

**Status and Management of the
Least Bell's Vireo and Southwestern Willow Flycatcher in the
Santa Ana River Watershed, 2011, and
Summary Data by Site and Watershed-wide, 2000-2011**

**Prepared by
The Santa Ana Watershed Association**

**Prepared for
Orange County Water District
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**Susan M. Hoffman
Richard Zembal
Co-Principal Field Investigators and Authors**

Field Investigators and Co-authors:

**Melody Aimar
Talula Barbee
Allyson Beckman
Jill Coumoutso
Nicole Peltier Housel
David McMichael
Terry Reeser
Giovanni Arechavaleta**

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ABSTRACT

The 2011 monitoring effort for the Least Bell's Vireo, *Vireo belli pusillus*, documented a slight decrease in abundance from 2010. In 2011, 852 vireo territories, 496 pairs, and 695 fledglings were documented in the Santa Ana Watershed outside the Prado Basin by SAWA and cooperating agencies. This abundance represents a 1% decrease from 2010. Combined with the 517 territories documented in the Prado Basin (Pike et al. 2011), 1,369 territorial Least Bell's Vireos were documented in the watershed, representing a 4% decrease.

Higher declines in pairs and fledglings were driven by vireo numbers inside the Prado Basin. The number of known pairs outside of Prado Basin decreased by 9% from 2010 levels; the number of fledglings increased by 2% from 2010. However, including the declines found at Prado, the number of pairs in the watershed decreased by 16% and the number of fledglings decreased by 15% (Tables 1A and 1B).

Productivity based on SAWA's well-monitored pairs was 2.9, an increase from 2.7 in 2010. Nesting success showed a continued decline from previous years from 71% in 2009 and 65% in 2010 to 56% in 2011. The depredation rate was 36% in 2011, an increase from 28% in 2010 and 22% in 2009.

SAWA's parasitism rate decreased to 2%, the lowest rate since SAWA began its cowbird management and nest monitoring program. The last three years have seen rates dramatically lower than the previous rates which ranged between 14 and 28%.

Four vireos fledged from two manipulated nests; seven nests were repaired and fledged six young.

Forty-eight percent of nests (n=243) were placed in five species of willow, *Salix spp.* and 24% were placed in mulefat, *Baccharis salicifolia*.

Brown-headed Cowbirds, *Molothrus ater*, were also managed throughout the watershed. Over 2,400 cowbirds were removed from 55 traps over 6,499 trap days between 3/14/11 and 8/1/11. An additional 4,200 cowbirds were removed from the watershed during the winter of 2010-2011 over 1,400 trap days.

No breeding Southwestern Willow Flycatchers, *Empidonax trailli extimus*, or Yellow-billed Cuckoos, *Coccyzus americanus occidentalis*, were detected outside the Prado Basin in 2011. Incidental sightings of other sensitive birds were documented. A minimum of 712 Yellow Warblers, *Setophaga petechia*, and 208 Yellow-breasted Chats, *Icteria virens*, were detected throughout the watershed. Continued degradation of riparian vegetation due to human intrusion occurred in 2011.

Since the Santa Ana Watershed Program began vireo and cowbird management, over 5,100 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.

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-six sites were surveyed during the 2011 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-839480-3 and a Memorandum of Understanding with the California Department of Fish and Game.

Fifty-five 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 2011, no nest monitoring was done at the March SKR Preserve or in Sycamore Canyon, Riverside. SAWA's surveys in the peripheral sites took place as usual.

A minimum of 8,000 field hours was spent in 2011 for the vireo management program including 2,738 on vireo monitoring and nest management, 486 hours on the vireo assessment surveys, and 3,281 hours on the spring/summer cowbird trapping program and over 1,000 hours for winter cowbird trapping. Over 700 hours were spent surveying and managing sensitive species; over 400 of these hours were spent in unreimbursed participation in the Western Riverside County Multi-species Habitat Plan monitoring program. Over 1,000 hours were spent on reporting and documentation for the season.

Appendices. Appendix A contains the GPS points for all survey sites. Appendix B contains the annual totals for all statistics. Appendix C contains 2010-2011 annual data by site. Appendix D contains annual data by site for 2000-2009.

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. 2009. 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).

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 between Tyler St. and Van Buren Blvd. burned in 2009 and 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). The width of the habitat is often less than 200 m. A private 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 Wildlife Refuge and the San Jacinto River at and above State Street were surveyed. Late surveys were done on the San Jacinto River between Sanderson and Bridge Street. This site was cleared of understory before the 2007 season and had not been resurveyed until this year.

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 to approximately two miles upstream of the intersection of Magnolia Avenue and Temescal Creek. 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 Nicole Peltier Housel and Talula Barbee; Hidden Valley, south side, was surveyed by Sue Hoffman; 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 and Harrison Reservoir were surveyed by Melody Aimar; Mockingbird Canyon was surveyed by Jill Coumoutso and Allyson Beckman, 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 and Nicole Peltier Housel.

The summary of results from the assessment surveys (presence/absence surveys) are listed in Table 10. Results for each survey visit are listed in Table 11. Patch sizes ranged from two mile stretches of ravines such as Van Buren Blvd. at Bountiful to small patches in urban parks as found in Norco and Chino Hills.

Appendix A contains the UTM coordinates of the upstream and downstream boundaries of the drainages surveyed.

RESULTS

Vireo Abundance

Vireo abundance in the Santa Ana watershed declined by 4% in 2011. Prado Basin showed a much greater decrease than outside of the Prado Basin. The number of territories reported at Prado represents a 9% decrease while a 2% decrease was documented for outside the basin (Tables 1A and 1B). In 2011, 852 territories were detected throughout the watershed by SAWA and cooperating agencies (excluding Prado Basin). In 2011, 496 pairs were detected, a decrease of 9% from 2010. The number of fledglings documented increased 2% to 696.

In 2011, SAWA managed sites had mixed results with respect to abundance. The number of territories documented was lower in San Timoteo Canyon, Mockingbird Canyon, and along the Santa Ana River between Mission and Hidden Valley, including Hidden Valley. The lower number on the north side of the river at Hidden Valley was due to winter scour. Numbers also declined at Featherly Park in the Santa Ana Canyon and in Chino Hills. An increase in abundance was documented on the Santa Ana River at Norco and in Temescal Canyon.

San Bernardino County Flood Control biologist Theresa Sims reported that the number of vireos detected on the Santa Ana River between Riverside Dr. and Waterman remained unchanged at 42 territories.

Reproductive success at 2.9 young/pair is a slight increase from 2010 and is reflected in the slight increase in fledgling numbers from 2010. However, losses in Prado Basin decreased fledgling abundance overall.

Six hundred twenty-six fledglings were detected at managed sites over 2,692 field hours, or .23 fledglings detected per hour of field work (Table 3). In 2010, 0.24 fledgling/hr were documented and in 2009, .27 fledglings were documented.

California State Parks and Recreation Department reported four territories in the periphery of Chino Hills State Parks and Carbon Canyon (Black Gold Golf Club and Pulte Wetlands) in 2011 (Alissa Ing, pers. comm.). MSHCP did not report any vireos in 2011. SAWA biologists also monitored the vireos at East Coyotes Hills Preserve in Fullerton for the Center for Natural Lands Management and documented four territories (not included in watershed totals).

Abundance - Vireo Assessment Surveys

One hundred fifty-six vireo territories were detected at 56 sites in the Santa Ana watershed during the 2011 assessment surveys (Table 10 and 11). This count represents a slight decrease in abundance from 2010 when 159 territories were documented. However, the last two years have seen an approximate 14% increase over 2009. These surveys were conducted in patches of riparian habitat isolated from the larger tracts of habitat where biologists manage vireos. Vireos were detected at 29 of the 56 sites for an occupation rate of 52%, a rate comparable to the last two years (54% in 2010 and 53% in 2009).

A few new sites were added this year. Arlington Falls in Riverside was surveyed where two singing Willow Flycatchers were detected on one survey only. Soquel

Canyon at Pipeline, a small fragment of habitat in Chino Hills was surveyed and two vireos were found. Santiago Pitts in Orange County will be added to the assessment schedule next year because successfully breeding vireos were found as well as California Gnatcatchers.

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 36% (20/56) of the sites in 2011.

SAWA also surveyed two sites where the number of birds was known through intensive monitoring. Monitors unfamiliar with the current status of the vireo at Featherly Park and Norco at Hwy 15 walked the site as if they were assessment sites. Twelve of 13 territories were detected at Norco and eight of 12 were documented at Featherly Park, upstream of Gypsum Canyon.

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), David McMicheal (DMc), Bonnie Nash (BN), Nicole Peltier Housel (NP), Terry Reeser (TRe), Richard Zembal (RZ), Henry Armijo (HA), and James Law (JL) with Neftali Mendoza, Arcenio Hernandez and Sameh El Morsy. Lee Reeder also participated.

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

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

Chronology of Breeding Activity

Surveys began throughout the watershed between 3/14 and 4/29 and ended between 7/7 and 9/23 (Table 2). The first vireo was detected 3/24 at Featherly Park in the Santa Ana Canyon. The earliest date for the arrival of 50% of the subpopulation at the larger population sites was 4/12 at Hidden Valley. All larger subpopulations showed 50% occupancy by 5/14. Fifty percent of all birds were paired at all sites by 5/9; one outlier was Featherly Park with a date of 6/2. The first nests were found on 4/14 in San Timoteo Canyon and Mockingbird Canyon. The last nest was found on 7/12 in Featherly Park.

The first fledging occurred in Temescal Canyon on 5/11. The last nest fledged on 7/28 in Featherly Park.

Nesting Site Preferences

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

Willows (*Salix spp.*) dominated the nest placement preference for vireos (Table 4). Five species of willow held 48% of the nests (n=112/234) in 2011. Arroyo willow, *Salix lasiolepis*, and Red Willow, *Salix laevigata*, were the most preferred of the willows holding 39 nests each. Mulefat, *Baccharis salicifolia*, held 24% (56/234) of the all nests.

Other nest-host species in 2011 included: wild grape, *Vitis girdiana*; Mexican elderberry, *Sambucus mexicana*; Fremont cottonwood, *Populus fremontii*; Tamarisk, *Tamarix ramosissima*; Peruvian pepper, *Schinus molle*; sugarbush, *Rhus ovata*; coyote bush, *Baccharis pilularis*; mugwort, *Artemisia douglasiana*; Sycamore, *Platanus racemosa*; Basketbush, *Rhus trilobata*; holly-leaved cherry, *Prunus ilicifolia*; orange tree, *citrus sinensis*; toyon, *Hetermeles arbutifolia*; tree tobacco, *Nicotiana glauca*; and wild rose, *Rosa californica*. One nest was placed on branches of Peruvian pepper and wild grape, *Vitis girdiana*. One nest was placed in deadfall.

Since 2000, 31% 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 increased in 2011. The productivity rate for 105 well-tracked pairs was 2.9, an increase from 2.7 based on 87 well-tracked pairs in 2010 (Appendix B-3). However, nesting success was 56% for 204 tracked nests, a decrease from the 65% success rate in 2010. See Appendix B for watershed-wide summary data. Average clutch size was 3.6, a slight increase from results of the past few years. See Appendix C, Site Summaries, for individual site data over time.

Predation Rates

In 2011, the depredation rate (complete nest loss due to missing eggs or chicks before the expected fledge date) was 36% (Table 5, row M.c.). Predation rates varied with site and ranged between 0% and 80%. Two sites, the San Jacinto River and the Green River Golf Club in the Santa Ana Canyon, had depredation rates above 50%. Historically, watershed-wide, nest loss due to depredation has varied between 22% and 40%. (Appendix B, Table B-3, row M.c.).

Again in 2011, most nest losses were due to unknown predators. 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, *Poliophtila 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

The parasitism rate declined to its lowest rate in 2011, 2%. Previously, 5% in 2010 was the historical low. However, parasitism was documented at four sites in 2011: the San Jacinto River, the Santa Ana River above Van Buren Blvd., Hidden Valley, and Temescal Canyon. Parasitism occurred at 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.

No parasitism was documented in San Timoteo in 2011. 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.

Only 1% of nests were lost to parasitism in 2011. 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.

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

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 2011

SAN JACINTO SUMMARY

In 2011 forty-one vireo territories were detected, up from 22 in 2010. 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. Five territories were located in the San Jacinto Wildlife area, up from 2 territories in 2010. In 2004, 2 vireo territories were detected in the San Jacinto River upstream of Bridge Street. A reduced monitoring effort has failed to detect these birds in recent years. Although the habitat had been removed from the river between Sanderson and Bridge Street, it has since grown back and is now suitable for vireo. Four territories were detected at this site late in the 2011 season.

Measures of reproductive success have varied over the years due in part to low vireo numbers and differential monitoring efforts. When SAWA began monitoring San Jacinto in 2003, no vireos were detected, but cowbirds were common in the habitat. In 2005, vireos were observed feeding cowbird fledglings and the biologist pulled three cowbird eggs out of one nest. Parasitism and/or predation were documented at most nests visited from 2004 to 2006.

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, 15,555 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 have steadily decreased from a high of 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. In 2011, 10% of well-monitored nests (1/10 nests) were parasitized, and a vireo on an additional territory was observed feeding a cowbird fledgling. Other species observed feeding cowbird fledglings in 2011 included Yellow Warblers, Song Sparrows, California Towhees, and a Lazuli Bunting.

It should be noted that the monitoring effort at this site was reduced in 2011 due to time constraints. As a result, only 1 pair was intensively monitored and produced no fledglings. Fourteen nests were discovered. Out of 10 well-tracked nests, only 1 was successful, producing 2 fledglings. Overall, 18 fledglings were detected in the San Jacinto River in 2011. Since 2004, nesting success is 54% based on 67 well-tracked nests. Depredation has been the major cause of nest loss in the last 8 years; 80% of well-tracked nests were depredated in 2011, and 34% of all nests have been lost due to depredation since 2003. Productivity rate has increased dramatically from a low of 1.8 in 2007, based on five well-tracked pairs, to a high of 4.5 in 2008, based on six well-tracked pairs. In the last six years, 150 vireo fledglings have been documented in San Jacinto.

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 (48%) and mulefat (41%) have been the primary plant species used for nest placement in San Jacinto since 2004 (n= 75 nests). Black willow held another 7% of nests. Only 3 of the 75 nests found from 2004-2011 were placed in non-native vegetation, 2 (3%) in Tamarisk and 1 (1%) in black mustard.

SAN TIMOTEO SUMMARY

In 2011, 116 vireo territories were documented in San Timoteo, down 8% from the 126 documented in 2010. However, the population in San Timoteo has experienced an overall increase of over 2200% in the past 11 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 understory, effects of natural storm cycles notwithstanding.

One hundred-one known pairs and 196 fledglings were detected in 2011. Nesting success was 60%, slightly down from 62% in 2010. Nest losses were primarily due to predation (30%); however 8% were lost due to reproductive failure.

Thirty-one well-monitored pairs had a 3.4 reproductive success rate. Nesting success is 58% over eleven years of monitoring (n=448 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 11 years; 33% of all nests have been lost due to depredation. Overall reproductive success based on productivity of well-tracked pairs in the last 11 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 1,769 cowbirds have been removed from San Timoteo Canyon during this time. In 2011, the parasitism rate was at an all-time low of 0% (0 of 73 well-tracked nests). This is the first time in 11 years that parasitism has 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 24% over eleven years (106 of 448 nests), only 6% of nests (25 of 448) 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.

Although cowbird trapping has occurred since 2001, parasitism rates remained very high through 2006. 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; O'Loghlen 1995). In 2007, we experimented by removing the original bait birds after local birds were captured. We kept local, second-year male birds in the traps for the remainder of the season. Additionally, with assistance from a local resident, we placed a trap in a new location near Live Oak Canyon in 2008. This one particular trap caught the majority of cowbirds throughout the canyon (50%) in 2008 and 2009, and 35% in 2010. We continued this protocol in 2010 and added three more traps in locations where parasitism was localized in prior years. Trapping efforts incorporating this new protocol will hopefully continue to control the rate of parasitism throughout the canyon. In the last five years, the parasitism rate has been below 20%, which may be a result of these additional efforts.

Mulefat (28%), arroyo willow (19%) and red willow (17%) have been the primary plant species used for nest placement in San Timoteo since 2001 (n= 499 nests). Black willow held another 11% of the nests. Only four nests found from 2001-2011 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. Also in 2009, an increased amount of illegal activities were detected in the creek causing further habitat degradation and a new safety threat. Due to this new threat, SAWA biologists were forced to travel in pairs and monitoring was often interrupted because of police activities.

SYCAMORE CANYON SUMMARY

In 2011, nine vireo territories were detected. Nests were not intensely monitored in 2011, however five pairs and four fledglings were detected over 46 hours of monitoring (average number of fledglings/pair = 0.8). Nesting success in 2008 was 50% (n=4 nests), down from 100% in 2007 (n=2 nests). The vireos in this canyon are

notoriously silent and therefore difficult to monitor. Vireos have never been observed feeding cowbird fledglings.

Due to the low parasitism rate, Sycamore Canyon has not been intensively managed except to document the number of territories and pairs. 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. In 2005 only one fledgling was observed from seven pairs but this low number can be attributed to the lack of monitoring effort. In 2008, 13 fledglings were observed from eight pairs. 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. No cowbird trapping was done at the site in 2010 and 2011.

MARCH SKR PRESERVE SUMMARY

Sixteen vireo territories, nine pairs, and seven fledglings were detected in March SKR Preserve in 2011. Since SAWA began monitoring in 2004, 7 to 16 vireos have been documented in March SKR Preserve annually and over 100 fledglings have been documented.

Measures of reproductive success have varied over the years, due in part to differential monitoring efforts. In 2011, 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 and 2011. 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 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 2011 at least one Yellow-breasted Chat, a minimum of six Yellow Warblers, and two Cooper's Hawk territories each with a nest 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 2011, Coyotes, *Canis latrans*, Black-tailed Jackrabbits, *Lepus californicus*, two Downy Woodpeckers, *Picoides pubescens*, one Northern Harrier, *Circus cyaneus*, and a Great Horned Owl, *Bubo virginianus*, incubating three nestlings, were 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 Downy Woodpeckers, and over one-hundred Western Spadefoot Toad tadpoles, *Spea hammondi*. 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* (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 is surrounded by development, and there is an approved proposal to develop the Preserve. The habitat patches currently occupied by vireos are small and support the vireos and associated nesting birds in part because of the adjacent open space, habitat, surface water in creeks, and foraging opportunities. In 2011, adjacent habitat along Van Buren Blvd. supported an additional 3 vireo territories; 2-4 vireos have been documented in that habitat since 2005. Unfortunately, recent settlements have confirmed development of the preserve within the near future. As a result, several scientists from different environmental agencies, including SAWA biologists, met in August 2011 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-intrusive manner in order to conserve quality habitat for key species. If development continues to occur to the edge of the riparian patches, the suitability of the habitat for nesting vireos and other native species will be greatly diminished. The ultimate fate of the vireo population, with its complement of riparian bird species and potential for supporting nesting Southwestern Willow Flycatchers, remains uncertain.

A special thanks to Bill Kronland, Biologist and Preserve Manager with the CNLM, for the collaboration of data regarding Least Bell's Vireo first detection dates at the preserve.

MOCKINGBIRD CANYON SUMMARY

In 2011, 37 vireo territories, 32 pairs, and 67 fledglings were detected in Mockingbird Canyon. These numbers represent a 14% decrease in territories and 6%

decrease in pairs from 2010. However, the vireo population in Mockingbird has increased 378% from 2003-2010. This year is the first decrease in population since monitoring began. 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 2011, no parasitism was documented (n=30 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 nine years (2003-2011), nesting success has averaged 54%. Since 2003, 33% 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 (22%) 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 2011 vireos at this site have nested in 17 different plant species or combination of species; 66% of nests have been placed in willow species or combinations with willow species. Only 6% 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-nine vireo territories, 23 pairs, and 32 fledglings were documented along the Santa Ana River between Fairmount Park and Hidden Valley in 2011, exclusive of Hidden Valley (See Appendix A). During the 2011 season, 14 nests were discovered and 10 were closely monitored. The success rate for these tracked nests was 60%. One nest (10%) failed as a result of parasitism, and three nests (30%) failed as a result of predation.

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 season.

The vireo population along this stretch of the Santa Ana River had been increasing since 2002. In 2010, it held 68 territories. Lower numbers in 2011 were consistent with lower numbers downstream in Hidden Valley. The storms of the winter of 2010-11 scoured the floodplain lowering the river by an estimated 4 feet and taking away much of the riparian habitat. Construction work at the Van Buren Blvd. Bridge has restricted river flow and caused habitat disturbance.

Nesting success has varied over the years. Nesting success is 66% over all years. Since monitoring began a minimum of 373 fledglings have been documented at this site. Cowbird trapping has occurred at private business and homeowner locations since 2002, and a total of 549 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 (32%) 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 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 site 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 winter and much of the acreage was eroded and sent to the Prado Basin. Acreage that was left was scoured of habitat. Only 4 vireos were documented near Van Buren Blvd. This count is down 73% from 15 territories in 2010. No nests were monitored. The lack of cowbird trapping shown in the area as shown by the Table 5 is somewhat misleading. One trap was placed on private property near Van Buren Blvd. (at Riverdale St.) and another six were placed between

Van Buren Blvd. and Hwy 15. Data for traps in this trap route 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 decreased by a few birds in 2011. In 2011, 55 territories, 36 pairs, and 41 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 three years has included a permitted biologist and a field assistant.

In 2011, the pair of vireos in habitat adjacent to Hidden Valley at Rancho La Sierra was documented for the second year. This territory is not included in the data for Hidden Valley Wildlife Preserve but is listed on Tables 1A and 1B.

The productivity rate for 5 well-tracked pairs in 2011 was 3.4. The productivity rate over 11 years is 2.5.

Nesting success in Hidden Valley is variable. It increased from 41% in 2010 to 60% in 2011. Four of ten monitored nests were lost in 2011. Three were lost due to depredation and one was lost due to parasitism. The two nests parasitized were in adjacent territories in the western downstream section of Hidden Valley. One pair successfully fledged two young while the other pair abandoned their first nest with three vireo eggs and successfully fledged three young from a second nest. 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-eight 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, 673 cowbirds have been removed from Hidden Valley over more than 4,800 trap days.

SAWA's Arundo Removal Project here began in 2008 when SAWA removed 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-cutting of *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. With the completion of the project more acreage will be restored 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* were 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 river was lowered four feet in some places (J. Vint, personal comm). The levee system that brings water to the ponds and creek system was washed out. Water flow to the ponds had been maintained during the 2009 season but failed during the 2010 and 2011 seasons. It should be a high priority to reestablish the flow to the ponds to preserve the riparian habitat.

Incidental surveys for other species of concern take place during vireo monitoring. In 2011, 85 Yellow Warblers and 38 Yellow-breasted Chat 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 wrens have been detected in the last several years when a few years previously, 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 466 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.

In 2011, 105 territorial males were detected. Fifty-nine of these males were paired and 91 fledglings were detected. Nesting success for 22 well-tracked nests was 45%. This is a substantial decrease from 89% in 2010. Most of the nest searching on the site this year was done opportunistically. Some areas were actively nest searched for purposes of *Arundo* removal monitoring and for the Multiple Species Habitat Conservation Program (MSHCP). In 2011, nest failures were due to depredation and reproductive failure. There was no nest loss due to parasitism. Twelve pairs monitored throughout the 2011 season had a 1.6 productivity rate. Since monitoring began at least 693 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 has reached an all time high of 105. Data on vireo territories near River Road Bridge was supplied by John Green.

Overall nesting success from 2001 through 2011 for the site is 65% (n= 217 nests, range= 33%-100%). Depredation has been the main cause of nest loss, occurring at a rate of 41% this year. In 2010, the depredation rate was only 11%, which is the lowest rate since 2005.

Cowbird trapping has occurred at Norco annually since 2004. Four hundred and sixty-six Brown-headed Cowbirds have been removed from Norco over 1,599 trap days. Parasitism has occurred on the site in six out of the nine 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, at a rate of 7% (2/29 nests). In 2009, the rate dropped to 2% (1/45 nests). In 2010 and 2011, no parasitism occurred on the site.

Mulefat has held 34% of all vireo nests (n=257) since 2001. Arroyo willow and Black willow have held 31% and 18% 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

In 2011, 102 territorial least Bell's vireo males were detected. Sixty-five of these males were known to be paired and 113 fledglings were detected. This count represents a 23% increase from the count of 83 territorial vireos in 2010 and an increase of over 1000% from the seven territorial vireos in 2001. The increase in 2011 is likely a result of an increased search effort in outlying areas that were not searched in previous years.

Nesting success for 32 well-tracked nests was 69%, a decrease from last year's 87% success rate, but the same as 2009. Eighteen pairs monitored throughout the season had a 2.9 reproductive rate. Nest loss was due to depredation; 10 of the 32 nests (31%) tracked were lost to depredation. No nests were lost due to parasitism or reproduction failure.

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, from Railroad Canyon to approximately two miles upstream of the intersection of Magnolia Avenue and Temescal Creek. An incidental sighting of one territorial male in Estelle Mountain Preserve was included. Temescal Canyon is characterized by patchy, dense riparian vegetation. Privately owned sand mines operate downstream in the northern section adjacent to the creek.

Overall nesting success for the site from 2001 to 2011 is 65%. Overall productivity of well-tracked pairs is 2.8.

Cowbird trapping has occurred at Temescal annually since 2001. Over 8,248 trap days, 1,688 Brown-headed Cowbirds have been removed from Temescal. Parasitism has been documented in Temescal in eight out of the eleven years surveyed, reaching its highest rate in 2007 (42%). The 2011 rate was 3%. 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'Loughlen and Rothstein 1995; O'Loughlen 1995). In 2011, we removed the original bait birds after local birds were captured. 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.

Over 66% of nests have been placed in mulefat (35%) or arroyo willow (31%) since 2001. In 2011, one nest along Lake Elsinore was placed in tamarisk, which dominates the habitat surrounding the lake. This nest was not successful. Riparian vegetation is fairly healthy throughout the canyon and includes mostly native species but it is heavily fragmented. In 2001, SAWA began removing the invasive *Arundo donax* from the entire canyon. It is currently being managed for non-native plant species such as arundo regrowth and habitat is being allowed to reestablish itself.

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. 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.

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 36% (n= 8/22 nests). Nest failure is due mainly to depredation (50%) 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 and the site was used again this season. The trap was open for 115 trap days and 16 cowbirds were removed, the same as removed last year. It is worth noting that removing 16 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.

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 at 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. 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 for 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. 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. 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 regrowth and improvement in the past two years. 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

Seventy-three territories were detected in the Santa Ana Canyon in 2011, which is consistent with counts over that last three years. However, the number of territories in Featherly Park decreased by seven territories. The number of pairs is trending down slightly since 2008. In 2011, the number of pairs documented was 38, six fewer than 2010. The good news is that number of fledglings remained constant at 47. Fledgling abundance in 2011 and 2010 is the lowest of the nine seasons that SAWA has been monitoring the Santa Ana Canyon.

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 will be additional pressures put on the habitat in the fall/winter of 2011 as the next phase of the riverbank stabilization project is scheduled to move upstream to remove several more acres of mature riparian habitat.

Cowbird trapping began in the Santa Ana Canyon in 2001 when parasitism was detected in five of 19 nests (26%). Since 2001, over 1,600 cowbirds have been removed from the canyon over 8,700 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 was recorded in either season.

Nesting success in the canyon for the last 11 years is 60%; in 2011 it was 62.5%. Since monitoring began in 2001, 669 fledglings have been produced in the Santa Ana Canyon. The upper canyon has produced a minimum of 219 fledglings, the Green River Golf Club has produced at least 230 fledglings and Featherly Park has produced at least 220 vireo fledglings. Depredation rates at the three sites have been rather low only going above 50% in a few years; however the rate was 60% for 2010 and 38% (6/16) in 2011.

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

This section of the Santa Ana Canyon had a season of increased vireo abundance with 14 territories, after two seasons of decreasing numbers (2009 n = 12, 2010 n = 11). The 2011 count represents a 30% 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. Since monitoring began in 2001, 219 fledglings have been produced, but the numbers are seriously trending downward.

GREEN RIVER GOLF CLUB

The vireo population was up slightly to 26 territories in 2011 from 24 territories in 2010 and the 22 territories in 2009, despite approximately half of the riparian habitat having been destroyed in the November 2008 wildfire. The 2011 count is the highest count recorded by SAWA since monitoring began in 2001. The vireo population at Green River Golf Club has more than doubled since monitoring began in 2001 when

only ten vireos were detected. Two hundred and thirty 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, scheduled to start during the fall/winter 2011 when several more acres of mature riparian habitat will be removed that includes full grown willow and cottonwood trees, habitat that was spared by the 2008 wildfire. This area supported 13 vireo territories in 2011.

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 2009, the first season after the wildfire of November 2008, 34 vireos were detected in Featherly Park, a decrease of only two territories from 2008. In 2010, 40 vireo territories were detected. In 2011 vireo territories decreased 18% to 33 territories. 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, cockleburr, *Xanthum 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.

Nesting success in 2011 was 100% (5 nests), up from 29% in 2010 (7 nests) and 55% (11 nests) in 2009 and considerably higher than the overall 47% success rate over the nine years.

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 are counted every year for a total of 220 fledglings produced over the last 11 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 2011 slowing Arundo regrowth and giving the native habitat a much better chance at recovery.

IRVINE REGIONAL PARK SUMMARY

Twenty-six territories were detected in 2011. Nine of these males were confirmed paired and seven fledglings were observed. The lower numbers of pairs and fledglings in 2011 was the result of a lesser monitoring effort. Only one nest was monitored and it was successful.

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. This site was kept on survey schedule consisting of three visits during the breeding season from 2007-2009. 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 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 UTM's 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 (CNDDDB).

In 2011, 712 Yellow Warblers and 208 Yellow-breasted Chats were documented throughout the watershed.

BROWN-HEADED COWBIRDS TRAPPING RESULTS

BROWN-HEADED COWBIRD TRAPPING, MARCH - JULY 2011

Fifty-five traps were deployed during the vireo season in 2011 and 2,470 cowbirds were removed from all sites over 6,499 trap days (Table 6, Figure 1). The sex and ages of the cowbirds removed in 2011 were 1,647 males, 612 females, and 211 juveniles. SAWA biologists and field assistants spent approximately 3,280 field hours servicing traps during the vireo season and another 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, seven; Hidden Valley, two; Temescal Canyon, eleven; Santa Ana Canyon, six; Chino Hills, one; March SKR Preserve, two; Santa Ana River from Jurupa Park to River Road, seven, and Fullerton at Hawk's Point residential track, two. All of the traps were opened by mid to late March and closed by 8/1. Traps at the San Jacinto dairies will remain open through the winter. Trapping results in this report end with 8/1 data. Trapping results after 8/1/2011 will be reported in winter trapping results in 2012.

In 2011, SAWA managed four traps in the Prado Basin for the Santa Ana Watershed Project Authority. Those data are published in Pike et al 2010.

In 2011 cowbird captures decreased again this year by 20% (3,093 birds were trapped in 2010). This year the biggest decrease was female captures, 33% less than the 918 birds trapped in 2010. The rate for trapping juveniles was 19% less than 2010 when 260 birds were caught. Fourteen percent fewer males were trapped in 2011 than in 2010 when 1,915 were trapped. Some of the decreases can be explained by the 7% decrease in 493 trap days. The San Jacinto and Santa Ana Canyon routes contributed to 90% of the decrease.

In 2011 three traps were vandalized, two were repaired and put back into service with little down time, the other was vandalized on the last day of the season and was removed. There also were two traps closed early in the season, one because there were nesting Tri-colored Blackbirds near the trap and the other because a Cooper's Hawk repeatedly killed the bait birds.

NON-TARGET AVIAN SPECIES CAUGHT IN COWBIRD TRAPS, MARCH – JULY 2011

Twenty-five non-target species, consisting of 6,892 individual trapping occurrences, were trapped in 55 cowbird traps (Table 7). The most common species were European Starling, *Sturnus vulgaris*, Red-winged Blackbird, *Agelaius phoeniceus*, and California Towhee, *Melospiza crissalis*. The mortality rate was 0.86%.

WINTER 2010-2011 BROWN-HEADED COWBIRD TRAPPING AND NON-TARGET CAPTURES

Cowbird trapping took place at San Jacinto and the Santa Ana Canyon at Green River Road during the non-breeding season (i.e., winter) of 2010-2011. Traps at Green River were left open after the breeding season because they were still catching cowbirds. They are closed as the winter trapping success decreases. A total of 4,289

cowbirds were removed over 1,400 trap days (Table 8). This trap rate represents a 45% decline in number of birds trapped over 7% fewer trap days from 2010.

Eight traps were open in San Jacinto for a total of 1,299 trap days between 8/9/10 and 3/13/11. The traps were located at dairies. A total of 4,168 cowbirds were removed (1,362 males, 1,477 females, and 1,329 juveniles).

In the Santa Ana Canyon, two traps at Green River Road Horse Stables and one trap at Green River Golf Club were open for 101 trap-days from 8/9/10 to 10/1/10. These traps caught 121 cowbirds, an 80% decrease in the winter trapping rate from 2010 when 528 birds were removed. The increase in 2010 was due to the increased capture of juveniles. But, there is much variability in trapping rates; in 2009, only 82 birds were removed.

European starlings were three times more likely to enter the traps in 2011 than its nearest 'competitor,' the Red-wing Blackbird (Table 9). The mortality rate for non-targets was 0.5%.

DISCUSSION

Vireo abundance was down slightly in 2011 but the population has increased annually since 2000 except for the decline in 2006. A population of over 1,300 territories remains in the Santa Ana watershed. This dramatic increase over 12 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 102 in 2011. The Santa Ana River at Norco, at Hwy 15, is also showing explosive growth. After a major *Arundo* burn in 2005, the population has grown to 101 territories in five years.

SAWA and Prado biologists have removed over 95,000 cowbirds from the watershed since 2000 and the 2% parasitism rate in 2011 is the lowest since the cowbird management program was begun. The disappearance of dairies from the watershed should be an additional aid to the decline in parasitism.

Nesting success declined again in 2011 to 56% from 65% in 2010. Depredation remains the main cause of nest failure.

Nest loss due to depredation was 36%. Nest loss from reproductive failure was 5%; examples of nest loss due to reproductive failure are egg abandonment, failure of all eggs to hatch, or failure of the vegetation to support the nest to a successful hatching. Only 1% of nests were lost to parasitism in 2011.

The parasitism rate declined for the sixth straight year to 2%. 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 2001-2011.

The lack of documented nesting Southwestern Willow Flycatchers in the watershed is not surprising given the continuing low numbers throughout the watershed. A single pair documented in the Prado Basin in 2011 had a parasitized nest (Pike et al 2011). 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.

At specific locations, it may be worthwhile to consider predator control although more data must be collected first to determine target species and examine preventative methods. 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.

Riparian areas are still under assault from adults and children playing war with paintballs. Websites are advertising locations of paintball 'parks', to the extent of even labeling them as "illegal." On San Timoteo Creek in 2002, for example, five vireo nests were located in habitat that was illegally altered for a paintball park during the breeding season. Large limbs (>12") of black willows were cut and stands of mulefat were destroyed on about five acres. The habitat alteration was reported to the appropriate authorities when first discovered but nothing was done and the abuse ended only when the canyon was scoured by winter storms. In 2003, biologists witnessed a woman driving a car full of young boys carrying paintball guns on to the service road on Live Oak Canyon Road at San Timoteo Creek. Nesting vireos were present in the area. Obviously, education of both parents and children is an important component in any

strategy to protect these resources. The habitat destruction associated with paintball games is probably finished at this location in San Timoteo because it was recently fenced to accommodate the habitat destruction associated with cattle grazing. There is some good news. After a clean up of an illegal paintball park in Mockingbird Canyon, paintball activities seemed to have ceased.

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

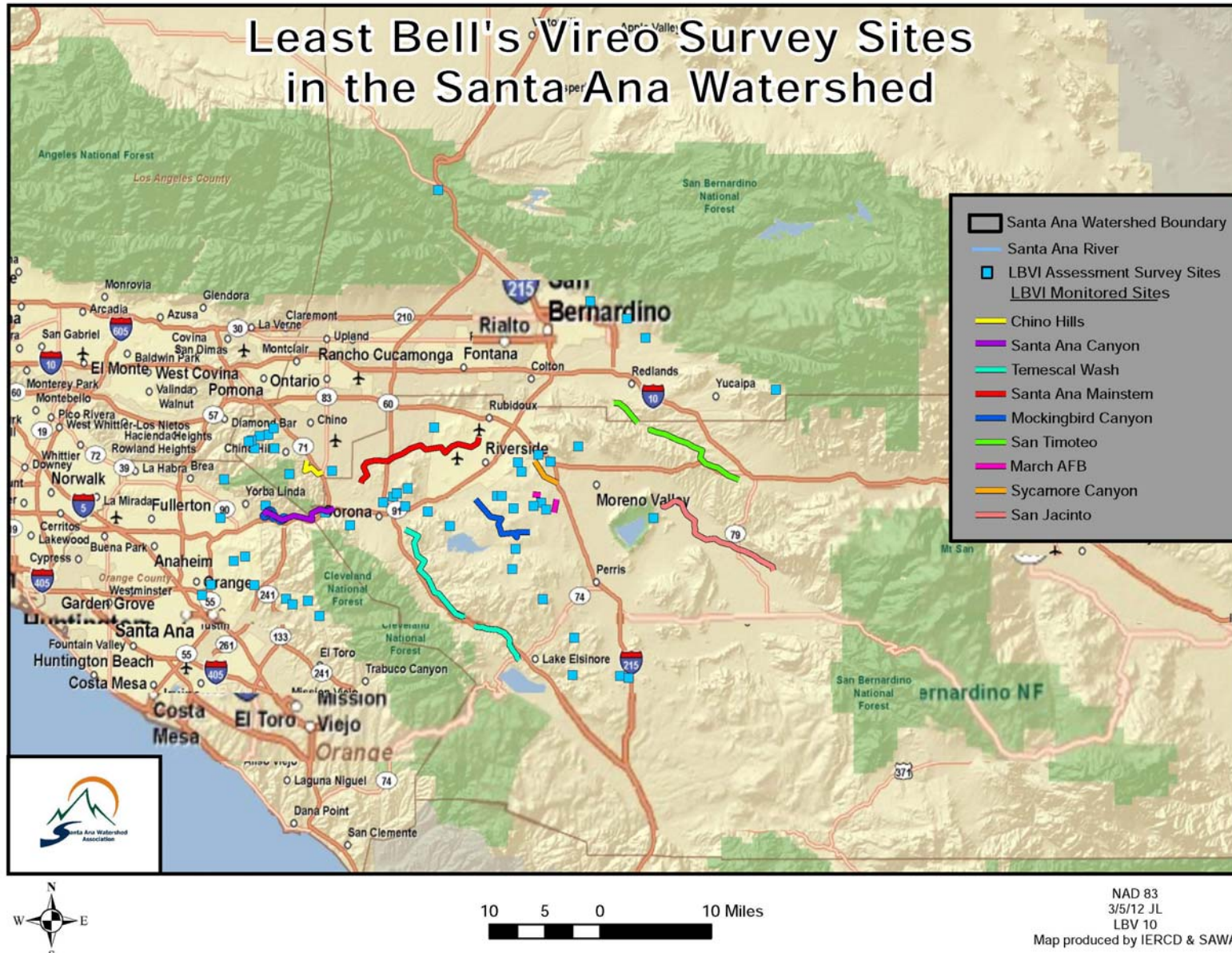
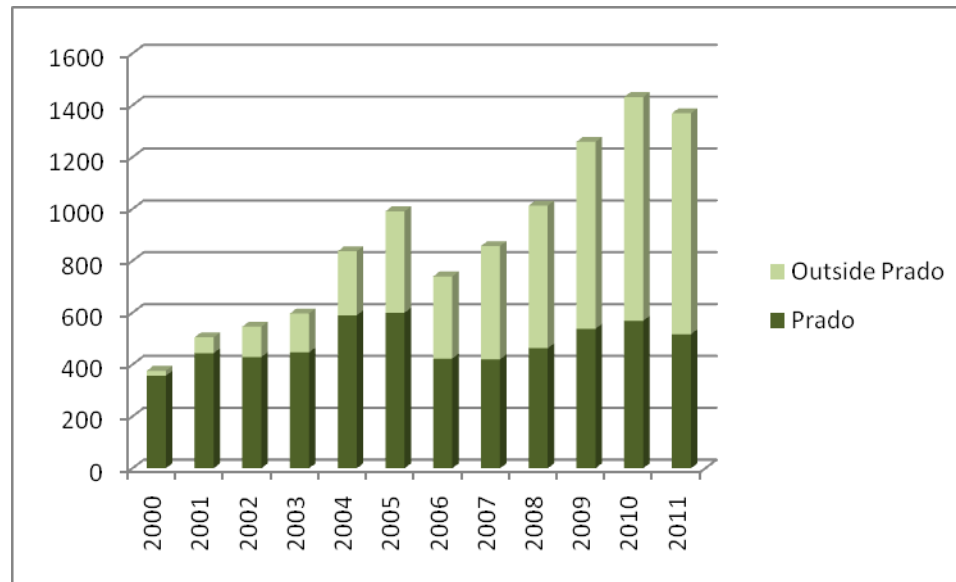
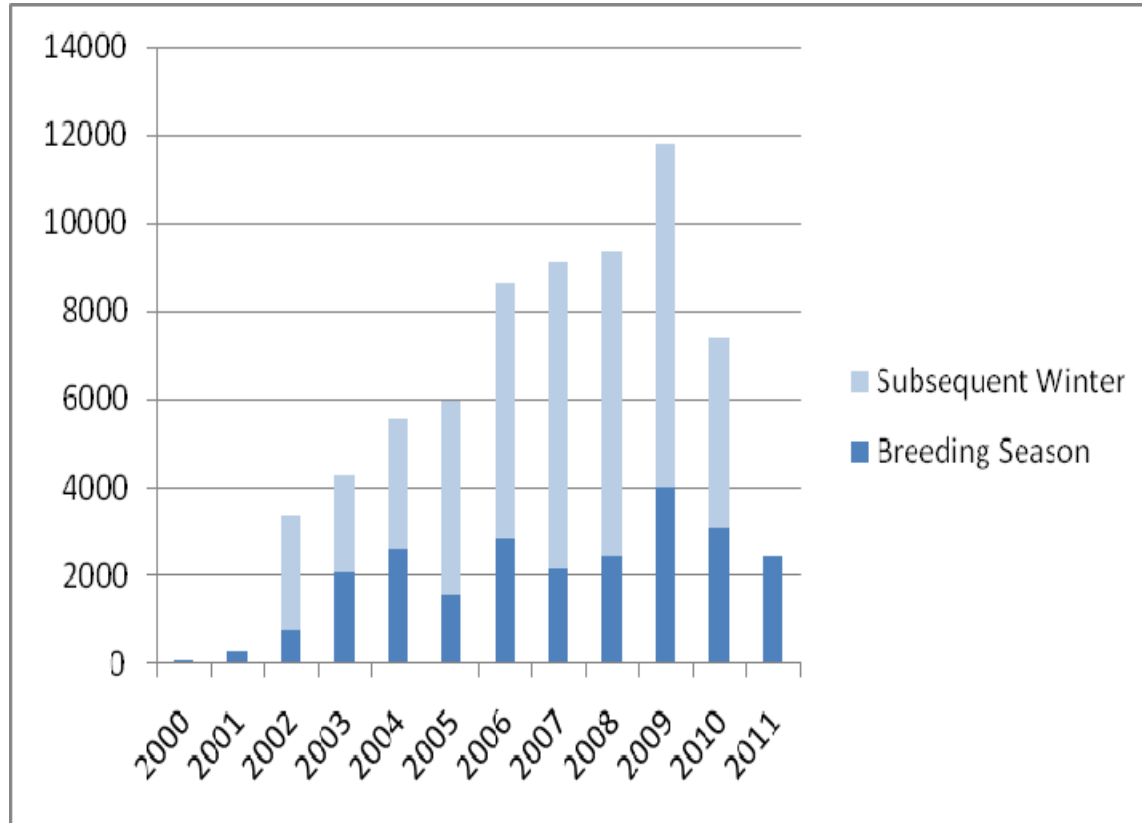


Figure 2: Vireo Abundance in the Watershed, Prado and Outside Prado, 2000-2011.



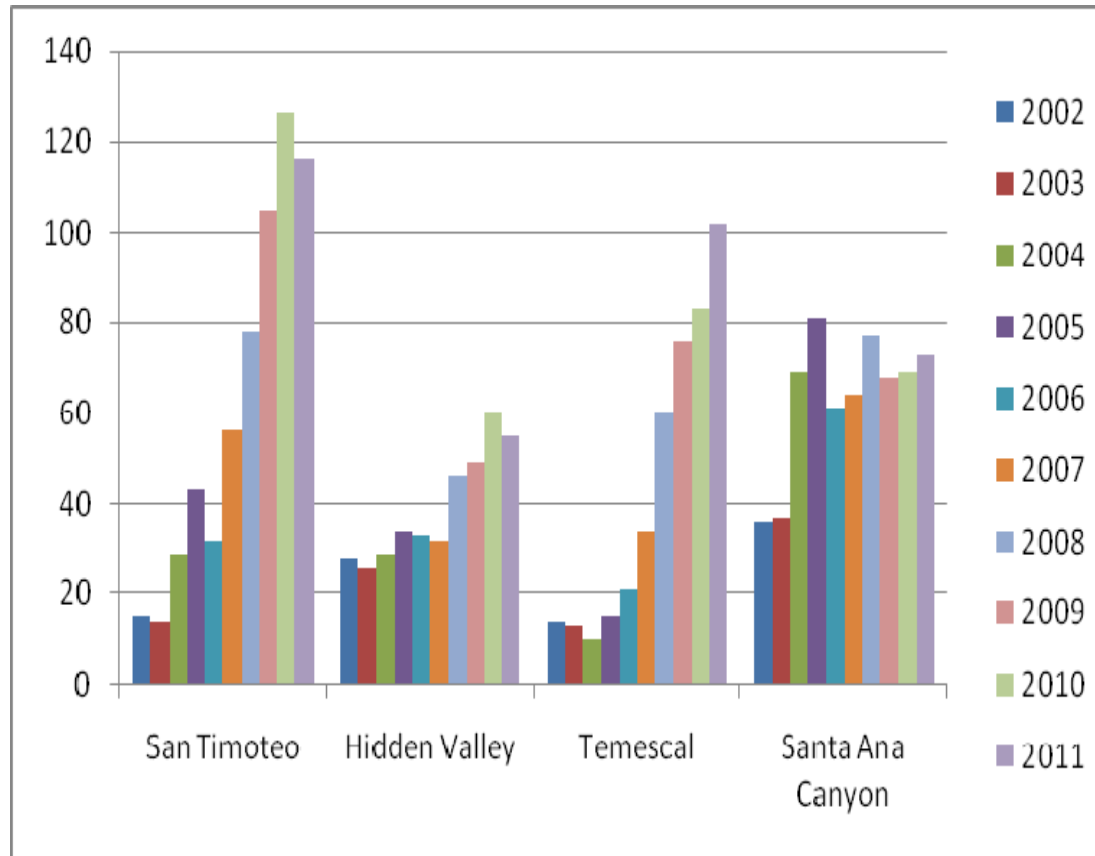
Source: Santa Ana Watershed Association

Figure 3: Number of Cowbirds Removed from SAWA Monitoring Sites in the Santa Ana Watershed, 2000-2011



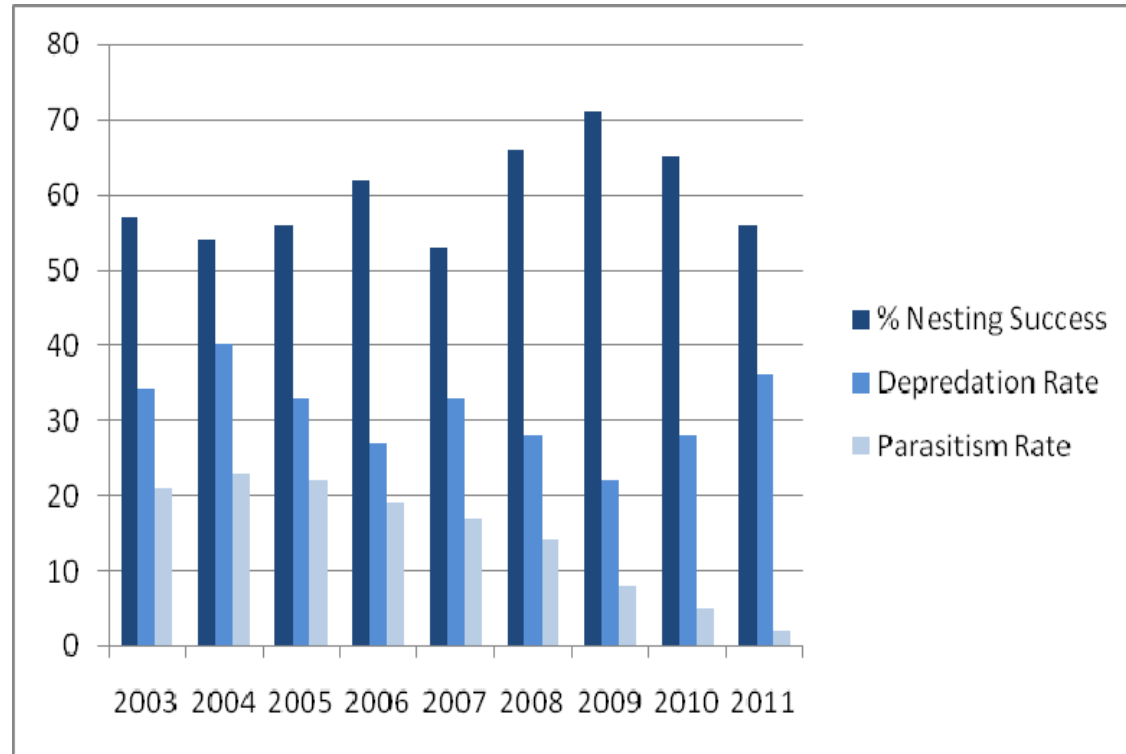
Breeding season: 15 March – 31 July
Winter: 1 Aug – 14 March
Source: Santa Ana Watershed Association
Dates approximate

Figure 4: Number of Least Bell's Vireo Territories at Four Sites in the Santa Ana Watershed, 2002-2011.



Source: Santa Ana Watershed Association

Figure 5: Least Bell's Vireo Nesting Success, Depredation Rates, Parasitism Rate in the Santa Ana Watershed, 2003-2011



Source: Santa Ana Watershed Association

Table 1A: Least Bell's Vireo status and distribution in the Santa Ana Watershed, 2010-2011

Table 1A: Least Bell's vireo status and distribution in the Santa Ana Watershed, 2010-2011. Numbers of territories, pairs, and fledglings detected										
SUBPOPULATION	2010	2011								
San Jacinto	22/18/28	41/25/18								
San Timoteo Canyon	126/95/137	116/101/196								
Sycamore Canyon	12/8/11	9/5/4								
March SKR Preserve (March ARB)	14/12/25	16/9/7								
Alessandro Arroyo	Assessment Survey	Assessment survey								
Mockingbird Canyon	43/34/25	37/32/67								
Harrison Reservoir	1/0/0	Not surveyed								
La Sierra Blvd., Riverside County	Assessment Survey	Assessment survey								
Santa Ana River - Fairmount Park/Mission to (u/s of) Hidden Valley)	68/50/58	49/23/32								
Hidden Valley	60/43/53	55/36/41								
Hidden Valley (north side of river) (new area)	15/12/18	4/2/2								
Santa Ana River - (d/s of) Hidden Valley-Norco to River Rd.	101/64/113	105/59/91								
Temescal Canyon (from Railroad Canyon to approx. Cajalco Rd.)	83/49/73	102/65/113								

Table 1A: Least Bell's vireo status and distribution in the Santa Ana Watershed, 2010-2011.										
Numbers of territories, pairs, and fledglings detected										
SUBPOPULATION	2010	2011								
Chino Hills (Butterfield Ranch)	11/7/7	8/3/1								
Santa Ana Canyon Upper Canyon (River below Prado Dam to Green River Golf Club)	11/4/6	14/5/5								
Santa Ana Canyon - Green River Golf Club	24/17/19	26/14/19								
Santa Ana Canyon - Featherly Reg. Park	40/23/22	33/19/23								
Santiago Creek - Irvine Reg. Park	24/14/18	26/9/7								
Santiago-Santiago Cyn Rd.	Assessment Survey	Assessment survey								
Santa Ana River mouth-Talbert Park	Not surveyed	1/0/0								
East Coyote Hills Preserve – Fullerton ⁽¹⁰⁾	(3/3/3) ¹⁰	(4/0/0) ¹⁰								
Misc. Sightings ---										
-- Shipley Nature Ctr, Huntington Beach	0/0/0 ¹²	0/0/0								
-- Santa Ana River, Woolly star Preserve	Not surveyed	Not surveyed								
Etiwanda Wildlife Preserve	1/0/0	Assessment survey								

Table 1A: Least Bell's vireo status and distribution in the Santa Ana Watershed, 2010-2011.
 Numbers of territories, pairs, and fledglings detected

SUBPOPULATION	2010	2011								
Mt. Baldy	Not surveyed	Assessment survey								
Chino Creek Park at Inland Empire Utilities Agency	2/1/1	2/1/1								
Chula Vista, CA ⁽¹⁰⁾	1/0/0	Not surveyed								
Protrero	2/0/0 ⁽⁵⁾	Not surveyed								
Rancho La Sierra West, Riverside	1/1/0	1/1/1								
Estelle Mountain Preserve	0/0/0 ⁽⁵⁾	1/0/0								
Yorba Dry Lake Bed Park	Assessment Survey	Assessment survey								
Black Gold Golf Club	Not available	2/0/0								
--Riverview Golf Club	Not surveyed	Not surveyed								
--Pulte Wetlands, adjacent to Chino Hills State Park (CHSP)	Not available	2/0/0								
--Rim Crest Dr. & Blue Gum Dr., adjacent to CHSP	Not available	0/0/0								
Plunge Creek, San Bernardino	Assessment survey	Assessment survey								
Santiago Pitts	Not surveyed	2/1/1								
Conrock, Tustin	Not surveyed	1/0/0								
UCR	Not surveyed	1/0/0								
Subtotal # LBVI	662/452/614	654/410/629								

Table 1A: Least Bell's vireo status and distribution in the Santa Ana Watershed, 2010-2011. Numbers of territories, pairs, and fledglings detected										
SUBPOPULATION	2010	2011								
# LBVI from SAWA Assessment Sites	159/65/41	156/63/36								
Total # LBV for all sites	821/517/655	810/473/665								
# LBV on Santa Ana River in San Bernardino County	42/26/24	42/23/30								
# LBV Chino Hills State Park	(51/23/14) ⁽⁶⁾	(42/17/7) ⁽⁶⁾								
Total for Santa Ana Watershed-excl. Prado Basin	863/543/679	852/496/695								
Prado Basin ⁽⁷⁾	569/286/479	517/200/286								
Total Number LBVI in Santa Ana Watershed	1432/829/1158	1369/696/ 981								

- (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, 2010-2011.
 Numbers of territories, pairs and fledglings detected. By Sub-watershed

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

Table 1B: Least Bell's Vireo status and distribution in the Santa Ana Watershed, 2010-2011.
 Numbers of territories, pairs and fledglings detected. By Sub-watershed

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

Table 1B: Least Bell's Vireo status and distribution in the Santa Ana Watershed, 2010-2011.
 Numbers of territories, pairs and fledglings detected. By Sub-watershed

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

Table 1B: Least Bell's Vireo status and distribution in the Santa Ana Watershed, 2010-2011.
 Numbers of territories, pairs and fledglings detected. By Sub-watershed

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

Table 1B: Least Bell's Vireo status and distribution in the Santa Ana Watershed, 2010-2011.
 Numbers of territories, pairs and fledglings detected. By Sub-watershed

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

Table 1B: Least Bell's Vireo status and distribution in the Santa Ana Watershed, 2010-2011.
 Numbers of territories, pairs and fledglings detected. By Sub-watershed

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

Table 1B: Least Bell's Vireo status and distribution in the Santa Ana Watershed, 2010-2011.
 Numbers of territories, pairs and fledglings detected. By Sub-watershed

Santa Ana Watershed	2010	2011							
Santiago Creek at Cannon Rd. (includes reservoir)	1/0/0	3/0/0							
Santiago Creek at Chapman Ave.	0/0/0	0/0/0							
Santiago Creek at Cambridge Ave.	0/0/0	0/0/0							
SUBTOTAL	821/517/65 5	810/473/665							
Santa Ana River - San Bernardino County****	42/26/24	42/23/30							
TOTAL FOR SANTA ANA WATERSHED EXCLUDING PRADO BASIN	863/543/67 9	852/496/695							
PRADO BASIN (Pike et al)	569/286/47 9	517/200/286							
TOTAL FOR SANTA ANA WATERSHED	1432/829/1 158	1369/696/98 1							
Santa Marguerita Watershed - Murrieta Creek	Not surveyed	Not surveyed							

* Reported for private property not managed

*** Reported by MSCHP

**** Reported by San Bernardino County Flood Control

Reported by Alisa Ing, California State Parks

[a] Entries correspond to numbers of territorial males/pairs/'known fledged young' for designated time and locale

[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.

Outside the Santa Ana Watershed - not included in total

Table 2: Least Bell's Vireo, Survey Dates and Breeding Chronology, 2011, 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	3/22/11	9/23/11	3/29/11	4/20/11	5/3/11 (n=97)	9/8/11
Sycamore Canyon	3/18/11	9/1/11	4/19/11	5/14/11	6/17/11	8/11/11
March SKR Reserve	3/18/11	9/1/11	4/4/11	4/15/11	5/25/11	9/1/11
Mockingbird Canyon	3/18/11	9/1/11	3/29/11	4/14/11	5/2/11	9/1/11
SAR mainstem: Mission Blvd. To Van Buren Blvd.	3/18/11	8/15/11	4/5/11	5/4/11	5/7/11	8/15/11
SAR mainstem: Hidden Valley Wildlife Preserve						
Hidden Valley (area monitored since 2000, south side of river)	3/14/11	8/24/11	4/4/11	4/15/11	5/3/11 (n=29)	9/20/11
North side of river in Hidden Valley Wildlife Preserve	4/12/11	8/9/11	4/12/11	4/12/11	4/21/11	8/9/11
SAR mainstem: Norco: Goose Creek Golf Course to River Rd.	3/14/11	9/20/11	3/28/11	4/18/11	5/9/11	9/20/11
Temescal Canyon	3/18/11	9/17/11	3/29/11	4/21/11 (n=59)	5/4/11 (n=37)	9/1/11
Chino Hills (Butterfield Ranch environs)	3/17/11	8/30/11	4/5/11	4/19/11	6/8/11	8/30/11
Santa Ana River - Upper Canyon, Santa Ana Canyon	4/13/11	8/22/11	4/13/11	5/12/11	5/13/11 (n=2)	8/22/11
Santa Ana River - Green River Golf Course, Santa Ana Canyon	3/16/11	8/10/11	4/4/11	4/18/11	5/3/11	8/10/11
Santa Ana River - Featherly Park, Santa Ana Canyon	3/15/11	9/16/11	3/24/11	4/21/11	6/2/11 (n=11)	8/31/11
Irvine Regional Park, Santiago Creek, Orange County	4/29/11	7/7/11	4/29/11	6/3/11	6/3/11	7/7/11
San Jacinto River Sub Watershed						
San Jacinto River	3/17/11	9/13/11	4/4/11	4/26/11 (n=30)	5/3/11 (n=17)	8/31/11
San Jacinto Wildlife Refuge	4/5/11	8/26/11	6/2/11	6/15/11	n/a	8/26/11

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	5/3/11 (n=97)	4/14/11	7/5/11	5/13/11	7/24/11
Sycamore Canyon	6/17/11	n/a	n/a	n/a	n/a
March SKR Reserve	5/25/11	n/a	n/a	n/a	n/a
Mockingbird Canyon	5/2/11	4/14/11	6/27/11	5/17/11	7/13/11
SAR mainstem (Mission Blvd. To Van Buren Blvd.)	5/7/11	5/3/11	6/6/11	5/28/11	6/28/11
SAR mainstem: Hidden Valley Wildlife Preserve					
Hidden Valley (area monitored since 2000, south side of river)	5/3/11	4/20/11	6/14/11	5/19/11	6/30/11
North side of river in Hidden Valley Wildlife Preserve	4/21/11	4/21/11	5/3/11	n/a	n/a
SAR mainstem - Norco - Goose Creek Golf Course to River Rd.	5/9/11	4/22/11	6/13/11	5/18/11	7/1/11
Temescal Canyon	5/4/11 (n=37)	4/15/11	6/23/11	5/11/11	7/23/11
Chino Hills (Butterfield Ranch environs)	6/8/11				
Santa Ana River - Upper Canyon, Santa Ana Canyon	5/13/11 (n=2)	5/13/11	5/13/11	5/26/11	n/a
Santa Ana River - Green River Golf Course, Santa Ana Canyon	5/3/11	4/22/11	7/6/11	5/16/11	7/26/11
Santa Ana River - Featherly Park, Santa Ana Canyon	6/2/11 (n=11)	4/21/11	7/12/11	6/4/11	7/28/11
Irvine Regional Park, Santiago Creek, Orange County	6/3/11	6/24/11	6/24/11		
San Jacinto River Sub Watershed					
San Jacinto River	5/3/11 (n=17)	4/15/11	6/8/11	5/8/11	Unknown
San Jacinto Wildlife Refuge	n/a	n/a	n/a	n/a	n/a

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, 2011.

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, 2011.																	
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			(Butterfield Ranch environs)	Irvine Regional Park	Total
												Upper Canyon*	Green River Golf Club	Featherly Reg. Park			
A.	Number of territorial males	41	116	16	9	37	49	55	4	105	102	14	26	33	8	26	641
B.	Number of known pairs (breeding and non-breeding)	25	101	9	5	32	23	36	2	59	65	5	14	19	3	9	407
C.	Number of fledged young observed	18	196	7	4	67	32	41	2	91	113	5	19	23	1	7	626
D.	Projected total recruitment of vireo young (a)	n/a	343	n/a	n/a	93	71	122	n/a	177	189	n/a	29	38	n/a	18	1080
E.	Average number of fledglings per pair (C/B)	0.7	1.9	0.8	0.8	2.1	1.5	1.1	1.0	1.5	1.7	1.0	1.4	1.2	0.3	0.8	1.5
F.	Projected number of fledglings per pair (D/B)	n/a	3.4	n/a	n/a	2.9	3.1	3.4	n/a	3.0	2.9	n/a	2.1	2.0	n/a	2.0	2.7
G.	Rate of missing eggs/chicks from nests (successful & unsuccessful)	80% (8/10)	30% (22/73)	n/a	n/a	60% (18/30)	30% (3/10)	30% (3/10)	n/a	45% (10/22)	34% (11/32)	n/a	55% (6/11)	20% (1/5)	n/a	0% (0/1)	40% (82/204)
H.	Rate of cowbird nest parasitism	10% (1/10)	0% (0/73)	n/a	n/a	0% (0/30)	10% (1/10)	20% (2/10)		0% (0/22)	3% (1/32)	n/a	0% (0/11)	0% (0/5)	n/a	0% (0/1)	2% (5/204)

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, 2011.
 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			(Butterfield Ranch environs)	Irvine Regional Park	Total
											Upper Canyon*	Green River Golf Club	Featherly Reg. Park			
I. Numbers of cowbirds removed from study area	1797	109	12	n/a	111	30	12		35	204	118			16	n/a	2444
K. Number of trap days (1 operative trap in the field for one day = 1 trap day)	982	1191	200	n/a	908	515	257		228	1245	692			115	n/a	6333
L. Average number of cowbirds trapped per trap day (I/K)	1.8	0.09	0.06	n/a	0.12	0.06	0.05		0.15	0.16	0.17			0.14	n/a	0.39
M. Number of field hours –LBV (+)	129	587	55	46	302	239	193	8	197	557	58	117	175	54	21	2738
N. Number of field hours – BHCO (+)	544	564	45	n/a	176	315	140	n/a	140	685	608			115	n/a	3281

^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.

***1061.5/386 (Excludes San Jacinto, Sycamore Canyon, Mockingbird Canyon, and Upper Canyon/SAC).

Table 4: Least Bell's Vireo nest placement preferences, monitored sites in the Santa Ana River Watershed, 2011

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	Irvine Regional Park	Total
											Upper Canyon	Green River Golf Course	Featherly Regional Park			
Black Willow (<i>Salix gooddingii</i>)		1			3				5	7	1	1	2			20
Arroyo Willow (<i>Salix lasiolepis</i>)		17			6	5	2	1	5	2			1			39
Red Willow (<i>Salix laevigata</i>)		13			13	1	2			10						39
Narrow-leafed Willow (<i>Salix exigua</i>)	8	1				1			1	1						12
Yellow Willow (<i>Salix lucida</i> spp. <i>lasiandra</i>)		2														2
Fremont Cottonwood (<i>Populus fremontii</i>)		4			1	1				2			4			12
Mulefat (<i>Baccharis salicifolia</i>)	1	25			2	1	3		10	7		5	2			56
Elderberry (<i>Sambucus mexicana</i>)		3			3	1			1	3	1	2	2	1		17
Wild Grape (<i>Vitis girdiana</i>)		10			1	2	2	1				1				17
Peruvian Pepper (<i>Schinus molle</i>)					1											1
Black mustard (<i>Brassica nigra</i>)																
Black Walnut, (<i>Juglans californica</i>)																
Tamarisk, (<i>Tamarix ramosissima</i>)										1						1
False Indigo (<i>Amorpha fruticosa</i>)																

Table 4. Least Bell's vireo nest placement preferences, monitored sites in the Santa Ana River Watershed, 2011

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	Irvine Regional Park	Total
											Upper Canyon	Green River Golf Course	Featherly Regional Park			
Deadfall		1														1
Dead Arroyo Willow																
Sugarbush (<i>Rhus ovata</i>)										1						1
Coyote Bush (<i>Baccharis pilularis</i>)										1		1				2
Mugwort (<i>Artemisia douglasiana</i>)		1														1
Sycamore (<i>Platanus racemosa</i>)		1														1
Basketbush (<i>Rhus trilobata</i>)		1														1
Holly-leaved Cherry (<i>Prunus ilicifolia</i>)					1											1
Orange Tree (<i>Rutaceae citrus sinensis</i>)													1			1
Black Willow (<i>Salix goodingii</i>) and Elderberry (<i>Sambucus mexicana</i>)												1				1
Toyon (<i>Heteromeles arbutifolia</i>)												1				1
Pepper Tree (<i>Schinus molle</i>) and Wild Grape (<i>Vitis girdiana</i>)												1				1
Tree Tobacco (<i>Nicotiana glauca</i>)						1										1
Wild Rose (<i>Rosa californica</i>)																

Table 4. Least Bell's vireo nest placement preferences, monitored sites in the Santa Ana River Watershed, 2011																
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	Irvine Regional Park	Total
											Upper Canyon	Green River Golf Course	Featherly Regional Park			
Unknown							2		3							5
Total	9	80	0	0	31	13	11	2	25	35	2	13	12	0	1	234

Table 5: Least Bell's Vireo reproductive success and breeding biology data, monitored sites in the Santa Ana River Watershed, 2011

Table 5: Least Bell's Vireo reproductive success and breeding biology data, monitored sites in the Santa Ana River Watershed, 2011		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	Invine Regional Park	Total
												Upper Canyon	Green River Golf Club	Featherly Reg. Park			
A.	Number of known pairs	25	101	9	5	32	23	36	2	59	65	5	14	19	3	9	407
B.	Number of breeding (nesting) pairs	20	78	5	3	31	19	33	2	56	57	5	12	18	1	5	345
C.	Number of breeding pairs that were well-monitored throughout the breeding season	1	31	0	0	16	7	5	0	12	18	0	7	7	0	1	105
D.	Number of 'known fledged young' OBSERVED	18	196	7	4	67	30	41	2	91	113	5	19	23	1	7	624
E.	Number of known fledged young produced by pairs monitored throughout the breeding season	0	104	0	0	46	22	17	0	36	52	n/a	15	14	n/a	2	308
F.	Average number of fledglings produced per breeding pair (minimum; D/B = 'productivity or breeding success')	0.9	2.5	1.4	1.3	2.2	1.6	1.2	1.0	1.6	2.0	1.0	1.6	1.3	1.0	1.4	1.8
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)	n/a	3.4	n/a	n/a	2.9	3.1	3.4	n/a	3.0	2.9	n/a	2.1	2.0	n/a	2.0	2.9
H.	Number of nests that were discovered	14	80	0	0	31	14	11	2	25	35	2	13	12	0	1	240

Table 5: Least Bell's Vireo reproductive success and breeding biology data, monitored sites in the Santa Ana River Watershed, 2011

		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	Irvine Regional Park	Total
											Upper Canyon	Green River Golf Club	Featherly Reg. Park				
I.	Number of nests that were regularly monitored or 'tracked'	10	73	n/a	n/a	30	10	10	0	22	32	0	11	5	n/a	1	204
J.	Number of 'tracked' nests that were successful I (% = J/I x 100)	10% (1/10)	60% (44/73)	n/a	n/a	50% (15/30)	60% (6/10)	60% (6/10)	n/a	45% (10/22)	69% (22/32)	n/a	45% (5/11)	100% (5/5)	n/a	100% (1/1)	56% (115/204)
K.	Rate of missing eggs/ chicks from nests (successful and unsuccessful) (%=K/I x100) (b)	80% (8/10)	30% (22/73)	n/a	n/a	60% (18/30)	30% (3/10)	30% (3/10)	n/a	45% (10/22)	34% (11/32)	n/a	55% (6/11)	20% (1/5)	n/a	0% (0/1)	40% (82/204)
L.	Number of 'tracked' nests that were parasitized by cowbirds (%=L/I x 100)	10% (1/10)	0% (0/73)	n/a	n/a	0% (0/30)	10% (1/10)	20% (2/10)	n/a	0% (0/22)	3% (1/32)	n/a	0% (0/11)	0% (0/5)	n/a	0% (0/1)	2% (5/204)
M.	A. Number of 'tracked' nests that failed as a result of reproductive failure	0% (0/10)	8% (6/73)	n/a	n/a	3% (1/30)	0% (0/10)	0% (0/10)	n/a	14% (3/22)	0% (0/32)	n/a	0% (0/11)	0% (0/5)	n/a	0% (0/1)	5% (10/204)
	B. Number of 'tracked' nests that failed as a result of parasitism	10% (1/10)	0% (0/73)	n/a	n/a	0% (0/30)	10% (1/10)	10% (1/10)	n/a	0% (0/22)	0% (0/32)	n/a	0% (0/11)	0% (0/5)	n/a	0% (0/1)	1% (3/204)
	C. Number of 'tracked' nests that failed as a result of predation- Predation Rate according to Vireo Working Group	80% (8/10)	30% (22/73)	n/a	n/a	43% (13/30)	30% (3/10)	30% (3/10)	n/a	41% (9/22)	31% (10/32)	n/a	55% (6/11)	0% (0/5)	n/a	0% (0/1)	36% (74/204)
	D. Number of 'tracked' nests that failed for unknown reasons	0% (0/10)	1% (1/73)	n/a	n/a	3% (1/30)	0% (0/10)	0% (0/10)	n/a	0% (0/22)	0% (0/32)	n/a	0% (0/11)	0% (0/5)	n/a	0% (0/1)	1% (2/204)

Table 5: Least Bell's Vireo reproductive success and breeding biology data, monitored sites in the Santa Ana River Watershed, 2011

		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	Irvine Regional Park	Total
												Upper Canyon	Green River Golf Club	Featherly Reg. Park			
N	Average clutch size	3.7	3.5	n/a	n/a	3.6	3.5	3.1	n/a	3.8	3.5	4.0	3.4	3.6	n/a	2.0	3.6
	Number of eggs/Number of clutches	37/10	225/64	n/a	n/a	94/26	38/11	25/8	n/a	92/24	116/33	8/2	31/9	18/5	n/a	2/1	686/193
O.	Number of cowbird eggs found in or near vireo nests	1	0	n/a	n/a	0	2	2	n/a	0	1	0	0	0	n/a	0	6
P.	Number of cowbird nestlings removed from 'tracked' nests	0	0	n/a	n/a	0	0	0	n/a	0	0	n/a	0	0	n/a	0	0
Q.	Number of cowbird young fledged by vireos	1	0	0	0	0	0	0	0	0	0	0	0	0	n/a	0	1
R.	Number of 'manipulated' parasitized nests	0	0	n/a	n/a	0	1	1	n/a	0	1	0	0	0	n/a	n/a	3
S.	Number of 'successful, manipulated' nests (%=S/R x100)	n/a	n/a	n/a	n/a	n/a	Unknown	100% (1/1)	n/a	n/a	100% (1/1)	n/a	n/a	n/a	n/a	n/a	100% (2/2)
T.	Number of vireos fledged from "manipulated" parasitized nests	n/a	n/a	n/a	n/a	n/a	Unknown	2	n/a	n/a	2	n/a	n/a	n/a	n/a	n/a	4
U.	Number of repaired nests	0	2	n/a	n/a	2	0	0	n/a	0	3	0	0	0	n/a	0	7
V.	% successful repaired nests	n/a	100% (2/2)	n/a	n/a	100% (2/2)	n/a	n/a	n/a	n/a	67% (2/3)	n/a	n/a	n/a	n/a	n/a	86% (6/7)
W.	Number of vireos fledged from repaired nests	n/a	7	n/a	n/a	6	n/a	n/a	n/a	n/a	3	n/a	n/a	n/a	n/a	n/a	16

(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, 2011

Monitored Site	Trap/Location	2011 Dates of Operation	Number of Trap Days	Cowbirds Removed				Daily Removed Averages	
				Total	Male	Female	Juveniles	Adults	All
San Jacinto									
	Scott Bros.	3/14-7/31	138	761	591	133	37	5.25	5.51
	R&J-Tuls 1	3/14-7/31	138	95	58	25	12	0.60	0.69
	R&J- Tuls 2	3/14-7/31	138	133	91	34	8	0.91	0.96
	CB#1	3/14-7/31	138	108	94	13	1	0.78	0.78
	CB#2	3/14-7/31	138	501	357	99	45	3.30	3.63
	Vanderwoude	4/5-7/29	135	153	75	37	41	0.83	1.13
	Alessandro Ponds	4/5-7/28	115	4	4	-1	1	0.03	0.03
	Oostdam	3/17-5/27	42	42	28	14	0	1.00	1.00
	Subtotal		982	1797	1298	354	145	1.68	1.83
San Timoteo									
	FISH	3/14-7/28	125	15	9	5	1	0.11	0.12
	San Tim. I-18	3/14-7/27	125	8	3	5	0	0.06	0.06
	Bee's	3/14-7/27	125	5	4	0	1	0.03	0.04
	ESR	3/14-7/27	136	11	6	5	0	0.08	0.08
	St Park	3/14-7/28	136	7	3	4	0	0.05	0.05
	English	3/14-7/27	136	8	3	5	0	0.06	0.06
	Headlee	3/14-7/27	136	36	18	13	5	0.23	0.26
	Younglove #1	3/14-7/28	136	1	1	0	0	0.01	0.01
	Younglove #3	3/14-7/28	136	18	8	10	0	0.13	0.13
	Subtotal		1191	109	55	47	7	0.09	0.09
Mockingbird Canyon									
	Reservoir	3/14-7/28	135	43	17	22	4	0.29	0.32
	Dale	3/14-7/29	137	20	7	9	4	0.12	0.15
	MBC Estates	3/14-7/29	136	25	9	9	7	0.13	0.18
	Ungerer	3/14-7/28	135	15	3	9	3	0.09	0.11
	Dak	3/14-7/25	132	1	2	-1	0	0.01	0.01
	Markham	3/14-7/27	125	-1	-1	-2	2	-0.02	-0.01
	Harrison	4/8-7/25	108	8	4	4	0	0.07	0.07
	Subtotal		908	111	41	50	20	0.10	0.12

Table 6: Brown Headed Cowbird Trapping Summary, monitored sites in the Santa Ana Watershed, 2011 (continued)

Monitored Site	Trap/Location	2011 Dates of Operation	Number of Trap Days	Cowbirds Removed				Daily Removed Averages	
				Total	Male	Female	Juveniles	Adults	All
Hidden Valley									
	Gate 3	3/17-7/31	133	9	7	2	0	0.07	0.07
	West Trailhead	3/21-7/24	124	3	2	1	0	0.02	0.02
	Subtotal		257	12	9	3	0	0.05	0.05
Temescal									
	Railroad Cyn. WM facility	3/15 - 7/8	113	17	7	10	0	0.15	0.15
	Marina	3/17-7/28	131	20	9	9	2	0.14	0.15
	Baker St.	3/14-7/28	133	38	13	20	5	0.25	0.29
	New Sump	3/14-7/28	123	44	23	14	7	0.30	0.36
	WRP3	4/22-7/21	85	24	10	9	5	0.22	0.28
	Lee Lake	3/14-7/27	133	23	17	6	0	0.17	0.17
	Kabian	3/14-6/23	98	1	1	0	0	0.01	0.01
	3M	3/14 - 7/6	112	0	0	0	0	0.00	0.00
	3M Ag	3/14-7/27	133	2	1	1	0	0.02	0.02
	Menifee #1	4/28-8/1	92	8	4	-1	5	0.03	0.09
	Menifee #2	4/28-8/1	92	27	18	6	3	0.26	0.29
	Subtotal		1245	204	103	74	27	0.14	0.16
Chino Hills									
	Butterfield Ranch CH Water-tank	3/14-7/16	115	16	9	7	0	0.14	0.14
	Subtotal		115	16	9	7	0	0.14	0.14
Fullerton									
	Hawk's Pointe #1	5/9-8/1	83	21	9	6	6	0.18	0.25
	Hawk's Pointe #2	5/9-8/1	83	5	2	2	1	0.05	0.06
	Subtotal		166	26	11	8	7	0.11	0.16

Table 6: Brown Headed Cowbird Trapping Summary, monitored sites in the Santa Ana Watershed, 2011(continued)

Monitored Site	Trap/Location	Dates of Operation	Number of Trap Days	Cowbirds Removed				Daily Removed	
				Total	Male	Female	Juveniles	Adults	All
Santa Ana Canyon									
	Horse Stables Full	3/14-7/23	122	37	24	10	3	0.28	0.30
	Horse Stables 1/2	3/14-7/18	116	11	8	2	1	0.09	0.09
	G. C. Maintenance	3/14-7/18	119	26	14	11	1	0.21	0.22
	Featherly Park RV#1	3/14-8/1	139	16	11	5	0	0.12	0.12
	Yorba #1	3/14-7/30	137	27	18	9	0	0.20	0.20
	Yorba #2	3/14-5/11	59	1	1	0	0	0.02	0.02
Subtotal			692	118	76	37	5	0.16	0.17
SKR Preserve									
	March SKR 1	4/18-7/26	100	8	4	4	0	0.08	0.08
	March SKR 2	4/18-7/26	100	4	3	1	0	0.04	0.04
Subtotal			200	12	7	5	0	0.06	0.06
Santa Ana River--									
	Jurupa Park	3/14-7/17	123	0	0	0	0	0.00	0.00
Jurupa Park to									
	Acorn 1	3/14-7/24	131	6	7	-1	0	0.05	0.05
Hidden Valley									
	Acorn 2	3/15-7/24	131	7	1	6	0	0.05	0.05
	Riverdale	3/15-7/24	130	17	9	8	0	0.13	0.13
Subtotal			515	30	17	13	0	0.06	0.06
Santa Ana River –									
River Road to Hidden Valley									
	Norco Horse Stables	3/28-5/31	65	11	5	6	0	0.17	0.17
	GooseCreek 1	3/15 - 7/17	123	16	9	7	0	0.13	0.13
	GooseCreek 2	6/15-7/24	40	8	7	1	0	0.20	0.20
Subtotal			228	35	21	14	0	0.15	0.15
GRAND TOTALS			6499	2470	1647	612	211	0.35	0.38

Table 7: Number of Times Non-Target Bird Species Trapped in Brown-headed Cowbird Traps in the Santa Ana Watershed, 2011

Species	San Jacinto		San Timoteo		March SKR Preserve		Mockingbird Canyon		Santa Ana River-Norco		SAR-Jurupa to Hidden Valley		Hidden Valley		Temescal		Fullerton		Santa Ana Canyon		Chino Hills		2011 Total		
	caught	died	caught	died	caught	died	caught	died	caught	died	caught	died	caught	died	caught	died	caught	died	caught	died	caught	died	caught	died	
AMKE																							0	0	
ANHU																								0	0
BEWR													1		7	5								8	5
BHCO(Great Basin)																								0	0
BHGR			2				1		2		1				2				1					9	0
BLPH																								0	0
BRBL	107	4																						107	4
BRCO																								0	0
BUOR	2		1				6																	9	0
CALT	3		824	4	1		394	3	11	1	6		56		120		147	5	268	4	14	1	1844	160	
CATH															3									3	0
COGD																								0	0
COHA	1																							1	0
COYE			1																					1	0
EUST	1109	7	2				4								24				100	1	1			1240	8
HOFI	33	1	22		18	1	56	2	6	1	7		2		139	3	4		4	2				291	14
HOOR							1								2	1								3	1
HOSP	112	1	18		7		19	1	3		77		1		56				1					294	2
HOWR			12	1			4	3	17				6											39	4
LASP			15		179	2	28																	222	2
LEGO															1									1	0
LOSH					1		1																	2	0
LOVE															1									1	0
MODO	3		2												1									6	0
NOMO			1																					1	0
RWBL	429		56		4					1					84	1			2					576	1
SOSP	161		23				1						4		139	1			11					339	1
SPTO			1				1		1						2		1		1					7	1
TRBL	124														4				1					129	0
WCSP			6				4	1											6	2				16	3
WEBL					1																			1	0
WEKI					3	1			1															4	1
WEME																			1					1	0
WESO																								0	0
WETA																								0	0
WEWP																								0	0
WIWA																								0	0
WSJA																								0	0
YHBL	49		1																					50	0
Unkn flycatcher																								0	0
Un-identified															1									1	0
TOTALS	2133	13	987	5	214	4	520	10	41	2	92	0	70	0	586	11	152	5	396	9	15	1	5206	207	
#/trap day	2.17		0.83		1.07		0.57		0.18		0.18		0.27		0.47		0.92		0.57		0.13			0.80	
Mortality %		0.61%		0.51%		1.87%		1.92%		4.88%		0.00%		0.00%		1.88%		3.29%		2.27%		6.67%		3.98%	
Mortality/trap day		1.3%		0.4%		2.0%		1.1%		0.9%		0.0%		0.0%		0.9%		3.0%		1.3%		0.9%		3.2%	
# BHCO removed/trap day		1.83		0.09		0.06		0.12		0.15		0.06		0.05		0.16		0.16		0.17		0.14			

Table 7: Number of Times Non-Target Bird Species Trapped in Brown-headed Cowbird Traps in the Santa Ana Watershed, 2011

Species	San Jacinto		San Timoteo		March SKR Preserve		Mockingbird Canyon		Santa Ana River-Norco		SAR-Jurupa to Hidden Valley		Hidden Valley		Temescal		Fullerton		Santa Ana Canyon		Chino Hills		2011 Total	
	caught	died	caught	died	caught	died	caught	died	caught	died	caught	died	caught	died	caught	died	caught	died	caught	died	caught	died	caught	died
CALT	3		824	4	1		394	3	11	1	6		56		120		147	5	268	4	14	1	1844	160
EUST	1109	7	2				4								24				100	1	1		1240	8
RWBL	429		56		4						1				84	1			2				576	1
SOSP	161		23				1						4		139	1			11				339	1
HOSP	112	1	18		7		19	1	3		77		1		56				1				294	2
HOFI	33	1	22		18	1	56	2	6	1	7		2		139	3	4		4	2			291	14
LASP			15		179	2	28																222	2
TRBL	124														4				1				129	0
BRBL	107	4																					107	4
YHBL	49		1																				50	0
HOWR			12	1			4	3	17				6										39	4
WCSP			6				4	1										6	2				16	3
BHGR			2				1		2		1				2				1				9	0
BUOR	2		1				6																9	0
BEWR													1		7	5							8	5
SPTO			1				1		1						2		1		1				7	1
MODO	3		2												1								6	0
WEKI					3	1			1														4	1
CATH															3								3	0
HOOR							1								2	1							3	1
LOSH					1		1																2	0
COHA	1																						1	0
COYE			1																				1	0
LEGO															1								1	0
LOVE															1								1	0
NOMO			1																				1	0
WEBL					1																		1	0
WEME																		1					1	0
Un-identified															1								1	0
AMKE																							0	0
ANHU																							0	0
BHCO(Great Basin)																							0	0
BLPH																							0	0
BRCO																							0	0
COGD																							0	0
WESO																							0	0
WETA																							0	0
WEWP																							0	0
WIWA																							0	0
WSJA																							0	0
Unkn flycatcher																							0	0
TOTALS	2133	13	987	5	214	4	520	10	41	2	92	0	70	0	586	11	152	5	396	9	15	1	5206	207
#/trap day	2.17		0.83		1.07		0.57		0.18		0.18		0.27		0.47		0.92		0.57		0.13		0.80	
Mortality %		0.6%		0.5%		1.9%		1.9%		4.9%		0.0%	0.0%		1.9%		3.3%		2.3%		6.7%		4.0%	
Mortality/trap day		1.3%		0.4%		2.0%		1.1%		0.9%		0.0%	0.0%		0.9%		3.0%		1.3%		0.9%		3.2%	
# BHCO removed/trap day	1.83		0.09		0.06		0.12		0.15		0.06		0.05		0.16		0.16		0.17		0.14			

Table 8: Winter 2010-2011 SAWA Cowbird Trapping Results

Monitored Site	Trap/Location	2010-2011 Dates of Operation	Number of Trap Days	Cowbirds Removed				Daily Removed Averages	
				Total	Male	Female	Juveniles	Adults	All
San Jacinto									
	Scott Bros.	8/9/10- 3/13/11	209	1843	539	575	729	5.33	8.82
	R&J-Tuls 1	8/9/10- 3/13/11	209	302	143	105	54	1.19	1.44
	R&J- Tuls 2	8/9/10- 3/13/11	209	524	122	227	175	1.67	2.51
	CB#1	8/9/10- 3/13/11	209	248	100	116	32	1.03	1.19
	CB#2	8/9/10- 3/13/11	209	458	159	200	99	1.72	2.19
	CB#3	8/9/10- 1/21/11	158	755	308	207	240	3.26	4.78
	Vanderwoude	1/25/11- 3/13/11	48	32	-4	36	0	0.67	0.67
	Oostdam	1/25/11- 3/13/11	48	6	-5	11	0	0.13	0.13
	Subtotal		1299	4168	1362	1477	1329	2.19	3.21
Santa Ana Canyon									
	Horse Stables Full	8/9/10- 10/1/10	37	74	6	6	62	0.32	2.00
	Horse Stables 1/2	8/9/10- 9/23/10	32	24	1	-1	24	0.00	0.75
	G. C. Maintenance	8/9/10- 9/23/10	32	23	0	1	22	0.03	0.72
	Subtotal		101	121	7	6	108	0.13	1.20
GRAND TOTALS									
			1400	4289	1369	1483	1437	2.04	3.06

Table 9: Number of Times Non-Target Bird Species Removed from Cowbird Traps, Winter 2010-2011

Species	San Jacinto		Santa Ana Canyon		Total	
	caught	died	caught	died	caught	died
EUST	1079	5	1	1	1080	6
RWBL	333	1			333	1
HOSP	136				136	0
CALT			131		131	0
HOFI	53	1			53	1
SOSP	13	1	9		22	1
TRBL	14				14	0
BRBL	6				6	0
YHBL	5				5	0
AMKE	4				4	0
COHA	3				3	0
EUCD	2				2	0
SSHA	2				2	0
HOWR			1		1	0
LASP	1				1	0
MODO	1				1	0
TOTALS	1652	8	142	1	1794	9
#/trap day	1.27		1.41		1.28	
Mortality %		0.48%		0.70%		0.50%
Mortality/trap day		0.6%		1%		0.6%
# BHCO removed/ trap day	3.21		1.20		3.06	

Table 10: Results of the Least Bell's Vireo Assessment Surveys in the Santa Ana Watershed, 2005-2011

Table 10. Results of the Least Bell's Vireo Assessment Surveys in the Santa Ana Watershed, 2005-2011							
Site	# LBVI Territories						
	2005	2006	2007	2008	2009	2010	2011
Santa Ana River & Tributaries							
Alessandro Arroyo/Prenda Arroyo	See Table 1	See Table 1	3	5	4	6	7
Arlington Falls	-	-	-	-	-	-	0
Box Springs	0	2	2	1	3	5	2
Cajalco Creek	1	1	1	See Temescal	See Temescal	See Temescal	3
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
Castleview Park	1	0	1	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
Chino Hills (Eucalyptus/Rancho Hills)	1	0	1	1	1	1	2
Chino Hills (Soquel Canyon/Pipeline)	-	-	-	-	-	-	2
Chino Hills Community Park	-	-	-	5	8	10	9
Chino Hills State Park - Bane Canyon	-	-	5	5	6	7	5
Chino Hills State Park - Lower Aliso Creek	-	-	10	12	13	24	16
Chino Hills State Park - Telegraph Canyon	-	-	2	6	10	10	9
Chino Hills State Park - Upper Aliso Creek	-	-	7	8	6	10	12
City Creek (Highland)	-	-	-	-	-	2	0

Table 10. Results of the Least Bell's Vireo Assessment Surveys in the Santa Ana Watershed, 2005-2011							
Site	# LBVI Territories						
	2005	2006	2007	2008	2009	2010	2011
Corona St. @ Gilmore	0	0	0	0	0	0	0
Fresno Canyon	2	4	2	1	0	1	1
Gavilan Hills	0	0	0	0	0	0	0
Goldenstar	-	0	0	0	1	0	0
Hidden Valley Golf Club	-	-	-	-	-	3	4
La Sierra/Lyon St.	-	-	1	2	2	3	3
Little Sand Basin (Highland)	-	-	-	-	-	2	3
Mead Valley (Cajalco/Aqueduct)	-	2	5	6	5	8	5
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
Oak Glen Preserve	-	0	0	0	0	0	0
Plunge Creek (Highland)	-	-	-	-	-	1	1
Poorman Reservoir	0	1	1	1	2	6	4
Porter Road (end)	0	0	0	0	0	0	0
Promenade	-	0	0	0	3	2	2
Pyrite Channel	-	-	-	1	1	3	3
Quail Run	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
Steele Valley	0	0	0	0	0	0	-

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

Table 10. Results of the Least Bell's Vireo Assessment Surveys in the Santa Ana Watershed, 2005-2011							
Site	# LBVI Territories						
	2005	2006	2007	2008	2009	2010	2011
Santiago Creek at Cannon Rd (including reservoir)	2	3	4	2	3	1	3
Santiago Creek at Chapman & Hwy 55, City of Orange	-	-	0	0	0	0	0
Santiago Oaks Regional Park (SORP)	0	0	0	0	0	1	0
Silverado Canyon	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

Table 11: Results of Least Bell's Vireo Assessment Surveys in the Santa Ana Water shed, 2011

Table 11: Results of the Least Bell's Vireo Assessment Surveys in the Santa Ana River Watershed, 2011																	
Surveyor	Site	SURVEY 1 4/12/11 5/03/11			SURVEY 2 5/23/11-6/10/11			SURVEY 3 6/27/11-7/25/11			TOTAL # VIREOS			# Visits	# Hours	Cowbirds Detected	Traps on site?
		Terr.	Pairs	Juv.	Terr.	Pairs	Juv.	Terr.	Pairs	Juv.	Terr.	Pairs	Juv.				
DZ	Alessandro Arroyo/Prenda Arroyo	3	0	0	7	5	0	4	1	0	7	5	0	3	13	Y	N
AB	Arlington Falls	0	0	0	0	0	0	0	0	0	0	0	0	3	6.5	N	N
GA	Box Springs	2	0	0	2	1	0	0	0	0	2	1	0	3	5.5	N	N
KR	Cajalco Creek										3	2	0	?	?	?	?
AB, JC	Cajon Wash	0	0	0	0	0	0	0	0	0	0	0	0	3	12.5	Y	N
HA	Canyon Crest	0	0	0	0	0	0	0	0	0	0	0	0	3	3.5	Y	N
TR	Carbon Canyon (Chino Hills Pkwy)	0	0	0	0	0	0	0	0	0	0	0	0	3	5.75	Y	N
TR	Carbon Canyon (Western Hills Golf Club)	0	0	0	0	0	0	0	0	0	0	0	0	3	2	N	N
JC	Carbon Canyon Reg. Park	8	2	0	5	3	1	7	0	5	13	7	5	4	23	Y	Y
GA	Castleview Park	0	0	0	0	0	0	0	0	0	0	0	0	3	2.75	N	N
TR	Chino Hills (Bayberry Dr.)	0	0	0	0	0	0	0	0	0	0	0	0	3	2.25	N	N
TR	Chino Hills (end of Eucalyptus)	0	0	0	0	0	0	0	0	0	0	0	0	3	2.75	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	1	0	1	1	0	2	1	2	2	1	2	6	5.75	Y	N
TR	Chino Hills (Soquel Canyon/Pipeline)	1	0	0	2	0	0	2	0	0	2	0	0	3	2.5	N	N
TR	Chino Hills Community Park (Eucalyptus/Peyton)	9	2	0	6	2	0	6	1	1	9	3	1	7	13.5	Y	N
TR, SH	Chino Hills State Park - Bane Canyon	4	0	0	4	1	0	3	0	0	5	1	0	3	13	N	N
MA, AB	Chino Hills State Park - Lower Aliso Creek	11	5	0	10	3	0	10	1	3	16	9	3	3	18	N	N
TB, DMc	Chino Hills State Park - Telegraph Canyon	6	2	0	4	1	0	7	0	0	9	3	0	3	17	N	N
TR, SH	Chino Hills State Park - Upper Aliso Creek	9	1	0	4	0	0	9	3	4	12	4	4	3	24	N	Y
GA	City Creek (Highland)	0	0	0	0	0	0	0	0	0	0	0	0	3	3	N	N
HA	Corona St. @ Gilmore	0	0	0	0	0	0	0	0	0	0	0	0	3	1.75	Y	N
TR	Fresno Canyon	0	0	0	0	0	0	1	0	1	1	1	1	3	8.75	N	N
JL, NM, AH, SE	Gavilan Hills	0	0	0	0	0	0	0	0	0	0	0	0	3	28.5	N	N
NH	Goldenstar	0	0	0	0	0	0	0	0	0	0	0	0	3	2.5	Y	N
SH, TR	Hidden Valley Golf Club	4	0	0	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	4	0	0	1	10	N	N
HA	La Sierra/Lyon St.	2	1	0	2	1	2	3	2	2	3	2	3	3	6	Y	N
GA, NH	Little Sand Basin (Highland)	3	1	0	2	1	0	2	0	1	3	2	1	3	7.5	Y	N
JL, NM, AH, SE	Mead Valley (Cajalco/Aqueduct)	5	3	0	5	4	0	4	1	5	5	4	5	3	42	N	N
HA	Norco Hills Park-mitigation area	0	0	0	0	0	0	0	0	0	0	0	0	3	0.75	N	N
NH	Oak Glen Preserve	0	0	0	0	0	0	0	0	0	0	0	0	3	2	Y	N

Table 11: Results of the Least Bell's Vireo Assessment Surveys in the Santa Ana River Watershed, 2011																	
Surveyor	Site	SURVEY 1 4/12/11 5/03/11			SURVEY 2 5/23/11-6/10/11			SURVEY 3 6/27/11-7/25/11			TOTAL # VIREOS			# Visits	# Hours	Cowbirds Detected	Traps on site?
		Terr	Pairs	Juv.	Terr.	Pairs	Juv.	Terr.	Pairs	Juv.	Terr.	Pairs	Juv.				
GA, NH	Plunge Creek (Highland)	0	0	0	0	0	0	1	0	0	1	0	0	3	3	Y	N
NH	Poorman Reservoir	4	1	0	4	0	0	3	0	1	4	1	1	3	6	Y	N
GA	Porter Rd. (end)	0	0	0	0	0	0	0	0	0	0	0	0	3	3	N	N
HA	Promenade	2	0	0	1	0	0	1	1	1	2	1	1	3	3.75	Y	N
JL, NM, AH, SE	Pyrite Channel	3	1	0	1	0	0	2	0	0	3	1	0	3	36	N	N
GA	Quail Run	0	0	0	0	0	0	0	0	0	0	0	0	3	2.25	N	N
SH	Starlight Dr. (Yorba Linda)	1	0	0	0	0	0	1	1	0	1	1	0	3	6	N	N
HA	Sun Canyon Park	0	0	0	0	0	0	0	0	0	0	0	0	3	1.75	Y	N
HA	Tequesquite Arroyo	0	0	0	0	0	0	0	0	0	0	0	0	3	1.75	N	N
GA	Van Buren Blvd. (Bountiful)	0	0	0	0	0	0	0	0	0	0	0	0	3	2.25	N	N
GA	Van Buren Blvd. (Plummer Rd-South)	1	0	0	2	0	0	3	1	3	3	2	3	3	5.5	N	N
TR	Wardlow Wash	0	0	0	0	0	0	0	0	0	0	0	0	3	6.75	N	N
NH	Woodcrest	0	0	0	0	0	0	0	0	0	0	0	0	3	2	N	N
HA	Wyle Labs (El Paso only)	1	0	0	1	0	0	1	0	0	1	0	0	3	1.25	N	N
SH	Yorba Park Dry Lake Bed	1	0	0	1	0	0	1	0	0	1	0	0	3	8	N	N
San Jacinto River Sub-Watershed																	
MA	Cottonwood Canyon	3	0	0	2	0	0	3	0	0	3	0	0	3	11	N	N
MA, BN	Kabian Park	3	1	0	1	1	0	1	0	0	3	1	0	3	30	Y	N
AB	Lake Perris	2	1	0	6	3	0	10	5	3	10	6	3	3	15.5	Y	Y
Santiago Creek Sub-Watershed																	
DM	Irvine Trust Management Area	1	0	0	1	0	0	1	0	0	1	0	0	3	0.75	N	Y
DM	Limestone Canyon (includes Old Haul Rd./Blue Diamond Rd.)	2	1	0	2	1	1	3	0	0	3	2	1	3	3	Y	Y
DM/MA	Peter's Canyon	12	0	0	10	1	0	11	2	2	16	3	2	3	15.5	Y	Y
DM	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
DM	Santiago Creek (u/s of Irvine Lake)	3	0	0	5	0	0	4	0	0	5	0	0	3	10.75	N	N

Surveyor	Site	SURVEY 1 4/12/11 5/03/11			SURVEY 2 5/23/11-6/10/11			SURVEY 3 6/27/11-7/25/11			TOTAL # VIREOS			# Visits	# Hours	Cowbirds Detected	Traps on site?
		Terr.	Pairs	Juv.	Terr.	Pairs	Juv.	Terr.	Pairs	Juv.	Terr.	Pairs	Juv.				
SH	Santiago Creek at Cambridge Ave., City of Orange	0	0	0	n.s.	n.s.	n.s.	0	0	0	0	0	0	2	1.5	N	N
SH	Santiago Creek at Cannon Rd (including	1	0	0	0	0	0	2	0	0	3	0	0	3	12.25	N	N
SH	Santiago Creek at Chapman & Hwy 55, City of Orange	0	0	0	n.s.	n.s.	n.s.	0	0	0	0	0	0	2	2.5	N	N
JC	Santiago Oaks Regional Park (SORP)	0	0	0	0	0	0	0	0	0	0	0	0	3	6.5	N	N
DM	Silverado Canyon	0	0	0	0	0	0	0	0	0	0	0	0	3	2.5	Y	Y
# Vireos Detected during Assessment Surveys		108	23	0	91	29	4	108	20	34	156	63	36	178	491.5		
BN	Featherly Park - control	8	0	0	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	8/12	0	0	1	2.25		
TB	Norco Bum - control	6	0	0	12	0	0	12	0	0	12/13	0.00	0.00	4	8		

Table 12: Observations of Sensitive Species by Location

Common Name	Scientific Name	San Jacinto		San Timoteo		Mockingbird		March		Sycamore Canyon		SAR-HV north side		SAR-VB to Misson		SAR-Hidden Valley south side	
		# territory	# indiv.	# territory	# indiv.	# territory	# indiv.	# territory	# indiv.	# territory	# indiv.	# territory	# indiv.	# territory	# indiv.	# territory	# indiv.
Avian																	
Double-crested Cormorant	<i>Phalacrocorax auritus</i>																
White-tailed Kite	<i>Elanus leucurus</i>			1									2				
Northern Harrier	<i>Circus cyaneus</i>		1						1		1		1				
Bald Eagle	<i>Haliaeetus leucocephalus</i>		1														
Golden Eagle	<i>Aquila chrysaetos</i>				1												
Osprey	<i>Pandion haliaetus</i>																
Cooper's Hawk	<i>Accipiter cooperii</i>	2	2	5	2	2	2	2		1		2		3	2		
Ferruginous Hawk	<i>Buteo regalis</i>		5		5												
Merlin	<i>Falco columbarius</i>	1			2												
Prairie Falcon	<i>Falco mexicanus</i>																
Peregrine Falcon	<i>Falco peregrinus</i>		1														
Burrowing Owl	<i>Athene cunicularia</i>																
Downy Woodpecker	<i>Picoides pubescens</i>		1	5				2					9	5	1		
Loggerhead Shrike	<i>Lanius ludovicianus</i>		6		1												1
Horned Lark	<i>Eremophila alpestris</i>	observed				5				1							
Tree Swallow	<i>Tachycineta bicolor</i>	1											13	2			
Coastal Cactus Wren	<i>Campylorhynchus brunneicapillus</i>																
California Gnatcatcher	<i>Polioptila californica</i>																
Yellow Warbler	<i>Setophaga petechia</i>	22		104		19		6				9		19		85	
Wilson's Warbler	<i>Cardellina pusilla</i>		2		1		1							15	1		
Yellow-breasted Chat	<i>Icteria virens</i>			19				1		2		2		12		38	
Rufous-crowned Sparrow	<i>Aimophila ruficeps canescens</i>									5							
Grasshopper Sparrow	<i>Ammodramus sarnnarum</i>																
Blue Grosbeak	<i>Passerina caerulea</i>																
Tri-colored Blackbird	<i>Agelaius tricolor</i>		134														
Lawrence's Goldfinch	<i>Carduelis lawrencei</i>	4		8		5								observed			
Reptiles																	
Granite Spiny Lizard	<i>Sceloporus orcutti</i>						3										
Orange-throated Whiptail	<i>Aspidoscelis hyperythrus</i>				1		1										
Coastal Western Whiptail	<i>Aspidoscelis tigris</i>																
Coast Horned Lizard	<i>Phrynosoma coronatum</i>		4														
Red Diamond Rattlesnake	<i>Crotalus ruber</i>																
Mammal																	
Black-tailed Jackrabbit	<i>Lepus californicus bennettii</i>		2				12		9		6						
Long-tailed Weasel	<i>Mustela frenata</i>				3										1		
Bobcat	<i>Lynx rufus</i>						1										
Other* - Includes all assessment areas and incidental sightings other than those within vireo-managed areas																	
Sensitive species are those that are listed as endangered, threatened, or species of concern by the resource agencies and those that are covered by the Western Riverside County																	
Multiple Species Habitat Conservation Plan (MSHCP).																	

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

Common Name	Scientific Name	SAR-HV to River Road		Temescal		SAC-Upper Cyn.		SAC-Green River		SAC-Featherly Park		Irvine Park		Other*	
		# territory	# indiv.	# territory	# indiv.	# territory	# indiv.	# territory	# indiv.	# territory	# indiv.	# territory	# indiv.	# territory	# indiv.
Avian															
Double-crested Cormorant	<i>Phalacrocorax auritus</i>														416
White-tailed Kite	<i>Elanus leucurus</i>	1								1				4	10
Northern Harrier	<i>Circus cyaneus</i>														
Bald Eagle	<i>Haliaeetus leucocephalus</i>													1	5
Golden Eagle	<i>Aquila chrysaetos</i>													1	
Osprey	<i>Pandion haliaetus</i>														14
Cooper's Hawk	<i>Accipiter cooperii</i>	1												3	5
Ferruginous Hawk	<i>Buteo regalis</i>														1
Merlin	<i>Falco columbarius</i>														1
Prairie Falcon	<i>Falco mexicanus</i>				1										
Peregrine Falcon	<i>Falco peregrinus</i>														4
Burrowing Owl	<i>Athene cunicularia</i>														1
Downy Woodpecker	<i>Picoides pubescens</i>			3				1		1				4	1
Loggerhead Shrike	<i>Lanius ludovicianus</i>														5
Horned Lark	<i>Eremophila alpestris</i>													1	
Tree Swallow	<i>Tachycineta bicolor</i>									3					264
Coastal Cactus Wren	<i>Campylorhynchus brunneicapillus</i>													2	
California Gnatcatcher	<i>Poliophtila californica</i>				1							1		5	4
Yellow Warbler	<i>Setophaga petechia</i>	70		99		21		41		40		6		171	9
Wilson's Warbler	<i>Cardellina pusilla</i>													3	1
Yellow-breasted Chat	<i>Icteria virens</i>	43		7		10		15		20		4		35	
Rufous-crowned Sparrow	<i>Aimophila ruficeps canescens</i>			1										13	
Grasshopper Sparrow	<i>Ammodramus savannarum</i>													4	
Blue Grosbeak	<i>Passerina caerulea</i>	3													
Tri-colored Blackbird	<i>Agelaius tricolor</i>				4										
Lawrence's Goldfinch	<i>Carduelis lawrencei</i>	2												2	9
Reptiles															
Granite Spiny Lizard	<i>Sceloporus orcutti</i>				4										25
Orange-throated Whiptail	<i>Aspidoscelis hyperythrus</i>				2										2
Coastal Western Whiptail	<i>Aspidoscelis tigris</i>									3					2
Coast Horned Lizard	<i>Phrynosoma coronatum</i>														
Red Diamond Rattlesnake	<i>Crotalus ruber</i>				4										1
Mammal															
Black-tailed Jackrabbit	<i>Lepus californicus bennettii</i>														1
Long-tailed Weasel	<i>Mustela frenata</i>		2												4
Bobcat	<i>Lynx rufus</i>														1
Other* - Includes all assessment areas and incidental sightings other than those within vireo-managed areas															
Sensitive species are those that are listed as endangered, threatened, or species of concern by the resource agencies and those that are covered by the Western Riverside County															
Multiple Species Habitat Conservation Plan (MSHCP).															

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

<u>Survey Site</u>	<u>Starting Coordinates</u>	<u>Ending Coordinates</u>
Chino Hills (Butterfield Ranch)	438975, 3754612	436980, 3755632
Harrison Reservoir (aka McAllister Creek)	460376, 3748576	462484, 3746911
March SKR Preserve	471879, 3752740	474210, 3749595
Mockingbird Canyon	461212, 3750319	469427, 3746409
San Jacinto	506426, 3739692	490640, 3749761
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
Santiago Canyon (Irvine Park)	440662, 3755052	429119, 3741253
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

<u>Survey Site</u>	<u>Starting Coordinates</u>	<u>Ending Coordinates</u>
Alessandro Arroyo/Prenda Arroyo	471087, 3750512	465058, 3754499
Arlington Falls	453856, 3748925	454753, 3748301
Box Springs	472400, 3756419	471898, 3757199
Cajalco Creek	n/a	n/a
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
Castlevew Park	468185, 3754936	468206, 3754970
Chino Hills (Bayberry Dr.)	432335, 3758297	431780, 3758507

Assessment Locations (cont.)

<u>Survey Site</u>	<u>Starting Coordinates</u>	<u>Ending Coordinates</u>
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
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
Hidden Valley Golf Club	451644, 3752551	452349, 3753225
La Sierra	457824, 3747117	457824, 3748724
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	451330, 3749951	451330, 3749951
Pyrite Channel	456496, 3762175	453872, 3759586
Quail Run	470673, 3757379	470399, 3757380
Santa Rosa Mine Road	471840, 3737819	471012, 3738146
SAR (north side Hidden Valley)	456260, 3758581	454885, 3759116
Starlight Dr. (Yorba Linda)	431041, 3749777	430990, 3749851
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	469376, 3749882
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.)

<u>Survey Site</u>	<u>Starting Coordinates</u>	<u>Ending Coordinates</u>
San Jacinto River Sub-watershed:		
Cottonwood Canyon	475633, 3725415	488261, 3754381
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 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)	426421, 3742002	428079, 3742770
Santiago Creek (Chapman Ave.)	423116, 3738554	423245, 3738906
Santiago Oaks Regional Park	428069, 3742690	429133, 3742111
Silverado Canyon	437692, 3734768	438878, 3734047

Miscellaneous Locations

<u>Survey Site</u>	<u>Starting Coordinates</u>	<u>Ending Coordinates</u>
Chino Creek Wetlands	3758246, 437620	3758840, 437395
Conrock Basin (FHQ)	423314, 3746089	423465, 3746370
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	3757910, 453521	3757077, 453547
Santiago Pitts	425344, 3740796	424678, 3740612
University of California, Riverside	470131, 3759262	470131, 3759262

APPENDIX B: WATERSHED ANNUAL RESULTS 2000-2011

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, 2010-2011. (See Tables 1A and 1B for total abundance.)

	Parameter	2010	2011							
A.	Number of territorial males	654	641							
B.	Number of pairs (breeding and non-breeding)	450	407							
C.	Number of fledged young observed	613	626							
D.	Projected total recruitment of vireo young (a)	1065.1	1080							
E.	Average number of fledglings per pair (C/B)	1.4	1.5							
F.	Projected number of fledglings per pair (D/B)	2.8	2.7							
G.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests)	43% (60/138)	40% (82/204)							
H.	Rate of cowbird nest parasitism	5% (7/138)	2% (5/204)							
I.	Numbers of cowbirds removed from study area	3,093	2444							
K.	Number of trap days (1 operative trap in the field for one day = 1 trap day)	6,992	6333							
L.	Average number of cowbirds trapped per trap day (J/K)	0.44	0.39							
M.	Number of field hours – LBV (+)	2,589	2738							
N.	Number of field hours – BHCO (+)	3,239	3281							

(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, 2010-2011.										
Host Plant Species	2010	2011								Total
Black Willow (<i>Salix gooddingii</i>)	12	20								256
Arroyo Willow (<i>Salix lasiolepis</i>)	27	39								357
Red Willow (<i>Salix laevigata</i>)	22	39								179
Narrow-leaved Willow (<i>Salix exigua</i>)	3	12								71
Yellow Willow (<i>Salix lucida</i> spp. <i>lasiandra</i>)	1	2								11
Willow species (<i>Salix</i> spp.)										6
Fremont Cottonwood (<i>Populus fremontii</i>)	6	12								67
Mulefat (<i>Baccharis salicifolia</i>)	66	56								540
Elderberry (<i>Sambucus mexicana</i>)	12	17								96
Black Walnut (<i>Juglans californica</i>)	2									7
Stinging Nettle (<i>Urtica dioica</i>)										1
Mugwort (<i>Artemisia douglasiana</i>)		1								19
Toyon (<i>Heteromeles arbutifolia</i>)		1								18
Poison Hemlock (<i>Conium maculatum</i>)										10
Wild Grape (<i>Vitis girdana</i>)	8	17								63
Wild Rose (<i>Rosa californica</i>)										5
Cockleburr (<i>Xanthium strumarium</i>)										2
Myoporum (<i>Myoporum luteum</i>)										1
Laurel Sumac (<i>Malosma laurina</i>)										6
Black mustard (<i>Brassica nigra</i>)	1									9
Peruvian Pepper Tree (<i>Schinus molle</i>)	3	1								9

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

Table B-2. Least Bell's Vireo nest placement preferences, monitored sites in the Santa Ana River watershed, 2010-2011.										
Host Plant Species	2010	2011								Total
Castor bean (<i>Rincus communis</i>)										1
Pepperweed (<i>Lepidium latifolium</i>) and Black Willow (<i>Salix goodingii</i>)										1
Common Sunflower (<i>Helianthus annus</i>)										1
Black Willow (<i>Salix goodingii</i>) and Grape (<i>Vitis girdiana</i>)										1
Mulefat/Black Mustard (<i>Baccharis salicifolia/Brassica nigra</i>)										1
Black Willow/Poison Hemlock (<i>Salix goodingii/Conium maculatum</i>)										1
Mulefat/Wild Grape (<i>Baccharis salicifolia/Vitis girdiana</i>)										2
Red Willow/Wild Grape (<i>S. lasiolepis/V. girdiana</i>)										1
Emory Baccharis (<i>Baccharis emoryii</i>)										3
Wild Celery (<i>Apium graveolens</i>)										1
Fig (<i>Ficus sp</i>)										1
White Alder (<i>Alnusrhombifolia</i>)										1
Box Elder (<i>Acer megundo</i>)										1
Red Willow/dead Stinging Nettle (<i>S. lasiolepis/U. dioica</i>)										1
Red Willow/Fresh Water Reed										1
Rose (<i>Rosa californicus</i>) & Wild Grape (<i>Vitis girdiana</i>)										1
<i>S. lasiolepis</i> & Fennel (<i>Foeniculum vulgare</i>)										1
Orange Tree (<i>Rufaceae citrus sinesnsi</i>)		1								2

Table B-2. Least Bell's Vireo nest placement preferences, monitored sites in the Santa Ana River watershed, 2010-2011.										
Host Plant Species	2010	2011								Total
Elderberry (<i>S. mexicanus</i>) & Wild Grape (<i>V. girdiana</i>)										1
Wax Leaf Pivet (<i>Ligustrum sp.</i>)										1
Dead Black Willow (<i>S. goodingii</i>) & Nettle (<i>U. dioica</i>)										1
Arroyo Willow (<i>S. lasiolepis</i>) & Black Mustard (<i>Brassica nigra</i>)										1
Dead Black Willow (<i>S. goodingii</i>) covered with living Black Willow										1
Deadfall	1	1								4
Dead <i>Salix sp.</i>										2
Dead <i>L. latifolium</i>										1
Dead <i>B. salicifolia</i>										5
Dead <i>S. lasiolepis</i>	1									1
Sugarbush (<i>Rhus ovata</i>)	1	1								2
False Indigo (<i>Amorpha fucosa</i>)	1									1
Basketbush (<i>Rhus trilobata</i>)		1								1
Holly-leaved Cherry (<i>prunus ilicifolia</i>)		1								1
Pepper Tree (<i>Schinus molle</i>) and Wild Grape (<i>Vitis girdiana</i>)		1								1
Tree Tobacco (<i>Nicotiana glauca</i>)		1								1
Black Willow (<i>Salix goodingii</i>) and Elderberry (<i>Sambucus Mexicana</i>)		1								1
Unknown		5								5
Total	168	234								1,832

Table B-3. Least Bell's Vireo reproductive success and breeding biology data, closely monitored sites in the Santa Ana River watershed, 2001- 2011. Please see Table 1 for total watershed numbers of territories, pairs, and fledglings observed.

Table B-3		2010	2011						
A.	Number of pairs	450	407						
B.	Number of breeding (nesting) pairs	361	345						
C.	Number of breeding pairs that were well-monitored throughout the breeding season	87	105						
D.	Number of 'known fledged young' OBSERVED	613	624						
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season	239	308						
F.	Average number of fledglings produced per breeding pair (minimum; D/B = 'productivity or breeding success')	1.7	1.8						
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)	2.7	2.9						
H.	Number of nests that were discovered	184	240						
I.	Number of nests that were regularly monitored or 'tracked'	138	204						
J.	Number of 'tracked' nests that were successful	65% (90/138)	56% (115/204)						
K.	Rate of missing eggs/chicks from nests (includes successful and unsuccessful nests)	43% (60/138)	40% (82/204)						
L.	Number of 'tracked' nests that were parasitized by cowbirds	5% (7/138)	2% (5/204)						
M.	A. Number of 'tracked' nests that failed as a result of reproductive failure	4% (6/138)	5% (10/204)						
	B. Number of 'tracked' nests that failed as a result of parasitism	3% (4/138)	1% (3/204)						
	C. Number of 'tracked' nests that failed as a result of predation – Predation Rate according to Vireo Working Group	28% (39/138)	36% (74/204)						
	D. Number of 'tracked' nests that failed for unknown reasons		1% (2/204)						
N.	Average clutch size	n/a	3.6						
O.	Number of cowbird eggs found in or near vireo nests	11	6						
P.	Number of cowbird nestlings removed from 'tracked' nests	0	0						

Table B-3		2010	2011						
Q.	Number of cowbird young fledged by vireos	1	1						
R.	Number of 'manipulated' parasitized nests	4% (5/138)	1% (3/204)						
S.	% 'successful, manipulated' nests	60% (3/5)	100% (2/2)						
T.	Number of vireos fledged from "manipulated" parasitized nests	8	4						
U.	Number of repaired nests	2	7						
V.	% successful repaired nests	50% (1/2)	86% (6/7)						
W.	Number of vireos fledged from repaired nests	2	16						

APPENDIX C: SUMMARY TABLES BY MANAGED SITE, FROM 2010-2011

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		2010	2011								Totals
A.	Number of territorial males	22	41								n/a
B.	Number of pairs (breeding and non-breeding)	18	25								86
C.	Number of fledged young observed	28	18								150
D.	Projected total of recruitment of vireo young (a)	n/a	n/a								122.1*
E.	Average number of fledglings per pair (C/B)	1.6	0.72								1.7
F.	Projected number of fledglings per pair (D/B)	n/a	n/a								2.8*
G.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %= $K/I \times 100$ (b)	0% (0/3)	80% (8/10)								27% (18/67)
H.	Rate of cowbird nest parasitism	0	10% (1/10)								10% (7/67)
I.	Numbers of cowbirds removed from study area	2136	1797								15,555
K.	Number of trap days (1 operative trap in the field for one day = 1 trap day)	993	982								8,380
L.	Average number of cowbirds trapped per trap day (I/K)	2.15	1.8								1.8
M.	Number of field hours -LBVI	79	129								5,702
N.	Number of field hours - BHCO	525	544								

*Excludes 2010 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

SAN TIMOTEO

Parameter		2010	2011								Totals
A.	Number of territorial males	126	116								n/a
B.	Number of pairs (breeding and non-breeding)	95	101								519
C.	Number of fledged young observed	137	196								968
D.	Projected total of recruitment of vireo young (a)	266	343								1527
E.	Average number of fledglings per pair (C/B)	1.4	1.9								1.9
F.	Projected number of fledglings per pair (D/B)	2.8	3.4								2.9
G.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %= $K/I \times 100$ (b)	65% (24/37)	30% (22/73)								44% (196/448)
H.	Rate of cowbird nest parasitism	8% (3/37)	0% (0/73)								24% (106/448)
I.	Numbers of cowbirds removed from study area	173	109								1,769
K.	Number of trap days (1 operative trap in the field for one day = 1 trap day)	1113	1191								8,767
L.	Average number of cowbirds trapped per trap day (I/K)	0.16	0.09								0.20
M.	Number of field hours -LBVI	505	587								8,684
N.	Number of field hours - BHCO	503	564								

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		2010	2011								Totals
A.	Number of territorial males	14	16								n/a
B.	Number of pairs (breeding and non-breeding)	12	9								54
C.	Number of fledged young observed	25	7								107
D.	Projected total of recruitment of vireo young (a)	75.6	n/a								196.1
E.	Average number of fledglings per pair (C/B)	2.1	0.78								2.0
F.	Projected number of fledglings per pair (D/B)	6.3	n/a								4.4
G.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %= $K/I \times 100$ (b)	0% (0/6)	n/a								27% (6/22) (n=5 yrs)
H.	Rate of cowbird nest parasitism	0% (0/6)	n/a								0% (0/22) (n=5 yrs)
I.	Numbers of cowbirds removed from study area	13	12								176
K.	Number of trap days (1 operative trap in the field for one day = 1 trap day)	280	200								1,683
L.	Average number of cowbirds trapped per trap day (I/K)	0.05	0.06								0.10
M.	Number of field hours -LBVI	62	55								574
N.	Number of field hours - BHCO	153	45								747

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
SYCAMORE CANYON

Parameter		2010	2011								Totals
A.	Number of territorial males	12	9								n/a
B.	Number of pairs (breeding and non-breeding)	8	5								48
C.	Number of fledged young observed	11	4								55
D.	Projected total of recruitment of vireo young (a)	n/a	n/a								39.6
E.	Average number of fledglings per pair (C/B)	1.4	0.8								1.1
F.	Projected number of fledglings per pair (D/B)	n/a	n/a								1.6*
G.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) $\% = K/I \times 100$ (b)	n/a	n/a								33% (3/9)
IH.	Rate of cowbird nest parasitism	n/a	n/a								22% (2/9)
I.	Numbers of cowbirds removed from study area	n/a	n/a								81
K.	Number of trap days (1 operative trap in the field for one day = 1 trap day)	n/a	n/a								635
L.	Average number of cowbirds trapped per trap day (I/K)	n/a	n/a								0.13
M.	Number of field hours -LBVI	54	46								574
N.	Number of field hours - BHCO	n/a	n/a								469

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		2010	2011								Totals
A.	Number of territorial males	43	37								n/a
B.	Number of pairs (breeding and non-breeding)	34	32								186
C.	Number of fledged young observed	25	67								310
D.	Projected total of recruitment of vireo young (a)	n/a	93								511
E.	Average number of fledglings per pair (C/B)	0.7	2.1								1.7
F.	Projected number of fledglings per pair (D/B)	n/a	2.9								3.4*
G.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)	n/a	60% (18/30)								44% (49/112)
H.	Rate of cowbird nest parasitism	n/a	0% (0/30)								11% (12/112)
I.	Numbers of cowbirds removed from study area	149	111								1,519
K.	Number of trap days (1 operative trap in the field for one day = 1 trap day)	1028	908								7,331
L.	Average number of cowbirds trapped per trap day (I/K)	0.14	0.12								0.21
M.	Number of field hours -LBVI	96	302								4,547
N.	Number of field hours - BHCO	312	176								

*excludes 2010 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
 Santa Ana River (Fairmount Park to Hidden Valley)

Parameter		2010	2011								Totals
A.	Number of territorial males	68	49								n/a
B.	Number of pairs (breeding and non-breeding)	50	22								259
C.	Number of fledged young observed	58	32								373
D.	Projected total of recruitment of vireo young (a)	100	71								500
E.	Average number of fledglings per pair (C/B)	1.2	1.5								1.6
F.	Projected number of fledglings per pair (D/B)	2.0	3.2								1.9
G.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %= $K/I \times 100$ (b)	36% (4/11)	30% (3/10)								32% (31/96)
H.	Rate of cowbird nest parasitism	0% (0/11)	10% (1/10)								14% (13/96)
I.	Numbers of cowbirds removed from study area	58	30								549
K.	Number of trap days (1 operative trap in the field for one day = 1 trap day)	530	515								4,779
L.	Average number of cowbirds trapped per trap day (I/K)	0.11	0.06								0.11
M.	Number of field hours -LBVI	335	239								2,925
N.	Number of field hours - BHCO	277	315								

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		2010	2011								Totals
A.	Number of territorial males	101	105								n/a
B.	Number of pairs (breeding and non-breeding)	64	59								356
C.	Number of fledged young observed	113	91								693
D.	Projected total of recruitment of vireo young (a)	211.2	177								833
E.	Average number of fledglings per pair (C/B)	1.8	1.5								1.9
F.	Projected number of fledglings per pair (D/B)	3.3	3.0								2.3
G.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %= $K/I \times 100$ (b)	28% (5/18)	45% (10/22)								40% (88/217)
H.	Rate of cowbird nest parasitism	0% (0/18)	0% (0/22)								6% (14/217)
I.	Numbers of cowbirds removed from study area	49	35								466
K.	Number of trap days (1 operative trap in the field for one day = 1 trap day)	269	228								1,599
L.	Average number of cowbirds trapped per trap day (I/K)	0.18	0.15								0.29
M.	Number of field hours -LBVI	183	197								2,716.5
N.	Number of field hours - BHCO	252	n/a								876

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 (as of 2010, south side of river)

Parameter		2010	2011								Totals
A.	Number of territorial males	60	55								n/a
B.	Number of pairs (breeding and non-breeding)	43	36								309
C.	Number of fledged young observed	53	41								501
D.	Projected total of recruitment of vireo young (a)	90.3	122								724 (12 yrs)
E.	Average number of fledglings per pair (C/B)	1.2	1.1								1.6
F.	Projected number of fledglings per pair (D/B)	2.1	3.4								2.3*
G.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)	64.7% (11/17)	30% (3/10)								40% (45/112)
H.	Rate of cowbird nest parasitism	5.8% (1/17)	20% (2/10)								8% (9/112)
I.	Numbers of cowbirds removed from study area	24	12								673
K.	Number of trap days (1 operative trap in the field for one day = 1 trap day)	252	257								4,807
L.	Average number of cowbirds trapped per trap day (I/K)	0.10	0.05								0.14
M.	Number of field hours -LBVI	330	193								5104
N.	Number of field hours -BHCO	196	228								

* Calculation excludes 2003, row B=(601.9/273-18)

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								Totals
A.	Number of territorial males	15	4								n/a
B.	Number of pairs (breeding and non-breeding)	12	2								14
C.	Number of fledged young observed	18	2								20
D.	Projected total of recruitment of vireo young (a)	27.6	n/a								27.6
E.	Average number of fledglings per pair (C/B)	1.5	1								1.4
F.	Projected number of fledglings per pair (D/B)	2.3	n/a								2.3
G.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %= $K/I \times 100$ (b)	11% (1/9)	n/a								11% (1/9)
H.	Rate of cowbird nest parasitism	33% (3/9)	n/a								33% (3/9)
I.	Numbers of cowbirds removed from study area	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
L.	Average number of cowbirds trapped per trap day (I/K)	n/a	n/a								n/a
M.	Number of field hours -LBVI	210									210
N.	Number of field hours -BHCO	n/a	n/a								n/a

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
TEMESCAL CANYON

Parameter		2010	2011								Totals
A.	Number of territorial males	83	102								n/a
B.	Number of pairs (breeding and non-breeding)	49	65								278
C.	Number of fledged young observed	73	113								525
D.	Projected total of recruitment of vireo young (a)	151.9	189								789
E.	Average number of fledglings per pair (C/B)	1.5	1.7								1.9
F.	Projected number of fledglings per pair (D/B)	3.1	2.9								2.8
G.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)	20% (3/15)	34% (11/32)								36.7% (66/180)
H.	Rate of cowbird nest parasitism	0% (0/15)	3% (1/32)								15.6% (28/180)
I.	Numbers of cowbirds removed from study area	134	204								1,688
K.	Number of trap days (1 operative trap in the field for one day = 1 trap day)	1191	1245								8,248
L.	Average number of cowbirds trapped per trap day (I/K)	0.11	0.16								0.20
M.	Number of field hours -LBVI	335	557								7,734
N.	Number of field hours - BHCO	467	685								

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		2010	2011								Totals
A.	Number of territorial males	11	14								n/a
B.	Number of pairs (breeding and non-breeding)	4	5								135
C.	Number of fledged young observed	6	5								219
D.	Projected total of recruitment of vireo young (a)	n/a	n/a								309.1 (n=8 yrs)
E.	Average number of fledglings per pair (C/B)	1.5	1.0								1.6
F.	Projected number of fledglings per pair (D/B)	n/a	n/a								2.7 (n=8 yrs)
G.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %= $K/I \times 100$ (b)	0% (0/1)	n/a								40% (26/65) (n=9 yrs)
H.	Rate of cowbird nest parasitism	0	n/a								6.3% (4/64) (n=9 yrs)
I.	Numbers of cowbirds removed from study area	165	48								514
K.	Number of trap days (1 operative trap in the field for one day = 1 trap day)	286	238								2,636
L.	Average number of cowbirds trapped per trap day (I/K)	0.58	0.20								0.19
M.	Number of field hours -LBVI	324*	350*								8,500
N.	Number of field hours - BHCO	425*	608*								

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 - GREEN RIVER GOLF CLUB

Parameter		2010	2011								Totals
A.	Number of territorial males	24	26								n/a
B.	Number of pairs (breeding and non-breeding)	17	14								149
C.	Number of fledged young observed	19	19								230
D.	Projected total of recruitment of vireo young (a)	30.6	29								370
E.	Average number of fledglings per pair (C/B)	1.2	1.4								1.7
F.	Projected number of fledglings per pair (D/B)	1.8	2.1								2.5
G.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %= $K/l \times 100$ (b)	71% (5/7)	55% (6/11)								34% (27/79)
H.	Rate of cowbird nest parasitism	0% (0/7)	0% (0/11)								5% (4/79)
I.	Numbers of cowbirds removed from study area	58	26								886
K.	Number of trap days (1 operative trap in the field for one day = 1 trap day)	407	119								3,627
L.	Average number of cowbirds trapped per trap day (I/K)	0.14	0.22								0.24
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		2010	2011								Totals
A.	Number of territorial males	40	33								n/a
B.	Number of pairs (breeding and non-breeding)	23	19								196
C.	Number of fledged young observed	22	23								220
D.	Projected total of recruitment of vireo young (a)	46	38								437
E.	Average number of fledglings per pair (C/B)	1.0	1.21								1.3
F.	Projected number of fledglings per pair (D/B)	2.0	2.0								2.3
G.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=(K/I x100) (b)	71% (5/7)	20% (1/5)								48% (37/77)
H.	Rate of cowbird nest parasitism	0% (0/7)	0% (0/5)								6% (5/77)
I.	Numbers of cowbirds removed from study area	118*	44*								289
K.	Number of trap days (1 operative trap in the field for one day = 1 trap day)	514*	335*								2,440
L.	Average number of cowbirds trapped per trap day (I/K)	0.23	0.13								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

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
CHINO HILLS

Parameter		2010	2011								Totals
A.	Number of territorial males	11	8								n/a
B.	Number of pairs (breeding and non-breeding)	7	3								55
C.	Number of fledged young observed	7	1								62
D.	Projected total of recruitment of vireo young (a)	11.9	n/a								64.9 (n=6 yrs)
E.	Average number of fledglings per pair (C/B)	1.0	0.33								1.1
F.	Projected number of fledglings per pair (D/B)	1.7	n/a								1.8 (n=6 yrs)
G.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=(K/I x100) (b)	67% (2/3)	n/a								64% (14/22) (n=5 yrs)
H.	Rate of cowbird nest parasitism	0% (0/3)	0								27% (6/22) (n=5 yrs)
I.	Numbers of cowbirds removed from study area	16	16								43
K.	Number of trap days (1 operative trap in the field for one day = 1 trap day)	129	115								458
L.	Average number of cowbirds trapped per trap day (I/K)	0.12	0.14								0.09
M.	Number of field hours -LBVI	59	54								501
N.	Number of field hours - BHCO	129	115								423

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								Totals
A.	Number of territorial males	24	26								n/a
B.	Number of pairs (breeding and non-breeding)	14	9								23
C.	Number of fledged young observed	18	7								25
D.	Projected total of recruitment of vireo young (a)	50	18								68
E.	Average number of fledglings per pair (C/B)	1.3	0.77								1.1
F.	Projected number of fledglings per pair (D/B)	3.6	9								3.0
G.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %= $K/I \times 100$ (b)	25% (1/4)	n/a								25% (1/4)
H.	Rate of cowbird nest parasitism	0	0								0
I.	Numbers of cowbirds removed from study area	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
L.	Average number of cowbirds trapped per trap day (I/K)	n/a	n/a								n/a
M.	Number of field hours -LBVI	25	21								46
N.	Number of field hours - BHCO	n/a	n/a								n/a

Table C-2. Least Bell's Vireo nest placement preferences, monitored sites in the Santa Ana River Watershed, 2010-2011, BY MANAGED SITE

SAN JACINTO

Host Plant Species	2010	2011									Totals
Mulefat (<i>Baccharis salicifolia</i>)	4	1									31
Black Willow (<i>Salix goodingii</i>)											5
Narrow-leaved Willow (<i>Salix exigua</i>)	2	8									36
Tamarisk (<i>Tamarix ramosissima</i>)	1										2
Black Mustard (<i>Brassica nigra</i>)											1
Totals:	7	9									75

Table C-2. Least Bell's Vireo nest placement preferences, monitored sites in the Santa Ana River Watershed, 2010-2011,
 BY MANAGED SITE
 SAN TIMOTEO CANYON

Host Plant Species	2010	2011								Totals
Arroyo Willow (<i>Salix lasiolepis</i>)	4	17								97
Mulefat (<i>Baccharis salicifolia</i>)	15	25								141
Black Willow (<i>Salix gooddingii</i>)	4	1								57
Red Willow (<i>Salix laevigata</i>)	8	13								85
Mugwort (<i>Artemisia douglasiana</i>)		1								15
Elderberry (<i>Sambucus mexicana</i>)	2	3								17
Narrow-leafed Willow (<i>Salix exigua</i>)		1								14
Fremont Cottonwood (<i>Populus fremontii</i>)	1	4								21
Wild Grape (<i>Vitis girdiana</i>)	5	10								25
Toyon (<i>Heteromeles arbutifolia</i>)										8
Mustard (<i>Brassica sp.</i>)										3
Yellow Willow (<i>Salix lucida</i> spp. <i>lasiandra</i>)		2								5
Emory baccharis (<i>Baccharis emoryii</i>)										1
Black Mustard (<i>Brassica nigra</i>)										1
Golden Current (<i>Ribes aureum</i>)										1
Four-winged Saltbrush (<i>Atriplex canescens</i>)										1
Arroyo Willow (<i>S. lasiolepis</i>) & Wild Grape (<i>Vitis girdiana</i>)										1
Box Elder (<i>Acer negundo</i>)										1
Arroyo Willow (<i>Salix lasiolepis</i>) & Fennel (<i>Foeniculum vulgare</i>)										1
Black Walnut (<i>Juglans californica</i>)	1									1
Sycamore (<i>Platanus raemosa</i>)		1								1
Basketbush (<i>Rhus trilobata</i>)		1								1
Deadfall		1								1
Totals	40	80								499

Table C-2. Least Bell's Vireo nest placement preferences, monitored sites in the Santa Ana River Watershed, 2010-2011, BY MANAGED SITE

MARCH SKR PRESERVE

Host Plant Species	2010	2011									Totals
Black Willow (<i>Salix gooddingii</i>)	1										10
Arroyo Willow (<i>Salix lasiolepis</i>)	1										6
Red Willow (<i>Salix laevigata</i>)	3										6
Mulefat (<i>Baccharis salicifolia</i>)	1										1
Totals	6	0									23

Table C-2. Least Bell's Vireo nest placement preferences, monitored sites in the Santa Ana River Watershed, 2010-2011, BY MANAGED SITE

MOCKINGBIRD CANYON

Host Plant Species	2010	2011								Totals
Black Willow (<i>Salix goodingii</i>)		3								29
Red Willow (<i>Salix laevigata</i>)	2	13								45
Elderberry (<i>Sambucus mexicana</i>)		3								16
Wild Grape (<i>Vitis girdiana</i>)		1								7
Mulefat (<i>Baccharis salicifolia</i>)	1	2								8
Peruvian Pepper Tree (<i>Schinus molle</i>)		1								3
Emory's Baccharis (<i>Baccharis emoryii</i>)										2
Pepperweed (<i>Lepidium latifolium</i>)										3
Willow species/Pepperweed (<i>Salix sp./Lepidium latifolium</i>)										1
Arroyo Willow (<i>Salix lasiolepis</i>)		6								8
Willow species (<i>Salix sp</i>)										1
Sycamore (<i>Platanus racemosa</i>)										1
Wild Celery (<i>Apium graveolens</i>)										1
Pepperweed (<i>Lepidium latifolium</i>) and Black Willow (<i>Salix goodingii</i>)										1
Black Willow (<i>Salix goodingii</i>) and Grape (<i>Vitis girdiana</i>)										1
Dead Salix sp.										1
Dead <i>L. latifolium</i>										1
Black Walnut (<i>Juglans californica</i>)										1
Holly-leaved Cherry (<i>Prunus ilicifolia</i>)		1								1
Fremont Cottonwood (<i>Populus fremontii</i>)		1								1
Totals	3	31								132

Table C-2. Least Bell's Vireo nest placement preferences, monitored sites in the Santa Ana River Watershed, 2010-2011, BY MANAGED SITE

SANTA ANA RIVER – FAIRMOUNT PARK TO HIDDEN VALLEY

Host Plant Species	2010	2011									Totals
Arroyo Willow (<i>Salix lasiolepis</i>)	4	5									37
Mulefat (<i>Baccharis salicifolia</i>)	7	1									34
Black Willow (<i>Salix goodingii</i>)											10
Fremont Cottonwood (<i>Populus fremontii</i>)		1									8
Elderberry (<i>Sambucus mexicana</i>)		1									4
Red Willow (<i>Salix laevigata</i>)	1	1									8
Scrub Oak (<i>Quercus</i> spp.)											2
Narrow-leaved Willow (<i>Salix exigua</i>)		1									3
Yellow Willow (<i>Salix lucida</i> spp. <i>Lasiandra</i>)											1
Willow species (<i>Salix</i> spp.)											1
Stinging Nettle (<i>Urtica dioica</i>)											1
Wild Rose (<i>Rosa californica</i>)											1
Black Willow (dead) (<i>Salix goodingii</i>)											1
Dead Black Willow (<i>Salix goodingii</i>) & Nettle (<i>Urtica dioica</i>)											1
Tamarisk (<i>Tamarix ramosissima</i>)											1
Wild Grape (<i>Vitis girdiana</i>)	1	2									3
Tree Tobacco (<i>Nicotiana glauca</i>)		1									1
Totals	13	13									117

Table C-2. Least Bell's Vireo nest placement preferences, monitored sites in the Santa Ana River Watershed, 2010-2011,
 BY MANAGED SITE

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

Host Plant Species	2010	2011									Totals
Arroyo Willow (<i>Salix lasiolepis</i>)	5	5									80
Black Willow (<i>Salix gooddingii</i>)	1	5									45
Mulefat (<i>Baccharis salicifolia</i>)	13	10									86
Wild Grape (<i>Vitis girdiana</i>)											9
Narrow-leafed Willow (<i>Salix exigua</i>)	1	1									10
Poison Hemlock (<i>Conium maculatum</i>)											4
Fremont Cottonwood (<i>Populus fremontii</i>)	1										12
Elderberry (<i>Sambucus mexicana</i>)		1									3
Ash (<i>Fraxinus</i> sp.)											1
Dead <i>B. salicifolia</i>											2
Black Willow (<i>Salix gooddingii</i>) & Poison Hemlock (<i>Conium maculatum</i>)											1
Dead Arroyo Willow (<i>Salix lasiolepis</i>)	1										1
Unknown		3									3
Totals	22	25									257

Table C-2. Least Bell's Vireo nest placement preferences, monitored sites in the Santa Ana River Watershed, 2010-2011, BY MANAGED SITE

HIDDEN VALLEY

Host Plant Species	2010	2011									Totals
Arroyo Willow (<i>Salix lasiolepis</i>)	6	2									51
Mulefat (<i>Baccharis salicifolia</i>)	9	3									41
Black Willow (<i>Salix gooddingii</i>)	1										16
Wild Grape (<i>Vitis girdiana</i>)		2									8
Red Willow (<i>Salix laevigata</i>)	1	2									7
Willow species (<i>Salix spp.</i>)											2
Narrow-leafed Willow (<i>Salix exigua</i>)											1
Yellow Willow (<i>Salix lucida spp. lasiandra</i>)											1
Elderberry (<i>Sambucus mexicana</i>)											3
Poison Oak (<i>Toxicodendron diversilobum</i>)											1
Coyote Bush (<i>Baccharis pilularis</i>)											1
Blackberry/Willow sp. (<i>Rubus ursinus/Salix sp.</i>)											1
S. lasiolepis/fresh water reed											1
Rose (<i>Rosa californica</i>) & Wild Grape (<i>Vitis girdiana</i>)											1
Unknown		2									2
Totals	17	11									137

Table C-2. Least Bell's Vireo nest placement preferences, monitored sites in the Santa Ana River Watershed, 2010-2011, BY MANAGED SITE

HIDDEN VALLEY (north side)

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

Table C-2. Least Bell's Vireo nest placement preferences, monitored sites in the Santa Ana River Watershed, 2010-2011, BY MANAGED SITE

TEMESCAL CANYON

Host Plant Species	2010	2011									Totals
Mulefat (<i>Baccharis salicifolia</i>)	6	7									78
Arroyo Willow (<i>Salix lasiolepis</i>)	7	2									70
Black Willow (<i>Salix gooddingii</i>)	2	7									27
Yellow Willow (<i>Salix lucida</i> spp. <i>lasiandra</i>)	1										4
Mugwort (<i>Artemisia douglasiana</i>)											1
Toyon (<i>Heteromeles arbutifolia</i>)											1
Poison Oak (<i>Toxicodendron diversilobum</i>)											1
Arrowweed (<i>Pluchea</i> sp.)											1
Coyote Bush (<i>Baccharis pilularis</i>)		1									2
Pepperweed (<i>Lepidium latifolium</i>)											1
Common Sunflower (<i>Helianthus annuus</i>)											1
Fremont Cottonwood (<i>Populus fremontii</i>)		2									4
Sycamore (<i>Platanus racemosa</i>)											1
Elderberry (<i>Sambucus mexicana</i>)	3	3									7
Dead <i>Salix</i> sp.											1
<i>S. lasiolepis</i> & Stinging Nettle (<i>Urtica dioica</i>) (dead)											1
<i>B. salicifolia</i> (dead)											3
Tamarisk (<i>Tamarix ramosissima</i>)		1									2
Deadfall	1										3
Red Willow (<i>Salix laevigata</i>)	1	10									11
Narrow-leaved Willow (<i>Salix exigua</i>)		1									1
Sugarbush (<i>Rhus ovata</i>)	1	1									2
Totals	22	35									223

Table C-2. Least Bell's Vireo nest placement preferences, monitored sites in the Santa Ana River Watershed, 2010-2011, BY MANAGED SITE

SANTA ANA CANYON – UPPER CANYON

Host Plant Species	2010	2011									Totals
Mulefat (<i>Baccharis salicifolia</i>)											33
Elderberry (<i>Sambucus mexicana</i>)	1	1									16
Black Willow (<i>Salix goodingii</i>)		1									11
Poison Oak (<i>Toxicodendron diversilobum</i>)											5
Fremont Cottonwood (<i>Populus fremontii</i>)	1										6
Wild Grape (<i>Vitis girdiana</i>)											4
Wild Rose (<i>Rosa californica</i>)											3
Red Willow (<i>Salix laevigata</i>)											3
Arroyo Willow (<i>Salix lasiolepis</i>)											2
Mustard (<i>Brassica</i> spp.)											2
Poison Hemlock (<i>Conium maculatum</i>)											2
Toyon (<i>Heteromeles arbutifolia</i>)											1
Scrub Oak (<i>Quercus berberidifolia</i>)											2
Willow Species(<i>Salix</i> spp.)											1
Cockleburr (<i>Xanthium strumarium</i>)											1
Narrow-leafed Willow (<i>Salix exigua</i>)											1
Peruvian Pepper Tree (<i>Schinus molle</i>)											1
Coast Live Oak (<i>Quercus agrifolia</i>)											1
Milk Thistle (<i>Silybum marianum</i>)											1
Coyote Bush (<i>Baccharis pilularis</i>)											1

Table C-2. Least Bell's Vireo nest placement preferences, monitored sites in the Santa Ana River Watershed, 2010-2011, BY MANAGED SITE

SANTA ANA CANYON – GREEN RIVER GOLF CLUB

Host Plant Species	2010	2011									Totals
Mulefat (<i>Baccharis salicifolia</i>)	1	5									41
Black Willow (<i>Salix gooddingii</i>)	2	1									8
Fremont Cottonwood (<i>Populus fremontii</i>)											4
Elderberry (<i>Sambucus mexicana</i>)		2									6
Laurel Sumac (<i>Malosma laurina</i>)											3
Arroyo Willow (<i>Salix lasiolepis</i>)											2
Red Willow (<i>Salix laevigata</i>)											4
Poison Hemlock (<i>Conium maculatum</i>)											2
Coyote Bush (<i>Baccharis pilularis</i>)		1									3
Narrow-leaved Willow (<i>Salix exigua</i>)											1
Toyon (<i>Heteromeles arbutifolia</i>)		1									2
Wild Grape (<i>Vitis girdiana</i>)		1									2
Myoporum (<i>Myoporum luteum</i>)											1
Peruvian Pepper Tree (<i>Schinus molle</i>)	3										5
Giant Reed (<i>Arundo donax</i>)											1
California Sagebrush (<i>Artemisia californica</i>)											1
Poison Oak (<i>Toxicodendron diversilobum</i>)											1
Elderberry (<i>Sambucus mexicana</i>) & Wild Grape (<i>Vitis girdiana</i>)											1
Wax Leaf Privet (<i>Ligustrum</i> sp.)											1
Black Walnut (<i>Juglans californica</i>)	1										1
Black Willow (<i>Salix gooddingii</i>) and Elderberry (<i>Sambucus Mexicana</i>)		1									1
Pepper Tree (<i>Schinus molle</i>) and Wild Grape (<i>Vitis girdiana</i>)		1									1
Totals	7	13									92

Table C-2. Least Bell's Vireo nest placement preferences, monitored sites in the Santa Ana River Watershed, 2010-2011, BY MANAGED SITE

SANTA ANA RIVER – FEATHERLY PARK

Host Plant Species	2010	2011									Totals
Mulefat (<i>Baccharis salicifolia</i>)	1	2									26
Elderberry (<i>Sambucus mexicana</i>)	3	2									16
Black Walnut (<i>Juglans californica</i>)											4
Black Willow (<i>Salix gooddingii</i>)	1	2									16
Laurel Sumac (<i>Malosma laurina</i>)											3
Arroyo Willow (<i>Salix lasiolepis</i>)		1									4
Red Willow (<i>Salix laevigata</i>)	2										4
Narrow-leafed Willow (<i>Salix exigua</i>)											4
Poison Hemlock (<i>Conium maculatum</i>)											2
Fremont Cottonwood (<i>Populus fremontii</i>)	3	4									11
Yellowspine Thistle (<i>Cirsium ochrocentrum</i>)											2
Mulefat (<i>Baccharis salicifolia</i>) & Wild Grape (<i>Vitis girdiana</i>)											2
Willow species (<i>Salix</i> sp.)											1
Poison Oak (<i>Toxicodendron diversilobum</i>)											1
Toyon (<i>Heteromeles arbutifolia</i>)											1
Wild Grape (<i>Vitis girdiana</i>)											1
White Alder (<i>Alnus rhombifolia</i>)											1
Dead Black Willow (<i>Salix gooddingii</i>) (covered w/ living Black Willow)											1
Arroyo Willow (<i>Salix lasiolepis</i>) & Black Mustard (<i>Brassica nigra</i>)											1

Table C-2. Least Bell's Vireo nest placement preferences, monitored sites in the Santa Ana River Watershed, 2010-2011,
 BY MANAGED SITE

SANTA ANA RIVER – FEATHERLY PARK (continued)

Black Mustard (<i>Brassica nigra</i>)	1										2
Orange Tree (<i>Rutaceae citrus sinensis</i>)		1									2
Cockleburr (<i>Xanithum strumaritum</i>)											1
Totals	11	12									106

Table C-2. Least Bell's Vireo nest placement preferences, monitored sites in the Santa Ana River Watershed, 2010-2011, BY MANAGED SITE

CHINO HILLS

Host Plant Species	2010	2011									Totals
Black Willow (<i>Salix goodingii</i>)											9
Mulefat (<i>Baccharis salicifolia</i>)	1										5
Red Willow (<i>Salix laevigata</i>)	2										5
Mugwort (<i>Artemisia douglasiana</i>)											3
Elderberry (<i>Sambucus mexicana</i>)											2
Toyon (<i>Heteromeles arbutifolia</i>)											1
Arroyo Willow (<i>Salix lasiolepis</i>)											1
Wild Grape (<i>Vitis girdiana</i>)											1
Totals	3	0									27

Table C-2. Least Bell's Vireo nest placement preferences, monitored sites in the Santa Ana River Watershed, 2010-2011,
 BY MANAGED SITE

IRVINE REGIONAL PARK

Host Plant Species	2010	2011									Totals
Mulefat (<i>Baccharis salicifolia</i>)	3										3
Elderberry (<i>Sambucus mexicana</i>)	1	1									2
False Indigo (<i>Amorpha fruticosa</i>)	1										1
Totals	5	1									6

Table C-3. Least Bell's Vireo reproductive success and breeding biology data, monitored sites, in the Santa Ana River watershed, 2010-2011, BY MANAGED SITE

SAN JACINTO

Parameter		2010	2011								Totals
A.	Number of pairs	18	25								n/a
B.	Number of breeding (nesting) pairs	15	20								74
C.	Number of breeding pairs that were well-monitored throughout the breeding season	0	1								30
D.	Number of 'known fledged young' OBSERVED	28	18								150
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season	n/a	0								93
F.	Average number of fledglings produced per breeding pair (minimum; D/B = 'productivity or breeding success')	1.9	0.9								2.0
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)	n/a	n/a								3.1
H.	Number of nests that were discovered	7	14								80
I.	Number of nests that were regularly monitored or 'tracked'	3	10								67
J.	Number of 'tracked' nests that were successful (% = J/I x 100)	100% (3/3)	10% (1/10)								54% (36/67)
K.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=(K/I x100) (b)	0% (0/3)	80% (8/10)								39% (26/67)
L.	Number of 'tracked' nests that were parasitized by cowbirds (% = L/I x 100)	0	10% (1/10)								10% (7/67)

Table C-3. Least Bell's Vireo reproductive success and breeding biology data, monitored sites, in the Santa Ana River watershed, 2010-2011, BY MANAGED SITE

SAN JACINTO (CONT.)

	Parameter	2010	2011									Totals
M.	A. Number of 'tracked' nests that failed as a result of reproductive failure	0% (0/3)	0% (0/10)									4% (3/67)
	B. Number of 'tracked' nests that failed as a result of parasitism	0% (0/3)	10% (1/10)									6-7% (4 or 5/67)
	C. Number of 'tracked' nests that failed as a result of predation – Predation Rate according to Vireo Working Group	0% (0/3)	80% (8/10)									34% (23/67)
N.	Average clutch size	3.3	3.7									n/a
O.	Number of cowbird eggs found in or near vireo nests	0	1									10
P.	Number of cowbird nestlings removed from 'tracked' nests	0	0									0
Q.	Number of cowbird young fledged by vireo	0	1									3
R.	Number of 'manipulated' parasitized nests	0	0									4
S.	Number of 'successful, manipulated' nests (% = S/R x 100)	n/a	n/a									40% (2/5)
T.	Number of vireo fledged from 'manipulated' parasitized nests	n/a	n/a									4
U.	Number of repaired nests	0	0									2
V.	% successful repaired nests	n/a	n/a									100% (2/2)
W.	Number of vireo fledged from repaired nests	n/a	n/a									6

Table C-3. Least Bell's Vireo reproductive success and breeding biology data, monitored sites, in the Santa Ana River watershed, 2010-2011, BY MANAGED SITE

SAN TIMOTEO CANYON

Parameter		2010	2011								Totals
A.	Number of pairs	95	101								n/a
B.	Number of breeding (nesting) pairs	76	78								441
C.	Number of breeding pairs that were well-monitored throughout the breeding season	24	31								238
D.	Number of 'known fledged young' OBSERVED	137	196								968
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season	67	104								668
F.	Average number of fledglings produced per breeding pair (minimum; D/B = 'productivity or breeding success')	1.8	2.5								2.2
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)	2.8	3.4								2.8
H.	Number of nests that were discovered	55	80								523
I.	Number of nests that were regularly monitored or 'tracked'	37	73								448
J.	Number of 'tracked' nests that were successful (% = J/I x 100)	62% (23/37)	60% (44/73)								58% (259/448)
K.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) % = K/I x 100 (b)	65% (24/37)	30% (22/73)								44% (196/448)
L.	Number of 'tracked' nests that were parasitized by cowbirds (% = L/I x 100)	8% (3/37)	0% (0/73)								24% (106/448)

Table C-3. Least Bell's Vireo reproductive success and breeding biology data, monitored sites, in the Santa Ana River watershed, 2010-2011, BY MANAGED SITE

SAN TIMOTEO CANYON (CONT.)

	Parameter	2010	2011									Totals
M.	A. Number of 'tracked' nests that failed as a result of reproductive failure	11% (4/37)	8% (6/73)									4% (17/448)
	B. Number of 'tracked' nests that failed as a result of parasitism	0% (0/41)	0% (0/73)									6% (25/448)
	C. Number of 'tracked' nests that failed as a result of predation – Predation Rate according to Vireo Working Group	27% (10/37)	30% (22/73)									33% (146/448)
	D. Number of 'tracked' nests that failed for unknown reasons		1% (1/73)									1% (1/73)
N.	Average clutch size	3.4	3.5									n/a
O.	Number of cowbird eggs found in or near vireo nests	3	0									121
P.	Number of cowbird nestlings removed from 'tracked' nests	0	0									6
Q.	Number of cowbird young fledged by vireo	0	0									2
R.	Number of 'manipulated' parasitized nests	8% (3)	0									87
S.	Number of 'successful, manipulated' nests (% = S/R x 100)	100% (3/3)	n/a									51% (44/87)
T.	Number of vireo fledged from 'manipulated' parasitized nests	8	n/a									96
U.	Number of repaired nests	1	2									6
V.	% successful repaired nests	0% (0/1)	100% (2/2)									67% (4/6)
W.	Number of vireo fledged from repaired nests	0	7									12

Table C-3. Least Bell's Vireo reproductive success and breeding biology data, monitored sites, in the Santa Ana River watershed, 2010-2011 BY MANAGED SITE

MARCH SKR PRESERVE

Parameter		2010	2011								Totals
A.	Number of pairs	12	9								n/a
B.	Number of breeding (nesting) pairs	8	5								43
C.	Number of breeding pairs that were well-monitored throughout the breeding season	3	0								12
D.	Number of 'known fledged young' OBSERVED	25	7								107
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season	19	0								57
F.	Average number of fledglings produced per breeding pair (minimum; D/B = 'productivity or breeding success')	3.1	1.4								2.5
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)	6.3									4.8
H.	Number of nests that were discovered	6	0								23
I.	Number of nests that were regularly monitored or 'tracked'	6	n/a								22
J.	Number of 'tracked' nests that were successful (% = J/I x 100)	100% (6/6)	n/a								77% (17/22)
K.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)	0% (0/6)	n/a								27% (6/22)
L.	Number of 'tracked' nests that were parasitized by cowbirds (% = L/I x 100)	0% (0/6)	n/a								0%

Table C-3. Least Bell's Vireo reproductive success and breeding biology data, monitored sites, in the Santa Ana River watershed, 2010-2011, BY MANAGED SITE

MARCH SKR PRSERVE (CONT.)

	Parameter	2010	2011									Totals
M.	A. Number of 'tracked' nests that failed as a result of reproductive failure	0% (0/6)	n/a									0
	B. Number of 'tracked' nests that failed as a result of parasitism	0% (0/6)	n/a									0
	C. Number of 'tracked' nests that failed as a result of predation – Predation Rate according to Vireo Working Group	0% (0/6)	n/a									23% (5/22)
N.	Average clutch size	3.5	n/a									n/a
O.	Number of cowbird eggs found in or near vireo nests	1	n/a									1
P.	Number of cowbird nestlings removed from 'tracked' nests	0	n/a									0
Q.	Number of cowbird young fledged by vireo	0	0									0
R.	Number of 'manipulated' parasitized nests	0	n/a									0
S.	Number of 'successful, manipulated' nests (% = S/R x 100)	n/a	n/a									n/a
T.	Number of vireo fledged from 'manipulated' parasitized nests	n/a	n/a									n/a
U.	Number of repaired nests	0	n/a									0
V.	% successful repaired nests	n/a	n/a									n/a
W.	Number of vireo fledged from repaired nests	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, 2010-2011, BY MANAGED SITE

SYCAMORE CANYON

Parameter		2010	2011									Totals
A.	Number of pairs	8	5									n/a
B.	Number of breeding (nesting) pairs	6	3									28
C.	Number of breeding pairs that were well-monitored throughout the breeding season	0	0									6
D.	Number of 'known fledged young' OBSERVED	11	4									55
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season	n/a	0									12
F.	Average number of fledglings produced per breeding pair (minimum; D/B = 'productivity or breeding success')	1.8	1.3									2.0
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)	n/a	n/a									2.0
H.	Number of nests that were discovered	0	0									10
I.	Number of nests that were regularly monitored or 'tracked'	n/a	n/a									9
J.	Number of 'tracked' nests that were successful (% = J/I x 100)	n/a	n/a									67% (6/9)
K.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) % = K/I x 100 (b)	n/a	n/a									33% (3/9)
L.	Number of 'tracked' nests that were parasitized by cowbirds (% = L/I x 100)	n/a	n/a									22% (2/9)

Table C-3. Least Bell's Vireo reproductive success and breeding biology data, monitored sites, in the Santa Ana River watershed, 2010-2011, BY MANAGED SITE

SYCAMORE CANYON (CONT.)

	Parameter	2010	2011									Totals
M.	A. Number of 'tracked' nests that failed as a result of reproductive failure	n/a	n/a									0% (0/9)
	B. Number of 'tracked' nests that failed as a result of parasitism	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	n/a	n/a									22% (2/9)
N.	Average clutch size	n/a	n/a									n/a
O.	Number of cowbird eggs found in or near vireo nests	n/a	n/a									2
P.	Number of cowbird nestlings removed from 'tracked' nests	n/a	n/a									0
Q.	Number of cowbird young fledged by vireo	n/a	0									0
R.	Number of 'manipulated' parasitized nests	n/a	n/a									1
S.	Number of 'successful, manipulated' nests (% = S/R x 100)	n/a	n/a									100% (1/1)
T.	Number of vireo fledged from 'manipulated' parasitized nests	n/a	n/a									1
U.	Number of repaired nests	n/a	n/a									0
V.	% successful repaired nests	n/a	n/a									n/a
W.	Number of vireo fledged from repaired nests	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, 2010-2011, BY MANAGED SITE

MOCKINGBIRD CANYON

Parameter		2010	2011									Totals
A.	Number of pairs	34	32									n/a
B.	Number of breeding (nesting) pairs	26	31									167
C.	Number of breeding pairs that were well-monitored throughout the breeding season	0	16									53
D.	Number of 'known fledged young' OBSERVED	25	67									310
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season	n/a	46									159
F.	Average number of fledglings produced per breeding pair (minimum; D/B = 'productivity or breeding success')	1.0	2.2									1.9
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)	n/a	2.9									3.0
H.	Number of nests that were discovered	3	31									133
I.	Number of nests that were regularly monitored or 'tracked'	0	30									112
J.	Number of 'tracked' nests that were successful (% = J/I x 100)	n/a	50% (15/30)									54% (60/112)
K.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)	n/a	60% (18/30)									44% (49/112)
L.	Number of 'tracked' nests that were parasitized by cowbirds (% = L/I x 100)	n/a	0% (0/30)									11% (12/112)

Table C-3. Least Bell's Vireo reproductive success and breeding biology data, monitored sites, in the Santa Ana River watershed, 2010-2011, BY MANAGED SITE

MOCKINGBIRD CANYON (CONT.)

	Parameter	2010	2011									Totals
M.	A. Number of 'tracked' nests that failed as a result of reproductive failure	n/a	3% (1/30)									7% (8/112)
	B. Number of 'tracked' nests that failed as a result of parasitism	n/a	0% (0/30)									5% (6/112)
	C. Number of 'tracked' nests that failed as a result of predation – Predation Rate according to Vireo Working Group	n/a	43% (13/30)									33% (37/112)
	D. Number of 'tracked' nests that failed for unknown reasons		3% (1/30)									3% (1/30)
N.	Average clutch size	3.0	3.6									n/a
O.	Number of cowbird eggs found in or near vireo nests	1	0									23
P.	Number of cowbird nestlings removed from 'tracked' nests	n/a	0									2
Q.	Number of cowbird young fledged by vireo	n/a	0									1
R.	Number of 'manipulated' parasitized nests	n/a	0									10
S.	Number of 'successful, manipulated' nests (% = S/R x 100)	n/a	n/a									10% (1/10)
T.	Number of vireo fledged from 'manipulated' parasitized nests	n/a	n/a									2
U.	Number of repaired nests	n/a	2									3
V.	% successful repaired nests	n/a	100% (2/2)									100% (3/3)
W.	Number of vireo fledged from repaired nests	n/a	6									7

Table C-3. Least Bell's Vireo reproductive success and breeding biology data, monitored sites, in the Santa Ana River watershed, 2010-2011, BY MANAGED SITE

SANTA ANA RIVER (RIVER ROAD TO NORCO)

Parameter		2010	2011								Totals
A.	Number of pairs	64	59								n/a
B.	Number of breeding (nesting) pairs	60	56								340
C.	Number of breeding pairs that were well-monitored throughout the breeding season	12	12								129
D.	Number of 'known fledged young' OBSERVED	113	91								693
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season	39	36								390
F.	Average number of fledglings produced per breeding pair (minimum; D/B = 'productivity or breeding success')	1.9	1.6								2.0
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)	3.3	3.0								2.8
H.	Number of nests that were discovered	22	25								259
I.	Number of nests that were regularly monitored or 'tracked'	18	22								217
J.	Number of 'tracked' nests that were successful (% = J/I x 100)	89% (16/18)	45% (10/22)								65% (141/217)
K.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)	28% (5/18)	45% (10/22)								41% (88/217)
L.	Number of 'tracked' nests that were parasitized by cowbirds (% = L/I x 100)	0% (0/18)	0% (0/22)								7% (15/217)

Table C-3. Least Bell's Vireo reproductive success and breeding biology data, monitored sites, in the Santa Ana River watershed, 2010-2011, BY MANAGED SITE

SANTA ANA RIVER (RIVER ROAD TO NORCO) (CONT.)

	Parameter	2010	2011									Totals
M.	A. Number of 'tracked' nests that failed as a result of reproductive failure	0% (0/18)	14% (3/22)									4% (9/217)
	B. Number of 'tracked' nests that failed as a result of parasitism	0% (0/18)	0% (0/22)									2% (4/217)
	C. Number of 'tracked' nests that failed as a result of predation – Predation Rate according to Vireo Working Group	11% (2/18)	41% (9/22)									29% (62/217)
N.	Average clutch size	3.7	3.8									n/a
O.	Number of cowbird eggs found in or near vireo nests	0	0									20
P.	Number of cowbird nestlings removed from 'tracked' nests	0	0									1
Q.	Number of cowbird young fledged by vireo	0	0									0
R.	Number of 'manipulated' parasitized nests	0	0									13
S.	Number of 'successful, manipulated' nests (% = S/R x 100)	n/a	n/a									64% (9/14)
T.	Number of vireo fledged from 'manipulated' parasitized nests	n/a	n/a									13
U.	Number of repaired nests	0	0									2
V.	% successful repaired nests	n/a	n/a									50% (1/2)
W.	Number of vireo fledged from repaired nests	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, 2010-2011, BY MANAGED SITE

SANTA ANA RIVER (FAIRMOUNT PARK TO HIDDEN VALLEY)

Parameter		2010	2011								Totals
A.	Number of pairs	50	23								n/a
B.	Number of breeding (nesting) pairs	39	19								207
C.	Number of breeding pairs that were well-monitored throughout the breeding season	9	7								67
D.	Number of 'known fledged young' OBSERVED	58	30								371
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season	18	22								173
F.	Average number of fledglings produced per breeding pair (minimum; D/B = 'productivity or breeding success')	1.5	1.6								1.8
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)	2.0	3.1								2.6
H.	Number of nests that were discovered	13	14								121
I.	Number of nests that were regularly monitored or 'tracked'	11	10								96
J.	Number of 'tracked' nests that were successful (% = J/I x 100)	55% (6/11)	60% (6/10)								66% (63/96)
K.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100 (b)	36% (4/11)	30% (3/10)								32% (31/96)
L.	Number of 'tracked' nests that were parasitized by cowbirds (% = L/I x 100)	0	10% (1/10)								14% (13/96)

Table C-3. Least Bell's Vireo reproductive success and breeding biology data, monitored sites, in the Santa Ana River watershed, 2010-2011, BY MANAGED SITE

SANTA ANA RIVER (FAIRMOUNT PARK TO HIDDEN VALLEY) (CONT.)

	Parameter	2010	2011									Totals
M.	A. Number of 'tracked' nests that failed as a result of reproductive failure	9% (1/11)	0% (0/10)									3% (3/96)
	B. Number of 'tracked' nests that failed as a result of parasitism	0% (0/11)	10% (1/10)									7% (7/96)
	C. Number of 'tracked' nests that failed as a result of predation – Predation Rate according to Vireo Working Group	36% (4/11)	30% (3/10)									24% (23/96)
N.	Average clutch size	3.2	3.5									n/a
O.	Number of cowbird eggs found in or near vireo nests	0	2									17
P.	Number of cowbird nestlings removed from 'tracked' nests	0	0									0
Q.	Number of cowbird young fledged by vireo	1	0									2
R.	Number of 'manipulated' parasitized nests	0	1									11
S.	Number of 'successful, manipulated' nests (% = S/R x 100)	n/a	Unknown									20% (2/11)
T.	Number of vireo fledged from 'manipulated' parasitized nests	n/a	Unknown									5
U.	Number of repaired nests	0	0									1
V.	% successful repaired nests	n/a	n/a									n/a
W.	Number of vireo fledged from repaired nests	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, 2010-2011, BY MANAGED SITE

HIDDEN VALLEY

Parameter		2010	2011								Totals
A.	Number of pairs	43	36								n/a
B.	Number of breeding (nesting) pairs	36	33								281
C.	Number of breeding pairs that were well-monitored throughout the breeding season	9	5								70
D.	Number of 'known fledged young' OBSERVED	53	41								501
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season	19	17								178
F.	Average number of fledglings produced per breeding pair (minimum; D/B = 'productivity or breeding success')	1.5	1.2								1.8
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)	2.1	3.4								2.5
H.	Number of nests that were discovered	18	11								143
I.	Number of nests that were regularly monitored or 'tracked'	17	10								112
J.	Number of 'tracked' nests that were successful (% = J/I x 100)	41% (7/17)	60% (6/10)								63% (71/112)
K.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)	65% (11/17)	30% (3/10)								41% (46/112)
L.	Number of 'tracked' nests that were parasitized by cowbirds (% = L/I x 100)	6% (1/17)	20% (2/10)								8% (9/112)

Table C-3. Least Bell's Vireo reproductive success and breeding biology data, monitored sites, in the Santa Ana River watershed, 2010-2011, BY MANAGED SITE

HIDDEN VALLEY (CONT.)

	Parameter	2010	2011									Totals
M.	A. Number of 'tracked' nests that failed as a result of reproductive failure	0% (0/17)	0% (0/10)									3% (3/112)
	B. Number of 'tracked' nests that failed as a result of parasitism	6% (1/17)	10% (1/10)									5% (6/112)
	C. Number of 'tracked' nests that failed as a result of predation – Predation Rate according to Vireo Working Group	53% (9/17)	30% (3/10)									29% (32/112)
N.	Average clutch size	3.4	3.1									N/A
O.	Number of cowbird eggs found in or near vireo nests	2	2									8
P.	Number of cowbird nestlings removed from 'tracked' nests	0	0									2
Q.	Number of cowbird young fledged by vireo	0	0									0
R.	Number of 'manipulated' parasitized nests	0	1									3
S.	Number of 'successful, manipulated' nests (% = S/R x 100)	n/a	100% (1/1)									100% (3/3)
T.	Number of vireo fledged from 'manipulated' parasitized nests	n/a	2									8
U.	Number of repaired nests	0	0									0
V.	% successful repaired nests	n/a	n/a									n/a
W.	Number of vireo fledged from repaired nests	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, 2010-2011, BY MANAGED SITE

HIDDEN VALLEY (north side)

Parameter		2010	2011								Totals
A.	Number of pairs	12	2								n/a
B.	Number of breeding (nesting) pairs	9	2								11
C.	Number of breeding pairs that were well-monitored throughout the breeding season	6	0								6
D.	Number of 'known fledged young' OBSERVED	18	2								20
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season	14	0								14
F.	Average number of fledglings produced per breeding pair (minimum; D/B = 'productivity or breeding success')	2.0	1.0								1.8
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)	2.3	0								2.3
H.	Number of nests that were discovered	10	2								12
I.	Number of nests that were regularly monitored or 'tracked'	9	0								9
J.	Number of 'tracked' nests that were successful (% = J/I x 100)	56% (5/9)	n/a								56% (5/9)
K.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) % = K/I x 100) (b)	11% (1/9)	n/a								11% (1/9)
L.	Number of 'tracked' nests that were parasitized by cowbirds (% = L/I x 100)	33% (3/9)	n/a								33% (3/9)

Table C-3. Least Bell's Vireo reproductive success and breeding biology data, monitored sites, in the Santa Ana River watershed, 2010-2011, BY MANAGED SITE

HIDDEN VALLEY (north side) (CONT.)

	Parameter	2010	2011									Totals
M.	A. Number of 'tracked' nests that failed as a result of reproductive failure	0	n/a									0
	B. Number of 'tracked' nests that failed as a result of parasitism	33% (3/9)	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									11% (1/9)
N.	Average clutch size	3.5	n/a									3.5
O.	Number of cowbird eggs found in or near vireo nests	4	n/a									4
P.	Number of cowbird nestlings removed from 'tracked' nests	0	n/a									0
Q.	Number of cowbird young fledged by vireo	0	0									0
R.	Number of 'manipulated' parasitized nests	2	n/a									2
S.	Number of 'successful, manipulated' nests (% = S/R x 100)	0% (0/2)	n/a									0%
T.	Number of vireo fledged from 'manipulated' parasitized nests	0% (0/2)	n/a									0%
U.	Number of repaired nests	0	n/a									0
V.	% successful repaired nests	n/a	n/a									n/a
W.	Number of vireo fledged from repaired nests	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, 2010-2011, BY MANAGED SITE

TEMESCAL CANYON

Parameter		2010	2011								Totals
A.	Number of pairs	49	65								n/a
B.	Number of breeding (nesting) pairs	38	57								241
C.	Number of breeding pairs that were well-monitored throughout the breeding season	11	18								110
D.	Number of 'known fledged young' OBSERVED	73	113								525
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season	34	52								303
F.	Average number of fledglings produced per breeding pair (minimum; D/B = 'productivity or breeding success')	1.9	2.0								2.2
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)	3.1	2.9								2.8
H.	Number of nests that were discovered	22	35								223
I.	Number of nests that were regularly monitored or 'tracked'	15	32								180
J.	Number of 'tracked' nests that were successful (% = J/I x 100)	87% (13/15)	69% (22/32)								65% (117/180)
K.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)	20% (3/15)	34% (11/32)								37% (66/180)
L.	Number of 'tracked' nests that were parasitized by cowbirds (% = L/I x 100)	0% (0/15)	3% (1/32)								16% (28/180)

Table C-3. Least Bell's Vireo reproductive success and breeding biology data, monitored sites, in the Santa Ana River watershed, 2010-2011, BY MANAGED SITE

TEMESCAL CANYON (CONT.)

	Parameter	2010	2011									Totals
M.	A. Number of 'tracked' nests that failed as a result of reproductive failure	0/15	0% (0/32)									3% (5/180)
	B. Number of 'tracked' nests that failed as a result of parasitism	0/15	0% (0/32)									2% (4/180)
	C. Number of 'tracked' nests that failed as a result of predation – Predation Rate according to Vireo Working Group	13% (2/15)	31% (10/32)									30% (54/180)
N.	Average clutch size	3.7	3.5									n/a
O.	Number of cowbird eggs found in or near vireo nests	0	1									34
P.	Number of cowbird nestlings removed from 'tracked' nests	0	0									2
Q.	Number of cowbird young fledged by vireo	0	0									2
R.	Number of 'manipulated' parasitized nests	0	1									30
S.	Number of 'successful, manipulated' nests (% = S/R x 100)	0	100% (1/1)									43% (13/30)
T.	Number of vireo fledged from 'manipulated' parasitized nests	na	2									28
U.	Number of repaired nests	0	3									3
V.	% successful repaired nests	na	67% (2/3)									67% (2/3)
W.	Number of vireo fledged from repaired nests	na	3									3

Table C-3. Least Bell's Vireo reproductive success and breeding biology data, monitored sites, in the Santa Ana River watershed, 2010-2011, BY MANAGED SITE

SANTA ANA CANYON – UPPER CANYON

Parameter		2010	2011								Totals
A.	Number of pairs	4	5								n/a
B.	Number of breeding (nesting) pairs	3	5								118
C.	Number of breeding pairs that were well-monitored throughout the breeding season	0	0								46
D.	Number of 'known fledged young' OBSERVED	6	5								219
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season	n/a	n/a								118
F.	Average number of fledglings produced per breeding pair (minimum; D/B = 'productivity or breeding success')	2.0	1.0								1.9
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)	n/a	n/a								2.6
H.	Number of nests that were discovered	2	2								101
I.	Number of nests that were regularly monitored or 'tracked'	1	0								65
J.	Number of 'tracked' nests that were successful (% = J/I x 100)	100% (1/1)	n/a								65% (42/65)
K.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)	0% (0/1)	n/a								40% (26/65)
L.	Number of 'tracked' nests that were parasitized by cowbirds (% = L/I x 100)	0% (0/1)	n/a								6% (4/65)

Table C-3. Least Bell's Vireo reproductive success and breeding biology data, monitored sites, in the Santa Ana River watershed, 2010-2011, BY MANAGED SITE

SANTA ANA CANYON – UPPER CANYON (CONT.)

	Parameter	2010	2011									Totals
M.	A. Number of 'tracked' nests that failed as a result of reproductive failure	0% (0/1)	n/a									5% (3/65)
	B. Number of 'tracked' nests that failed as a result of parasitism	0% (0/1)	n/a									3% (2/65)
	C. Number of 'tracked' nests that failed as a result of predation – Predation Rate according to Vireo Working Group	0% (0/1)	n/a									28% (18/65)
N.	Average clutch size	4.0	4.0									n/a
O.	Number of cowbird eggs found in or near vireo nests	0	0									3
P.	Number of cowbird nestlings removed from 'tracked' nests	0	n/a									1
Q.	Number of cowbird young fledged by vireo	0	0									0
R.	Number of 'manipulated' parasitized nests	0	0									1
S.	Number of 'successful, manipulated' nests (% = S/R x 100)	n/a	n/a									100% (1/1)
T.	Number of vireo fledged from 'manipulated' parasitized nests	n/a	n/a									1
U.	Number of repaired nests	0	0									2
V.	% successful repaired nests	n/a	n/a									0% (0/2)
W.	Number of vireo fledged from repaired nests	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, 2010-2011, BY MANAGED SITE

SANTA ANA CANYON – GREEN RIVER GOLF CLUB

Parameter		2010	2011									Totals
A.	Number of pairs	17	14									n/a
B.	Number of breeding (nesting) pairs	14	12									118
C.	Number of breeding pairs that were well-monitored throughout the breeding season	4	7									55
D.	Number of 'known fledged young' OBSERVED	19	19									230
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season	7	15									140
F.	Average number of fledglings produced per breeding pair (minimum; D/B = 'productivity or breeding success')	1.4	1.6									1.9
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)	1.8	2.1									2.5
H.	Number of nests that were discovered	7	13									93
I.	Number of nests that were regularly monitored or 'tracked'	7	11									79
J.	Number of 'tracked' nests that were successful (% = J/I x 100)	43% (3/7)	45% (5/11)									66% (52/79)
K.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)	71% (5/7)	55% (6/11)									34% (27/79)
L.	Number of 'tracked' nests that were parasitized by cowbirds (% = L/I x 100)	0% (0/7)	0% (0/11)									5% (4/79)

Table C-3. Least Bell's Vireo reproductive success and breeding biology data, monitored sites, in the Santa Ana River watershed, 2010-2011, BY MANAGED SITE

SANTA ANA CANYON – GREEN RIVER GOLF CLUB (CONT.)

	Parameter	2010	2011									Totals
M.	A. Number of 'tracked' nests that failed as a result of reproductive failure	0% (0/7)	0% (0/11)									5% (4/79)
	B. Number of 'tracked' nests that failed as a result of parasitism	0% (0/7)	0% (0/11)									1% (1/79)
	C. Number of 'tracked' nests that failed as a result of predation – Predation Rate according to Vireo Working Group	57% (4/7)	55% (6/11)									28% (22/79)
N.	Average clutch size	4.0	3.4									n/a
O.	Number of cowbird eggs found in or near vireo nests	0	0									4
P.	Number of cowbird nestlings removed from 'tracked' nests	0	0									0
Q.	Number of cowbird young fledged by vireo	0	0									0
R.	Number of 'manipulated' parasitized nests	0	0									2
S.	Number of 'successful, manipulated' nests (% = S/R x 100)	n/a	n/a									100% (2/2)
T.	Number of vireo fledged from 'manipulated' parasitized nests	n/a	n/a									6
U.	Number of repaired nests	0	0									4
V.	% successful repaired nests	n/a	n/a									75% (3/4)
W.	Number of vireo fledged from repaired nests	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, 2010-2011, BY MANAGED SITE

SANTA ANA RIVER – FEATHERLY PARK

Parameter		2010	2011									Totals
A.	Number of pairs	23	19									n/a
B.	Number of breeding (nesting) pairs	18	18									145
C.	Number of breeding pairs that were well-monitored throughout the breeding season	3	7									46
D.	Number of 'known fledged young' OBSERVED	22	23									220
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season	6	14									93
F.	Average number of fledglings produced per breeding pair (minimum; D/B = 'productivity or breeding success')	1.2	1.3									1.5
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)	2.0	2.0									2.0
H.	Number of nests that were discovered	11	12									106
I.	Number of nests that were regularly monitored or 'tracked'	7	5									77
J.	Number of 'tracked' nests that were successful (% = J/I x 100)	29% (2/7)	100% (5/5)									51% (39/77)
K.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)	71% (5/7)	20% (1/5)									48% (37/77)
L.	Number of 'tracked' nests that were parasitized by cowbirds (% = L/I x 100)	0% (0/7)	0% (0/5)									6% (5/77)

Table C-3. Least Bell's Vireo reproductive success and breeding biology data, monitored sites, in the Santa Ana River watershed, 2010-2011, BY MANAGED SITE

SANTA ANA RIVER – FEATHERLY PARK (CONT.)

	Parameter	2010	2011									Totals
M.	A. Number of 'tracked' nests that failed as a result of reproductive failure	0% (0/7)	0% (0/5)									4% (3/77)
	B. Number of 'tracked' nests that failed as a result of parasitism	0% (0/7)	0% (0/5)									3% (2/77)
	C. Number of 'tracked' nests that failed as a result of predation – Predation Rate according to Vireo Working Group	71% (5/7)	0% (0/5)									43% (33/77)
N.	Average clutch size	4.0	3.6									n/a
O.	Number of cowbird eggs found in or near vireo nests	0	0									4
P.	Number of cowbird nestlings removed from 'tracked' nests	0	0									1
Q.	Number of cowbird young fledged by vireo	0	0									0
R.	Number of 'manipulated' parasitized nests	0	0									3
S.	Number of 'successful, manipulated' nests (% = S/R x 100)	n/a	n/a									33% (1/3)
T.	Number of vireo fledged from 'manipulated' parasitized nests	n/a	n/a									2
U.	Number of repaired nests	1	0									5
V.	% successful repaired nests	100% (1/1)	n/a									100% (5/5)
W.	Number of vireo fledged from repaired nests	2	n/a									16

Table C-3. Least Bell's Vireo reproductive success and breeding biology data, monitored sites, in the Santa Ana River watershed, 2010-2011, BY MANAGED SITE

CHINO HILLS

Parameter		2010	2011								Totals
A.	Number of pairs	7	3								n/a
B.	Number of breeding (nesting) pairs	4	1								42
C.	Number of breeding pairs that were well-monitored throughout the breeding season	3	0								18 (n=5 yrs)
D.	Number of 'known fledged young' OBSERVED	7	1								62
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season	5	n/a								24 (n=5 yrs)
F.	Average number of fledglings produced per breeding pair (minimum; D/B = 'productivity or breeding success')	1.8	n/a								1.5
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)	1.7	n/a								1.3
H.	Number of nests that were discovered	3	0								27
I.	Number of nests that were regularly monitored or 'tracked'	3	n/a								22
J.	Number of 'tracked' nests that were successful (% = J/I x 100)	67% (2/3)	n/a								36% (8/22)
K.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)	33% (1/3)	n/a								59% (13/22)
L.	Number of 'tracked' nests that were parasitized by cowbirds (% = L/I x 100)	0% (0/3)	n/a								27% (6/22)

Table C-3. Least Bell's Vireo reproductive success and breeding biology data, monitored sites, in the Santa Ana River watershed, 2010-2011, BY MANAGED SITE

CHINO HILLS (CONT.)

	Parameter	2010	2011									Totals
M.	A. Number of 'tracked' nests that failed as a result of reproductive failure	0% (0/3)	n/a									5% (1/22)
	B. Number of 'tracked' nests that failed as a result of parasitism	0% (0/3)	n/a									9% (2/22)
	C. Number of 'tracked' nests that failed as a result of predation – Predation Rate according to Vireo Working Group	33% (1/3)	n/a									50% (11/22)
N.	Average clutch size	3.7	n/a									n/a
O.	Number of cowbird eggs found in or near vireo nests	0	n/a									9
P.	Number of cowbird nestlings removed from 'tracked' nests	0	n/a									0
Q.	Number of cowbird young fledged by vireo	0	n/a									0
R.	Number of 'manipulated' parasitized nests	0	n/a									6
S.	Number of 'successful, manipulated' nests (% = S/R x 100)	n/a	n/a									0% (0/6)
T.	Number of vireo fledged from 'manipulated' parasitized nests	n/a	n/a									0
U.	Number of repaired nests	0	n/a									0
V.	% successful repaired nests	n/a	n/a									n/a
W.	Number of vireo fledged from repaired nests	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, 2010-2011, BY MANAGED SITE

IRVINE REGIONAL PARK

Parameter		2010	2011								Totals
A.	Number of pairs	14	9								n/a
B.	Number of breeding (nesting) pairs	9	5								14
C.	Number of breeding pairs that were well-monitored throughout the breeding season	3	1								4
D.	Number of 'known fledged young' OBSERVED	18	7								25
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season	11	2								13
F.	Average number of fledglings produced per breeding pair (minimum; D/B = 'productivity or breeding success')	2.0	1.4								1.8
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)	3.6	2.0								3.2
H.	Number of nests that were discovered	5	1								6
I.	Number of nests that were regularly monitored or 'tracked'	4	1								5
J.	Number of 'tracked' nests that were successful (% = J/I x 100)	75% (3/4)	100% (1/1)								80% (4/5)
K.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)	25% (1/4)	n/a								20% (1/5)
L.	Number of 'tracked' nests that were parasitized by cowbirds (% = L/I x 100)	0	n/a								0

Table C-3. Least Bell's Vireo reproductive success and breeding biology data, monitored sites, in the Santa Ana River watershed, 2010-2011, BY MANAGED SITE

IRVINE REGIONAL PARK (CONT.)

	Parameter	2010	2011									Totals
M.	A. Number of 'tracked' nests that failed as a result of reproductive failure	0	n/a									0
	B. Number of 'tracked' nests that failed as a result of parasitism	0	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									20% (1/5)
N.	Average clutch size	3.5	2.0									n/a
O.	Number of cowbird eggs found in or near vireo nests	4	0									4
P.	Number of cowbird nestlings removed from 'tracked' nests	0	0									0
Q.	Number of cowbird young fledged by vireo	0	0									0
R.	Number of 'manipulated' parasitized nests	n/a	n/a									0
S.	Number of 'successful, manipulated' nests (% = S/R x 100)	n/a	n/a									0
T.	Number of vireo fledged from 'manipulated' parasitized nests	n/a	n/a									0
U.	Number of repaired nests	0	0									0
V.	% successful repaired nests	n/a	n/a									0
W.	Number of vireo fledged from repaired nests	n/a	n/a									0

**APPENDIX D: SUMMARY TABLES BY MANAGED SITE,
FROM 2000-2009**

Table 13A: Least Bell's Vireo status and distribution in the Santa Ana Watershed, 2000-2009. Numbers of territories, pairs, and fledglings detected

SUBPOPULATION	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
San Jacinto	-	-	-	0/0/0 +	3/2/0	6/5/2	9/5/6	11/7/9	9/9/34	15/15/53
San Timoteo Canyon	5/2/2 [a]	5/4/11	15/13/15	14/13/28	29/28/18	43/35/36	32/29/66	56/50/102	78/65/165	105/84/192
Sycamore Canyon	[b]	-	-	4/-/- +	6/5/9	7/7/1 +	4/2/0 +	5/5/8	9/8/13	9/8/9
March SKR Preserve (March ARB)	-	-	-	-	7/7/20	9/5/9	9/3/4	6/4/9	10/5/5	10/10/28
Allessandro Arroyo	-	-	-	-	0/0/0 +	4/1/1 +	2/0/0 +	See Table 10	See Table 10	See Table 10
Mockingbird Canyon	-	-	-	9/8/4 +	9/8/19	15/11/29	17/14/36	23/21/30	27/21/35	41/35/65
Harrison Reservoir	-	-	-	-	4/3/1	4/1/3	2/2/6	4/3/7	3/1/1	2/1/1 +
La Sierra Blvd., Riverside County	-	-	-	2/1/2	1/1/2 +		See Table 10	See Table 10	See Table 10	See Table 10
Santa Ana River - Fair-mount Park/Mission to (u/s of) Hidden Valley	-	-	18/2/4 ⁽⁸⁾	16/13/13	24/21/30	27/19/35	18/14/36	33/21/27	33/21/31	59/46/107
Hidden Valley	14/11/23	18/13/32	28/21/47	26/18/37	29/27/51	34/27/49	33/24/37	32/24/31	46/28/36	49/37/64
Santa Ana River - (d/s of) Hidden Valley-Norco to River Rd.	-	8/4/9 + ⁽⁹⁾	6/4/4 ⁽⁹⁾	12/8/23 ⁽⁹⁾	28/23/62	42/26/24	32/26/46	45/31/45	65/43/106	91/68/170
Temescal Canyon (from Railroad Canyon to approx. Cajalco Rd.)	-	7/1/6 +	14/6/6	13/10/21	10/8/19	15/9/42	16/13/29 plus (5/0/0)	34/26/25	60/35/73	76/56/118

Table 13A: Least Bell's Vireo status and distribution in the Santa Ana Watershed, 2000-2009. Numbers of territories, pairs, and fledglings detected

SUBPOPULATION	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Chino Hills (Butterfield Ranch)	-	-	-	9/6/11 +	11/8/7	12/9/14	7/6/11	8/7/3	8/4/2	9/5/6
Santa Ana Canyon Upper Canyon (River below Prado Dam to Green River Golf Club)	-	13/12/30	20/18/39	22/18/51	28/20/22	28/17/26	21/13/13	21/11/12	20/11/6	12/6/9
Santa Ana Canyon - Green River Golf Club	-	10/10/20	8/8/17	9/6/22	17/12/17	23/17/28	17/12/24	14/8/12	21/12/25	22/16/27
Santa Ana Canyon - Featherly Reg. Park	-	0/0/0	8/3/0	6/4/9	24/18/23	30/20/28	23/18/35	29/20/24	36/25/28	34/23/28
Santiago-Irvine Park	-	-	-	6/4/10	9/8/8	11/6/6 +	5/3/3 +	See Table 10	See Table 10	See Table 10
Santiago-Santiago Cyn Rd.	-	-	-	-	1/0/0 +	1/0/0 +	0/0/0 +	See Table 10	See Table 10	See Table 10
Santa Ana River mouth-Talbert Park	-	-	-	4/3/6 [c] +	5/3/1 +	6/6/2	3/3/0 +	0/0/0	1/0/0 +	1/0/0+
East Coyote Hills Preserve - Fullerton	-	-	-	-	-	-	-	1/1/0	(4/4/6) ¹⁰	(3/3/5) ¹⁰
Misc. Sightings ---										
-- Shipley Nature Ctr, Huntington Beach	-	-	-	-	-	-	1/0/0 + ⁽⁴⁾	-	-	-
-- Santa Ana River, Woolly star Preserve	-	-	-	-	1/1/1 +	-	-	-	(included in San B. Co)	(Included in San B. Co.)
--Protrero	-	-	-	-	-	-	-	2/0/0 ⁽⁵⁾	Not surveyed	1/0/0 ⁽⁵⁾

Table 13A: Least Bell's Vireo status and distribution in the Santa Ana Watershed, 2000-2009. Numbers of territories, pairs, and fledglings detected

SUBPOPULATION	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
--Estelle Mountain Preserve	-	-	-	-	-	-	-	1/0/0 ⁽⁵⁾	(included in Temescal Cyn)	not surveyed
--Yorba Dry Lake Bed Park	-	-	-	-	-	-	-	1/0/0	(see table 10)	(see Table 10)
--Black Gold Golf Club									2/0/0 ¹¹	2/0/0 ¹¹
--Riverview Golf Club									1/0/0	not surveyed
--Pulte Wetlands, adjacent to Chino Hills State Park (CHSP)										1/0/0 ¹¹
--Rim Crest Dr. & Blue Gum Dr., adjacent to CHSP										1/0/0 ¹¹
Plunge Creek, San Bernardino										1/0/0 ⁽²⁾
Subtotal # LBVI	19/13/25	61/44/108	117/85/132	150/111/235	247/203/310	318/224/337	256/187/352	326/239/344	429/288/560	541/410/877
# LBVI from SAWA Assessment Sites						36/14/9	35/10/11	92/32/16	100/47/42	137/65/69
Total # LBV for all sites						354/238/346	291/197/363	418/271/360	529/335/602	678/475/946
# LBV on Santa Ana River in San Bernardino County		\				15/12/21 ⁽²⁾	13/11/9 ⁽²⁾	19/15/13 ⁽²⁾	21/13/12 ⁽²⁾	43/33/30 ⁽²⁾
# LBV Chino Hills State Park						22/-/- ⁽³⁾	13/-/- ⁽³⁾	(24/10/1) ⁶	(31/16/12) ⁶	(35/22/17) ⁶

Table 13A: Least Bell's Vireo status and distribution in the Santa Ana Watershed, 2000-2009. Numbers of territories, pairs, and fledglings detected

SUBPOPULATION	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Total for Santa Ana Watershed-excl. Prado Basin						391/250/367	317/208/ 372	437/286/ 373	550/348/614	721/508/976
Prado Basin ⁽⁷⁾	357/281/649	444/336/718	429/312/598	447/339/688	590/413/767	600/386/525	423/219/ 361	420/237/ 365	463/236/417	538/273/457
Total Number LBVI in Santa Ana Watershed	376/294/674	505/380/826	546/406/730	597/450/923	837/616/1077	991/636/892	740/427/ 733	857/523/ 738	1013/584/ 1031	1259/781/ 1433

- (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.

Table 1B: Least Bell's Vireo status and distribution in the Santa Ana Watershed, 2000-2009. Numbers of territories, pairs and fledglings detected. By Sub-watershed										
Santa Ana Watershed	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Santa Ana River and Tributaries										
Cajon Wash	-	-	-	-	-	-	0/x/x	0/0/0	0/0/0	0/0/0
Oak Glen Preserve	-	-	-	-	-	-	0/x/x	0/x/x	0/0/0	0/0/0
San Timoteo Canyon	5/2/2	5/4/11	15/13 / 15	14/13/ 28	29/28/ 18	43/35/ 36	32/29/ 66	56/50/ 102	78/65/1 65	105/84 / 192
Box Springs	-	-	-	-	-	0/x/x	2/2/5	2/2/0	1/0/0	3/1/2
Poorman Reservoir	-	-	-	-	-	0/x/x	1/x/x	1/0/0	1/1/2	2/2/2
Quail Run	-	-	-	-	-	0/x/x	0/x/x	0/0/0	0/0/0	0/0/0
Sycamore Canyon	-	-	-	4/x/x	6/5/9	7/7/1	4/2/0	5/5/8	9/8/13	9/8/9
March SKR Reserve	-	-	-	-	7/7/20	9/5/9	9/3/4	6/4/9	10/5/5	10/10/ 28
Golden Star	-	-	-	-	-	-	0/x/x	0/0/0	0/0/0	1/0/0
Woodcrest	-	-	-	-	-	-	0/x/x	0/0/0	0/0/0	0/0/0
Mead Valley at Cajalco & Calif. Aqueduct	-	-	-	-	-	-	2/x/x	5/0/0	6/5/7	5/5/8
Gavilan Hills	-	-	-	-	-	0/x/x	0/x/x	0/0/0	0/0/0	0/0/0
Menifee - Paloma Valley High School	-	-	-	-	-	0/x/x	0/x/x	0/0/0	0/0/0	-
Menifee - Huan Rd.	-	-	-	-	-	0/x/x	0/x/x	0/0/0	0/0/0	-
Steele Valley	-	-	-	-	-	0/x/x	0/x/x	0/0/0	0/0/0	0/0/0
Santa Rosa Mine Rd.	-	-	-	-	-	0/x/x	0/x/x	0/0/0	0/0/0	0/0/0
Van Buren Blvd - Village West to Orange Terrace	-	-	-	-	-	3/1/0	2/x/x	2/0/0	3/2/1	3/2/2
Van Buren Blvd. at Bountiful	-	-	-	-	-	0/x/x	0/x/x	0/0/0	0/0/0	1/0/0
Van Buren Blvd @ Porter (end).	-	-	-	-	-	0/x/x	0/x/x	0/0/0	0/0/0	0/0/0
Canyon Crest	-	-	-	-	-	-	0/x/x	-	not surveyed	-
Mockingbird Canyon	-	-	-	9/8/4	9/8/19	15/13/ 29	17/14/ 36	23/21/ 30	27/21/3 5	41/35/ 65
Alessandro Arroyo/Prenda Arroyo	-	-	-	-	0/0/0	4/1/1	2/0/0	3/1/0	5/2/0	4/3/1
Castleview Park	-	-	-	-	-	1/x/x	0/x/x	1/1/0	0/0/0	0/0/0

Table 1B: Least Bell's Vireo status and distribution in the Santa Ana Watershed, 2000-2009.										
Numbers of territories, pairs and fledglings detected. By Sub-watershed										
Santa Ana Watershed	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Tequesquite Arroyo	-	-	-	-	-	0/x/x	0/x/x	0/0/0	0/0/0	0/0/0
SAR mainstem at Van Buren Blvd.	-	-	18/12/4							
SAR mainstem - Mission to Hidden Valley	-	-	-	16/13/13	24/21/30	27/19/35	18/14/36	33/21/27	33/21/31	59/46/107
Pyrite Ravine (environs of Van Buren/Limonite)									1/1/1	1/1/2
SAR mainstem - North side at Hidden Valley	-	-	-	-	-	5/3/2	3/1/1	6/0/0	1/0/0	6/5/8
SAR - Hidden Valley	14/11/23	18/13/32	28/21/47	26/18/37	29/27/51	34/27/49	33/24/37	32/24/31	46/28/36	49/37/64
Wyle Labs at El Paso Rd.	-	-	-	-	-	0/x/x	1/x/x	1/0/0	0/0/0	1/1/0
Norco Hills Park - mitigation area	-	-	-	-	-	2/x/x	0/x/x	0/0/0	0/0/0	0/0/0
Promenade Ave, Norco	-	-	-	-	-	-	0/x/x	0/0/0	0/0/0	3/0/0
Corona St./Gilmore, Norco	-	-	-	-	-	0/x/x	0/x/x	0/0/0	0/0/0	0/0/0
SAR mainstem - Hidden Valley to River Rd., so. side.	-	8/4/9	6/4/4	12/8/23						
SAR mainstem-Goose Creek Golf Course (Norco) to River Rd.	-	-	-	-	28/23/62	42/26/24	32/26/46	45/31/45	65/43/06	91/68/170
Temescal Canyon	-	7/1/6	14/6/6	13/10/21	10/8/19	15/9/42	16/13/29 5/0/0*	34/26/25	60/35/73	76/56/118
Harrison Reservoir	-	-	-	-	4/3/1	4/1/3	2/2/6	4/3/7	3/1/1	2/1/1 +
La Sierra Ave.	-	-	-	-	2/1/2	1/1/2	-	1/1/1	2/0/0	2/0/0
Cajalco Canyon	-	-	-	-	-	1/x/x	1/1/1	1/1/0	(see Temescal)	(see Temescal)
Chino Hills - Butterfield Ranch	-	-	-	9/6/11	11/8/7	12/9/14	7/6/11	8/7/3	8/4/2	9/5/6
Chino Hills - Eucalyptus at Rancho Hills	-	-	-	-	-	1/1/0	0/x/x	1/1/1	1/0/0	1/0/0
Chino Hills - Eucalyptus at Del Monte	-	-	-	-	-	3/3/1	1/x/x	1/0/0	0/0/0	1/1/0
Chino Hills - End of Eucalyptus (s/o Rancho Hills)	-	-	-	-	-	0/x/x	0/x/x	0/0/0	0/0/0	0/0/0
Carbon Canyon Blvd. at Western Hills Golf Club	-	-	-	-	-	0/x/x	0/x/x	0/0/0	0/0/0	1/1/0
Carbon Canyon Blvd at Chino Hills Pkwy.	-	-	-	-	-	0/x/x	0/x/x	1/0/0	0/0/0	0/0/0

Table 1B: Least Bell's Vireo status and distribution in the Santa Ana Watershed, 2000-2009.										
Numbers of territories, pairs and fledglings detected. By Sub-watershed										
Santa Ana Watershed	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
NW c/o Eucalyptus and Peton Dr., Chino Hills									5/0/0	8/3/1
Bayberry Dr., Chino Hills									0/0/0	0/0/0
Carbon Canyon Regional Park & Carbon Canyon Rd.	-	-	-	-	-	6/x/x	5/2/2	7/1/0	5/3/3	3/3/1
Black Gold Golf Club, Yorba Linda									2/0/0 [#]	2/0/0 [#]
Sun Canyon Park	-	-	-	-	-	0/x/x	0/x/x	0/0/0	0/0/0	0/0/0
Wardlow Wash	-	-	-	-	-	0/x/x	0/x/x	1/0/0	0/0/0	0/0/0
Fresno Canyon	-	-	-	-	-	2/x/x	4/2/1	2/1/2	1/0/0	0/0/0
Santa Ana Canyon - Upper Canyon-Prado Dam to Green River Golf Course	-	13/12/ 30	20/18 / 39	22/18/ 51	28/20/ 22	28/17/ 26	21/13/ 13	21/11/ 12	20/11/6	12/6/9
Santa Ana Canyon - Green River Golf Club	-	10/10/ 20	8/8/1 7	9/6/22	17/12/ 17	23/17/ 28	17/12/ 24	14/8/1 2	21/12/2 5	22/16/ 27
Santa Ana Canyon - Featherly Park	-	0/0/0	8/3/0	6/4/9	24/18/ 23	30/20/ 28	23/18/ 35	29/20/ 24	36/25/2 8	34/23/ 28
Starlight Dr. & Hidden Hills Rd., Yorba Linda	-	-	-	-	-	1/x/x	0/x/x	0/0/0	0/0/0	-
Santa Ana River mouth - Talbert Park and environs	-	-	-	4/3/6	5/3/1	6/6/2	3/3/0	0/0/0	1/0/0	1/0/0
Chino Hills State Park	-	-	-	-	-	22/0/0 **	13/0/0 **	24/10/ 1	31/16/1 2	35/22/ 17
Pulte Wetlands, adjacent to Chino Hills State Park (CHSP)										1/0/0 [#]
Rim Crest Dr & Blue Gum Dr, adjacent to CHSP										1/0/0 [#]
SAR - Miscellaneous Sightings/Reporting										
Plunge Creek, San Bernardino	-	-	-	-	-	-	-	-	-	1/0/0
Potrero	-	-	-	-	-	-	-	2/0/0** *	not surveyed	1/0/0
SAR mainstem at Woolly star Preserve	-	-	-	-	1/1/1	-	-	-	(included in S. B. Co)	(included in S. B. Co)
Estelle Mountain Reserve	-	-	-	-	-	-	-	1/0/0** *	(included in	Not surveyed

Table 1B: Least Bell's Vireo status and distribution in the Santa Ana Watershed, 2000-2009. Numbers of territories, pairs and fledglings detected. By Sub-watershed										
Santa Ana Watershed	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
									Temesc al)	ed
Yorba Linda Dry Lake Bed Park	-	-	-	-	-	-	-	1/0/0	0/0/0	1/1/0
Shipley Nature Center	-	-	-	-	-	-	1/0/0	-		
Coyote Hills East Reserve (Fullerton)	-	-	-	-	-	-	-	1/1/0	(4/4/6) ^{##}	(3/3/5) [#]
River View Golf Course, Santa Ana									1/0/0	Not surveyed
San Jacinto Sub Watershed										
Kabian Park	-	-	-	-	-	2/2/2	4/2/1	4/3/3	3/2/1	4/1/1
San Jacinto	-	-	-	0/0/0	3/2/0	6/5/2	9/5/6	11/7/9	9/9/34	15/15/53
Lake Perris	-	-	-	-	-	1/1/1	1/x/x	3/2/2	2/0/0	4/2/3
East of Canyon Lake	-	-	-	-	-	2/x/x	develo ped			
Cottonwood Canyon	-	-	-	-	-	0/x/x	0/x/x	0/0/0	0/0/0	0/0/0
Santiago Creek Sub Watershed	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Silverado Canyon	-	-	-	-	-	0/0/0	0/0/0	0/0/0	0/0/0	0/0/0
Santiago Creek u/s of Irvine Lake								0/0/0	4/0/0	4/0/0
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.)	-	-	-	-	1/0/0	1/0/0	0/0/0	2/1/2	2/0/0	2/1/3
Peter's Canyon	-	-	-	-	-	4/2/2	4/x/x	5/1/2	5/0/0	8/0/0
Irvine Regional Park	-	-	-	6/4/10	9/8/8	11/6/6	5/3/3	14/6/2	19/15/15	29/9/17
Irvine Company Land (near Peter's Canyon)										1/1/1
Santiago Oaks Regional Park	-	-	-	-	-	0/x/x	0/x/x	0/0/0	0/0/0	0/0/0
Santiago Creek at Cannon Rd. (includes reservoir)	-	-	-	-	-	2/1/1	3/x/x	4/0/0	2/0/0	3/0/0
Santiago Creek at Chapman Ave.	-	-	-	-	-	-	-	0/0/0	0/0/0	0/0/0
Santiago Creek at Cambridge Ave.	-	-	-	-	-	-	1/x/x	0/0/0	0/0/0	0/0/0

Table 1B: Least Bell's Vireo status and distribution in the Santa Ana Watershed, 2000-2009. Numbers of territories, pairs and fledglings detected. By Sub-watershed										
Santa Ana Watershed	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
SUBTOTAL	19/13 /25	61/44/ 108	117/8 5/132	150/1 11/23 5	247/20 3/ 310	376/ 238/ 346	304/ 197/ 363	418/ 271/ 360	529/335 / 602	678/47 5 /946
Santa Ana River - San Bernardino County****						15/12/ 21	13/11/ 9	19/15/ 13	21/13/1 2	43/33/ 30
TOTAL FOR SANTA ANA WATERSHED EXCLUDING PRADO BASIN						391/ 250/ 367	317/ 208/ 372	437/ 286/ 373	550/ 348/ 614	721/50 8/ 976
PRADO BASIN (Pike et al)	357/2 81/64 9	444/33 6/ 718	429/3 12/59 8	447/3 39/68 8	590/41 3/ 767	600/ 386/ 525	423/ 219/ 361	420/ 237/ 365	463/236 / 417	538/27 3/ 457
TOTAL FOR SANTA ANA WATERSHED						991/ 636/ 892	740/ 427/ 733	857/ 523/ 738	1013/ 584/ 1031	1259/7 81/143 3
Santa Marguerita Watershed - Murrieta Creek								1/0/0	3/2/0	Not surveyed

* Reported for private property not managed

** Chino Hills State Park reported by State Parks in 2005, 2006; by SAWA 2007

*** Reported by MSCHP

**** Reported by San Bernardino County Flood Control

Reported by Alisa Ing, California State Parks

Outside the Santa Ana Watershed - not included in total

[a] Entries correspond to numbers of territorial males/pairs/'known fledged young' for designated time and locale.

[b] "--" 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.

APPENDIX A - SURVEY SITES, STARTING AND ENDING COORDINATES

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

Monitored Locations

<u>Survey Site</u>	<u>Starting Coordinates</u>	<u>Ending Coordinates</u>
San Jacinto	506426, 3739692	490640, 3749761
San Timoteo:		
-Riverside County	484860, 3762464	501099, 3753159
-San Bernardino County	481911, 3764699	484860, 3762464
March SKR Preserve	471879, 3752740	474210, 3749595
Mockingbird Canyon	461212, 3750319	469427, 3746409
Sycamore Canyon	470287, 3756422	473519, 3753591
Temescal Canyon	471093, 3721033	451657, 3746371
Harrison Reservoir (aka McAllister Creek)	460376, 3748576	462484, 3746911
Chino Hills	438975, 3754612	436980, 3755632
Santa Ana River:		
-Fairmount Park to Hidden Valley	464841, 3762311	455523, 3757886
-River Rd to Hidden Valley	448474, 3756090	444626, 3754049
-Hidden Valley south side of river	455523, 3757886	451482, 3757751
- Hidden Valley, north side of river	456941, 3758360	451564, 3758587
-Talbert Park (Orange County)	411796, 3722775	412029, 3723877
Santa Ana Canyon:		
-Upper Canyon	440677, 3749724	438736, 3749743
-Green River Golf Course	438736, 3749743	436675, 3748403
-Featherly Park	436613, 3748409	430885, 3748343

Assessment Locations

<u>Survey Site</u>	<u>Starting Coordinates</u>	<u>Ending Coordinates</u>
Alessandro Arroyo/Prenda Arroyo	471087, 3750512	465058, 3754499*
Box Springs	472400, 3756419	471898, 3757199
Cajon Wash	456115, 3795872	457587, 3791800
Canyon Crest	468569, 3757034	468569, 3757034
Carbon Canyon Regional Park	425027, 3753806	422688, 3753071
Carbon Canyon (Western Hills Golf Club)	429466, 3758320	429755, 3758496
Carbon Canyon (Chino Hills Pkwy)	431484, 3760317	430579, 3758914
Castleview Park	468185, 3754936	468206, 3754970
Chino Hills (Bayberry Dr.)	432335, 3758297	431780, 3758507
Chino Hills (Eucalyptus/Del Monte)	430160, 3760140	430259, 3760276
Chino Hills (Eucalyptus/Rancho Hills)	429001, 3759503	429108, 3759352
Chino Hills (Eucalyptus/Peyton)	432227, 3761262	431895, 3761650
Chino Hills (End of Eucalyptus)	428612, 3759298	428291, 3759409
Chino Hills State Park (Bane Cyn)	435061, 3757365	435376, 3753499
Chino Hills State Park (Lower Aliso Cyn)	435288, 3753302	438033, 3749528

<u>Survey Site</u>	<u>Starting Coordinates</u>	<u>Ending Coordinates</u>
Chino Hills State Park (Upper Aliso Cyn)	435216, 3753358	433824, 3765039
Chino Hills State Park (Telegraph Cyn)	434818, 3753694	424101, 3753165
City Creek	483528, 3777209	482595, 3777631
Corona St. at Gilmore	448093, 3750572	448406, 3750398
Cottonwood Hills	475633, 3725415	477261, 3724381
Fresno Canyon	439703, 3749067	440954, 3749370
Gavilan Hills	466851, 3740839	467107, 3742104
Goldenstar	464626, 3751480	464853, 3751466
Hidden Valley Golf Club	451644, 3752551	452349, 3753225
Irvine Trust Management Land	429845, 3738585	429845, 3738585
Kabian Park	475841, 3730880	476070, 3732369
Lake Perris	481389, 3747006	486012, 3746515
La Sierra	457824, 3747117	457824, 3748724
Limestone Canyon	434012, 3736548	434913, 3735769
Little Sand Basin	478169, 3779701	478365, 3779815
Mead Valley (Cajalco/aqueduct)	467326, 3743795	471767, 3744324
Menifee-Paloma H. S.	482515, 3725307	481557, 3724847
Menifee-Haun Rd	483716, 3725045	483706, 3724364
Murrieta Creek	476609, 3716171	476299, 3715809
Norco Hills Park Mitigation	449570, 3751384	448340, 3751225
Oak Glen Preserve	505148, 3766841	505153, 3766838
Peter's Canyon	429409, 3738523	428545, 3735641
Plunge Creek	486209, 3774394	487048, 3775342
Poorman Reservoir	476434, 3758610	477243, 3757320
Porter Road (end)	467009, 3749689	466170, 3745974
Promenade	451330, 3749951	451330, 3749951
Pyrite Channel	455500, 3761369	455734, 3761476
Quail Run	470673, 3757379	470399, 3757380
Santa Rosa Mine Road	471840, 3737819	471012, 3738146
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 (Cannon Road)	426421, 3742002	428079, 3742770
Santiago Creek (Cambridge Road)	421793, 3737067	421619, 3737952
Santiago Creek (Chapman Ave.)	423116, 3738554	423245, 3738906
Santiago Oaks Regional Park	428069, 3742690	429133, 3742111
SAR (north side Hidden Valley)	456260, 3758581	454885, 3759116
Silverado Canyon	438878, 3734047	437692, 3734768
Starlight Dr. (Yorba Linda)	431072, 3750086	430990, 3749851
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	469376, 3749882

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

APPENDIX B – WATERSHED-WIDE

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, 2001-2009. (See Tables 1A and 1B for total abundance.)

	Parameter	2001	2002	2003	2004	2005	2006	2007	2008	2009
A.	Number of territorial males	61	117	150	247	318	227	321	351	534
B.	Number of pairs (breeding and non-breeding)	44	85	111	203	224	176	238	246	410
C.	Number of fledged young observed	108	132	235	310	337	345	344	515	877
D.	Projected total recruitment of vireo young (a)	114	138	192.8	461	536	462.3	468.8	806.7	1,404.3
E.	Average number of fledglings per pair (C/B)	2.5	1.6	2.1	1.5	1.5	2.0	1.4	2.1	2.1
F.	Projected number of fledglings per pair (D/B)	2.6	1.6	1.7	2.3	2.4	2.6	2.0	3.3	3.4
G.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests)	28%	49%	53%	52%	47%	46%	40%	34%	27%
H.	Rate of cowbird nest parasitism	25%	28%	21%	23%	23%	19%	17%	14%	8%
I.	Numbers of cowbirds removed from study area	276	781	2085	2353	1569	2881	2151	2,463	4,031
K.	Number of trap days (1 operative trap in the field for one day = 1 trap day)	1018	3615	6130	5036	3662	5045	5022	5,538	6,625
L.	Average number of cowbirds trapped per trap day (J/K)	.27	.22	.34	.47	.4	.57	.42	0.44	0.61
M.	Number of field hours – LBV (+)				1542	1991	2519	2599.8	3088	3,268
N.	Number of field hours – BHCO (+)	2200	2749	4059	2265	2143	2084	1993.5	2902	3,611

(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, 2001-2009

Host Plant Species	2001	2002	2003	2004	2005	2006	2007	2008	2009	Total
Black Willow (<i>Salix gooddingii</i>)	2	14	17*	43	28	34	41	21	24	224
Arroyo Willow (<i>Salix lasiolepis</i>)	4	11	11	37	32	45	44	42	65	291
Red Willow (<i>Salix laevigata</i>)	3	3	9	2	10	9	20	30	32	118
Narrow-leafed Willow (<i>Salix exigua</i>)		1	2	6	6	4	4	10	23	56
Shining (Yellow) Willow (<i>Salix lucida</i> <i>spp. lasiandra</i>)				1	1	2	3		1	8
Willow species (<i>Salix spp.</i>)		1	2	1	1	1				6
Fremont Cottonwood (<i>Populus fremontii</i>)	3	6	3	2	5	3	4	8	15	49
Mulefat (<i>Baccharis salicifolia</i>)	17	36	47	61	47	16	27	68	99	418
Elderberry (<i>Sambucus mexicana</i>)	3	3	12	8	16	9	3	9	4	67
Black Walnut (<i>Juglans californica</i>)			1		1	2			1	5
Stinging Nettle (<i>Urtica dioica</i>)					1					1
Mugwort (<i>Artemisia douglasiana</i>)	1	1	6	6	1	3				18
Toyon (<i>Heteromeles arbutifolia</i>)	1			4	2	2	4	2	2	17
Poison Hemlock (<i>Conium maculatum</i>)	1	2		1	6					10
Wild Grape (<i>Vitis girdiana</i>)	3	5	1	1	6	8	6	5	3	38
Wild Rose (<i>Rosa californica</i>)		1	1	1	2					5
Cockleburr (<i>Xanthium strumarium</i>)					1				1	2

*corrected value

Table B-2 (cont). Least Bell's Vireo nest placement preferences, monitored sites in the Santa Ana River watershed, 2001-2009.

Host plant species	2001	2002	2003	2004	2005	2006	2007	2008	2009	Total
Myoporum (<i>Myoporum laetum</i>)					1					1
Laurel Sumac (<i>Malosma laurina</i>)			1	2	2	1				6
Black mustard (<i>Brassica nigra</i>)	1		4		1	1			1	8
Peruvian Pepper Tree (<i>Schinus molle</i>)				1	1	1	1	1		5
Golden Currant (<i>Ribes aureum</i>)					1					1
Yellowspine Thistle (<i>Cirsium ochrocentrum</i>)				1	1					2
Coast Live Oak (<i>Quercus agrifolia</i>)					1					1
Giant Reed (<i>Arundo donax</i>)						1				1
Milk Thistle (<i>Silybum marianum</i>)			1							1
Arroweed (<i>Pluchea sp.</i>)						1				1
California Sagebrush (<i>Artemisia californica</i>)		1								1
Scrub Oak (<i>Quercus spp.</i>)						1	2	1		4
Poison Oak (<i>Toxicodendron diversilobum</i>)	1	5		1			2			9
Ash (<i>Fraxinus sp.</i>)	1									1
Coyote Bush (<i>Baccharis pilularis</i>)	2	3								5
Broom Baccharis (<i>Baccharis sarothroides</i>)		1								1
Black Willow (dead) (<i>Salix gooddingii</i>)			1							1
Tamarisk (<i>Tamarix ramosissima</i>)			1				1		1	3
Willow species/Pepperweed (<i>Salix sp/Lepidium latifolium</i>)			1							1

Table B-2 (cont.) Least Bell's Vireo nest placement preferences, monitored sites in the Santa Ana River watershed, 2001-2009.

Host Species	2001	2002	2003	2004	2005	2006	2007	2008	2009	Total
Blackberry/Willow sp. (<i>Rubus ursinus</i> / <i>Salix</i> <i>sp.</i>)			1							1
Sycamore (<i>Platanus racemosa</i>)			1					1		2
Pepperweed (<i>Lepidium</i> <i>latifolium</i>)			1	1			1	1		4
Fourwing Saltbush (<i>Atriplex canescens</i>)			1							1
Castor Bean (<i>Rincus communis</i>)				1						1
Pepperweed (<i>Lepidium</i> <i>latifolium</i>) and Black Willow (<i>Salix</i> <i>gooddingii</i>)				1						1
Common Sunflower (<i>Helianthus annuus</i>)				1						1
Black Willow(<i>Salix</i> <i>gooddingi</i>) and Grape (<i>Vitis girdiana</i>)				1						1
Mulefat/Black Mustard (<i>Baccharis</i> <i>salicifolia</i> / <i>Brassica</i> <i>nigra</i>)	1									1
Black Willow/Poison Hemlock (<i>Salix</i> <i>gooddingi</i> / <i>Conium</i> <i>maculatum</i>)						1				1
Mulefat/Wild Grape (<i>Baccharis</i> <i>salicifolia</i> / <i>Vitis girdiana</i>)							2			2
Red Willow/Wild Grape (<i>S. lasiolepis</i> / <i>V.</i> <i>girdiana</i>)								1		1
Emory baccharis (<i>Baccharis emoryii</i>)							1	2		3
Wild Celery (<i>Apium</i> <i>graveolens</i>)							1			1
Fig (<i>Ficus sp</i>)							1			1
White Alder (<i>Alnus rhombifolia</i>)								1		1
Box Elder (<i>Acer</i> <i>negundo</i>)								1		1

Table B-2 (cont.) Least Bell's Vireo nest placement preferences, monitored sites in the Santa Ana River watershed, 2001-2009.										
Host Species	2001	2002	2003	2004	2005	2006	2007	2008	2009	TOTAL
Red Willow/dead Stinging Nettle (<i>S. lasiolepis</i> / <i>U. dioica</i>)								1		1
Red Willow/Fresh Water Reed								1		1
Rose (<i>Rosa californicus</i>) & Wild Grape (<i>Vitis girdiana</i>)									1	1
<i>S. lasiolepis</i> & Fennel (<i>Foeniculum vulgare</i>)									1	1
Orange Tree (<i>Rutaceae citrus sinensis</i>)									1	1
Elderberry (<i>S. mexicanus</i>) & Wild Grape (<i>V. girdiana</i>)									1	1
Wax Leaf Pivet (<i>Ligustrum sp.</i>)									1	1
Dead Black Willow (<i>S. gooddingii</i>) & Nettle (<i>U. dioica</i>)									1	1
Arroyo Willow (<i>S. lasiolepis</i>) & Black Mustard (<i>Brassica nigra</i>)									1	1
Dead Black Willow (<i>S. gooddingii</i>) covered with living Black Willow									1	1
Deadfall									2	2
Dead <i>Salix sp.</i>								1	1	2
Dead <i>L. latifolium</i>								1		1
Dead <i>B. salicifolia</i>								3	2	5
Total	44	94	125	184	174	145	168	211	285	1,430*

*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, 2001- 2009. Please see Table 1 for total watershed numbers of territories, pairs, and fledglings observed.

Table B-3		2001	2002	2003	2004	2005	2006	2007	2008	2009
A.	Number of pairs	44	85	111	203	224	187	238	246	410
B.	Number of breeding (nesting) pairs	41	81	107	183	192	166	209	226	362
C.	Number of breeding pairs that were well-monitored throughout the breeding season	25	44	45	99	53	87	100	100	149
D.	Number of 'known fledged young' OBSERVED	108	132	235	310	337	352	344	515	877
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season	65	75	124	207	138	226	200	333	527
F.	Average number of fledglings produced per breeding pair (minimum; D/B = 'productivity or breeding success')	2.6	1.6	2.2	1.7	1.8	2.1	1.6	2.3	2.4
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)	3.1	1.7	2.8	2.1	2.6	2.6	2.0	3.3	3.5
H.	Number of nests that were discovered	44	95	130	184	176	145	169	215	289
I.	Number of nests that were regularly monitored or 'tracked'	32	74	95	143	127	125	142	188	258
J.	Number of 'tracked' nests that were successful	78%	42%	57%	54%	56%	62%	53%	66%	71%
K.	Rate of missing eggs/chicks from nests (includes successful and unsuccessful nests)	28%	49%	53%	52%	47%	46%	39%	34%	27%
L.	Number of 'tracked' nests that were parasitized by cowbirds	25%	28%	21%	23%	23%	19%	17%	14%	8%
M.	A. Number of 'tracked' nests that failed as a result of reproductive failure	0	1%	2%	4%	5%	4%	8%	3%	3%
	B. Number of 'tracked' nests that failed as a result of parasitism	N/A	N/A	7%	2%	6%	6%	6%	4%	3%
	C. Number of 'tracked' nests that failed as a result of predation – Predation Rate according to Vireo Working Group	N/A	N/A	34%	40%	33%	27%	33%	28%	22%
N.	Average clutch size	3.7	3.4	3.6	3.3	3.5	3.6	3.4	3.5	3.5
O.	Number of cowbird eggs found in or near vireo nests	7	23	33	39	45	26	24	29	22
P.	Number of cowbird nestlings removed from 'tracked' nests	1	3	0	2	0	1	3	1	4

Table B-3		2001	2002	2003	2004	2005	2006	2007	2008	2009
Q.	Number of cowbird young fledged by vireos	0	1	2	1	2	1	1	0	0
R.	Number of 'manipulated' parasitized nests	6	19	16	28	26	16	19	21	18
S.	% 'successful, manipulated' nests	100%	11%	31%	40%	54%	68.8%	47.4%*	57%	39%
T.	Number of vireos fledged from "manipulated" parasitized nests	13	4	12	18	25	24	16	30	16
U.	Number of repaired nests	0	0	2	0	5	3	5	0	4
V.	% successful repaired nests	0	0	100%	0	60%	67%	60%	n/a	75%
W.	Number of vireos fledged from repaired nests	0	0	7	0	9	4	5	n/a	12

*corrected value

APPENDIX C – SUMMARY TABLES BY MANAGED SITE, FROM INCEPTION, 2009

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	2001	2002	2003	2004	2005	2006	2007	2008	2009	Totals
A.	Number of territorial males				0	3	6	9	11	9	15	n/a
B.	Number of pairs (breeding and non-breeding)				0	2	5	5	7	9	15	43
C.	Number of fledged young observed				0	0	2	6	9	34	53	104
D.	Projected total of recruitment of vireo young (a)				0.0	n/a	2.0	10.0	12.6	40.5	57	122.1
E.	Average number of fledglings per pair (C/B)				0.0	0.0	0.4	1.2	1.3	3.8	3.5	2.4
F.	Projected number of fledglings per pair (D/B)				0	n/a	n/a	2	1.8	4.5	3.8	2.8
G.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %= $K/I \times 100$ (b)				n/a	100% (1/1)	33% (1/3)	100% (2/2)	50% (4/8)	23% (3/13)	26% (7/27)	33.3% (10/54)
H.	Rate of cowbird nest parasitism				n/a	0% (0/1)	33% (1/3)	50% (1/2)	13% (1/8)	0% (0/13)	11% (3/27)	11.1% (6/54)
I.	Numbers of cowbirds removed from study area				1074	1629	912	1903	1394	1,653	3,057	11,622
K.	Number of trap days (1 operative trap in the field for one day = 1 trap day)				617	972	570	1235	1120	959	932	6,405
L.	Average number of cowbirds trapped per trap day (I/K)				1.74	1.68	1.6	1.54	1.24	1.72	3.28	1.81
M.	Number of field hours -LBVI				548.0	30.0	100.0	118.0	151.0	151	171	4,425.2
N.	Number of field hours - BHCO					366.0	644.0	411.0	360.2	880	495	

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 TIMOTEO

Parameter		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Totals
A.	Number of territorial males	5	5	15	14	29	43	32	56	78	105	n/a
B.	Number of pairs (breeding and non-breeding)	2	4	13	13	28	35	29	50	65	84	323
C.	Number of fledged young observed	2	11	15	28	18	36	66	102	165	192	635
D.	Projected total of recruitment of vireo young (a)	n/d	12.0	14.0	36.4	21.6	66.5	75.4	130.0	234	327.6	918*
E.	Average number of fledglings per pair (C/B)	1.0	2.8	1.2	2.2	0.6	1.0	2.3	2.0	2.5	2.3	2.0
F.	Projected number of fledglings per pair (D/B)	n/d	3.0	1.1	2.8	0.8	1.9	2.6	2.6	3.6	3.9	2.8*
G.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)	n/d	25% (1/4)	41% (7/17)	76% (16/21)	77% (24/31)	62% (21/34)	33% (11/33)	32% (14/44)	33% (25/75)	39% (31/79)	44.4% (150/338)
H.	Rate of cowbird nest parasitism	n/d	75% (3/4)	65% (11/17)	24% (5/21)	74% (23/31)	53% (18/34)	43% (14/33)	16% (7/44)	19% (14/75)	10% (8/79)	30.5% (103/338)
I.	Numbers of cowbirds removed from study area	n/d	51*	270	218	76	116	223	99	214	220	1,487
K.	Number of trap days (1 operative trap in the field for one day = 1 trap day)	n/d	93	876	722	512	540	931	791	903	1095	6,463
L.	Average number of cowbirds trapped per trap day (I/K)	n/d	0.55	0.31	0.30	0.15	0.2	0.24	0.13	0.24	0.20	0.23
M.	Number of field hours -LBVI	n/d	400.0	572.0	554.0	174.0	262.0	372.0	577.1	713	648	6,524.6
N.	Number of field hours - BHCO	n/d				249.0	297.0	418.0	289.5	394	605	

*corrected 2-24-12

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	2001	2002	2003	2004	2005	2006	2007	2008	2009	Totals
A.	Number of territorial males					7	9	3	6	10	10	n/a
B.	Number of pairs (breeding and non-breeding)					7	5	2	4	5	10	33
C.	Number of fledged young observed					20	9	4	9	5	28	75
D.	Projected total of recruitment of vireo young (a)					38.5	10.0	n/a	12.0		60.0	120.5 (n=4 yrs)
E.	Average number of fledglings per pair (C/B)					2.9	1.8	2.0	2.3	1.0	2.8	2.3
F.	Projected number of fledglings per pair (D/B)					5.5	2.0	n/a	3.0		6.0	4.6* (n=4 yrs)
G.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)					33% (1/3)	66% (4/6)	n/a	50% (1/2)		0% (0/5)	37.5% (6/16) (n=4 yrs)
H.	Rate of cowbird nest parasitism					0% (0/3)	0% (0/6)	n/a	0% (0/2)		0% (0/5)	0.0% (0/16) (n=4 yrs)
I.	Numbers of cowbirds removed from study area					69	18	28	15	11	10	151
K.	Number of trap days (1 operative trap in the field for one day = 1 trap day)					225	188	179	146	226	239	1,203
L.	Average number of cowbirds trapped per trap day (I/K)					0.31	0.1	0.16	0.1	0.05	0.04	0.13
M.	Number of field hours -LBVI					55.0	87.0	42.0	60.0	65	148	457
N.	Number of field hours - BHCO					123.0	22.0	74.0	73.0	58	154	504

*Calculation excludes 2006, 2008 (120.5/26 = 4.6) corrected 1/23/12

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
SYCAMORE CANYON

Parameter		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Totals
A.	Number of territorial males				4	6	7	4	5	9	9	n/a
B.	Number of pairs (breeding and non-breeding)				n/d	5	7	2	5	8	8	35
C.	Number of fledged young observed				n/d	9	1	n/d	8	13	9	40
D.	Projected total of recruitment of vireo young (a)				n/a	10.0	1.0	n/d	15.0	13.6	n/d	39.6
E.	Average number of fledglings per pair (C/B)				n/d	1.8	n/a	n/d	1.6	1.6	1.1	1.1
F.	Projected number of fledglings per pair (D/B)				n/d	2.00	0.14 (1/7)	n/d	3.0	1.7	n/d	1.6* (39.6/25)
G.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)				n/d	67% (2/3)	n/a	n/a	0% (0/2)	25% (1/4)	n/a	33.3% (3/9)
IH.	Rate of cowbird nest parasitism				n/d	33% (1/3)	n/a	n/a	0% (0/2)	25% (1/4)	n/a	22.2% (2/9)
I.	Numbers of cowbirds removed from study area				n/a	42	8	12	1	18	0	81
K.	Number of trap days (1 operative trap in the field for one day = 1 trap day)				n/a	109	78	97	68	177	106	635
L.	Average number of cowbirds trapped per trap day (I/K)				n/d	0.39	0.1	0.12	0.01	0.10	0.0	0.13
M.	Number of field hours -LBVI				40.0	64.0	18.0	39.0	90.0	117	106	474
N.	Number of field hours - BHCO				n/a	141.0	24.0	45.0	51.0	54	154	469

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	2001	2002	2003	2004	2005	2006	2007	2008	2009	Totals
A.	Number of territorial males				9	9	15	17	23	27	41	n/a
B.	Number of pairs (breeding and non-breeding)				8	8	13	14	21	21	35	120
C.	Number of fledged young observed				4	19	29	36	30	35	65	218
D.	Projected total of recruitment of vireo young (a)				10.4	24.0	49.4	43.4	52.5	63	175.0	417.7
E.	Average number of fledglings per pair (C/B)				0.5	2.4	2.2	2.6	1.4	1.7	1.8	1.8
F.	Projected number of fledglings per pair (D/B)				1.3	3.0	3.8	3.1	2.5	3.0	5.0	3.5
G.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/l x100) (b)				85% (11/13)	33% (3/9)	53% (8/15)	25% (3/12)	22% (2/9)	25% (3/12)	8% (1/12)	37.8% (31/82)
H.	Rate of cowbird nest parasitism				62% (8/13)	0% (0/9)	7% (1/15)	0% (0/12)	0% (0/9)	17% (2/12)	8% (1/12)	14.6% (12/82)
I.	Numbers of cowbirds removed from study area				83	281	230	183	101	224	156	1,258
K.	Number of trap days (1 operative trap in the field for one day = 1 trap day)				300	966	861	769	638	829	1,032	5,395
L.	Average number of cowbirds trapped per trap day (I/K)				0.28	0.29	0.3	0.24	0.16	0.27	0.15	0.23
M.	Number of field hours -LBVI				447.0	122.0	181.0	166.0	338.4	352	368	3,661
N.	Number of field hours - BHCO					300.0	293.0	177.0	228.6	350	338	

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
HARRISON RESERVOIR/RAVINE

Parameter		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Totals
A.	Number of territorial males					4	4	2	4	3	2	n/a
B.	Number of pairs (breeding and non-breeding)					3	1	2	3	1	1	11
C.	Number of fledged young observed					1	3	6	7	1	1	19
D.	Projected total of recruitment of vireo young (a)					1.5	3.0	8.0	9.0		n/d	21.5 (n=4 yrs)
E.	Average number of fledglings per pair (C/B)					0.3	3.0	3.0	2.3	1.0	1.0	1.7
F.	Projected number of fledglings per pair (D/B)					0.5	3.0	4.0	3.0		n/d	2.4* (n=4 yrs)
G.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %= $K/I \times 100$ (b)					50% (1/2)	0% (0/1)	50% (1/2)	0% (0/2)		n/a	28.6% (2/7) (n=4 yrs)
H.	Rate of cowbird nest parasitism					100% (2/2)	100% (1/1)	0% (0/2)	0% (0/2)		n/a	42.9% (3/7) (n=4 yrs)
I.	Numbers of cowbirds removed from study area					n/a	2	28	39	2	0	71
K.	Number of trap days (1 operative trap in the field for one day = 1 trap day)					n/a	28	93	110	121	99	451
L.	Average number of cowbirds trapped per trap day (I/K)					n/a	0.1	0.3	0.35	0.02	0.0	0.16
M.	Number of field hours -LBVI					40.0	70.0	31.0	50.5	15	13	220
N.	Number of field hours - BHCO					n/a	18.0	72.0	82.6	60	60	293

*Calculation excludes 2008 data ($21.5/9=2.4$)

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 (Fairmount Park to Hidden Valley)

Parameter		2000	2001	2002*	2003**	2004	2005	2006	2007	2008	2009	Totals
A.	Number of territorial males			18	16	24	27	18	33	33	59	n/a
B.	Number of pairs (breeding and non-breeding)			12	13	21	19	14	21	21	46	167
C.	Number of fledged young observed			4	13	30	35	36	27	31	107	283
D.	Projected total of recruitment of vireo young (a)			n/d	n/a	69.3	43.7	36.4	42.0		138.0	329.4 (n=5 yrs)
E.	Average number of fledglings per pair (C/B)			0.3	1.0	1.4	1.8	2.6	1.3	1.5	2.3	1.7
F.	Projected number of fledglings per pair (D/B)			n/d	n/a	3.3	2.3	2.6	2.0		3.0	2.3* (n=5 yrs)
G.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)			33% (3/9)	40% (2/5)	40% (4/10)	47% (9/19)	33% (3/9)	22% (2/9)		7% (1/14)	32.0% (24/75) (n=7 yrs)
H.	Rate of cowbird nest parasitism			67% (6/9)	20% (1/5)	20% (2/10)	16% (3/19)	0% (0/9)	0% (0/9)		0% (0/14)	16.0% (12/75) (n=7 yrs)
I.	Numbers of cowbirds removed from study area			n/a	139	40	60	56	86	46	34	461
K.	Number of trap days (1 operative trap in the field for one day = 1 trap day)			19	899	516	418	384	490	477	531	3,734
L.	Average number of cowbirds trapped per trap day (I/K)			0	0.15	0.08	0.1	0.15	0.18	0.10	0.06	0.12
M.	Number of field hours -LBVI			85.0	63.0	101.0	122.0	157.0	124.0	102	297	2,333
N.	Number of field hours - BHCO					248.0	143.0	156.0	132.9	129	473	

*Calculation excludes 2208 data (329.4/146 = 2.3)

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	2001**	2002**	2003**	2004	2005	2006	2007	2008	2009	Totals
A.	Number of territorial males		8	6	12	28	42	32	45	65	91	n/a
B.	Number of pairs (breeding and non-breeding)		4	4	8	23	26	26	31	43	68	233
C.	Number of fledged young observed		9	4	23	62	24	46	45	106	170	489
D.	Projected total of recruitment of vireo young (a)		12.0	4.0	24.0	62.1	70.2	59.8	62.0	150.5	251.6	444.6
E.	Average number of fledglings per pair (C/B)		2.6	1.0	2.9	2.7	0.9	1.8	1.5	2.5	2.5	2.1
F.	Projected number of fledglings per pair (D/B)		3.0	1.0	3.0	2.7	n/a	2.3	2.0	3.5	3.7	2.7
G.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %= $K/I \times 100$ (b)		0% (0/1)	67% (2/3)	44% (4/9)	50% (17/34)	25% (1/4)	78% (21/27)	52% (13/25)	21% (6/29)	20% (9/45)	41.2% (73/177)
H.	Rate of cowbird nest parasitism		0% (0/1)	33% (1/3)	0% (0/9)	0% (0/34)	25% (1/4)	22% (6/27)	16% (4/25)	7% (2/29)	2% (1/45)	8.5% (14/177)
I.	Numbers of cowbirds removed from study area		n/a	n/a	n/a	72	47	40	150	24	49	382
K.	Number of trap days (1 operative trap in the field for one day = 1 trap day)		n/a	n/a	n/a	212	39	104	252	236	259	1,102
L.	Average number of cowbirds trapped per trap day (I/K)		n/a	n/a	n/a	0.34	1.2	0.38	0.6	0.10	0.19	0.35
M.	Number of field hours -LBVI		420*	68	99	169	249	500	289	308	235	2,337
N.	Number of field hours - BHCO		n/a	n/a	n/a	129	39	16	99	111	230	624

*840 hours for Santa Ana River (River Rd to Hidden Valley) and Hidden Valley split between the two sites.

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

Parameter		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Totals
A.	Number of territorial males	14	18	28	26	29	34	33	32	46	49	n/a
B.	Number of pairs (breeding and non-breeding)	11	13	21	18	27	27	24	24	28	37	230
C.	Number of fledged young observed	23	32	47	37	51	49	37	31	36	64	407
D.	Projected total of recruitment of vireo young (a)	29.7	32.0	50.0	n/d	62.1	54.0	67.2	50.4	70	96.2	511.6 (n=9 yrs)
E.	Average number of fledglings per pair (C/B)	2.1	2.5	2.2	2.1	1.9	1.8	1.5	1.3	1.3	1.7	1.8
F.	Projected number of fledglings per pair (D/B)	2.7	2.5	2.4	n/d	2.3	n/a	2.8	2.1	2.5	2.6	2.4*** (n=9 yrs)
G.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)	0% (0/6)	29% (2/7)	33% (3/9)	25% (1/4)	67% (10/15)	29% (2/7)	0% (0/5)	33% (3/9)	71% (5/7)	31% (5/16)	36.4% (31/85)
H.	Rate of cowbird nest parasitism	0% (0/6)	0% (0/7)	0% (0/9)	0% (0/4)	0% (0/15)	14% (1/7)	0% (0/5)	44% (4/9)	0% (0/7)	6% (1/16)	7.0% (6/85)
I.	Numbers of cowbirds removed from study area	82	152	64	65	44	59	117	2	33	19	637
K.	Number of trap days (1 operative trap in the field for one day = 1 trap day)	544	535	562	640	383	291	428	297	251	358	4,298
L.	Average number of cowbirds trapped per trap day (I/K)	0.15	0.28	0.11	0.1	0.11	0.2	0.27	0.01	0.13	0.05	0.15
M.	Number of field hours -LBVI	641.0	420**	467.0	472.0	190.0	125.0	196.0	153.5	230	265	4,156.7
N.	Number of field hours - BHCO					200.0	170.0	155.0	132.2	110	230	

**840 hours for Santa Ana River (River Rd to Hidden Valley) and Hidden Valley split between the two sites.

***Calculation excludes 2003 data (511.6/212=2.4)

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

TEMESCAL CANYON

Parameter		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Totals
A.	Number of territorial males		7	14	13	10	15	16	34	60	76	n/a
B.	Number of pairs (breeding and non-breeding)		1	6	10	8	9	13	26	35	56	164
C.	Number of fledged young observed		6	6	21	19	42	29	25	73	118	339
D.	Projected total of recruitment of vireo young (a)		n/a	6.0	21.0	25.6	42.0	31.2	26.0	101.5	194.4	447.7
E.	Average number of fledglings per pair (C/B)		6.0	1.0	2.1	1.9	4.7	2.2	1.0	2.1	2.1	2.1
F.	Projected number of fledglings per pair (D/B)		n/a	1.0	2.1	3.2	6.0	2.4	1.0	2.9	3.5	2.7
G.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)		0% (0/1)	75% (3/4)	45% (5/11)	42% (5/12)	20% (2/10)	50% (6/12)	58% (7/12)	50% (16/32)	21% (8/39)	39.1% (52/133)
H.	Rate of cowbird nest parasitism		0% (0/1)	25% (1/4)	27% (3/11)	0% (0/12)	30% (3/10)	25% (3/12)	42% (5/12)	22% (7/32)	13% (5/39)	20.3% (27/133)
I.	Numbers of cowbirds removed from study area		51	260	122	105	25	194	173	134	286	1,350
K.	Number of trap days (1 operative trap in the field for one day = 1 trap day)		163	1040	828	703	292	393	697	681	1,015	5,812
L.	Average number of cowbirds trapped per trap day (I/K)		0.31	0.25	0.15	0.15	0.1	0.49	0.25	0.2	0.28	0.23
M.	Number of field hours -LBVI		360	839	831	124	201	294	279	403	516	5,690
N.	Number of field hours - BHCO					318	263	284	229	341	408	

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	2001	2002	2003	2004	2005	2006	2007	2008	2009	Totals
A.	Number of territorial males		13	20	22	28	28	21	21	20	12	n/a
B.	Number of pairs (breeding and non-breeding)		12	18	18	20	17	13	11	11	6	126
C.	Number of fledged young observed		30	39	51	22	26	13	12	6	9	208
D.	Projected total of recruitment of vireo young (a)		35.0	45.0	54.0	64.0	42.5	32.5	12.1		24.0	309.1 (n=8 yrs)
E.	Average number of fledglings per pair (C/B)		2.5	2.2	2.8	1.1	1.6	1.0	1.1	1.8	1.5	1.7
F.	Projected number of fledglings per pair (D/B)		2.9	2.5	3.0	3.2	2.5	2.5	1.1		4.0	2.7* * (n=8 yrs)
G.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/l x100) (b)		30% (3/10)	47% (9/19)	41% (7/17)	25% (1/4)	33% (2/6)	67% (2/3)	50% (2/4)		0% (0/1)	40.6% (26/64) (n=8 yrs)
H.	Rate of cowbird nest parasitism		10% (1/10)	0% (0/19)	18% (3/17)	0% (0/4)	0% (0/6)	0% (0/3)	0% (0/4)		0% (0/1)	6.3% (4/64) (n=8yrs)
I.	Numbers of cowbirds removed from study area		16	-6	9	-3	57	50	94	32	52	301
K.	Number of trap days (1 operative trap in the field for one day = 1 trap day)		85	322	468	148	174	192	226	254	243	2,112
L.	Average number of cowbirds trapped per trap day (I/K)		0.19	0	0.02	-0.02	0.3	0.26	0.42	0.13	0.21	0.14
M.	Number of field hours -LBVI		600*	718*	841*	331*	524*	477*	388*	559*	445*	6,793
N.	Number of field hours - BHCO					191*	430*	276*	315.*	313*	385*	

*Vireo and Cowbird Hours for all of SAC (Upper Canyon, Green River Golf Club, Featherly Park)

**Calculation excludes 2008 data (309.1/115=2.7)

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 - GREEN RIVER GOLF CLUB

Parameter		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Totals
A.	Number of territorial males		10	8	9	17	23	17	14	21	22	n/a
B.	Number of pairs (breeding and non-breeding)		10	8	6	12	17	12	8	12	16	101
C.	Number of fledged young observed		20	17	22	17	28	24	12	25	27	192
D.	Projected total of recruitment of vireo young (a)		23.0	19.0	25.8	24.0	59.5	43.2	14.4	33.6	36.8	279.3
E.	Average number of fledglings per pair (C/B)		2.0	2.1	3.7	1.4	1.6	2.0	1.5	2.1	1.7	1.9
F.	Projected number of fledglings per pair (D/B)		2.3	2.4	4.3	2.0	3.5	3.6	1.8	2.8	2.3	2.8
G.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %= $K/I \times 100$ (b)		33% (3/9)	60% (6/10)	25% (2/8)	0% (0/4)	17% (1/6)	17% (1/6)	33% (1/3)	0% (0/6)	22% (2/9)	26.2% (16/61)
H.	Rate of cowbird nest parasitism		44% (4/9)	0% (0/10)	0% (0/8)	0% (0/4)	0% (0/6)	0% (0/6)	0% (0/3)	0% (0/6)	0% (0/9)	6.6% (4/61)
I.	Numbers of cowbirds removed from study area		6	184	145	239	33	40	19	33	103	802
K.	Number of trap days (1 operative trap in the field for one day = 1 trap day)		142	610	800	564	84	151	187	197	366	3,101
L.	Average number of cowbirds trapped per trap day (I/K)		0.04	0.3	0.18	0.42	0.4	0.26	0.1	0.17	0.28	0.26
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	2001	2002	2003	2004	2005	2006	2007	2008	2009	Totals
A.	Number of territorial males		0	8	6	24	30	23	29	36	34	n/a
B.	Number of pairs (breeding and non-breeding)		0	3	4	18	20	18	20	25	23	131
C.	Number of fledged young observed		0	0	9	23	28	35	24	28	28	175
D.	Projected total of recruitment of vireo young (a)		0.0	0.0	12.0	36.0	46.0	41.4	28.0	100	43.7	307.1
E.	Average number of fledglings per pair (C/B)		0.0	0.0	2.3	1.3	1.4	1.9	1.2	1.1	1.2	1.3
F.	Projected number of fledglings per pair (D/B)		0.0	0.0	3.0	2.0	2.3	2.3	1.4	4.0	1.9	2.3
G.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %= $K/I \times 100$ (b)		n/a	100% (3/3)	33% (1/3)	29% (2/7)	54% (7/13)	50% (5/10)	38% (3/8)	50% (5/10)	45% (5/11)	47.7% (31/65)
H.	Rate of cowbird nest parasitism		n/a	67% (2/3)	0% (0/3)	29% (2/7)	0% (0/13)	0% (0/10)	0% (0/8)	0% (0/10)	9% (1/11)	7.7% (5/65)
I.	Numbers of cowbirds removed from study area		n/a	9	21	-2	2	7	17	36	37	127
K.	Number of trap days (1 operative trap in the field for one day = 1 trap day)		n/a	186	454	290	99	89	110	127	236	1,591
L.	Average number of cowbirds trapped per trap day (I/K)		n/a	0.05	0.05	-0.01	< 0.1	0.08	0.15	0.28	0.16	0.08
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

CHINO HILLS

Parameter		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Totals
A.	Number of territorial males				9	11	12	7	8	8	9	n/a
B.	Number of pairs (breeding and non-breeding)				6	8	9	6	7	4	5	45
C.	Number of fledged young observed				11	7	14	11	3	2	6	54
D.	Projected total of recruitment of vireo young (a)				n/a	4.8	31.5	13.8	2.8		n/a	52.9 (n=4 yrs)
E.	Average number of fledglings per pair (C/B)				1.8	0.9	1.6	1.8	0.4	0.5	1.2	1.2
F.	Projected number of fledglings per pair (D/B)				n/d	0.6	3.5	2.3	0.4		n/d	1.8* (n=4 yrs)
G.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)				n/a	57% (4/7)	67% (2/3)	50% (2/4)	80% (4/5)		n/a	63.2% (12/19) (n= 4 yrs)
H.	Rate of cowbird nest parasitism				n/a	43% (3/7)	0% (0/3)	0% (0/4)	60% (3/5)		n/a	31.6% (6/19) (n=4 yrs)
I.	Numbers of cowbirds removed from study area				n/a	n/a	n/a	n/a	n/a	3	8	11
K.	Number of trap days (1 operative trap in the field for one day = 1 trap day)				n/a	n/a	n/a	n/a	n/a	100	114	214
L.	Average number of cowbirds trapped per trap day (I/K)				n/d	n/a	n/a	n/a	n/a	0.03	0.07	0.05
M.	Number of field hours -LBVI				36	52	18	68	90	68	56	388
N.	Number of field hours - BHCO				n/a	n/a	n/a	n/a	n/a	102	77	179

*Calculation excludes 2008 data (52.9/30 = 1.8

Table C-2. Least Bell's Vireo nest placement preferences, monitored sites in the Santa Ana River Watershed, 2001-2011, BY MANAGED SITE

SAN JACINTO

Host Plant Species	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Totals
Mulefat (<i>Baccharis salicifolia</i>)					2	2	1	2	10	9	26
Black Willow (<i>Salix goodingii</i>)								5			5
Narrow-leaved Willow (<i>Salix exigua</i>)						1	1	2	4	18	26
Tamarisk (<i>Tamarix ramosissima</i>)								1			1
Black Mustard (<i>Brassica nigra</i>)							1				1
Totals:				0	2	3	3	10	14	27	59

Table C-2. Least Bell's Vireo nest placement preferences, monitored sites in the Santa Ana River Watershed, 2001-2009,
 BY MANAGED SITE **SAN TIMOTEO CANYON**

Host Plant Species	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Totals
Arroyo Willow (<i>Salix lasiolepis</i>)		1	4	3	11	11	11	11	9	15	76
Mulefat (<i>Baccharis salicifolia</i>)		1	12	9	16	5	2	3	21	32	101
Black Willow (<i>Salix gooddingii</i>)				1	1	6	8	14	11	11	52
Red Willow (<i>Salix laevigata</i>)						9	7	11	23	14	64
Mugwort (<i>Artemisia douglasiana</i>)		1	1	5	6	1					14
Elderberry (<i>Sambucus mexicana</i>)			1			7	1		2	1	12
Narrow-leafed Willow (<i>Salix exigua</i>)					1	5	2		4	1	13
Fremont Cottonwood (<i>Populus fremontii</i>)			2	2	1	1		2	2	6	16
Wild Grape (<i>Vitis girdiana</i>)						1	3	2	2	2	10
Toyon (<i>Heteromeles arbutifolia</i>)		1				1		2	2	2	8
Mustard (<i>Brassica sp.</i>)				3							3
Shining Willow (<i>Salix lucida</i> spp. <i>lasiandra</i>)							2			1	3
Emory baccharis (<i>Baccharis emoryii</i>)								1			1
Black Mustard (<i>Brassica nigra</i>)						1					1
Golden Current (<i>Ribes aureum</i>)						1					1
Four-winged Saltbrush (<i>Atriplex canescens</i>)				1							1
Arroyo Willow (<i>S. lasiolepis</i>) & Wild Grape (<i>Vitis girdiana</i>)									1		1
Box Elder (<i>Acer negundo</i>)									1		1
Arroyo Willow (<i>Salix lasiolepis</i>) & Fennel (<i>Foeniculum vulgare</i>)										1	1
Totals	n/d	4	20	24	36	49	36	46	78	86	379

Table C-2. Least Bell's Vireo nest placement preferences, monitored sites in the Santa Ana River Watershed, 2001-2011, BY MANAGED SITE

MARCH SKR PRESERVE

Host Plant Species	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Totals
Black Willow (<i>Salix gooddingii</i>)					3	5				1	9
Arroyo Willow (<i>Salix lasiolepis</i>)								2		3	5
Red Willow (<i>Salix laevigata</i>)						1				2	3
Totals					3	6	0	2		6	17

Table C-2. Least Bell's Vireo nest placement preferences, monitored sites in the Santa Ana River Watershed, 2001-2010, BY MANAGED SITE

SYCAMORE CANYON

Host Plant Species	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Totals
Black Willow (<i>Salix gooddingii</i>)					3			2	4			9
Elderberry (<i>Sambucus mexicanus</i>)									1			1
Totals					3			2	5			10

HARRISON RESERVOIR/RAVINE

Host Plant Species	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Totals
Black Willow (<i>Salix gooddingii</i>)					2		2	1				5
Arroyo Willow (<i>Salix lasiolepis</i>)						1		1				2
Elderberry (<i>Sambucus mexicana</i>)					1						1	2
Fig (<i>Ficus sp.</i>)								1				1
Totals					3	1	2	3			1	10

Table C-2. Least Bell's Vireo nest placement preferences, monitored sites in the Santa Ana River Watershed, 2001-2009,
 BY MANAGED SITE
 MOCKINGBIRD CANYON

Host Plant Species	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Totals
Black Willow (<i>Salix gooddingii</i>)				2	5	11	5	1		2	26
Red Willow (<i>Salix laevigata</i>)				6	1		2	4	6	11	30
Elderberry (<i>Sambucus mexicana</i>)				3	1	3	3	1	2		13
Wild Grape (<i>Vitis girdiana</i>)						4	1	1			6
Mulefat (<i>Baccharis salicifolia</i>)				1			1	1	1	1	5
Peruvian Pepper Tree (<i>Schinus molle</i>)						1		1			2
Emory's Baccharis (<i>Baccharis emoryii</i>)									2		2
Pepperweed (<i>Lepidium latifolium</i>)					1			1	1		3
Willow species/Pepperwed (<i>Salix sp./Lepidium latifolium</i>)				1							1
Arroyo Willow (<i>Salix lasiolepis</i>)				1					1		2
Willow species (<i>Salix spp.</i>)				1							1
Sycamore (<i>Platanus racemosa</i>)				1							1
Wild Celery (<i>Apium graveolens</i>)								1			1
Pepperweed (<i>Lepidium latifolium</i>) and Black Willow (<i>Salix gooddingii</i>)					1						1
Black Willow (<i>Salix gooddingii</i>) and Grape (<i>Vitis girdiana</i>)					1						1
Dead <i>Salix sp.</i>									1		1
Dead <i>L. latifolium</i>									1		1
Black Walnut (<i>Juglans californica</i>)										1	1
Totals				16	10	19	12	11	15	15	98

Table C-2. Least Bell's Vireo nest placement preferences, monitored sites in the Santa Ana River Watershed, 2001-2009, BY MANAGED SITE

SANTA ANA RIVER – FAIRMOUNT PARK TO HIDDEN VALLEY

Host Plant Species	2000	2001	2002*	2003**	2004	2005	2006	2007	2008	2009	Totals
Arroyo Willow (<i>Salix lasiolepis</i>)			1		5	6	5	7		4	28
Mulefat (<i>Baccharis salicifolia</i>)			2	3	6	5	3	2		5	26
Black Willow (<i>Salix gooddingii</i>)			4	3		2				1	10
Fremont Cottonwood (<i>Populus fremontii</i>)			1			3				3	7
Elderberry (<i>Sambucus mexicana</i>)					1	2					3
Red Willow (<i>Salix laevigata</i>)				2						4	6
Scrub Oak (<i>Quercus spp.</i>)							1	1			2
Narrow-leafed Willow (<i>Salix exigua</i>)				1						1	2
Yellow Willow (<i>Salix lucida spp. lasiandra</i>)					1						1
Willow species (<i>Salix spp.</i>)			1								1
Stinging Nettle (<i>Urtica dioica</i>)						1					1
Wild Rose (<i>Rosa californica</i>)				1							1
Black Willow (dead) (<i>Salix gooddingii</i>)				1							1
Dead Black Willow (<i>Salix gooddingii</i>) & Nettle (<i>Urtica dioica</i>)										1	1
Tamarisk (<i>Tamarix ramosissima</i>)				1							1
Totals			9	12	13	19	9	10		19	91
*Van Buren to Hidden Valley											
**Fairmount Park to Van Buren Blvd											

Table C-2. Least Bell's Vireo nest placement preferences, monitored sites in the Santa Ana River Watershed, 2001-2009, BY MANAGED SITE

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

Host Plant Species	2000	2001*	2002*	2003*	2004	2005	2006	2007	2008	2009	Totals
Arroyo Willow (<i>Salix lasiolepis</i>)				2	7	5	16	13	11	16	70
Black Willow (<i>Salix gooddingii</i>)		1	1	3	18	2	7	4	1	2	39
Mulefat (<i>Baccharis salicifolia</i>)			2	3	10	1	3	8	12	24	63
Wild Grape (<i>Vitis girdiana</i>)		1		1			3	2	1	1	9
Narrow-leafed Willow (<i>Salix exigua</i>)					4			1	2	1	8
Poison Hemlock (<i>Conium maculatum</i>)					1	3					4
Fremont Cottonwood (<i>Populus fremontii</i>)						1	2	1	4	3	11
Elderberry (<i>Sambucus mexicana</i>)				1	1						2
Ash (<i>Fraxinus sp.</i>)		1									1
Dead <i>B. salicifolia</i>									2		2
Black Willow/Poison Hemlock (<i>Salix gooddingii/Conium maculatum</i>)							1				1
Totals		3	3	10	41	12	32	29	33	47	210

*River Rd to Hidden Valley, south side

Table C-2. Least Bell's Vireo nest placement preferences, monitored sites in the Santa Ana River Watershed, 2001-2009, BY MANAGED SITE

HIDDEN VALLEY

Host Plant Species	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Totals
Arroyo Willow (<i>Salix lasiolepis</i>)	4	3	4	2	10	2	5	4	2	7	43
Mulefat (<i>Baccharis salicifolia</i>)	1	5	3	3	5	2	1	2	1	6	29
Black Willow (<i>Salix gooddingii</i>)	2		6		1		2		2	2	15
Wild Grape (<i>Vitis girdiana</i>)			2			1	1	1	1		6
Red Willow (<i>Salix laevigata</i>)	1	1			1			1			4
Willow species (<i>Salix spp.</i>)				1		1					2
Narrow-leafed Willow (<i>Salix exigua</i>)								1			1
Yellow Willow (<i>Salix lucida spp. lasiandra</i>)						1					1
Elderberry (<i>Sambucus mexicana</i>)				1					1	1	3
Poison Oak (<i>Toxicodendron diversilobum</i>)		1									1
Coyote Bush (<i>Baccharis pilularis</i>)		1									1
Blackberry/Willow sp. (<i>Rubus ursinus/Salix sp.</i>)				1							1
S. lasiolepis/fresh water reed									1		1
Rose (<i>Rosa californica</i>) & Wild Grape (<i>Vitis girdiana</i>)										1	1
Totals	8	11	15	8	17	7	9	9	8	17	109

Table C-2. Least Bell's Vireo nest placement preferences, monitored sites in the Santa Ana River Watershed, 2001-2009, BY MANAGED SITE

TEMESCAL CANYON

Host Plant Species	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Totals
Mulefat (<i>Baccharis salicifolia</i>)		1	4	7	7	14	2	2	13	15	65
Arroyo Willow (<i>Salix lasiolepis</i>)				1	2	6	8	6	18	20	61
Black Willow (<i>Salix gooddingii</i>)		1		3	4		6	3	1		18
Yellow Willow (<i>Salix lucida</i> spp. <i>lasiandra</i>)								3			3
Mugwort (<i>Artemisia douglasiana</i>)				1							1
Toyon (<i>Heteromeles arbutifolia</i>)								1			1
Poison Oak (<i>Toxicodendron diversilobum</i>)								1			1
Arrowweed (<i>Pluchea</i> sp.)							1				1
Coyote Bush (<i>Baccharis pilularis</i>)			1								1
Pepperweed (<i>Lepidium latifolium</i>)				1							1
Common Sunflower (<i>Helianthus annuus</i>)					1						1
Cottonwood (<i>Populus fremontii</i>)									1	1	2
Sycamore (<i>Platanus racemosa</i>)									1		1
Elderberry (<i>Sambucus mexicana</i>)										1	1
Dead <i>Salix</i> sp.										1	1
<i>S. lasiolepis</i> /Stinging Nettle (<i>Urtica dioica</i>) (dead)									1		1
<i>B. salicifolia</i> (dead)									1	2	3
Tamarisk (<i>Tamarix ramosissima</i>)										1	1
Deadfall										2	2
Totals		2	5	13	14	20	17	16	36	43	166

Table C-2. Least Bell's Vireo nest placement preferences, monitored sites in the Santa Ana River Watershed, 2001-2009,
 BY MANAGED SITE **SANTA ANA CANYON – UPPER CANYON**

Host Plant Species	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Totals
Mulefat (<i>Baccharis salicifolia</i>)		4	7	11	5	3	1	2			33
Elderberry (<i>Sambucus mexicana</i>)		3		5		2	1	2	1		14
Black Willow (<i>Salix gooddingii</i>)			2	3			1	3		1	10
Poison Oak (<i>Toxicodendron diversilobum</i>)			5								5
Fremont Cottonwood (<i>Populus fremontii</i>)		2	1	1						1	5
Wild Grape (<i>Vitis girdiana</i>)		1	3								4
Wild Rose (<i>Rosa californica</i>)			1			2					3
Red Willow (<i>Salix laevigata</i>)		1	1					1			3
Arroyo Willow (<i>Salix lasiolepis</i>)			2								2
Mustard (<i>Brassica</i> spp.)		1		1							2
Poison Hemlock (<i>Conium maculatum</i>)			1			1					2
Toyon (<i>Heteromeles arbutifolia</i>)						1					1
Scrub Oak (<i>Quercus berberidifolia</i>)								1	1		2
Willow species (<i>Salix</i> spp.)							1				1
Cockleburr (<i>Xanthium strumarium</i>)						1					1
Narrow-leaved Willow (<i>Salix exigua</i>)				1							1

Table C-2. Least Bell's Vireo nest placement preferences, monitored sites in the Santa Ana River Watershed, 2001-2009, BY MANAGED SITE

SANTA ANA CANYON – UPPER CANYON (CONT.)

Host Species	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Totals
Peruvian Pepper Tree (<i>Schinus molle</i>)					1						1
Coast Live Oak (<i>Quercus agrifolia</i>)						1					1
Milk Thistle (<i>Silybum marianum</i>)				1							1
Coyote Bush (<i>Baccharis pilularis</i>)			1								1
Broom Baccharis (<i>Baccharis sarothroides</i>)			1								1
Castor Bean (<i>Rincus communis</i>)					1						1
Black Willow/Poison Hemlock (<i>Salix gooddingii/Conium maculatum</i>)		1									1
Totals		13	25	23	7	11	4	9	2	2	96

Table C-2. Least Bell's Vireo nest placement preferences, monitored sites in the Santa Ana River Watershed, 2001-2009, BY MANAGED SITE SANTA ANA CANYON – GREEN RIVER GOLF CLUB

Host Plant Species	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Totals
Mulefat (<i>Baccharis salicifolia</i>)		6	3	4	3	5		4	4	6	35
Black Willow (<i>Salix gooddingii</i>)			1		1		2		1		5
Fremont Cottonwood (<i>Populus fremontii</i>)		1	2							1	4
Elderberry (<i>Sambucus mexicana</i>)			2	1					1		4
Laruel Sumac (<i>Malosma laurina</i>)				1	1	1					3
Arroyo Willow (<i>Salix lasiolepis</i>)				2							2
Red Willow (<i>Salix laevigata</i>)		1	1						1	1	4
Poison Hemlock (<i>Conium maculatum</i>)		1				1					2
Coyote Bush (<i>Baccharis pilularis</i>)		1	1								2
Narrow-leaved Willow (<i>Salix exigua</i>)							1				1
Toyon (<i>Heteromeles arbutifolia</i>)							1				1
Wild Grape (<i>Vitis girdiana</i>)		1									1
Myoporum (<i>Myoporum luteum</i>)						1					1
Peruvian Pepper Tree (<i>Schinus molle</i>)							1		1		2
Giant Reed (<i>Arundo donax</i>)							1				1
California Sagebrush (<i>Artemisia californica</i>)			1								1
Poison Oak (<i>Toxicodendron diversilobum</i>)					1						1
Elderberry and Wild Grape (<i>Sambucus mexicana/Vitis girdiana</i>)										1	1
Wax Leaf Privet (<i>Ligustrum sp.</i>)										1	1
Totals		11	11	8	6	8	6	4	8	10	72

*nest sites found in areas burned by Nov 2008 Freeway Complex Fire in the Santa Ana Canyon

^ Pair remained in the same territory but nest placed in other vegetation when vegetation historically used was burned

Table C-2. Least Bell's Vireo nest placement preferences, monitored sites in the Santa Ana River Watershed, 2001-2009, BY MANAGED SITE

SANTA ANA RIVER – FEATHERLY PARK

Host Plant Species	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Totals
Mulefat (<i>Baccharis salicifolia</i>)			3		3	7	2	1	6	1	23
Elderberry (<i>Sambucus mexicana</i>)				1	2	2	4		1	1	11
Black Walnut (<i>Juglans californica</i>)				1		1	2				4
Black Willow (<i>Salix gooddingii</i>)					1	2		5	1	4	13
Laruel Sumac (<i>Malosma laurina</i>)					1	1	1				3
Arroyo Willow (<i>Salix lasiolepis</i>)					2				1		3
Red Willow (<i>Salix laevigata</i>)			1	1							2
Narrow-leaved Willow (<i>Salix exigua</i>)			1		1					2	4
Poison Hemlock (<i>Conium maculatum</i>)			1			1					2
Fremont Cottonwood (<i>Populus fremontii</i>)					1		1	1	1		4
Yellowspine Thistle (<i>Cirsium ochrocentrum</i>)					1	1					2
Mulefat (<i>Baccharis salicifolia</i>) and Wild Grape (<i>Vitis girdiana</i>)								2			2
Willow species (<i>Salix spp.</i>)					1						1
Poison Oak (<i>Toxicodendron diversilobum</i>)								1			1
Toyon (<i>Heteromeles arbutifolia</i>)							1				1
Wild Grape (<i>Vitis girdiana</i>)									1		1
White Alder (<i>Alnus rhombifolia</i>)									1		1
Dead Black Willow (<i>S. gooddingii</i>) (covered w/ living Black Willow)										1	1

Table C-2. Least Bell's Vireo nest placement preferences, monitored sites in the Santa Ana River Watershed, 2001-2009,
BY MANAGED SITE

SANTA ANA RIVER – FEATHERLY PARK (continued)

Host Plant Species	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Totals
Arroyo Willow (<i>S. lasiolepis</i>) & Black Mustard (<i>Brassica nigra</i>)										1	1
Black Mustard (<i>Brassica nigra</i>)										1	1
Orange Tree (<i>Rutaceae citrus sinensis</i>)										1	1
Cockleburr (<i>Xanithum strumaritum</i>)										1	1
Totals		0	6	3	13	15	11	10	12	13	83

Table C-2. Least Bell's Vireo nest placement preferences, monitored sites in the Santa Ana River Watershed, 2001-2009, BY MANAGED SITE

CHINO HILLS

Host Plant Species	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Totals
Black Willow (<i>Salix gooddingii</i>)				1	4		1	3			9
Mulefat (<i>Baccharis salicifolia</i>)					2	2					4
Red Willow (<i>Salix laevigata</i>)								3			3
Mugwort (<i>Artemisia douglasiana</i>)							3				3
Elderberry (<i>Sambucus mexicana</i>)					2						2
Toyon (<i>Heteromeles arbutifolia</i>)								1			1
Arroyo Willow (<i>Salix lasiolepis</i>)						1					1
Wild Grape (<i>Vitis girdiana</i>)					1						1
Totals				1	9	3	4	7			24

Table C-3. Least Bell's Vireo reproductive success and breeding biology data, monitored sites, in the Santa Ana River watershed, 2000-2010, BY MANAGED SITE

SAN JACINTO

Parameter		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Totals
A.	Number of pairs					2	5	5	7	9	15	43
B.	Number of breeding (nesting) pairs					2	4	4	6	9	14	39
C.	Number of breeding pairs that were well-monitored throughout the breeding season					1	1	2	5	6	14	29
D.	Number of 'known fledged young' OBSERVED					0	2	6	9	34	53	104
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season					0	0	4	9	27	53	93
F.	Average number of fledglings produced per breeding pair (minimum; D/B = 'productivity or breeding success')					0	0.5	1.5	1.5	3.8	3.8	2.7
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)					0	0	2.0	1.8	4.5	3.8	3.2
H.	Number of nests that were discovered					2	3	3	10	14	27	59
I.	Number of nests that were regularly monitored or 'tracked'					1	3	2	8	13	27	54
J.	Number of 'tracked' nests that were successful (% = J/I x 100)					(0/1) 0%	(1/3) 33%	(2/2) 100%	(3/8) 38%	(9/13) 69%	(17/27) 63%	(32/54) 59%
K.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=(K/I x100) (b)					(1/1) 100%	(1/3) 33%	(2/2) 100%	(4/8) 50%	(3/13) 23%	(7/27) 26%	(18/54) 33%
L.	Number of 'tracked' nests that were parasitized by cowbirds (% = L/I x 100)					(0/1) 0%	(1/3) 33%	(1/2) 50%	(1/8) 13%	(0/13) 0%	(3/27) 11%	(6/54) 11%

Table C-3. Least Bell's Vireo reproductive success and breeding biology data, monitored sites, in the Santa Ana River watershed, 2000-2010, BY MANAGED SITE

SAN JACINTO (CONT.)

	Parameter	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Totals
M.	A. Number of 'tracked' nests that failed as a result of reproductive failure					(0/1) 0%	(0/3) 0%	(0/2) 0%	(0/8) 0%	(1/13) 8%	(2/27) 7%	(3/54) 0.1%
	B. Number of 'tracked' nests that failed as a result of parasitism					(0/1) 0%	(1/3) 33%	(0/2) 0%	(1/8) 13%	(0/13) 0%	(1 or 2/27) 4-7%	(3 or 4/54) 0.1%
	C. Number of 'tracked' nests that failed as a result of predation – Predation Rate according to Vireo Working Group					(1/1) 100%	(1/3) 33%	(0/2) 0%	(4/8) 50%	(3/13) 23%	(6/27) 22%	(15/54) 28%
N.	Average clutch size					4.0	3.0	3.0	3.0	3.7	3.3	n/a
O.	Number of cowbird eggs found in or near vireo nests					0	3	2	1	0	3	9
P.	Number of cowbird nestlings removed from 'tracked' nests					0	0	0	0	0	0	0
Q.	Number of cowbird young fledged by vireo					0	2	0	0	0	0	2
R.	Number of 'manipulated' parasitized nests					0	1 (twice)	1	0	n/a	2	4
S.	Number of 'successful, manipulated' nests (% = S/R x 100)					n/a	(0/2) 0%	(1/1) 100%	n/a	n/a	(1/2) 50%	(2/5) 40%
T.	Number of vireo fledged from 'manipulated' parasitized nests					n/a	0	3	n/a	n/a	1	4
U.	Number of repaired nests					0	1	0	0	0	1	2
V.	% successful repaired nests					n/a	(1/1) 100%	n/a	n/a	n/a	(1/1) 100%	(2/2) 100%
W.	Number of vireo fledged from repaired nests					n/a	2	n/a	n/a	n/a	4	6

Table C-3. Least Bell's Vireo reproductive success and breeding biology data, monitored sites, in the Santa Ana River watershed, 2000-2010, BY MANAGED SITE

SAN TIMOTEO CANYON

Parameter		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Totals
A.	Number of pairs	2	4	13	13	28	35	29	50	65	84	n/a
B.	Number of breeding (nesting) pairs	n/d	4	12	12	26	27	28	48	60	70	287
C.	Number of breeding pairs that were well-monitored throughout the breeding season	n/d	2	11	10	22	13	23	29	32	41	183
D.	Number of 'known fledged young' OBSERVED	2	11	15	28	18	36	66	102	165	192	635
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season	n/d	6	12	28	17	25	59	76	114	160	497
F.	Average number of fledglings produced per breeding pair (minimum; D/B = 'productivity or breeding success')	n/d	2.8	1.3	2.3	0.7	1.3	2.4	2.1	2.8	2.7	2.2
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)	n/d	3	1.1	2.8	0.8	1.9	2.6	2.6	3.6	3.9	2.7
H.	Number of nests that were discovered	n/d	4	20	24	41	49	36	47	78	89	388
I.	Number of nests that were regularly monitored or 'tracked'	n/d	4	17	21	31	34	33	44	75	79	338
J.	Number of 'tracked' nests that were successful (% = J/I x 100)	n/d	100% (4/4)	35% (6/17)	48% (10/21)	29% (9/31)	44% (15/34)	64% (21/33)	61% (27/44)	65% (49/75)	65% (51/79)	57% (192*/ 338)
K.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) % = K/I x 100 (b)	n/d	25% (1/4)	41% (7/17)	76% (16/21)	77% (24/31)	62% (21/34)	33% (11/33)	32% (14/44)	33% (25/75)	39% (31/79)	44% (150*/ 338)
L.	Number of 'tracked' nests that were parasitized by cowbirds (% = L/I x 100)	n/d	75% (3/4)	65% (11/17)	24% (5/21)	74% (23/31)	53% (18/34)	42% (14/33)	16% (7/44)	19% (14/75)	10% (8/79)	30% (103/338)

*corrected value 2-24-12

Table C-3. Least Bell's Vireo reproductive success and breeding biology data, monitored sites, in the Santa Ana River watershed, 2000-2010, BY MANAGED SITE

SAN TIMOTEO CANYON (CONT.)

	Parameter	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Totals
M.	A. Number of 'tracked' nests that failed as a result of reproductive failure	n/d	0% (0/4)	0% (0/17)	0% (0/21)	0% (0/31)	6% (2/34)	0% (0/33)	2% (1/44)	4% (3/75)	1% (1/79)	2% (7/338)
	B. Number of 'tracked' nests that failed as a result of parasitism	n/d	0% (0/4)	29% (5/17)	0% (0/21)	6% (2/31)	15% (5/34)	12% (4/33)	9% (4/44)	5% (4/75)	1% (1/79)	7% (25/338)
	C. Number of 'tracked' nests that failed as a result of predation – Predation Rate according to Vireo Working Group	n/d	0% (0/4)	35% (6/17)	52% (11/21)	65% (20/31)	35%* (12/34)	24% (8/33)	27% (12/44)	25% (19/75)	33% (26/79)	34% (114/338)
N.	Average clutch size	n/d	3.0	3.3	3.8	3.9	3.3	3.4	3.3	3.5	3.5	n/a
O.	Number of cowbird eggs found in or near vireo nests	n/d	3	10	7	25	29	14	7	15	8	118
P.	Number of cowbird nestlings removed from 'tracked' nests	n/d	0	3	0	2	0	0	1	0	0	6
Q.	Number of cowbird young fledged by vireo	n/d	0	0	1	1	0	0	0	0	0	2
R.	Number of 'manipulated' parasitized nests	n/d	3	11	6	18	14	9	5	10	8	84
S.	Number of 'successful, manipulated' nests (% = S/R x 100)	n/d	100% (3/3)	9% (1/11)	67% (4/6)	33% (6/18)	57% (8/14)	67% (6/9)	60% (3/5)*	70% (7/10)	38% (3/8)	49% (41/84)
T.	Number of vireo fledged from 'manipulated' parasitized nests	n/d	6	2	9	11	13	16	5	18	8	88
U.	Number of repaired nests	n/d	n/d	n/d	1	0	0	0	2	0	0	3
V.	% successful repaired nests	n/d	n/d	n/d	(1/1) 100%	n/a	n/a	n/a	(1/2) 50%	n/a	n/a	66.7% (2/3)
W.	Number of vireo fledged from repaired nests	n/d	n/d	n/d	4	n/a	n/a	n/a	1	n/a	n/a	5

*corrected value 2-24-12

Table C-3. Least Bell's Vireo reproductive success and breeding biology data, monitored sites, in the Santa Ana River watershed, 2000-2010 BY MANAGED SITE

MARCH SKR PRESERVE

Parameter		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Totals
A.	Number of pairs					7	5	3	4	5	10	n/a
B.	Number of breeding (nesting) pairs					7	5	2	4	5	7	30
C.	Number of breeding pairs that were well-monitored throughout the breeding season					2	3	0	1		3	9 (n=4 yrs)
D.	Number of 'known fledged young' OBSERVED					20	9	4	9	5	28	75
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season					11	6	n/d	3		18	38 (n=4 yrs)
F.	Average number of fledglings produced per breeding pair (minimum; D/B = 'productivity or breeding success')					2.9	1.8	2.0	2.3	1.0	4.0	2.5
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)					5.5	2	n/d	3		6.0	4.2
H.	Number of nests that were discovered					3	6	n/d	2		6	17
I.	Number of nests that were regularly monitored or 'tracked'					3	6	n/d	2		5	16
J.	Number of 'tracked' nests that were successful (% = J/I x 100)					67% (2/3)	33% (2/6)	n/d	100% (2/2)		100% (5/5)	68.8% (11/16)
K.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)					33% (1/3)	67% (4/6)	n/d	50% (1/2)		0% (0/5)	37.5% (6/16)
L.	Number of 'tracked' nests that were parasitized by cowbirds (% = L/I x 100)					0% (0/3)	0% (0/6)	n/d	0% (0/2)		0% (0/5)	0% (0/16)

Table C-3. Least Bell's Vireo reproductive success and breeding biology data, monitored sites, in the Santa Ana River watershed, 2000-2010, BY MANAGED SITE

MARCH SKR PRSERVE (CONT.)

	Parameter	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Totals
M.	A. Number of 'tracked' nests that failed as a result of reproductive failure					0% (0/3)	0% (0/6)	n/d	0% (0/2)		0% (0/5)	0.0% (0/16)
	B. Number of 'tracked' nests that failed as a result of parasitism					0% (0/3)	0% (0/6)	n/d	0% (0/2)		0% (0/5)	0.0% (0/16)
	C. Number of 'tracked' nests that failed as a result of predation – Predation Rate according to Vireo Working Group					33% (1/3)	67% (4/6)	n/d	0% (0/2)		0% (0/5)	31.2% (5/16)
N.	Average clutch size					4.0	3.6	n/d	3.0		3.7	n/a
O.	Number of cowbird eggs found in or near vireo nests					0	0	n/d	0		0	0
P.	Number of cowbird nestlings removed from 'tracked' nests					0	0	n/d	0		0	0
Q.	Number of cowbird young fledged by vireo					0	0	n/d	0		0	0
R.	Number of 'manipulated' parasitized nests					0	0	n/d	0		0	0
S.	Number of 'successful, manipulated' nests (% = S/R x 100)					n/a	n/a	n/d	n/a		n/a	n/a
T.	Number of vireo fledged from 'manipulated' parasitized nests					n/a	n/a	n/d	n/a		n/a	n/a
U.	Number of repaired nests					0	0	n/d	0		0	0
V.	% successful repaired nests					n/a	n/a	n/d	n/a		n/a	n/a
W.	Number of vireo fledged from repaired nests					n/a	n/a	n/d	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, 2000-2010, BY MANAGED SITE

SYCAMORE CANYON

Parameter		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Totals
A.	Number of pairs					5	7	2	5	8	8	n/a
B.	Number of breeding (nesting) pairs					5	n/d	n/d	3	7	4	19
C.	Number of breeding pairs that were well-monitored throughout the breeding season					2	n/d	n/d	1	3	0	6
D.	Number of 'known fledged young' OBSERVED					9	1	n/d	8	13	9	40
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season					4	n/d	n/d	3	5	n/a	12
F.	Average number of fledglings produced per breeding pair (minimum; D/B = 'productivity or breeding success')					1.8	n/d	n/d	2.7	1.9	2.3	2.1
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)					2	n/d	n/d	3	1.7	n/a	2.0
H.	Number of nests that were discovered					3	n/d	0	2	5	0	10
I.	Number of nests that were regularly monitored or 'tracked'					3	n/d	n/d	2	4	n/a	9
J.	Number of 'tracked' nests that were successful (% = J/I x 100)					67% (2/3)	n/d	n/d	100% (2/2)	50% (2/4)	n/a	66.7% (6/9)
K.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)					67% (2/3)	n/d	n/d	0% (0/2)	25% (1/4)	n/a	33.3% (3/9)
L.	Number of 'tracked' nests that were parasitized by cowbirds (% = L/I x 100)					33% (1/3)	n/d	n/d	0% (0/2)	25% (1/4)	n/a	22.2% (2/9)

Table C-3. Least Bell's Vireo reproductive success and breeding biology data, monitored sites, in the Santa Ana River watershed, 2000-2010, BY MANAGED SITE

SYCAMORE CANYON (CONT.)

	Parameter	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Totals
M.	A. Number of 'tracked' nests that failed as a result of reproductive failure					0% (0/3)	n/d	n/d	0% (0/2)	0% (0/4)	n/a	0% (0/9)
	B. Number of 'tracked' nests that failed as a result of parasitism					0% (0/3)	n/d	n/d	0% (0/2)	25% (1/4)	n/a	11.1% (1/9)
	C. Number of 'tracked' nests that failed as a result of predation – Predation Rate according to Vireo Working Group					33% (1/3)	n/d	n/d	0% (0/2)	25% (1/4)	n/a	22.2% (2/9)
N.	Average clutch size					2.7	n/d	n/d	3.0	3.0	n/a	n/a
O.	Number of cowbird eggs found in or near vireo nests					1	n/d	n/d	0	1	n/a	2
P.	Number of cowbird nestlings removed from 'tracked' nests					0	n/d	n/d	0	0	0	0
Q.	Number of cowbird young fledged by vireo					0	n/d	n/d	0	0	n/a	0
R.	Number of 'manipulated' parasitized nests					1	n/d	n/d	0	0	n/a	1
S.	Number of 'successful, manipulated' nests (% = S/R x 100)					100% (1/1)	n/d	n/d	0	n/a	n/a	100% (1/1)
T.	Number of vireo fledged from 'manipulated' parasitized nests					1	n/d	n/d	n/a	n/a	n/a	1
U.	Number of repaired nests					0	n/d	n/d	0	0	n/a	0
V.	% successful repaired nests					n/a	n/d	n/d	n/a	n/a	n/a	n/d
W.	Number of vireo fledged from repaired nests					n/a	n/d	n/d	n/a	n/a	n/a	n/d

Table C-3. Least Bell's Vireo reproductive success and breeding biology data, monitored sites, in the Santa Ana River watershed, 2000-2010, BY MANAGED SITE

MOCKINGBIRD CANYON

Parameter		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Totals
A.	Number of pairs				8	8	13	14	21	21	35	n/a
B.	Number of breeding (nesting) pairs				8	8	12	13	17	20	32	110
C.	Number of breeding pairs that were well-monitored throughout the breeding season				3	5	6	8	6	7	2	37
D.	Number of 'known fledged young' OBSERVED				4	19	29	36	30	35	65	218
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season				4	15	23	25	15	21	10	113
F.	Average number of fledglings produced per breeding pair (minimum; D/B = 'productivity or breeding success')				0.5	2.4	2.4	2.8	1.8	1.8	2.0	2.0
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)				1.3	3	3.8	3.1	2.5	3.0	5.0	3.0
H.	Number of nests that were discovered				16	10	17	12	11	17	16	99
I.	Number of nests that were regularly monitored or 'tracked'				13	9	15	12	9	12	12	82
J.	Number of 'tracked' nests that were successful (% = J/I x 100)				15% (2/13)	44% (4/9)	53% (8/15)	75% (9/12)	56% (5/9)	58% (7/12)	83% (10/12)	54.9% (45/82)
K.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)				85% (11/13)	33% (3/9)	53% (8/15)	25% (3/12)	22% (2/9)	25% (3/12)	8% (1/12)	37.8% (31/82)
L.	Number of 'tracked' nests that were parasitized by cowbirds (% = L/I x 100)				62% (8/13)	0% (0/9)	7% (1/15)	0% (0/12)	0% (0/9)	17% (2/12)	8% (1/12)	14.6% (12/82)

Table C-3. Least Bell's Vireo reproductive success and breeding biology data, monitored sites, in the Santa Ana River watershed, 2000-2010, BY MANAGED SITE

MOCKINGBIRD CANYON (CONT.)

	Parameter	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Totals
M.	A. Number of 'tracked' nests that failed as a result of reproductive failure				0% (0/13)	22% (2/9)	7% (1/15)	8% (1/12)	22% (2/9)	8% (1/12)	0% (0/12)	8.5% (7/82)
	B. Number of 'tracked' nests that failed as a result of parasitism				31% (4/13)	0% (0/9)	0% (0/15)	0% (0/12)	0% (0/9)	8% (1/12)	8% (1/12)	7.3% (6/82)
	C. Number of 'tracked' nests that failed as a result of predation – Predation Rate according to Vireo Working Group				54% (7/13)	33% (3/9)	40% (6/15)	17% (2/12)	22% (2/9)	25% (3/12)	8% (1/12)	29.3% (24/82)
N.	Average clutch size				3.0	3.5	3.5	3.2	3.4	3.3	3.3	n/a
O.	Number of cowbird eggs found in or near vireo nests				19	0	1	0	0	2	0	22
P.	Number of cowbird nestlings removed from 'tracked' nests				0	0	0	0	0	1	1	2
Q.	Number of cowbird young fledged by vireo				1	0	0	0	0	0	0	1
R.	Number of 'manipulated' parasitized nests				7	0	1	0	0	2	0	10
S.	Number of 'successful, manipulated' nests (% = S/R x 100)				0% (0/7)	n/a	100% (1/1)	n/a	0	0% (0/2)	n/a	10% (1/10)
T.	Number of vireo fledged from 'manipulated' parasitized nests				0	n/a	2	n/a	n/a	0	n/a	2
U.	Number of repaired nests				0	0	0	1	0	0	0	1
V.	% successful repaired nests				n/a	n/a	n/a	100% (1/1)	n/a	n/a	n/a	100% (1/1)
W.	Number of vireo fledged from repaired nests				n/a	n/a	n/a	1	n/a	n/a	n/a	1

Table C-3. Least Bell's Vireo reproductive success and breeding biology data, monitored sites, in the Santa Ana River watershed, 2000-2010, BY MANAGED SITE

HARRISON RESERVOIR

Parameter		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Totals
A.	Number of pairs					3	1	2	3	1	1	n/a
B.	Number of breeding (nesting) pairs					3	1	2	3	1	1	11
C.	Number of breeding pairs that were well-monitored throughout the breeding season					2	1	1	2		0	6
D.	Number of 'known fledged young' OBSERVED					1	3	6	7		1	18
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season					1	3	4	6		n/a	14
F.	Average number of fledglings produced per breeding pair (minimum; D/B = 'productivity or breeding success')					0.3	3.0	3.0	2.3		n/a	1.8 (4 yrs.)
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)					0.5	3	4	3		n/a	2.3
H.	Number of nests that were discovered					3	1	2	3		0	9
I.	Number of nests that were regularly monitored or 'tracked'					2	1	2	2		0	7
J.	Number of 'tracked' nests that were successful (% = J/I x 100)					50% (1/2)	100% (1/1)	50% (1/2)	100% (2/2)		n/a	71.4% (5/7)
K.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)					50% (1/2)	0% (0/1)	50% (1/2)	0% (0/2)		n/a	28.6% (2/7)
L.	Number of 'tracked' nests that were parasitized by cowbirds (% = L/I x 100)					100% (2/2)	100% (1/1)	0% (0/2)	0% (0/2)		n/a	42.9% (3/7)

Table C-3. Least Bell's Vireo reproductive success and breeding biology data, monitored sites, in the Santa Ana River watershed, 2000-2010, BY MANAGED SITE

HARRISON RESERVOIR (CONT.)

	Parameter	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Totals
M.	A. Number of 'tracked' nests that failed as a result of reproductive failure					50% (1/2)	0% (0/1)	0% (0/2)	0% (0/2)		n/a	14.3% (1/7)
	B. Number of 'tracked' nests that failed as a result of parasitism					0% (0/2)	0% (0/1)	0% (0/2)	0% (0/2)		n/a	0% (0/7)
	C. Number of 'tracked' nests that failed as a result of predation – Predation Rate according to Vireo Working Group					0% (0/2)	0% (0/1)	50% (1/2)	0% (0/2)		n/a	14.3% (1/7)
N.	Average clutch size					n/a	n/a	3.5	3.5		n/a	n/a
O.	Number of cowbird eggs found in or near vireo nests					3	2	0	0		n/a	5
P.	Number of cowbird nestlings removed from 'tracked' nests					0	0	0	0		n/a	0
Q.	Number of cowbird young fledged by vireo					0	0	0	0		n/a	0
R.	Number of 'manipulated' parasitized nests					2	1	0	0		n/a	3
S.	Number of 'successful, manipulated' nests (% = S/R x 100)					50% (1/2)	100% (1/1)	n/a	n/a		n/a	66.7% (2/3)
T.	Number of vireo fledged from 'manipulated' parasitized nests					1	3	n/a	n/a		n/a	4
U.	Number of repaired nests					0	0	0	n/a		n/a	0
V.	% successful repaired nests					n/a	n/a	n/a	n/a		n/a	n/d
W.	Number of vireo fledged from repaired nests					n/a	n/a	n/a	n/a		n/a	n/d

Table C-3. Least Bell's Vireo reproductive success and breeding biology data, monitored sites, in the Santa Ana River watershed, 2000-2010, BY MANAGED SITE

SANTA ANA RIVER (RIVER RD. TO NORCO)

Parameter	2000	2001*	2002*	2003*	2004	2005	2006	2007	2008	2009	Totals
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A.	Number of pairs		4	4	8	23	26	26	31	43	68	n/a
B.	Number of breeding (nesting) pairs		4	4	8	23	22	25	28	42	68	224
C.	Number of breeding pairs that were well-monitored throughout the breeding season		1	3	6	21	0	12	11	22	29	105
D.	Number of 'known fledged young' OBSERVED		9	4	23	62	24	46	45	106	170	489
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season		3	3	18	57	n/a	27	22	77	108	315
F.	Average number of fledglings produced per breeding pair (minimum; D/B = 'productivity or breeding success')		2.6	1.0	2.9	2.7	1.1	1.8	1.6	2.5	2.5	2.23
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)		3	1	3	2.7	n/a	2.3	2	3.5	3.7	3.0
H.	Number of nests that were discovered		3	3	10	41	14	32	29	33	47	212
I.	Number of nests that were regularly monitored or 'tracked'		1	3	9	34	4	27	25	29	45	177
J.	Number of 'tracked' nests that were successful (% = J/I x 100)		100% (1/1)	33% (1/3)	67% (6/9)	65% (22/34)	100% (4/4)	41% (11/27)	44% (11/25)	79% (23/29)	80% (36/45)	65.0% (115/177)
K.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=(K/I x100) (b)		0% (0/1)	67% (2/3)	44% (4/9)	50% (17/34)	25% (1/4)	78% (21/27)	52% (13/25)	21% (6/29)	20% (9/45)	41.2% (73/177)
L.	Number of 'tracked' nests that were parasitized by cowbirds (% = L/I x 100)		0% (0/1)	33% (1/3)	0% (0/9)	0% (0/34)	25% (1/4)	22% (6/27)	16% (4/25)	7% (2/29)	2% (1/45)	8.5% (15/177)

Table C-3. Least Bell's Vireo reproductive success and breeding biology data, monitored sites, in the Santa Ana River watershed, 2000-2010, BY MANAGED SITE

SANTA ANA RIVER (RIVER RD. TO NORCO) (CONT.)

	Parameter	2000	2001*	2002*	2003*	2004	2005	2006	2007	2008	2009	Totals
M.	A. Number of 'tracked' nests that failed as a result of reproductive failure		0% (0/1)	0% (0/3)	0% (0/9)	3% (1/34)	0% (0/4)	6% (1/27)	12% (3/25)	0% (0/29)	2% (1/45)	3.4% (6/177)

	B. Number of 'tracked' nests that failed as a result of parasitism		0% (0/1)	0% (0/3)	0% (0/9)	0% (0/34)	0% (0/4)	25% (4/27)	0% (0/25)	0% (0/29)	0% (0/45)	2.3% (4/177)
	C. Number of 'tracked' nests that failed as a result of predation – Predation Rate according to Vireo Working Group		0% (0/1)	67% (2/3)	33% (3/9)	32% (11/34)	0% (0/4)	69% (11/27)	44% (11/25)	21% (6/29)	16% (7/45)	28.8% (45/177)
N.	Average clutch size		3.0	4.0	3.3	3.0	3.4	3.7	3.3	3.8	3.7	n/a
O.	Number of cowbird eggs found in or near vireo nests		0	1	0	0	3	7	5	3	1	20
P.	Number of cowbird nestlings removed from 'tracked' nests		0	0	0	0	0	1	0	0	0	1
Q.	Number of cowbird young fledged by vireo		0	0	0	0	0	0	0	0	0	0
R.	Number of 'manipulated' parasitized nests		0	1	0	0	3	3	4	2	1	13
S.	Number of 'successful, manipulated' nests (% = S/R x 100)		n/a	0% (0/1)	n/a	n/a	67% (2/3)	100% (3/3)	75% (3/4)	0% (0/2)	100% (1/1)	64.3% (9/14)
T.	Number of vireo fledged from 'manipulated' parasitized nests		n/a	0	n/a	n/a	2	4	4	0	3	13
U.	Number of repaired nests		n/d	n/d	0	0	0	0	1	0	1	2
V.	% successful repaired nests		n/d	n/d	n/d	n/a	n/a	n/a	0% (0/1)	n/a	100% (1/1)	50% (1/2)
W.	Number of vireo fledged from repaired nests		n/d	n/d	n/d	n/a	n/a	n/a	0	n/a	4	n/a

*River Rd to Hidden Valley, south side

Table C-3. Least Bell's Vireo reproductive success and breeding biology data, monitored sites, in the Santa Ana River watershed, 2000-2010, BY MANAGED SITE

SANTA ANA RIVER (FAIRMOUNT PARK TO HIDDEN VALLEY)

Parameter		2000	2001	2002*	2003**	2004	2005	2006	2007	2008	2009	Totals
A.	Number of pairs			12	13	21	19	14	21	21	46	n/a

B.	Number of breeding (nesting) pairs			11	13	16	18	14	15	19	43	149
C.	Number of breeding pairs that were well-monitored throughout the breeding season			0	0	8	15	9	9	0	10	51 (n=5 yrs)
D.	Number of 'known fledged young' OBSERVED			4	13	30	35	36	27	31	107	283
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season			0	n/a	26	35	23	19	n/d	30	133 (n=5 yrs)
F.	Average number of fledglings produced per breeding pair (minimum; D/B = 'productivity or breeding success')			0.4	1.0	1.9	1.9	2.6	1.8	1.6	2.5	1.9
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)			0	n/a	3.3	2.3	2.6	2.1	n/d	3.0	2.6 (n=5 yrs)
H.	Number of nests that were discovered			9	16	13	19	9	10		18	94
I.	Number of nests that were regularly monitored or 'tracked'			9	5	10	19	9	9		14	75
J.	Number of 'tracked' nests that were successful (% = J/I x 100)			11% (1/9)	60% (3/5)	80% (8/10)	63% (12/19)	89% (8/9)	67% (6/9)		93% (13/14)	68.0% (51/75)
K.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)			33% (3/9)	40% (2/5)	40% (4/10)	47% (9/19)	33% (3/9)	22% (2/9)		7% (1/14)	32.0% (24/75)
L.	Number of 'tracked' nests that were parasitized by cowbirds (% = L/I x 100)			67% (6/9)	20% (1/5)	20% (2/10)	16% (3/19)	0% (0/9)	0% (0/9)		0% (0/14)	16.0% (12/75)

Table C-3. Least Bell's Vireo reproductive success and breeding biology data, monitored sites, in the Santa Ana River watershed, 2000-2010, BY MANAGED SITE

SANTA ANA RIVER (FAIRMOUNT PARK TO HIDDEN VALLEY) (CONT.)

	Parameter	2000	2001	2002*	2003**	2004	2005	2006	2007	2008	2009	Totals
M.	A. Number of 'tracked' nests that failed as a result of reproductive failure			0% (0/9)	0% (0/5)	0% (0/10)	5% (1/19)	0% (0/9)	11% (1/9)		0% (0/14)	2.7% (2/75)
	B. Number of 'tracked' nests that failed as a result of parasitism			56% (5/9)	20% (1/5)	0% (0/10)	0% (0/19)	0% (0/9)	0% (0/9)		0% (0/14)	8.0% (6/75)
	C. Number of 'tracked' nests that failed as a result of predation – Predation Rate according to Vireo Working Group			33% (3/9)	20% (1/5)	20% (2/10)	32% (6/19)	11% (1/9)	22% (2/9)		7% (1/14)	21.3% (16/75)
N.	Average clutch size			n/a	3.9	3.9	3.7	3.4	3.4		3.4	n/a
O.	Number of cowbird eggs found in or near vireo nests			9	1	2	3	0	0		0	15
P.	Number of cowbird nestlings removed from 'tracked' nests			0	0	0	0	0	0		0	0
Q.	Number of cowbird young fledged by vireo			1	0	0	0	0	0		0	1
R.	Number of 'manipulated' parasitized nests			5	0	2	3	0	0		0	10
S.	Number of 'successful, manipulated' nests (% = S/R x 100)			20% (1/5)	n/a	50% (1/2)	0% (0/3)	n/a	n/a		n/a	20.0% (2/10)
T.	Number of vireo fledged from 'manipulated' parasitized nests			2	n/a	3	0	0	n/a		n/a	5
U.	Number of repaired nests			n/d	0	0	0	0	0		1	1
V.	% successful repaired nests			n/d	n/d	n/a	n/a	n/a	n/a		n/a	n/d
W.	Number of vireo fledged from repaired nests			n/d	n/d	n/a	n/a	n/a	n/a		n/a	n/d

*Van Buren Blvd to Hidden Valley

**Fairmount Park to Van Buren Blvd

Table C-3. Least Bell's Vireo reproductive success and breeding biology data, monitored sites, in the Santa Ana River watershed, 2000-2010, BY MANAGED SITE

HIDDEN VALLEY

Parameter		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Totals
A.	Number of pairs	11	13	21	18	27	27	24	24	28	37	n/a
B.	Number of breeding (nesting) pairs	9	12	20	18	26	24	21	21	26	35	212
C.	Number of breeding pairs that were well-monitored throughout the breeding season	6	7	5	0	9	1	5	7	4	12	56
D.	Number of 'known fledged young' OBSERVED	23	32	47	37	51	49	37	31	36	64	407
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season	16	17	12	n/a	21	6	14	15	10	31	142
F.	Average number of fledglings produced per breeding pair (minimum; D/B = 'productivity or breeding success')	2.6	2.7	2.4	2.1	2.0	2.0	1.7	1.5	1.4	1.8	1.9
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)	2.7	2.4	2.4	n/a	2.3	n/a	2.8	2.1	2.5	2.6	2.5
H.	Number of nests that were discovered	8	11	16	8	17	8	9	9	10	18	114
I.	Number of nests that were regularly monitored or 'tracked'	6	7	9	4	15	7	5	9	7	16	85
J.	Number of 'tracked' nests that were successful (% = J/I x 100)	100% (6/6)	86% (6/7)	78% (7/9)	100% (4/4)	60% (9/15)	57% (4/7)	80% (4/5)	44% (4/9)	43% (3/7)	69% (11/16)	68% (58/85)
K.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) % = K/I x 100 (b)	0% (0/6)	29% (2/7)	33% (3/9)	25% (1/4)	67% (10/15)	29% (2/7)	0% (0/5)	33% (3/9)	71% (5/7)	31% (5/16)	36% (31/85)
L.	Number of 'tracked' nests that were parasitized by cowbirds (% = L/I x 100)	0% (0/6)	0% (0/7)	0% (0/9)	0% (0/4)	0% (0/15)	14% (1/7)	0% (0/5)	44% (4/9)	0% (0/7)	6% (1/16)	7% (6/85)

Table C-3. Least Bell's Vireo reproductive success and breeding biology data, monitored sites, in the Santa Ana River watershed, 2000-2010, BY MANAGED SITE

HIDDEN VALLEY (CONT.)

	Parameter	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Totals
M.	A. Number of 'tracked' nests that failed as a result of reproductive failure	0% (0/6)	0% (0/7)	0% (0/9)	0% (0/4)	0% (0/15)	0% (0/7)	20% (1/5)	0% (0/9)	0% (0/7)	13% (2/16)	4% (3/85)
	B. Number of 'tracked' nests that failed as a result of parasitism	0% (0/6)	0% (0/7)	0% (0/9)	0% (0/4)	0% (0/15)	14% (1/7)	0% (0/5)	22% (2/9)	0% (0/7)	6% (1/16)	5% (4/85)
	C. Number of 'tracked' nests that failed as a result of predation – Predation Rate according to Vireo Working Group	0% (0/6)	14% (1/7)	22% (2/9)	0% (0/4)	40% (6/15)	29% (2/7)	0% (0/5)	33% (3/9)	57% (4/7)	13% (2/16)	24% (20/85)
N.	Average clutch size	3.7	3.9	3.5	4.0	3.5	3.5	4.0	3.2	3.7	3.5	n/a
O.	Number of cowbird eggs found in or near vireo nests	0	0	0	0	0	1	0	2	0	1	4
P.	Number of cowbird nestlings removed from 'tracked' nests	0	0	0	0	0	0	0	2	0	0	2
Q.	Number of cowbird young fledged by vireo	0	0	0	0	0	0	0	0	0	0	0
R.	Number of 'manipulated' parasitized nests	0	0	0	0	0	0	0	2	0	0	2
S.	Number of 'successful, manipulated' nests (% = S/R x 100)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	100% (2/2)	n/a	n/a	100% (2/2)
T.	Number of vireo fledged from 'manipulated' parasitized nests	n/a	n/a	n/a	n/a	n/a	n/a	n/a	6	n/a	n/a	6
U.	Number of repaired nests	n/d	n/d	n/d	0	0	0	0	0	0	0	0
V.	% successful repaired nests	n/d	n/d	n/d	n/d	n/a	n/a	n/a	n/a	n/a	n/a	n/d
W.	Number of vireo fledged from repaired nests	n/d	n/d	n/d	n/d	n/a	n/a	n/a	n/a	n/a	n/a	n/d

Table C-3. Least Bell's Vireo reproductive success and breeding biology data, monitored sites, in the Santa Ana River watershed, 2000-2010, BY MANAGED SITE

TEMESCAL CANYON

Parameter		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Totals
A.	Number of pairs		1	6	10	8	9	13	26	35	56	n/a
B.	Number of breeding (nesting) pairs		1	6	9	8	9	13	21	33	46	146
C.	Number of breeding pairs that were well-monitored throughout the breeding season		0	4	7	8	1	10	8	19	24	81
D.	Number of 'known fledged young' OBSERVED		6	6	21	19	42	29	25	73	118	339
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season		n/a	4	15	19	5	24	8	56	86	217
F.	Average number of fledglings produced per breeding pair (minimum; D/B = 'productivity or breeding success')		6.0	1.0	2.3	2.4	4.7	2.2	1.2	2.2	2.6	2.3
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)		n/a	1	2.1	2.4	n/a	2.4	1	2.9	3.6	2.7
H.	Number of nests that were discovered		2	5	13	14	20	17	16	36	43	166
I.	Number of nests that were regularly monitored or 'tracked'		1	4	11	12	10	12	12	32	39	133
J.	Number of 'tracked' nests that were successful (% = J/I x 100)		100% (1/1)	25% (1/4)	55% (6/11)	58% (7/12)	80% (8/10)	67% (8/12)	33% (4/12)	63% (20/32)	69% (27/39)	61.6% (82/133)
K.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)		0% (0/1)	75% (3/4)	45% (5/11)	42% (5/12)	20% (2/10)	50% (6/12)	58% (7/12)	50% (16/32)	21% (8/39)	39.1% (52/133)
L.	Number of 'tracked' nests that were parasitized by cowbirds (% = L/I x 100)		0% (0/1)	2% (1/4)	27% (3/11)	0% (0/12)	30% (3/10)	25% (3/12)	42% (5/12)	22% (7/32)	13% (5/39)	20.3% (27/133)

Table C-3. Least Bell's Vireo reproductive success and breeding biology data, monitored sites, in the Santa Ana River watershed, 2000-2010, BY MANAGED SITE

TEMESCAL CANYON (CONT.)

	Parameter	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Totals
M.	A. Number of 'tracked' nests that failed as a result of reproductive failure		0% (0/1)	0% (0/4)	9% (1/11)	0% (0/12)	0% (0/10)	8% (1/12)	8% (1/12)	0% (0/32)	5% (2/39)	3.8% (5/133)
	B. Number of 'tracked' nests that failed as a result of parasitism		0% (0/1)	0% (0/4)	0% (0/11)	0% (0/12)	0% (0/10)	0% (0/12)	8% (1/12)	3% (1/32)	5% (2/39)	3.0% (4/133)
	C. Number of 'tracked' nests that failed as a result of predation – Predation Rate according to Vireo Working Group		0% (0/1)	75% (3/4)	36% (4/11)	42% (5/12)	20% (2/10)	25% (3/12)	50% (6/12)	34% (11/32)	21% (8/39)	31.6% (42/133)
N.	Average clutch size		3.0	3.6	3.6	3.0	3.7	3.8	3.8	3.7	3.7	n/a
O.	Number of cowbird eggs found in or near vireo nests		0	1	3	0	3	3	6	8	9	33
P.	Number of cowbird nestlings removed from 'tracked' nests		0	0	0	0	0	0	0	0	2	2
Q.	Number of cowbird young fledged by vireo		0	0	0	0	0	1	1	0	0	2
R.	Number of 'manipulated' parasitized nests		0	1	3	0	3	3	5	7	7	29
S.	Number of 'successful, manipulated' nests (% = S/R x 100)		n/a	0% (0/1)	33% (1/3)	n/a	67% (2/3)	33% (1/3)	20% (1/5)	71% (5/7)	29% (2/7)	41.4% (12/29)
T.	Number of vireo fledged from 'manipulated' parasitized nests		n/a	0	3	n/a	5	1	1	12	4	26
U.	Number of repaired nests		n/d	n/d	0	0	0	0	0	0	0	0
V.	% successful repaired nests		n/d	n/d	n/d	n/a	n/a	n/a	n/a	n/a	n/a	n/d
W.	Number of vireo fledged from repaired nests		n/d	n/d	n/d	n/a	n/a	n/a	n/a	n/a	n/a	n/d

Table C-3. Least Bell's Vireo reproductive success and breeding biology data, monitored sites, in the Santa Ana River watershed, 2000-2010, BY MANAGED SITE

SANTA ANA CANYON – UPPER CANYON

Parameter		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Totals
A.	Number of pairs		12	18	18	20	17	13	11	11	6	n/a
B.	Number of breeding (nesting) pairs		11	17	18	15	17	10	10	6	6	110
C.	Number of breeding pairs that were well-monitored throughout the breeding season		8	11	11	4	2	2	7	0	1	46
D.	Number of 'known fledged young' OBSERVED		30	39	51	22	26	13	12	6	9	208
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season		23	27	33	13	5	5	8	n/a	4	118
F.	Average number of fledglings produced per breeding pair (minimum; D/B = 'productivity or breeding success')		2.7	2.3	2.8	1.5	1.5	1.3	1.2	1.0	1.5	1.9
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)		2.9	2.5	3	3.3	2.5	2.5	1.1	n/a	4.0	2.6
H.	Number of nests that were discovered		13	25	23	7	12	4	9	2	2	97
I.	Number of nests that were regularly monitored or 'tracked'		10	19	17	4	6	3	4	0	1	64
J.	Number of 'tracked' nests that were successful (% = J/I x 100)		80% (8/10)	53% (10/19)	71% (12/17)	75% (3/4)	50% (3/6)	67% (2/3)	50% (2/4)	n/a	100% (1/1)	64.1% (41/64)
K.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)		30% (3/10)	47% (9/19)	41% (7/17)	25% (1/4)	33% (2/6)	67% (2/3)	50% (2/4)	n/a	0% (0/1)	40.6% (26/64)
L.	Number of 'tracked' nests that were parasitized by cowbirds (% = L/I x 100)		10% (1/10)	0% (0/19)	18% (3/17)	0% (0/4)	0% (0/6)	0% (0/3)	0% (0/4)	n/a	0% (0/1)	6.3% (4/64)

Table C-3. Least Bell's Vireo reproductive success and breeding biology data, monitored sites, in the Santa Ana River watershed, 2000-2010, BY MANAGED SITE

SANTA ANA CANYON – UPPER CANYON (CONT.)

	Parameter	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Totals
M.	A. Number of 'tracked' nests that failed as a result of reproductive failure		0% (0/10)	5% (1/19)	0% (0/17)	25% (1/4)	17% (1/6)	0% (0/3)	0% (0/4)		0% (0/1)	4.7% (3/64)
	B. Number of 'tracked' nests that failed as a result of parasitism		0% (0/10)	0% (0/19)	12% (2/17)	0% (0/4)	0% (0/6)	0% (0/3)	0% (0/4)		0% (0/1)	3.1% (2/64)
	C. Number of 'tracked' nests that failed as a result of predation – Predation Rate according to Vireo Working Group		20% (2/10)	42% (8/19)	18% (3/17)	0% (0/4)	33% (2/6)	33% (1/3)	50% (2/4)		0% (0/1)	28.1% (18/64)
N.	Average clutch size		3.9	3.3	3.5	3.7	3.1	4.0	3.0		4.0	n/a
O.	Number of cowbird eggs found in or near vireo nests		0	0	3	0	0	0	0		0	3
P.	Number of cowbird nestlings removed from 'tracked' nests		1	0	0	0	0	0	0		0	1
Q.	Number of cowbird young fledged by vireo		0	0	0	0	0	0	0		0	0
R.	Number of 'manipulated' parasitized nests		1	0	0	0	0	0	0		0	1
S.	Number of 'successful, manipulated' nests (% = S/R x 100)		100% (1/1)	n/a	n/a	n/a	n/a	n/a	n/a		n/a	100% (1/1)
T.	Number of vireo fledged from 'manipulated' parasitized nests		1	0	0	n/a	n/a	0	n/a		n/a	1
U.	Number of repaired nests		n/d	n/d	0	0	2	0	0		0	2
V.	% successful repaired nests		n/d	n/d	n/a	n/a	0% (0/2)	n/a	n/a		n/a	0% (0/2)
W.	Number of vireo fledged from repaired nests		n/d	n/d	n/a	n/a	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, 2000-2010, BY MANAGED SITE

SANTA ANA CANYON – GREEN RIVER GOLF CLUB

Parameter		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Totals
A.	Number of pairs		10	8	6	12	17	12	8	12	16	n/a
B.	Number of breeding (nesting) pairs		9	8	6	11	15	9	8	11	15	92
C.	Number of breeding pairs that were well-monitored throughout the breeding season		7	7	3	4	4	5	4	4	6	44
D.	Number of 'known fledged young' OBSERVED		20	17	22	17	28	24	12	25	27	192
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season		16	17	13	8	14	18	7	11	14	118
F.	Average number of fledglings produced per breeding pair (minimum; D/B = 'productivity or breeding success')		2.2	2.1	3.7	1.5	1.9	2.7	1.5	2.3	1.8	2.1
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)		2.3	2.4	4.3	2	3.5	3.6	1.8	2.8	2.3	2.7
H.	Number of nests that were discovered		11	11	8	6	9	6	4	8	10	73
I.	Number of nests that were regularly monitored or 'tracked'		9	10	8	4	6	6	3	6	9	61
J.	Number of 'tracked' nests that were successful (% = J/I x 100)		56% (5/9)	50% (5/10)	75% (6/8)	75% (3/4)	83% (5/6)	83% (5/6)	100% (3/3)	100% (6/6)	67% (6/9)	72.1% (44/61)
K.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=(K/I x100) (b)		33% (3/9)	60% (6/10)	25% (2/8)	0% (0/4)	17% (1/6)	17% (1/6)	33% (1/3)	0% (0/6)	22% (2/9)	26.2% (16/61)
L.	Number of 'tracked' nests that were parasitized by cowbirds (% = L/I x 100)		44% (4/9)	0% (0/10)	0% (0/8)	0% (0/4)	0% (0/6)	0% (0/6)	0% (0/3)	0% (0/6)	0% (0/9)	6.6% (4/61)

Table C-3. Least Bell's Vireo reproductive success and breeding biology data, monitored sites, in the Santa Ana River watershed, 2000-2010, BY MANAGED SITE

SANTA ANA CANYON – GREEN RIVER GOLF CLUB (CONT.)

	Parameter	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Totals
M.	A. Number of 'tracked' nests that failed as a result of reproductive failure		11% (1/9)	0% (0/10)	0% (0/8)	25% (1/4)	17% (1/6)	0% (0/6)	0% (0/3)	0% (0/6)	11% (1/9)	6.6% (4/61)
	B. Number of 'tracked' nests that failed as a result of parasitism		11% (1/9)	0% (0/10)	0% (0/8)	0% (0/4)	0% (0/6)	0% (0/6)	0% (0/3)	0% (0/6)	0% (0/9)	1.6% (1/61)
	C. Number of 'tracked' nests that failed as a result of predation – Predation Rate according to Vireo Working Group		22% (2/9)	50% (5/10)	25% (2/8)	0% (0/4)	0% (0/6)	17% (1/6)	0% (0/3)	0% (0/6)	22% (2/9)	19.7% (12/61)
N.	Average clutch size		3.6	3.6	3.5	3.0	3.6	4.0	3.7	3.6	3.5	n/a
O.	Number of cowbird eggs found in or near vireo nests		4	0	0	0	0	0	0	0	0	4
P.	Number of cowbird nestlings removed from 'tracked' nests		0	0	0	0	0	0	0	0	0	0
Q.	Number of cowbird young fledged by vireo		0	0	0	0	0	0	0	0	0	0
R.	Number of 'manipulated' parasitized nests		2	0	0	0	0	0	0	0	0	2
S.	Number of 'successful, manipulated' nests (% = S/R x 100)		100% (2/2)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	100% (2/2)
T.	Number of vireo fledged from 'manipulated' parasitized nests		6	0	n/d	n/a	n/a	0	n/a	n/a	n/a	6
U.	Number of repaired nests		n/d	n/d	1	0	0	2	1	0	0	4
V.	% successful repaired nests		n/d	n/d	100% (1/1)	n/a	n/a	50% (1/2)	100% (1/1)	n/a	n/a	75.0% (3/4)
W.	Number of vireo fledged from repaired nests		n/d	n/d	3	n/a	n/a	3	1	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, 2000-2010, BY MANAGED SITE

SANTA ANA RIVER – FEATHERLY PARK

Parameter		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Totals
A.	Number of pairs		0	3	4	18	20	18	20	25	23	n/a
B.	Number of breeding (nesting) pairs		0	3	4	14	18	17	18	18	17	109
C.	Number of breeding pairs that were well-monitored throughout the breeding season		0	3	2	5	4	7	5	3	7	36
D.	Number of 'known fledged young' OBSERVED		0	0	9	23	28	35	24	28	28	175
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season		0	0	6	10	9	16	7	12	13	73
F.	Average number of fledglings produced per breeding pair (minimum; D/B = 'productivity or breeding success')		0.0	0.0	2.3	1.6	1.5	2.1	1.3	1.6	1.6	1.6
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)		0	0	3	2	2.3	2.3	1.4	4.0	1.9	2.0
H.	Number of nests that were discovered		0	6	3	13	15	11	10	12	13	83
I.	Number of nests that were regularly monitored or 'tracked'		n/a	3	3	7	13	10	8	10	11	65
J.	Number of 'tracked' nests that were successful (% = J/I x 100)		n/a	0% (0/3)	67% (2/3)	71% (5/7)	46% (6/13)	50% (5/10)	38% (3/8)	50% (5/10)	55% (6/11)	49.2% (32/65)
K.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=(K/I x100) (b)		n/a	100% (3/3)	33% (1/3)	29% (2/7)	54% (7/13)	50% (5/10)	38% (3/8)	50% (5/10)	45% (5/11)	47.7% (31/65)
L.	Number of 'tracked' nests that were parasitized by cowbirds (% = L/I x 100)		n/a	67% (2/3)	0% (0/3)	29% (2/7)	0% (0/13)	0% (0/10)	0% (0/8)	0% (0/10)	9% (1/11)	7.7% (5/65)

Table C-3. Least Bell's Vireo reproductive success and breeding biology data, monitored sites, in the Santa Ana River watershed, 2000-2010, BY MANAGED SITE

SANTA ANA RIVER – FEATHERLY PARK (CONT.)

	Parameter	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Totals
M.	A. Number of 'tracked' nests that failed as a result of reproductive failure		n/a	0% (0/3)	0% (0/3)	0% (0/7)	0% (0/13)	0% (1/10)	25% (2/8)	0% (0/10)	0% (0/11)	4.7% (3/65)
	B. Number of 'tracked' nests that failed as a result of parasitism		n/a	33% (1/3)	0% (0/3)	0% (0/7)	0% (0/13)	0% (0/10)	0% (0/8)	0% (0/10)	9% (1/11)	3.1% (2/65)
	C. Number of 'tracked' nests that failed as a result of predation – Predation Rate according to Vireo Working Group		n/a	67% (2/3)	33% (1/3)	29%* (2/7)	54% (7/13)	40% (4/10)	38% (3/8)	50% (5/10)	36% (4/11)	43.1% (28/65)
N.	Average clutch size		n/a	3.0	3.7	3.3	3.5	3.6	3.4	3.4	2.9	n/a
O.	Number of cowbird eggs found in or near vireo nests		n/a	2	0	2	0	0	0	0	0	4
P.	Number of cowbird nestlings removed from 'tracked' nests		n/a	0	0	0	0	0	0	0	1	1
Q.	Number of cowbird young fledged by vireo		n/a	0	0	0	0	0	0	0	0	0
R.	Number of 'manipulated' parasitized nests		n/a	1	0	2	0	0	0	0	0	3
S.	Number of 'successful, manipulated' nests (% = S/R x 100)		n/a	0% (0/1)	n/a	50% (1/2)	n/a	n/a	n/a	n/a	n/a	33.3% (1/3)
T.	Number of vireo fledged from 'manipulated' parasitized nests		n/a	0	n/d	2	n/a	0	n/a	n/a	n/a	2
U.	Number of repaired nests		n/d	n/d	0	0	2	0	1	0	1	4
V.	% successful repaired nests		n/d	n/d	n/d	n/a	100% (2/2)	n/a	100% (1/1)	n/a	100% (1/1)	100% (4/4)
W.	Number of vireo fledged from repaired nests		n/d	n/d	n/d	n/a	7	n/a	3	n/a	4	14

*corrected value

Table C-3. Least Bell's Vireo reproductive success and breeding biology data, monitored sites, in the Santa Ana River watershed, 2000-2010, BY MANAGED SITE

CHINO HILLS

Parameter		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Totals
A.	Number of pairs				6	8	9	6	7	4	5	n/a
B.	Number of breeding (nesting) pairs				4	8	7	5	7	2	4	37
C.	Number of breeding pairs that were well-monitored throughout the breeding season				0	5	2	3	5	0	0	15 (n=4 yrs)
D.	Number of 'known fledged young' OBSERVED				11	7	14	11	3	2	6	54
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season				n/a	3	7	7	2		n/a	19 (n=4 yrs)
F.	Average number of fledglings produced per breeding pair (minimum; D/B = 'productivity or breeding success')				2.8	0.9	2.0	2.2	0.4	1.0	1.5	1.5
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)				n/a	0.6	3.5	2.3	0.4		n/a	1.3 (n=4 yrs)
H.	Number of nests that were discovered				1	9	3	4	7	0	0	24
I.	Number of nests that were regularly monitored or 'tracked'				n/a	7	3	4	5		0	19
J.	Number of 'tracked' nests that were successful (% = J/I x 100)				n/a	14% (1/7)	67% (2/3)	50% (2/4)	20% (1/5)		n/a	31.6% (6/19)
K.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)				n/a	57% (4/7)	67% (2/3)	50% (2/4)	80% (4/5)		n/a	63.2% (12/19)
L.	Number of 'tracked' nests that were parasitized by cowbirds (% = L/I x 100)				n/a	43% (3/7)	0% (0/3)	0% (0/4)	60% (3/5)		n/a	31.6% (6/19)

Table C-3. Least Bell's Vireo reproductive success and breeding biology data, monitored sites, in the Santa Ana River watershed, 2000-2010, BY MANAGED SITE

CHINO HILLS (CONT.)

	Parameter	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Totals
M.	A. Number of 'tracked' nests that failed as a result of reproductive failure				n/a	0% (0/7)	0% (0/3)	0% (0/4)	20% (1/5)		n/a	5.3% (1/19)
	B. Number of 'tracked' nests that failed as a result of parasitism				n/a	14% (1/7)	0% (0/3)	0% (0/4)	20% (1/5)		n/a	10.5% (2/19)
	C. Number of 'tracked' nests that failed as a result of predation – Predation Rate according to Vireo Working Group				n/a	71% (5/7)	33% (1/3)	50% (2/4)	40% (2/5)		n/a	52.6% (10/19)
N.	Average clutch size				n/a	3.0	4.0	3.5	3.3		n/a	n/a
O.	Number of cowbird eggs found in or near vireo nests				0	6	0	0	3		n/a	9
P.	Number of cowbird nestlings removed from 'tracked' nests				0	0	0	0	0		n/a	0
Q.	Number of cowbird young fledged by vireo				0	0	0	0	0		n/a	0
R.	Number of 'manipulated' parasitized nests				0	3	0	0	3		n/a	6
S.	Number of 'successful, manipulated' nests (% = S/R x 100)				n/a	0% (0/3)	n/a	n/a	0% (0/3)		n/a	0% (0/6)
T.	Number of vireo fledged from 'manipulated' parasitized nests				n/d	0	n/a	0	0		n/a	0
U.	Number of repaired nests				0	0	0	0	0		n/a	0
V.	% successful repaired nests				n/d	n/a	n/a	n/a	n/a		n/a	n/d
W.	Number of vireo fledged from repaired nests				n/d	n/a	n/a	n/a	n/a		n/a	n/d