	2						4
Dead Arroyo Willow (*Salix lasiolepis*)		1									1
Black walnut (*Juglans californica*)					1						1
Fremont cottonwood (*Populus fremontii*) (dead)					1						1
Unknown			3								3
Totals	210	22	25	19	31						307

Table C-2. Least Bell's Vireo nest placement preferences, monitored sites in the Santa Ana River Watershed, 2000-2013, BY MANAGED SITE

HIDDEN VALLEY

Host Plant Species	2000-2009	2010	2011	2012	2013						Totals
Arroyo Willow (*Salix lasiolepis*)	43	6	2	1	2						54
Mulefat (*Baccharis salicifolia*)	29	9	3	2	3						46
Black Willow (*Salix gooddingii*)	15	1			2						18
Wild Grape (*Vitis girdiana*)	6		2	2							10
Red Willow (*Salix laevigata*)	4	1	2		2						9
Willow species (*Salix spp.*)	2										2
Narrow-leafed Willow (*Salix exigua*)	1			1	1						3
Yellow Willow (*Salix lucida spp. lasiandra*)	1										1
Elderberry (*Sambucus mexicana*)	3										3
Poison Oak (*Toxicodendron diversilobum*)	1										1
Coyote Bush (*Baccharis pilularis*)	1										1
Blackberry (*R. ursinus*) and Willow sp. (*Salix sp.*)	1										1
S. lasiolepsis/fresh water reed	1										1
Rose (*R. californica*) and Wild Grape (*V. girdiana*)	1										1
Mulefat and Hemlock				1							1
Unknown			2								2
Totals	109	17	11	7	10						154

HIDDEN VALLEY (north side)

Host Plant Species	2010	2011	2012	2013							Totals
Mulefat (*Baccharis salicifolia*)	4		n/a	n/a							4
Wild Grape (*Vitis girdiana*)	2	1	n/a	n/a							3
Red Willow (*Salix laevigata*)	2		n/a	n/a							2
Elderberry (*Sambucus mexicana*)	2		n/a	n/a							2
Arroyo Willow (*Salix lasiolepis*)		1	n/a	n/a							1
Totals	10	2	n/a	n/a							12

Table C-2. Least Bell's Vireo nest placement preferences, monitored sites in the Santa Ana River Watershed, 2000-2013, BY MANAGED SITE

TEMESCAL CANYON

Host Plant Species	2000-2009	2010	2011	2012	2013						Totals
Mulefat (*Baccharis salicifolia*)	65	6	7	2	1						81
Arroyo Willow (*Salix lasiolepis*)	61	7	2	1	1						72
Black Willow (*Salix gooddingii*)	18	2	7	2	1						30
Yellow Willow (*Salix lucida spp. lasiandra*)	3	1									4
Mugwort (*Artemisia douglasiana*)	1										1
Toyon (*Heteromeles arbutifolia*)	1										1
Poison Oak (*Toxicodendron diversilobum*)	1										1
Arrowweed (*Pluchea* sp.)	1			1							2
Coyote Bush (*Baccharis pilularis*)	1		1								2
Pepperweed (*Lepidium latifolium*)	1										1
Common Sunflower (*Helianthus annuus*)	1										1
Fremont Cottonwood (*Populus fremontii*)	2		2								4
Sycamore (*Platanus racemosa*)	1										1
Elderberry (*Sambucus mexicana*)	1	3	3	1							8
Dead *Salix* sp.	1										1
S. lasiolepsis & Stinging Nettle (*Utica dioica*) (dead)	1										1
B. salicifolia (dead)	3										3
Tamarisk (*Tamarix ramosissima*)	1		1	2							4
Deadfall	2	1									3
Red Willow (*Salix laevigata*)		1	10	3							14
Narrow-leafed Willow (*Salix exigua*)			1								1
Sugarbush (*Rhus ovata*)		1	1								2
Brittlebush				1							1
Mustard				1							1
California Blackberry				1							1
Totals	166	22	35	15	3						241

Table C-2. Least Bell's Vireo nest placement preferences, monitored sites in the Santa Ana River Watershed, 2000-2013, BY MANAGED SITE

SANTA ANA CANYON – UPPER CANYON

Host Plant Species	2000-2009	2010	2011	2012	2013						Totals
Mulefat (*Baccharis salicifolia*)	33				3						36
Elderberry (*Sambucus mexicana*)	14	1	1	1	1						18
Black Willow (*Salix goodingii*)	10		1								11
Poison Oak (*Toxicodendron diversilobum*)	5										5
Fremont Cottonwood (*Populus fremontii*)	5	1			1						7
Wild Grape (*Vitis girdiana*)	4										4
Wild Rose (*Rosa californica*)	3										3
Red Willow (*Salix laevigata*)	3										3
Arroyo Willow (*Salix lasiolepis*)	2				1						3
Mustard (*Brassica* spp.)	2										2
Poison Hemlock (*Conium maculatum*)	2										2
Toyon (*Heteromeles arbutifolia*)	1										1
Scrub Oak (*Quercus berberidifolia*)	2										2
Willow Species(*Salix* spp.)	1										1
Cockleburr (*Xanthium strumarium*)	1										1
Narrow-leafed Willow (*Salix exigua*)	1										1
Peruvian Pepper Tree (*Schinus molle*)	1										1
Coast Live Oak (*Quercus agrifolia*)	1										1
Milk Thistle (*Silybum marianum*)	1										1
Coyote Bush (*Baccharis pilularis*)	1										1
Broom Baccharis (*Baccharis sarothroides*)	1										1
Castor Bean (*Rincus communis*)	1										1
Black Willow (*S. goodingii*) and Poison Hemlock (*C. maculatum*)	1										1
Mulefat and Wild Grape				1							1
Totals	96	2	2	2	6						108

Table C-2. Least Bell's Vireo nest placement preferences, monitored sites in the Santa Ana River Watershed, 2000-2013, BY MANAGED SITE

SANTA ANA CANYON – GREEN RIVER GOLF CLUB

Host Plant Species	2000-2009	2010	2011	2012	2013						Totals
Mulefat (*Baccharis salicifolia*)	35	1	5	2	1						44
Black Willow (*Salix gooddingii*)	5	2	1	3							11
Fremont Cottonwood (*Populus fremontii*)	4										4
Elderberry (*Sambucus mexicana*)	4		2		2						8
Laurel Sumac (*Malosma laurina*)	3										3
Arroyo Willow (*Salix lasiolepis*)	2										2
Red Willow (*Salix laevigata*)	4										4
Poison Hemlock (*Conium maculatum*)	2										2
Coyote Bush (*Baccharis pilularis*)	2		1								3
Narrow-leaf Willow (*Salix exigua*)	1				1						2
Toyon (*Hetermeles arbutifolia*)	1		1								2
Wild Grape (*Vitis girdiana*)	1		1								2
Myoporum (*Myoporum luteumi*)	1										1
Peruvian Pepper Tree (*Schinus molle*)	2	3									5
Giant Reed (*Arundo donax*)	1										1
California Sagebrush (*Artemisia californica*)	1										1
Poison Oak (*Toxicodendron diversilobum*)	1										1
Elderberry (*S. mexicana*) and Wild Grape (*V. girdiana*)	1										1
Wax Leaf Privet (*Ligustrum* sp.)	1										1
Black Walnut (*Juglans californica*)		1									1
Black Willow (*S. goodingii*) and Elderberry (*S. Mexicana*)			1								1
Pepper Tree (*S. molle*) and Wild Grape (*V. girdiana*)			1								1
Blue Plumbago (*Plumbago auriculata*)				1	1						2
Brazilian Pepper Tree (*Schinus terebinthifolius*)				1							1
Totals	72	7	13	7	5						104

Table C-2. Least Bell's Vireo nest placement preferences, monitored sites in the Santa Ana River Watershed, 2000-2013, BY MANAGED SITE

SANTA ANA RIVER – FEATHERLY PARK

Host Plant Species	2000-2009	2010	2011	2012	2013						Totals
Mulefat (*Baccharis salicifolia*)	23	1	2		3						29
Elderberry (*Sambucus mexicana*)	11	3	2	2	2						20
Black Walnut (*Juglans californica*)	4				3						7
Black Willow (*Salix gooddingii*)	13	1	2		3						19
Laurel Sumac (*Malosma laurina*)	3				3						6
Arroyo Willow (*Salix lasiolepis*)	3		1								4
Red Willow (*Salix laevigata*)	2	2									4
Narrow-leafed Willow (*Salix exigua*)	4										4
Poison Hemlock (*Conium maculatum*)	2										2
Fremont Cottonwood (*Populus fremontii*)	4	3	4	4	2						17
Yellowspine Thistle (*Cirsium ochrocentrum*)	2										2
Mulefat (*B. salicifolia*) and Wild Grape (*V. girdiana*)	2										2
Willow species (*Salix* sp.)	1										1
Poison Oak (*Toxicodendron diversilobum*)	1				4						5
Toyon (*Heteromeles arbutifolia*)	1										1
Wild Grape (*Vitis girdiana*)	1										1
White Alder (*Alnus rhombifolia*)	1										1
Dead Black Willow (*S. goodingii)* (covered w/ living Black Willow)	1										1
Arroyo Willow (*S. lasiolepis*) and Black Mustard (*B. nigra*)	1										1
Black Mustard (*Brassica nigra*)	1	1									2
Orange Tree (*Rutaceae citrus sinensis*)	1		1	1							3
Cockleburr (*Xanithum strumaritum*)	1										1
Thick-leaved yerba santa (*Eriodictyon crassifolium*)					1						1
Fiddleneck (*Amsinckia* sp.)					1						1
Black Cottonwood (*Populus trichocarpa*)					1						1
Mulefat and Castorbean				1							1
Totals	83	11	12	8	23						137

CHINO HILLS

Host Plant Species	2000-2009	2010	2011	2012	2013						Totals
Black Willow (*Salix goodingii*)	9										9
Mulefat (*Baccharis salicifolia*)	4	1									5
Red Willow (*Salix laevigata*)	3	2		1							6
Mugwort (*Artemisia douglasiana*)	3										3
Elderberry (*Sambucus mexicana*)	2										2
Toyon (*Heteromeles arbutifolia*)	1										1
Arroyo Willow (*Salix lasiolepis*)	1										1
Wild Grape (*Vitis girdiana*)	1										1
Coast live oak (*Quercus agrifolia*)					1						1
Totals	24	3	0	1	1						29

Table C-2. Least Bell's Vireo nest placement preferences, monitored sites in the Santa Ana River Watershed, 2000-2013, BY MANAGED SITE

IRVINE REGIONAL PARK

Host Plant Species	2000-2009	2010	2011	2012	2013						Totals
Mulefat (*Baccharis salicifolia*)		3									3
Elderberry (*Sambucus mexicana*)		1	1								2
False Indigo (*Amorpha fruticosa*)		1									1
Totals		5	1	0							6

Table C-3. Least Bell's Vireo reproductive success and breeding biology data, monitored sites, in the Santa Ana River watershed, 2000-2013, BY MANAGED SITE

SAN JACINTO

	Parameter	2000-2009	2010	2011	2012	2013			Totals
A.	Number of pairs	43	18	25	36	29			n/a
B.	Number of breeding (nesting) pairs	39	15	20	22	28			124
C.	Number of breeding pairs that were well-monitored throughout the breeding season	29	0	1	9	6			45
D.	Number of 'known fledged young' OBSERVED	104	28	18	49	39			238
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season	93	n/a	0	26	8			127
F.	Average number of fledglings produced per breeding pair (minimum; D/B = 'productivity or breeding success')	2.7	1.9	0.9	2.2	1.4			1.9
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)	3.2	n/a	n/a	2.9	1.3			2.8
H.	Number of nests that were discovered	59	7	14	13	17			110
I.	Number of nests that were regularly monitored or 'tracked'	54	3	10	13	13			93
J.	Number of 'tracked' nests that were successful (% = J/I x 100)	(32/54) 59%	100% (3/3)	10% (1/10)	69% (9/13)	38% (5/13)			54% (50/93)
K.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)	(18/54) 33%	0% (0/3)	80% (8/10)	31% (4/13)	69% (9/13)			42% (39/93)
L.	Number of 'tracked' nests that were parasitized by cowbirds (% = L/I x 100)	(6/54) 11%	0	10% (1/10)	8% (1/13)	0% (0/13)			9% (8/93)
M.	A. Number of 'tracked' nests that failed as a result of reproductive failure	(3/54) 5%	0% (0/3)	0% (0/10)	0% (0/13)	8% (1/13)			4% (4/93)
	B. Number of 'tracked' nests that failed as a result of parasitism	(3 or 4/54) 5-7%	0% (0/3)	10% (1/10)	0% (0/13)	0% (0/13)			4-5% (4 or 5/93)
	C. Number of 'tracked' nests that failed as a result of predation – Predation Rate according to Vireo Working Group	(15/54) 28%	0% (0/3)	80% (8/10)	31% (4/13)	54% (7/13)			37% (34/93)
N.	Average clutch size	n/a	3.3	3.7	3.3	3.5			n/a
O.	Number of cowbird eggs found in or near vireo nests	9	0	1	1	0			11
P.	Number of cowbird nestlings removed from 'tracked' nests	0	0	0	0	0			0
Q.	Number of cowbird young fledged by vireo	2	0	1	0	2			5
R.	Number of 'manipulated' parasitized nests	4	0	0	1	0			5
S.	Number of 'successful, manipulated' nests (% = S/R x 100)	(2/5) 40%	n/a	n/a	100% (1/1)	n/a			50% (3/6)
T.	Number of vireo fledged from 'manipulated' parasitized nests	4	n/a	n/a	3	n/a			7
U.	Number of repaired nests	2	0	0	1	0			3
V.	% successful repaired nests	(2/2) 100%	n/a	n/a	100% (1/1)	n/a			100% (3/3)
W.	Number of vireo fledged from repaired nests	6	n/a	n/a	4	n/a			10

Table C-3. Least Bell's Vireo reproductive success and breeding biology data, monitored sites, in the Santa Ana River watershed, 2000-2013, BY MANAGED SITE

SAN TIMOTEO CANYON

	Parameter	2000-2009	2010	2011	2012	2013			Totals
A.	Number of pairs	n/a	95	101	102	80			n/a
B.	Number of breeding (nesting) pairs	287	76	78	73	67			581
C.	Number of breeding pairs that were well-monitored throughout the breeding season	183	24	31	32	35			305
D.	Number of 'known fledged young' OBSERVED	635	137	196	153	179			1,300
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season	497	67	104	90	127			885
F.	Average number of fledglings produced per breeding pair (minimum; D/B = 'productivity or breeding success')	2.2	1.8	2.5	2.1	2.7			2.2
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)	2.7	2.8	3.4	2.8	3.6			2.9
H.	Number of nests that were discovered	388	55	80	47	80			650
I.	Number of nests that were regularly monitored or 'tracked'	338	37	73	45	76			569
J.	Number of 'tracked' nests that were successful (% = J/I x 100)	57% (192*/338)	62% (23/37)	60% (44/73)	64% (29/45)	57% (43/76)			58% (331/569)
K.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)	44% (150*/338)	65% (24/37)	30% (22/73)	42% (19/45)	43% (246/569)			43% (246/569)
L.	Number of 'tracked' nests that were parasitized by cowbirds (% = L/I x 100)	30% (103/338)	8% (3/37)	0% (0/73)	2% (1/45)	19% (109/569)			19% (109/569)
M.	A. Number of 'tracked' nests that failed as a result of reproductive failure	2% (7/338)	11% (4/37)	8% (6/73)	0% (0/45)	5% (4/76)			4% (21/569)
	B. Number of 'tracked' nests that failed as a result of parasitism	7% (25/338)	0% (0/37)	0% (0/73)	2% (1/45)	0% (0/76)			5% (26/569)
	C. Number of 'tracked' nests that failed as a result of predation – Predation Rate according to Vireo Working Group	34% (114/338)	27% (10/37)	30% (22/73)	33% (15/45)	36% (27/76)			33% (188/569)
	D. Number of 'tracked' nests that failed for unknown reasons	n/a		1% (1/73)	0% (0/45)	3% (2/76)			2% (3/194)
N.	Average clutch size	n/a	3.4	3.5	3.3	3.4			n/a
O.	Number of cowbird eggs found in or near vireo nests	118	3	0	1	2			124
P.	Number of cowbird nestlings removed from 'tracked' nests	6	0	0	0	0			6
Q.	Number of cowbird young fledged by vireo	2	0	0	0	0			2
R.	Number of 'manipulated' parasitized nests	84	3	0	0	2			89
S.	Number of 'successful, manipulated' nests (% = S/R x 100)	49% (41/84)	100% (3/3)	n/a	n/a	50% (1/2)			50% (45/89)
T.	Number of vireo fledged from 'manipulated' parasitized nests	88	8	n/a	n/a	1			97
U.	Number of repaired nests	3	1	2	1	1			8
V.	% successful repaired nests	66.7% (2/3)	0% (0/1)	100% (2/2)	100% (1/1)	100% (1/1)			75% (6/8)
W.	Number of vireo fledged from repaired nests	5	0	7	2	4			18

Table C-3. Least Bell's Vireo reproductive success and breeding biology data, monitored sites, in the Santa Ana River watershed, 2000-2013, BY MANAGED SITE

MARCH SKR PRESERVE

	Parameter	2000-2009	2010	2011	2012	2013			Totals
A.	Number of pairs	n/a	12	9	7	12			n/a
B.	Number of breeding (nesting) pairs	30	8	5	6	9			58
C.	Number of breeding pairs that were well-monitored throughout the breeding season	9 (n=4 yrs)	3	0	0	0			12
D.	Number of 'known fledged young' OBSERVED	75	25	7	8	16			131
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season	38 (n=4 yrs)	19	0	n/a	n/a			57*
F.	Average number of fledglings produced per breeding pair (minimum; D/B = 'productivity or breeding success')	2.5	3.1	1.4	1.3	1.8			2.3
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)	4.2	6.3	n/a	n/a	n/a			4.8*
H.	Number of nests that were discovered	17	6	n/a	n/a	n/a			23
I.	Number of nests that were regularly monitored or 'tracked'	16	6	n/a	n/a	n/a			22
J.	Number of 'tracked' nests that were successful (% = J/I x 100)	68.8% (11/16)	100% (6/6)	n/a	n/a	n/a			77% (17/22)
K.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)	37.5% (6/16)	0% (0/6)	n/a	n/a	n/a			27% (6/22)
L.	Number of 'tracked' nests that were parasitized by cowbirds (% = L/I x 100)	0% (0/16)	0% (0/6)	n/a	n/a	n/a			0% (0/22)
M.	A. Number of 'tracked' nests that failed as a result of reproductive failure	0.0% (0/16)	0% (0/6)	n/a	n/a	n/a			0% (0/22)
	B. Number of 'tracked' nests that failed as a result of parasitism	0.0% (0/16)	0% (0/6)	n/a	n/a	n/a			0% (0/22)
	C. Number of 'tracked' nests that failed as a result of predation – Predation Rate according to Vireo Working Group	31.2% (5/16)	0% (0/6)	n/a	n/a	n/a			23% (5/22)
N.	Average clutch size	n/a	3.5	n/a	n/a	n/a			n/a
O.	Number of cowbird eggs found in or near vireo nests	0	1	n/a	n/a	n/a			1
P.	Number of cowbird nestlings removed from 'tracked' nests	0	0	n/a	n/a	n/a			0
Q.	Number of cowbird young fledged by vireo	0	0	0	n/a	n/a			0
R.	Number of 'manipulated' parasitized nests	0	0	n/a	n/a	n/a			0
S.	Number of 'successful, manipulated' nests (% = S/R x 100)	n/a	n/a	n/a	n/a	n/a			n/a
T.	Number of vireo fledged from 'manipulated' parasitized nests	n/a	n/a	n/a	n/a	n/a			n/a
U.	Number of repaired nests	0	0	n/a	n/a	n/a			0
V.	% successful repaired nests	n/a	n/a	n/a	n/a	n/a			n/a
W.	Number of vireo fledged from repaired nests	n/a	n/a	n/a	n/a	n/a			n/a

*Excludes 2011-2013 data

Table C-3. Least Bell's Vireo reproductive success and breeding biology data, monitored sites, in the Santa Ana River watershed, 2000-2013, BY MANAGED SITE

SYCAMORE CANYON

	Parameter	2000-2009	2010	2011	2012	2013			Totals
A.	Number of pairs	n/a	8	5	7	n/a			n/a
B.	Number of breeding (nesting) pairs	19	6	3	4	n/a			32
C.	Number of breeding pairs that were well-monitored throughout the breeding season	6	0	0	0	n/a			6
D.	Number of 'known fledged young' OBSERVED	40	11	4	5	n/a			60
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season	12	n/a	0	n/a	n/a			12
F.	Average number of fledglings produced per breeding pair (minimum; D/B = 'productivity or breeding success')	2.1	1.8	1.3	1.3	n/a			1.9
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)	2.0	n/a	n/a	n/a	n/a			2.0
H.	Number of nests that were discovered	10	0	0	n/a	n/a			10
I.	Number of nests that were regularly monitored or 'tracked'	9	n/a	n/a	n/a	n/a			9
J.	Number of 'tracked' nests that were successful (% = J/I x 100)	66.7% (6/9)	n/a	n/a	n/a	n/a			67% (6/9)
K.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)	33.3% (3/9)	n/a	n/a	n/a	n/a			33% (3/9)
L.	Number of 'tracked' nests that were parasitized by cowbirds (% = L/I x 100)	22.2% (2/9)	n/a	n/a	n/a	n/a			22% (2/9)
M.	A. Number of 'tracked' nests that failed as a result of reproductive failure	0% (0/9)	n/a	n/a	n/a	n/a			0% (0/9)
	B. Number of 'tracked' nests that failed as a result of parasitism	11.1% (1/9)	n/a	n/a	n/a	n/a			11% (1/9)
	C. Number of 'tracked' nests that failed as a result of predation – Predation Rate according to Vireo Working Group	22.2% (2/9)	n/a	n/a	n/a	n/a			22% (2/9)
N.	Average clutch size	n/a	n/a	n/a	n/a	n/a			n/a
O.	Number of cowbird eggs found in or near vireo nests	2	n/a	n/a	n/a	n/a			2
P.	Number of cowbird nestlings removed from 'tracked' nests	0	n/a	n/a	n/a	n/a			0
Q.	Number of cowbird young fledged by vireo	0	n/a	0	n/a	n/a			0
R.	Number of 'manipulated' parasitized nests	1	n/a	n/a	n/a	n/a			1
S.	Number of 'successful, manipulated' nests (% = S/R x 100)	100% (1/1)	n/a	n/a	n/a	n/a			100% (1/1)
T.	Number of vireo fledged from 'manipulated' parasitized nests	1	n/a	n/a	n/a	n/a			1
U.	Number of repaired nests	0	n/a	n/a	n/a	n/a			0
V.	% successful repaired nests	n/d	n/a	n/a	n/a	n/a			n/a
W.	Number of vireo fledged from repaired nests	n/d	n/a	n/a	n/a	n/a			n/a

Table C-3. Least Bell's Vireo reproductive success and breeding biology data, monitored sites, in the Santa Ana River watershed, 2000-2013, BY MANAGED SITE

MOCKINGBIRD CANYON

	Parameter	2000-2009	2010	2011	2012	2013			Totals
A.	Number of pairs	n/a	34	32	26	24			n/a
B.	Number of breeding (nesting) pairs	110	26	31	21	22			210
C.	Number of breeding pairs that were well-monitored throughout the breeding season	37	0	16	5	6			64
D.	Number of 'known fledged young' OBSERVED	218	25	67	39	40			389
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season	113	n/a	46	15	20			194
F.	Average number of fledglings produced per breeding pair (minimum; D/B = 'productivity or breeding success')	2.0	1.0	2.2	1.9	1.8			1.9
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)	3.0	n/a	2.9	3	3.3			3
H.	Number of nests that were discovered	99	3	31	19	20			172
I.	Number of nests that were regularly monitored or 'tracked'	82	0	30	17	17			146
J.	Number of 'tracked' nests that were successful (% = J/I x 100)	54.9% (45/82)	n/a	50% (15/30)	47% (8/17)	59% (10/17)			53% (78/146)
K.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)	37.8% (31/82)	n/a	60% (18/30)	53% (9/17)	47% (8/17)			45% (66/146)
L.	Number of 'tracked' nests that were parasitized by cowbirds (% = L/I x 100)	14.6% (12/82)	n/a	0% (0/30)	6% (1/17)	18% (3/17)			11% (16/146)
M.	A. Number of 'tracked' nests that failed as a result of reproductive failure	8.5% (7/82)	n/a	3% (1/30)	6% (1/17)	6% (1/17)			7% (10/146)
	B. Number of 'tracked' nests that failed as a result of parasitism	7.3% (6/82)	n/a	0% (0/30)	0% (0/17)	0% (0/17)			4% (6/146)
	C. Number of 'tracked' nests that failed as a result of predation – Predation Rate according to Vireo Working Group	29.3% (24/82)	n/a	43% (13/30)	47% (8/17)	35% (6/17)			35% (51/146)
	D. Number of 'tracked' nests that failed for unknown reasons	n/a		3% (1/30)	0	0			3% (1/30)
N.	Average clutch size	n/a	3.0	3.6	3.5	2.9			n/a
O.	Number of cowbird eggs found in or near vireo nests	2	1	0	1	3			27
P.	Number of cowbird nestlings removed from 'tracked' nests	1	n/a	0	0	0			2
Q.	Number of cowbird young fledged by vireo	10	n/a	0	0	0			1
R.	Number of 'manipulated' parasitized nests	10% (1/10)	n/a	0	1	2			13
S.	Number of 'successful, manipulated' nests (% = S/R x 100)	2	n/a	n/a	100% (1/1)	100% (2/2)			13% (4/13)
T.	Number of vireo fledged from 'manipulated' parasitized nests	1	n/a	n/a	1	5			8
U.	Number of repaired nests	100% (1/1)	n/a	2	0	0			3
V.	% successful repaired nests	1	n/a	100% (2/2)	n/a	n/a			100% (3/3)
W.	Number of vireo fledged from repaired nests		n/a	6	n/a	n/a			7

Table C-3. Least Bell's Vireo reproductive success and breeding biology data, monitored sites, in the Santa Ana River watershed, 2000-2013, BY MANAGED SITE

SANTA ANA RIVER (RIVER ROAD TO NORCO)

	Parameter	2000-2009	2010	2011	2012	2013			Totals
A.	Number of pairs	n/a	64	59	51	52			n/a
B.	Number of breeding (nesting) pairs	224	60	56	48	50			438
C.	Number of breeding pairs that were well-monitored throughout the breeding season	105	12	12	8	20			157
D.	Number of 'known fledged young' OBSERVED	489	113	91	86	109			888
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season	315	39	36	29	68			487
F.	Average number of fledglings produced per breeding pair (minimum; D/B = 'productivity or breeding success')	2.23	1.9	1.6	1.8	2.2			2.0
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)	3.0	3.3	3.0	3.6	3.4			3.1
H.	Number of nests that were discovered	212	22	25	19	31			309
I.	Number of nests that were regularly monitored or 'tracked'	177	18	22	17	29			263
J.	Number of 'tracked' nests that were successful (% = J/I x 100)	65.0% (115/177)	89% (16/18)	45% (10/22)	71% (12/17)	83% (24/29)			67% (177/263)
K.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)	41.2% (73/177)	28% (5/18)	45% (10/22)	0% (0/17)	26% (8/29)			37% (96/263)
L.	Number of 'tracked' nests that were parasitized by cowbirds (% = L/I x 100)	8.5% (15/177)	0% (0/18)	0% (0/22)	0% (0/17)	7% (2/29)			6% (17/263)
M.	A. Number of 'tracked' nests that failed as a result of reproductive failure	3.4% (6/177)	0% (0/18)	14% (3/22)	12% (2/17)	0% (0/29)			4% (11/263)
	B. Number of 'tracked' nests that failed as a result of parasitism	2.3% (4/177)	0% (0/18)	0% (0/22)	0% (0/17)	0% (0/29)			2% (4/263)
	C. Number of 'tracked' nests that failed as a result of predation – Predation Rate according to Vireo Working Group	28.8% (51/177)	11% (2/18)	41% (9/22)	18% (3/17)	14% (4/29)			26% (69/263)
	D. Number of "tracked" nests that failed for Other/Unknown Reasons	1% (1/177)				3% (1/29)			1% (2/206)
N.	Average clutch size	n/a	3.7	3.8	3.6	3.7			n/a
O.	Number of cowbird eggs found in or near vireo nests	20	0	0	0	2			22
P.	Number of cowbird nestlings removed from 'tracked' nests	1	0	0	0	0			1
Q.	Number of cowbird young fledged by vireo	0	0	0	0	0			0
R.	Number of 'manipulated' parasitized nests	14	0	0	0	2			16
S.	Number of 'successful, manipulated' nests (% = S/R x 100)	64.3% (9/14)	n/a	n/a	n/a	100% (2/2)			69% (11/16)
T.	Number of vireo fledged from 'manipulated' parasitized nests	13	n/a	n/a	n/a	5			18
U.	Number of repaired nests	2	0	0	0	0			2
V.	% successful repaired nests	50% (1/2)	n/a	n/a	n/a	n/a			50% (1/2)
W.	Number of vireo fledged from repaired nests	n/a	n/a	n/a	n/a	n/a			n/a

Table C-3. Least Bell's Vireo reproductive success and breeding biology data, monitored sites, in the Santa Ana River watershed, 2000-2013, BY MANAGED SITE

SANTA ANA RIVER (RIVERSIDE AVE TO HIDDEN VALLEY)

	Parameter	2000-2009	2010	2011	2012	2013			Totals
A.	Number of pairs	n/a	50	23	11	n/a			n/a
B.	Number of breeding (nesting) pairs	149	39	19	7	n/a			214
C.	Number of breeding pairs that were well-monitored throughout the breeding season	51 (n=5 yrs)	9	7	0	0			67
D.	Number of 'known fledged young' OBSERVED	283	58	30	7	7			385
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season	133 (n=5 yrs)	18	22	n/a	N/a			173
F.	Average number of fledglings produced per breeding pair (minimum; D/B = 'productivity or breeding success')	1.9	1.5	1.6	n/a	N/a			1.8
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)	2.6 (n=5 yrs)	2.0	3.1	n/a	n/a			2.6
H.	Number of nests that were discovered	94	13	14	2	0			123
I.	Number of nests that were regularly monitored or 'tracked'	75	11	10	0	0			96
J.	Number of 'tracked' nests that were successful (% = J/I x 100)	68.0% (51/75)	55% (6/11)	60% (6/10)	n/a	n/a			66% (63/96)
K.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)	32.0% (24/75)	36% (4/11)	30% (3/10)	n/a	n/a			32% (31/96)
L.	Number of 'tracked' nests that were parasitized by cowbirds (% = L/I x 100)	16.0% (12/75)	0	10% (1/10)	n/a/	n/a			14% (13/96)
M.	A. Number of 'tracked' nests that failed as a result of reproductive failure	2.7% (2/75)	9% (1/11)	0% (0/10)	n/a	n/a			3% (3/96)
	B. Number of 'tracked' nests that failed as a result of parasitism	8.0% (6/75)	0% (0/11)	10% (1/10)	n/a	n/a			7% (7/96)
	C. Number of 'tracked' nests that failed as a result of predation – Predation Rate according to Vireo Working Group	21.3% (16/75)	36% (4/11)	30% (3/10)	n/a	n/a			24% (23/96)
N.	Average clutch size	n/a	3.2	3.5	3.0	n/a			n/a
O.	Number of cowbird eggs found in or near vireo nests	15	0	2	1	n/a			18
P.	Number of cowbird nestlings removed from 'tracked' nests	0	0	0	n/a	n/a			0
Q.	Number of cowbird young fledged by vireo	1	1	0	n/a	n/a			2
R.	Number of 'manipulated' parasitized nests	10	0	1	0	n/a			11
S.	Number of 'successful, manipulated' nests (% = S/R x 100)	20.0% (2/10)	n/a	Unknown	n/a	n/a			20% (2/11)
T.	Number of vireo fledged from 'manipulated' parasitized nests	5	n/a	Unknown	n/a	n/a			5
U.	Number of repaired nests	1	0	0	0	n/a			1
V.	% successful repaired nests	n/d	n/a	n/a	n/a	n/a			n/a
W.	Number of vireo fledged from repaired nests	n/d	n/a	n/a	n/a	n/a			n/a

Table C-3. Least Bell's Vireo reproductive success and breeding biology data, monitored sites, in the Santa Ana River watershed, 2000-2013, BY MANAGED SITE

HIDDEN VALLEY

	Parameter	2000-2009	2010	2011	2012	2013			Totals
A.	Number of pairs	n/a	43	36	37	42			n/a
B.	Number of breeding (nesting) pairs	212	36	33	31	37			349
C.	Number of breeding pairs that were well-monitored throughout the breeding season	56	9	5	4	8			82
D.	Number of 'known fledged young' OBSERVED	407	53	41	45	66			612
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season	142	19	17	11	21			210
F.	Average number of fledglings produced per breeding pair (minimum; D/B = 'productivity or breeding success')	1.9	1.5	1.2	1.5	1.8			1.8
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)	2.5	2.1	3.4	2.8	2.6			2.6
H.	Number of nests that were discovered	114	18	11	8	10			161
I.	Number of nests that were regularly monitored or 'tracked'	85	17	10	8	8			128
J.	Number of 'tracked' nests that were successful (% = J/I x 100)	68% (58/85)	41% (7/17)	60% (6/10)	63% (5/8)	88% (7/8)			65% (83/128)
K.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)	36% (31/85)	65% (11/17)	30% (3/10)	0% (0/8)	25% (2/8)			37% (47/128)
L.	Number of 'tracked' nests that were parasitized by cowbirds (% = L/I x 100)	7% (6/85)	6% (1/17)	20% (2/10)	0% (0/8)	0% (0/8)			7% (9/128)
M.	A. Number of 'tracked' nests that failed as a result of reproductive failure	4% (3/85)	0% (0/17)	0% (0/10)	0% (0/8)	0% (0/8)			2% (3/128)
	B. Number of 'tracked' nests that failed as a result of parasitism	5% (4/85)	6% (1/17)	10% (1/10)	0% (0/8)	0% (0/8)			5% (6/128)
	C. Number of 'tracked' nests that failed as a result of predation – Predation Rate according to Vireo Working Group	24% (20/85)	53% (9/17)	30% (3/10)	38% (3/8)	13% (1/13)			28% (36/128)
N.	Average clutch size	n/a	3.4	3.1	3.2	3.3			N/A
O.	Number of cowbird eggs found in or near vireo nests	4	2	2	0	0			8
P.	Number of cowbird nestlings removed from 'tracked' nests	2	0	0	0	0			2
Q.	Number of cowbird young fledged by vireo	0	0	0	0	0			0
R.	Number of 'manipulated' parasitized nests	2	0	1	0	0			3
S.	Number of 'successful, manipulated' nests (% = S/R x 100)	100% (2/2)	n/a	100% (1/1)	n/a	n/a			100% (3/3)
T.	Number of vireo fledged from 'manipulated' parasitized nests	6	n/a	2	n/a	n/a			8
U.	Number of repaired nests	0	0	0	0	0			0
V.	% successful repaired nests	n/d	n/a	n/a	n/a	n/a			n/a
W.	Number of vireo fledged from repaired nests	n/d	n/a	n/a	n/a	n/a			n/a

Table C-3. Least Bell's Vireo reproductive success and breeding biology data, monitored sites, in the Santa Ana River watershed, 2000-2013, BY MANAGED SITE

HIDDEN VALLEY (north side)

	Parameter	2000-2009	2010	2011	2012	2013			Totals
A.	Number of pairs	n/a	12	2	3	2			n/a
B.	Number of breeding (nesting) pairs	n/a	9	2	2	2			15
C.	Number of breeding pairs that were well-monitored throughout the breeding season	n/a	6	0	0	0			6
D.	Number of 'known fledged young' OBSERVED	n/a	18	2	1	3			24
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season	n/a	14	0	n/a	n/a			14
F.	Average number of fledglings produced per breeding pair (minimum; D/B = 'productivity or breeding success')	n/a	2.0	1.0	n/a	1.5			1.6
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)	n/a	2.3	0	n/a	n/a			2.3
H.	Number of nests that were discovered	n/a	10	2	0	n/a			12
I.	Number of nests that were regularly monitored or 'tracked'	n/a	9	0	0	n/a			9
J.	Number of 'tracked' nests that were successful (% = J/I x 100)	n/a	56% (5/9)	n/a	n/a	n/a			56% (5/9)
K.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)	n/a	11% (1/9)	n/a	n/a	n/a			11% (1/9)
L.	Number of 'tracked' nests that were parasitized by cowbirds (% = L/I x 100)	n/a	33% (3/9)	n/a	n/a	n/a			33% (3/9)
M.	A. Number of 'tracked' nests that failed as a result of reproductive failure	n/a	0	n/a	n/a	n/a			0
	B. Number of 'tracked' nests that failed as a result of parasitism	n/a	33% (3/9)	n/a	n/a	n/a			33% (3/9)
	C. Number of 'tracked' nests that failed as a result of predation – Predation Rate according to Vireo Working Group	n/a	11% (1/9)	n/a	n/a	n/a			11% (1/9)
N.	Average clutch size	n/a	3.5	n/a	n/a	n/a			3.5
O.	Number of cowbird eggs found in or near vireo nests	n/a	4	n/a	n/a	n/a			4
P.	Number of cowbird nestlings removed from 'tracked' nests	n/a	0	n/a	n/a	n/a			0
Q.	Number of cowbird young fledged by vireo	n/a	0	0	n/a	n/a			0
R.	Number of 'manipulated' parasitized nests	n/a	2	n/a	0	n/a			2
S.	Number of 'successful, manipulated' nests (% = S/R x 100)	n/a	0% (0/2)	n/a	n/a	n/a			0%
T.	Number of vireo fledged from 'manipulated' parasitized nests	n/a	0% (0/2)	n/a	n/a	n/a			0%
U.	Number of repaired nests	n/a	0	n/a	0	n/a			0
V.	% successful repaired nests	n/a	n/a	n/a	n/a	n/a			n/a
W.	Number of vireo fledged from repaired nests	n/a	n/a	n/a	n/a	n/a			n/a

Table C-3. Least Bell's Vireo reproductive success and breeding biology data, monitored sites, in the Santa Ana River watershed, 2000-2013, BY MANAGED SITE

TEMESCAL CANYON

	Parameter	2000-2009	2010	2011	2012	2013			Totals
A.	Number of pairs	n/a	49	65	63	50			n/a
B.	Number of breeding (nesting) pairs	146	38	57	48	42			331
C.	Number of breeding pairs that were well-monitored throughout the breeding season	81	11	18	8	0			118
D.	Number of 'known fledged young' OBSERVED	339	73	113	71	48			644
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season	217	34	52	24	0			327
F.	Average number of fledglings produced per breeding pair (minimum; D/B = 'productivity or breeding success')	2.3	1.9	2.0	1.5	1.1			1.9
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)	2.7	3.1	2.9	3.0	0			2.8
H.	Number of nests that were discovered	166	22	35	16	3			242
I.	Number of nests that were regularly monitored or 'tracked'	133	15	32	12	0			192
J.	Number of 'tracked' nests that were successful (% = J/I x 100)	62% (82/133)	87% (13/15)	69% (22/32)	58% (7/12)	n/a			65% (124/192)
K.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)	39% (52/133)	20% (3/15)	34% (11/32)	0% (0/12)	n/a			34% (66/192)
L.	Number of 'tracked' nests that were parasitized by cowbirds (% = L/I x 100)	20% (27/133)	0% (0/15)	3% (1/32)	25% (3/12)	n/a			16% (31/192)
M.	A. Number of 'tracked' nests that failed as a result of reproductive failure	3.8% (5/133)	0/15	0% (0/32)	0% (0/12)	n/a			3% (5/192)
	B. Number of 'tracked' nests that failed as a result of parasitism	3.0% (4/133)	0/15	0% (0/32)	17% (2/12)	n/a			3% (6/192)
	C. Number of 'tracked' nests that failed as a result of predation – Predation Rate according to Vireo Working Group	32% (42/133)	13% (2/15)	31% (10/32)	25% (3/12)	n/a			30% (57/192)
N.	Average clutch size	n/a	3.7	3.5	3.5	3.7			n/a
O.	Number of cowbird eggs found in or near vireo nests	33	0	1	5	0			39
P.	Number of cowbird nestlings removed from 'tracked' nests	2	0	0	0	0			2
Q.	Number of cowbird young fledged by vireo	2	0	0	0	0			2
R.	Number of 'manipulated' parasitized nests	29	0	1	2	0			32
S.	Number of 'successful, manipulated' nests (% = S/R x 100)	41% (12/29)	0	100% (1/1)	100% (2/2)	n/a			47% (15/32)
T.	Number of vireo fledged from 'manipulated' parasitized nests	26	na	2	6	n/a			34
U.	Number of repaired nests	0	0	3	0	0			3
V.	% successful repaired nests	n/d	na	67% (2/3)	n/a	n/a			67% (2/3)
W.	Number of vireo fledged from repaired nests	n/d	na	3	n/a	n/a			3

Table C-3. Least Bell's Vireo reproductive success and breeding biology data, monitored sites, in the Santa Ana River watershed, 2000-2013, BY MANAGED SITE

SANTA ANA CANYON – UPPER CANYON

	Parameter	2000-2009	2010	2011	2012	2013			Totals
A.	Number of pairs	n/a	4	5	4	14			n/a
B.	Number of breeding (nesting) pairs	110	3	5	4	12			134
C.	Number of breeding pairs that were well-monitored throughout the breeding season	46	0	0	1	4			51
D.	Number of 'known fledged young' OBSERVED	208	6	5	6	23			248
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season	118	n/a	n/a	3	12			133
F.	Average number of fledglings produced per breeding pair (minimum; D/B = 'productivity or breeding success')	1.9	2.0	1.0	1.5	1.9			1.9
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)	2.6	n/a	n/a	3.0	3.0			2.6
H.	Number of nests that were discovered	97	2	2	2	6			109
I.	Number of nests that were regularly monitored or 'tracked'	64	1	0	1	5			71
J.	Number of 'tracked' nests that were successful (% = J/I x 100)	64% (41/64)	100% (1/1)	n/a	100% (1/1)	80% (4/5)			66% (47/71)
K.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)	41% (26/64)	0% (0/1)	n/a	0% (0/1)	40% (2/5)			39% (28/71)
L.	Number of 'tracked' nests that were parasitized by cowbirds (% = L/I x 100)	6.3% (4/64)	0% (0/1)	n/a	0% (0/1)	0% (0/5)			6% (4/71)
M.	A. Number of 'tracked' nests that failed as a result of reproductive failure	4.7% (3/64)	0% (0/1)	n/a	0% (0/1)	0% (0/5)			4% (3/71)
	B. Number of 'tracked' nests that failed as a result of parasitism	3.1% (2/64)	0% (0/1)	n/a	0% (0/1)	0% (0/5)			3% (2/71)
	C. Number of 'tracked' nests that failed as a result of predation – Predation Rate according to Vireo Working Group	28% (18/64)	0% (0/1)	n/a	0% (0/1)	20% (1/5)			27% (19/71)
N.	Average clutch size	n/a	4.0	4.0	3.0	3.5			n/a
O.	Number of cowbird eggs found in or near vireo nests	3	0	0	0	0			3
P.	Number of cowbird nestlings removed from 'tracked' nests	1	0	n/a	0	0			1
Q.	Number of cowbird young fledged by vireo	0	0	0	0	0			0
R.	Number of 'manipulated' parasitized nests	1	0	0	0	0			1
S.	Number of 'successful, manipulated' nests (% = S/R x 100)	100% (1/1)	n/a	n/a	n/a	n/a			100% (1/1)
T.	Number of vireo fledged from 'manipulated' parasitized nests	1	n/a	n/a	n/a	n/a			1
U.	Number of repaired nests	2	0	0	0	0			2
V.	% successful repaired nests	0% (0/2)	n/a	n/a	n/a	n/a			0% (0/2)
W.	Number of vireo fledged from repaired nests	0	n/a	n/a	n/a	n/a			0

Table C-3. Least Bell's Vireo reproductive success and breeding biology data, monitored sites, in the Santa Ana River watershed, 2000-2013, BY MANAGED SITE

SANTA ANA CANYON – GREEN RIVER GOLF CLUB

	Parameter	2000-2009	2010	2011	2012	2013			Totals
A.	Number of pairs	n/a	17	14	11	19			n/a
B.	Number of breeding (nesting) pairs	92	14	12	8	15			141
C.	Number of breeding pairs that were well-monitored throughout the breeding season	44	4	7	4	2			61
D.	Number of 'known fledged young' OBSERVED	192	19	19	11	19			260
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season	118	7	15	9	0			149
F.	Average number of fledglings produced per breeding pair (minimum; D/B = 'productivity or breeding success')	2.1	1.4	1.6	1.4	1.3			1.8
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)	2.7	1.8	2.1	2.3	0.0			2.4
H.	Number of nests that were discovered	73	7	13	7	5			105
I.	Number of nests that were regularly monitored or 'tracked'	61	7	11	5	4			88
J.	Number of 'tracked' nests that were successful (% = J/I x 100)	72% (44/61)	43% (3/7)	45% (5/11)	60% (3/5)	25% (1/4)			64% (56/88)
K.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)	26% (16/61)	71% (5/7)	55% (6/11)	20% 1/5)	50% (2/4)			34% (30/88)
L.	Number of 'tracked' nests that were parasitized by cowbirds (% = L/I x 100)	6.6% (4/61)	0% (0/7)	0% (0/11)	0% (0/5)	0% (0/4)			5% (4/88)
M.	A. Number of 'tracked' nests that failed as a result of reproductive failure	6.6% (4/61)	0% (0/7)	0% (0/11)	20% (1/5)	0% (0/4)			6% (5/88)
	B. Number of 'tracked' nests that failed as a result of parasitism	1.6% (1/61)	0% (0/7)	0% (0/11)	0% (0/5)	0% (0/4)			1% (1/88)
	C. Number of 'tracked' nests that failed as a result of predation – Predation Rate according to Vireo Working Group	20% (12/61)	57% (4/7)	55% (6/11)	20% (1/5)	75% (3/4)			30% (26/88)
N.	Average clutch size	n/a	4.0	3.4	3.2	3.0			n/a
O.	Number of cowbird eggs found in or near vireo nests	4	0	0	0	0			4
P.	Number of cowbird nestlings removed from 'tracked' nests	0	0	0	0	0			0
Q.	Number of cowbird young fledged by vireo	0	0	0	0	0			0
R.	Number of 'manipulated' parasitized nests	2	0	0	0	0			0
S.	Number of 'successful, manipulated' nests (% = S/R x 100)	100% (2/2)	n/a	n/a	n/a	n/a			100% (2/2)
T.	Number of vireo fledged from 'manipulated' parasitized nests	6	n/a	n/a	n/a	n/a			6
U.	Number of repaired nests	4	0	0	0	0			4
V.	% successful repaired nests	75% (3/4)	n/a	n/a	n/a	n/a			75% (3/4)
W.	Number of vireo fledged from repaired nests	7	n/a	n/a	n/a	n/a			7

Table C-3. Least Bell's Vireo reproductive success and breeding biology data, monitored sites, in the Santa Ana River watershed, 2000-2013, BY MANAGED SITE

SANTA ANA RIVER – FEATHERLY PARK

	Parameter	2000-2009	2010	2011	2012	2013			Totals
A.	Number of pairs	n/a	23	19	16	45			n/a
B.	Number of breeding (nesting) pairs	109	18	18	11	37			193
C.	Number of breeding pairs that were well-monitored throughout the breeding season	36	3	7	2	10			58
D.	Number of 'known fledged young' OBSERVED	175	22	23	12	55			287
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season	73	6	14	0	17			110
F.	Average number of fledglings produced per breeding pair (minimum; D/B = 'productivity or breeding success')	1.6	1.2	1.3	1.1	1.5			1.5
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)	2.0	2.0	2.0	0	1.7			1.9
H.	Number of nests that were discovered	83	11	12	8	23			137
I.	Number of nests that were regularly monitored or 'tracked'	65	7	5	4	14			95
J.	Number of 'tracked' nests that were successful (% = J/I x 100)	49% (32/65)	29% (2/7)	100% (5/5)	0% (0/4)	50% (7/14)			48% (46/95)
K.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)	48% (31/65)	71% (5/7)	20% (1/5)	100% (4/4)	50% (7/14)			51% (48/95)
L.	Number of 'tracked' nests that were parasitized by cowbirds (% = L/I x 100)	7.7% (5/65)	0% (07)	0% (0/5)	0% (0/4)	0% (0/14)			5% (5/95)
M.	A. Number of 'tracked' nests that failed as a result of reproductive failure	4.7% (3/65)	0% (0/7)	0% (0/5)	0% (0/4)	7% (1/14)			4% (4/95)
	B. Number of 'tracked' nests that failed as a result of parasitism	3.1% (2/65)	0% (0/7)	0% (0/5)	0% (0/4)	0% (0/14)			2% (2/95)
	C. Number of 'tracked' nests that failed as a result of predation – Predation Rate according to Vireo Working Group	43% (28/65)	71% (5/7)	0% (0/5)	100% (4/4)	43% (6/14)			45% (43/95)
N.	Average clutch size	n/a	4.0	3.6	4.0	3.4			n/a
O.	Number of cowbird eggs found in or near vireo nests	4	0	0	0	0			4
P.	Number of cowbird nestlings removed from 'tracked' nests	1	0	0	0	0			1
Q.	Number of cowbird young fledged by vireo	0	0	0	0	0			0
R.	Number of 'manipulated' parasitized nests	3	0	0	0	0			3
S.	Number of 'successful, manipulated' nests (% = S/R x 100)	33% (1/3)	n/a	n/a	n/a	n/a			33% (1/3)
T.	Number of vireo fledged from 'manipulated' parasitized nests	2	n/a	n/a	n/a	n/a			2
U.	Number of repaired nests	4	1	0	0	0			5
V.	% successful repaired nests	100% (4/4)	100% (1/1)	n/a	n/a	n/a			100% (5/5)
W.	Number of vireo fledged from repaired nests	14	2	n/a	n/a	n/a			16

Table C-3. Least Bell's Vireo reproductive success and breeding biology data, monitored sites, in the Santa Ana River watershed, 2000-2013, BY MANAGED SITE

CHINO HILLS

	Parameter	2000-2009	2010	2011	2012	2013			Totals
A.	Number of pairs	n/a	7	3	2	5			n/a
B.	Number of breeding (nesting) pairs	37	4	1	2	4			48
C.	Number of breeding pairs that were well-monitored throughout the breeding season	15 (n=4 yrs)	3	0	1	1			20 (n=7 yrs)
D.	Number of 'known fledged young' OBSERVED	54	7	1	1	7			70
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season	19 (n=4 yrs)	5	n/a	0	4			28 (n=7 yrs)
F.	Average number of fledglings produced per breeding pair (minimum; D/B = 'productivity or breeding success')	1.5	1.8	n/a	0.5	1.8			1.5
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)	1.3 (n=4 yrs)	1.7	n/a	0	4.0			1.4
H.	Number of nests that were discovered	24	3	0	1	1			29
I.	Number of nests that were regularly monitored or 'tracked'	19	3	n/a	1	1			24
J.	Number of 'tracked' nests that were successful (% = J/I x 100)	32% (6/19)	67% (2/3)	n/a	0% (0/1)	100% (1/1)			38% (9/24)
K.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)	63% (12/19)	33% (1/3)	n/a	100% (1/1)	0% (0/1)			58% (14/24)
L.	Number of 'tracked' nests that were parasitized by cowbirds (% = L/I x 100)	32% (6/19)	0% (0/3)	n/a	0% (0/1)	0% (0/1)			25% (6/24)
M.	A. Number of 'tracked' nests that failed as a result of reproductive failure	5.3% (1/19)	0% (0/3)	n/a	0% (0/1)	0% (0/1)			4% (1/24)
	B. Number of 'tracked' nests that failed as a result of parasitism	10.5% (2/19)	0% (0/3)	n/a	0% (0/1)	0% (0/1)			8% (2/24)
	C. Number of 'tracked' nests that failed as a result of predation – Predation Rate according to Vireo Working Group	53% (10/19)	33% (1/3)	n/a	100% (1/1)	0% (0/1)			50% (12/24)
N.	Average clutch size	n/a	3.7	n/a	3.0	4.0			n/a
O.	Number of cowbird eggs found in or near vireo nests	9	0	n/a	0	0			9
P.	Number of cowbird nestlings removed from 'tracked' nests	0	0	n/a	0	0			0
Q.	Number of cowbird young fledged by vireo	0	0	n/a	0	0			0
R.	Number of 'manipulated' parasitized nests	6	0	n/a	0	0			6
S.	Number of 'successful, manipulated' nests (% = S/R x 100)	0% (0/6)	n/a	n/a	n/a	n/a			0% (0/6)
T.	Number of vireo fledged from 'manipulated' parasitized nests	0	n/a	n/a	n/a	n/a			0
U.	Number of repaired nests	0	0	n/a	0	0			0
V.	% successful repaired nests	n/d	n/a	n/a	n/a	n/a			n/a
W.	Number of vireo fledged from repaired nests	n/d	n/a	n/a	n/a	n/a			n/a

Table C-3. Least Bell's Vireo reproductive success and breeding biology data, monitored sites, in the Santa Ana River watershed, 2000-2013, BY MANAGED SITE

IRVINE REGIONAL PARK

	Parameter	2000-1009	2010	2011	2012	2013			Totals
A.	Number of pairs	n/a	14	9	5	n/a			n/a
B.	Number of breeding (nesting) pairs	n/a	9	5	5	n/a			19
C.	Number of breeding pairs that were well-monitored throughout the breeding season	n/a	3	1	0	n/a			4
D.	Number of 'known fledged young' OBSERVED	n/a	18	7	5	n/a			30
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season	n/a	11	2	n/a	n/a			13
F.	Average number of fledglings produced per breeding pair (minimum; D/B = 'productivity or breeding success')	n/a	2.0	1.4	n/a	n/a			1.6
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)	n/a	3.6	2.0	n/a	n/a			3.3
H.	Number of nests that were discovered	n/a	5	1	n/a	n/a			6
I.	Number of nests that were regularly monitored or 'tracked'	n/a	4	1	n/a	n/a			5
J.	Number of 'tracked' nests that were successful (% = J/I x 100)	n/a	75% (3/4)	100% (1/1)	n/a	n/a			80% (4/5)
K.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)	n/a	25% (1/4)	n/a	n/a	n/a			20% (1/5)
L.	Number of 'tracked' nests that were parasitized by cowbirds (% = L/I x 100)	n/a	0	n/a	n/a	n/a			0
M.	A. Number of 'tracked' nests that failed as a result of reproductive failure	n/a	0	n/a	n/a	n/a			0
	B. Number of 'tracked' nests that failed as a result of parasitism	n/a	0	n/a	n/a	n/a			0
	C. Number of 'tracked' nests that failed as a result of predation – Predation Rate according to Vireo Working Group	n/a	25% (1/4)	n/a	n/a	n/a			20% (1/5)
N.	Average clutch size	n/a	3.5	2.0	n/a	n/a			n/a
O.	Number of cowbird eggs found in or near vireo nests	n/a	4	0	n/a	n/a			4
P.	Number of cowbird nestlings removed from 'tracked' nests	n/a	0	0	n/a	n/a			0
Q.	Number of cowbird young fledged by vireo	n/a	0	0	n/a	n/a			0
R.	Number of 'manipulated' parasitized nests	n/a	n/a	n/a	n/a	n/a			0
S.	Number of 'successful, manipulated' nests (% = S/R x 100)	n/a	n/a	n/a	n/a	n/a			0
T.	Number of vireo fledged from 'manipulated' parasitized nests	n/a	n/a	n/a	n/a	n/a			0
U.	Number of repaired nests	n/a	0	0	n/	n/a			0
V.	% successful repaired nests	n/a	n/a	n/a	n/a	n/a			0
W.	Number of vireo fledged from repaired nests	n/a	n/a	n/a	n/a	n/a			0