Status and Management of the Least Bell's Vireo and Southwestern Willow Flycatcher in the Santa Ana River Watershed, 2012, and Summary Data by Site and Watershed-wide, 2000-2012

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ABSTRACT

The 2012 monitoring effort for the Least Bell's Vireo, *Vireo belli pusillus*, documented a decrease in abundance for the second year. In 2012, vireo abundance throughout the watershed, including Prado, declined by 10% from 2011 and 14% from 2010. Twelve hundred thirty-seven Least Bell's Vireos were documented throughout the watershed by SAWA , Prado, and cooperating agencies. The number of pairs decreased by 12% from 2011 and 26% from 2010. Fledgling counts decreased 19% from 2011 and 32% from 2010.

Productivity based on SAWA's well-monitored pairs in 2012 was 2.8, a 0.1 decline from 2.9 in 2011. Nesting success was 60%. Nesting success has ranged between 56% and 65% in the last 3 years. The depredation rate was 34% in 2012, a decrease from 36% in 2011.

SAWA's parasitism rate increased to 5% in 2012 from 2% in 2011. Rates in the last 3 years are dramatically lower than the previous rates which ranged between 14 and 28%.

Ten vireos fledged from four manipulated nests; two nests were repaired and fledged six young.

Fifty-one per cent of nests were placed in four species of willow, Salix spp. and 23% were placed in mulefat, *Baccharis salicifolia*.

Brown-headed Cowbirds, *Molothrus ater*, were also managed throughout the watershed. Over 2,800 cowbirds were removed from 46 traps over 5,400 trap days between 3/19/12 and 8/3/12. An additional 4,138 cowbirds were removed from the watershed during the winter of 2011-2012 over 1,303 trap days.

No breeding Southwestern Willow Flycatchers, *Empidonax trailli extimus*, or Yellow-billed Cuckoos, *Coccyzus americianus occidentalis*, were detected outside the Prado Basin in 2012. Incidental sightings of other sensitive birds were documented. A minimum of 814 Yellow Warblers, *Setophaga petechia*, and 177 Yellow-breasted Chats, *Icteria virens*, were detected throughout the watershed.

Since the Santa Ana Watershed Program began vireo and cowbird management, over 4,900 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 from March into August. The surveys began in March and ended in September and October (Table 2A). 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 2012.

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. Fifty sites were surveyed during the 2012 season, usually three times, mainly during the first weeks of May, June and July (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-eight 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 will 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 2012, no nest monitoring was done at the March SKR Preserve, Sycamore Canyon, Riverside, or the north side of Hidden Valley along the Santa Ana River. SAWA's surveys in the peripheral sites took place as usual.

A minimum of 6,500 field hours was spent in 2012 for the vireo management program including 2,300 hours on vireo monitoring and nest management, 471 hours on the vireo assessment surveys, and 2,800 hours on the spring/summer cowbird trapping program and over 1,000 hours 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.

Appendices. Appendices A and AA contains the GPS points and maps for all survey sites. Appendix B contains the annual totals for all statistics. Appendix C contains 2010-2012 annual data by site. Appendix D contains annual data by site for 2000-2009, now under separate cover.

Study Sites

The Santa Ana River was monitored from Mission Boulevard 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. 2012. The following tributaries to the Santa Ana River were surveyed: San Timoteo Canyon, Sycamore Canyon, March SKR Preserve, Mockingbird Canyon, Harrison Reservoir (McAllister Creek), Temescal Canyon, Chino Hills-Butterfield Ranch environs and the San Jacinto watershed (Figure 1 and Appendix D).

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, intensive nest monitoring has been done on approximately 340 acres (138 ha) in Hidden Valley Wildlife Preserve on the north side of the river. 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). In 2012, the habitat within the SARI line project in lower Featherly Park was not surveyed by SAWA. 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.

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.

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. SAWA biologists have been refused entry into the easements owned by the Riverside-Corona Resource Conservation District which includes the Dos Lagos Golf Course habitat. Surveys at that 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 and Giovanni Arechavaleta. The Santa Ana River between Mission Boulevard and Van Buren Boulevard was surveyed by Talula Barbee with assistance from Cameron MacBeth; Hidden Valley, south side, was surveyed by Sue Hoffman with assistance from many of the SAWA biologists; Hidden Valley, north side was surveyed by Talula Barbee, 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 Terry Reeser and Sue Hoffman; Temescal Creek was surveyed by Melody Aimar with support from Henry Armijo; Mockingbird Canyon was surveyed by Jill Coumoutso and Giovanni Arechavaleta, Sycamore Canyon and March SKR Preserve were surveyed by Giovanni Arechavaleta, Chino Hills was surveyed by Terry Reeser; San Jacinto was surveyed by Allyson Beckman.

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 the site at Van Buren Blvd at Bountiful to small patches in urban parks as found in Norco and Chino Hills. Irvine Regional Park was surveyed as an assessment site in 2012.

Appendix A contains the UTM coordinates of the upstream and downstream boundaries of the drainages surveyed. Appendix D contains maps of all the site surveyed for vireo. Figure 1 visually displays the monitoring sites throughout the watershed.

RESULTS

Vireo Abundance

The 2012 monitoring effort for the Least Bell's Vireo, *Vireo belli pusillus*, documented a decrease in abundance for the second year. In 2012, vireo abundance throughout the watershed, including Prado, declined by 10% from 2011 and 14% from 2010. Twelve hundred thirty-seven Least Bell's Vireos were documented throughout the watershed by SAWA , Prado, and cooperating agencies. The number of pairs decreased by 12% from 2011 and 26% from 2010. Fledgling counts decreased 19% from 2011 and 32% from 2010 (Tables 1A and 1B).

Sites monitored by SAWA in 2012 showed at 7% decline from 2011 and an 8% decline from 2010 (Table 1A). In 2012, 756 male territories were documented, down from 810 in 2011 and 821 in 2010. Prado Basin showed an even greater decline with a decrease of 21% from 2010 (PIke et al 2012) (Table 1A).

In 2012, SAWA managed sites had mixed results with respect to abundance. The number of territories documented was lower on the river at Norco and above Van Buren Blvd. but higher at Hidden Valley. San Timoteo, San Jacinto, and Chino Hills populations were stable, with abundance within a few territories of 2011 numbers. The population in Temescal has increased 30% since 2010. Three sites are showing dramatic declines. Mockingbird Canyon showed a 24% decline from 2011 and a 35% decline from 2010. The vireo population on the Santa Ana River above Van Buren has declined 38% since 2010. The Santa Ana Canyon has declined 13% since 2010.

San Bernardino County Flood Control biologist Theresa Sims reported 30 territories on the Santa Ana River between Riverside Dr. and Waterman, a 29% decrease. Forty-two territories had been detected in 2010 and 2011.

At sites managed by SAWA, reproductive success was 2.8 young/pair (Table 5). The number of observed fledglings decreased 21%, from 626 to 494, at managed sites.

Four hundred ninety-four fledglings were detected at managed sites over 2,364 field hours, or .21 fledglings detected per hour of field work (Table 3). In 2011, .23 fledglings/hr. were documented, in 2010, 0.24 fledgling/hr, and in 2009, .27 fledglings were documented.

MSHCP miscellaneous sighting in Temescal at Aberhill is noted in Tables 1A and 1B; othewise vireo sightings reported to us by MSHCP were considered duplications. SAWA biologists also monitored the vireos at East Coyotes Hills Preserve in Fullerton for the Center for Natural Lands Management and documented 2 territories (not included in watershed totals).

Abundance - Vireo Assessment Surveys

One hundred forty-six vireo territories were detected at 49 sites in the Santa Ana watershed during the 2012 assessment surveys (Tables 10 and 11). This count has ranged from 159 to 156 in the last 3 years. 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 to 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 31 of the 49 sites for an occupation rate of 63%, a rate higher than the last three years (52% in 2011, 54% in 2010 and 53% in 2009). This higher rate is probably an artifact of this year's methodology; sites with little or no historical occupancy were excluded from the surveys due to staffing shortages. Anecdotally, biologists found that birds seemed quiet this year. Fewer viroes were documented at several sites: Santiago Creek at Cannon, Kabian, Peters's Canyon, Poorman Resevoir in Riverside, and Chino Hills State Park all had fewer birds documented. 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.

Brown-headed Cowbirds were observed at 34% (17/50) of the sites in 2012.

No 'control' sites were surveyed this year. Usually, SAWA will ask a biologist, unfamiliar with a site, to survey a site with a known number of bird.

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

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

*includes Murrieta Creek (outside the SA watershed) ** excludes Murrieta Creek not surveyed

Chronology of Breeding Activity

Surveys began throughout the watershed between 3/19 and 4/10 and ended between 7/17 and 9/19 (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 4/10 at Mockingbird Canyon. All larger subpopulations showed 50% occupancy by 5/9. The earliest date for 50% paired was 5/8 in the Santa Ana Canyon at the Green River Golf Club and the Upper Canyon below Prado Dam, and 5/9 at Mockingbird Canyon. The first nest was found on 4/5 in Featherly Park; the last nest was found on 7/6 in Mockingbird Canyon. The first and last fledging occurred on the Santa Ana River at Norco on 5/13/12 and 7/20 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). Four species of willow held 51% of the nests (n=72/140) in 2012. Arroyo willow, *Salix lasiolepis*, was the most preferred of the willows holding 31 nests. Mulefat, *Baccharis salicifolia*, held 23% (32/140) of the all nests.

Other nest-host species in 2012 included but not limited to: wild grape, *Vitis girdiana*; Mexican elderberry, *Sambucus mexicana*; Fremont cottonwood, *Populus fremontii*; Tamarisk, *Tamarix ramosissima*; Peruvian pepper, *Schinus molle*; mugwort, *Artemisia douglasiana*; orange tree, *citrus sinensis*; toyon, *Hetermeles arbutifolia*; and California Blackberry, *Rubus ursinus*.

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).

Reproductive Success

Reproductive success as measured by productivity of well-tracked pairs decreased slightly in 2012 to 2.8 from 2.9 in 2011. The rate over the last three years has ranged from 2.7 to 2.9. (Appendix B-3). Nesting success increased to 60% in 2012 from 56% in 2011. 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. (See Appendix C, Site Summaries, for individual site data over time.).

Predation Rates

In 2012, the depredation rate (complete nest loss due to missing eggs or chicks before the expected fledge date) was 34%. Rates varied among sites (Table 5, row M.c.). At sites with more than 5 nests monitored, rates varied between 18% and 47%. Historically, watershed-wide, nest loss due to depredation is 31% (Appendix B, Table B-3, row M.c.).

Again in 2012, most nest losses were due to unknown predators. Of note may be that J. Coumoutso followed a vireo nest within a foot and a half of a Caltifornia Thrarsher, *Toxostoma redivivum*, nest. Both were successful.

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. The ponds at Hidden Valley remained empty in 2006 until early June when repair work was done. The levee broke again in 2008 and was repaired but the storms of 2010 again broke the levee and the system remains unrepaired.

Brown-headed Cowbird Parasitism

Although the parasitism rate increased to 5% in 2012 from 2% in 2011, the actual number of parasitized nests increased only by one nest, from five in 2011 to six in 2012.

Parasitism was documented at four sites in 2011: the San Jacinto River, San Timoteo Canyon, Mockingbird Canyon, and Temescal Canyon. Parasitism occurred at four sites in 2011, three sites in 2010, seven sites in 2009, and five sites in 2008.

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.

Parasitism occurred at five sites in 2008. These sites included San Timoteo, the Santa Ana River at Norco, and Temescal, all of which usually have parasitism. San Timoteo accounted for 54% of all parasitized nests this year. Sycamore Canyon and Mockingbird Canyon, which have episodic occurrences, also had parasitism this year. 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.

Parasitism occurred at six sites in 2007 up from four sites in 2006 and including those same sites: San Timoteo, the Santa Ana River between River Road and Norco, Temescal and San Jacinto. The two additional sites parasitized in 2007 were Hidden Valley and Chino Hills. 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.

Only 2% of nests were lost to parasitism in 2012. 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 2012, four nests were manipulated. All four were successful and fledged 10 young. In 2011, three manipulated nests fledged four birds. Two nests were successful and fledged two birds each; the third nest had an unknown result. In 2010, five manipulated nests had a 60% success rate and fledged eight vireos. In 2009, 18 manipulated nests had a 39% success rate and fledged 16 vireos. In 2008, 30 vireos, or 5% of the fledglings observed, fledged from 21 manipulated nests; all of these fledglings fledged from nests in San Timoteo and Temescal. Fifty-seven percent of manipulated nests were successful in 2008. In 2007, 19 nests were manipulated with a 43% success rate and produced 16 vireos. In 2006, 16 nests were manipulated with a 69% success rate and produced 24 young. In 2005, 26 nests were manipulated with a 54% success rate and produced 25 young. In 2004, 40% of the manipulated nests successfully fledged 18 young.

Repaired Vireo Nests

Two nests, one in San Jacinto and one in San Timoteo, were repaired in 2012. Both nests were observed with the openings at about ninety-degree angles from their original positions and were repaired by a biologist with zip ties to secure the rim of the nest to the branch. Both nests were successful and produced six fledglings. Sixty-one vireos have fledged from 30 repaired nests since 2000.

Seven nests hanging sideways were repaired in 2011. Nests in San Timoteo and Mockingbird Canyon were repaired with short zip-ties. In Temescal the biologist repaired a nest with a belt-clip from a GPS unit and stems and later with needle and thread but the nest was unsuccessful. Three of four 5-6 day-old nestlings were found dead below a hanging nest. One nestling remained and the nest was secured with stems and the nestling successfully fledged. Nesting success for all repaired nests was 86% and these nests fledged 16 vireos.

Two nests were repaired in 2010 and one of the nests fledged two young. A sagging branch holding a nest was zip-tied to another branch to bring the nest level. The two eggs that hatched probably received the heat from incubation while the nest was tilted; two other eggs did not hatch. A nest hanging from a branch in San Timoteo was reattached with thread but the nest failed.

In 2009, four nests were repaired and fledged 12 vireos; 75% of repaired nests were successful (Table 5). One of the nests was built in emerging growth from a burned elderberry in Featherly Park. The nest was supported by branches placed under the nest. In Norco, the biologist used wire to attach a sagging branch to a stronger branch. The nest contained 8-day old nestlings. In San Jacinto, the rim of a nest became detached from the branch so the biologist zip-tied the rim to the branch. On the Santa Ana River, a sagging branch of mulefat with a nest was attached to a second branch for support with a zip-tie but the nest was depredated.

No nests were repaired in 2008. Five nests were repaired during the 2007 season with a 60% success rate. Five young fledged from repaired nests. Two nests were repaired in San Timoteo; one successfully produced a fledgling. The repaired nest along the river in Norco failed. The two nests repaired at the Green River Golf Club and Featherly Park successfully fledged four young. Three nests were repaired during the 2006 season with a 67% success rate and fledging four young. One nest was repaired

in Mockingbird Canyon and fledged one young. Two nests were repaired in the Santa Ana Canyon at the Green River Golf Club; one nest was successful and fledged three young. The two nests at the Green River Golf Club were repaired by securing the side of the nest to the branch with white zip ties. The nest in *Arundo* was eventually depredated. The second nest, in willow, was dangling from the branch with the three nestlings on the verge of tumbling out. The parents were very actively feeding the nestlings. A second repair was also made on the second nest. After both repairs, the parents returned to the nest and seemed oblivious to the new material. At Mockingbird, the nest was braced with a branch to keep it upright.

Five nests were repaired during the 2005 season. Four nests were repaired in the Santa Ana Canyon and one in San Jacinto. The nests needing support were built in hemlock, cocklebur, narrow-leaf willow, black willow, and mulefat. The nest in narrow-leaf willow successfully fledged four vireos. The nest in hemlock lost its three eggs to either depredation or to the branch failing. The nest in cocklebur was depredated with the loss of four eggs. The nest in black willow was secured to its branches with thread. It successfully fledged its three nestlings. The fifth nest, in mulefat, was located in the San Jacinto River. It was repaired with mulefat stems, wire, and duct tape. It fledged two young. Overall, the success rate was 60% and nine young fledged.

Tolerance of vireos to the repair work varies. Some birds scold then leave. Others continued to scold while the work was being done. One bird perched quietly nearby and then returned to the nest after the nest had been secured.

Site Summaries 2012

SAN JACINTO SUMMARY

In 2012 forty-two vireo territories were detected, up from 41 in 2011. 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. Seven territories were located in the San Jacinto Wildlife Area, up from 5 territories in 2011. Riparian habitat along the river between Sanderson Road and Bridge Street had been removed many years ago but it has since grown back and is now suitable for vireo. Two territories were detected at this site in 2012; four territories were detected in 2011.

Thirty-six known pairs and 49 fledglings were detected in 2012. Nesting success was 69%, well up from only 10% in 2011. Nest losses were due to predation (4 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 56% based on 80 well-tracked nests. Depredation has been the major cause of nest loss in the last 9 years (27 of 80 nests, or 34%). Since 2005, 199 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,

17,283 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.

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 (52%) and Mulefat (39%) have been the primary plant species used for nest placement in San Jacinto since 2004 (n= 88 nests). Black willow held another 6% of nests. Only 3 of the 88 nests found from 2004-2012 were placed in non-native vegetation, two (2%) in Tamarisk and one (1%) in Black mustard.

SAN TIMOTEO SUMMARY

In 2012, 118 vireo territories were documented in San Timoteo, up 2% from the 116 documented in 2011. However, the population in San Timoteo has experienced an overall increase of over 2200% in the past 12 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 giant reed and Tamarisk (*Tamarix sp.).* SAWA removed 239 acres of invasive plants from 1997 to 2001, and continues a maintenance program to control regrowth. Restoration of the native plant community through natural recruitment has taken place throughout the canyon resulting in a healthy riparian under-story, effects of natural storm cycles notwithstanding.

One hundred-two pairs and 153 fledglings were detected in 2012. Nesting success was 64%, up from 60% in 2011. Nest losses were primarily due to predation (33%). Thirty-two well-monitored pairs had a 2.8 reproductive success rate, down from 3.4 in 2011. Nesting success is 58% over twelve years of monitoring (n=493 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 12 years; 33% of all nests have been lost due to depredation. Overall reproductive success based on productivity of well-tracked pairs in the last 12 years is 2.8 and has ranged from a low in 2004 of 0.8 to a high of 3.9 in 2009.

Cowbird trapping has occurred in San Timoteo since 2001, and a total of 1,912 cowbirds have been removed from San Timoteo Canyon during this time. 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 22% over twelve years (107 of 493 nests), only 5% of nests (26 of 493) have failed due to parasitism. There was no failure of nests due to parasitism in 2010 or 2011. This low failure rate is primarily a result of intensive nest monitoring efforts which include nest manipulation.

Mulefat (28%), Arroyo willow (21%) and Red willow (17%) have been the primary plant species used for nest placement in San Timoteo since 2001 (n= 546 nests). Black willow held another 11% of the nests. Only five nests found from 2001-2012 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 is beginning 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.

In 2012, seven vireo territories were detected. Seven pairs and five fledglings were detected over 22 hours of monitoring (average number of fledglings/pair = 0.7).

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

Thirteen vireo territories, eleven pairs, and eight fledglings were detected in March SKR Preserve in 2012. Since SAWA began monitoring in 2004, 7 to 16 vireo territories have been documented in March SKR Preserve annually and over 100 fledglings have been detected. In 2012, adjacent habitat along Van Buren Blvd. supported an additional 2 vireo territories; 2 to 4 vireos have been documented in that habitat since 2005.

Measures of reproductive success have varied over the years, due in part to differential monitoring efforts. In 2012, 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. Although nesting data was not collected this year, Black willow has been the primary choice for nest placement at this site in previous years, along with Red willow and Arroyo willow.

Willow Flycatchers, *Empidonax traillii*, are detected routinely in the riparian habitat at the March SKR Preserve. In 2008, multiple sightings of a flycatcher were made in the same area on 5/18 (one bird), 5/29 (two birds), 6/9 and 6/11 (one bird) but no breeding was confirmed. In 2009 one sighting of Willow Flycatchers included two birds on 5/27. Willow Flycatchers were not detected in 2010 through 2012. March SKR Preserve provides ideal habitat for this flycatcher in that there is abundant willow habitat and the several creeks provide surface water which is considered a requirement for the flycatcher.

California species of concern detected in 2009 included at least one Yellow Warbler, *Setophaga petechia*, and a minimum of one Yellow-breasted Chat, *Icteria virens*. A Cooper's Hawk, *Accipiter cooperii*, was sighted several times and was observed delivering food to a nest in 2009. In 2012 at least one Yellow-breasted Chat, a minimum of four Yellow Warblers, and one Cooper's Hawk territory were observed.

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. In 2012, Coyotes, *Canis latrans*, Black-tailed Jackrabbits, *Lepus californicus*, three Downy Woodpeckers, *Picoides pubescens*, and one Northern Harrier, *Circus cyaneus*, were observed. In 2011, a Great Horned Owl, *Bubo virginianus*, incubating three nestlings, was observed. In 2010, multiple Coyotes were observed and, in 2009, a pair with pups was observed. In addition, three Red-tailed Hawks, *Buteo jamaicensis*, were observed; two of the hawks had active nests with three nestlings in one nest and one juvenile in the other. Also in 2010, a Lawrence's Goldfinch, *Carduelis lawrencei* (Federal Species of Concern) was observed in addition to a Long-tailed Weasel, *Mustela frenata*, two Downey Woodpeckers, and over one-hundred Western Spadefoot Toad tadpoles, *Spea hammondii*. In 2009, a Western Bluebird, *Sialia mexicana*, a Loggerhead Shrike, *Lanius ludovicianus* (Federal and California Species of Concern and Federal Bird of Conservation Concern), a Lark Sparrow, *Chondestes grammacus* (Federal Species of Concern), and a Black-throated Gray Warbler, *Dendroica nigrescens*, were also observed. Sightings of interest, in 2008, in addition to Willow Flycatchers mentioned above, include a pair of Black-headed Grosbeaks, *Pheucticus melanocephalus*, and a male Blue Grosbeak, *Guiraca caerulea*, seen multiple times in the same location as well as four Western Kingbirds, *Tyrannus verticalis*. In 2005, incidental sightings included a pair of White-tailed Kites, *Elanus*

leucurus (a USFWS Migratory Nongame Bird of Management Concern and DFG Fully Protected Species), and a Long-tailed Weasel. In 2004, a Cooper's Hawk perched on a cowbird trap, was observed taking an endangered Stephen's Kangaroo Rat, *Dipodomys stephensii*. Miscellaneous observations of species in riparian habitat at March SKR Preserve in 2004 included a pair of Loggerhead Shrikes, nesting Great Horned Owls, with three fledglings, one Yellow Warbler and one Yellow-breasted Chat. A Western Whiptail, *Aspidoscelis tigris*, was detected in the upland.

Although the March SKR Preserve is currently protected, and under management by the Center for Natural Lands Management (CNLM) for its wildlife values, 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. On the positive side, recent legal decisions have ensured that a small connection between March SKR Preserve and Sycamore Canyon will remain undeveloped.

SAWA biologists remain dedicated to contribute to 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 2012, 28 vireo territories, 26 pairs, and 39 fledglings were detected in Mockingbird Canyon. These numbers represent a 24% decrease in territories and 19% decrease in pairs from 2011. This year represents the second annual decrease in population since monitoring began. 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 13 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 2012, one parasitism was documented (n=17 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%. Over ten years (2003-2012), nesting success has averaged 53%. Since 2003, 35% of all nests have been lost due to depredation, 7% to reproductive failure, and 5% to parasitism.

Red willow (34%) has been the primary choice for nest placement at this site, along with black willow (21%) and Mexican elderberry (12%). 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 18 different plant species or combination of species; 62% of nests have been placed in willow

species or combinations with willow species. Only 7% 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 – FAIRMOUNT PARK/MISSION BOULEVARD TO VAN BUREN BOULEVARD SUMMARY

Forty-three vireo territories, 11 pairs, and 7 fledglings were documented along the Santa Ana River between Mission Ave. and Hidden Valley in 2012, exclusive of Hidden Valley (See Appendix A). Two of those birds were detected below Riverside Ave. During the 2012 season, 2 nests were discovered, but none were closely monitored. Since no nests were closely monitored, success rate and causes of failure could not be determined.

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. Current vireo abundance is down 38% from 2010.

Nesting success has varied over the years. Nesting success is 66% over all years. Since monitoring began a minimum of 371 fledglings have been documented at this site. Cowbird trapping has occurred at private business and homeowner locations since 2002, and a total of 586 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 since 2000. Data reported as "Hidden Valley" refers to this area. The north side of the river has been surveyed three times each season since 2005. 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 a 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

This area was flooded during the 2010-2011 winter and much of the acreage was scoured . However, habitat is coming back and 9 vireos were documented in 2012, an increase from 5 territories in 2011. Fifteen territories were detected in 2010. Nest monitoring was not done in 2012. 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 13% in 2012. In 2012, 62 territories, 37 pairs, and 45 fledglings were documented. Large increases in abundance (by at least 10 territories) took place between 2001-2002, 2007-2008 and 2009-2010. The monitoring effort over the last four years has included a permitted biologist and a field assistant. In 2012, nest searching and monitoring was done by S. Hoffman and T. Barbee with assistance from N. Housel, C. MacBeth, M. Aimar, and J. Coumoutso.

Vireos were again documented in habitat adjacent to Hidden Valley at Rancho La Sierra for the third year. In 2012, one fledgling was documented with one pair. This territory is not included in the data for Hidden Valley Wildlife Preserve but is listed on Tables 1A and 1B under Miscellaneous sightings.

The productivity rate for 4 well-tracked pairs in 2012 was 2.8 The productivity rate for 74 pairs over 12 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. All nests lost in 2012 were due to predation. Hidden Valley has a 63% nesting success rate over the last 12 years. Depredation remains the main cause of nest failure.

Willows, *Salix* spp., are the most common plant species used for nest placement. Fifty-six percent of all nests found in the last 12 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, 697 cowbirds have been removed from Hidden Valley over more than 5,100 trap days. Management strategies under consideration include the removal of some of the wild grape, *Vitis californica*, that is growing on and killing mature native trees.

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 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 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 and probably will not be replaced by the county or the City of Riverside. The water flow to the ponds was maintained during the 2009 season but has not occurred since 2010.

Incidental surveys for other species of concern take place during vireo monitoring. In 2012, 130 Yellow Warbler*, Setophaga petechia*, and 39 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.

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 eighth year of management by SAWA, the native vegetation at the site is successfully recolonizing; vireo abundance has increased from 28 territories in 2004 to 105 territories in 2011. Cowbird trapping has removed 502 Brown-headed Cowbirds from the habitat.

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. Hwy 15 crosses the river.

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 further habitat destruction to the site. Again in the winter of 2011, habitat was illegal 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.

In 2012, 95 territorial males were detected. Fifty-one of these males were paired and 86 fledglings were detected. Nesting success for 17 well-tracked nests was 71%. This is a substantial increase from 45% in 2011. In 2012, nest failures were due to depredation, reproductive failure, and abandonment. There was no nest loss due to parasitism. Eight pairs monitored throughout the 2012 season had a 1.8 productivity rate. Since monitoring began, at least 779 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. In 2009 and 2010, the number of territorial males reached a total of 91 and 101, respectively. In 2011, the number of territorial males reached an all time high of 105. In 2012, numbers have dropped slightly by 9.5%.

Overall nesting success from 2001 through 2011 for the site is 65% (n= 234 nests, range= 33%-100%). Depredation has been the main cause of nest loss, occurring at a rate of 18% this year. This is down from 41% in 2011. 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 two Brown-headed Cowbirds have been removed from Norco over 1,829 trap days. Parasitism has occurred on the site in six out of the twelve 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.

Mulefat has held 33% of all vireo nests (n=276) since 2001. Arroyo willow and Black willow have held 32% and 17% of nests respectively. 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.

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 burms, but allow for good quality riparian habitat.

In 2012, 109 territorial least Bell's vireo males were detected. Sixty-three of these males were known to be paired and 71 fledglings were detected. This count represents a 7% increase from the count of 102 territorial vireos in 2011 and an increase of over 1000% from the seven territorial males found in 2001.

Nesting success for 12 well-tracked nests was 58%, a decrease from last year's 69% success rate. Eight pairs monitored throughout the season had a 3.0 reproductive rate. Three of the 12 nests (25%) tracked were lost to depredation. Two of the 12 nests (17%) tracked were lost due to parasitism. No tracked nests failed due to reproductive failure.

Overall nesting success for the site from 2001 to 2012 is 65%. Overall productivity of well-tracked pairs during the same time is 2.8.

Over 63% of nests have been placed in mulefat (34%) or arroyo willow (30%) since 2001. In 2012, two nests along Lake Elsinore were placed in tamarisk, which dominates the habitat surrounding the Lake. One of these nests fledged successfully. Another clutch successfully fledged from a nest placed in mustard. Riparian vegetation is fairly healthy throughout the wash and includes mostly native species but it is heavily

fragmented. 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 9,099 trap days, 2,254 brown-headed cowbirds have been removed from Temescal. Parasitism has been documented in Temescal in nine out of the 12 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 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. This methodology was tested in San Timoteo beginning 2007 and as shown promise with increased captures and decreased parasitism. The 2012 parasitism rate was 25% in Temescal. Unfortunately, due to budget constraints, all traps in Temescal were closed on weekends. In at least one instance, a vireo nest near a cowbird trap was parasitized over the weekend closure. A female cowbird was trapped at that location on the following Monday. Had that trap been open, the cowbird may have been caught before the nest was parasitized. The higher parasitism rate in 2012 may be attributed to the weekend closures.

CHINO HILLS SUMMARY

Patchy habitat in Chino Hills has been surveyed annually since 2003. These sites include two ravine 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. Nine territories were found in these patches in 2009; five of these vireos were paired and produced six fledglings. In 2010, eleven territories were found with seven of these paired producing seven fledglings. In 2011, eight territories were found with only three of these paired with just one fledgling detected. Another ravine and adjacent drainage sites at Slate Dr. were added late in the 2012 season to the survey. In 2012, 8 territories were found with two of these paired with one fledgling detected. Numbers of vireo territories usually detected in these patches range from seven to 12. Potential development, human activity and cattle grazing impact these sites. Vireos and their nests are highly susceptible to depredation in such small patches of habitat. The suitability of these patches of habitat for vireo occupancy is tenuous.

Nest monitoring was conducted in 2012 with one nest found, but it failed due to depredation. No nest monitoring was done in 2011. Since 2004, nesting success for well-tracked nests has been poor with an overall success rate of only 35% (n= 8/23 nests). Nest failure is due mainly to depredation (52%) and parasitism (9%).

Cowbird trapping had not been conducted in Chino Hills until 2008. Working with the City of Chino Hills a suitable location for a trap was found. The trap was open for 124 trap days in 2012 and 6 cowbirds were removed, fewer than the16 cowbirds that were removed for each of the last two years. It is worth noting that removing even 6 cowbirds from the habitat can be extremely advantageous to nesting birds. Often one

female cowbird can target an area and lay up to 30 eggs a season, which may mean the loss of 30 nests of native birds.

All of the habitat monitored in Chino Hills exhibited signs of drought-like conditions in 2007 with a lack of ground cover and thin under story vegetation. This condition abated somewhat in 2010 with understory remaining somewhat dense until late in the breeding season. In 2011 the conditions continued to improve with the season's normal rainfall totals. 2012's less than normal rainfall didn't seem to adversely effect the habitat.

Small, peripheral patches of habitat are surveyed three times during the season. These patches have episodic occupancy. In 2008 two additional patches of habitat were surveyed in addition to the five patches usually monitored. These sites are isolated by past and current development that continues to fragment the habitat. The habitat patches surveyed are listed in Table 11. In 2008 five new vireo territories were found in a patch of habitat next to a large ballpark, Chino Hills Community Park. In 2010, ten territories were detected at this site and in 2011, nine territories were detected. Only three territories were detected in 2012. A habitat patch at Eucalyptus at Rancho Hills has been surveyed since 2005 when a pair of vireos was observed feeding a cowbird at this site. From 2006 to 2008, a 98 unit gated community was being constructed adjacent to the site. No vireos were detected here in 2006, when grading was being done within 100 feet of the habitat. In 2007, a pair of vireos successfully fledged at least one fledgling. In 2008 construction was completed. One vireo territory was detected in 2008, 2009 and again in 2010 with a successful nest with two fledglings. In 2011, two territories were detected; one nest was monitored, repaired during incubation and successfully fledged four young. In 2012 one territory was detected but no breeding was confirmed. Another site, a riparian drainage through private property at Carbon Canyon Road and the Western Hills Country Club, has been surveyed since 2005 without any vireo detections until 2009. In May 2008 a small wildfire burned the entire drainage except for a narrow strip along the road directly across from the country club. In 2009 the drainage's vegetation was slowly recovering and the first detection of a vireo pair was made. The pair foraged in the riparian habitat and nested in the vegetation surrounding the club's pool area. Unfortunately the nest was unsuccessful due to parasitism. Surveys in 2010 and 2011 failed to detect any vireos despite the native vegetation's continued re-growth and improvement in the past two years. Two brief site visits were conducted in 2012 with no detections. This drainage is slated for development, which has been delayed probably due to the poor economy. How much of the native vegetation will be protected or replaced is unclear at this time.

SANTA ANA RIVER — SANTA ANA CANYON SUMMARY

Sixty-five territories were detected in the Santa Ana Canyon in 2012 which is down about 11% from the numbers detected 2009-2011. The number of pairs has been trending down since 2008. In 2012 the number of pairs observed was 31, down 18% (n=7) from 2011 when the number of pairs documented was 38, six fewer than 2010. Fledgling abundance in 2011 and 2010 (n=47) was the lowest of the nine seasons that

SAWA has been monitoring the Santa Ana Canyon. In 2012 the number of observed fledglings decreased even further to 29, down 38% (n=18).

The fire of November 15, 2008 destroyed habitat over an estimated 50% of the Santa Ana Canyon's vireo population; habitat for an estimated 43 territories was destroyed. However, most of the canyon's vireo numbers were not as affected as feared with only moderate decreases in 2009 at the Upper Canyon and Featherly Park. The Army Corps of Engineers riverbank stabilization project started in the winter of 2009/2010 around and through the western half of Green River Golf Club, taking out 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. Habitat loss from the two events will continue to create great pressure on the remaining habitat for the next few years, however, the 2010 vireo numbers actually increased by two territories at the golf course, and again in 2011 by another two territories. There were additional pressures put on the habitat 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. In 2012 the vireo numbers dropped by 11 territories, 27%, through the Upper Canyon and Green River Golf Club areas where the construction is taking place.

Cowbird trapping began in the Santa Ana Canyon in 2001 when parasitism was detected in five of 19 nests (26%). Since 2001, over 1,818 cowbirds have been removed from the canyon over 9,176 trap days during the vireo's breeding season. 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 in 2010 and 2011 and removed over 118 cowbirds. No parasitism has been recorded since then.

Nesting success in the canyon for the last 12 years is 59%; in 2011 it was 62.5% and in 2012 it was 40%. Since monitoring began in 2001, 698 fledglings have been produced in the Santa Ana Canyon. The upper canyon has produced a minimum of 225 fledglings, the Green River Golf Club has produced at least 241 fledglings and Featherly Park has produced at least 232 vireo fledglings. Depredation rates at the three sites have been rather low only going above 50% in a few years; The depredation rate was 50% in 2012.

Orange County has initiated implementation of the Santa Ana River Canyon Habitat Management Plan. Several SAWA biologists sit on 2 subcommittees overseeing implementation of the plan. We hope 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 canyon has undergone habitat removal, restoration, subsequent removal and fire in the last decade. In 2012, this section held 10 territories, a 28% decrease (n=4) from 2011. In 2011 vireo occupation had increased to 14 territories after two seasons of decreasing numbers (2009 n = 12, 2010 n = 11). The 2012 count represents a 50% decrease from the 20 vireos detected in 2008. Heavy construction around Prado Dam occurred from 2005 to 2008. Due to this construction, habitat for 10 territories was destroyed in 2005. Some of the habitat that was restored

after the construction is more upland-oriented and vireo have not used it, but other restored riparian habitat is maturing and is being used by the vireo. Part of the decrease in territories in areas downstream from the aforementioned construction could be explained by the November 2008 wildfire that destroyed a wide swath of habitat that had harbored six territories that were not detected in 2009 or 2010; one of these territories was occupied in 2011. These areas are now part of the most current phase of the riverbank stabilization project and the related habitat removal possibly explains the vireo numbers trending downward again. Since monitoring began in 2001, 225 fledglings have been produced. Surprisingly the fledgling numbers have been low but stable for the last three seasons (2012,n=6, 2011, n=5, 2010, n=6).

GREEN RIVER GOLF CLUB

In 2012 the vireo population decreased 27% (n=7) to 19 territories after trending upward for three years (26 in 2011, 24 in 2010 and 22 in 2009). The 2009-2011 increases occurred despite the destruction of approximately half of the riparian habitat in the November 2008 wildfire. The 2011 count was the highest count recorded by SAWA since monitoring began in 2001. The vireo population at Green River Golf Club has almost doubled since monitoring began in 2001 when only ten vireos were detected. Fledglings detected in 2012 were down 42% (n=8) from 2011. Two hundred forty-one fledglings have been observed at the golf club since 2001.

Habitat at the golf club is slowly re-growing after the devastating wildfire that swept through the Santa Ana Canyon November 15, 2008, however, very few of the mature trees touched by the fire survived. The Army Corp of Engineers Bank Stabilization project removed almost 16 acres of habitat that the fire did not touch; the habitat removed in 2010 had doubled its vireo occupancy from three in 2008 to six in 2009. The next phase of the Bank Stabilization project started during the fall/winter 2011 with several more acres of mature riparian habitat removed that includes full grown willow and cottonwood trees that had spared by the 2008 wildfire. This area supported 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 this season.

Management at Green River Golf Club has continued its cooperative relationship with SAWA and is supportive of SAWA's efforts to manage the vireo, other sensitive species and habitat improvement.

FEATHERLY REGIONAL PARK

In 2012 Featherly Park had 36 territories, an increase of three (9%) from 2011. In 2009, the first season after the wildfire of November 2008, 34 vireos were detected in Feathery Park, a decrease of only two territories (6%) from 2008. In 2010, 40 vireo territories were detected. In 2011 vireo territories decreased 18% to 33 territories. Although SAWA did not survey within the SARI line project area below Gypsum Canyon Rd., a vireo was reported to SAWA by the consulting biologist in a territory usually occupied. This vireo located at the line crossing was included in our totals and mapped.

This habitat is slowly re-growing after the devastating fire in 2008, in which 80% to 90% of the riparian habitat was destroyed. An estimated 70% of Featherly Park's 2008 vireo population had occupied this habitat a few months before. In 2009, many vireos returned and stayed in territories that had burned. Most of the breeding vireos found nest sites in unburned vegetation or the reemerging native vegetation with just four using non-native vegetation which included black mustard, *Brassica niger*, cockleburr, *Xanithum strumarium,* wax leaf privet, *Ligustrum* sp., and a small orange tree, *Rutaceae citrus sinensis,* on the edge of a burned area. In 2010, of the 11 nests that were detected, only one used non-native vegetation, black mustard, one nest was in non-burned native vegetation and the remaining nine nests were in well-established re-growth. In 2011, of the 12 nests found, 11 were in native vegetation, one was in an orange tree. In 2012, of the 8 nests found, 6 were in native vegetation, 1 was in a mix of native mulefat, *Baccharis salicifolia,* and non-native castor-bean, *Rincus communis,* and 1 was in another orange tree.

There were no successful well tracked nests (4 nests) in 2012. Nesting success in 2011 was 100% (5 nests), up from 29% in 2010 (7 nests) and 55% (11 nests) in 2009. The overall success rate over the last eleven years is 48%. Fledglings detected in 2012 were down 48% (n=11) with just 12 observed.

The vireo population 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 major increase came in 2004 when it quadrupled from six to 24. No fledglings were detected in the first two years of monitoring. Then in 2003, nine fledglings were observed. Since then, over 20 fledglings were counted every year through 2011. Only 12 fledglings were documented in 2012. A total of 232 fledglings produced over the last 12 years.

Before the 2009 breeding season started, Orange County park management was able to get approval to spray herbicide on the rapid regrowth of the invasive Arundo donax, which started re-growing within two weeks of the 2008 fire. By taking advantage of the fire, which decreased the Arundo's biomass, and getting the project moving as quickly as possible, the Arundo growth was slowed before the breeding season started in March. Most of the spraying stopped until after the nesting season, and then working with SAWA biologists, contractors sprayed and cut trails to the remaining stands of Arundo. This same process continued through 2012 slowing Arundo regrowth and giving the native habitat a much better chance at recovery.

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 2012. Five of these males were confirmed paired and five fledglings were observed. The lower numbers of pairs and fledglings in 2012 was the result of a lesser monitoring effort

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 2012, SAWA and Prado biologists detected 4 male willow flycatchers and one breeding 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 - JULY 2012

Forty-eight cowbird traps were deployed during the 2012 vireo season and 2,826 cowbirds were removed from all sites over 5,473 trap days (Table 6, Figure 1). The sex and ages of the cowbirds removed in 2012 were: 1,769 males, 771 females, and 286 juveniles. SAWA biologists and field assistants spent approximately 2,800 field hours servicing traps during the vireo season and over 1,000 hours on winter trapping.

The areas trapped and the numbers of traps in each area are as follows: San Jacinto, eight; San Timoteo, nine; Mockingbird Canyon, four; Hidden Valley, three; Temescal Canyon, nine; Santa Ana Canyon, four; Chino Hills, one; March SKR Preserve, two; Santa Ana River from Jurupa Park to River Road, six, and Fullerton at Hawk's Point residential tract, two. All of the traps were opened by mid to late March and closed by 8/3. 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 8/3 data. Trapping results after 8/3/2012 will be reported in winter trapping results in 2013.

In 2012, SAWA managed four traps in the Prado Basin for the Santa Ana Watershed Project Authority. Those data are published in Pike et al 2012.

In 2012 cowbird captures increased by 14% over 2011 captures (2,470) which had decreased by 20% (3,093 birds were trapped in 2010). This year the biggest increase was female captures, 26% more than the 612 birds trapped in 2011. Thirty-six percent more juveniles were trapped in 2012 than in 2011 when 211 birds were caught. Seven percent more males were trapped in 2012 than in 2011 when 1,647 were trapped. The increased captures occurred despite a decrease of seven traps and 1,026 trap days; One new, well placed, trap at a small dairy in Temescal Canyon made the difference. The overall capture rate increased to .52 from .38 (# birds trapped/# trap days).

In 2012 two traps were vandalized. One trap in Temescal Canyon was vandalized and lost 6 cowbirds. The trap was repaired and put back in service but was closed on weekends with the birds moved to another location for the weekend and redeployed to the original trap at the start on the new week. The other trap was in San Timoteo Canyon and was closed for the season mid-way through May because of re-occurring vandalism. It lost five cowbirds before it was closed.

NON-TARGET AVIAN SPECIES CAUGHT IN COWBIRD TRAPS, MARCH – JULY 2012

Twenty-four non-target species, consisting of 7,384 individual trapping occurrences, were trapped in the 48 cowbird traps (Table 7). The most common species were European Starling, *Sturnus vulgaris*, Red-winged Blackbird, *Agelaius phoeniceu*s, California Towhee, *Melozone crissalis*, House Sparrow, *Passer domesticus,* House Finch, *Carpodacus mexicanus,* Brewer's Blackbird, *Euphagus cyanocephalus,* and Yellow-headed Blackbird, *Xanthocephalus xanthocephalus.* The mortality rate for 2012 was much improved from 2011 with a 0.60% rate. The reported non-target mortality

rate for 2011 was reported in error at 3.98% on Table 6 and 0.86% in the Trapping Results narrative, the correct rate for 2011 is 1.15%.

WINTER 2011-2012 BROWN-HEADED COWBIRD TRAPPING AND NON-TARGET CAPTURES

Cowbird trapping took place at San Jacinto during the non-breeding season (i.e., winter) of 2011-2012. Seven traps were located at dairies and were open between 8/1/2011 and 3/18/2012. A total of 4,138 cowbirds were removed (1,254 males, 1,322 females, and 1,562 juveniles) over 1,303 trap days (Table 8). The number of cowbirds trapped declined 4% (down 151 birds) from the prior winter and the number of trap days decreased by 7% (down 103 trap days). No trapping occurred in the Santa Ana Canyon and one less trap was deployed in San Jacinto.

The non-target species caught the most often were European Starlings, Red-wing Blackbirds, House Sparrows and Song Sparrows, *Melospiza melodia,* (Table 9). The mortality rate for non-targets was 0.50%, the same rate as in winter 2010-2011.

DISCUSSION

Vireo abundance decreased in the Santa Ana watershed for the second year in 2012, down 13% from 2010. Decreases have been reported throughout Southern California. The decline is more dramatic in the Prado Basin than in the remaining watershed where some sites actually show increases over the last two years.

Despite the current two-year trend, the population has increased annually since 2000 except for the decline in 2006. A population of over 1,200 territories remains in the Santa Ana watershed. This dramatic increase over 13 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.

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 an increased rate of 60% in 2012, from 56% in 2011. Over thirteen years, the nesting success rate is 61% (n=1650 nests). Depredation remains the main cause of nest failure.

Nest loss due to depredation was 34%. 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. Only 2% of nests were lost to parasitism in 2012.

The parasitism rates have ranged between 2% to 5% over the years. 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 2003-2012.

The lack of documented nesting Southwestern Willow Flycatchers in the watershed is not surprising given the continuing low numbers throughout the watershed. Two males were detected in the Prado Basin in 2012. One was paired and one nest fledged 2 young after at least one unsuccessful attempt (Pike et al, 2012). 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.

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Special thanks go out to the following residents of Mockingbird Canyon, San Timoteo Canyon, and Lake Elsinore for their assistance in cowbird trap placement: Jill Dale, 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

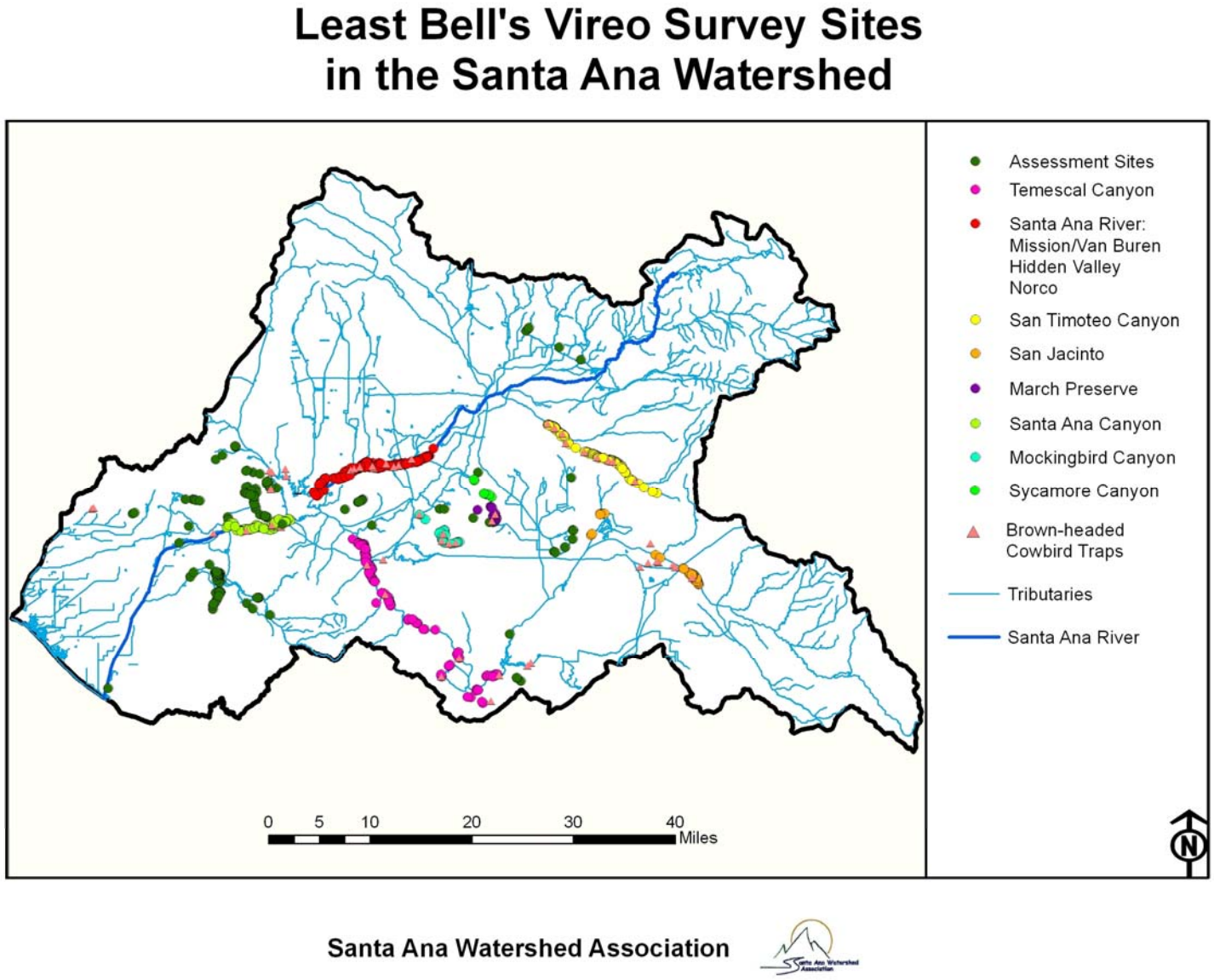
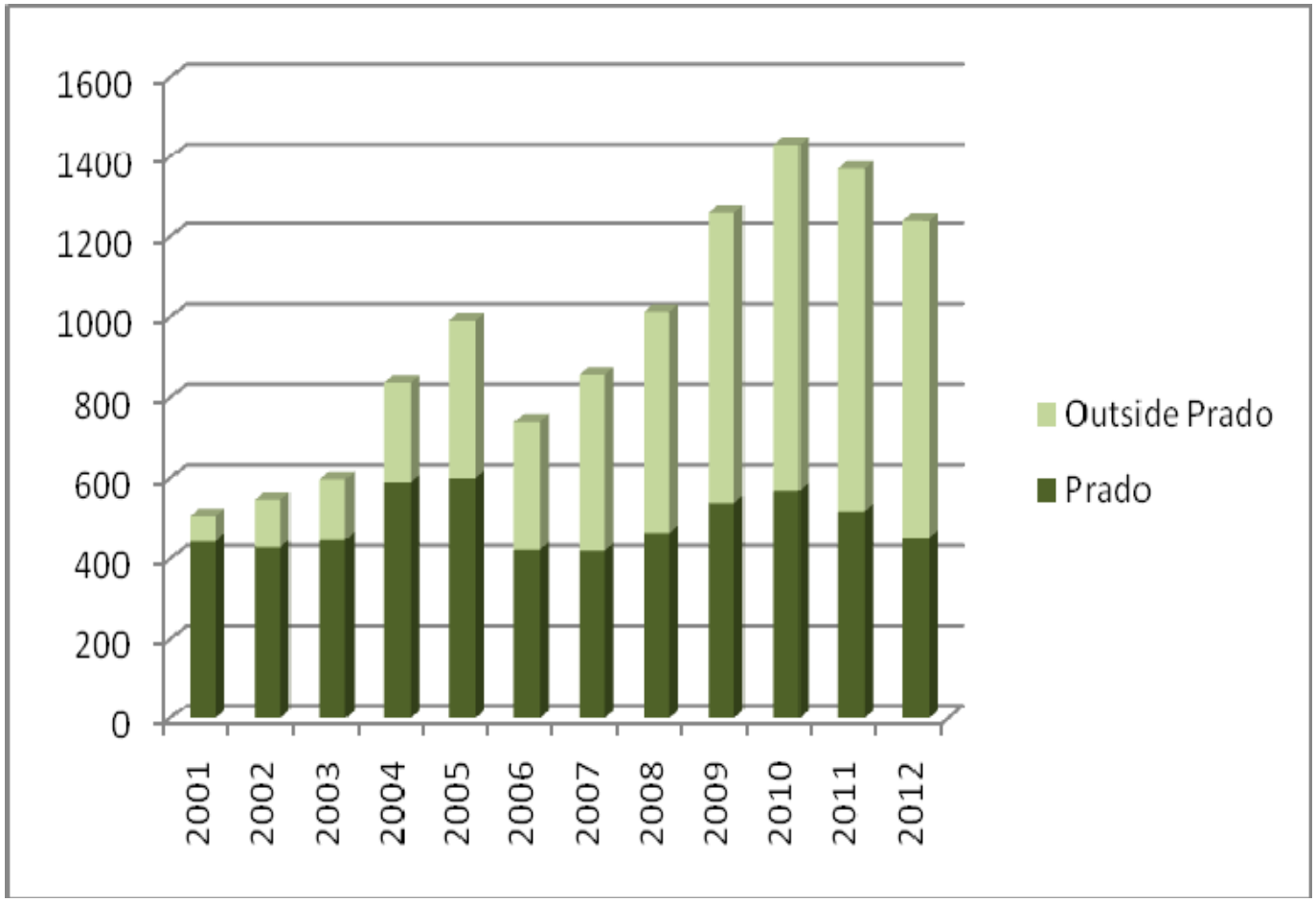
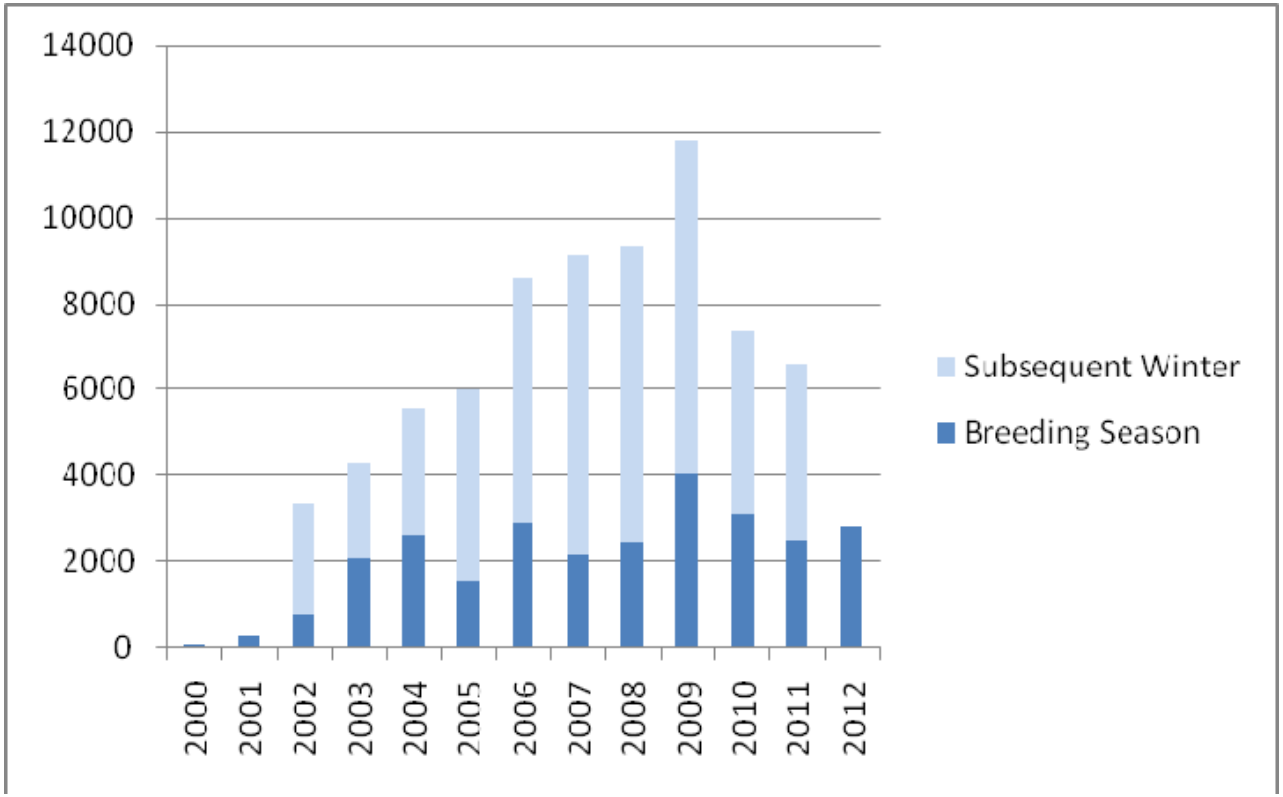


Figure 2: Vireo Abundance in the Watershed, Prado and Outside Prado, 2001-2012.



Source: Santa Ana Watershed Association

Figure 3: Number of Cowbirds Removed from SAWA Monitoring Sites in the Santa Ana Watershed, 2000-2012



Breeding season: 15 March – 31 July (about) (2012)
Winter: 1 Aug (about) – 14 March (2011-2012)
Source: Santa Ana Watershed Association
Dates approximate

Figure 4: Number of Least Bell's Vireo Territories at Four Sites in the Santa Ana Watershed, 2003-2012

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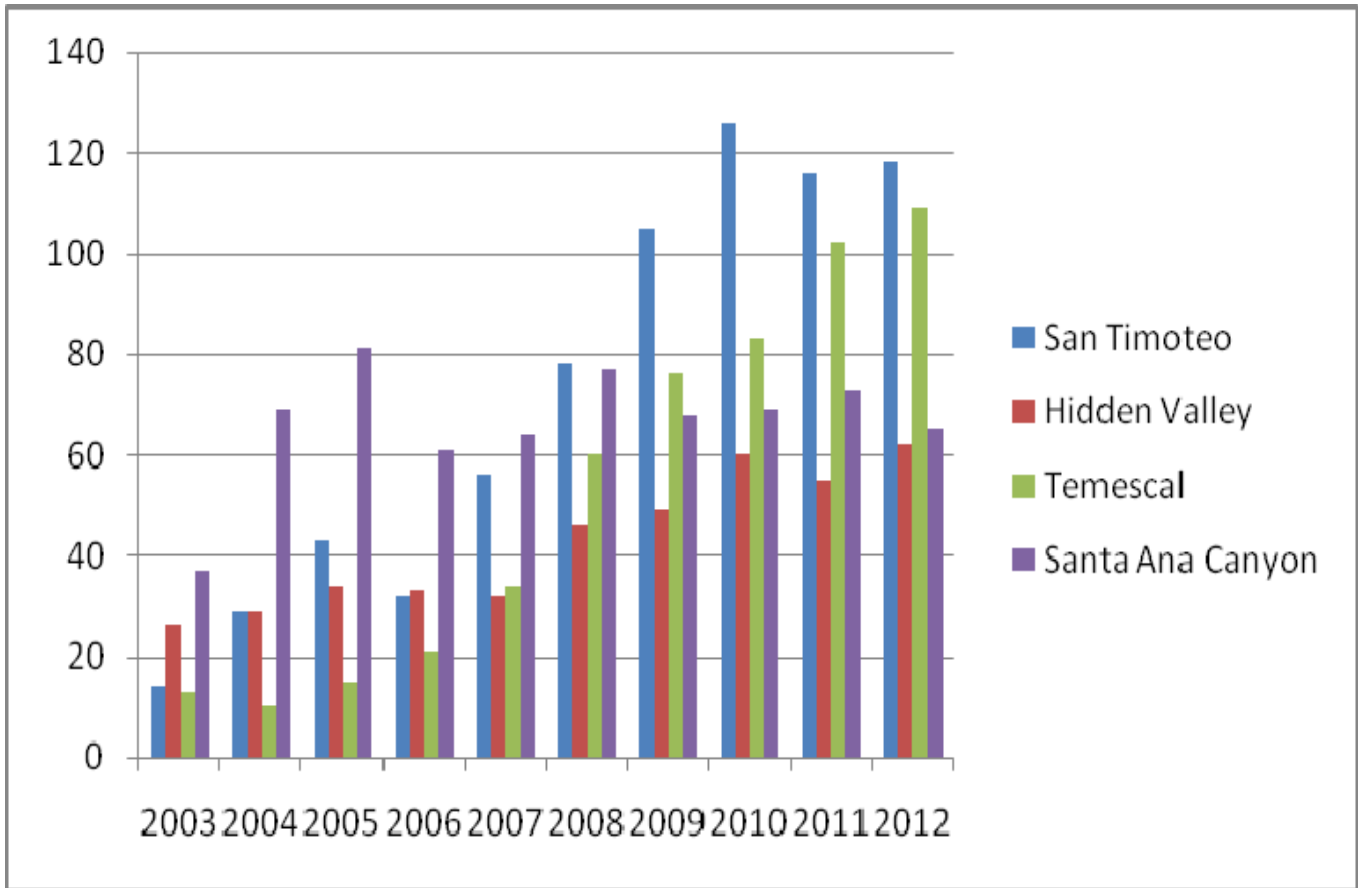
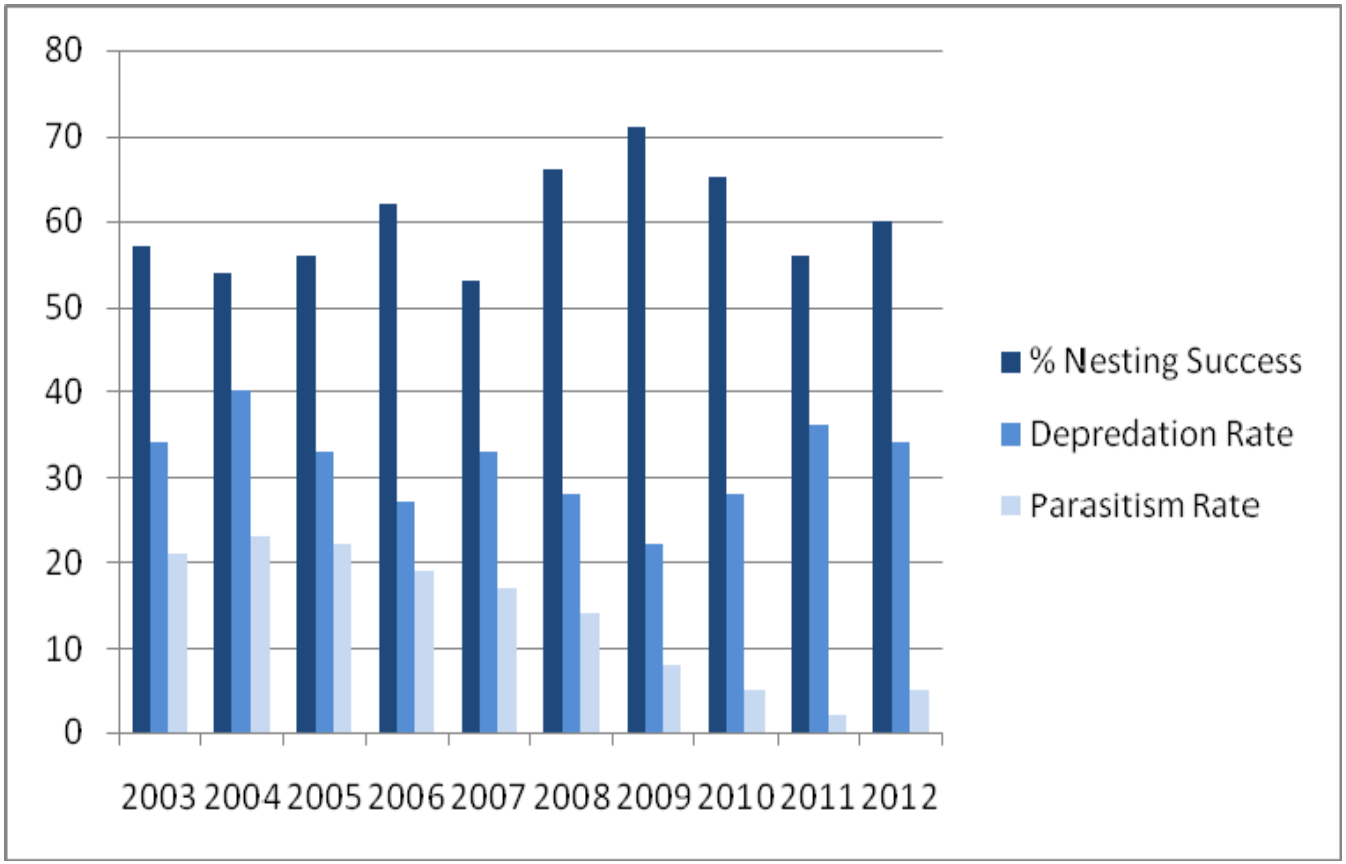


Source: Santa Ana Watershed Association

Figure 5: Least Bell's Vireo Nesting Success, Depredation Rates, Parasitism Rate in the Santa Ana Watershed, 2003-2012



Source: Santa Ana Watershed Association

Table 1A: Least Bell's Vireo status and distribution in the Santa Ana Watershed, 2010-2012

Table 1A: Least Bell's vireo status and distribution in the Santa Ana Watershed, 2010-2012.
Numbers of territories, pairs, and fledglings detected

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

Table 1A: Least Bell's vireo status and distribution in the Santa Ana Watershed, 2010-2012.
Numbers of territories, pairs, and fledglings detected

SUBPOPULATION	2010	2011	2012							
approx. Cajalco Rd.)										
Chino Hills (Butterfield Ranch)	11/7/7	8/3/1	8/2/1							
Santa Ana Canyon Upper Canyon (River below Prado Dam to Green River Golf Club)	11/4/6	14/5/5	10/4/6							
Santa Ana Canyon - Green River Golf Club	24/17/19	26/14/19	19/11/11							
Santa Ana Canyon - Featherly Reg. Park	40/23/22	33/19/23	36/16/12							
Santiago Creek - Irvine Reg. Park	24/14/18	26/9/7	Assessment survey							
Santiago-Santiago Cyn Rd.	Assessment Survey	Assessment survey	Assessment Survey							
Santa Ana River mouth-Talbert Park	Not surveyed	1/0/0	2/0/0							
East Coyote Hills Preserve – Fullerton	(3/3/3)[10]	(4/0/0)[10]	(2/0/0)[10]							
Misc. Sightings ---										
-- Shipley Nature Ctr, Huntington Beach	0/0/0[12]	0/0/0[12]	0/0/0[12]							

Table 1A: Least Bell's vireo status and distribution in the Santa Ana Watershed, 2010-2012.
Numbers of territories, pairs, and fledglings detected

SUBPOPULATION	2010	2011	2012							
-- Santa Ana River, Woolly star Preserve	Not surveyed	Not surveyed	0/0/0							
Etiwanda Wildlife Preserve	1/0/0	Assessment survey	Not surveyed							
Mt. Baldy	Not surveyed	Assessment survey	Not surveyed							
Chino Creek Park at Inland Empire Utilities Agency	2/1/1	2/1/1	1/0/0							
Chula Vista, CA	1/0/0[10]	Not surveyed	Not surveyed							
Protrero	2/0/0[5]	Not surveyed	Not surveyed							
Rancho La Sierra West, Riverside	1/1/0	1/1/1	1/1/1							
Estelle Mountain Preserve	0/0/0[5]	1/0/0	Not surveyed							
Yorba Dry Lake Bed Park	Assessment Survey	Assessment survey	Assessment Survey							
Black Gold Golf Club	Not available	2/0/0[11]	4/0/0[11]							
--Riverview Golf Club	Not surveyed	Not surveyed	Not surveyed							
--Pulte Wetlands, adjacent to Chino Hills State Park CHSP)	Not available	2/0/0[11]	Not surveyed (11)							
--Rim Crest Dr. & Blue Gum Dr., adjacent to CHSP	Not available	0/0/0[11]	Not surveyed(11)							
Blue Mud Canyon	Not available	Not available	1/0/0[11]							

Table 1A: Least Bell's vireo status and distribution in the Santa Ana Watershed, 2010-2012.
Numbers of territories, pairs, and fledglings detected

SUBPOPULATION	2010	2011	2012							
South Coal Canyon (Santa Ana Canyon)	Not available	Not available	1/0/0[11]							
Plunge Creek, San Bernardino	Assessment survey	Assessment survey	Assessment survey							
Santiago Pitts	Not surveyed	2/1/1	Assessment survey							
Conrock, Tustin	Not surveyed	1/0/0	0/0/0							
UCR	Not surveyed	1/0/0	0/0/0							
Aberhill - Temescal	0/0/0	0/0/0	1/0/0[5]							
Santa Ana River – Mission to Riverside Ave	Not available	Not available	2/0/0							
Subtotal # LBVI	662/452/614	654/410/629	610/381/495							
# LBVI from SAWA Assessment Sites	159/65/41	156/63/36	146/49/44							
Total # LBV for all sites	821/517/655	810/473/665	756/430/539							
# LBV on Santa Ana River in San Bernardino County	42/26/24	42/23/30	30/22/25							
# LBV Chino Hills State Park	(51/23/14)[6]	(42/17/7)[6]	(33/14/11)[6]							
Total for Santa Ana Watershed-excl. Prado Basin	863/543/679	852/496/695	786/452/564							
Prado Basin	569/286/479[7]	517/200/286[7]	**451/158/229[7]**							

Table 1A: Least Bell's vireo status and distribution in the Santa Ana Watershed, 2010-2012.
Numbers of territories, pairs, and fledglings detected

SUBPOPULATION	2010	2011	2012							
Total Number LBVI in Santa Ana Watershed	1432/829/1158	1369/696/ 981	1237/610/793							

(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

Table 1B: Least Bell's Vireo status and distribution in the Santa Ana Watershed, 2010-2012.
Numbers of territories, pairs and fledglings detected. By Sub-watershed

Santa Ana Watershed	**2010**	**2011**	**2012**
Santa Ana River and Tributaries			
Cajon Wash	0/0/0	0/0/0	Not surveyed
Plunge Creek, Highland	1/1/0	1/0/0	1/1/1
City Creek, Highland	2/1/0	0/0/0	0/0/0
Little Sand Basin, Highland	2/0/0	3/2/1	3/2/0
Arlington Falls	Not surveyed	0/0/0	0/0/0
Oak Glen Preserve	0/0/0	0/0/0	Not surveyed
San Timoteo Canyon	126/95/137	116/101/196	118/102/153
Box Springs	5/2/1	2/1/0	1/1/1
Poorman Reservoir	6/1/0	4/1/1	1/1/2
Quail Run	0/0/0	0/0/0	0/0/0
Sycamore Canyon	12/8/11	9/5/4	7/7/5
March SKR Reserve	14/12/25	16/9/7	13/11/8
Golden Star	0/0/0	0/0/0	0/0/0
Woodcrest	0/0/0	0/0/0	0/0/0
Mead Valley at Cajalco & Calif. Aqueduct	8/0/0	5/4/5	4/1/2
Gavilan Hills	0/0/0	0/0/0	Not surveyed

Table 1B: Least Bell's Vireo status and distribution in the Santa Ana Watershed, 2010-2012.
Numbers of territories, pairs and fledglings detected. By Sub-watershed

Santa Ana Watershed	2010	2011	2012
Menifee - Paloma Valley High School	0/0/0	Not surveyed	Not surveyed
Menifee - Huan Rd.	0/0/0	Not surveyed	Not surveyed
Steele Valley	0/0/0	Not surveyed	Not surveyed
Santa Rosa Mine Rd.	Not surveyed	Not surveyed	Not surveyed
Van Buren Blvd – Plummer Rd So.	4/3/2	3/2/3	2/1/1
Van Buren Blvd. at Bountiful	0/0/0	0/0/0	0/0/0
Van Buren Blvd @ Porter (end).	0/0/0	0/0/0	Not surveyed
Canyon Crest	0/0/0	0/0/0	Not surveyed
Mockingbird Canyon	43/34/25	37/32/67	28/26/39
Alessandro Arroyo/Prenda Arroyo	6/2/0	7/5/0	6/4/4
Conrock Basin FHQ	Not surveyed	1/0/0	0/0/0
Castleview Park	0/0/0	0/0/0	0/0/0
Tequesquite Arroyo	0/0/0	0/0/0	Not surveyed
Pyrite Ravine (environs of Van Buren/Limonite)	3/0/0	3/1/0	0/0/0
SAR mainstem at Van Buren Blvd.	n/a	n/a	n/a
SAR Mainstem - Mission to Hidden Valley	68/50/58	49/23/32	41/11/7
SAR Mainstem - North side at Hidden Valley	15/12/18	4/2/2	9/3/1

Table 1B: Least Bell's Vireo status and distribution in the Santa Ana Watershed, 2010-2012.
Numbers of territories, pairs and fledglings detected. By Sub-watershed

Santa Ana Watershed	**2010**	**2011**	**2012**
SAR - Hidden Valley	60/43/53	55/36/41	62/37/45
Hidden Valley Golf Club	3/0/0	4/0/0	6/0/0
Wyle Labs at El Paso Rd.	1/1/2	1/0/0	1/1/1
Norco Hills Park - mitigation area	0/0/0	0/0/0	0/0/0
Promenade Ave, Norco	2/2/4	2/1/1	2/1/1
Corona St./Gilmore, Norco	0/0/0	0/0/0	Not surveyed
SAR Mainstem - Hidden Valley to River Rd., so. side	n/a	n/a	n/a
SAR Mainstem-Goose Creek Golf Course (Norco) to River Rd.	101/64/113	105/59/91	95/51/86
Temescal Canyon	83/49/73	102/65/113	109/63/71
Harrison Reservoir	1/0/0	Not surveyed	3/0/0
La Sierra Ave./Lyon St.	3/0/0	3/2/3	2/1/1
Cajalco Canyon	See Temescal	3/2/0	1/0/0
Chino Hills - Butterfield Ranch	11/7/7	8/3/1	8/2/1
Chino Hills - Eucalyptus at Rancho Hills	1/1/2	2/1/2	1/0/0
Chino Hills - Eucalyptus at Del Monte	2/1/0	0/0/0	0/0/0
Chino Hills - End of Eucalyptus (s/o Rancho Hills)	0/0/0	0/0/0	Not surveyed

Table 1B: Least Bell's Vireo status and distribution in the Santa Ana Watershed, 2010-2012.
Numbers of territories, pairs and fledglings detected. By Sub-watershed

Santa Ana Watershed	2010	2011	2012
Carbon Canyon Blvd. at Western Hills Golf Club	0/0/0	0/0/0	Not surveyed
Carbon Canyon Blvd at Chino Hills Pkwy.	0/0/0	0/0/0	Not surveyed
NW c/o Eucalyptus and Peyton Dr., Chino Hills	10/4/1	9/3/1	3/1/0
Bayberry Dr., Chino Hills	0/0/0	0/0/0	Not surveyed
Soquel Canyon Parkway at Pipeline	Not surveyed	2/0/0	2/1/1
Carbon Canyon Regional Park & Carbon Canyon Rd.	8/6/3	13/7/5	12/7/7
Black Gold Golf Club, Yorba Linda	Not available	2/0/0(11)	4/0/0(11)
South Coal Canyon (Santa Ana Canyon)	Not available	Not available	1/0/0(11)
Blue Mud Canyon	Not available	Not available	1/0/0(11)
Sun Canyon Park	0/0/0	0/0/0	Not surveyed
Wardlow Wash	0/0/0	0/0/0	Not surveyed
Fresno Canyon	1/0/0	1/1/1	0/0/0
Santa Ana Canyon - Upper Canyon-Prado Dam to Green River Golf Club	11/4/6	14/5/5	10/4/6
Santa Ana Canyon - Green River Golf Club	24/17/19	26/14/19	19/11/11
Santa Ana Canyon - Featherly Park	40/23/22	33/19/23	36/16/12

Table 1B: Least Bell's Vireo status and distribution in the Santa Ana Watershed, 2010-2012.
Numbers of territories, pairs and fledglings detected. By Sub-watershed

Santa Ana Watershed	**2010**	**2011**	**2012**
Starlight Dr. & Hidden Hills Rd., Yorba Linda	2/0/0	1/1/0	2/0/0
Santa Ana River mouth - Talbert Park and environs	Not surveyed	1/0/0	2/0/0
Chino Hills State Park	51/23/14	42/17/7	33/14/11
Pulte Wetlands, adjacent to Chino Hills State Park (CHSP)	Not available	2/0/0	Not Surveyed(11)
Rim Crest Dr & Blue Gum Dr, adjacent to CHSP	Not available	0/0/0	Not Surveyed(11)
SAR - Miscellaneous Sightings/Reporting			
Potrero	2/0/0[5]	Not surveyed	Not surveyed
SAR Mainstem at Woolly star Preserve	Not surveyed	Not surveyed	Not surveyed
Estelle Mountain Reserve	0/0/0[5]	1/0/0[5]	Not surveyed
Yorba Linda Dry Lake Bed Park	1/1/1	1/0/0	1/0/0
Shipley Nature Center	0/0/0[12]	0/0/0[12]	0/0/0[12]
Etiwanda Wildlife Preserve	1/0/0	0/0/0	Not surveyed
Mt. Baldy (Shinn Rd.)	Not surveyed	0/0/0	Not surveyed
Chino Creek Park at Inland Empire Utilities Agency	2/1/1	2/1/1	1/0/0
Coyote Hills East Reserve (Fullerton)	(3/3/3)[10]	(4/0/0)[10]	(2/0/0)[10]
Rancho La Sierra West, Riverside	1/1/0	1/1/1	1/1/1
(Chula Vista, CA)	(1/0/0)[10]	Not surveyed	Not surveyed

Table 1B: Least Bell's Vireo status and distribution in the Santa Ana Watershed, 2010-2012.
Numbers of territories, pairs and fledglings detected. By Sub-watershed

Santa Ana Watershed	2010	2011	2012
River View Golf Course, Santa Ana	Not surveyed	Not surveyed	Not surveyed
UCR	Not surveyed	1/0/0	0/0/0
Alberhill - Temescal	0/0/0	0/0/0	1/0/0
Santa Ana River – Mission to Riverside Ave	Not available	Not available	2/0/0
Santiago Pitts	Not surveyed	2/1/1	1/0/0
San Jacinto Sub Watershed			
Kabian Park	3/3/0	3/1/0	1/0/0
San Jacinto	22/18/28	41/25/18	42/36/49
Lake Perris	6/4/4	10/6/3	8/4/4
East of Canyon Lake	Not surveyed	Not surveyed	Not surveyed
Cottonwood Canyon	2/0/0	3/0/0	3/0/0
Santiago Creek Sub Watershed			
Silverado Canyon	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
Santiago Creek (unnamed tributary to Irvine Lake)	0/0/0	0/0/0	0/0/0
Limestone Canyon (including Old Haul Rd./Blue Diamond Rd.)	3/3/5	3/2/1	0/0/0
Peter's Canyon	14/5/1	16/3/2	12/2/0
Irvine Regional Park	24/14/18	26/9/7	29/5/5
Irvine Trust Mgmt Area Irvine Company Land (across from	1/0/0	1/0/0	1/0/0

Table 1B: Least Bell's Vireo status and distribution in the Santa Ana Watershed, 2010-2012.
Numbers of territories, pairs and fledglings detected. By Sub-watershed

Santa Ana Watershed	2010	2011	2012
Peter's Canyon)			
Santiago Oaks Regional Park	1/1/1	0/0/0	0/0/0
Santiago Creek at Cannon Rd. (includes reservoir)	1/0/0	3/0/0	0/0/0
Santiago Creek at Chapman Ave.	0/0/0	0/0/0	0/0/0
Santiago Creek at Cambridge Ave.	0/0/0	0/0/0	0/0/0
SUBTOTAL	821/517/655	810/473/665	756/430/539
Santa Ana River - San Bernardino County	42/26/24(2)	42/23/30(2)	30/22/25(2)
TOTAL FOR SANTA ANA WATERSHED EXCLUDING PRADO BASIN	863/543/679	852/496/695	786/452/564
PRADO BASIN (Pike et al)	569/286/479	517/200/286	451/158/229
TOTAL FOR SANTA ANA WATERSHED	1432/829/1158	1369/696/981	1237/610/793
Santa Marguerita Watershed - Murrieta Creek	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

Table 2: Least Bell's Vireo, Survey Dates and Breeding Chronology, 2012, Part I

	Survey Start Date	Survey End Date	First Arrival Date	50% Arrived	50% Paired	Date Last Detected
Santa Ana River and Tributaries						
San Timoteo Canyon	3/27/12	9/19/12	4/3/12	4/18/12	5/10/12	9/6/12
Sycamore Canyon # visits = 4	4/6/12	7/17/12	4/6/12	4/6/12	4/29/12	7/17/12
March SKR Reserve	4/10/12	7/23/12	4/10/12	5/3/12	6/8/12	7/23/12
Mockingbird Canyon	3/20/12	8/16/12	3/22/12	4/10/12	5/9/12	9/6/12
SAR mainstem: Mission Blvd. To Van Buren Blvd.	4/3/12	8/7/12	4/3/12	5/9/12	5/31/12 (n=11)	8/7/12
SAR mainstem: Hidden Valley Wildlife Preserve						
Hidden Valley (area monitored since 2000, south side of river)	3/27/12	8/14/12	3/28/12	4/18/12	5/16/12 (n=25)	9/13/12
North side of river in Hidden Valley Wildlife Preserve	4/5/12	7/23/12	4/5/12	5/30/12	5/30/12 (n=3)	7/23/12
SAR mainstem: Norco: Goose Creek Golf Course to River Rd.	3/20/12	8/31/12	3/27/12	4/16/12	6/7/12	9/11/12
Temescal Canyon	3/20/12	8/13/12	3/27/12	4/12/12 (n=70)	4/20/12 (n=25)	8/13/12
Chino Hills (Butterfield Ranch environs)	3/19/12	9/19/12	4/6/12	4/9/12	5/7/12	8/21/12
Santa Ana River - Upper Canyon, Santa Ana Canyon	3/30/12	8/7/12	3/30/12	4/19/12	5/30/12	8/7/12
Santa Ana River - Green River Golf Course, Santa Ana Canyon	3/20/12	9/19/12	3/29/12	4/16/12	5/8/12	8/23/12
Santa Ana River - Featherly Park, Santa Ana Canyon	3/22/12	9/18/12	3/29/12	4/12/12	5/8/12	8/20/12
Irvine Regional Park, Santiago Creek, Orange County						
San Jacinto River Sub Watershed						
San Jacinto River	4/3/12	8/23/12	4/3/12	4/16/12	5/1/12	8/23/12

Table 2. Least Bell's Vireo, Survey Dates and Breeding Chronology, Part II

	50% Paired	First nest found	Last nest found	First Fledge Date	Last Fledge Date
Santa Ana River and Tributaries					
San Timoteo Canyon	5/10/12	4/25/12	6/14/12	5/23/12	7/14/12
Sycamore Canyon	4/29/12	--	--	--	--
March SKR Reserve	6/8/12	--	--	--	--
Mockingbird Canyon	5/9/12	4/20/12	7/6/12	5/29/12	7/12/12
SAR mainstem (Mission Blvd. To Van Buren Blvd.)		4/25/12	5/31/12	--	--
SAR mainstem: Hidden Valley Wildlife Preserve					
Hidden Valley (area monitored since 2000, south side of river)	5/16/12	5/3/12	5/30/12	5/22/12	6/27/12
North side of river in Hidden Valley Wildlife Preserve	5/30/12	--	--	--	--
SAR mainstem - Norco - Goose Creek Golf Course to River Rd.	6/7/12	4/12/12	6/28/12	5/13/12	7/20/12
Temescal Canyon	4/20/12 (n=25)	4/16/12	6/20/12	5/20/12	6/19/12
Chino Hills (Butterfield Ranch environs)	5/7/12	5/7/12	--	--	--
Santa Ana River - Upper Canyon, Santa Ana Canyon	5/30/12	5/29/12	5/30/12	6/1/12	--
Santa Ana River - Green River Golf Course, Santa Ana Canyon	5/8/12	4/25/12	6/14/12	6/1/12	7/13/12
Santa Ana River - Featherly Park, Santa Ana Canyon	5/8/12	4/5/12	6/13/12	6/2/12	--
Irvine Regional Park, Santiago Creek, Orange County	--	--	--	--	--
San Jacinto River Sub Watershed					
San Jacinto River	5/1/12	4/17/12	6/4/12	5/21/12	7/3/12

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, 2012.

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, 2012.

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-\Mission Blvd. to Van Buren Blvd.***	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	42	118	13	7	28	43	62	9	95	109	10	19	36	8		599
B.	Number of known pairs (breeding and non-breeding)	36	102	11	7	26	11	37	3	51	63	4	11	16	2		380
C.	Number of fledged young observed	49	153	8	5	39	7	45	1	86	71	6	11	12	1		494
D.	Projected total recruitment of vireo young (a)	104	286	---	---	78	---	104	---	184	189	12	25	0	0		982
E.	Average number of fledglings per pair (C/B)	1.4	1.5	0.7	0.7	1.5	---	1.2	---	1.7	1.1	1.5	1.0	0.75	0.5		1.3
F.	Projected number of fledglings per pair (D/B)	2.9	2.8	---	---	3.0	---	2.8	---	3.6	3.0	3.0	2.3	0	0		2.6
G.	Rate of missing eggs/chicks from nests (successful &unsuccessful	31% (4/13)	42% (19/45)	--	--	53% (9/17)	--	50% (4/8)	--	18% (3/17)	25% (3/12)	0% (0/1)	20% (1/5)	100% (4/4)	100% (1/1)		39% (48/123)
H.	Rate of cowbird nest parasitism	8% (1/13)	2% (1/45)	--	--	6% (1/17)	--	0% (0/8)	--	0% (0/17)	25% (3/12)	0% (0/1)	0% (0/5)	0% (0/4)	0% (0/1)		4.9% (6/123)

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, 2012.

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-\Mission Blvd. to Van Buren Blvd.***	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			
I.	Numbers of cowbirds removed from study area	1728	143	16	--	140	37	24	--	34	566	129			6		2823
K.	Number of trap days (1 operative trap in the field for one day = 1 trap day)	984	982	235	--	495	469	348	--	230	851	473			124		5191
L.	Average number of cowbirds trapped per trap day (I/K)	1.8	0.15	0.07	--	0.28	0.08	0.07	--	0.15	0.67	0.27			0.05		0.54
M.	Number of field hours –LBV (+)	161	407	22	22	203	144	261	12	232	531	42	127	156	44		2364
N.	Number of field hours – BHCO (+)	711	326	60	--	215	234	129	--	230	377	432			124		2838

[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 Interstate Hwy 91. **Harrison BHCO included in Mockingbird.

***includes 2 LBVI documented above Mission to Riverside Ave.

Table 4: Least Bell's Vireo nest placement preferences, monitored sites in the Santa Ana River Watershed, 2012

Table 4. Least Bell's vireo nest placement preferences, monitored sites in the Santa Ana River Watershed, 2012

Host Plant Species	San Jacinto	San Timoteo	March SKR Preserve	Sycamore Canyon	Mockingbird Canyon	SAR-\Mission Blvd. to Van Buren Blvd.	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)*		1			1	1			2	2		3				10
Arroyo Willow *(Salix lasiolepis)*		17			3		1		9	1						31
Red Willow *(Salix laevigata)*		6			7				2	3				1		19
Narrow-leafed Willow (*Salix exigua)*	10						1									11
Yellow Willow *(Salix lucida spp. lasiandra)*																0
Fremont Cottonwood *(Populus fremontii)*					1				1				4			6
Mulefat (Baccharis salicifolia)	3	12			3	1	2		4	2		2				29
Elderberry *(Sambucus mexicana)*		5			2					1	1		2			11
Wild Grape *(Vitis girdiana)*		1					2		1							4
Peruvian Pepper (*Schinus molle*)					1											1
Black mustard *(Brassica nigra)*										1						1
Black Walnut,*(Juglans californica)*																0
Tamarisk, *(Tamarix ramosissima)*		1								2						3
False Indigo (*Amorpha fruticosa*)																0

Table 4. Least Bell's vireo nest placement preferences, monitored sites in the Santa Ana River Watershed, 2012

Host Plant Species	San Jacinto	San Timoteo	March SKR Preserve	Sycamore Canyon	Mockingbird Canyon	SAR-Mission Blvd. to Van Buren Blvd.	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			
Deadfall																0
Dead Arroyo Willow																0
Dead Willow sp. (*Salix sp.*)		1														1
Dead Fremont Cottonwood (*Populus fremontii*)		1														1
Brazilian Pepper Tree (*Schinus terebinthifolius*)												1				1
Sugarbush (*Rhus ovata*)																0
Coyote Bush (*Baccharis pilularis*)																0
Mugwort (*Artemisia douglasiana*)		1														1
Sycamore (*Platanus racemosa*)																0
Basketbush (*Rhus trilobata*)																0
Holly-leafed Cherry (*Prunus ilicifolia*)																0
Orange Tree (*Rutaceae citrus sinensis*)													1			1
Blue Plumbago (*Plumbago auriculata*)												1				1
Toyon *(Heteromeles arbutifolia)*		1														1

Table 4. Least Bell's vireo nest placement preferences, monitored sites in the Santa Ana River Watershed, 2012

Host Plant Species	San Jacinto	San Timoteo	March SKR Preserve	Sycamore Canyon	Mockingbird Canyon	SAR-\Mission Blvd. to Van Buren Blvd.	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			
Mulefat (*Baccharis salicifolia*) and Wild Grape (*Vitis girdiana*)											1					1
Mulefat (*Baccharis salicifolia*) and Castor Bean (*Ricinus communis*)													1			1
Pepperweed (*Lepidium latifolium*)					1											1
Brittlebush (*Encelia farinosa*)										1						1
California Blackberry (*Rubus ursinus*)										1						1
Arrowweed (*Pluchea sericea*)										1						1
Mulefat (*Baccharis salicifolia*) and Poison Hemlock (*Conium maculatum*)							1									1
Unknown																0
Total	13	47	0	0	19	2	7	0	19	15	2	7	8	1	0	140

Table 5: Least Bell's Vireo reproductive success and breeding biology data, monitored sites in the Santa Ana River Watershed, 2012

Table 5: Least Bell's Vireo reproductive success and breeding biology data, monitored sites in the Santa Ana River Watershed, 2012																	
												Santa Ana Canyon					
		San Jacinto	San Timoteo	March SKR Preserve	Sycamore Canyon	Mockingbird Canyon	SAR-\Mission Blvd. to Van Buren Blvd.	Hidden Valley (so side of SAR)	Hidden Valley (no side of SAR)	SAR- -Norco (River Rd to Hidden Valley)	Temescal	Upper Canyon	Green River Golf Club	Featherly Reg. Park	Chino Hills-Butterfield Ranch environs	_	**Total**
A.	Number of known pairs	36	102	7	7	26	11	37	3	51	63	4	11	16	2		376
B.	Number of breeding (nesting) pairs	22	73	6	4	21	7	31	2	48	48	4	8	11	2		287
C.	Number of breeding pairs that were well-monitored throughout the breeding season	9	32	0	0	5	0	4	0	8	8	1	4	2	1		74
D.	Number of 'known fledged young' OBSERVED	49	153	8	5	39		45	1	86	71	6	11	12	1		487
E.	Number of known fledged young produced by pairs monitored throughout the breeding season	26	90	n/a	--	15		11	--	29	24	3	9	0	0		207
F.	Average number of fledglings produced per breeding pair (minimum; D/B = 'productivity or breeding success')	2.2	2.1	1.3	--	1.9		1.5	--	1.8	1.5	1.5	1.4	1.1	0.5		1.7
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)	2.9	2.8	--	--	3.0		2.8	--	3.6	3.0	3.0	2.3	0.0	0		2.8
H.	Number of nests that were discovered	13	47	--	--	19	2	8	0	19	16	2	7	8	1		142

Table 5: Least Bell's Vireo reproductive success and breeding biology data, monitored sites in the Santa Ana River Watershed, 2012

		San Jacinto	San Timoteo	March SKR Preserve	Sycamore Canyon	Mockingbird Canyon	SAR-\Mission Blvd. to Van Buren Blvd.	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			
I.	Number of nests that were regularly monitored or 'tracked'	13	45	--	--	17	0	8	--	17	12	1	5	4	1		123
J.	Number of 'tracked' nests that were successful l (% = J/I x 100)	69% (9/13)	64% (29/45)	--	--	47% (8/17)	--	63% (5/8)	--	71% (12/17)	58% (7/12)	100% (1/1)	60% (3/5)	0% (0/4)	0% (0/1)		60% (74/123)
K.	Rate of missing eggs/ chicks from nests (successful and unsuccessful) (%=K/I x100) (b)	31% (4/13)	42% (19/45)	--	--	53% (9/17)	--	50% (4/8)	--	18% (3/17)	25% (3/12)	0% (0/1)	20% (1/5)	100% (4/4)	100% (1/1)		39% (48/123)
L.	Number of 'tracked' nests that were parasitized by cowbirds (%=L/I x 100)	8% (1/13)	2% (1/45)	--	--	6% (1/17)	--	0% (0/8)	--	0% (0/17)	25% (3/12)	0% (0/1)	0% (0/5)	0% (0/4)	0% (0/1)		4.9% (6/123)
M.	A. Number of 'tracked' nests that failed as a result of reproductive failure	0% (0/13)	0% (0/45)	--	--	6% (1/17)	--	0% (0/8)	--	12% (2/17)	--	0% (0/1)	20% (1/5)	0% (0/4)	0% (0/1)		3.3% (4/123)
	B. Number of 'tracked'' nests that failed as a result of parasitism	0% (0/13)	2% (1/45)	--	--	0% (0/17)	--	0% (0/8)	--	0% (0/17)	17% (2/12)	0% (0/1)	0% (0/5)	0% (0/4)	0% (0/1)		2.4% (3/123)
	C. Number of 'tracked' nests that failed as a result of predation-Predation Rate according to Vireo Working Group	31% (4/13)	33% (15/45)	--	--	47% (8/17)	--	38% (3/8)	--	18% (3/17)	25% (3/12)	0% (0/1)	20% (1/5)	100% (4/4)	100% (1/1)		34% (42/123)

Table 5: Least Bell's Vireo reproductive success and breeding biology data, monitored sites in the Santa Ana River Watershed, 2012

		San Jacinto	San Timoteo	March SKR Preserve	Sycamore Canyon	Mockingbird Canyon	SAR-\Mission Blvd. to Van Buren Blvd.	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			
	D. Number of 'tracked' nests that failed for unknown reasons	--	--	--	--	--	--	--	--	--	--		--	--	--		--
	Average clutch size	3.3	3.3	--	--	3.5	3.0	3.2		3.6	3.5	3.0	3.2	4.0	3.0		3.4
N	Number of eggs/Number of clutches	43/13	129/39	--	--	45/13	3/1	19/6		61/17	39/11	3/1	16/5	12/3	3/1		373/110
O.	Number of cowbird eggs found in or near vireo nests	1	1	--	--	1	1	0		0	5	0	0	0	0		9
P.	Number of cowbird nestlings removed from 'tracked' nests	0	0	--	--	0	--	0		0	0	0	0	0	0		0
Q.	Number of cowbird young fledged by vireos	0	0	--	--	0	--	0		0	0	0	0	0	0		0
R.	Number of 'manipulated' parasitized nests	1	0	--	--	1	0	0		0	2	0	0	0	0		4
S.	Number of 'successful, manipulated' nests (%=S/R x100)	100% (1/1)	n/a	--	--	100% (1/1)	--	n/a		n/a	100% (2/2)	n/a	n/a	n/a	n/a		100% (4/4)
T.	Number of vireos fledged from "manipulated' parasitized nests	3	n/a	--	--	1	--	n/a		n/a	6	n/a	n/a	n/a	n/a		10
U.	Number of repaired nests	1	1	--	--	0	0	0		0	0	0	0	0	0		2

Table 5: Least Bell's Vireo reproductive success and breeding biology data, monitored sites in the Santa Ana River Watershed, 2012

		San Jacinto	San Timoteo	March SKR Preserve	Sycamore Canyon	Mockingbird Canyon	SAR-\Mission Blvd. to Van Buren Blvd.	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			
V.	% successful repaired nests	100% (1/1)	100% (1/1)	--	--	n/a	--	n/a		n/a	n/a	n/a	n/a	n/a	n/a		100% (2/2)
W.	Number of vireos fledged from repaired nests	4	2	--	--	n/a	--	n/a		n/a	n/a	n/a	n/a	n/a	n/a		6

(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 Summary, monitored sites in the Santa Ana Watershed, 2012

Table 6: Brown Headed Cowbird Trapping Summary, monitored sites in the Santa Ana Watershed, 2012									
				Cowbirds Removed				Daily Removed Averages	
Monitored Site	Trap/Location	2012 Dates of Operation	Number of Trap Days	Total	Male	Female	Juveniles	Adults	All
San Jacinto									
	Scott Bros.	3/20-8/3	124	666	480	112	74	4.77	5.37
	R&J-Tuls 1	3/20-8/3	123	158	92	45	21	1.11	1.28
	R&J- Tuls 2	3/20-8/3	123	142	104	22	16	1.02	1.15
	CB#1	3/20-8/3	123	81	59	16	6	0.61	0.66
	CB#2	3/20-8/3	123	334	270	56	8	2.65	2.72
	Vanderwoude	3/20-8/3	123	198	107	49	42	1.27	1.61
	Alessandro Ponds	3/20-8/1	121	7	5	2	0	0.06	0.06
	Oostdam	3/20-8/3	124	142	83	39	20	0.98	1.15
Subtotal			984	1728	1200	341	187	1.57	1.76
San Timoteo									
	Fishermans	3/19-7/28	118	15	8	5	2	0.11	0.13
	San Tim. I-18	3/20-5/16	47	13	6	7	0	0.28	0.28
	Bee's	3/20-7/28	117	2	-1	3	0	0.02	0.02
	ESR	3/20-7/27	116	0	0	-1	1	-0.01	0.00
	St Park	3/20-7/28	117	17	7	8	2	0.13	0.15
	English	3/20-7/27	115	13	6	7	0	0.11	0.11
	Headlee	3/20-7/28	117	37	19	17	1	0.31	0.32
	Younglove #1	3/20-7/28	117	30	13	14	3	0.23	0.26
	Younglove #3	3/19-7/28	118	16	8	7	1	0.13	0.14
Subtotal			982	143	66	67	10	0.14	0.15
Mockingbird	Reservoir	3/21-7/30	127	83	44	31	8	0.59	0.65
Canyon	Dale	3/29-7/30	122	38	20	15	3	0.29	0.31
	MBC Estates	3/22-7/27	122	10	5	4	1	0.07	0.08
	Ungerer	3/22-7/27	124	9	5	4	0	0.07	0.07
Subtotal			495	140	74	54	12	0.26	0.28

Table 6: Brown Headed Cowbird Trapping Summary, monitored sites in the Santa Ana Watershed, 2012

Monitored Site	Trap/Location	2012 Dates of Operation	Number of Trap Days	Cowbirds Removed				Daily Removed Averages	
				Total	Male	Female	Juveniles	Adults	All
Hidden Valley									
	Gate 3	3/26-7/28	116	2	1	1	0	0.02	0.02
	West Trailhead	3/26-7/28	116	6	6	0	0	0.05	0.05
	Cliff	3/26-7/28	116	16	8	7	1	0.13	0.14
Subtotal			348	24	15	8	1	0.07	0.07
Temescal									
	Railroad Cyn. WM facility	3/20 - 7/27	92	15	6	8	1	0.15	0.16
	Marina	3/20 - 7/27	91	15	11	4	0	0.16	0.16
	Baker St.	3/19-8/1	96	24	10	14	0	0.25	0.25
	New Sump	3/19-8/2	98	16	6	9	1	0.15	0.16
	WRF3	3/19 - 7/27	94	14	5	5	4	0.11	0.15
	Archery Range	3/19 - 7/11	75	4	2	2	0	0.05	0.05
	DeJong's Dairy	3/5 - 7/27	114	445	234	159	52	3.45	3.90
	Menifee #1	3/20 - 8/2	96	28	14	10	4	0.25	0.29
	Menifee #2	3/20 - 8/1	95	5	3	2	0	0.05	0.05
Subtotal			851	566	291	213	62	0.59	0.67
Santa Ana Canyon									
	Horse Stables Full	4/10-8/3	105	62	36	23	3	0.56	0.59
	G. C. Maintenance	3/27-8/2	124	37	20	16	1	0.29	0.30
	Featherly Park RV#1	3/26-7/31	123	13	6	7	0	0.11	0.11
	Yorba #1	3/26-7/31	121	17	11	3	3	0.12	0.14
	CH Water-tank	3/27-7/30	124	6	3	3	0	0.05	0.05
Subtotal			597	135	76	52	7	0.21	0.23

Table 6: Brown Headed Cowbird Trapping Summary, monitored sites in the Santa Ana Watershed, 2012									
				Cowbirds Removed				Daily Removed Averages	
Monitored Site	Trap/Location	2012 Dates of Operation	Number of Trap Days	Total	Male	Female	Juveniles	Adults	All
Fullerton	Hawk's Pointe Full	2/28-8/1	141	3	3	0	0	0.02	0.02
	Hawk's Pointe Half	2/28-8/1	141	0	0	0	0	0.00	0.00
Subtotal			282	3	3	0	0	0.01	0.01
SKR Preserve	March SKR 1	3/27-7/26	120	8	7	1	0	0.07	0.07
	March SKR 2	3/27-7/26	115	8	4	3	1	0.06	0.07
Subtotal			235	16	11	4	1	0.06	0.07
Santa Ana River--	Jurupa Park	3/27-7/31	117	6	2	3	1	0.04	0.05
Jurupa Park to	Acorn 1	3/27-7/31	117	6	4	1	1	0.04	0.05
Hidden Valley	Acorn 2	3/26-7/29	118	9	3	4	2	0.06	0.08
	Riverdale	3/27-7/31	117	16	8	8	0	0.14	0.14
Subtotal			469	37	17	16	4	0.07	0.08
Santa Ana River – Norco									
River Road to Hidden Valley	GooseCreek 1	3/27-7/27	115	0	-2	2	0	0.00	0.00
	GooseCreek 2	3/27-7/27	115	34	18	14	2	0.28	0.30
Subtotal			230	34	16	16	2	0.14	0.15
GRAND TOTALS			**5473**	**2826**	**1769**	**771**	**286**	**0.46**	**0.52**

Table 7: Number of Times Non-Target Bird Species Trapped in Brown-headed Cowbird Traps in the Santa Ana Watershed, 2012

2012 Non-Target Species		San Jacinto		San Timoteo		March SKR Preserve		Mocking-bird Canyon		Santa Ana River-Norco		SAR-Jurupa to Hidden Valley		Hidden Valley		Temescal		Fullerton		Santa Ana Canyon		**2012 Total**	
		caught	died	caught	died	caught	died	caught	died	caught	died	caught	died	caught	died	caught	died	caught	died	caught	died	caught	died
California towhee	*Melozone crissalis*	54	1	812	5	1		684		54		63				24		282	2	381	5	2355	13
Red-winged blackbird	*Agelaius phoeniceus*	465		536		45		21				1				341	3					1409	3
House sparrow	*Passer domesticus*	911	3	10				10		2		5		2		67				1		1008	3
House finch	*Carpodacus mexicanus*	533	2	43	4			33								115	3			19	1	743	10
Brewer's Blackbird	*Euphagus cyanocephalus*	627	3													1						628	3
European starling	*Sturnus vulgaris*	488	5	13				1								97	2			4		603	7
Yellow-headed Blackbird	*Xanthocephalus xanthocephalus*	303		6				16								18				2		345	0
Song sparrow	*Melospiza melodia*	6		30		1		11								46	2			65		159	2
Lark sparrow	*Chondestes grammacus*	1		1		25		1								10						38	0
Blue grosbeak	*Passerina caerulea*					32																32	0
Tri-colored Blackbird	*Agelaius tricolor*	13																				13	0
Northern Mockingbird	*Mimus polyglottos*			1								3		1		3	1	1				9	1
Spotted towhee	*Pipilo maculatus*			3						5		1										9	0
California quail	*Callipepla californica*															6		1	1			7	1
Black-headed grosbeak	*Pheucticus melanocephalus*			4																2		6	0
Bewick's wren	*Thryomanes bewickii*															2	1			1		3	1
Budgerigar	*Melopsittacus undulatus*			2												1						3	0
Cooper's hawk	*Accipiter cooperii*	2				1																3	0
Barn owl	*Tyto alba*	2																				2	0
California thrasher	*Toxostoma redivivum*							1								1						2	0
Mourning dove	*Zenaida macroura*	2																				2	0
White-crowned	*Zonotrichia leucophrys*			1				1														2	0

2012 Non-Target Species		San Jacinto		San Timoteo		March SKR Preserve		Mocking-bird Canyon		Santa Ana River-Norco		SAR-Jurupa to Hidden Valley		Hidden Valley		Temescal		Fullerton		Santa Ana Canyon		**2012 Total**	
sparrow																							
Hooded oriole	*Icterus cucullatus*															1						1	0
Nuttall's woodpecker	*Picoides nuttallii*													1								1	0
Say's phoebe	*Sayornis saya*					1																1	0
TOTALS		3407	14	1462	9	106	0	779	0	61	0	73	0	4	0	733	12	284	3	475	6	7384	44
#/trap day		3.5		1.5		0.4		1.6		0.3		0.2		0		0.9		1.0		0.8		1.4	
Mortality %			0.4%		0.6%		0%		0%		0%		0%		0%		1.6%		1.1%		1.3%		0.6%
Mortality/trap day			0.01		0.01		0		0		0		0		0		0.01		0.01		0.01		0
# BHCO removed/ trap day		1.8		0.2		0.1		0.3		0.2		0.1		0.1		0.7		0		0.2		0.5	

Table 8: Winter 2011-2012 SAWA Cowbird Trapping Results

Monitored Site	Trap/Location	Winter 2011-2012 Dates of Operation	Number of Trap Days	Cowbirds Removed				Daily Removed Averages	
				Total	Male	Female	Juveniles	Adults	All
San Jacinto									
	Scott Bros.	8/1/2011-3/18/2012	190	1806	481	396	929	4.62	9.51
	R&J-Tuls 1	8/1/2011-3/18/2012	190	397	222	116	59	1.78	2.09
	R&J- Tuls 2	8/1/2011-3/18/2012	190	423	144	192	87	1.77	2.23
	CB#1	8/1/2011-3/18/2012	190	108	56	48	4	0.55	0.57
	CB#2	8/1/2011-3/18/2012	190	344	120	195	29	1.66	1.81
	Vanderwoude	8/1/2011-3/18/2012	190	761	143	237	381	2.00	4.01
	Oostdam	8/29/2011-3/18/2012	163	299	88	138	73	1.39	1.83
Total			**1303**	**4138**	**1254**	**1322**	**1562**	**1.98**	**3.18**

Table 9: Number of Times Non-Target Bird Species Removed from Cowbird Traps, Winter 2011-2012

2011-2012 Non-Target Species		San Jacinto				Winter 2011-2012 Total	
		caught	**died**			**caught**	**died**
European starling	*Sturnus vulgaris*	1019	3			1019	3
Red-winged blackbird	*Agelaius phoeniceus*	438	2			438	2
House sparrow	*Passer domesticus*	108	1			108	1
Song sparrow	*Melospiza melodia*	64				64	0
House finch	*Carpodacus mexicanus*	59				59	0
Brewer's blackbird	*Euphagus cyanocephalus*	28				28	0
Yellow-headed blackbird	*Xanthocephalus xanthocephalus*	23				23	0
Tri-colored blackbird	*Agelaius tricolor*	21				21	0
Mourning dove	*Zenaida macroura*	14	2			14	2
Cooper's hawk	*Accipiter cooperii*	10				10	0
Loggerhead shrike	*Lanius ludovicianus*	5				5	0
Eurasian Collared-dove	*Streptopelia decaocto*	1	1			1	1
Yellow-rumped warbler	*Setophaga coronata*	1				1	0
TOTALS		1791	9			1791	9
#/trap day (1303)		1.37				1.37	
Mortality %			0.50%				0.50%
Mortality/trap day			0.7%				0.7%
# BHCO removed(4,138)/ trap day		3.18				3.18	

Table 10: Results of the Least Bell's Vireo Assessment Surveys in the Santa Ana Watershed, 2005-2012

Table 10: Results of the Least Bell's Vireo Assessment Surveys in the Santa Ana Watershed, 2005-2012								
Site	**# LBVI Territories**							
	2005	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
Alessandro Arroyo/Prenda Arroyo	See Table 1	See Table 1	3	5	4	6	7	6
Arlington Falls	-	-	-	-	-	-	0	0
Box Springs	0	2	2	1	3	5	2	1
Cajalco Creek	1	1	1	See Temescal	See Temescal	See Temescal	3	1
Cajon Wash	-	0	0	0	0	0	0	-
Canyon Crest	-	0	-	-	-	0	0	-
Carbon Canyon (Chino Hills Pkwy)	0	0	1	0	0	0	0	-
Carbon Canyon (Western Hills Golf Club)	0	0	0	0	1	0	0	-
Carbon Canyon Regional Park	6	5	7	5	3	8	13	12
Castleview Park	1	0	1	0	0	0	0	0
Chino Hills (Bayberry Dr.)	-	-	-	0	0	0	0	-
Chino Hills (end of Eucalyptus)	0	0	0	0	0	0	0	-
Chino Hills (Eucalyptus/Del Monte)	3	1	1	0	1	2	0	0
Chino Hills (Eucalyptus/Rancho Hills)	1	0	1	1	1	1	2	1
Chino Hills (Soquel Canyon/Pipeline)	-	-	-	-	-	-	2	2
Chino Hills Community Park	-	-	-	5	8	10	9	3
Chino Hills State Park - Bane Canyon	-	-	5	5	6	7	5	5
Chino Hills State Park - Lower Aliso Creek	-	-	10	12	13	24	16	11
Chino Hills State Park - Telegraph Canyon	-	-	2	6	10	10	9	9
Chino Hills State Park - Upper Aliso Creek	-	-	7	8	6	10	12	8
City Creek (Highland)	-	-	-	-	-	2	0	0
Conrock Basin FHQ	-	-	-	-	-	-	1	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, 2005-2012								
Site	**# LBVI Territories**							
	2005	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
Fresno Canyon	2	4	2	1	0	1	1	0
Gavilan Hills	0	0	0	0	0	0	0	-
Goldenstar	-	0	0	0	1	0	0	0
Harrison Reservoir	See Temescal	See Temescal	See Temescal	See Temescal	See Temescal	See Temescal	See Temescal	3
Hidden Valley Golf Club	-	-	-	-	-	3	4	6
La Sierra/Lyon St.	-	-	1	2	2	3	3	2
Little Sand Basin (Highland)	-	-	-	-	-	2	3	3
Mead Valley (Cajalco/Aqueduct)	-	2	5	6	5	8	5	4
Menifee - Huan Rd.	0	0	0	0	-	0	-	-
Menifee - Paloma HS	0	0	0	0	-	0	-	-
Motte-Rimrock Preserve	-	-	0	-	-	-	-	-
Norco Hills Park Mitigation area	2	0	0	0	0	0	0	0
Oak Glen Preserve	-	0	0	0	0	0	0	-
Plunge Creek (Highland)	-	-	-	-	-	1	1	1
Poorman Reservoir	0	1	1	1	2	6	4	1
Porter Road (end)	0	0	0	0	0	0	0	-
Promenade	-	0	0	0	3	2	2	2
Pyrite Channel	-	-	-	1	1	3	3	0
Quail Run	0	0	0	0	0	0	0	0
Santa Rosa Mine Rd.	0	0	0	0	0	-	-	-
SAR (north side of Hidden Valley)	5	3	6	1	6	-	-	-
Starlight Dr (@ Hidden Hills Rd., Yorba Linda)	1	0	0	0	-	2	1	2
Steele Valley	0	0	0	0	0	0	-	-
Sun Canyon Park	0	0	0	0	0	0	0	-

Table 10: Results of the Least Bell's Vireo Assessment Surveys in the Santa Ana Watershed, 2005-2012								
Site	**# LBVI Territories**							
	2005	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
Tequesquite Arroyo	0	0	0	0	0	0	0	-
Van Buren Blvd. (Bountiful)	0	0	0	0	1	0	0	0
Van Buren Blvd. (Plummer Rd-south)	3	2	2	3	3	4	3	2
Wardlow Wash	0	0	1	0	0	0	0	-
Woodcrest	-	0	0	0	0	0	0	0
Wyle Labs (El Paso only)	0	1	1	0	1	1	1	1
Yorba Park Dry Lake Bed	-	-	-	0	1	1	1	1
San Jacinto River Sub-Watershed								
Cottonwood Canyon	0	0	0	0	0	2	3	3
East of Canyon Lake	2	-	-	-	-	-	-	-
Kabian Park	2	4	4	3	4	3	3	1
Lake Perris	1	1	3	2	4	6	10	8
Santiago Creek Sub-Watershed								
Irvine Regional Park	See Table 1	See Table 1	14	19	29	See tables 1A&1B	See tables 1A&1B	29
Irvine Trust Management Area	-	-	-	-	1	1	1	1
Limestone Canyon (includes Old Haul Rd./Blue Diamond Rd.)	See Table 1	See Table 1	2	2	2	3	3	0
Peter's Canyon	4	4	5	5	8	14	16	12
Santiago Canyon Rd (unnamed trib to Irvine Lake	-	-	0	0	0	0	0	0
Santiago Creek (u/s of Irvine Lake)	0	-	0	4	4	6	5	4
Santiago Creek at Cambridge Ave., City of Orange	-	1	0	0	0	0	0	-
Santiago Creek at Cannon Rd (including reservoir)	2	3	4	2	3	1	3	0
Santiago Creek at Chapman & Hwy 55, City of	-	-	0	0	0	0	0	0

Table 10: Results of the Least Bell's Vireo Assessment Surveys in the Santa Ana Watershed, 2005-2012								
Site	**# LBVI Territories**							
	2005	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
Orange								
Santiago Oaks Regional Park (SORP)	0	0	0	0	0	1	0	0
Santiago Pitts	-	-	-	-	-	-	2	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	**36**	**35**	**93**	**103**	**139**	**159**	**156**	**146**

Table 11: Results of Least Bell's Vireo Assessment Surveys in the Santa Ana Water shed, 2012

Table 11: Results of the Least Bell's Vireo Assessment Surveys in the Santa Ana River Watershed, 2012

	Site	SURVEY 1 4/27/12-5/07/12			SURVEY 2 5/31/12-6/13/12			SURVEY 3 6/30/12-7/21/12			TOTAL # VIREOS						
Surveyor	Santa Ana River & Tributaries	Terr	Pairs	Juv.	Terr.	Pairs	Juv.	Terr.	Pairs	Juv.	Terr.	Pairs	Juv.	# Visits	# Hours	Cowb-birds Detected	Traps on site?
DZ	Alessandro Arroyo	6	1	0	6	2	0	4	4	4	6	4	4	3	23	Y	N
AB	Arlington Falls	0	0	0	0	0	0	0	0	0	0	0	0	3	7	N	N
HA	Box Springs	0	0	0	1	0	0	1	1	1	1	1	1	3	9	N	N
MA	Cajalco Creek	N.S.			1	0	0	N.S.			1	0	0	1	1	N	N
JC, TB	Carbon Canyon Reg. Park	6	1	0	10	2	2	9	4	5	12	7	7	3	20.5	Y	N
CM	Castleview Park	N.S.			0	0	0	0	0	0	0	0	0	2	1.75	N	N
TR	Chino Hills (Eucalyptus/Del Monte)	0	0	0	0	0	0	0	0	0	0	0	0	3	3	N	N
TR	Chino Hills (Eucalyptus/Rancho Hills)	1	0	0	1	0	0	1	0	0	1	0	0	3	3.75	N	N
TR	Chino Hills (Soquel Canyon/Pipeline)	2	0	0	2	1	1	1	0	0	2	1	1	3	3	N	N
TR	Chino Hills Community Park (Eucaluptus/Peyton)	3	1	0	3	1	0	2	1	0	3	1	0	3	10	N	N
TR, SH	Chino Hills State Park - Bane Canyon	2	1	0	3	1	1	2	0	0	5	2	1	3	21.5	N	N
MA, AB	Chino Hills State Park - Lower Aliso Creek	6	2	0	7	4	2	7	5	4	11	8	7	3	18	Y	Y
TB	Chino Hills State Park - Telegraph Canyon	5	1	0	9	2	0	5	3	2	9	2	2	3	12	Y	N
TR, SH	Chino Hills State Park - Upper Aliso Creek	6	1	0	6	1	1	6	0	0	8	2	1	3	25	N	Y
CM	City Creek (Highland)	N.S.			0	0	0	0	0	0	0	0	0	2	3	N	N
DM	Conrock Basin FHQ	0	0	0	0	0	0	0	0	0	0	0	0	3	0.75	N	N
TR, CM	Fresno Canyon	0	0	0	0	0	0	0	0	0	0	0	0	3	10.25	N	N
CM	Goldenstar	N.S.			0	0	0	0	0	0	0	0	0	2	2	N	N

Table 11: Results of the Least Bell's Vireo Assessment Surveys in the Santa Ana River Watershed, 2012

Surveyor	Site: Santa Ana River & Tributaries	SURVEY 1 4/27/12-5/07/12			SURVEY 2 5/31/12-6/13/12			SURVEY 3 6/30/12-7/21/12			TOTAL # VIREOS			# Visits	# Hours	Cowbirds Detected	Traps on site?
		Terr	Pairs	Juv.	Terr.	Pairs	Juv.	Terr.	Pairs	Juv.	Terr.	Pairs	Juv.				
HA, CM	Harrison Reservoir	1	0	0	2	0	0	1	0	0	3	0	0	3	9.5	Y	N
SH, TR	Hidden Valley Golf Club	5	0	0	4	0	0	1	0	0	6	0	0	3	27.75	N	N
HA	La Sierra/Lyon St.	2	0	0	1	0	0	1	1	1	2	1	1	3	8	Y	N
GA	Little Sand Basin (Highland)	3	1	0	3	2	0	2	1	0	3	2	0	3	4.5	Y	N
JL, AH, SE, C	Mead Valley (Cajalco/Aqueduct)	4	1	0	2	0	0	2	1	2	4	1	2	3	25.5	N	N
HA	Norco Hills Park-mitigation area	N.S.			0	0	0	0	0	0	0	0	0	2	0.75	N	N
GA	Plunge Creek (Highland)	1	0	0	1	1	0	1	1	1	1	1	1	3	4.5	Y	N
GA, CM	Poorman Reservoir	0	0	0	0	0	0	1	1	2	1	1	2	3	7.5	N	N
HA	Promenade	1	0	0	2	1	1	1	0	0	2	1	1	3	4.5	Y	N
JL, NM, AH, SE	Pyrite Channel	0	0	0	0	0	0	0	0	0	0	0	0	3	24	N	N
CM	Quail Run	N.S.			0	0	0	0	0	0	0	0	0	2	1.75	N	N
SH	Starlight Dr. (Yorba Linda)	2	0	0	1	0	0	1	0	0	2	0	0	3	8.25	N	N
CM	Van Buren Blvd. (Bountiful)	N.S.			0	0	0	0	0	0	0	0	0	2	1.5	N	N
GA	Van Buren Blvd. (Plummer Rd-South)	1	0	0	0	0	0	2	1	1	2	1	1	3	6	N	N
CM	Woodcrest	N.S.			0	0	0	0	0	0	0	0	0	2	2	N	N
HA	Wyle Labs (El Paso only)	1	0	0	1	0	0	1	1	1	1	1	1	3	2	N	N
SH, CM	Yorba Park Dry Lake Bed	1	0	0	0	0	0	1	0	0	1	0	0	3	6	Y	N
San Jacinto River Sub-Watershed																	
MA	Cottonwood Canyon	2	0	0	2	0	0	2	0	0	3	0	0	3	10.5	N	N
MA, BN	Kabian Park	1	0	0	0	0	0	0	0	0	1	0	0	3	31	Y	N

Table 11: Results of the Least Bell's Vireo Assessment Surveys in the Santa Ana River Watershed, 2012

Surveyor	Site: Santa Ana River & Tributaries	SURVEY 1 4/27/12-5/07/12			SURVEY 2 5/31/12-6/13/12			SURVEY 3 6/30/12-7/21/12			TOTAL # VIREOS			# Visits	# Hours	Cowbirds Detected	Traps on site?
		Terr	Pairs	Juv.	Terr.	Pairs	Juv.	Terr.	Pairs	Juv.	Terr.	Pairs	Juv.				
JC, TB	Lake Perris	6	0	0	7	3	0	8	4	4	8	4	4	3	32.5	Y	Y
Santiago Creek Sub-Watershed																	
DM	Irvine Regional Park	19	2	0	25	2	3	20	1	2	29	5	5	3	9.5	Y	Y
DM	Irvine Trust Management Area	0	0	0	1	0	0	0	0	0	1	0	0	3	0.75	Y	Y
TB	Limestone Canyon (includes Old Haul Rd./Blue Diamond Rd.)	0	0	0	0	0	0	0	0	0	0	0	0	3	3	N	Y
DM/MA	Peter's Canyon	10	2	0	6	0	0	8	2	0	12	2	0	3	14.5	Y	Y
TB	Santiago Canyon Rd (unnamed trib to Irvine Lake	0	0	0	0	0	0	0	0	0	0	0	0	3	1.5	N	N
TB	Santiago Creek (u/s of Irvine Lake)	3	1	0	3	1	0	4	1	2	4	1	2	3	10.5	Y	N
SH	Santiago Creek at Cannon Rd (including reservoir)	0	0	0	0	0	0	0	0	0	0	0	0	3	15	N	N
SH	Santiago Creek at Chapman & Hwy 55, City of Orange	N.S.			0	0	0	0	0	0	0	0	0	2	5	N	N
JC, CM	Santiago Oaks Regional Park (SORP)	0	0	0	0	0	0	0	0	0	0	0	0	3	7.25	N	N
DM	Santiago Pitts	0	0	0	1	0	0	0	0	0	1	0	0	3	2.5	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 during Assessment Surveys		**100**	**15**	**0**	**111**	**24**	**11**	**95**	**33**	**32**	**146**	**49**	**44**	**137**	**465**		

Table 12: Observations of Sensitive Species by Location, 2012

	Common Name	Scientific Name	San Jacinto		San Timoteo		Mockingbird		March		Sycamore Canyon		PAR	
			# territory	# indiv.	# territory	# indiv.	# territory	# indiv.	# territory	# indiv.	# territory	# indiv.	# territory	# indiv.
Avian	Double-crested Cormorant	*Phalacrocorax auritus*												
	White-tailed Kite	*Elanus leucurus*			1									
	Northern Harrier	*Circus cyaneus*								1				
	Bald Eagle	*Haliaeetus leucocephalus*												
	Golden Eagle	*Aquila chrysaetos*												
	Osprey	*Pandion haliaetus*												
	Cooper's Hawk	*Accipiter cooperii*			6		1		1					
	Red-tailed Hawk	*Buteo jamaicensis*												
	Red-shouldered Hawk	*Buteo lineatus*			1									
	Ferruginous Hawk	*Buteo regalis*												
	Merlin	*Falco columbarius*												
	Prairie Falcon	*Falco mexicanus*												
	Peregrine Falcon	*Falco peregrinus*												
	Burrowing Owl	*Athene cunicularia*												
	Downy Woodpecker	*Picoides pubescens*			8			1	3					4
	Loggerhead Shrike	*Lanius ludovicianus*												
	Horned Lark	*Eremophila alpestris*					4	15						
	Tree Swallow	*Tachycineta bicolor*												
	Coastal Cactus Wren	*Campylorhynchus brunneicapillus*												
	California Gnatcatcher	*Polioptila californica*												
	Yellow Warbler	*Setophaga petechia*	23		109		17		4		4		12	
	Wilson's Warbler	*Cardellina pusilla*						1						
	Yellow-breasted Chat	*Icteria virens*			17				1				2	
	Rufous-crowned Sparrow	*Aimophila ruficeps canescens*		1										
	Grasshopper Sparrow	Ammodramus savannarum												
	Blue Grosbeak	*Passerina caerulea*												
	Tri-colored Blackbird	*Agelaius tricolor*		34										
	Lawrence's Goldfinch	*Carduelis lawrencei*			10	20								
	Nashville Warbler	*Oreothlypis ruficapilla*												
	California Least Tern	*Sternula antillarum browni*												
	Black Skimmer	*Rynchops niger*												
	Ash-throated Flycatcher	*Myiarchus cinerascens*												
	Red-crowned Parrot	*Amazona viridigenalis*												
Reptiles	Granite Spiny Lizard	*Sceloporus orcutti*						7						
	Orange-throated Whiptail	*Aspidoscelis hyperythrus*				1								
	Coastal Western Whiptail	*Aspidoscelis tigris*												
	Coast Horned Lizard	*Phrynosoma coronatum*												
	Red Diamond Rattlesnake	*Crotalus ruber*												
	Coast Range Newt	*Taricha torosa*												
	Two-striped Garter Snake	*Thamnophis hammondii*												
	Coastal Rosy Boa	*Charina trivirgata*												
Mammal	Black-tailed Jackrabbit	*Lepus californicus bennettii*		4				12		3		2		
	Long-tailed Weasel	*Mustela frenata*												
	Bobcat	*Lynx rufus*				4								
	Coyote	*Canis latrans*												
	Feral Pig	*Sus scrofa*												

Table 12: Observations of Sensitive Species by Location (Continued)

	Common Name	Scientific Name	SAR-VB to Misson		SAR-Hidden Valley		SAR-HV to River Rd.		Temescal		SAC-Upper Cyn.		SAC-Green River	
			# territory	# indiv.	# territory	# indiv.	# territory	# indiv.	# territory	# indiv.	# territory	# indiv.	# territory	# indiv.
Avian	Double-crested Cormorant	*Phalacrocorax auritus*												
	White-tailed Kite	*Elanus leucurus*				1			1		1		1	
	Northern Harrier	*Circus cyaneus*				4								
	Bald Eagle	*Haliaeetus leucocephalus*												
	Golden Eagle	*Aquila chrysaetos*						3						
	Osprey	*Pandion haliaetus*												
	Cooper's Hawk	*Accipiter cooperii*			1	1	7		1					
	Red-tailed Hawk	*Buteo jamaicensis*			2									
	Red-shouldered Hawk	*Buteo lineatus*				1								
	Ferruginous Hawk	*Buteo regalis*												
	Merlin	*Falco columbarius*												
	Prairie Falcon	*Falco mexicanus*												
	Peregrine Falcon	*Falco peregrinus*				1								
	Burrowing Owl	*Athene cunicularia*												
	Downy Woodpecker	*Picoides pubescens*	4			5	4		1				2	
	Loggerhead Shrike	*Lanius ludovicianus*				2								
	Horned Lark	*Eremophila alpestris*				1								
	Tree Swallow	*Tachycineta bicolor*	5							100				
	Coastal Cactus Wren	*Campylorhynchus brunneicapillus*												
	California Gnatcatcher	*Polioptila californica*												
	Yellow Warbler	*Setophaga petechia*	15		130		78		124		17		36	
	Wilson's Warbler	*Cardellina pusilla*						2						
	Yellow-breasted Chat	*Icteria virens*	5		39		38		3		5		12	
	Rufous-crowned Sparrow	*Aimophila ruficeps canescens*												
	Grasshopper Sparrow	Ammodramus savannarum												
	Blue Grosbeak	*Passerina caerulea*												
	Tri-colored Blackbird	*Agelaius tricolor*												
	Lawrence's Goldfinch	*Carduelis lawrencei*	1			50								
	Nashville Warbler	*Oreothlypis ruficapilla*												
	California Least Tern	*Sternula antillarum browni*												
	Black Skimmer	*Rynchops niger*												
	Ash-throated Flycatcher	*Myiarchus cinerascens*												
	Red-crowned Parrot	*Amazona viridigenalis*												
Reptiles	Granite Spiny Lizard	*Sceloporus orcutti*								5				
	Orange-throated Whiptail	*Aspidoscelis hyperythrus*								7				
	Coastal Western Whiptail	*Aspidoscelis tigris*												1
	Coast Horned Lizard	*Phrynosoma coronatum*												
	Red Diamond Rattlesnake	*Crotalus ruber*								2				
	Coast Range Newt	*Taricha torosa*												
	Two-striped Garter Snake	*Thamnophis hammondii*												
	Coastal Rosy Boa	*Charina trivirgata*								3				
Mammal	Black-tailed Jackrabbit	*Lepus californicus bennettii*												
	Long-tailed Weasel	*Mustela frenata*						3						1
	Bobcat	*Lynx rufus*						1		1				
	Coyote	*Canis latrans*				2								
	Feral Pig	*Sus scrofa*						5						

Table 12: Observations of Sensitive Species by Location (Continued)

	Common Name	Scientific Name	SAC-Featherly Park		Irvine Park		Santa Rosa Plateau		Harrison		Chino Creek Park	
			# territory	# indiv.	# territory	# indiv.	# territory	#indiv.	# territory	#indiv.	# territory	# indiv.
Avian	Double-crested Cormorant	*Phalacrocorax auritus*										
	White-tailed Kite	*Elanus leucurus*	1									
	Northern Harrier	*Circus cyaneus*										
	Bald Eagle	*Haliaeetus leucocephalus*										
	Golden Eagle	*Aquila chrysaetos*										
	Osprey	*Pandion haliaetus*										
	Cooper's Hawk	*Accipiter cooperii*	1									
	Red-tailed Hawk	*Buteo jamaicensis*	1									
	Red-shouldered Hawk	*Buteo lineatus*										
	Ferruginous Hawk	*Buteo regalis*										
	Merlin	*Falco columbarius*										
	Prairie Falcon	*Falco mexicanus*										
	Peregrine Falcon	*Falco peregrinus*										
	Burrowing Owl	*Athene cunicularia*										
	Downy Woodpecker	*Picoides pubescens*	1									
	Loggerhead Shrike	*Lanius ludovicianus*										
	Horned Lark	*Eremophila alpestris*										
	Tree Swallow	*Tachycineta bicolor*	18								20	
	Coastal Cactus Wren	*Campylorhynchus brunneicapillus*										
	California Gnatcatcher	*Polioptila californica*			1					1		
	Yellow Warbler	*Setophaga petechia*	46		7				2		6	
	Wilson's Warbler	*Cardellina pusilla*		2								
	Yellow-breasted Chat	*Icteria virens*	13		5						1	
	Rufous-crowned Sparrow	*Aimophila ruficeps canescens*										
	Grasshopper Sparrow	Ammodramus savannarum										
	Blue Grosbeak	*Passerina caerulea*										
	Tri-colored Blackbird	*Agelaius tricolor*										
	Lawrence's Goldfinch	*Carduelis lawrencei*		1								
	Nashville Warbler	*Oreothlypis ruficapilla*										
	California Least Tern	*Sternula antillarum browni*										
	Black Skimmer	*Rynchops niger*										
	Ash-throated Flycatcher	*Myiarchus cinerascens*										
	Red-crowned Parrot	*Amazona viridigenalis*										
Reptiles	Granite Spiny Lizard	*Sceloporus orcutti*										
	Orange-throated Whiptail	*Aspidoscelis hyperythrus*						3				
	Coastal Western Whiptail	*Aspidoscelis tigris*										
	Coast Horned Lizard	*Phrynosoma coronatum*										
	Red Diamond Rattlesnake	*Crotalus ruber*										
	Coast Range Newt	*Taricha torosa*						16				
	Two-striped Garter Snake	*Thamnophis hammondii*						9				
	Coastal Rosy Boa	*Charina trivirgata*										
Mammal	Black-tailed Jackrabbit	*Lepus californicus bennettii*										
	Long-tailed Weasel	*Mustela frenata*										
	Bobcat	*Lynx rufus*										1
	Coyote	*Canis latrans*										
	Feral Pig	*Sus scrofa*										

Table 12: Observations of Sensitive Species by Location (Continued)

	Common Name	Scientific Name	Other*		Totals*	
			# territory	# indiv.	# territory	# indiv.
Avian	Double-crested Cormorant	*Phalacrocorax auritus*			0	0
	White-tailed Kite	*Elanus leucurus*	3	5	8	6
	Northern Harrier	*Circus cyaneus*		3	0	8
	Bald Eagle	*Haliaeetus leucocephalus*			0	0
	Golden Eagle	*Aquila chrysaetos*	1		1	3
	Osprey	*Pandion haliaetus*			0	0
	Cooper's Hawk	*Accipiter cooperii*	11	6	29	7
	Red-tailed Hawk	*Buteo jamaicensis*			3	0
	Red-shouldered Hawk	*Buteo lineatus*	2		3	1
	Ferruginous Hawk	*Buteo regalis*			0	0
	Merlin	*Falco columbarius*			0	0
	Prairie Falcon	*Falco mexicanus*			0	0
	Peregrine Falcon	*Falco peregrinus*			0	1
	Burrowing Owl	*Athene cunicularia*	2		2	0
	Downy Woodpecker	*Picoides pubescens*		3	23	13
	Loggerhead Shrike	*Lanius ludovicianus*		3	0	5
	Horned Lark	*Eremophila alpestris*			4	16
	Tree Swallow	*Tachycineta bicolor*	9		152	100
	Coastal Cactus Wren	*Campylorhynchus brunneicapillus*	1		1	0
	California Gnatcatcher	*Polioptila californica*	17	8	18	9
	Yellow Warbler	*Setophaga petechia*	184		814	0
	Wilson's Warbler	*Cardellina pusilla*		2	0	7
	Yellow-breasted Chat	*Icteria virens*	36		177	0
	Rufous-crowned Sparrow	*Aimophila ruficeps canescens*		3	0	4
	Grasshopper Sparrow	Ammodramus savannarum			0	0
	Blue Grosbeak	*Passerina caerulea*			0	0
	Tri-colored Blackbird	*Agelaius tricolor*		166	0	200
	Lawrence's Goldfinch	*Carduelis lawrencei*		4	11	75
	Nashville Warbler	*Oreothlypis ruficapilla*		3	0	3
	California Least Tern	*Sternula antillarum browni*	11		11	0
	Black Skimmer	*Rynchops niger*	20		20	0
	Ash-throated Flycatcher	*Myiarchus cinerascens*	7		7	0
	Red-crowned Parrot	*Amazona viridigenalis*		16	0	16
Reptiles	Granite Spiny Lizard	*Sceloporus orcutti*		7	0	19
	Orange-throated Whiptail	*Aspidoscelis hyperythrus*		1	0	12
	Coastal Western Whiptail	*Aspidoscelis tigris*			0	1
	Coast Horned Lizard	*Phrynosoma coronatum*			0	0
	Red Diamond Rattlesnake	*Crotalus ruber*		2	0	4
	Coast Range Newt	*Taricha torosa*			0	16
	Two-striped Garter Snake	*Thamnophis hammondii*			0	9
	Coastal Rosy Boa	*Charina trivirgata*			0	3
Mammal	Black-tailed Jackrabbit	*Lepus californicus bennettii*			0	21
	Long-tailed Weasel	*Mustela frenata*		2	0	6
	Bobcat	*Lynx rufus*			0	7
	Coyote	*Canis latrans*			0	2
	Feral Pig	*Sus scrofa*			0	5

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	471879, 3752740	474210, 3749595
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):		
-Fairmount Park to Hidden Valley	464841, 3762311	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)	411796, 3722775	412029, 3723877
San Timoteo:		
-Riverside County	484860, 3762464	501099, 3753159
-San Bernardino County	481911, 3764699	484860, 3762464
Sycamore Canyon	470287, 3756422	473519, 3753591
Temescal Canyon	471486, 3720612	450724, 3746925

Assessment Locations

Survey Site	Starting Coordinates	Ending Coordinates
Alessandro Arroyo/Prenda Arroyo	471087, 3750512	465058, 3754499
Arlington Falls	453856, 3748925	454753, 3748301
Box Springs	472400, 3756419	471898, 3757199
Cajalco Creek	453805, 3742988	453767, 3743230
Cajon Wash*	456115, 3795872	457587, 3791800
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	431895, 3761650
Chino Hills State Park (Bane Cyn)	435061, 3757365	435376, 3753499
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
Conrock Basin (FHQ)	423314, 3746089	423465, 3746370
Corona St. at Gilmore*	448093, 3750572	448406, 3750398
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
Promenade	451350, 3749618	451336, 3749919
Pyrite Channel	456496, 3762175	453872, 3759586
Quail Run	470673, 3757379	470399, 3757380
Santa Rosa Mine Road*	471840, 3737819	471012, 3738146
Starlight Dr. (Yorba Linda)	431064, 3749722	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 Park Dry Lake Bed	424530, 3748301	424909, 3749091

Assessment Locations (cont.)

Survey Site	Starting Coordinates	Ending Coordinates
San Jacinto River Sub-watershed:		
Cottonwood Canyon	475633, 3725415	477503, 3724023
Kabian Park	475841, 3730880	476070, 3732369
Lake Perris	484522, 3744830	485461, 3748329
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)	425540, 3741436	428079, 3742770
Santiago Creek (Chapman Ave.)	423116, 3738554	423740, 3739316
Santiago Oaks Regional Park	428069, 3742690	429133, 3742111
Santiago Pitts	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
East Coyote Hills Preserve	415417, 3750601	417337, 3751214
Etiwanda Preserve*	451769, 3780654	451186, 3787544
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.

APPENDIX B: WATERSHED ANNUAL RESULTS 2000-2012

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, 2000-2012. (See Tables 1A and 1B for total abundance.)

	Parameter	2000-2009	2010	2011	2012						Total
A.	Number of territorial males	n/a	654	641	599						n/a
B.	Number of pairs (breeding and non-breeding)	1,737	450	407	380						2,974
C.	Number of fledged young observed	3,203	613	626	494						4,936
D.	Projected total recruitment of vireo young **(**a)	4,584	1,065	1,080	982						7,711
E.	Average number of fledglings per pair (C/B)	1.8	1.4	1.5	1.3						1.7
F.	Projected number of fledglings per pair (D/B)	1.4	2.8	2.7	2.6						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)						40% (657/1650)
H.	Rate of cowbird nest parasitism	17% (204/1185)	5% (7/138)	2% (5/204)	4.9% (6/123)						13% (222/1650)
I.	Numbers of cowbirds removed from study area	18,590	3,093	2,444	2,823						26,950
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						60,206
L.	Average number of cowbirds trapped per trap day (I/K)	0.45	0.44	0.39	0.54						0.45
M.	Number of field hours – LBV (+)		2,589	2,738	2,364						
N.	Number of field hours – BHCO (+)	39,014	3,239	3,281	2,838						56,063

(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, 2000-2012.

Host Plant Species	2000-2009	2010	2011	2012						Total
Black Willow *(Salix gooddingii)*	224	12	20	10						266
Arroyo Willow *(Salix lasiolepis)*	291	27	39	31						388
Red Willow *(Salix laevigata)*	118	22	39	19						198
Narrow-leafed Willow *(Salix exigua)*	56	3	12	11						82
Yellow Willow *(Salix lucida spp. lasiandra)*	8	1	2							11
Willow species (*Salix spp.*)	6									6
Fremont Cottonwood *(Populus fremontii)*	49	6	12	6						73
Mulefat *(Baccharis salicifolia)*	418	66	56	29						569
Elderberry *(Sambucus mexicana)*	67	12	17	11						107
Black Walnut *(Juglans californica)*	5	2								7
Stinging Nettle (*Urtica dioica*)	1									1
Mugwort (*Artemisia douglasiana*)	18		1	1						20
Toyon (*Heteromeles arbutifolia*)	17		1	1						19
Poison Hemlock (*Conium maculatum*)	10									10
Wild Grape *(Vitis girdana)*	38	8	17	4						67
Wild Rose (*Rosa californica*)	5									5
Cockleburr (*Xanthium strumarium*)	2									2
Myoporum (*Myoporum luteum*)	1									1
Laurel Sumac (*Malosma laurina*)	6									6
Black mustard (Brassica nigra)	8	1		1						10
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, 2000-2012.

Host Plant Species	2000-2009	2010	2011	2012						Total
Golden Current (*Ribes aureum*)	1									1
Yellowspine Thistle (*Cirsium ochrocentrum*)	2									2
Coast Live Oak (*Quercus agrifolia*)	1									1
Giant Reed (*Arundo donax*)	1									1
Milk Thistle (*Sylybum marianum*)	1									1
Arroweed (*Pluchea sp.*)	1			1						2
California Sagebrush (*Artemisia californica*)	1									1
Scrub Oak (*Quercus spp.*)	4									4
Poison Oak (*Toxicodendron diversilobum*)	9									9
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

Table B-2. Least Bell's Vireo nest placement preferences, monitored sites in the Santa Ana River watershed, 2000-2012.

Host Plant Species	2000-2009	2010	2011	2012						Total
Castor bean (*Rincus communis*)	1									1
Pepperweed (*Lepidium latifolium*) and Black Willow (*Salix goodingii*)	1									1
Common Sunflower (*Helianthus annus*)	1									1
Black Willow (*Salix goodingii*) and Grape (*Vitis girdiana*)	1									1
Mulefat/Black Mustard (*Baccharis salicifolia/Brassica nigra*)	1									1
Black Willow/Poison Hemlock (*Salix goodingii/Conium maculatum*)	1									1
Mulefat/Wild Grape (*Baccharis salicifolia/Vitis girdiana*)	2			1						3
Red Willow/Wild Grape (*S. lasiolepsis/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/dead Stinging Nettle (*S. lasiolepsis/U. dioica*)	1									1
Red Willow/Fresh Water Reed	1									1
Rose (*Rosa californicus*) & Wild Grape (*Vitis girdiana*)	1									1
S. lasiolepsis & Fennel (*Foeniculum vulgare*)	1									1
Orange Tree (*Rufaceae citrus sinesnsi*)	1		1	1						3

Table B-2. Least Bell's Vireo nest placement preferences, monitored sites in the Santa Ana River watershed, 2000-2012.

Host Plant Species	2000-2009	2010	2011	2012						Total
Elderbery (*S. mexicanus*) & Wild Grape (*V. girdiana*)	1									1
Wax Leaf Pivet (*Ligustrum sp.*)	1									1
Dead Black Willow (*S. goodingii*) & Nettle (*U. dioica*)	1									1
Arroyo Willow (*S. lasiolepsis*) & Black Mustard (*Brassica 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
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 (*Schinus molle*) and Wild Grape (*Vitis girdiana*)	0		1							1
Tree Tobacco (*Nicotiana glauca*)	0		1							1
Black Willow (*Salix goodingii*) and Elderberry (*Sambucus Mexicana*)	0		1							1
Mulefat (*Baccharis salicifolia*) and Poison Hemlock (*Conium maculatum*)	0			1						1
Mulefat (*Baccharis salicifolia*) and Castorbean (*Ricinus communis*)	0			1						1
California Blackberry	0			1						1

Table B-2. Least Bell's Vireo nest placement preferences, monitored sites in the Santa Ana River watershed, 2000-2012.

Host Plant Species	2000-2009	2010	2011	2012						Total
(*Rubus ursinus*)										
Brittlebush (*Encelia farinosa*)	0			1						1
Dead Fremont Cottonwood	0			1						1
Brazilian Pepper Tree (*Schinus terebinthifolius*)	0			1						1
Blue Plumbago (*Plubago auriculata*)	0			1						1
Unknown	0		5							5
Total	**1,430***	**168**	**234**	140						**1,972***

*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- 2012. Please see Table 1 for total watershed numbers of territories, pairs, and fledglings observed.

Table B-3		2000-2009	2010	2011	2012					Total
A.	Number of pairs	1748	450	407	376					n/a
B.	Number of breeding (nesting) pairs	1567	361	345	287					2560
C.	Number of breeding pairs that were well-monitored throughout the breeding season	702	87	105	74					968
D.	Number of 'known fledged young' OBSERVED	3210	613	626	487					4936
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season	1895	239	308	207					2649
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
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)	2.7	2.7	2.9	2.8					2.7
H.	Number of nests that were discovered	1447	184	240	142					2013
I.	Number of nests that were regularly monitored or 'tracked'	1185	138	204	123					1650
J.	Number of 'tracked' nests that were successful	61% (720/1185)	65% (90/138)	56% (115/204)	60% (74/123)					61% (999/1650)
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)					40% (657/1650)
L.	Number of 'tracked' nests that were parasitized by cowbirds	17% (204/1185)	5% (7/138)	2% (5/204)	5% (6/123)					13% (222/1650)
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)					4% (65/1650)
	B. Number of 'tracked'' nests that failed as a result of parasitism	5% (61/1185)	3% (4/138)	1% (3/204)	2% (3/123)					4% (71/1650)
	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)					31% (513/1650)
	D. Number of 'tracked' nests that failed for unknown reasons	0% (1/1185)	0% (0/138)	1% (2/204)	0% (0/123)					0% (3/1650)

Table B-3		2000-2009	2010	2011	2012					Total
N.	Average clutch size	n/a	n/a	3.6	3.4					n/a
O.	Number of cowbird eggs found in or near vireo nests	248	11	6	9					274
P.	Number of cowbird nestlings removed from 'tracked' nests	15	0	0	0					15
Q.	Number of cowbird young fledged by vireos	8	1	1	0					10
R.	Number of 'manipulated' parasitized nests	169	5	3	4					181
S.	% 'successful, manipulated' nests	45% (76/169)	60% (3/5)	100% (2/2)*	100% (4/4)					47% (85/180)
T.	Number of vireos fledged from "manipulated' parasitized nests	158	8	4	10					180
U.	Number of repaired nests	19	2	7	2					30
V.	% successful repaired nests	72% (13/18)*	50% (1/2)	86% (6/7)	100% (2/2)					76% (22/29)
W.	Number of vireos fledged from repaired nests	37	2	16	6					61

*one outcome unknown

APPENDIX C: SUMMARY TABLES BY MANAGED SITE, FROM 2000-2012

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							Totals
A.	Number of territorial males	n/a	22	41	42							n/a
B.	Number of pairs (breeding and non-breeding)	43	18	25	36							122
C.	Number of fledged young observed	104	28	18	49							199
D.	Projected total of recruitment of vireo young (a)	122.1	n/a	n/a	104							226*
E.	Average number of fledglings per pair (C/B)	2.4	1.6	0.72	1.4							1.6
F.	Projected number of fledglings per pair (D/B)	2.8	n/a	n/a	2.9							2.9*
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)							38% (30/80)
H.	Rate of cowbird nest parasitism	11.1% (6/54)	0	10% (1/10)	8% (1/13)							10% (8/80)
I.	Numbers of cowbirds removed from study area	11,622	2136	1797	1728							17,283
K.	Number of trap days (1 operative trap in the field for one day = 1 trap day)	6,405	993	982	984							9,364
L.	Average number of cowbirds trapped per trap day (I/K)	1.81	2.15	1.8	1.8							1.8
M.	Number of field hours -LBVI	4,425.2	79	129	161							6,574
N.	Number of field hours - BHCO		525	544	711							

*Excludes 2010 and 2011 data

SAN TIMOTEO

	Parameter	2000-2009	2010	2011	2012							Totals
A.	Number of territorial males	n/a	126	116	118							n/a
B.	Number of pairs (breeding and non-breeding)	323	95	101	102							621
C.	Number of fledged young observed	635	137	196	153							1,121
D.	Projected total of recruitment of vireo young (a)	918*	266	343	286							1,813
E.	Average number of fledglings per pair (C/B)	2.0	1.4	1.9	1.5							1.8
F.	Projected number of fledglings per pair (D/B)	2.8*	2.8	3.4	2.8							2.9
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)							44% (215/493)
H.	Rate of cowbird nest parasitism	30.5% (103/338)	8% (3/37)	0% (0/73)	2% (1/45)							22% (107/493)
I.	Numbers of cowbirds removed from study area	1,487	173	109	143							1,912
K.	Number of trap days (1 operative trap in the field for one day = 1 trap day)	6,463	1113	1191	982							9,749
L.	Average number of cowbirds trapped per trap day (I/K)	0.23	0.16	0.09	0.15							0.20
M.	Number of field hours -LBVI	6,524.6	505	587	407							9,417
N.	Number of field hours - BHCO		503	564	326							

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							Totals
A.	Number of territorial males	n/a	14	16	13							n/a
B.	Number of pairs (breeding and non-breeding)	33	12	9	11							65
C.	Number of fledged young observed	75	25	7	8							115
D.	Projected total of recruitment of vireo young (a)	120.5 (n=4 yrs)	75.6	n/a	n/a							196.1
E.	Average number of fledglings per pair (C/B)	2.3	2.1	0.8	0.7							1.8
F.	Projected number of fledglings per pair (D/B)	4.6* (n=4 yrs)	6.3	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							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							0% (0/22) (n=5 yrs)
I.	Numbers of cowbirds removed from study area	151	13	12	16							192
K.	Number of trap days (1 operative trap in the field for one day = 1 trap day)	1,203	280	200	235							1,918
L.	Average number of cowbirds trapped per trap day (I/K)	0.13	0.05	0.06	0.07							0.10
M.	Number of field hours -LBVI	457	62	55	22							596
N.	Number of field hours - BHCO	504	153	45	60							762

*Excludes 2010 and 2011 data

SYCAMORE CANYON

	Parameter	2000-2009	2010	2011	2012							Totals
A.	Number of territorial males	n/a	12	9	7							n/a
B.	Number of pairs (breeding and non-breeding)	35	8	5	7							55
C.	Number of fledged young observed	40	11	4	5							60
D.	Projected total of recruitment of vireo young (a)	39.6	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							1.1
F.	Projected number of fledglings per pair (D/B)	1.6* (39.6/25)	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							33% (3/9)
H.	Rate of cowbird nest parasitism	22.2% (2/9)	n/a	n/a	n/a							22% (2/9)
I.	Numbers of cowbirds removed from study area	81	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							635
L.	Average number of cowbirds trapped per trap day (I/K)	0.13	n/a	n/a	n/a							0.13
M.	Number of field hours -LBVI	474	54	46	22							596
N.	Number of field hours - BHCO	469	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							Totals
A.	Number of territorial males	n/a	43	37	28							n/a
B.	Number of pairs (breeding and non-breeding)	120	34	32	26							212
C.	Number of fledged young observed	218	25	67	39							349
D.	Projected total of recruitment of vireo young (a)	417.7	n/a	93	78							589
E.	Average number of fledglings per pair (C/B)	1.8	0.7	2.1	1.5							1.6
F.	Projected number of fledglings per pair (D/B)	3.5	n/a	2.9	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)							45% (58/129)
H.	Rate of cowbird nest parasitism	14.6% (12/82)	n/a	0% (0/30)	6% (1/17)							10% (13/129)
I.	Numbers of cowbirds removed from study area	1,258	149	111	140							1,658
K.	Number of trap days (1 operative trap in the field for one day = 1 trap day)	5,395	1028	908	495							7,826
L.	Average number of cowbirds trapped per trap day (I/K)	0.23	0.14	0.12	0.28							0.21
M.	Number of field hours -LBVI	3,661	96	302	203							4,965
N.	Number of field hours - BHCO		312	176	215							

*excludes 2010 data

Santa Ana River (Fairmount Park to Hidden Valley)

	Parameter	2000-2009	2010	2011	2012							Totals
A.	Number of territorial males	n/a	68	49	43							n/a
B.	Number of pairs (breeding and non-breeding)	167	50	22	11							250
C.	Number of fledged young observed	283	58	32	7							380
D.	Projected total of recruitment of vireo young **(a)**	329.4 (n=5 yrs)	100	71	n/a							500
E.	Average number of fledglings per pair (C/B)	1.7	1.2	1.5	0.6							1.5
F.	Projected number of fledglings per pair (D/B)	2.7 (121/329	2.0	3.2	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							32% (31/96)
H.	Rate of cowbird nest parasitism	16.0% (12/75)	0% (0/11)	10% (1/10)	n/a							14% (13/96)
I.	Numbers of cowbirds removed from study area	461	58	30	37							586
K.	Number of trap days (1 operative trap in the field for one day = 1 trap day)	3,734	530	515	468							5,247
L.	Average number of cowbirds trapped per trap day (I/K)	0.12	0.11	0.06	0.08							0.11
M.	Number of field hours -LBVI	2,333	335	239	144							3,877
N.	Number of field hours - BHCO		277	315	234							

*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							Totals
A.	Number of territorial males	n/a	101	105	95							n/a
B.	Number of pairs (breeding and non-breeding)	233	64	59	51							407
C.	Number of fledged young observed	489	113	91	86							779
D.	Projected total of recruitment of vireo young (a)	696.2	211.2	177	184							1268
E.	Average number of fledglings per pair (C/B)	2.1	1.8	1.5	1.7							1.9
F.	Projected number of fledglings per pair (D/B)	2.7	3.3	3.0	3.6							2.5
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)							38% (88/234)
H.	Rate of cowbird nest parasitism	8.5% (14/177)	0% (0/18)	0% (0/22)	0% (0/17)							6% (14/234)
I.	Numbers of cowbirds removed from study area	382	49	35	34							500
K.	Number of trap days (1 operative trap in the field for one day = 1 trap day)	1,102	269	228	230							1,829
L.	Average number of cowbirds trapped per trap day (I/K)	0.35	0.18	0.15	0.15							0.27
M.	Number of field hours -LBVI	2,337	183	197	232							2,949
N.	Number of field hours - BHCO	624	252	n/a	230							1,106

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

	Parameter	2000-2009	2010	2011	2012							Totals
A.	Number of territorial males	n/a	60	--	62							n/a
B.	Number of pairs (breeding and non-breeding)	230	43	36	37							346
C.	Number of fledged young observed	407	53	41	45							546
D.	Projected total of recruitment of vireo young **(a)**	511.6 (n=9 yrs)	90.3	122	104							828 (12 yrs)
E.	Average number of fledglings per pair (C/B)	1.8	1.2	1.1	1.2							1.6
F.	Projected number of fledglings per pair (D/B)	2.4* (n=9 yrs)	2.1	3.4	2.8							2.5*
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)							41% (49/120)
H.	Rate of cowbird nest parasitism	7.0% (6/85)	5.8% (1/17)	20% (2/10)	0% (0/8)							8% (9/120)
I.	Numbers of cowbirds removed from study area	637	24	12	24							697
K.	Number of trap days (1 operative trap in the field for one day = 1 trap day)	4,298	252	257	348							5,155
L.	Average number of cowbirds trapped per trap day (I/K)	0.15	0.10	0.05	0.07							0.14
M.	Number of field hours -LBVI	4,156.7	330	193	261							5494
N.	Number of field hours -BHCO		196	228	129							

* 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	2010	2011	2012								Totals
A.	Number of territorial males	15	4	9								n/a
B.	Number of pairs (breeding and non-breeding)	12	2	3								17
C.	Number of fledged young observed	18	2	1								21
D.	Projected total of recruitment of vireo young (a)	27.6	n/a	n/a								27.6
E.	Average number of fledglings per pair (C/B)	1.5	1	0.3								1.2
F.	Projected number of fledglings per pair (D/B)	2.3	n/a	n/a								2.3
G.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)	11% (1/9)	n/a	n/a								11% (1/9)
H.	Rate of cowbird nest parasitism	33% (3/9)	n/a	n/a								33% (3/9)
I.	Numbers of cowbirds removed from study area	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
L.	Average number of cowbirds trapped per trap day (I/K)	n/a	n/a	n/a								n/a
M.	Number of field hours -LBVI	210	8	12								230
N.	Number of field hours -BHCO	n/a	n/a	--								n/a

TEMESCAL CANYON

	Parameter	2000-2009	2010	2011	2012							Totals
A.	Number of territorial males	n/a	83	102	109							n/a
B.	Number of pairs (breeding and non-breeding)	164	49	65	63							341
C.	Number of fledged young observed	339	73	113	71							596
D.	Projected total of recruitment of vireo young (a)	447.7	151.9	189	189							978
E.	Average number of fledglings per pair (C/B)	2.1	1.5	1.7	1.1							1.7
F.	Projected number of fledglings per pair (D/B)	2.7	3.1	2.9	3.0							2.9
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)							34% (66/192)
H.	Rate of cowbird nest parasitism	20.3% (27/133)	0% (0/15)	3% (1/32)	25% (3/12)							16% (31/192)
I.	Numbers of cowbirds removed from study area	1,350	134	204	566							2254
K.	Number of trap days (1 operative trap in the field for one day = 1 trap day)	5,812	1191	1245	851							9099
L.	Average number of cowbirds trapped per trap day (I/K)	0.23	0.11	0.16	0.52							0.25
M.	Number of field hours -LBVI	5,690	335	557	531							8642
N.	Number of field hours - BHCO		467	685	377							

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							Totals
A.	Number of territorial males	n/a	11	14	10							n/a
B.	Number of pairs (breeding and non-breeding)	126	4	5	4							139
C.	Number of fledged young observed	208	6	5	6							225
D.	Projected total of recruitment of vireo young (a)	309.1 (n=8 yrs)	n/a	n/a	12							321.1 (n=9 yrs)
E.	Average number of fledglings per pair (C/B)	1.7	1.5	1.0	1.5							1.6
F.	Projected number of fledglings per pair (D/B)	2.7* * (n=8 yrs)	n/a	n/a	3.0							2.3 (n=9 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)							39% (26/66) (n=9 yrs)
H.	Rate of cowbird nest parasitism	6.3% (4/64) (n=8yrs)	0% (0/1)	n/a	0% (0/1)							6.1% (4/66) (n=9 yrs)
I.	Numbers of cowbirds removed from study area	301	165	48	62							576
K.	Number of trap days (1 operative trap in the field for one day = 1 trap day)	2,112	286	238	105							2,741
L.	Average number of cowbirds trapped per trap day (I/K)	0.14	0.58	0.20	0.59							0.21
M.	Number of field hours -LBVI	6,793	324*	350*	325							9257
N.	Number of field hours - BHCO		425*	608*	432							

SANTA ANA CANYON - GREEN RIVER GOLF CLUB

	Parameter	2000-2009	2010	2011	2012							Totals
A.	Number of territorial males	n/a	24	26	19							n/a
B.	Number of pairs (breeding and non-breeding)	101	17	14	11							143
C.	Number of fledged young observed	192	19	19	11							241
D.	Projected total of recruitment of vireo young (a)	279.3	30.6	29	25							363.9
E.	Average number of fledglings per pair (C/B)	1.9	1.2	1.4	1.0							1.7
F.	Projected number of fledglings per pair (D/B)	2.8	1.8	2.1	2.3							2.5
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)							33% (28/84)
H.	Rate of cowbird nest parasitism	6.6% (4/61)	0% (0/7)	0% (0/11)	0% (0/5)							5% (4/84)
I.	Numbers of cowbirds removed from study area	802	58	26	37							923
K.	Number of trap days (1 operative trap in the field for one day = 1 trap day)	3,101	407	119	124							3,751
L.	Average number of cowbirds trapped per trap day (I/K)	0.26	0.14	0.22	0.3							0.25
M.	Number of field hours -LBVI	*See Upper Canyon Summary Sheet for all Santa Ana Canyon hours										
N.	Number of field hours - BHCO											

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							Totals
A.	Number of territorial males	n/a	40	33	36							n/a
B.	Number of pairs (breeding and non-breeding)	131	23	19	16							189
C.	Number of fledged young observed	175	22	23	12							232
D.	Projected total of recruitment of vireo young (a)	307.1	46	38	--							391.1
E.	Average number of fledglings per pair (C/B)	1.3	1.0	1.21	0.75							1.2
F.	Projected number of fledglings per pair (D/B)	2.3	2.0	2.0	0							2.1
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)							51% (41/81)
H.	Rate of cowbird nest parasitism	7.7% (5/65)	0% (0/7)	0% (0/5)	0% (0/4)							6% (5/81)
I.	Numbers of cowbirds removed from study area	127	118	44	30							319
K.	Number of trap days (1 operative trap in the field for one day = 1 trap day)	1,591	514	335	244							2,684
L.	Average number of cowbirds trapped per trap day (I/K)	0.08	0.23	0.13	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							Totals
A.	Number of territorial males	n/a	11	8	8							n/a
B.	Number of pairs (breeding and non-breeding)	45	7	3	2							57
C.	Number of fledged young observed	54	7	1	1							63
D.	Projected total of recruitment of vireo young (a)	52.9 (n=4 yrs)	11.9	n/a	--							64.8 (n=5 yrs)
E.	Average number of fledglings per pair (C/B)	1.2	1.0	0.33	0.5							1.1 (n=7 yrs)
F.	Projected number of fledglings per pair (D/B)	1.8* (n=4 yrs)	1.7	n/a	0							1.8 (n=5 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)							65% (15/23) (n=5 yrs)
H.	Rate of cowbird nest parasitism	31.6% (6/19) (n=4 yrs)	0% (0/3)	n/a	0% (0/1)							26% (6/23) (n=6 yrs)
I.	Numbers of cowbirds removed from study area	11	16	16	6							49
K.	Number of trap days (1 operative trap in the field for one day = 1 trap day)	214	129	115	124							582
L.	Average number of cowbirds trapped per trap day (I/K)	0.05	0.12	0.14	0.05							0.08
M.	Number of field hours -LBVI	388	59	54	44							545
N.	Number of field hours - BHCO	179	129	115	124							547

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

SAN JACINTO

Host Plant Species	2000-2009	2010	2011	2012							Totals
Mulefat (*Baccharis salicifolia*)	26	4	1	3							34
Black Willow (*Salix goodingii*)	5										5
Narrow-leafed Willow (*Salix exigua*)	26	2	8	10							46
Tamarisk (*Tamarix ramosissima*)	1	1									2
Black Mustard (*Brassica nigra*)	1										1
Totals:	59	7	9	13							88

SAN TIMOTEO CANYON

Host Plant Species	2000-2009	2010	2011	2012							Totals
Arroyo Willow (*Salix lasiolepis*)	76	4	17	17							114
Mulefat (*Baccharis salicifolia*)	101	15	25	12							153
Black Willow (*Salix gooddingii*)	52	4	1	1							58
Red Willow (*Salix laevigata*)	64	8	13	6							91
Mugwort (*Artemisia douglasiana*)	14		1	1							16
Elderberry (*Sambucus mexicana*)	12	2	3	5							22
Narrow-leafed Willow (*Salix exigua*)	13		1								14
Fremont Cottonwood (*Populus fremontii*)	16	1	4								21
Wild Grape (*Vitis girdiana*)	10	5	10	1							26
Toyon (*Heteromeles arbutifolia*)	8			1							9
Mustard (*Brassica sp.*)	3										3
Yellow Willow (*Salix lucida spp. lasiandra*)	3		2								5
Emory baccharis (*Baccharis emoryii*)	1										1
Black Mustard (*Brassica nigra*)	1										1
Golden Current (*Ribes aureum*)	1										1
Four-winged Saltbrush (*Atriplex candescens*)	1										1
Arroyo Willow *(S. lasiolepsis*) & Wild Grape (*Vitis girdiana*)	1										1
Box Elder *(Acer negundo*)	1										1
Arroyo Willow (*Salix lasiolepis*) & Fennel (*Foeniculum vulgare*)	1										1
Black Walnut (*Juglans californica*)	379	1									1
Sycamore (*Platanus raemosa*)			1								1
Basketbush (*Rhus trilobata*)			1								1
Tamarisk				1							1
Dead Salix				1							1
Dead Cottonwood				1							1
Deadfall			1								1
Totals		40	80	47							546

Table C-2. Least Bell's Vireo nest placement preferences, monitored sites in the Santa Ana River Watershed, 2000-2012, BY MANAGED SITE

MARCH SKR PRESERVE

Host Plant Species	2000-2009	2010	2011	2012							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							23

MOCKINGBIRD CANYON

Host Plant Species	2000-2009	2010	2011	2012							Totals
Black Willow (*Salix goodingii*)	26		3	1							30
Red Willow (*Salix laevigata*)	30	2	13	7							52
Elderberry (*Sambucus mexicana*)	13		3	2							18
Wild Grape (*Vitis girdiana*)	6		1								7
Mulefat (*Baccharis salicifolia*)	5	1	2	3							11
Peruvian Pepper Tree (*Schinus molle*)	2		1	1							4
Emory's Baccharis (*Baccharis emoryii*)	2										2
Pepperweed (*Lepidium latifolium*)	3										3
Willow species/Pepperweed (*Salix* sp./*Lepidium latifolium*)	1										1
Arroyo Willow (*Salix lasiolepis*)	2		6	3							11
Willow species (*Salix* sp)	1										1
Sycamore (*Platanus racemosa*)	1										1
Wild Celery (*Apium graveolens*)	1										1
Pepperweed (*Lepidium latifolium*) and Black Willow (*Salix goodingii*)	1										1
Black Willow (*Salix goodingii*) and Grape (*Vitis 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
Fremont Cottonwood (*Populus fremontii*)			1	1							2
Pepperweed (*Lepidium latifolium*)				1							1
Totals	98	3	31	19							151

Table C-2. Least Bell's Vireo nest placement preferences, monitored sites in the Santa Ana River Watershed, 2000-2012, BY MANAGED SITE

SANTA ANA RIVER – FAIRMOUNT PARK TO HIDDEN VALLEY

Host Plant Species	2000-2009	2010	2011	2012							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 (*Salix goodingii*) & Nettle (*Urtica 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							119

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

Host Plant Species	2000-2009	2010	2011	2012							Totals
Arroyo Willow (*Salix lasiolepis*)	70	5	5	9							89
Black Willow (*Salix gooddingii*)	39	1	5	2							47
Mulefat (*Baccharis salicifolia*)	63	13	10	4							90
Wild Grape (*Vitis girdiana*)	9			1							10
Narrow-leafed Willow (*Salix exigua*)	8	1	1								10
Poison Hemlock (*Conium maculatum*)	4										4
Fremont Cottonwood (*Populus fremontii*)	11	1		1							13
Elderberry (*Sambucus mexicana*)	2		1								3
Ash (*Fraxinus* sp.)	1										1
Dead *B. salicifolia*	2										2
Black Willow (*Salix goodingii*) & Poison Hemlock (*Conium maculatum*)	1										1
Red Willow (*Salix laevigata*)				2							2
Dead Arroyo Willow (*Salix lasiolepis*)		1									1
Unknown			3								3
Totals	210	22	25	19							276

Table C-2. Least Bell's Vireo nest placement preferences, monitored sites in the Santa Ana River Watershed, 2000-2012, BY MANAGED SITE

HIDDEN VALLEY

Host Plant Species	2000-2009	2010	2011	2012							Totals
Arroyo Willow (*Salix lasiolepis*)	43	6	2	1							52
Mulefat (*Baccharis salicifolia*)	29	9	3	2							43
Black Willow (*Salix gooddingii*)	15	1									16
Wild Grape (*Vitis girdiana*)	6		2	2							10
Red Willow (*Salix laevigata*)	4	1	2								7
Willow species (*Salix spp.*)	2										2
Narrow-leafed Willow (*Salix exigua*)	1			1							2
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/Willow sp. (*Rubus ursinus/Salix sp.*)	1										1
S. lasiolepsis/fresh water reed	1										1
Rose (*Rosa californica*) & Wild Grape (*Vitis girdiana*)	1										1
Mulefat and Hemlock				1							1
Unknown			2								2
Totals	109	17	11	7							144

HIDDEN VALLEY (north side)

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

Table C-2. Least Bell's Vireo nest placement preferences, monitored sites in the Santa Ana River Watershed, 2000-2012, BY MANAGED SITE

TEMESCAL CANYON

Host Plant Species	2000-2009	2010	2011	2012							Totals
Mulefat (*Baccharis salicifolia*)	65	6	7	2							80
Arroyo Willow (*Salix lasiolepis*)	61	7	2	1							71
Black Willow (*Salix gooddingii*)	18	2	7	2							29
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							238

SANTA ANA CANYON – UPPER CANYON

Host Plant Species	2000-2009	2010	2011	2012							Totals
Mulefat (*Baccharis salicifolia*)	33										33
Elderberry (*Sambucus mexicana*)	14	1	1	1							17
Black Willow (*Salix goodingii*)	10		1								11
Poison Oak (*Toxicodendron diversilobum*)	5										5
Fremont Cottonwood (*Populus fremontii*)	5	1									6
Wild Grape (*Vitis girdiana*)	4										4
Wild Rose (*Rosa californica*)	3										3
Red Willow (*Salix laevigata*)	3										3
Arroyo Willow (*Salix lasiolepis*)	2										2
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 (*Salix goodingii*) & Poison Hemlock (*Conium maculatum*)	1										1
Mulefat and Wild Grape				1							1
Totals	96	2	2	2							102

Table C-2. Least Bell's Vireo nest placement preferences, monitored sites in the Santa Ana River Watershed, 2000-2012, BY MANAGED SITE

SANTA ANA CANYON – GREEN RIVER GOLF CLUB

Host Plant Species	2000-2009	2010	2011	2012							Totals
Mulefat (*Baccharis salicifolia*)	35	1	5	2							43
Black Willow (*Salix gooddingii*)	5	2	1	3							11
Fremont Cottonwood (*Populus fremontii*)	4										4
Elderberry (*Sambucus mexicana*)	4		2								6
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-leafed Willow (*Salix exigua*)	1										1
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 (*Sambucus mexicana*) & Wild Grape (*Vitis girdiana*)	1										1
Wax Leaf Privet (*Ligustrum* sp.)	1										1
Black Walnut (*Juglans californica*)		1									1
Black Willow (*Salix goodingii*) and Elderberry (*Sambucus Mexicana*)			1								1
Pepper Tree (*Schinus molle*) and Wild Grape (*Vitis girdiana*)			1								1
Blue Plumbago (*Plumbago auriculata*)				1							1
Brazilian Pepper Tree (*Schinus terebinthifolius*)				1							1
Totals	72	7	13	7							99

SANTA ANA RIVER – FEATHERLY PARK

Host Plant Species	2000-2009	2010	2011	2012							Totals
Mulefat (*Baccharis salicifolia*)	23	1	2								26
Elderberry (*Sambucus mexicana*)	11	3	2	2							18
Black Walnut (*Juglans californica*)	4										4
Black Willow (*Salix gooddingii*)	13	1	2								16
Laurel Sumac (*Malosma laurina*)	3										3
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							15
Yellowspine Thistle (*Cirsium ochrocentrum*)	2										2
Mulefat (*Baccharis salicifolia*) & Wild Grape (*Vitis girdiana*)	2										2
Willow species (*Salix* sp.)	1										1
Poison Oak (*Toxicodendron diversilobum*)	1										1
Toyon (*Heteromeles arbutifolia*)	1										1
Wild Grape (*Vitis girdiana*)	1										1
White Alder (*Alnus rhombifolia*)	1										1
Dead Black Willow (*Salix goodingii)* (covered w/ living Black Willow)	1										1
Arroyo Willow (*Salix lasiolepis*) & Black Mustard (*Brassica nigra*)	1										1
Black Mustard (*Brassica nigra*)	1	1									2
Orange Tree (*Rutaceae citrus sinensis*)	1		1	1							3
Cockleburr (*Xanithum strumaritum*)	1										1
Mulefat and Castorbean				1							1
Totals	83	11	12	8							114

Table C-2. Least Bell's Vireo nest placement preferences, monitored sites in the Santa Ana River Watershed, 2000-2012, BY MANAGED SITE

CHINO HILLS

Host Plant Species	2000-2009	2010	2011	2012							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
Totals	24	3	0	1							28

IRVINE REGIONAL PARK

Host Plant Species	2010	2011	2012								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, 2000-2012, BY MANAGED SITE

SAN JACINTO

	Parameter	2000-2009	2010	2011	2012							Totals
A.	Number of pairs	43	18	25	36							n/a
B.	Number of breeding (nesting) pairs	39	15	20	22							96
C.	Number of breeding pairs that were well-monitored throughout the breeding season	29	0	1	9							39
D.	Number of 'known fledged young' OBSERVED	104	28	18	49							199
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season	93	n/a	0	26							119
F.	Average number of fledglings produced per breeding pair (minimum; D/B = 'productivity or breeding success')	2.7	1.9	0.9	2.2							2.1
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)	3.2	n/a	n/a	2.9							3.1
H.	Number of nests that were discovered	59	7	14	13							93
I.	Number of nests that were regularly monitored or 'tracked'	54	3	10	13							80
J.	Number of 'tracked' nests that were successful (% = J/I x 100)	(32/54) 59%	100% (3/3)	10% (1/10)	69% (9/13)							56% (45/80)
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)							38% (30/80)
L.	Number of 'tracked' nests that were parasitized by cowbirds (% = L/I x 100)	(6/54) 11%	0	10% (1/10)	8% (1/13)							10% (8/80)
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)							4% (3/80)
	B. Number of 'tracked' nests that failed as a result of parasitism	(3 or 4/54)	0% (0/3)	10% (1/10)	0% (0/13)							5-6% (4 or
	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)							34% (27/80)
N.	Average clutch size	n/a	3.3	3.7	3.3							n/a
O.	Number of cowbird eggs found in or near vireo nests	9	0	1	1							11
P.	Number of cowbird nestlings removed from 'tracked' nests	0	0	0	0							0
Q.	Number of cowbird young fledged by vireo	2	0	1	0							3
R.	Number of 'manipulated' parasitized nests	4	0	0	1							5
S.	Number of 'successful, manipulated' nests (% = S/R x 100)	(2/5) 40%	n/a	n/a	100% (1/1)							50% (3/6)
T.	Number of vireo fledged from 'manipulated' parasitized nests	4	n/a	n/a	3							7
U.	Number of repaired nests	2	0	0	1							3
V.	% successful repaired nests	(2/2) 100%	n/a	n/a	100% (1/1)							100% (3/3)
W.	Number of vireo fledged from repaired nests	6	n/a	n/a	4							10

Table C-3. Least Bell's Vireo reproductive success and breeding biology data, monitored sites, in the Santa Ana River watershed, 2000-2012, BY MANAGED SITE

SAN TIMOTEO CANYON

	Parameter	2000-2009	2010	2011	2012						Totals
A.	Number of pairs	n/a	95	101	102						n/a
B.	Number of breeding (nesting) pairs	287	76	78	73						514
C.	Number of breeding pairs that were well-monitored throughout the breeding season	183	24	31	32						270
D.	Number of 'known fledged young' OBSERVED	635	137	196	153						1,121
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season	497	67	104	90						758
F.	Average number of fledglings produced per breeding pair (minimum; D/B = 'productivity or breeding success')	2.2	1.8	2.5	2.1						2.2
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)	2.7	2.8	3.4	2.8						2.8
H.	Number of nests that were discovered	388	55	80	47						570
I.	Number of nests that were regularly monitored or 'tracked'	338	37	73	45						493
J.	Number of 'tracked' nests that were successful (% = J/I x 100)	57% (192*/ 338)	62% (23/37)	60% (44/73)	64% (29/45)						58% (288/493)
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)						44% (215/493)
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)						22% (107/493)
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)						3% (17/493)
	B. Number of 'tracked' nests that failed as a result of parasitism	7% (25/338)	0% (0/37)	0% (0/73)	2% (1/45)						5% (26/493)
	C. Number of 'tracked' nests that failed as a result of predation – Predation Rate according to Vireo	34% (114/338)	27% (10/37)	30% (22/73)	33% (15/45)						33% (161/493)
	D. Number of 'tracked' nests that failed for unknown reasons	n/a		1% (1/73)	0% (0/45)						0.8% (1/118)
N.	Average clutch size	n/a	3.4	3.5	3.3						n/a
O.	Number of cowbird eggs found in or near vireo nests	118	3	0	1						122
P.	Number of cowbird nestlings removed from 'tracked' nests	6	0	0	0						6
Q.	Number of cowbird young fledged by vireo	2	0	0	0						2
R.	Number of 'manipulated' parasitized nests	84	3	0	0						87
S.	Number of 'successful, manipulated' nests (% = S/R x 100)	49% (41/84)	100% (3/3)	n/a	n/a						51% (44/87)
T.	Number of vireo fledged from 'manipulated' parasitized nests	88	8	n/a	n/a						96
U.	Number of repaired nests	3	1	2	1						7
V.	% successful repaired nests	66.7%	0%	100%	100%						71% (5/7)
W.	Number of vireo fledged from repaired nests	5	0	7	2						14

Table C-3. Least Bell's Vireo reproductive success and breeding biology data, monitored sites, in the Santa Ana River watershed, 2000-2012BY MANAGED SITE

MARCH SKR PRESERVE

	Parameter	2000-2009	2010	2011	2012							Totals
A.	Number of pairs	n/a	12	9	7							n/a
B.	Number of breeding (nesting) pairs	30	8	5	6							49
C.	Number of breeding pairs that were well-monitored throughout the breeding season	9 (n=4 yrs)	3	0	0							12
D.	Number of 'known fledged young' OBSERVED	75	25	7	8							115
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season	38 (n=4 yrs)	19	0	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							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							4.8
H.	Number of nests that were discovered	17	6	n/a	n/a							23
I.	Number of nests that were regularly monitored or 'tracked'	16	6	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							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							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							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							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							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							23% (5/22)
N.	Average clutch size	n/a	3.5	n/a	n/a							n/a
O.	Number of cowbird eggs found in or near vireo nests	0	1	n/a	n/a							1
P.	Number of cowbird nestlings removed from 'tracked' nests	0	0	n/a	n/a							0
Q.	Number of cowbird young fledged by vireo	0	0	0	n/a							0
R.	Number of 'manipulated' parasitized nests	0	0	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
T.	Number of vireo fledged from 'manipulated' parasitized nests	n/a	n/a	n/a	n/a							n/a
U.	Number of repaired nests	0	0	n/a	n/a							0
V.	% successful repaired nests	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

Table C-3. Least Bell's Vireo reproductive success and breeding biology data, monitored sites, in the Santa Ana River watershed, 2000-2012, BY MANAGED SITE

SYCAMORE CANYON

	Parameter	2000-2009	2010	2011	2012							Totals
A.	Number of pairs	n/a	8	5	7							n/a
B.	Number of breeding (nesting) pairs	19	6	3	4							32
C.	Number of breeding pairs that were well-monitored throughout the breeding season	6	0	0	0							6
D.	Number of 'known fledged young' OBSERVED	40	11	4	5							60
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season	12	n/a	0	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							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							2.0
H.	Number of nests that were discovered	10	0	0	n/a							10
I.	Number of nests that were regularly monitored or 'tracked'	9	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							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							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							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							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							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							22% (2/9)
N.	Average clutch size	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							2
P.	Number of cowbird nestlings removed from 'tracked' nests	0	n/a	n/a	n/a							0
Q.	Number of cowbird young fledged by vireo	0	n/a	0	n/a							0
R.	Number of 'manipulated' parasitized nests	1	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							100% (1/1)
T.	Number of vireo fledged from 'manipulated' parasitized nests	1	n/a	n/a	n/a							1
U.	Number of repaired nests	0	n/a	n/a	n/a							0
V.	% successful repaired nests	n/d	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

Table C-3. Least Bell's Vireo reproductive success and breeding biology data, monitored sites, in the Santa Ana River watershed, 2000-2012, BY MANAGED SITE

MOCKINGBIRD CANYON

	Parameter	2000-2009	2010	2011	2012							Totals
A.	Number of pairs	n/a	34	32	26							n/a
B.	Number of breeding (nesting) pairs	110	26	31	21							188
C.	Number of breeding pairs that were well-monitored throughout the breeding season	37	0	16	5							58
D.	Number of 'known fledged young' OBSERVED	218	25	67	39							349
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season	113	n/a	46	15							174
F.	Average number of fledglings produced per breeding pair (minimum; D/B = 'productivity or breeding success')	2.0	1.0	2.2	1.9							1.9
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)	3.0	n/a	2.9	3							3
H.	Number of nests that were discovered	99	3	31	19							152
I.	Number of nests that were regularly monitored or 'tracked'	82	0	30	17							129
J.	Number of 'tracked' nests that were successful (% = J/I x 100)	54.9% (45/82)	n/a	50% (15/30)	47% (8/17)							53% (68/129)
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)							45% (58/129)
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)							10% (13/129)
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)							7% (9/129)
	B. Number of 'tracked' nests that failed as a result of parasitism	7.3% (6/82)	n/a	0% (0/30)	0% (0/17)							5% (6/129)
	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% (45/129)
	D. Number of 'tracked' nests that failed for unknown reasons	n/a		3% (1/30)	0							3% (1/30)
N.	Average clutch size	n/a	3.0	3.6	3.5							n/a
O.	Number of cowbird eggs found in or near vireo nests	2	1	0	1							24
P.	Number of cowbird nestlings removed from 'tracked' nests	1	n/a	0	0							2
Q.	Number of cowbird young fledged by vireo	10	n/a	0	0							1
R.	Number of 'manipulated' parasitized nests	10% (1/10)	n/a	0	1							11
S.	Number of 'successful, manipulated' nests (% = S/R x 100)	2	n/a	n/a	100% (1/1)							18% (2/11)
T.	Number of vireo fledged from 'manipulated' parasitized nests	1	n/a	n/a	1							3
U.	Number of repaired nests	100% (1/1)	n/a	2	0							3
V.	% successful repaired nests	1	n/a	100% (2/2)	n/a							100% (3/3)
W.	Number of vireo fledged from repaired nests		n/a	6	n/a							7

Table C-3. Least Bell's Vireo reproductive success and breeding biology data, monitored sites, in the Santa Ana River watershed, 2000-2012, BY MANAGED SITE

SANTA ANA RIVER (RIVER ROAD TO NORCO)

	Parameter	2000-2009	2010	2011	2012							Totals
A.	Number of pairs	n/a	64	59	51							n/a
B.	Number of breeding (nesting) pairs	224	60	56	48							388
C.	Number of breeding pairs that were well-monitored throughout the breeding season	105	12	12	8							137
D.	Number of 'known fledged young' OBSERVED	489	113	91	86							779
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season	315	39	36	29							419
F.	Average number of fledglings produced per breeding pair (minimum; D/B = 'productivity or breeding success')	2.23	1.9	1.6	1.8							2.0
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)	3.0	3.3	3.0	3.6							3.0
H.	Number of nests that were discovered	212	22	25	19							278
I.	Number of nests that were regularly monitored or 'tracked'	177	18	22	17							234
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)							65% (153/234)
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)							38% (88/234)
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)							6% (15/234)
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)							5% (11/234)
	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)							2% (4/234)
	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)							28% (65/234)
	D. Number of "tracked" nests that failed for Other/Unknown Reasons	1% (1/177)										1% (1/177)
N.	Average clutch size	n/a	3.7	3.8	3.6							n/a
O.	Number of cowbird eggs found in or near vireo nests	20	0	0	0							20
P.	Number of cowbird nestlings removed from 'tracked' nests	1	0	0	0							1
Q.	Number of cowbird young fledged by vireo	0	0	0	0							0
R.	Number of 'manipulated' parasitized nests	14	0	0	0							14
S.	Number of 'successful, manipulated' nests (% = S/R x 100)	64.3% (9/14)	n/a	n/a	n/a							64% (9/14)
T.	Number of vireo fledged from 'manipulated' parasitized nests	13	n/a	n/a	n/a							13
U.	Number of repaired nests	2	0	0	0							2
V.	% successful repaired nests	50% (1/2)	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

Table C-3. Least Bell's Vireo reproductive success and breeding biology data, monitored sites, in the Santa Ana River watershed, 2000-2012, BY MANAGED SITE

SANTA ANA RIVER (FAIRMOUNT PARK TO HIDDEN VALLEY)

	Parameter	2000-2009	2010	2011	2012							Totals
A.	Number of pairs	n/a	50	23	11							n/a
B.	Number of breeding (nesting) pairs	149	39	19	7							214
C.	Number of breeding pairs that were well-monitored throughout the breeding season	51 (n=5 yrs)	9	7	0							67
D.	Number of 'known fledged young' OBSERVED	283	58	30	n/a							371
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season	133 (n=5 yrs)	18	22	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							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							2.6
H.	Number of nests that were discovered	94	13	14	2							123
I.	Number of nests that were regularly monitored or 'tracked'	75	11	10	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							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							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/							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							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							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							24% (23/96)
N.	Average clutch size	n/a	3.2	3.5	3.0							n/a
O.	Number of cowbird eggs found in or near vireo nests	15	0	2	1							18
P.	Number of cowbird nestlings removed from 'tracked' nests	0	0	0	n/a							0
Q.	Number of cowbird young fledged by vireo	1	1	0	n/a							2
R.	Number of 'manipulated' parasitized nests	10	0	1	0							11
S.	Number of 'successful, manipulated' nests (% = S/R x 100)	20.0% (2/10)	n/a	Unknown	n/a							20% (2/11)
T.	Number of vireo fledged from 'manipulated' parasitized nests	5	n/a	Unknown	n/a							5
U.	Number of repaired nests	1	0	0	0							1
V.	% successful repaired nests	n/d	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

Table C-3. Least Bell's Vireo reproductive success and breeding biology data, monitored sites, in the Santa Ana River watershed, 2000-2012, BY MANAGED SITE

HIDDEN VALLEY

	Parameter	2000-2009	2010	2011	2012							Totals
A.	Number of pairs	n/a	43	36	37							n/a
B.	Number of breeding (nesting) pairs	212	36	33	31							312
C.	Number of breeding pairs that were well-monitored throughout the breeding season	56	9	5	4							74
D.	Number of 'known fledged young' OBSERVED	407	53	41	45							546
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season	142	19	17	11							189
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
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
H.	Number of nests that were discovered	114	18	11	8							151
I.	Number of nests that were regularly monitored or 'tracked'	85	17	10	8							120
J.	Number of 'tracked' nests that were successful (% = J/I x 100)	68% (58/85)	41% (7/17)	60% (6/10)	63% (5/8)							63% (76/120)
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)							38% (45/120)
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)							8% (9/120)
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)							3% (3/120)
	B. Number of 'tracked' nests that failed as a result of parasitism	5% (4/85)	6% (1/17)	10% (1/10)	0% (0/8)							5% (6/120)
	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)							29% (35/120)
N.	Average clutch size	n/a	3.4	3.1	3.2							N/A
O.	Number of cowbird eggs found in or near vireo nests	4	2	2	0							8
P.	Number of cowbird nestlings removed from 'tracked' nests	2	0	0	0							2
Q.	Number of cowbird young fledged by vireo	0	0	0	0							0
R.	Number of 'manipulated' parasitized nests	2	0	1	0							3
S.	Number of 'successful, manipulated' nests (% = S/R x 100)	100% (2/2)	n/a	100% (1/1)	n/a							100% (3/3)
T.	Number of vireo fledged from 'manipulated' parasitized nests	6	n/a	2	n/a							8
U.	Number of repaired nests	0	0	0	0							0
V.	% successful repaired nests	n/d	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

Table C-3. Least Bell's Vireo reproductive success and breeding biology data, monitored sites, in the Santa Ana River watershed, 2000-2012, BY MANAGED SITE

HIDDEN VALLEY (north side)

	Parameter	2010	2011	2012								Totals
A.	Number of pairs	12	2	3								n/a
B.	Number of breeding (nesting) pairs	9	2	2								13
C.	Number of breeding pairs that were well-monitored throughout the breeding season	6	0	0								6
D.	Number of 'known fledged young' OBSERVED	18	2	1								21
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season	14	0	n/a								14
F.	Average number of fledglings produced per breeding pair (minimum; D/B = 'productivity or breeding success')	2.0	1.0	n/a								1.6
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)	2.3	0	n/a								2.3
H.	Number of nests that were discovered	10	2	0								12
I.	Number of nests that were regularly monitored or 'tracked'	9	0	0								9
J.	Number of 'tracked' nests that were successful (% = J/I x 100)	56% (5/9)	n/a	n/a								56% (5/9)
K.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)	11% (1/9)	n/a	n/a								11% (1/9)
L.	Number of 'tracked' nests that were parasitized by cowbirds (% = L/I x 100)	33% (3/9)	n/a	n/a								33% (3/9)
M.	A. Number of 'tracked' nests that failed as a result of reproductive failure	0	n/a	n/a								0
	B. Number of 'tracked' nests that failed as a result of parasitism	33% (3/9)	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	11% (1/9)	n/a	n/a								11% (1/9)
N.	Average clutch size	3.5	n/a	n/a								3.5
O.	Number of cowbird eggs found in or near vireo nests	4	n/a	n/a								4
P.	Number of cowbird nestlings removed from 'tracked' nests	0	n/a	n/a								0
Q.	Number of cowbird young fledged by vireo	0	0	n/a								0
R.	Number of 'manipulated' parasitized nests	2	n/a	0								2
S.	Number of 'successful, manipulated' nests (% = S/R x 100)	0% (0/2)	n/a	n/a								0%
T.	Number of vireo fledged from 'manipulated' parasitized nests	0% (0/2)	n/a	n/a								0%
U.	Number of repaired nests	0	n/a	0								0
V.	% successful repaired nests	n/a	n/a	n/a								n/a
W.	Number of vireo fledged from repaired nests	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, 2000-2012, BY MANAGED SITE

TEMESCAL CANYON

	Parameter	2000-2009	2010	2011	2012							Totals
A.	Number of pairs	n/a	49	65	63							n/a
B.	Number of breeding (nesting) pairs	146	38	57	48							289
C.	Number of breeding pairs that were well-monitored throughout the breeding season	81	11	18	8							118
D.	Number of 'known fledged young' OBSERVED	339	73	113	71							596
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season	217	34	52	24							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							2.1
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)	2.7	3.1	2.9	3.0							2.8
H.	Number of nests that were discovered	166	22	35	16							239
I.	Number of nests that were regularly monitored or 'tracked'	133	15	32	12							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)							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)							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)							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)							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)							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)							30% (57/192)
N.	Average clutch size	n/a	3.7	3.5	3.5							n/a
O.	Number of cowbird eggs found in or near vireo nests	33	0	1	5							39
P.	Number of cowbird nestlings removed from 'tracked' nests	2	0	0	0							2
Q.	Number of cowbird young fledged by vireo	2	0	0	0							2
R.	Number of 'manipulated' parasitized nests	29	0	1	2							32
S.	Number of 'successful, manipulated' nests (% = S/R x 100)	41% (12/29)	0	100% (1/1)	100% (2/2)							47% (15/32)
T.	Number of vireo fledged from 'manipulated' parasitized nests	26	na	2	6							34
U.	Number of repaired nests	0	0	3	0							3
V.	% successful repaired nests	n/d	na	67% (2/3)	n/a							67% (2/3)
W.	Number of vireo fledged from repaired nests	n/d	na	3	n/a							3

Table C-3. Least Bell's Vireo reproductive success and breeding biology data, monitored sites, in the Santa Ana River watershed, 2000-2012, BY MANAGED SITE

SANTA ANA CANYON – UPPER CANYON

	Parameter	2000-2009	2010	2011	2012							Totals
A.	Number of pairs	n/a	4	5	4							n/a
B.	Number of breeding (nesting) pairs	110	3	5	4							122
C.	Number of breeding pairs that were well-monitored throughout the breeding season	46	0	0	1							47
D.	Number of 'known fledged young' OBSERVED	208	6	5	6							225
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season	118	n/a	n/a	3							121
F.	Average number of fledglings produced per breeding pair (minimum; D/B = 'productivity or breeding success')	1.9	2.0	1.0	1.5							1.8
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)	2.6	n/a	n/a	3.0							2.6
H.	Number of nests that were discovered	97	2	2	2							103
I.	Number of nests that were regularly monitored or 'tracked'	64	1	0	1							66
J.	Number of 'tracked' nests that were successful (% = J/I x 100)	64% (41/64)	100% (1/1)	n/a	100% (1/1)							65% (43/66)
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)							39% (26/66)
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)							6% (4/66)
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)							5% (3/66)
	B. Number of 'tracked' nests that failed as a result of parasitism	3.1% (2/64)	0% (0/1)	n/a	0% (0/1)							3% (2/66)
	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)							27% (18/66)
N.	Average clutch size	n/a	4.0	4.0	3.0							n/a
O.	Number of cowbird eggs found in or near vireo nests	3	0	0	0							3
P.	Number of cowbird nestlings removed from 'tracked' nests	1	0	n/a	0							1
Q.	Number of cowbird young fledged by vireo	0	0	0	0							0
R.	Number of 'manipulated' parasitized nests	1	0	0	0							1
S.	Number of 'successful, manipulated' nests (% = S/R x 100)	100% (1/1)	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							1
U.	Number of repaired nests	2	0	0	0							2
V.	% successful repaired nests	0% (0/2)	n/a	n/a	n/a							0% (0/2)
W.	Number of vireo fledged from repaired nests	0	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, 2000-2012, BY MANAGED SITE

SANTA ANA CANYON – GREEN RIVER GOLF CLUB

	Parameter	2000-2009	2010	2011	2012							Totals
A.	Number of pairs	n/a	17	14	11							n/a
B.	Number of breeding (nesting) pairs	92	14	12	8							126
C.	Number of breeding pairs that were well-monitored throughout the breeding season	44	4	7	4							59
D.	Number of 'known fledged young' OBSERVED	192	19	19	11							241
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season	118	7	15	9							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							1.9
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)	2.7	1.8	2.1	2.3							2.5
H.	Number of nests that were discovered	73	7	13	7							100
I.	Number of nests that were regularly monitored or 'tracked'	61	7	11	5							84
J.	Number of 'tracked' nests that were successful (% = J/I x 100)	72% (44/61)	43% (3/7)	45% (5/11)	60% (3/5)							65% (55/84)
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)							33% (28/84)
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)							5% (4/84)
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)							6% (5/84)
	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)							1% (1/84)
	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)							27% (23/84)
N.	Average clutch size	n/a	4.0	3.4	3.2							n/a
O.	Number of cowbird eggs found in or near vireo nests	4	0	0	0							4
P.	Number of cowbird nestlings removed from 'tracked' nests	0	0	0	0							0
Q.	Number of cowbird young fledged by vireo	0	0	0	0							0
R.	Number of 'manipulated' parasitized nests	2	0	0	0							0
S.	Number of 'successful, manipulated' nests (% = S/R x 100)	100% (2/2)	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							6
U.	Number of repaired nests	4	0	0	0							4
V.	% successful repaired nests	75% (3/4)	n/a	n/a	n/a							75% (3/4)
W.	Number of vireo fledged from repaired nests	7	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, 2000-2012, BY MANAGED SITE

SANTA ANA RIVER – FEATHERLY PARK

	Parameter	2000-2009	2010	2011	2012							Totals
A.	Number of pairs	n/a	23	19	16							n/a
B.	Number of breeding (nesting) pairs	109	18	18	11							156
C.	Number of breeding pairs that were well-monitored throughout the breeding season	36	3	7	2							48
D.	Number of 'known fledged young' OBSERVED	175	22	23	12							232
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season	73	6	14	0							93
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
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)	2.0	2.0	2.0	0							1.9
H.	Number of nests that were discovered	83	11	12	8							114
I.	Number of nests that were regularly monitored or 'tracked'	65	7	5	4							81
J.	Number of 'tracked' nests that were successful (% = J/I x 100)	49% (32/65)	29% (2/7)	100% (5/5)	0% (0/4)							48% (39/81)
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)							51% (41/81)
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)							6% (5/81)
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)							4% (3/81)
	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)							2% (2/81)
	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)							46% (37/81)
N.	Average clutch size	n/a	4.0	3.6	4.0							n/a
O.	Number of cowbird eggs found in or near vireo nests	4	0	0	0							4
P.	Number of cowbird nestlings removed from 'tracked' nests	1	0	0	0							1
Q.	Number of cowbird young fledged by vireo	0	0	0	0							0
R.	Number of 'manipulated' parasitized nests	3	0	0	0							3
S.	Number of 'successful, manipulated' nests (% = S/R x 100)	33% (1/3)	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							2
U.	Number of repaired nests	4	1	0	0							5
V.	% successful repaired nests	100% (4/4)	100% (1/1)	n/a	n/a							100% (5/5)
W.	Number of vireo fledged from repaired nests	14	2	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, 2000-2012, BY MANAGED SITE

CHINO HILLS

	Parameter	2000-2009	2010	2011	2012							Totals
A.	Number of pairs	n/a	7	3	2							n/a
B.	Number of breeding (nesting) pairs	37	4	1	2							44
C.	Number of breeding pairs that were well-monitored throughout the breeding season	15 (n=4 yrs)	3	0	1							19 (n=6 yrs)
D.	Number of 'known fledged young' OBSERVED	54	7	1	1							63
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season	19 (n=4 yrs)	5	n/a	0							24 (n=5 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							1.4
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							1.3
H.	Number of nests that were discovered	24	3	0	1							28
I.	Number of nests that were regularly monitored or 'tracked'	19	3	n/a	1							23
J.	Number of 'tracked' nests that were successful (% = J/I x 100)	32% (6/19)	67% (2/3)	n/a	0% (0/1)							35% (8/23)
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)							61% (14/23)
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)							26% (6/23)
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)							4% (1/23)
	B. Number of 'tracked' nests that failed as a result of parasitism	10.5% (2/19)	0% (0/3)	n/a	0% (0/1)							9% (2/23)
	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)							52% (12/23)
N.	Average clutch size	n/a	3.7	n/a	3.0							n/a
O.	Number of cowbird eggs found in or near vireo nests	9	0	n/a	0							9
P.	Number of cowbird nestlings removed from 'tracked' nests	0	0	n/a	0							0
Q.	Number of cowbird young fledged by vireo	0	0	n/a	0							0
R.	Number of 'manipulated' parasitized nests	6	0	n/a	0							6
S.	Number of 'successful, manipulated' nests (% = S/R x 100)	0% (0/6)	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							0
U.	Number of repaired nests	0	0	n/a	0							0
V.	% successful repaired nests	n/d	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

Table C-3. Least Bell's Vireo reproductive success and breeding biology data, monitored sites, in the Santa Ana River watershed, 2000-2012, BY MANAGED SITE

IRVINE REGIONAL PARK

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