

**Status and Management of the Least Bell's Vireo and Southwestern Willow
Flycatcher in the Santa Ana River Watershed, 2009, and
Summary Data by Site and Watershed-wide, 2000-2009**

**Prepared by
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ABSTRACT

The 2009 monitoring effort for the least Bell's Vireo, *Vireo belli pusillus*, documented a continued increase in abundance from the low level in 2006 and increased productivity as compared to past seasons.

In 2009, 721 territories, 508 pairs and 976 fledglings were documented in the Santa Ana Watershed outside the Prado Basin by SAWA and cooperating agencies. This abundance represents an increase of 31% increase from 2008 and 127% recovery from the low 2006 count of 317 territories. Combined with the 538 territories documented in the Prado Basin (Pike et al, 2009), 1,259 territorial Least Bell's Vireos were documented in the watershed.

The 508 pairs detected in 2009 are a 46% increase from 2008 and a 144% increase from the low count in 2006.

The number of fledglings detected again increased dramatically for the second year from the fairly constant levels of around 370 for the years 2005-2007. In 2009 the number of fledglings increased 59% from the 2008, which saw a 65% increase in fledglings between 2007 and 2008.

Productivity increased for the second year from a low of 2.0 in 2007. Productivity based on well-monitored pairs was 3.5, an increase from 2008 level of 3.3. Nesting success also increased from 66% in 2008 to 71% in 2009, the highest success rate in the last eight years. The depredation rate was 22%, the lowest rates since monitoring began.

The parasitism rate declined dramatically to 8%, the lowest rate since SAWA began its cowbird management program. Parasitism rates have ranged between 14%-28%. Sixteen vireos fledged from 18 manipulated nests; one nest, built in new growth in a badly burned habitat, required repair and fledged 4 young.

Fifty-one per cent of nests (n=285) were placed in 5 species of willow, *Salix spp.* and 35% were placed in mulefat, *Baccharis salicifolia*.

Brown-headed cowbirds, *Molothrus ater*, were also managed throughout the watershed. Over 4,000 cowbirds were removed from 55 traps over 6,625 trap days between 3/16/09 and 8/2/09. An additional 6,900 cowbirds were removed from the watershed during the winter of 2008-2009 over 1,522 trap days.

No breeding Southwestern Willow Flycatchers, *Epidonax trailli extimus*, or Yellow-billed Cuckoos, *Coccyzus americanus occidentalis*, were detected outside the Prado Basin in 2009. Incidental sightings of other sensitive birds were made. A minimum of 424 Yellow Warblers, *Dendroica petechia*, and 203 Yellow-breasted Chats, *Icteria virens*, were detected throughout the watershed. Continued degradation of riparian vegetation due to human intrusion occurred in 2009. Continued drought conditions led to sparse understories in many areas.

Since the Santa Ana Watershed Program began vireo and cowbird management, over 3,000 vireo fledglings have been produced and population levels throughout the watershed show increases. 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.

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.

In addition to the above intensive monitoring, abbreviated surveys were made of all riparian habitat in the watershed. In 2009, biologists identified habitat not regularly monitored. Approximately 50 sites were surveyed during the season, usually three times, during the weeks of 5/4, 6/1, and 7/6. 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. A few sites were surveyed 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 whom nests were not located, who were never observed nest building or were 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.

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.

A minimum of 9,450 hours was spent in the field in 2009 for the vireo management program including 3,268 on vireo monitoring and nest management, 418 hours on the vireo assessment surveys, and 3,865 hours on the spring/summer cowbird trapping program and over 1,000 hours for winter cowbird trapping. At least 900 hours were spent surveying and managing sensitive species.

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 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 1300 acres (526 ha) of riparian habitat. In this report Hidden Valley refers to approximately 500 acres (200 ha) of riparian habitat on the south side of the river bounded roughly by the river on the north, Pedley Street on the west and Tyler Street to the east. 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. It 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) is 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. The San Jacinto River between Sanderson and Bridge Street was cleared of understory before the 2007 season and was not surveyed.

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 intensively surveyed from the Norton Younglove Preserve to approximately 10 miles (16 km) downstream. A program initiated by SAWA to restore riparian habitat has removed giant reed, *Arundo donax*, along the entire creek watershed. The canyon's immediate uplands contain citrus groves and remnants of over grazed coastal sage scrub. A railroad and a two-lane road border the canyon. Development of portions of the uplands for homes 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 Melody Aimar and Allyson Beckman. The Santa Ana River between Mission Boulevard and Van Buren Boulevard was surveyed by Nicole Peltier Housel, Terry Reeser, and Talula Barbee; Hidden Valley was surveyed by Sue Hoffman; 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 Jill Coumoutso and Talula Barbee; Mockingbird Canyon was surveyed by Nicole Peltier Housel and Melody Aimar, Sycamore Canyon was surveyed by Allyson Beckman, March SKR Preserve was surveyed by Melody Aimar, Giovanni Arechavaleta and Sasha Auer, of the Center for Natural Lands Management; Chino Hills was surveyed by Terry Reeser; San Jacinto was surveyed by Allyson Beckman and Melody Aimar.

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

Results - Vireo Abundance

Vireo abundance, in the Santa Ana watershed outside of the Prado Basin, continued to rebound from its decline in 2006 to its highest level since SAWA began monitoring in 2000 (Tables 1A and 1B). In 2009, 721 territories were detected

throughout the watershed by SAWA and cooperating agencies. This abundance is the highest to date and represents a 31% increase from 2008. In 2009, 508 pairs were detected, an increase of 46% from 2008. The number of fledglings increased 59% from 614 to 976.

Increases in abundance occurred at sites that have seen increases in the last few years. In 2009 increases continued (the increase from 2008 is in parentheses): San Jacinto River (67%), San Timoteo (35%), Mockingbird Canyon (52%), the Santa Ana River between Mission Blvd. and Van Buren Blvd. (79%), the Santa Ana River between River Rd. and Hidden Valley-Norco (40%), and Temescal Canyon (27%). San Bernardino County reported that the number of vireos detected doubled on the Santa Ana River between Mission Blvd. and Waterman from 21 to 43. Subpopulations remained stable at the other monitored sites.

The number of fledglings at most sites increased as well in 2009: San Jacinto River (56%), San Timoteo (16%), March SKR Preserve (460%, due probably to increased monitoring efforts), Mockingbird Canyon (86%), the Santa Ana River between Mission and Van Buren-Hidden Valley (245%), the Santa Ana River between River Rd. and Norco-Hidden Valley (60%), Hidden Valley (78%), Temescal (62%), and Santa Ana Canyon (8%). The biologists at the County of San Bernardino reported a 150% increase in fledglings along the Santa Ana River in San Bernardino County.

California State Parks and Recreation Department reported 2 vireos at the edge of the Chino Hills State Park in marginal habitat. These territories are not surprising given the fire that swept through the area in November 2008. However, the vireo population within the park remained stable (see Assessment Surveys below). MSHCP reported one vireo detected at Potrero. The biologists with San Bernardino County Flood Control made an incidental observation of a vireo at Plunge Creek. SAWA biologists also monitored the vireos at East Coyotes Hills Preserve in Fullerton for the Center for Natural Lands Management and documented 3 pairs and 5 fledglings.

Results – Abundance - Vireo Assessment Surveys

One hundred thirty-seven vireo territories were detected in the Santa Ana watershed during the 2009 assessment surveys (Table 10 and 11). This count represents a 37% increase over 2008 at the same sites visited last year, with a few exceptions. These surveys were conducted in patches of riparian habitat isolated from the larger tracts of habitat where biologists manage vireos. Fifty-one sites were surveyed in 2009. Vireos were detected at 27 sites for an occupation rate of 53% which is an increase from the approximately 38% for the past 2 years. Juveniles were detected at 15 sites. Sixty-five pairs and 69 juveniles were documented. In 2008, breeding was detected at 10 sites and 47 pairs and 42 fledglings were documented. These results from 2008 and 2009 represent a substantial increase in detected breeding activity from 2007 when 32 pairs and 16 juveniles were documented.

The largest increase was seen at Irvine Regional Park which increased its population from 19 in 2008 to 29 in 2009. Irvine Regional Park may become a monitored area in 2010. The small population of five vireos found in 2008 Chino Hills at Eucalyptus and Peyton Dr. increased to 8 in 2009.

Vireos were found at many sites for the first time in 2009. Vireos were detected for the first time in a ravine at McKinley and Promenade in just off Hwy 91 in Norco. Vireo presence was also detected for the first time in Goldenstar, a SAWA *Arundo* removal and restoration project underway for many years. This vireo was detected when the biologist was following up on an earlier sighting of willow flycatchers. A vireo was found at a new site in Chino Hills at the entrance of Western Hills Golf Club on Carbon Canyon Rd.; unfortunately, this bird fledged a cowbird. A vireo was found in a small patch of riparian vegetation off of Van Buren Blvd. near Bountiful behind the Starbuck's in a mitigation site that is apparently no longer being managed. A pair was detected at Yorba Dry Lake bed; this site was added to the surveys when a vireo was detected by R. Zembal in 2007. One vireo was detected at a new site this year only incidentally when a male and a fledgling were found in a unnamed ravine on Irvine Company property across Jamboree Rd from Peter's Canyon.

Some nest monitoring occurred at assessment sites. At Lake Perris, 2 nests were found and those 2 pairs fledged 3 young. At Carbon Canyon Regional Park, a parasitized nest was found in *Polygonum sp.*, smartweed. The cowbird egg was removed but the nest failed due to weakness of the vegetation. In Chino Hills, a nest was found at the Chino Hills Community Park but it was depredated. Another nest at Western Hills Country Club in Chino Hills failed due to parasitism. Three nests were found in Telegraph Canyon, Chino Hills State Park, but all failed due to depredation. Two of these nests were in black walnut, the third was in mustard. At Irvine Regional Park 2 nests were found in mulefat; one was incomplete, and another fledged 4. A nest in Limestone Canyon in black willow fledged 3.

Brown-headed cowbirds were observed at 24 sites, an increase from the 15 sites in 2008.

SAWA surveyed sites where the number of birds was known through intensive monitoring. Monitors unfamiliar with the current status of the vireo at the sites walked transects in Hidden Valley and Mockingbird Canyon as if they were assessment sites in May and June. In Hidden Valley, in May, 76% of the vireos were detected and in June, 69% were detected. In Mockingbird Canyon, in May, 33% of the vireos on territories were detected.

The following people participated in the surveys: Melody Aimar (MA), Giovanni Archavaleta (GA), Talula Barbee (TB), Allyson Beckman (AB), Jill Coumoutso (JC), Samantha Dempster (SD), Sue Hoffman (SH), David McMicheal (DMc), Bonnie Nash (BN), Nicole Peltier Housel (NP), Terry Reeser (TRe), Richard Zembal (RZ), Henry Armijo (HA), and Tim Romo (TRo) with Neftali Mendoza and Arcenio Hernandez.

Year	Number of Surveyors	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

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

Chronology of Breeding Activity 2009

Surveys began throughout the watershed between 3/12 and 4/3 and ended between 8/12 and 10/5 (Table 2). The first vireos were detected 3/18 on the Santa Ana River at Norco. The earliest date for the arrival of 50% of the subpopulation at the larger population sites was 3/30 at Green River Golf Club in the Santa Ana Canyon. All sites showed 50% occupancy by 4/22. Fifty per cent of all birds were paired at all sites by 5/28. The first nest was found on 3/31 in San Timoteo Canyon. The last nests were found on 7/14 in Hidden Valley and close by on the Santa Ana River at Norco.

The first fledgling occurred in Hidden Valley on 5/1. The first fledgling occurred in May at all sites. The last nest fledged on 7/31 in San Timoteo.

Results - 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 51% of the nests (n=285) in 2009. Arroyo willow, *Salix lasiolepis*, was the most preferred of the willows holding 65 nests, double that of any other willow species. While arroyo willow held 23% of all nests, mulefat, *Baccharis salicifolia*, held 35% of the all nests. Average nest height was 42.2 in. for 266 nests.

Other nest-host species included: wild grape, *Vitis girdiana*, Mexican elderberry, *Sambucus mexicana*, Fremont cottonwood, *Populus fremonti*, toyon, *Heteromeles arbutifolia*, black walnut, *Juglans californica*, black mustard, *Brassica niger*, Orange tree, *Rutaceae citrus sinensis*, Tamarisk, *Tamarix ramosissima*, Cockleburr, *Xanthium strumarium*, and Wax Leaf Privet, *Ligustrum sp.* Vireos also placed nests in two species of vegetation including arroyo willow and Fennel, *Foeniculum vulgare*, arroyo willow and black mustard, California rose, *Rosa californicus*, and wild grape, elderberry and wild grape, dead black willow, *Salx gooddingii*, and stinging nettle, *Utica dioica*. Nests were also placed in dead vegetation. In 2009, 2 nests were placed in deadfall, fallen branches hung up against living branches.

Over the past eight years, 49% of all nests have been found in willow species with arroyo willow and black willow predominating. Mulefat has held 29%. Between 2003 – 2006, four nests have been found in the black walnuts along the Santa Ana River in Featherly Park. Non-native vegetation used by vireos in the watershed include mustard, Myoporum, *Myoporum luteum*, Yellowspine Thistle, *Circium ochrocentrum*, and pepperweed (Appendix B, Table B-2).

Results - Reproductive Success

Reproductive success increased as measured by productivity of well-tracked pairs. The productivity rate for 149 well-tracked pairs was 3.5, up from 3.3 in 2008 and much increased from the 2.0 in 2007 (Table 5 and Appendix B). Nesting success was 71% which is the highest success rate in the last several years. See Appendix B for watershed-wide summary data. The number of young observed for well-monitored

pairs (n=877) is a 43% increase in fledglings numbers from 2008, a year which saw about a 65% increase from 2007. The years 2005 to 2007 saw fairly unchanging levels of fledgling numbers. The numbers of fledglings observed from all sites outside of Prado Basin increased 59% from 614 to 976 (Table 1A). Clutch size was 3.5, unchanged from 2008. See Appendix C, Site Summaries, for individual site data over time.

Results - Predation Rates

In 2009, the depredation rate (complete nest loss due to missing eggs or chicks before the expected fledge date) was 22%, the lowest rate yet (Table 5, row M.c.). Predation rates varied with site and ranged between 0% and 36%. Historically, watershed-wide, nest loss due to depredation has varied between 27% to 40%. (Appendix B, Table B-3, row M.c.).

In 2009, San Timoteo Canyon continued to be plagued with habitat disturbances. Since 2007, sheep and cattle caused much damage to the habitat. In 2009, feral pigs, *Sus scrofa*, continue to be observed frequently the canyon, digging up soil and riparian vegetation.

Biologists noted more cover in 2008 than in 2007 and the depredation rate dropped from 33% in 2007 to 28% in 2008. In 2008, nest depredation by Argentine ants occurred in Mockingbird 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. Cattle grazing 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 prebasic moult; Moulting usually occurs 15 days out of the nest (J Pike, pers comm.)

In 2006, a pair of California Gnatcatchers, *Poliioptila 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. On 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.

Other suspected avian predators include the greater roadrunner, *Geococcyx californianus*, and the California thrasher, *Toxostoma redivivum*.

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, gopher snakes, *coachwhips*, *Masticophis flagellum*, and raccoons, *Procyon lotor*. Feral hogs are present along the river and their foraging in the under story 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 repaired was expected to take place during the winter of 2008-2009.

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.

Results - Brown-headed Cowbird Parasitism

The parasitism rate continued to decrease in 2009 to 8%, a historical low. Until 2009, the lowest rate was 14% in 2008.

Parasitism occurred at 7 sites in 2009 an increase from 5 sites affected in 2008. Parasitism occurred in San Jacinto River, San Timoteo, Mockingbird Canyon, Hidden Valley, on the Santa Ana River between River Rd. and Norco, Temescal, and Featherly Park in the Santa Ana Canyon. In 2009, San Timoteo accounted 40% of all parasitized nests. 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 3 pairs which had unsuccessful parasitized first nests were successful after the trap was put up.

Parasitism occurred at 5 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.

San Timoteo's parasitism rate continues to decrease even though it accounts for a substantial number of parasitized nests in the watershed. Its 2009 rate decreased from 16% in 2007 and 19% in 2008 to 10% in 2009. These rates are substantially lower than the rates that occurred from 2004 - 2006 when they ranged from 43% to 74%. 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.

Nest lost due to parasitism in 2009 was 3%, the second lowest rate since SAWA began monitoring. Nest losses due to parasitism have ranged between 2%-7%. The criteria for judging nest failure being due to parasitism is abandonment of vireo eggs in the presence of a cowbird egg.

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 per cent 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.

Results - Repaired Vireo Nests

Four nests were repaired in 2009 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 (see Exhibit 1, sent as separate file in electronic copy). 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, 2000-2009

(Appendix C – Tables)

San Jacinto Summary

In 2009 fifteen vireo territories were detected, up from 9 in 2008. Vireos were clustered on the San Jacinto River approximately 1.2 miles upstream of State Street adjacent to Soboba Road. No vireos had been detected at this location prior to 2004. This sub-population has steadily increased from 3 in 2004 (first year detected) to 15 in 2009. Two territories occupied in the San Jacinto Wildlife Area in 2007 were not present in 2008 or 2009. In 2004, two vireo territories were detected in the San Jacinto River, upstream of Bridge Street. A reduced monitoring effort failed to detect these birds in 2005 and 2006. The habitat has since been removed from the river between Sanderson and Bridge Street and so this site is no longer suitable for vireos.

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. Nesting success has ranged from 0% to 100% from 2004

to 2006 based on one to three well-tracked nests. Parasitism and 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 Eastern Municipal Water District. Since 2003, 11,622 have been removed from San Jacinto during the vireo breeding season. Cowbird trapping has most likely played a large role in the increased population size. Parasitism rates steadily decreased from 50% in 2006 to 13% in 2007 and 0% 2008, respectively. However, the parasitism rate increased to 11% in 2009.

A more intense monitoring effort in 2009 showed 63% nesting success based on 27 nests. Since 2004, nesting success is 59% based on 54 well-tracked nests. In 2009 predation of closely monitored nests was 22%, less than half the 50% documented in 2007 but comparable to the 23% in 2008. Productivity rate has increased dramatically from 1.8 in 2007, based on 5 well-tracked pairs, to 3.8 in 2009, based on 14 well-tracked pairs. Four pairs successfully double-clutched in 2009 and fledged 27 vireos, just over half of the total fledglings confirmed (n=53). In the last 5 years, over 100 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. In 2004 nests were found only in mulefat. Nesting site choice in 2007 included the largest variety of plants to date with 50% in black willow, 20% in both mulefat and narrow-leafed willow, and 10% in tamarisk. In 2008 and 2009, only two types of plants were used as nesting substrate. In 2008, the majority of nests were placed in mulefat (71%) with the remaining 29% in narrow-leaf willow. However in 2009 the majority of nests (67%) were in narrow-leaf willow and 33% in mulefat.

San Timoteo Summary

The vireo population on San Timoteo Creek has increased significantly since 2000 due 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 (*Arundo donax*) and Tamarisk (*Tamarix sp.*). SAWA removed 239 acres of invasive plants from 1997 to 2001, and continues a maintenance program to control re-growth. Restoration of the native plant community through natural recruitment has taken place throughout the canyon resulting in a healthy riparian under-story, effects of natural storm cycles notwithstanding.

In 2009, 105 vireo territories were detected, up 35% from the 78 territories found in 2008. Eighty-four pairs and 192 fledglings were detected. Nesting success was 65% in 2009 which was the same as the rate in 2008. Nest losses were primarily due to predation (33%); however one nest was lost due to parasitism and one was lost due to reproductive failure. Forty-one well-monitored pairs showed a 3.9 reproductive success rate.

The vireo population in San Timoteo has increased dramatically over the past 10 years, from five territories in 2000 to 105 territories in 2009. The number of territories discovered did decrease between 2005 (43 territories) and 2006 (32 territories), but overall the population has increased by more than 2000%. Nesting success is 57% over nine years of intense monitoring (n=338 well-tracked nests), ranging from a low of 29% in 2004 (n=31 nests) to a high of 100% in 2001 (n=4 nests). Reproductive success based on productivity of well-tracked pairs overall is 2.7 and has ranged from a low in 2004 of 0.8 to a high of 3.9 in 2009. Depredation has been the major cause of nest loss; 34% of all nests have been lost due to depredation. The 2009 depredation rate was 33%.

Cowbird trapping has occurred in San Timoteo since 2001, and a total of 1,487 cowbirds have been removed from San Timoteo Canyon during this time. In 2009, the parasitism rate was at an all time low of 10% (eight of 79 nests). This low rate remains a marked decrease from a high of 75% in 2001. Although parasitism by cowbirds still occurs, at a rate of 30% over nine years (103 of 338 nests), only 7% of nests (25 of 338) have failed due to parasitism. Failure due to parasitism in 2009 was only 1%. This low failure rate is primarily a result of intensive nest monitoring efforts.

Although intensive cowbird trapping has occurred since 2001, parasitism rates remained very high through 2006. Recent literature suggests that cowbirds have different regional dialects and female cowbirds tend to prefer older males that use local flight whistles, to younger males or older males that have a foreign dialect (O'Loghlen and Rothstein 1995 and O'Loghlen 1995). In 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 again in 2009. We continued this protocol in 2009 and added two more traps in locations where parasitism was localized the prior year. Ongoing trapping efforts incorporating this new protocol will hopefully continue to control the rate of parasitism throughout the canyon. In the last three years, the parasitism rate has been below 20%, which may be a result of these additional efforts.

Mulefat (27%) and arroyo willow (20%) have been the primary plant species used for nest placement in San Timoteo since 2001 (n= 379 nests). Red willow and black willow held another 17% and 14% of the nests, respectively. Only four nests found from 2001-2009 were placed in non-native vegetation.

Although the riparian area is protected under existing laws, residential 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 increased throughout the canyon in 2008 and continued in 2009. 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 2009, nine vireo territories were detected, the same number as in 2008. Nest were not monitored in 2009, however 8 pairs and 9 fledglings were detected over 106 hours of monitoring (average number of fledglings/pair = 1.1). Nesting success in 2008 was 50% based on four closely monitored nests, down from 100% in 2007. However, only two nests were closely monitored in 2007. 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 mainly to document the number of territories and pairs. No breeding data were gathered in 2003 or 2006. In 2004, three nests of 2 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 7 pairs but this low number can be attributed to the lack of monitoring effort. In 2008, 13 fledglings were observed from 8 pairs. Cowbird trapping has occurred in Sycamore Canyon since 2004, and 63 cowbirds have been removed from the canyon during this time (42 of these captures occurred in 2004). No cowbirds were removed from the area in 2009. Continued trapping effort will hopefully control the rate of parasitism throughout the canyon for this very quiet and secretive small subpopulation.

March SKR Preserve Summary

Ten vireo territories, all paired, and 28 fledglings were detected in March SKR Preserve in 2009. Since SAWA began monitoring in 2004, 7 to 10 vireos have been documented in March SKR Preserve annually. A total of 75 fledglings have been produced since monitoring began.

Measures of reproductive success have varied over the years, due in part to differential monitoring efforts. Nesting success was 100% in 2009 and 68% over 4 years. Reproductive success of tracked pairs was 6.0 in 2009 and 4.2 over 4 years. No parasitism has been detected since surveys began.

Black willow (53%) has been the primary choice for nest placement at this site, along with arroyo willow (29%) and red willow (18%). Vireos at this site have nested exclusively in willow species, probably due to availability. This year a pair of vireo chose to nest a second time in their first nest in a red willow, behavior that is uncommon for vireo. The pair was observed fixing and preparing the first nest for a second nesting attempt. Both nesting attempts in the same nest were successful and fledged a total of seven vireos.

Willow Flycatchers, *Epidonax 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. 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, *Dendroica petechia*, and a minimum of one Yellow-breasted Chat, *Icteria virens*. A Cooper's Hawk, *Accipiter cooperii*, was sighted several times and was observed delivering food to a nest.

March SKR Preserve is an important piece of the remaining, fragmented riparian habitat in Southern California. A full complement of riparian birds occupies the Preserve. In 2009, multiple coyotes, *Canis latrans*, were observed including a pair with pups. In addition, three Red-tailed Hawks, *Buteo jamaicensis*, were observed all with active nests. 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 2007, incidental sightings included a Cooper's Hawk nest, a pair of Lawrence's Goldfinch, *Carduelis lawrencei* (Federal Species of Concern), feeding on a fiddleneck, a Pacific-slope Flycatcher, *Empidonax difficilis*, and several Lark Sparrows. Also present were Black-tailed Jackrabbits, *Lepus californicus*, and a coachwhip, *Masticophis flagellum*. In 2005, incidental sightings included a pair of White-tailed Kites, *Elanus leucurus* (a USFWS Migratory Nongame Bird of Management Concern and DFG Fully Protected Species), and a Long-tailed Weasel, *Mustela frenata*. In 2004, a Cooper's Hawk perched on a cowbird trap, was observed taking and 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, *Bubo virginianus*, 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 Lands Management 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. Currently, adjacent habitat supports an additional 3 vireo territories. 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.

Mockingbird Canyon Summary

Forty-one vireo territories, 35 pairs, and 65 fledglings were detected in Mockingbird Canyon in 2009. Nesting success of 12 well-tracked nests was 83%. Nest loss was due to depredation (8%) and parasitism (8%). Parasitism occurred for the fourth time since 2003. In 2003, the first year vireos were monitored in Mockingbird

Canyon, parasitism was 62% and caused nest failure in 4 of 13 nests (31%). Beginning in 2004, an intensive cowbird management program was initiated. The parasitism rate decreased sharply after this management program, and occurs episodically, but seems to be controlled. Several land owners have allowed traps on their property which has greatly facilitated our program.

The vireo population in Mockingbird has increased 350% since 2003 from 9 territories in 2003 and 2004 to 41 territories in 2009. Nesting success has also increased. In 2003, nesting success was a low 15%. Over the last 6 years, nesting success has been 55%. Since 2003, 29% of all nests have been lost due to depredation, 9% to reproductive failure, and 7% to parasitism.

Overall, red willow (31%) has been the primary choice for nest placement at this site, along with black willow (27%) and Mexican elderberry (13%). However, some nests have been successfully placed in non-native vegetation, such as perennial pepperweed and Peruvian pepper trees. To date vireos at this site have nested in 16 different plant species or combination of species; 64% of nests have been placed in willow species or combinations with willow species. Only 5% 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. 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

Fifty-nine vireo territories, 46 pairs, and 107 fledglings were documented along the Santa Ana River between Fairmount Park and Hidden Valley in 2009, exclusive of Hidden Valley (see Appendix A). During the 2009 season, 18 nests were discovered and 14 of those were closely monitored. The success rate for these tracked nests was 93%, with the only failure due to 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, occurred through the 2009 breeding season. In 2009 10 territories were found within the park, an increase of 5 since 2007. The remaining 49 territories were found along both sides of the river downstream to just past Van Buren Blvd.

The vireo population along this stretch of the Santa Ana River has increased 228% from 18 territories in 2002 to 59 territories in 2009. Nesting success has varied

over the years. The lowest success rate in 2002 (11%) occurred the year before cowbird trapping began. Since cowbird trapping and nest monitoring began, nesting success has been 76% between the years of 2003 to 2009. Nesting success has been 68% over all years. Since monitoring began a minimum of 283 fledglings have been documented at this site. Cowbird trapping occurs at private business and homeowner locations.

Arroyo willow (31%) has been the primary choice for nest placement at this site, along with mulefat (29%). Some nests have been successfully placed in non-native vegetation, such as Tamarisk. To date, vireos at this site have nested in 14 different plant species or combination of species. Overall, 56% of all 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 disturbance 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 Summary

In 2009, 49 territories, 37 pairs, and 64 fledglings were detected. This count is the highest count since monitoring began in 2000, when 14 territories were detected. Population levels have been relatively stable over the past 10 years. Large increases in abundance (by at least 10 territories) took place between 2001-2002 and 2007-2008. Sixty-four fledglings were documented in 2009 but up to 96 fledglings may have been produced, the highest number yet for Hidden Valley. Since monitoring began, 407 fledglings have been observed and up to 512 may have been produced. The productivity rate for well-tracked pairs in 2009 was 2.6; the productivity rate over 10 years is 2.5.

Nesting success was 69% in 2009, a welcome change from the success rates of the last 2 years which were in the low 40% range. Of the five nests lost in 2009, 2 were lost due to depredation, 2 were lost due to reproductive failure (both abandoned nests with eggs), and 1 was lost due to parasitism (the nest was abandoned after it was parasitized). Hidden Valley has a 68% nesting success rate over the last 10 years and depredation remains the main cause of nest failure.

Willow species, *Salix* spp., are the most common plant species used for nest placement. Sixty-one per cent of all nests found in the last ten years were placed in willows, mainly arroyo willow, *Salix lasiolepis*, and black willow, *Salix gooddingi* (n=67/109 nests). Mulefat, *Baccharis salicifolia*, has held 27% of all nests.

Management strategies at Hidden Valley include cowbird trapping as well as nest manipulation. Since 2000, 637 cowbirds have been removed from Hidden Valley over almost 4,300 trap days.

Parasitism is detected sporadically in Hidden Valley. One parasitized nest was documented in 2009. Parasitism was not detected in Hidden Valley until 2005 when one nest was parasitized. Parasitism occurred again in 2007 when 4 of 9 nests were parasitized. All these nests were located west of the gated Department of Fish and Game (DFG) area. Traps on the west side in previous years had been destroyed by

vandalism early in the season so no coverage was possible. To counteract the cowbird activity in 2007, a new location for a cowbird trap on the west side was found in 2008 that was hidden from public view. This trap has been very productive over the past 2 years and has trapped 54% of the cowbird caught in Hidden Valley those years.

Hidden Valley has been surveyed since 2000 and SAWA biologists work closely with the county management team. Surveys have focused on the riparian habitat on the south side of the river, along the diversion creek downstream from around Tyler to the old power house below Pedley Substation Road. Surveys of the habitat north of the agricultural fields were done before the 2004-05 flooding and only incidentally until 2008. In 2008, SAWA began a project to remove 475 acres of *Arundo donax* from the 728 acre Hidden Valley Wildlife Preserve. The project was halted in March 2008 due to the onset of the breeding season. At that time, 150 acres on the south side of the river, north of the former agricultural field, had been cleared. Removal of *Arundo* was expected to continue during the winter of 2008-2009 but State budget problems caused a postponement. The removal project began again in October 2009 with an expected completion date of December 2009. With the completion of the project more habitat will be opened up for monitoring and increases in the extent of native habitat and vireo population are expected. Herbicide applications will continue once the biomass has been cut and removed.

The opening up of the habitat at Hidden Valley has had other benefits. In 2008 and 2009, illegal activities within the dense stands of *Arundo* have been stopped. 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.

A second issue at Hidden Valley is the constant breakdown of the levee that diverts water from the Santa Ana River to the ponds and creeks at the site leading to dry creeks and vegetation. The water flow was maintained during the 2009 season and levee maintenance seems to be improving.

Incidental surveys for other species of concern take place during vireo monitoring. In 2009, 67 Yellow Warbler, *Dendroica petechia*, and 45 Yellow-breasted Chat, *Icteria virens*, territories were detected. A decline in numbers of a common bird, the marsh wren, *Cistothorus palustris*, is due to the loss of cattails in dry and silted ponds. Only a few wrens were detected in 2009 when a few years ago, 50 territories were estimated.

Santa Ana River between River Road and Norco (Goose Creek Golf Club) **Summary**

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.

This section of river slopes from northeast to the southwest and contains habitat-altering flows depending on precipitation. The surrounding land use includes former

diary land, residential, cattle grazing, and a golf course. Open water and riparian habitat border the site to the south, southwest and southeast. Hwy 15 crosses the river.

In 2009, 91 territorial males were detected. Sixty-eight of these males were paired and 170 fledglings were detected. The vireo population on the Santa Ana River between River Rd. and 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, the number of territorial males has reached an all time high of 91. Data on vireo territories near River Road Bridge was supplied by John Green.

Twenty-nine pairs monitored throughout the 2009 season had a 3.7 productivity rate; the highest rate since monitoring began. Since monitoring began at least 489 fledglings have been produced at this site.

Nesting success in 2009 was 80% based on 45 well-monitored nests. Nest failures were due to depredation (16%) and reproductive failure (2%). Overall nesting success for the site is 65% (n=177 nests, range= 33%-100%). Depredation has been the main cause of nest loss, although it only occurred at a rate of 29%.

Cowbird trapping has occurred at Norco annually since 2004. Three hundred and eighty two Brown-headed Cowbirds have been removed from Norco over 1,102 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%.

Arroyo willow has held 33% of all vireo nests since 2001. Black willow and mulefat have held 19% and 30% of nests respectively. The riparian vegetation overall is greater than 50% native. The dominant non-native was *Arundo donax*. A fire in 2002 burned much of the *Arundo* at which time SAWA initiated a spray maintenance program now in its 6th year. The habitat is recolonizing naturally.

A sighting of interest this season was the discovery of a banded male vireo which held a territory located on the Goose Creek Golf Club. He was first detected on 4/3 and seen with a female building a nest on 4/30. Four eggs were laid in the nest, but the nest failed after getting wet by the golf course sprinklers. The second nest was found on 5/26, but eggs were not laid in it until 6/29. The biologist confirmed that the nest was out of the range of the sprinklers. The female laid 3 eggs, resulting in 2 verified fledglings. The male was captured on 7/1 by Barbara Kus (USGS) and Jill Coumoutso (SAWA) by use of mist net. It was discovered that this bird was originally banded as a nestling by Barbara Kus on 7/3/08 on the San Luis Rey near Oceanside.

I did not realize the sprinklers hit the nest until I found it wet. I did mention this to Ross and showed him the nest location. When the 2nd nest was built I made sure it was not in the sprinklers range. If it had been I was going to ask Ross about refraining from running those particular sprinklers or adjusting them (so as not to spray the nest area) somehow until the nest fledged.

Temescal Canyon Summary

In 2009, 76 territorial males were detected. Fifty-six of these males were paired and 118 fledglings were detected. This count represents an increase of 27% from the count of 60 territorial vireos in 2008 and an increase of 985% from the 7 territorial vireos detected in 2001. Numbers remained stable in most areas. Detection of parasitized nests at Lake Elsinore lead to an increased monitoring effort with the discovery of additional vireo territories.

Nesting success for 39 well-tracked nests was 69%, an increase from last year's 63% success rate. Twenty-four pairs monitored throughout the season had a 3.6 reproductive rate. Nest lost was mainly due to depredation; 8 of the 39 nests (21%) tracked were lost to depredation; 5% of nests were lost due to parasitism.

Temescal has been surveyed since 2001. 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. Temescal Canyon is characterized by patchy, dense riparian vegetation. Privately owned sand mines operate downstream in the northern section of the creek.

Overall nesting success for the site from 2001 to 2009 is 62%. Overall productivity of well-tracked pairs is 2.7.

Cowbird trapping has occurred at Temescal annually since 2001. One thousand three hundred and fifty Brown-headed Cowbirds have been removed from Temescal over 5,812 trap days. Parasitism has occurred in Temescal in 7 out of the 9 years surveyed, reaching its highest rate in 2007 (42%). The 2009 rate was 13%.

Mulefat has held 39% of all vireo nests since 2001. Arroyo Willow held another 37% of all nests. Riparian vegetation is fairly healthy throughout the canyon and includes mostly native species. In 2001, SAWA began removing the invasive *Arundo donax* from the entire canyon. It is currently managing *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 6 fledglings. Numbers of vireo territories usually detected in these patches range from 7 to 12. Potential development, human activity and cattle grazing impact these sites. Vireos and their nests are highly susceptible to depredation in such small patches of habitat. The suitability of these patches of habitat for vireo occupancy is tenuous.

Nest monitoring was not done in Chino Hills this year. However, since 2004, nesting success for well-tracked nests has been poor with an overall success rate of only 32% (n= 6/19 nests). Nest failure is due mostly to depredation (53%) and parasitism (11%).

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 114 trap days and 8 cowbirds were removed, an increase from 3 for last year. It is worth noting that removing 8 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 2008 and 2009 with under story remaining somewhat dense until late in the breeding season. The devastating wildfire that swept through the Santa Ana Canyon and Chino Hills State Park was diverted and slightly touched only one of the areas monitored with minimal loss of vegetation.

As part of the vireo assessment surveys, 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 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 2009, eight territories were detected at this site.

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 and 2009.

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. This drainage is now slated for development. How much of the native vegetation will be protected or replaced is unclear at this time.

Santa Ana River – Santa Ana Canyon Summary

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 from the 2008 season's numbers at the Upper Canyon and Featherly Park. The upcoming Army Corps of Engineers river bank stabilization project due to start in the winter of 2009 around and through the western half of Green River golf course will take out over 16 acres of mature riparian habitat that survived the fire. Habitat loss from the two events will continue to create great pressure on the remaining habitat for the next few years.

Sixty-eight territories were detected in the Santa Ana Canyon in 2009, a decrease from the 77 territories that were detected in the Santa Ana Canyon in 2008. In 2009, two of the three sections of the canyon, Featherly Park and the Upper Canyon, saw decreases of 10 territories. The third section, Green River Golf Club, had an increase of one territory. The number of pairs also decreased slightly in 2009 to 45 from 48 pairs in 2008. The number of fledglings observed increased for 2009 to 64 from 59 in 2008. Abundance in 2009 represents the highest survey count in the last three years and only 5% lower than the highest count in 2005. Fledgling numbers show more variation.

Cowbird trapping began in the Santa Ana Canyon in 2001 when parasitism was detected in 5 of 19 nests (26%). Since 2001, over 1,200 cowbirds have been removed from the canyon over 6,804 trap days during the vireo's breeding season. Parasitism was last recorded in 2004: however, in 2009 parasitism was detected in one of 21 nests (5%). SAWA is planning to deploy a trap near that location in 2010.

Depredation rates at the three sites have been rather low only going above 50% in a few years.

Nesting success in the canyon for the last 9 years is 61.6%. Since monitoring began in 2001, 575 fledglings have been produced in the Santa Ana Canyon. The upper canyon has produced a minimum of 208 fledglings, the Green River Golf Course has produced at least 192 fledglings and Featherly Park has produced at least 175 vireo fledglings since vireos were first detected there in 2002.

Upper Canyon – Downstream of Prado Dam to above the Green River Golf Course

This section of the Santa Ana Canyon showed a 40% decrease in vireo abundance this year with 12 vireo territories down from the 20 vireos detected in 2008. The population has ranged from a low of 13 in 2001 to a high of 28 in 2004 and 2005. The heavy construction around Prado Dam occurred until 2008. Due to this construction, habitat was destroyed that comprised ten territories in 2005. Some of the habitat that remains is deteriorating due to human interference and drought-like conditions that kept the under-story and ground cover very sparse. In 2005, there were 3 vireo territories in this habitat, in 2006, one territory was detected and in 2007 through 2009 no territories were detected.

Part of the decrease in territories in areas down river from the afore-mentioned construction can be explained by the November 2008 wildfire that destroyed a wide swath of habitat that has harbored six territories that were not detected this season.

Since monitoring began in 2001, 208 fledglings have been produced, but the numbers are seriously trending downward

The birds here continue to nest in marginal habitat barely surviving the drought conditions. At the end of the 2008 season temporary irrigation was set up in the construction areas and before the 2009 season the area was hydro seeded for the replanting of vegetation which was mainly native grasses; however, the additional water did help the adjacent riparian areas that remained.

Green River Golf Club

The vireo population was up slightly at 22 territories despite approximately half of the riparian habitat having been destroyed in the wildfire last November. The 2009 count is the second highest count after the 23 vireos detected in 2005. The vireo population at Green River Golf Club has doubled since monitoring began in 2001 when only ten vireos were detected. One hundred ninety-two 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 mentioned above will be removing habitat that the fire did not touch. The habitat to be removed doubled its vireo occupancy from 3 in 2008 to 6 in 2009 and will be gone in 2010. Management at Green River Golf Club continues to be very supportive of SAWA's efforts to manage the vireo and management has continued the same cooperative relationship with SAWA as in past years.

Featherly Park

In 2009, the first season after the wildfire of November 2008, 34 vireos were detected in Featherly Park, a decrease of only 2 territories from 2008. The habitat throughout Featherly Park 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 to and stayed in territories that had burned. Most of the breeding vireos found nest sites in unburned vegetation or the reemerging native vegetation with just four using non-native vegetation which included black mustard, *Brassica niger*, cockleburr, *Xanthum strumarium*, wax leaf privet, *Ligustrum* sp., and a small Orange tree, *Rutaceae citrus sinensis*, on the edge of a burned area. Only 4 pairs returned to and nested in areas unaffected by the fire. The surprisingly higher than expected number of vireo returning to this area is a testament to the species site tenacity.

Nesting success in 2009 was 55%, slightly higher than the overall 49% success rate over 8 years. All but one nest loss was due to depredation; one nest was lost to parasitism. A nest in emergent growth of a burned elderberry was secured by sturdy branches placed under the nest for support. Four vireos fledged from this nest.

The vireo population in Featherly Park is a success story given that there were no vireos detected in 2001, the first year of monitoring. The population's major increase came in 2004 when it quadrupled from six to 24. For the first two years of monitoring, no fledglings were detected. Then in 2003, nine fledglings were observed. Since then, over 20 fledglings are counted every year for a total of 175 fledglings produced over the last seven years.

Before the 2009 breeding season started, local park management was able to get approval to spray herbicide on the rapid re-growth of the invasive *Arundo donax* which started re-growing within two weeks of the 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, then working with SAWA biologists, contractors sprayed and cut trails to the remaining stands of *Arundo*. Great progress in stopping the *Arundo* from rebounding has given the native habitat a much better chance at recovery.

Results - Southwestern Willow Flycatcher

No breeding southwestern willow flycatchers were documented in the watershed by SAWA biologists. We were unable to confirm a report of 3 to 4 possible pairs willow flycatchers sightings in San Timoteo. We documented 10 single birds in the watershed. In San Timoteo, a minimum of 2 willow flycatchers were documented; There were 4 sightings; two males were heard on 6/8 and 6/11 in different locations. We documented 6 other single willow flycatchers within the watershed. There were 2 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 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 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 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 Parks property which may have been the same bird. Another flycatcher was spotted on May 30 about 200 m east of the U.S. Army Corps of Engineers detention ponds.

A 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 counter singing 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 counter-singing 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 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 visualized 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 UGS 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 flycatchers were detected on a single survey at Harrison by Jason Berkely (pers. comm.). A willow flycatcher was observed at Perris Lake (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 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, interesting sightings and potential predators.

In 2009, a minimum of 424 Yellow Warbler territories, *Dendroica petechia*, were documented throughout the watershed. Yellow Warblers were detected in San Timoteo (n= 69), Santa Ana Canyon (n=58), Hidden Valley (n=67), the Santa Ana River, from River Road to Norco (n=40), Chino Hills environs (n=22), Chino Hills, Eucalyptus at Del Monte (n=2), Eucalyptus at Peyton (n=7), Eucalyptus at Rancho Hills (n=2), Chino Hills State Park (n=19), Irvine Regional Park (n=7), the Santa Ana River between Mission and Van Buren (n=27), Temescal (12), Peter's Canyon (n=9), Mockingbird Canyon (n=17), San Jacinto River (n=9), San Jacinto Wildlife Area (n=3), Cajon Wash (n=10), Santiago Creek at Cannon (n=1), Santiago Creek upstream of Irvine Lake (n=3), Limestone Canyon (n=1), Santiago Oaks Regional Park (n=2), Sycamore Canyon (n=6), Carbon Canyon Regional Park (n=2), Carbon Canyon Rd. at Chino Hills Pkwy. (n=3), Poorman Reservoir (n=4), Quail Run (n=1), Fresno Creek (n=4), Cottonwood Canyon (n=4), Lake Perris (n=1), Kabian Park (n=4), Box Springs (n=1), Castlevew (n=1), and March SKR Preserve (n=2), Yellow Warblers were present at Corona at Gilmore St., Harrison Reservoir, La Sierra Blvd. and Van Buren Blvd. at Bountiful. Additionally, a minimum of 32 Yellow Warbler fledglings or juveniles were observed at Norco, Hidden Valley, Temescal, Santa Ana Canyon (Featherly Park and Green River Golf Club), Santiago Oaks Regional Park, and Chino Hills).

In 2008, a minimum of 373 Yellow Warbler territories, *Dendroica petechia*, were documented throughout the watershed. Yellow Warblers were detected in San Timoteo (n= 73), Santa Ana Canyon (n=79), Hidden Valley (n=51), the Santa Ana River, from River Road to Norco (n=31), Chino Hills State Park (n=21), Irvine Regional Park (n=20), the Santa Ana River between Mission and Van Buren (n=15), Temescal (n=14), Peter's Canyon (n=11), Mockingbird Canyon, (n=10), San Jacinto (n=10), Sycamore Canyon

(n=10), Chino Hills surrounding areas (n=12), Carbon Canyon (n=2 pairs), Wardlow Wash (n=3), Cottonwood Canyon (n=3), Fresno Creek (3), and Lake Perris (n=1), March SKR Preserve (n=1), and Yorba Linda at Starlight Dr. (n=1). Yellow Warblers were present at Santiago Oaks Regional Park and Cajon Wash. Additionally, 30 Yellow Warbler fledglings or juveniles were observed in the Santa Ana Canyon, Hidden Valley, on the Santa Ana River at Norco, and Temescal.

Sites with the highest numbers of Yellow Warblers in 2007 included: Santa Ana Canyon (n=52), Hidden Valley (n=32), San Timoteo (n=20), the Santa Ana River, from River Road to Norco (n=13), Mockingbird Canyon, (n=12), and San Jacinto (n=10), Chino Hills Butterfield Ranch area (n=5), Sycamore Canyon (n=3), Lake Perris (n=at least seven), Peter's Canyon (n=5), Santiago Creek at Cannon Road (n=5), and Mead Valley at the aqueduct (n=3). Fledglings were observed in the Santa Ana Canyon, on the Santa Ana River at Norco, and Temescal. In San Timoteo a Yellow Warbler was observed feeding a cowbird juvenile. Yellow warblers were found in small, fragmented, habitats as well, such as: Yorba Linda at Starlight Dr., a residential track with a small patch of riparian habitat in an adjacent ravine; Van Buren Boulevard at Plummer in the City of Riverside; and Eucalyptus at Rancho Hills in the City of Chino Hills, Box Springs, and a ravine at Gilmore Street at Hwy 15 in Corona, to name only a few.

In 2009, a minimum of 210 Yellow-breasted Chats, *Icteria virens*, were detected. Sites with chats detected were: Hidden Valley (n=45), Santa Ana Canyon (n=34), the Santa Ana River at Norco (n=20 and 4 fledglings), San Timoteo Canyon (n=14), Temescal (n=10), Santa Ana River, between Mission and Hidden Valley (n=35), Sycamore Canyon (n=1), Poorman Reservoir (n=1), San Jacinto (n=2), Cottonwood Canyon (n=1), Mockingbird Canyon (n=2), Chino Hills environs (n=4), Irvine Regional Park (n=9), Chino Hills State Park (n=5), Peters Canyon (n=8), Limestone Canyon (n=3), March SKR Preserve (n=1), Yorba Dry Lake Bed (n=1), Santiago Oaks Regional Park (n=1), Carbon Canyon Regional Park (n=2 adults and 2 fledglings), Santiago Creek at Cannon (n=2), Santiago Creek upstream of Irvine Lake (n=5), Cajon (n=2), and Irvine Company property across from Peter's Canyon (n=1). A nest with 2 chicks was detected at the Alessandra Arroyo.

In 2008, a minimum of 138 Yellow-breasted Chats, *Icteria virens*, were detected. Sites with the highest numbers included: Hidden Valley (n=47), Santa Ana Canyon (n=22), the Santa Ana River at Norco (n=15), San Timoteo Canyon (n=14), Santa Ana River, between Mission and Hidden Valley (n=5), Irvine Regional Park (n=5), Chino Hills State Park (n=7), Peters Canyon (n=4), Sycamore Canyon (n=3), Temescal (n=3), Wardlow Wash (n=1), San Jacinto (n=2), Mockingbird Canyon (n=1), Carbon Canyon (n=3), and areas surrounding Chino Hills (n=2), Fresno (n=1), Cottonwood Canyon (n=1), and March SKR Preserve (n=1). Chats were also present in Cajon.

A minimum of 107 Yellow-breasted Chats were detected throughout the watershed in 2007. Chats were observed at the following sites: Santa Ana Canyon (n=34), Hidden Valley (23), the Santa Ana River at Norco (n=15), San Timoteo (n=10), March SKR Reserve (n=4), Peter's Canyon (n=5), Santiago Creek at Cannon Road (n=4), Chino Hills State Park (n=3), Temescal Canyon (n=3), Harrison Reservoir (n=3), Mockingbird Canyon (n=2), Sycamore Canyon (n=1), and Chino Hills, in the fragmented habitat in the Butterfield Ranch area (n=1). Their presence was noted at Cottonwood Canyon, in Lake Elsinore, Kabian Park, and Alessandro Arroyo as well.

In 2009, one pair and 3 juvenile California Gnatcatchers, *Polioptila californica*, were observed in Mockingbird Canyon where this species is usually detected in small numbers. They were present in Peter's Canyon.

In 2008, two pairs of California Gnatcatchers were observed with fledglings for the third consecutive year in Mockingbird Canyon. Two males were observed in Temescal and one was observed in Cajon. Gnatcatchers were detected on the Santa Ana River at Opal Avenue and in Chino Hills State Park along the boundary with the Green River Golf Club.

In 2007, California Gnatcatchers were detected for the third consecutive year at Harrison Reservoir below Lake Matthews and in Mockingbird Canyon. A pair with two offspring was detected at the 3M Plant in Corona. Gnatcatchers were also detected at Peter's Canyon, Dos Lagos in Temescal, and in Silverado Canyon near Santiago Creek.

Downy Woodpeckers, *Picoides pubescens*, were seen in small numbers throughout the watershed in 2009. Three pairs were observed in San Timoteo. A female with a juvenile was seen on the River between Mission and Hidden Valley. A male was observed at the 3M plant in Corona and a pair was observed in Dos Lagos, and one was observed in Lake Elsinore in Temescal Two were detected in Hidden Valley. A pair was detected in Mockingbird Canyon. A pair was observed at a nest feeding fledglings was observed on the Santa Ana River in Norco where 3 additional territories were documented. In the Santa Ana Canyon, in Featherly Park, an adult was observed entering a nest cavity and a pair was seen in the upper canyon just below Prado Dam. Downy woodpeckers were present Eucalyptus at Rancho Hills in Chino, in Jurupa Park, La Sierra Blvd. in Riverside County below Lake Matthews, San Jacinto.

In 2008, Downy Woodpeckers, were observed in Santa Ana Canyon (n=1+1pr), Temescal (n=1+1pr), San Timoteo (two pr, one with nestlings), Santa Ana River between Mission and Hidden Valley (n=1 pr) and the Santa Ana River at Norco (n=1) and one each at Peters Canyon, Santiago Oaks, Mockingbird Canyon, and Chino Hills.

In 2007, Downy Woodpeckers were observed at several sites: Santa Ana Canyon (n=3); Hidden Valley (pair); Santa Ana River at Norco (n=4 territories, including one downy woodpecker feeding chicks in tree cavity); Mockingbird Canyon (n=at least 2); and along Van Buren Boulevard near Orange Terrace (n=1). The presence of Downy Woodpeckers was also noted at San Timoteo, and Cottonwood Canyon.

In 2009, Loggerhead Shrikes, *Lanius ludovicianus*, were detected at Norco Burn (n=1) and their presence was noted at March SKR Preseve, at the Green River Golf Club in the Santa Ana Canyon, and in and around the San Jacinto Wildlife Area .

Loggerhead Shrikes were observed only in the San Jacinto Wildlife Refuge in 2008. The pair (at E0489027, N3748017, near the entrance to the refuge) was first observed on January 14, 2008 and courtship behavior was detected on January 17. Nest building was observed on February 14 and on March 13 the pair was carrying food to the nest. On May 17, fledgling was confirmed for this pair. A second pair was observed with fledglings near the E-pond.

Several sightings of Loggerhead Shrikes were made throughout the watershed in 2007. Shrikes were detected in the Santa Ana Canyon (n=1), San Timoteo (one pair), the Santa Ana River at Norco (a pair courtship feeding was observed), and the San Jacinto Wildlife Area (n=4). No shrikes were caught as non-targets in the cowbird traps

in San Jacinto in 2007. There were eight occurrences of shrikes in cowbird traps at the San Jacinto Wildlife Area in 2006 and all were released. In 2005, shrikes were detected in San Jacinto and at Newport Slough, a marsh at the mouth of the Santa Ana River. In 2004, one was observed in the basin at Mockingbird Canyon. In 2004 a shrike was observed defending its territory against a Greater Roadrunner, *Geococcyx californianus*, at the base of Prado Dam in the upper Santa Ana Canyon. The shrike's apparent territory overlapped with a vireo territory. In previous years they have been detected on the Santa Ana River at Riverside Avenue and in the Prado Basin.

In 2009, a flock of Tri-colored Blackbirds, *Aegelaius tricolor*, were observed in Chino Hills State Park 6/1/09. Twenty birds were caught in cowbird traps during the 2009 season: San Jacinto (n= 15), San Timoteo (n=2), and Mockingbird Canyon (n=3). Seven tri-colored blackbirds were incidentally trapped in San Jacinto during the previous winter. All trapped birds were released alive.

In 2008, small numbers of Tri-colored Blackbirds, were detected in San Timoteo Canyon throughout the nesting season near Fisherman's Retreat. At one time 300 individuals with juveniles were observed foraging between Fisherman's Retreat and Younglove Preserve. Many birds from this flock (n=297 occurrences) were captured in a cowbird trap at Fisherman's Retreat. This trap was closed. No banded birds were captured and there was no mortality. Twenty-four Tri-colored Blackbirds were captured in cowbird traps at San Jacinto dairies and one was caught in Jurupa Park in Riverside. Again, no banded birds were captured and there was no mortality. A Tri-colored Blackbird was observed foraging at the San Jacinto Wildlife Refuge.

Tri-colored Blackbirds were caught in cowbird traps in San Jacinto (64 occurrences) and San Timoteo (one occurrence) during 2007. No banded birds were captured and there was no mortality.

In 2009, only a few Rufous-crowned Sparrow, *Aimophila ruficeps*, were documented. An adult was detected at 3M in Corona and they were present at Lake Perris, Mt. Rubidoux, San Jacinto, and Sycamore Canyon.

In 2008, Rufous-crowned Sparrows, , were detected in Chino Hills (n=5+1 pair with four fledglings), Mount Rubidoux (n=3), Sycamore Canyon (n=2), Box Springs (n=1 pair with one fledgling) and Temescal (n=1). In 2007, Rufous-crowned Sparrows were detected in Silverado Canyon (n=1), Cottonwood Canyon in Lake Elsinore (n=3), at the end of Porter Street off of Van Buren Boulevard in Riverside (n=1), and Harrison Reservoir (n=1). They were detected in San Timoteo and at the 3M plant in Temescal in 2006. In 2005, two Rufous-crowned Sparrows were detected at Sycamore Canyon.

SAWA joined the multi-county-wide Cactus Wren Working Group last year and is responsible for tracking current and historical sites of cactus wren occupancy. Please contact Melody Aimar at SAWA for more information. Numbers of cactus wrens in Chino Hills State Park have remained low in 2009

In 2008, eight occupied Cactus Wren, *Campylorhynchus brunneicapillus*, territories were detected in lower Aliso Canyon and nearby environs in Chino Hills State Park. Unfortunately, the devastating wildfire in November burned the park. As of this writing, three of the eight territories remain occupied. Another Cactus Wren was detected in Telegraph Canyon. The post-fire status of this individual is unknown. They were detected in Santiago Canyon, Orange Hills and the Santa Ana River near Redlands during SAWA focus surveys.

There were no new sightings of Cactus Wrens during the 2007 season. They were sighted in their usual location in Chino Hills State Park at the Green River Golf Course in winter (2007-08). They were detected on the hillside above Santiago Canyon Road, east of the 261 toll way in 2006. The previously-reported Cactus Wren at Perris Lake during the vireo surveys in 2005 was probably a Canyon Wren whose identity was mistaken due to a mix-up regarding the four-letter abbreviation codes, CAWR vs. CACW. Cactus Wrens were detected at El Toro Marine Base in 2005 during SAWA's herpetological surveys.

Several Burrowing Owls, *Athene cunicularia*, have been documented in the open fields and dairies at Prado Basin (B. Nash, OCWD) over several years; SAWA is in the process of mapping locations of Burrowing Owls in the watershed.

Sightings of Burrowing Owls in 2009 included Kabian Park where pair was observed with 3 fledglings. Eight owls were seen in Mockingbird Canyon at Alder and Scottsdale on a residential property a site that was also occupied in 2008, The owls at Markham and Wood observed in 2008 were not seen in 2009.

The pair of owls at El Prado Rd and Kimball Ave in Chino were observed early in the 2009 season but were not being observed later in the season. In 2008 a pair of owls was documented for the third year at the southeast corner of El Prado and Kimball Avenues. This pair's burrow is in a dirt berm along El Prado Road contiguous to the new Chino Creek Park, a 20 acre wetlands park. SAWA has installed two artificial burrows in hopes of enticing the pair to a safe location within the park; El Prado Road is slated for 'improvement' in the near future. A Burrowing Owl was also documented approximately 100 m from the same corner in the field of the Chino State Institute for Men in January 2009 (Lee Reeder, photo on SAWA web page).

In 2008, 12 Burrowing Owls, including some fledglings, were detected at the San Bernardino airport in the City of San Bernardino. Another Burrowing Owl and a juvenile were observed at Indigo Avenue near Colton Golf Club. Owls were also detected at two locations in Mockingbird Canyon. One of these sites held a pair with at least one fledgling; the other site had at least eight owls both adults and juveniles.

The previously-reported two pairs of Burrowing Owls observed at San Timoteo in 2007 has been questioned and we are following up. One Burrowing Owl was observed at Yorba Dry Lake Bed in 2007.

A pair detected within a fenced culvert at Limonite Avenue and Bain Street along the Santa Ana River remained after the 2007 fire and one individual was observed there in the spring of 2008. The site appeared active in 2009 but owls were not observed (D. McLain, pers comm.). The site in Mockingbird Canyon at Wood Street, where Burrowing Owls were detected in 2005, has been developed. In 2005, a pair with a fledgling was observed at Mockingbird Canyon and a pair was observed at Perris Lake.

A minimum of 17 individuals including seven pairs were documented in Mead Valley, near the aqueduct off of Cajalco Road in 2006. This small population still remains in 2008. In 2008, one owl was detected adjacent to this larger population near Cajalco Road

In 2009, the presence of Greater Roadrunners, *Geococcyx californianus*, was documented in Chino Hills at Carbon Canyon at Western Hills golf course and Eucalyptus at Rancho Hills. They were also documented at Fresno Creek, Gavilon

Hills, Lake Elsinore, Lake Perris, March SKR Preserve, Norco Burn, Quail Run, the Santa Ana Canyon, San Jacinto, San Timoteo, and Sycamore Canyon.

In 2008, one pair of Greater Roadrunners, *Geococcyx californianus*, with a fledgling was observed in Peters Canyon. A pair was also observed at the Alexander Wetlands off Cajalco and Alexander in Riverside. In 2004, Greater Roadrunners were observed at the Green River Golf Club and in Mockingbird Canyon, both in the basin and in the canyon, trying to enter cowbird traps. The traps were in upland habitat above the reservoir and in habitat greatly disturbed by off-road vehicles in the canyon. Fortunately, the roadrunners were unsuccessful in entering the traps.

The Tree Swallow box program continued at the Chino Creek Wetlands Park (CCP) at the Inland Empire Utilities Agency for the second year. In 2009, 19 of 25 boxes were used (76% utilization rate) and a minimum of 93 Tree Swallows fledged. In 2008, at the CCP, 11 of 16 boxes were used (69% utilization rate) and a minimum of 43 Tree Swallows fledged. The Orange County Water District has had a Tree Swallow box program in Prado Basin for many years. In 2009, 163 boxes were available and 863 tree swallows fledged from 144 nesting boxes (J. Pike, in progress). In 2009 Tree Swallows, *Tachycineta bicolor* were also observed in Chino Hills at Carbon Canyon Rd. at Chino Hills Parkway, at Bayberry Dr., and the end of Eucalyptus, south of Rancho Hills. Also seen in San Timoteo, Oak Glen and Wardlow Wash. In 2008, Tree Swallows were observed using nest boxes at the San Jacinto Wildlife Refuge and a snag-cavity (nestlings seen) at the Featherly Park.

There were no documented sightings of White-throated Swifts, *Aeronautes saxatalis*, in 2009. In 2008, they were observed foraging in Featherly Park.

In 2009, an adult Lawrence's Goldfinch, *Carduelis lawrencei*, was observed with a fledgling in Chino Hills at Carbon Canyon Rd at Chino Hills Parkway. A pair with 3 juveniles was observed in Mockingbird Canyon. Presence was noted in San Timoteo and Wardlow Wash. In 2008 three pairs and a separate flock of 30 Lawrence's Goldfinches, with juveniles, were observed in San Timoteo Canyon; three adults were also observed on the Santa Ana River in Norco.

In 2009, Horned Larks, *Eremophila alpestris*, were observed in Sycamore Canyon. Nesting Horned Larks were documented in Prado Basin (J.Pike, pers.comm.) In 2008, 10 Horned Larks, were detected in San Jacinto in January and a pair was observed on the Santa Ana River in Norco.

A flock of 50 Mountain Plover, *Charadrius montanus*, was detected in San Jacinto Valley in 2008 and about 24 were observed again in 2009.

In 2009, the only documented sighting of a Warbling Vireo, *Vireo gilvus*, was on Santiago Creek at Cannon. In 2008, Warbling Vireos were detected in Santa Ana Canyon, Mockingbird Canyon and Glen Oak during migration. In 2007, Warbling Vireos were detected as late as the end of May, at the end of their migration. They were detected in Alessandro Arroyo on May 23, Featherly Park on May 15, and in Cottonwood Canyon on April 21. Warbling Vireos are now considered migrants but they used to nest along coastal southern California and their decline is thought to be due to cowbird parasitism (Garrett and Dunn 1981).

In 2009, Wilson's Warblers were observed in Mockingbird Canyon, the Santa Ana Canyon at Green River Golf Club, and San Timoteo. In 2008, three singing male Wilson's Warblers, *Wilsonia pusilla*, were detected in San Timoteo Canyon and one was

detected in Upper Aliso Canyon in Chino Hills State Park. In 2007, they were detected in the Santa Ana Canyon, Cottonwood Canyon, Kabian Park, Irvine Regional Park, and the Santa Ana Canyon.

Other interesting sightings in 2008 include a Scissor-tailed Flycatcher, *Tyrannus forficatus*, at Hidden Valley and at Norco, flying over the Santa Ana River. A MacGillivray's Warbler, *Oporornis tolmiei*, was detected May 5 on the Santa Ana River at Norco. A Tundra Swan, *Cygnus columbianus*, was observed March 3 sleeping on the shore of a pond at the San Jacinto Wildlife Refuge. An Eastern Phoebe, *Sayornis phoebe*, was observed January 24 foraging at the San Jacinto Wildlife Refuge.

A Black-throated Gray Warbler, *Dendroica nigrescens*, observed at the March SKR Preserve in 2009 and in Mockingbird Canyon in 2008.

The presence of Lazuli Buntings, *Passerina amoena*, were documented in Bane Canyon of Chino Hills State Park in 2009. In 2008, a female Lazuli Bunting, was observed exhibiting nest-defense behavior in San Timoteo Canyon, however, no nest was detected; approximately 15 Lazuli Buntings were observed throughout the season along the creek in Younglove Reserve.

In 2009, Blue Grosbeaks, *Guiraca caerulea*, were documented at Chino Hills State Park with 3 pairs in Upper Aliso Canyon. An adult male was seen at Dos Lagos, a pair was observed at Fresno Creek. Three were observed in Hidden Valley, 2 at Limestone Canyon. Their presence was noted at Lake Elsinore, March SKR Preserve, Norco, San Jacinto, San Timoteo, Sycamore Canyon, and Wyle Lab at El Paso.

In 2008, Blue Grosbeaks were again detected in Hidden Valley (one pair and three males). They were also detected in Carbon Canyon (n=1), March SKR Preserve (one pair + one male), Chino Hills (n=2) and the Santa Ana River at Norco (nest with chicks that fledged by July 3, one pair with fledgling, one pair, and three adults and a juvenile male). Numerous Blue Grosbeaks were present the upland habitat in San Timoteo. In 2007, Blue Grosbeaks were detected in Hidden Valley (n=5 and one pair) and March SKR Reserve, (one pair that was probably nesting and two other males). Two pairs were observed in the Norco area of the Santa Ana River, one pair was feeding two fledglings. Blue Grosbeaks were present in San Timoteo and on Van Buren at the end of Porter Avenue

in 2009 Ash-throated Flycatchers were documented. A pair was observed at Fresno Canyon. Three flycatchers were documented at Cajon Wash, 2 at Hidden Valley, 1 in Featherly Park, an adult and 1 juvenile at Green River Golf Club, 2 at Santiago Oaks Regional Park. They were also present at Carbon Canyon Regional Park, Chino Hills at Bayberry Dr., and Chino Hills State Park at Bane Canyon and Upper Aliso Canyon, Harrison Reservoir, Lake Elsinore, La Sierra Blvd., Mockingbird Canyon, Norco, San Jacinto, and Santiago at Cannon, San Timoteo, Santa Ana River at Mission to Hidden Valley, Sycamore Canyon.

In 2008, Ash-throated Flycatchers, *Myriarchus cinerascens*, were detected throughout the watershed where habitat persists. Documented sightings occurred in San Timoteo, Chino Hills, Santa Ana River from Mission Road to Hidden Valley, Santa Ana Canyon, Norco, Peters Canyon, and Featherly Park, where a nest was observed in a snag. In 2007, Ash-throated Flycatchers were documented in Cottonwood Canyon, Santiago Creek (n=1), Peter's Canyon (n=3), on Van Buren Boulevard near Orange

Terrace in the City of Riverside, in the Santa Ana Canyon, Featherly Park (n=3), Hidden Valley (n=2), and March SKR Preserve (n=1).

In 2006, Ash-throated Flycatchers were observed in the small patch of riparian habitat at Starlight Dr. in Yorba Linda, in Peter's Canyon, March SKR Preserve, Mockingbird Canyon, and San Timoteo and Cottonwood Canyon in Lake Elsinore. In Chino Hills they were documented at Eucalyptus and Del Monte and south of Rancho Hills and at the Carbon Canyon entrance to Western Hills Golf Course. Two Ash-throated Flycatchers were observed in Hidden Valley, and three in Featherly Park. This species was also present in the City of Riverside at Huan Road and Santa Rosa Mine Road.

In 2009, a nest of the Black-headed Grosbeak was found in Dos Lagos and 3 chicks fledged. The species was also noted at Cajon Wash, Chino Hills at Carbon Canyon and Chino Hills Parkway, end of Eucalyptus south of Rancho Hills, and Eucalyptus at Rancho Hills, Chino Hills State Park at Bane Canyon and Upper Aliso Canyon, Hidden Valley (n= 11), Frenso Creek, Mockingbird Canyon, Peter's Canyon (n=3), San Jacinto, San Timoteo, Sycamore Canyon, Featherly Park (n=14), the Santa Ana River from Mission to Hidden Valley, and Wardlow Wash.

In 2008, Black-headed Grosbeaks, *Pheucticus melanocephalus*, were detected throughout the watershed. Documented sightings include Carbon Canyon, Chino Hills and Chino Hills State Park, San Timoteo, Sycamore Canyon, Hidden Valley, Norco, Temescal, and Santa Ana Canyon. In 2007, three nests of Black-headed Grosbeaks were documented on the Santa Ana River in the Norco area; one nest contained a three day old chick. Pairs were also documented at Peter's Canyon (as well as three other males) and the ravine at Starlight Dr. in Yorba Linda. One to seven black-headed grosbeaks were detected at various sites throughout the watershed. Seven territories were detected in Hidden Valley. Six Black-headed Grosbeaks were documented in Featherly Park below Gypsum Canyon Road in 2007; eight were recorded in 2006. Their presence was also detected in Mockingbird Canyon and in San Timoteo in 2006 and 2007. A Black-headed Grosbeak nest in hemlock, eventually abandoned, was detected just downstream from Prado Dam in 2006. A Black and White warbler, *Mniotilta varia*, and nine Black-headed Grosbeak territories were detected in Featherly Park below Gypsum Canyon Road in 2005.

A Black and White Warbler, *Mniotilta varia*, was observed in Hidden Valley on 9/10/09.

In 2009, a male Vermillion Flycatcher, *Pyrocephalus rubinus*, was observed several days in January on the Santa Ana River in Norco. In 2008, a male Vermillion Flycatcher, was observed at Carbon Canyon Regional Park and one juvenile was observed at Reid Park in Riverside. Although two Vermillion Flycatchers were documented in the Santa Ana Canyon in 2005, none was documented in 2006, 2007, 2008, or 2009.

In 2008, four immature Wood Ducks, *Aix sponsa*, were observed at Featherly Park. One pair with ducklings was observed at the Green River Golf Club, and one male was observed at Mockingbird Canyon Reservoir. Several pairs of Wood Ducks were observed at boxes and in the ponds at Hidden Valley. In 2009, Wood Ducks were again documented at the reservoir at Mockingbird Canyon, in Hidden Valley, and in the Santa Ana Canyon. Additionally, a male was observed at Santiago Creek at Cannon.

Wood Ducks have been observed annually since 2005 along the river in Featherly Park and in Hidden Valley in 2005 and 2006. In 2007, they were also observed at the Green River Golf Club in the Santa Ana Canyon. In 2004 a pair was observed in the reservoir at Mockingbird Canyon. The Orange County Water District sponsors a nest box program in the Prado Basin. In 2008, 892 wood ducklings fledged from 165 boxes.

In 2009, American Bitterns, *Botaurus lentiginosus*, were documented in Dos Lagos (2 sightings), Norco (3 sightings), Santiago Oaks Regional Park (1 sighting). In 2008, American Bitterns, were detected in the Santa Ana River in Norco (n=6 sightings), Temescal (n=2 sightings), and Santiago Oaks (n=2 sightings).

In 2009 Black-crowned Night Herons, *Nycticorax nycticorax*, were observed in Hidden Valley, Mockingbird Canyon, and San Timoteo. In 2008 they were observed roosting in the riparian vegetation at the San Jacinto Wildlife Refuge in 2008.

In 2008 and 2009, a Green Heron, *Butorides virescens*, was observed in the Santa Ana River, between Mission Avenue and Hidden Valley.

Below are documented raptor sightings that occurred during vireo monitoring. For more complete information on raptor presence and activity in the watershed please see SAWA's annual reports documenting driving raptor surveys at 4 sites in the watershed: San Timoteo Canyon, San Jacinto, Cajon, and Lake Perris. The reports can be found at www.sawawatershed.org.

Several Red-tailed Hawk nests were documented in 2009. A nest with a chick was observed at Chino Hills, Carbon Canyon Rd at Chino Hills Parkway. A pair with 2 juveniles in a nest was observed at Hidden Valley; another nest was seen earlier in the year but the outcome was unknown. A nest with 2 nestlings was observed at Lake Perris. Three active nests with chicks were documented at March SKR Preserve. On the Santa Ana River near Van Buren Blvd, a nest with 2 nestlings was documented. A nest and 2 juveniles were observed at Sycamore Canyon. At Mockingbird Canyon, a juvenile was observed attacking adult with food; a second adult was present.

In 2008, seven active Red-tail Hawks, *Buteo jamecensis*, nests were detected. Nests were found in Featherly Park (no young observed but the nest was found on 7/30), Chino Hills (a nest was seen on an electrical tower), Harrison Reservoir (nest was in a palm tree but no young observed), San Timoteo (nestlings observed), and Mockingbird Canyon (no young observed). Two nests were found in Norco, one fledged two young and adults were observed feeding at least one nestling at the second nest but the outcome is unknown. Adults and juveniles were observed on the Santa Ana River near Mission Avenue.

In 2007, active Red-tailed Hawk nests were detected at Carbon Canyon Regional Park, Temescal Canyon, the Santa Ana River at Norco, Hidden Valley and in Menifee at Huan Road. Pairs were observed at Santiago Oaks Regional Park and near Porter Avenue and Van Buren Boulevard in Riverside. In 2006, 16 active nests were detected throughout the watershed. Nestlings or fledglings were observed at Hidden Valley (one nest) and Featherly Park (one nest). Three nests were detected in San Timoteo; four in Temescal; two at Harrison Reservoir; one at Sycamore Canyon; one in San Jacinto off of Soboba; one in Mockingbird Canyon; one along the Santa Ana River at Norco; and one at Huan Road in the City of Riverside.

In 2009 Cooper's Hawks, *Accipiter cooperii*, were present at Cajon Wash, Chino Hills at the end of Eucalyptus-south of Rancho Hills, Fresno Creek, Goldenstar-Woodcrest area, Harrison Reservoir, Hidden Valley, Jurupa Park, Lake Elsinore, La Sierra Blvd., March SKR Preserve, Mockingbird Canyon, Norco, San Jacinto, Santiago Oaks Regional Park, San Timoteo, Santa Ana River Mission to Hidden Valley, Sycamore Canyon. A pair nested at Featherly Park and an additional territory was documented. A nest was documented at Bane Canyon in Chino Hills State Park and at Chino Hills Butterfield Ranch area.

Although Cooper's Hawks were observed throughout the watershed in 2008, only three nests and two additional family groups were documented. Two nests were found on the Santa Ana River in Norco; one nest fledged three young and the second nest was inactive two weeks after incubation was observed between May 15 and May 29. The third nest was found in Chino Hills. In Mockingbird Canyon, a pair was observed and young were heard nearby in a palm tree. In Featherly Park an adult flew at the biologist during three visits and a juvenile was observed one month later in the same area.

At least four active Cooper's Hawk nests were documented in 2007. Two nests, each with three nestlings, were located in Featherly Park downstream of Gypsum Canyon Road within one mile of each other. One nest contained three male nestlings and the other nest contained two female and one male nestlings all of which were banded by Pete Bloom. A nest with a least one fledgling was located in Cottonwood Pond at Hidden Valley. A nest was detected at Alessandro Arroyo and a nest was also probably active at March SKR Preserve.

In 2009, White-Tailed Kites, *Elanus leucurus*, were observed in Hidden Valley and San Jacinto; an adult with 3 juveniles were documented at Irvine Regional Park; in San Timoteo a nest fledged 3 chicks.

In 2008, one adult and one juvenile White-tailed Kite were observed on separate occasions but in the same locations in Hidden Valley. A kite was observed eating a bird on the river at Norco. In 2007, kites were documented in Chino Hills (one pair), Mockingbird (one pair), Featherly Park (one individual), San Timoteo (three individuals), the Santa Ana River in Norco, where a kite was observed harassing a perched Red-tailed Hawk, Hidden Valley (one individual), San Jacinto Wildlife Area (one individual), Santiago Oaks Regional Park (one individual), and Santiago Creek at Cannon Road (one individual, possibly the same as observed at Santiago Oak Regional Park).

Bald Eagles, *Haliaeetus leucocephalus*, were present in Lake Perris and San Jacinto in 2009. Golden Eagles, *Aquila chrysaetos*, were detected in Cajon and San Jacinto in 2009. In March of 2008, two juvenile Bald Eagles, and one adult Golden Eagle were observed soaring over the San Jacinto Wildlife Refuge.

Ospreys, *Pandion haliaetus*, were observed in the San Jacinto Wildlife Refuge and Lake Perris throughout the 2008 season; they were documented in Lake Perris and San Timoteo in 2009.

In 2008 two Peregrine Falcons, *Falco peregrinus*, were observed in the San Jacinto Valley. In 2009, they were observed in San Jacinto and Lake Perris.

In 2008 another raptor sighting was that of an adult Ferruginous Hawk, *Buteo regalis*, in San Timoteo Canyon. In 2009, they were observed in Lake Perris, San Jacinto, and Sycamore Canyon.

In 2009, American Kestrels, *Falco sparverius*, were observed in Cajon (a female). A pair was observed on Carbon Canyon Rd. on Chino Hills Parkway. Their presence was also noted in Chino Hills at Eucalyptus and Peyton, in Bane Canyon and Upper Aliso Canyons in Chino Hills State Park, Harrison Reservoir, Hidden Valley, Lake Perris, La Sierra Blvd., Mockingbird canyon, Norco Hills Park, San Jacinto River and the Wildlife Area, San Timoteo, Steele Valley, and Sycamore Canyon.

In 2009, Northern Harriers, *Circus cyaneus*, were present in Lake Perris, San Jacinto River and Wildlife Area, and San Timoteo.

In 2009, Red-shouldered Hawk, *Buteo linnaeus*, nest with chicks was documented in Carbon Canyon Regional Park. A pair with 2 juveniles was observed at Green River Golf Club. four nests were documented in San Timoteo. Presence was also noted in Sycamore Canyon, Santa Ana River at Anza Narrows, Santiago Oaks Regional Park, Santiago Creek at Cannon, San Jacinto River, Mockingbird Canyon, Hidden Valley, Lake Perris, Golden Star, Chino Hills State Park at Lower Aliso Canyon, Carbon Canyon Rd at Western Hills Golf Club, and Cajon Wash.

In 2008, a pair of Nutmeg Manniken, *Lonchura punctulata*, was observed in Carbon Canyon Regional Park. This non-native bird from southern Asia established small populations in California during the 1980's.

In 2009 Horned Lizards, *Phrynosoma coronatum blainvillii*, were documented at Santa Ana Canyon (n=1), San Jacinto River (n=2). Their presence was noted at San Timoteo and included juveniles. SAWA has begun a study to document the presence of horned lizards throughout the watershed. Transects have been established at Hidden Valley, along the Santa Ana River near Limonite and Bain and in San Bernardino, Gavilon Hills, Featherly Park, Rancho Cucamonga, San Timoteo, San Jacinto, and Chino Hills State Park. For further information please contact Terry Reeser at reeser-sawa@sbcglobal.net.

In 2008, the Coast Horned Lizard, was observed in Cajon Wash, San Jacinto and in Mead Valley, adjacent to Cajalco Road. The only detections in 2007 occurred during the herpetological study consisting of six pit fall trap arrays in the Upper Canyon in the Santa Ana Canyon. Numerous sightings have been made along the Santa Ana River off of Limonite Avenue over the past three years but in 2007 a fire swept through the sandy floodplain and upland. No horned lizards were documented in the area after the fire; in 2006, eight sightings had been made, in 2005, three were seen, and in 2004, ten were detected. The Horned Lizard continues to be seen along the State Park Road in Chino Hills downstream of Prado Dam in 2008. First observed by SAWA biologists in 2003 and 2004 near a cowbird trap, one small and three baby lizards were observed in 2006. This species is getting special attention from State Parks and the Army Corps of Engineers due to the need to cross its habitat in order to access construction projects in the river. Again, in 2006, Horned Lizards were observed in San Timoteo at Younglove Preserve. In 2003, a Horned Lizard was also seen in the riverbed of the Santa Ana River above Tippecanoe Avenue.

In 2009, Orange-throated Whiptails, *Aspidoscelis hyperythra beldingi*, were detected in Box Springs, Kabian Park, Lake Perris, Mockingbird canyon, San Jacinto River, and Dos Lagos in Temescal. A hatchling was seen on the Santa Ana River between Anza Narrows and Van Buren Blvd. In 2008, were observed in Mockingbird

Canyon, Quail Run, and Temescal. Several adults and juveniles were captured in herpetological surveys at Lake Perris. In 2007, they were observed only in Mockingbird Canyon (n=2) and off of Van Buren Boulevard at Porter Avenue (n=3). In 2006, they were observed in San Timoteo, Mockingbird Canyon, Temescal, Sycamore Canyon and along the Santa Ana River in Norco. In 2005, they were documented in Mockingbird Canyon (adults and juveniles), San Timoteo, Sycamore Canyon, Cottonwood Canyon (an adult on 6/10). In 2004, sightings of Orange-throated Whiptails, occurred in both Mockingbird Canyon basin and canyon, at Harrison Reservoir, and in Sycamore Canyon. In 2003, juvenile they were detected in two locations at Mockingbird Canyon; adults with young were detected at a third location.

Western Whiptails, *Aspidoscelis tigris*, were documented in Fresno Creek, Mockingbird Canyon, Featherly Park, San Timoteo, and Wardlow Wash in 2009. In 2008 they were observed in Mockingbird Canyon, Featherly Park, San Jacinto Wildlife Refuge, San Timoteo, and Temescal in 2008. Additionally, several individuals were captured during herpetological surveys at Lake Perris. Granite Spiny Lizards, *Sceloporus orcutti*, were observed at Mount Rubidoux, Sycamore Canyon, Lake Perris, Quail Run and Temescal in 2008.

Due to the drought conditions, Western Spadefoot Toads, *Spea hammondi*, were not observed incidentally or at known locations in 2009, 2008, 2007 or 2006. In 2005, Western Spadefoot Toads were detected at Sycamore Canyon breeding in pools of water in tire track ruts during the vireo season. The toads were also found at the lands set aside for El Toro wildlife refuge. During the winter of 2004-2005, breeding was documented in two transient ponds in the San Jacinto River off Soboba Road. In 2003-2004, Spadefoot Toads were observed in the uplands above a riparian ravine in Dos Logos, Temescal. This ravine has been filled in to make a golf course.

Red Diamond Rattlesnakes, *Crotalus ruber*, were observed at the 3M plant in Corona and Lake Elsinore in 2009. In 2008, the Red Diamond Rattlesnake was observed at the Green River Golf Club, Featherly Park, and a dead individual, with its head and tail cut-off, was discovered at Lake Perris. They were detected in San Timoteo in 2006 and 2005. Previously, it has been sighted in 2005 and 2004 in Sycamore Canyon and in 2005 at Perris Lake.

In 2009, the Southern Pacific Rattlesnake, *Crotalus viridis helleri*, was observed on the Santa Ana River at Van Buren Blvd. Five observations were made in San Timoteo, including one road-kill and one that was a prey item for a Red-tailed Hawk. In 2008, Southern Pacific Rattlesnakes were observed at the Green River Golf Club, San Timoteo, Sycamore Canyon, and Peters Canyon. In 2006, sightings of were made at Santiago Creek at Cannon Road, Eucalyptus at Del Monte in Chino Hills, San Timoteo Canyon, and the Santa Ana Canyon. In the Santa Ana Canyon, alert postures by a California Ground Squirrel, *Spermophilus beecheyi*, and a California Thrasher alerted a SAWA biologist to a rattlesnake in the brush. A Pacific Rattlesnake was observed eating a California Ground Squirrel. In 2007, sightings of the Pacific Rattlesnake continue to occur in San Timoteo and the Santa Ana Canyon.

An adult Western Ringneck Snake, *Diadophis punctatus*, was observed in Mockingbird Canyon in 2009. In 2008, a Western Ringneck Snake was observed in Telegraph Canyon, Chino Hills State Park. It was also happily and unexpectedly detected in Yorba Linda at a small patch of riparian habitat off of Starlight Dr. in 2008.

In 2005, one was captured in pit-fall traps at the El Toro refuge; one had been observed in a creek at San Timoteo in 2003.

Two-striped Garter Snakes, *Thamnophis hammondi*, were observed in Mockingbird Canyon in 2003 and at Irvine Park in 2004. The snake in Irvine Park was found dead along a trail in the riparian habitat, the probable victim of a mountain biker.

In 2008, Coachwhip snakes, *Masticophis flagellum piceus*, were observed at Lake Perris, San Jacinto Wildlife Refuge (one road kill), Norco, Green River Golf Club, the upper Santa Ana Canyon below Prado Dam, and in San Timoteo (n=2, one was dead and appeared to have been shot).

In 2009, a Red-sided Garter Snake, *Thamnophis sirtalis infernalis*, was seen in mulefat at Norco Burn. In 2008, one adult and one juvenile Red-sided Garter snake, were observed in the Santa Ana River near Interstate 15 in Norco; recent reports of this species in the Santa Ana Watershed have only been documented in the Prado Basin with one dead adult found along Sunnyslope Creek.

A California striped racer, *Masticophis lateralis*, was detected on the river in Norco in 2008. In 2009, a yellow-bellied racer was observed in San Timoteo.

Rosy boas were reported in San Timoteo in 2009.

In 2009, an adult Long-tailed Weasel, *Mustela frenata* was observed in Norco and at Anza Narrows. In 2008, the only sightings were in Prado basin. Three individuals were seen in the vicinity of Euclid Avenue and Chino Creek by Prado and SAWA biologists (pers. comm. T. Barbee, D. McMichael). They were observed in San Timoteo and along the Santa Ana River in Norco in 2007. They were observed in San Timoteo Canyon and at March SKR Preserve in 2005.

Large mammals detected included bobcats and mule deer in 2009. Mule deer, *Odocoileus hemionus*, were observed in Chino Hills off of Eucalyptus south of Rancho Hills. A female deer with two young juveniles were seen in Upper Aliso in Chino Hills State Park. Three observations were made in San Timoteo including one road-kill. They were seen at Anza Narrows and in Lake Perris when, during the day a doe was seen coming from the hills and walking into the riparian vegetation. Bobcats, *Lynx rufus*, were seen in Lower Aliso at Chino Hills State Park, Dos Lagos, and at Hidden Valley. American black bear, *Ursus americanus*, tracks and scat were seen at Oak Glen.

Southern California Black Walnut, *Juglans californica*, are found in Featherly Park, Chino Creek south of Central Ave., Lower Aliso Creek in Chino Hills State Park, Mockingbird Canyon, and San Timoteo.

Woollystar, *Eriastrum densifolium*, the common subspecies, was detected upstream of the confluence of Cajon and Lytle Creek in 2006, 2007 and in 2008 it was found in other locations in Cajon Wash and Lytle Creek.

Woollystar was also found at Martha McLean Anza Narrows Park in 2008. This population was identified by Andrew Sanders, Curator and Museum Scientist of the UCR Herbarium, Riverside, CA, as the more common sub-species, *Eriastrum densifolium* ssp. *densifolium*. The individual plant originally reported in 2005 in floodplain at Norco was still present in 2007 and 2008 but appeared stressed and did not bloom. Its identity as ssp. *sanctorum* as previously reported is now questionable given that the larger, more common subspecies was also found in the floodplain at the lower elevation.

At March SKR Preserve in 2008, one and two Willow Flycatchers, *Empidonax traillii*, were observed multiple times during May and June but no breeding was detected. Other riparian species observed were one Yellow Warbler, two Yellow-breasted Chats, one male Blue Grosbeak seen several times in the same location, a pair of Black-headed Grosbeaks, four Western Kingbirds, *Tyrannus verticalis*, and a Cooper's Hawk. This preserve is still connected to undeveloped lands and has coyote visitation. In 2009, willow flycatchers were again documented and a yellow-breast chat and yellow warbler were present.

In 2007, incidental sightings at March SKR Preserve included four Yellow-breasted Chats, at least one pair of Blue Grosbeaks, but probably three pairs, a Black-headed Grosbeak, a Cooper's Hawk nest, a pair of Lawrence's Goldfinch, *Carduelis lawrencei*, feeding on fiddleneck, a Pacific-slope flycatcher, *Empidonax difficilis*, an Ash-throated Flycatcher, several Lark Sparrows, *Condestes grammacus*, and American and Lesser Goldfinch, *Cardeulis tristis* and *Cardeulis psaltria*, feeding fledglings. Also present were jack rabbits, *Lepus californicus*, and a coachwhip, *Masticophis flagellum*. In 2005, incidental sightings included a pair of White-tailed Kites and a Long-tailed Weasel. In 2004, a Cooper's Hawk, perched on a cowbird trap, was observed taking an endangered Stephens' Kangaroo Rat, *Dipodomys stephensii*. Miscellaneous observations of species in riparian habitat at March SKR Reserve in 2004 included a pair of Loggerhead Shrikes, nesting Great Horned Owls, *Bubo virginianus*, with three fledglings, one Yellow Warbler and one Yellow-breasted Chat; a Western Whiptail *Aspidoscelis tigris*, was detected in the upland.

Results – Brown-headed Cowbird Trapping, March – July 2009

Fifty five traps were deployed during the vireo season in 2009 and 4,031 cowbirds were removed from all sites over 6,625 trap days (Table 6, Figure 1). The sex and ages of the cowbirds removed in 2009 were 2,637 males, 1,009 females, and 385 juveniles. Over 4,000 hours were spent on the BHCO program during the vireo season. SAWA biologists and field assistants spent approximately 3,748 field hours servicing traps. An additional 400 hours were spent for administrative functions.

The areas trapped and the number of traps in each area is as follows: San Jacinto, 7; San Timoteo, 9; Mockingbird Canyon, 9; Hidden Valley, 3; Temescal Canyon, 10; Santa Ana Canyon, 7; Chino Hills, one; March SKR Preserve, 2; Sycamore Canyon, 1; Santa Ana River, from Jurupa Park to River Road, 6. The majority of the traps were opened in mid to late March and closed July 31. Two sites will remain open through the winter (Green River and San Jacinto dairies). Trapping results in this report end with July 31 data (week ending August 2). Trapping results after July 2009 will be reported in winter trapping results in 2010.

In 2009, the number of trapped cowbirds increased by 64%, from 2,463 in 2008 to 4,031 in 2009. The increased captures can be attributed to the additional five traps and 1,087 trap days for the season. The majority of the total increased capture of 1,568 cowbirds were taken at the San Jacinto dairy traps (n=1,404). Male cowbirds captured

increased by the greatest margin, increasing 69% over the 1,559 males trapped in 2008. In 2009 the number of female captures increased 56% from the relatively stable 2008 captures of 645 (665 in 2007, 659 in 2006). The number of juveniles trapped increased by 126 birds, an 49% increase over 259 in 2008 but still down from 485 in 2006.

In 2009 only 2 traps were vandalized but were repaired and put back into service with minimal down time and no further problems for the season.

Results - Non-Target Avian Species Caught in Cowbird Traps, March – July 2009

Twenty-six 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*, California Towhee, *Pipilo crissalis*, House Sparrow, *Passer domesticus*, Song Sparrow, *Melospiza melodia*, House Finch, *Carpodacus mexicanus*, Lark Sparrow, *Chondestes grammacus*, Brewer's Blackbird, *Euphagus cyanocephalus*, Yellow-headed Blackbird, *Xanthocephalus xanthocephalus*. The mortality rate was 0.86%.

The number of non-targets caught during the 2009 season increased 48% from that of 2008 (n=4,655). In 2009, 60% of the non-targets were native birds. This percentage has varied over the years. Usually, the number of European Starlings trapped exceeds that of any native species.

Results - Winter 2008-2009 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 winter (non-breeding season) of 2008-2009. These traps were left open after the breeding season because they were still trapping cowbirds. They are closed as the winter trapping success decreases. There were a total of 6,900 cowbirds removed over a total of 1,522 trap days (Table 8). Compared to the previous winter, 78 fewer cowbirds were removed over 78 more trap days.

Six traps were open in San Jacinto for a total of 1,314 trap days between 8/4/08 and 3/15/09. The six traps were located at dairies. 6,818 cowbirds were removed (3,283 males, 2,686 females, and 849 juveniles). The total removed was only a 1% increase over 2007-2008 (n=6,735) but a 40% increase in males, 26% increase in females and a 62% decrease in juveniles removed. A total of 2,122 non-target birds were trapped and released, a 288% increase over the 2007-2008 period (n=547) (Table 9). With 3 less traps and 26 additional trap days, there were 83 more cowbirds caught for the 2008-2009 winter.

In the Santa Ana Canyon, two horse stable traps at Green River Road were open for 188 trap-days from 8/4/08 to 12/19/08 and one trap was open at the Canyon RV Park for 20 trap-days from 8/4/08 to 8/29/08. These traps caught 82 cowbirds (19

males, 37 females, and 26 juveniles) down from the 243 cowbirds caught last winter (2007-2008) and down considerably from the 491 cowbirds caught in the previous winter (2006-2007). Sixty non-targets were caught and released which was more than the 37 non-targets caught last winter (2007-2008) but is a decrease from the 89 caught in the previous winter (2006-2007).

Although the number of trapped non-targets increased, non-target mortalities for San Jacinto and Santa Ana Canyon combined was 0.50%, down from 0.86% for last winter.

DISCUSSION

Vireo abundance has increased annually since 2000 except for the decline in 2006 and we now have a population of over 1,200 territories in the Santa Ana watershed. This dramatic increase 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 has increased its vireo population from five in 2000 to 105 in 2009, Temescal Canyon has shown similar increases with a vireo population increasing from 7 in 2001 to 76 in 2009.

SAWA has removed over 50,000 cowbirds from the watershed since 2000 and the 8% parasitism rate in 2009 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 was 71% in 2009, the highest rate since 2001. The quality of the cover seemed improved from 2007 and may have resulted in increased nesting success. Nest loss due to depredation is lowest to date at 22%. In 2008 and 2009, only 3% failed due to reproductive failure. Examples of nest loss due to reproductive failure are egg abandonment, failure of all eggs to hatch, or failure of the vegetation to support the nest to a successful hatching. Only 3% of nests were lost to parasitism in 2009.

The parasitism rate declined for the fourth straight year to 8%. Parasitism continues to be a problem at San Timoteo and Temescal, and it has returned to Mockingbird Canyon. 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 2001-2009.

The lack of nesting southwestern willow flycatchers in the watershed is not surprising given the continuing low number in the Prado Basin (Pike et al 2007). 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 habitat. 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 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 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. In 2004, we asked the question "Where will the ousted paintballers destroy habitat next?" In 2005, the answer is, they just moved further upstream. Paintball enthusiasts also are now using Railroad Canyon in Lake Elsinore and since they have lost a site now being developed for housing in Mockingbird Canyon, they have moved to the Mockingbird Canyon basin below Gage Canal. The basin is the site of one of SAWA's habitat restoration projects. This situation exemplifies a major problem in wildlife management today. Setting aside and enhancing habitat does little good when that land is transformed for other uses by trespassers.

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. 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 through volunteerism, and partnerships with enforcement agencies and landowners.

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Table 1A: 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
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

Table 1A: 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
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⁾
--Estelle Mountain Preserve	-	-	-	-	-	-	-	1/0/0 ⁽⁵⁾	(included in Temescal Cyn)	not surveyed
--Yorba Dry Lake	-	-	-	-	-	-	-	1/0/0	(see table 10)	(see Table 10)

Table 1A: 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
Bed Park										
--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
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	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

Table 1A: 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
Ana Watershed										

- (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	78/65/165	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

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
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	27/21/35	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
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						

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
SAR mainstem-Goose Creek Golf Course (Norco) to River Rd.	-	-	-	-	28/23/62	42/26/24	32/26/46	45/31/45	65/43/106	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
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

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
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	8/8/17	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 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
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	31/16/12	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 Temescal)	Not surveyed
Yorba Linda Dry Lake Bed Park	-	-	-	-	-	-	-	1/0/0	0/0/0	1/1/0
Shipley Nature Center	-	-	-	-	-	-	1/0/0	-		

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
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	developed			
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

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
Santiago Creek at Cambridge Ave.	-	-	-	-	-	-	1/x/x	0/0/0	0/0/0	0/0/0
SUBTOTAL	19/13/25	61/44/108	117/85/132	150/111/235	247/203/310	376/ 238/346	304/ 197/363	418/ 271/360	529/335/602	678/475/946
Santa Ana River - San Bernardino County****						15/12/21	13/11/9	19/15/13	21/13/12	43/33/30
TOTAL FOR SANTA ANA WATERSHED EXCLUDING PRADO BASIN						391/ 250/367	317/ 208/372	437/ 286/373	550/ 348/614	721/508/976
PRADO BASIN (Pike et al)	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 FOR SANTA ANA WATERSHED						991/ 636/892	740/ 427/733	857/ 523/738	1013/ 584/1031	1259/781/1433
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.

Table 2: Least Bell's Vireo, Survey Dates and Breeding Chronology, 2009, 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	3/19	8/31	3/19	4/6	4/29	8/26
Sycamore Canyon	3/16	10/5	3/26	3/31	5/14	8/13
March SKR Reserve	3/23	10/5	3/30	4/1	5/12	9/9
Mockingbird Canyon	3/27	9/8	3/27	n/a	n/a	9/8
SAR mainstem (Mission Blvd. To Van Buren Blvd.)	3/12	9/9	3/30	4/15	5/28	8/21
Hidden Valley	3/16	9/10	3/20	4/1 (n=44)	4/25 (n=29)	9/10
SAR mainstem - Goose Creek Golf Course to River Rd. (Norco)	3/13	9/15	3/18	4/13	5/27	9/15
Temescal Canyon	3/24	8/20	3/24	4/22	5/1	8/20
Harrison Reservoir	Included in Temescal					
Chino Hills (Butterfield Ranch environs)	3/24	8/12	3/24	4/8	4/8	8/12
Santa Ana River - Upper Canyon, Santa Ana Canyon	3/23	8/24	3/23	4/13	5/27	8/17
Santa Ana River - Green River Golf Course, Santa Ana Canyon	3/23	8/18	3/23	3/30	5/13	8/18
Santa Ana River - Featherly Park, Santa Ana Canyon	3/18	9/3	3/19	4/7	4/29	8/26
San Jacinto River Sub Watershed						
San Jacinto River	3/24	9/14	3/24	4/9	4/17	8/25
San Jacinto Wildlife Refuge	4/3	8/29	-	-	-	-

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	4/6	3/31	7/7	5/6	7/31
Sycamore Canyon	5/14	--	--	--	--
March SKR Reserve	5/12	4/16	6/19	5/12	7/16
Mockingbird Canyon	N/A	5/14	6/25	5/22	7/8
SAR mainstem (Mission Blvd. To Van Buren Blvd.)	5/28	4/6	7/6	5/15	7/20
Hidden Valley	4/25 (n = 29)	4/9	7/14	5/1	7/28
SAR mainstem - Goose Creek Golf Course to River Rd.	5/27	4/6	7/14	5/11	7/29
Temescal Canyon	5/1	4/7	6/26	5/2	7/20
Harrison Reservoir	--	--	--	--	--
Chino Hills (Butterfield Ranch environs)	4/8	--	--	--	--
Santa Ana River - Upper Canyon, Santa Ana Canyon	5/27	4/16	5/27	5/13	--
Santa Ana River - Green River Golf Course, Santa Ana Canyon	5/13	4/23	6/30	5/4	7/17
Santa Ana River - Featherly Park, Santa Ana Canyon	4/29	5/1	6/18	5/8	7/21
San Jacinto River Sub Watershed					
San Jacinto River	4/17	4/17	6/29	5/16	7/28
San Jacinto Wildlife Refuge	--	--	--	--	--

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, 2009. 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	Harrison Reservoir**	Santa Ana River (Fairmount Park to Hidden Valley)	Hidden Valley	Santa Ana River (River Rd to Goos Creek G.C./Norco)	Temescal Canyon	Santa Ana Canyon			Chino Hills (Butterfield Ranch environs)	Total
	Upper Canyon*	Green River Golf Club	Featherly Reg. Park												
A. Number of territorial males	15	105	10	9	41	2	59	49	91	76	12	22	34	9	534
B. Number of pairs (breeding and non-breeding)	15	84	10	8	35	1	46	37	68	56	6	16	23	5	410
C. Number of fledged young observed	53	192	28	9	65	1	107	64	170	118	9	27	28	6	877
D. Projected total recruitment of vireo young (a)	57.0	327.6	60.0	n/d	175.0	n/d	138.0	96.2	251.6	194.4	24.0	36.8	43.7	na	1,404.3
E. Average number of fledglings per pair (C/B)	3.5	2.3	2.8	1.1	1.8	1.0	2.3	1.7	2.5	2.1	1.5	1.7	1.2	1.2	2.1
F. Projected number of fledglings per pair (D/B)	3.8	3.9	6.0	n/d	5.0	n/d	3.0	2.6	3.7	3.5	4.0	2.3	1.9	n/d	3.4
G. Rate of missing eggs/chicks from nests (successful and unsuccessful)	26% (7/27)	39% (31/79)	0% (0/5)	n/a	8% (1/12)	n/a	7% (1/14)	31% (5/16)	20% (9/45)	21% (8/39)	0% (0/1)	22% (2/9)	45% (5/11)	n/a	27% (69/258)
H. Rate of cowbird nest parasitism	11% (3/27)	10% (8/79)	0% (0/5)	n/d	8% (1/12)	n/a	0% (0/14)	6% (1/16)	2% (1/45)	13% (5/39)	0% (0/1)	0% (0/9)	9% (1/11)	n/a	8% (20/258)

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, 2009. 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	Harrison Reservoir**	Santa Ana River (Fairmount Park to Hidden Valley)	Hidden Valley	Santa Ana River (River Rd to Goos Creek G.C./Norco)	Temescal Canyon	Santa Ana Canyon			Chino Hills (Butterfield Ranch environs)	Total
											Upper Canyon*	Green River Golf Club	Featherly Reg. Park		
I. Numbers of cowbirds removed from study area	3,057	220	10	0	156	0	34	19	49	286	52	103	37	8	4,031
K. Number of trap days (1 operative trap in the field for one day = 1 trap day)	932	1,095	239	106	1,032	99	531	358	259	1,015	243	366	236	114	6,625
L. Average number of cowbirds trapped per trap day (I/K)	3.3	0.20	0.04	0.0	0.15	0.0	0.06	0.05	0.19	0.28	.021	0.28	0.16	0.07	0.61
M. Number of field hours –LBV (+)	171	648	148	106	368	13	297	265	235	516	66	116	263	56	3,268
N. Number of field hours – BHCO (+)	495	605	154	154	338	60	473	231	231	408	385			77	3,611

^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 trap broken out from Temescal for this table

Table 4: Least Bell's Vireo nest placement preferences, monitored sites in the Santa Ana River Watershed, 2009

Host Plant Species	San Jacinto	San Timoteo	March SKR Preserve	Sycamore Canyon	Mockingbird Canyon	Harrison Reservoir	Santa Ana River (Fairmount Park to Hidden Valley)	Hidden Valley	Santa Ana River (River Rd to Hidden Valley)	Temescal Canyon	Chino Hills	Santa Ana Canyon			Total
												Upper Canyon	Green River Golf Course	Featherly Regional Park	
Black Willow (<i>Salix gooddingi</i>)		11	1		2		1	2	2			1		4	24
Arroyo Willow (<i>Salix lasiolepis</i>)		15	3				4	7	16	20					65
Red Willow (<i>Salix laevigata</i>)		14	2		11		4						1		32
Narrow-leaved Willow/ (<i>Salix exigua</i>)	18	1					1		1					2	23
Yellow Willow (<i>Salix lucida</i> spp. <i>lasiandra</i>)		1													1
Fremont Cottonwood (<i>Populus fremontii</i>)		6					3		3	1		1	1		15
Mulefat (<i>Baccharis salicifolia</i>)	9	32			1		5	6**	24	15			6	1	99
Elderberry (<i>Sambucus mexicana</i>)		1						1		1				1	4
Wild Grape (<i>Vitis girdiana</i>)		2							1						3
Toyon (<i>Heteromeles arbutifolia</i>)		2													2
Dead <i>Salix</i> sp.										1					1
Dead Black Willow, <i>S. gooddingi</i> (covered with living Black Willow)														1	1
Dead Black Willow, and Nettle (<i>Utica dioica</i>)							1								1
Dead <i>B. salicifolia</i>										2					2

Table 4: Least Bell's Vireo nest placement preferences, monitored sites in the Santa Ana River Watershed, 2009

Host Plant Species	San Jacinto	San Timoteo	March SKR Preserve	Sycamore Canyon	Mockingbird Canyon	Harrison Reservoir	Santa Ana River (Fairmount Park to Hidden Valley)	Hidden Valley	Santa Ana River (River Rd to Hidden Valley)	Temescal Canyon	Chino Hills	Santa Ana Canyon			Total
												Upper Canyon	Green River Golf Course	Featherly Regional Park	
Arroyo Willow (<i>S. lasiolepis</i>) and black mustard (<i>Brassica nigra</i>)													1		1
Rose (<i>Rosa californius</i>) and <i>Vitis girdiana</i> (wild grape)							1								1
Elderberry (<i>S. mexicanus</i>) and Wild Grape (<i>V. girdiana</i>)												1			1
Wax Leaf Pivet (<i>Ligustrum</i> sp.)												1			1
Black mustard (<i>B.nigra</i>)													1		1
<i>S. lasiolepis</i> and Fennel, <i>Foeniculum vulgare</i>		1													1
Orange tree (<i>Rutaceae citrus sinensis.</i>)													1		1
Black Walnut, (<i>Juglans californica</i>)					1										1
Tamarisk, (<i>Tamarix ramosissima</i>)									1						1
Cockleburr (<i>Xanthum strumarium</i>)													1		1
Deadfall										2					2
Total	27	86	6	0	15	0	19	17	47	43	0	2	10	13	285

Also, Hidden Valley – 2 mulefat nests, one covered by grape, the other by arroyo willow.

Table 5: Least Bell's Vireo reproductive success and breeding biology data, monitored sites in the Santa Ana River Watershed, 2009

		San Jacinto	San Timoteo	March SKR Preserve	Sycamore Canyon	Mockingbird Canyon	Harrison Reservoir	Santa Ana River (Fairmount Park to Hidden Valley)	Hidden Valley	Santa Ana River (River Rd to Hidden Valley)	Temescal	Santa Ana Canyon			Chino Hills-Butterfield Ranch environs		Total
												Upper Canyon	Green River Golf Club	Featherly Reg. Park			
A.	Number of pairs	15	84	10	8	35	1	46	37	68	56	6	16	23	5		410
B.	Number of breeding (nesting) pairs	14	70	7	4	32	1	43	35	68	46	6	15	17	4		362
C.	Number of breeding pairs that were well-monitored throughout the breeding season	14	41	3	0	2	0	10	12	29	24	1	6	7	0		149
D.	Number of 'known fledged young' OBSERVED	53	192	28	9	65	1	107	64	170	118	9	27	28	6		877
E.	Number of known fledged young produced by pairs monitored throughout the breeding season	53	160	18	0	10	n/a	30	31	108	86	4	14	13	n/a		527
F.	Average number of fledglings produced per breeding pair (minimum; D/B = 'productivity or breeding success')	3.8	2.7	4.0	2.3	2.0	n/a	2.5	1.8	2.5	2.6	1.5	1.8	1.6	1.5		2.4
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)	3.8	3.9	6.0	n/a	5.0	n/a	3.0	2.6	3.7	3.6	4.0	2.3	1.9	n/a		3.5
H.	Number of nests that were discovered	27	89	6	0	16	0	18	18	47	43	2	10	13	0		289
I.	Number of nests that were regularly monitored or 'tracked'	27	79	5	n/a	12	0	14	16	45	39	1	9	11	0		258

Table 5: Least Bell's Vireo reproductive success and breeding biology data, monitored sites in the Santa Ana River Watershed, 2009

		San Jacinto	San Timoteo	March SKR Preserve	Sycamore Canyon	Mockingbird Canyon	Harrison Reservoir	Santa Ana River (Fairmount Park to Hidden Valley)	Hidden Valley	Santa Ana River (River Rd to Hidden Valley)	Temescal	Santa Ana Canyon			Chino Hills-Butterfield Ranch environs	Total
												Upper Canyon	Green River Golf Club	Featherly Reg. Park		
J.	Number of 'tracked' nests that were successful I (% = J/I x 100)	63% (17/27)	65% (51/79)	100% (5/5)	n/a	83% (10/12)	n/a	93% (13/14)	69% (11/16)	80% (36/45)	69% (27/39)	100% (1/1)	67% (6/9)	55% (6/11)	n/a	71% (183/258)
K.	Rate of missing eggs/chicks from nests (successful and unsuccessful) (%=K/I x100) (b)	26% (7/27)	39% (31/79)	0% (0/5)	n/a	8% (1/12)	n/a	7% (1/14)	31% (5/16)	20% (9/45)	21% (8/39)	0% (0/1)	22% (2/9)	45% (5/11)	n/a	27% (69/258)
L.	Number of 'tracked' nests that were parasitized by cowbirds (%=L/I x 100)	11% (3/27)	10% (8/79)	0% (0/5)	n/a	8% (1/12)	n/a	0% (0/14)	6% (1/16)	2% (1/45)	13% (5/39)	0% (0/1)	0% (0/9)	9% (1/11)	n/a	8% (20/258)
M.	A. Number of 'tracked' nests that failed as a result of reproductive failure	7% (2/27)	1% (1/79)	0% (0/5)	n/a	0% (0/12)	n/a	0% (0/14)	13% (2/16)	2% (1/45)	5% (2/39)	0% (0/1)	11% (1/9)	0% (0/11)	n/a	3% (9/258)
	B. Number of 'tracked' nests that failed as a result of parasitism	4-7% (1 or 2 /27)	1% (1/79)	0% (0/5)	n/a	8% (1/12)	n/a	0% (0/14)	6% (1/16)	0% (0/45)	5% (2/39)	0% (0/1)	0% (0/9)	9% (1/11)	n/a	3% (7 or 8/258)
	C. Number of 'tracked' nests that failed as a result of predation- Predation Rate according to Vireo Working Group	22% (6/27)	33% (26/79)	0% (0/5)	n/a	8% (1/12)	n/a	7% (1/14)	13% (2/16)	16% (7/45)	21% (8/39)	0% (0/1)	22% (2/9)	36% (4/11)	n/a	22% (57/258)
N	Average clutch size	3.3	3.5	3.7	n/a	3.3	n/a	3.4	3.5	3.7	3.7	4.0	3.5	2.9	n/a	3.5
	(number of clutches)	23	83	6	n/a	12	n/a	16	13	38	33	1	8	9	n/a	242
O.	Number of cowbird eggs found in or near vireo nests	3	8	0	n/a	0	n/a	0	1	1	9	0	0	0	n/a	22

Table 5: Least Bell's Vireo reproductive success and breeding biology data, monitored sites in the Santa Ana River Watershed, 2009

		San Jacinto	San Timoteo	March SKR Preserve	Sycamore Canyon	Mockingbird Canyon	Harrison Reservoir	Santa Ana River (Fairmount Park to Hidden Valley)	Hidden Valley	Santa Ana River (River Rd to Hidden Valley)	Temescal	Santa Ana Canyon			Chino Hills-Butterfield Ranch environs		Total
												Upper Canyon	Green River Golf Club	Featherly Reg. Park			
P.	Number of cowbird nestlings removed from 'tracked' nests	0	0	0	n/a	1	n/a	0	0	0	2	0	0	1	n/a		4
Q.	Number of cowbird young fledged by vireos	0	0	0	n/a	0	n/a	0	0	0	0	0	0	0	n/a		0
R.	Number of 'manipulated' parasitized nests	2	8	0	n/a	0	n/a	0	0	1	7	0	0	0	n/a		18
S.	Number of 'successful, manipulated' nests (%=S/R x100)	50% (1/2)	38% (3/8)	n/a	n/a	n/a	n/a	n/a	n/a	100% (1/1)	29% (2/7)	n/a	n/a	n/a	n/a		39% (7/18)
T.	Number of vireos fledged from "manipulated" parasitized nests	1	8	n/a	n/a	n/a	n/a	n/a	n/a	3	4	n/a	n/a	n/a	n/a		16
U.	Number of repaired nests	1	0	0	n/a	0	n/a	1	0	1	0	0	0	1	n/a		4
V.	% successful repaired nests	100% (1/1)	n/a	n/a	n/a	n/a	n/a	0% (0/1)	n/a	100% (1/1)	n/a	n/a	n/a	100% (1/1)	n/a		75% (3/4)
W.	Number of vireos fledged from repaired nests	4	n/a	n/a	n/a	n/a	n/a	0	n/a	4	n/a	n/a	n/a	4	n/a		12

(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 nests

Table 6: Brown-headed cowbird trapping summary, monitored sites in the Santa Ana Watershed, 2009

Monitored Site	Trap/Location	2009 Dates of Operation	Number of Trap Days	Cowbirds Removed				Daily Removed Averages	
				Total	Male	Female	Juveniles	Adults	All
San Jacinto									
	Scott Bros.	3/16-8/2	134	1370	1082	196	92	9.54	10.22
	R&J-Tuls 1	3/16-8/2	134	161	100	47	14	1.10	1.20
	R&J- Tuls 2	3/16-8/2	134	129	88	28	13	0.87	0.96
	CB#1	3/16-8/2	134	319	218	95	6	2.34	2.38
	CB#2	3/16-8/2	134	560	319	208	33	3.93	4.18
	CB#3	3/16-8/2	134	447	334	43	70	2.81	3.34
	Alessandro Ponds	3/16-8/2	128	71	39	23	9	0.48	0.55
	SJWR 1			0					
	SJWR 3			0					
	Subtotal		932	3057	2180	640	237	3.03	3.28
San Timoteo									
	FISH	3/16-7/31	136	26	12	4	10	0.12	0.19
	San Tim. I-18	3/16-8/2	137	10	1	4	5	0.04	0.07
	Bee's	3/16-8/1	137	17	10	5	2	0.11	0.12
	ESR	3/23-7/3	103	21	5	15	1	0.19	0.20
	St Park	3/23-7/24	123	5	3	2	0	0.04	0.04
	English	3/23-8/2	132	10	4	4	2	0.06	0.08
	Headlee	3/16-8/2	138	109	60	41	8	0.73	0.79
	Younglove #1	3/23-5/16	53	4	2	2	0	0.08	0.08
	Younglove #3	3/16-7/31	136	18	7	10	1	0.13	0.13
	Subtotal		1095	220	104	87	29	0.17	0.20
Mockingbird Canyon									
	Reservoir	3/16-8/2	130	54	33	17	4	0.38	0.42
	Tobin	3/23-7/26	118	11	7	4	0	0.09	0.09
	Dale	3/16-7/19	118	13	1	5	7	0.05	0.11
	MBC Estates	4/19-8/2	103	29	14	9	6	0.22	0.28
	Ungerer	3/30-7/26	111	4	3	-2	3	0.01	0.04
	Dak	3/30-8/2	117	11	5	4	2	0.08	0.09
	Samantha's	3/16-8/2	84	6	3	2	1	0.06	0.07
	Cajalco Rd.	3/16-8/2	130	25	16	5	4	0.16	0.19
	Markham	3/23-7/26	121	3	0	2	1	0.02	0.02
	Subtotal		1032	156	82	46	28	0.12	0.15
Hidden Valley									
	East End			0					

Table 6: Brown-headed cowbird trapping summary, monitored sites in the Santa Ana Watershed, 2009

Monitored Site	Trap/Location	2009 Dates of Operation	Number of Trap Days	Cowbirds Removed			Daily Removed Averages		
				Total	Male	Female	Juveniles	Adults	All
	Gate 1	3/23-8/2	125	11	2	4	5	0.05	0.09
	Sand pile	3/23-7/19	108	-1	0	-2	1	-0.02	-0.01
	West Trailhead	3/23-8/2	125	9	8	1	0	0.07	0.07
Subtotal			358	19	10	3	6	0.04	0.05
Temescal									
	Railroad Cyn. WM facility	4/5 - 7/31	123	15	9	4	2	0.11	0.12
	Marina	5/11-8/2	79	78	26	23	29	0.62	0.99
	Baker St.	3/23-8/2	121	86	41	31	14	0.60	0.71
	New Sump	3/23-8/2	121	5	5	0	0	0.04	0.04
	Dos Lagos 1	3/23-8/2	121	9	5	4	0	0.07	0.07
	Dos Lagos 2	3/23-8/2	121	0	1	-1	0	0.00	0.00
	Dos Lagos 3	3/23-8/2	121	85	29	44	12	0.60	0.70
	3M	3/23-8/2	103	4	1	3	0	0.04	0.04
	3M Ag	3/16-8/2	105	4	1	3	0	0.04	0.04
	Harrison	3/23-8/2	99	0	-1	-1	2	-0.02	0.00
Subtotal			1114	286	117	110	59	0.20	0.26
Chino Hills									
Butterfield Ranch	CH Water-tank	3/16-7/26	114	8	7	1	0	0.07	0.07
Subtotal			114	8	7	1	0	0.07	0.07
Santa Ana Canyon									
Upper Canyon									
Horse Stables at Green River	Horse Stables Full	3/16-8/2	122	44	22	16	6	0.31	0.36
	Horse Stables 1/2	3/16-8/2	121	8	3	2	3	0.04	0.07
Green River Golf Club									
	G. C. Maintenance	3/16-8/2	126	86	42	40	4	0.65	0.68
	GC Path	3/16-8/2	122	13	3	10	0	0.11	0.11
	GC Orange T-Box 5	3/16-7/26	118	4	2	2	0	0.03	0.03
Featherly Park									
	Featherly Park RV#1	3/16-8/2	126	34	14	16	4	0.24	0.27
	Featherly Park RV#2	3/16-7/13	110	3	1	2	0	0.03	0.03
Santa Ana Cyn. Subtotal			845	192	87	88	17	0.21	0.23
SKR Preserve									
	March SKR 1	3/16-8/2	128	5	3	0	2	0.02	0.04
	March SKR 2	3/30-7/26	111	5	1	3	1	0.04	0.05

Monitored Site	Trap/Location	2009 Dates of Operation	Number of Trap Days	Cowbirds Removed			Daily Removed Averages		
				Total	Male	Female	Juveniles	Adults	All
Subtotal			239	10	4	3	3	0.03	0.04
Sycamore Canyon	Sycamore 1	3/30-7/19	106	0	0	0	0	0.00	0.00
Subtotal			106	0	0	0	0	0.00	0.00
Santa Ana River--	Jurupa Park	3/16-8/2	134	1	1	0	0	0.01	0.01
Jurupa Park to	Acorn 1	3/16-8/2	134	7	3	4	0	0.05	0.05
Hidden Valley	Acorn 2	3/16-8/2	134	18	10	8	0	0.13	0.13
	Riverdale	3/23-8/2	129	8	6	2	0	0.06	0.06
Subtotal			531	34	20	14	0	0.06	0.06
Santa Ana River –									
River Road to Hidden Valley	Norco Horse Stables	3/23-8/2	125	34	15	13	6	0.22	0.27
	Goose Creek 1	3/16 - 7/29	134	15	11	4	0	0.11	0.11
	Goose Creek 2			0					
Subtotal			259	49	26	17	6	0.17	0.19
GRAND TOTALS			6625	4031	2637	1009	385	0.55	0.61

Table 7: Number of times non-target bird species trapped in 55 Brown-headed Cowbird traps in the Santa Ana River watershed, 2009
 (Mortalities are in parentheses and are included in the number stated, e.g., in Mockingbird 9 EUST were caught, 2 of those died.)

Species	San Jacinto		San Timoteo		March SKR Preserve		Sycamore		Mockingbird Canyon		Santa Ana River-Norco		SAR-Jurupa to Hidden Valley		Hidden Valley		Temescal		Santa Ana Canyon		Chino Hills		2009 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
EUST	2122	2	6	1					9	2			2				28	5	27				2194	10
RWBL	377	1	59		16				368		21		50		7		679	3	19				1596	4
CALT	82		707	8	2		1		149	8	7		4		64	1	101		75		11		1203	17
HOSP	16		12				44		67	1	9		393		9		15	1	9		1		575	2
SOSP	281	1	205		1				2						7	1	21		2				519	2
HOFI	16	1	106	1	8		1		166	5			1		10		86	1	9				403	8
LASP	2		151		7				5								2						167	0
YHBL	51								2								33	1					86	1
BRBL	69	2															1						70	2
TRBL	15		2						3														20	0
BEWR			1						6	3	1						2	1					10	4
NOMO			1	1					2	1			2	1	2		2						9	3
BHGR			1						1										6				8	0
HOOR			1						5	3													6	3
BUOR									1		2		2		1								6	0
WCSP											3												3	0
HOWR													1	1			2	2					3	3
SPTO															3								3	0
BLPH			1								1												2	0
CATH															2								2	0
MODO	1		1																				2	0
COHA									1														1	0
COGD											1												1	0
BRCO																	1						1	0
WESO									1														1	0
Unkn flycatcher					1																		1	0
TOTALS	3032	7	1254	11	35	0	46	0	788	23	45	0	455	2	105	2	973	14	147	0	12	0	6892	59
#/trap day	3.25		1.15		0.15		0.43		0.76		0.17		0.86		0.29		0.87		0.17		0.11		1.04	

Table 7: Number of times non-target bird species trapped in 55 Brown-headed Cowbird traps in the Santa Ana River watershed, 2009
 (Mortalities are in parentheses and are included in the number stated, e.g., in Mockingbird 9 EUST were caught, 2 of those died.)

Species	San Jacinto		San Timoteo		March SKR Preserve		Sycamore		Mockingbird Canyon		Santa Ana River-Norco		SAR-Jurupa to Hidden Valley		Hidden Valley		Temescal		Santa Ana Canyon		Chino Hills		2009 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
Mortality %		0.23 %		0.88 %		0.00 %		0.00 %		2.92 %		0.00 %		0.44 %		1.90 %		1.44 %		0.00 %		0.00 %		0.86 %
Mortality/trap day		0.008		0.010		0.000		0.000		0.022		0.000		0.004		0.006		0.013		0.000		0.000		0.009
# BHCO removed/trap day	3.28		0.20		0.04		0.00		0.02		0.19		0.06		0.05		0.26		0.23		0.07			

* Abbreviations used in Table 7.

BEWR: Bewick's Wren; BHGR: Black-headed Grosbeak; BRBL: Brewer's Blackbird; BRCO: Bronzed Cowbird; BLPH: Black Phoebe; BUOR: Bullock's Oriole; CALT: California Towhee (formerly CATO in SAWA reports); CATH: California Thrasher; COGD: Common Ground Dove; COHA: Cooper's Hawk; EUST: European Starling; HOFI: House Finch; HOOR: Hooded Oriole; HOSP: House Sparrow; HOWR: House Wren; LASP: Lark Sparrow; MODO: Mourning Dove; NOMO: Northern Mockingbird; RWBL: Red-wing Blackbird; SOSP: Song Sparrow; SPTO: Spotted Towhee; TRBL: Tricolored Blackbird; WCSP: White-crowned Sparrow; WESO: Western Screech Owl; YHBL: Yellow-headed Blackbird

Table 8: Winter 2008-2009 SAWA Cowbird Trapping Results

Monitored Site	Trap/Location	Dates of Operation	Number of Trap Days	Cowbirds Removed				Daily Removed Averages	
				Total	Male	Female	Juveniles	Adults	All
San Jacinto									
	Scott Bros.	8/4/08-3/15/09	219	2025	1069	715	241	8.15	9.25
	R&J-Tuls 1	8/4/08-3/15/09	219	544	250	272	22	2.38	2.48
	R&J- Tuls 2	8/4/08-3/15/09	219	590	303	268	19	2.61	2.69
	CB#1	8/4/08-3/15/09	219	503	73	386	44	2.10	2.30
	CB#2	8/4/08-3/15/09	219	1584	960	472	152	6.54	7.23
	CB#3	8/4/08-3/15/09	219	1572	628	573	371	5.48	7.18
	Subtotal		1314	6818	3283	2686	849	4.54	5.19
Santa Ana Canyon									
Upper Canyon									
Horse Stables at	Horse Stables Full	8/4/08-12/19/08	94	62	15	25	22	0.43	0.66
Green River	Horse Stables 1/2	8/4/08-12/19/08	94	20	4	12	4	0.17	0.21
Featherly Park	Featherly Park RV#1	8/4-29/08	20	0	0	0	0	0.00	0.00
Santa Ana Cyn. Subtotal			208	82	19	37	26	0.27	0.39
GRAND TOTALS									
			1522	6900	3302	2723	875	3.96	4.53

Table 9: Non-targets removed from SAWA cowbird traps during the winter 2008-2009

Species	San Jacinto		Santa Ana Canyon		Total	
	caught	died	caught	died	caught	died
EUST	1067	9	1		1068	9
RWBL	938	1	2		940	1
HOSP	77	1			77	1
CALT			50		50	0
BRBL	12				12	0
HOFI	7		3		10	0
COHA	9				9	0
TRBL	7				7	0
SOSP	3				3	0
WCSP			3		3	0
BHCO(Great Basin)			1		1	0
MODO	1				1	0
YHBL	1				1	0
TOTALS	2122	11	60	0	2182	11
#/trap day	1.61		0.29		1.43	
Mortality %		0.52%		0.00%		0.50%
Mortality/trap day		0.008		0.000		0.007
# BHCO removed/ trap day	5.19		0.39		4.53	

Abbreviations used in Table 9:

BHCO (Great Basin): Brown-headed Cowbird (Great Basin); BRBL: Brewer's Blackbird; CALT: California Towhee; COHA: Cooper's Hawk; EUST: European Starling; HOFI: House Finch; HOSP: House Sparrow; MODO: Mourning Dove; RWBL: Red-wing Blackbird; SOSP: Song Sparrow; TRBL: Tricolored Blackbird; WCSP: White-crowned Sparrow; YHBL: Yellow-headed Blackbird

Table 10: Results of the Least Bell's Vireo Assessment Surveys in the Santa Ana River Watershed, 2005-2009					
Site	# LBVI Territories				
	2005	2006	2007	2008	2009
Santa Ana River & Tributaries					
Cajon Wash	-	0	0	0	0
Oak Glen Preserve	-	0	0	0	0
Box Springs	0	2	2	1	3
Poorman Reservoir	0	1	1	1	2
Motte-Rimrock Preserve	-	-	0	-	-
Quail Run (behind UCR)	0	0	0	0	0
Goldenstar	-	0	0	0	1
Woodcrest	-	0	0	0	0
Mead Valley @ Cajalco & Calif. Aqueduct	-	2	5	6	5
Gavilan Hills	0	0	0	0	0
Menifee - Paloma Valley High School	0	0	0	0	-
Menifee - Huan Rd.	0	0	0	0	-
Steele Valley	0	0	0	0	0
Santa Rosa Mine Rd.	0	0	0	0	0
Van Buren Blvd. @ Orange Terrace to Village West	3	2	2	3	3
Van Buren Blvd. @ Bountiful	0	0	0	0	1
Van Buren Blvd. @ Porter	0	0	0	0	0
Canyon Crest	-	0	-	-	-
Alessandro Arroyo and Prenda Arroyo	See Table 1		3	5	4
Castleview Park	1	0	1	0	0
Tequesquite Arroyo	0	0	0	0	0
La Sierra			1	2	2
North SAR - across from Hidden Valley	5	3	6	1	6
Pyrite Ravine	-	-	-	1	1
Wyle Labs @ El Paso only	0	1	1	0	1
Norco Hills Park-mitigation area	2	0	0	0	0
Promenade	-	0	0	0	3
Corona St. @ Gilmore	0	0	0	0	0
Cajalco Canyon	1	1	1	See Temescal	
Chino Hills, Eucalyptus @ Rancho Hills	1	0	1	1	1
Chino Hills, Eucalyptus @ Del Monte	3	1	1	0	1
Chino Hills, Eucalyptus-end (s/o Rancho Hills)	0	0	0	0	0
Carbon Canyon Rd. at entrance to Western Hills Golf Club	0	0	0	0	1
Carbon Canyon Rd. at Chino Hills Pkwy	0	0	1	0	0
Eucalyptus and Peyton Dr., Chino Hills	-	-	-	5	8
Bayberry Dr., Chino Hills	-	-	-	0	0
Carbon Canyon Reg. Park and Carbon Canyon Rd.	6	5	7	5	3
Chino Hills State Park					
Upper Aliso Creek	-	-	7	8	6
Lower Aliso Creek	-	-	10	12	13
Bane Canyon	-	-	5	5	6
Telegraph Canyon	-	-	2	6	10
Sun Canyon Park	0	0	0	0	0

Table 10: Results of the Least Bell's Vireo Assessment Surveys in the Santa Ana River Watershed, 2005-2009					
Site	# LBVI Territories				
	2005	2006	2007	2008	2009
Santa Ana River & Tributaries					
Wardlow Wash	0	0	1	0	0
Fresno Canyon	2	4	2	1	0
Starlight Dr. @ Hidden Hills Rd., Yorba Linda	1	0	0	0	-
Yorba Dry Lake Bed	-	-	-	0	1
Kabian Park	2	4	4	3	4
Lake Perris	1	1	3	2	4
East of Canyon Lake	2	-	-	-	-
Cottonwood Hills	0	0	0	0	0
Lamb's Canyon	-	-	0	-	-
Santiago Creek Sub-Watershed					
Silverado Canyon	0	0	0	0	0
Santiago Creek (u/s of Irvine Lake)	0	-	0	4	4
Limestone Canyon (includes Old Haul Rd./Blue Diamond Rd.)	See Table 1		2	2	2
Santiago Cyn Rd (unnamed tributary to Irvine Lake)	-	-	0	0	0
Irvine Company Land near Peter's Cyn	-	-	-	-	1
Peter's Canyon	4	4	5	5	8
Irvine Regional Park	See Table 1		14	19	29
Santiago Oaks Regional Park (SORP)	0	0	0	0	0
Santiago Creek at Cannon Rd (including reservoir)	2	3	4	2	3
Santiago Creek at Chapman & Hwy 55, City of Orange	-	-	0	0	0
Santiago Creek at Cambridge Ave., City of Orange	-	1	0	0	0
Total number least Bell's vireos detected in the Santa Ana. Watershed during Assessment Surveys	36	35	92	100	137
S. Marguerita Watershed - Murrieta Creek	-	-	1	3	-
Total number least Bell's vireos detected during Assessment Surveys	36	35	93	103	137

Table 11: Results of the Least Bell's Vireo Assessment Surveys in the Santa Ana River Watershed, 2009

Surveyor	Site Santa Ana River & Tributaries	5/04/09-5/08/09			6/01/09-6/05/09			7/06/09-7/10/09			TOTAL # VIREOS			# Visits	# Hours	Cowb- birds Detected
		Terr	Pairs	Juv.	Terr.	Pairs	Juv.	Terr.	Pairs	Juv.	Terr.	Pairs	Juv.			
AB, JC	Cajon Wash	0	0	0	0	0	0	0	0	0	0	0	0	3	11.25	Y
NH	Oak Glen Preserve	0	0	0	0	0	0	0	0	0	0	0	0	3	3.75	Y
GA	Box Springs	1	0	0	2	1	2	3	0	0	3	1	2	3	8	N
AB	Poorman Reservoir	1	1	0	2	1	1	2	2	2	2	2	2	3	6	Y
MA	Motte-Rimrock Preserve	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GA	Quail Run (behind UCR)	0	0	0	0	0	0	0	0	0	0	0	0	3	2.5	N
NH	Goldenstar	0	0	0	0	0	0	1**	0	0	1	0	0	3	2.5	N
NH	Woodcrest	0	0	0	0	0	0	0	0	0	0	0	0	3	2	N
Tro	Mead Valley @ Cajalco & Calif. Aqueduct	5	3	0	5	5	8	5	1	1	5	5	8	3	27.5	Y
Tro	Gavilon Hills	0	0	0	0	0	0	0	0	0	0	0	0	3	15	N
SD	Menifee - Paloma Valley High School	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SD	Menifee - Huan Rd.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SD	Steele Valley	-	-	-	0	0	0	0	0	0	0	0	0	2	2	Y
SD	Santa Rosa Mine Rd.	-	-	-	0	0	0	0	0	0	0	0	0	2	1	N
GA	Van Buren Blvd. @ Orange Terrace to Village West	1	0	0	3	0	0	2	2	2	3	2	2	3	6.5	N

Table 11: Results of the Least Bell's Vireo Assessment Surveys in the Santa Ana River Watershed, 2009

Surveyor	Site Santa Ana River & Tributaries	5/04/09-5/08/09			6/01/09-6/05/09			7/06/09-7/10/09			TOTAL # VIREOS			# Visits	# Hours	Cowb- birds Detected
		Terr	Pairs	Juv.	Terr.	Pairs	Juv.	Terr.	Pairs	Juv.	Terr.	Pairs	Juv.			
SD	Van Buren Blvd. @ Bountiful	1	0	0	1	0	0	0	0	0	1	0	0	3	3	Y
GA	Van Buren Blvd. @ Porter	-	-	-	0	0	0	0	0	0	0	0	0	2	2.5	N
	Canyon Crest	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RZ	Allesandro Arroyo & Prenda Arroyo	-	-	-	4	3	1	2	0	0	4	3	1	2	6	??
SD	Castlevew Park	0	0	0	0	0	0	0	0	0	0	0	0	3	3.75	Y
SD	Tequesquite Arroyo	0	0	0	0	0	0	0	0	0	0	0	0	3	2.25	Y
HA	La Sierra	2	0	0	2	0	0	1	0	0	2	0	0	3	7.5	Y
Tro	North SAR - across from Hidden Valley	-.	-	-	6	5	8	5	1	1	6	5	8	2	24	Y
Tro	Pyrite Ravine	1	0	0	1	1	2	1	1	1	1	1	2	3	11.5	Y
SD, HA	Wyle Labs @ El Paso only	1	0	0	1	1	0	0	0	0	1	1	0	3	1.75	Y
SD, HA	Norco Hills Park-mitigation area	0	0	0	0	0	0	0	0	0	0	0	0	3	2.25	Y
SD	Promenade	3	0	0	2	0	0	1	0	0	3	0	0	3	3	Y
SD, HA	Corona St. @ Gilmore	0	0	0	0	0	0	0	0	0	0	0	0	3	2.5	Y
KR	Cajalco Canyon	See Temescal														

Table 11: Results of the Least Bell's Vireo Assessment Surveys in the Santa Ana River Watershed, 2009

Surveyor	Site Santa Ana River & Tributaries	5/04/09-5/08/09			6/01/09-6/05/09			7/06/09-7/10/09			TOTAL # VIREOS			# Visits	# Hours	Cow- birds Detected
		Terr	Pairs	Juv.	Terr.	Pairs	Juv.	Terr.	Pairs	Juv.	Terr.	Pairs	Juv.			
TR	Chino Hills, Eucalyptus @ Rancho Hills	1	0	0	1	0	0	1	0	0	1	0	0	3	2.5	Y
TR	Chino Hills, Eucalyptus @ Del Monte	1	1	0	1	1	0	1	1	0	1	1	0	3	4	N
TR	Chino Hills, Eucalyptus south of Rancho Hills	0	0	0	0	0	0	0	0	0	0	0	0	3	2.75	N
TR	Carbon Canyon Rd. at entrance to Western Hills Golf Club	0	0	0	1	1	0	0	0	0	1	1	0	3	2.25	Y
TR	Carbon Canyon Rd. at Chino Hills Pkwy	0	0	0	0	0	0	0	0	0	0	0	0	3	6.75	Y
TR	N/W c/o Eucalyptus and Peyton Dr., Chino Hills	6	2	0	6	1	1	7	1	1	8	3	1	3	7	Y
TR	Bayberry Dr., Chino Hills	0	0	0	0	0	0	0	0	0	0	0	0	3	2.5	N
JC	Carbon Canyon Reg. Park and Carbon Canyon Rd.	2	1	0	3	2	0	3	2	1	3	3	1	3	11	Y

Table 11: Results of the Least Bell's Vireo Assessment Surveys in the Santa Ana River Watershed, 2009

Surveyor	Site Santa Ana River & Tributaries	5/04/09-5/08/09			6/01/09-6/05/09			7/06/09-7/10/09			TOTAL # VIREOS			# Visits	# Hours	Cow- birds Detected
		Terr	Pairs	Juv.	Terr.	Pairs	Juv.	Terr.	Pairs	Juv.	Terr.	Pairs	Juv.			
	Chino Hills State Park															
TR, SH	Upper Aliso Creek	3	2	0	4	0	0	5	2	2	6	4	2	3	15	Y
MA, AB	Lower Aliso Creek	10	1	0	10	7	4	10	2	4	13	10	8	3	24	N
TR, SH	Bane Canyon	6	0	0	5	2	1	4	2	1	6	3	2	3	24.5	Y
TB, DMc	Telegraph Canyon	7	1	0	9	4	2	5	2	3	10	5	5	3	15	N
HA	Sun Canyon Park	0	0	0	0	0	0	0	0	0	0	0	0	3	2.5	N
TR	Wardlow Wash	0	0	0	0	0	0	0	0	0	0	0	0	3	7.25	N
TR	Fresno Canyon	0	0	0	0	0	0	0	0	0	0	0	0	3	9.75	N
SH	Starlight Dr. @ Hidden Hills Rd., Yorba Linda	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SH	Yorba Dry Lake Bed	1	1	0	0	0	0	0	0	0	1	1	0	3	7.5	N
	San Jacinto Sub- Watershed															
MA, BN	Kabian Park	3	1	0	3	0	0	3	1	1	4	1	1	3	15	Y
MA	Lake Perris	3	2	0	2	2	3	3	0	0	4	2	3	3	24	Y
AB	Cottonwood Canyon	0	0	0	0	0	0	0	0	0	0	0	0	3	9.25	Y

Table 11: Results of the Least Bell's Vireo Assessment Surveys in the Santa Ana River Watershed, 2009

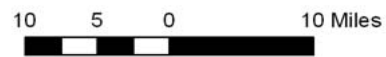
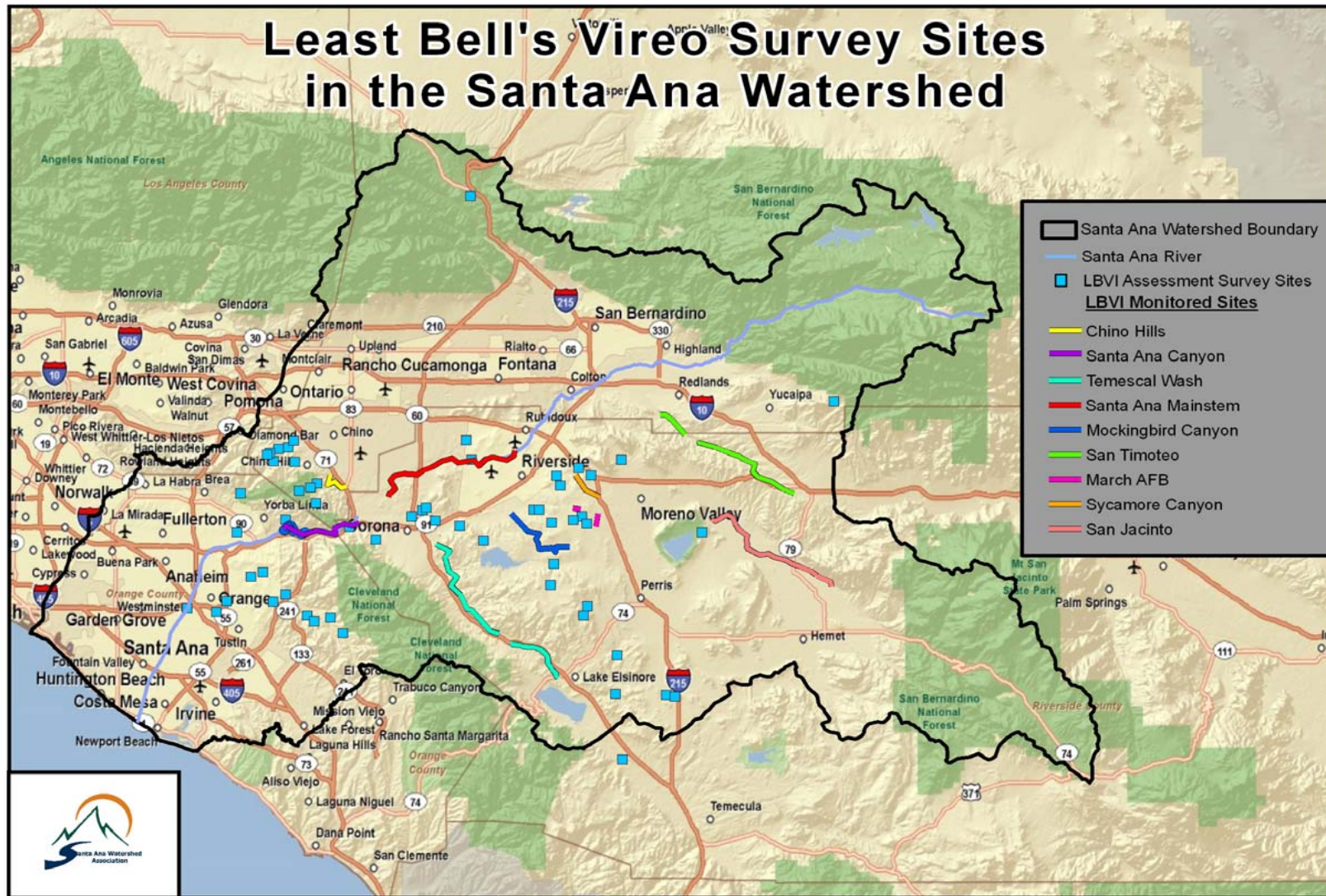
Surveyor	Site Santa Ana River & Tributaries	5/04/09-5/08/09			6/01/09-6/05/09			7/06/09-7/10/09			TOTAL # VIREOS			# Visits	# Hours	Cow- birds Detected
		Terr	Pairs	Juv.	Terr.	Pairs	Juv.	Terr.	Pairs	Juv.	Terr.	Pairs	Juv.			
Santiago Creek Sub-Watershed																
DM	Silverado Canyon	0	0	0	0	0	0	0	0	0	0	0	0	3	2.75	N
DM	Santiago Creek (u/s of Irvine Lake)	3	0	0	2	0	0	4	0	0	4	0	0	3	5.5	N
DM	Limestone Canyon (includes Old Haul Rd./Blue Diamond Rd.)	2	1	0	1	1	2	2	1	3	2	1	3	3	3.5	N
DM	Santiago Cyn Rd (unnamed tributary to Irvine Lake)	0	0	0	0	0	0	0	0	0	0	0	0	3	1	N
SH	Irvine Company Land (near Peter's Cyn)	-	-	-	1	0	0	0	1	1	1	1	1	2	1	N
SH	Peter's Canyon	5	0	0	8	0	0	6	0	0	8	0	0	4	16.25	N
DM, AB	Irvine Regional Park	25	3	1	21	2	5	19	4	11	29	9	17	3	15.2	N
JC	Santiago Oaks Regional Park (SORP)	0	0	0	0	0	0	0	0	0	0	0	0	3	4.5	N
SH	Santiago Creek at Cannon Rd (incl reservoir)	2	0	0	1	0	0	1	0	0	3	0	0	3	8	N

Table 11: Results of the Least Bell's Vireo Assessment Surveys in the Santa Ana River Watershed, 2009

Surveyor	Site Santa Ana River & Tributaries	5/04/09-5/08/09			6/01/09-6/05/09			7/06/09-7/10/09			TOTAL # VIREOS			# Visits	# Hours	Cowb- birds Detected
		Terr	Pairs	Juv.	Terr.	Pairs	Juv.	Terr.	Pairs	Juv.	Terr.	Pairs	Juv.			
SH	Santiago Creek at Chapman & Hwy 55, City of Orange	0	0	0	0	0	0	-	-	-	0	0	0	2	1.5	N
SH	Santiago Creek at Cambridge Ave., City of Orange	0	0	0	-	-	-	-	-	-	0	0	0	1	1	N
# Vireos Detected in Santa Ana Watershed during Assessment Surveys		99	20	1	108	40	40	96	26	35	137	65	69	154	410.7	
CONTROL TRANSECTS																
Control Transect – Hidden Valley		10	0	0	9	0	0	n.s.			n/a			2	5.5	
Control Transect – Mockingbird Canyon		3	0	0	n.s.			n.s.			n/a			1	2	

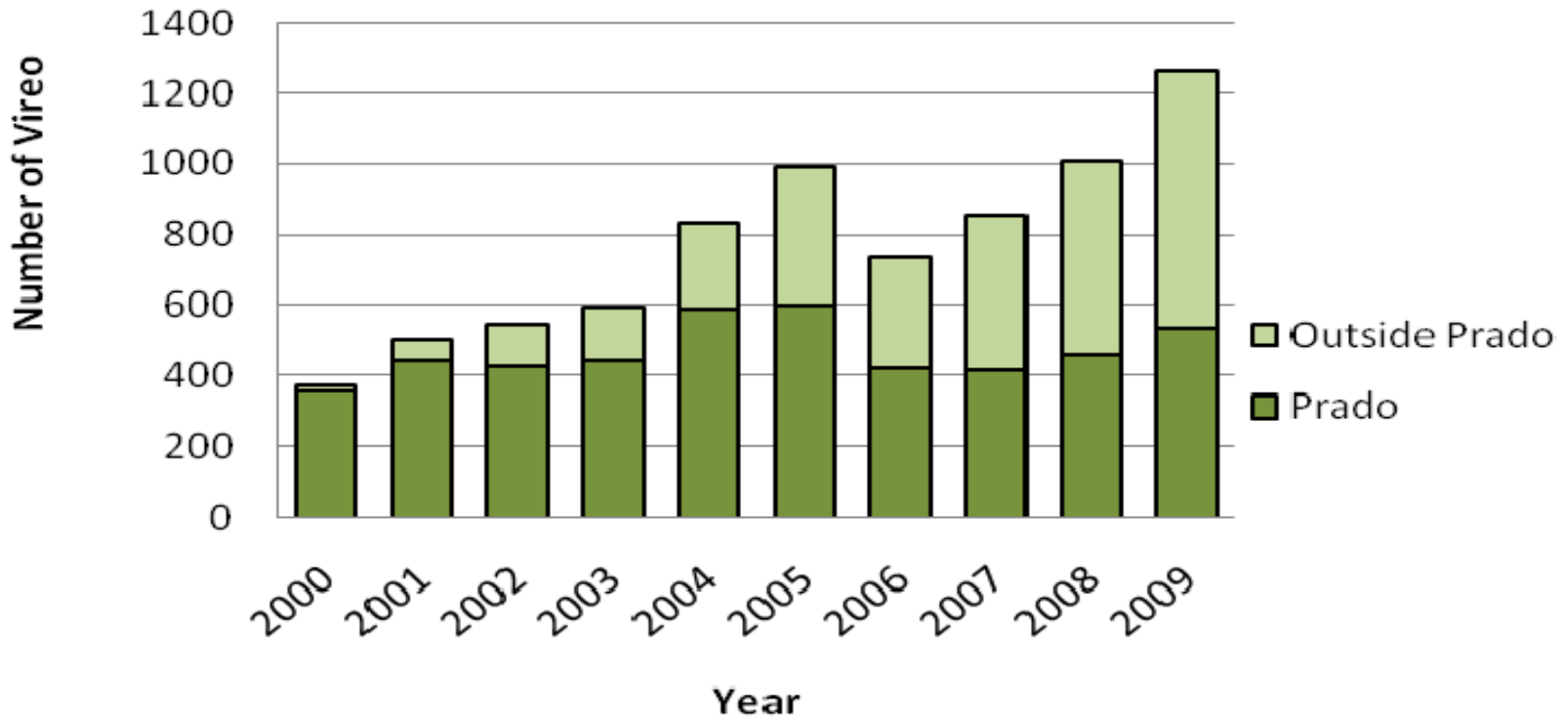
**** Vireo detected at Goldenstar on 7/14, not during actual assessment survey**

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



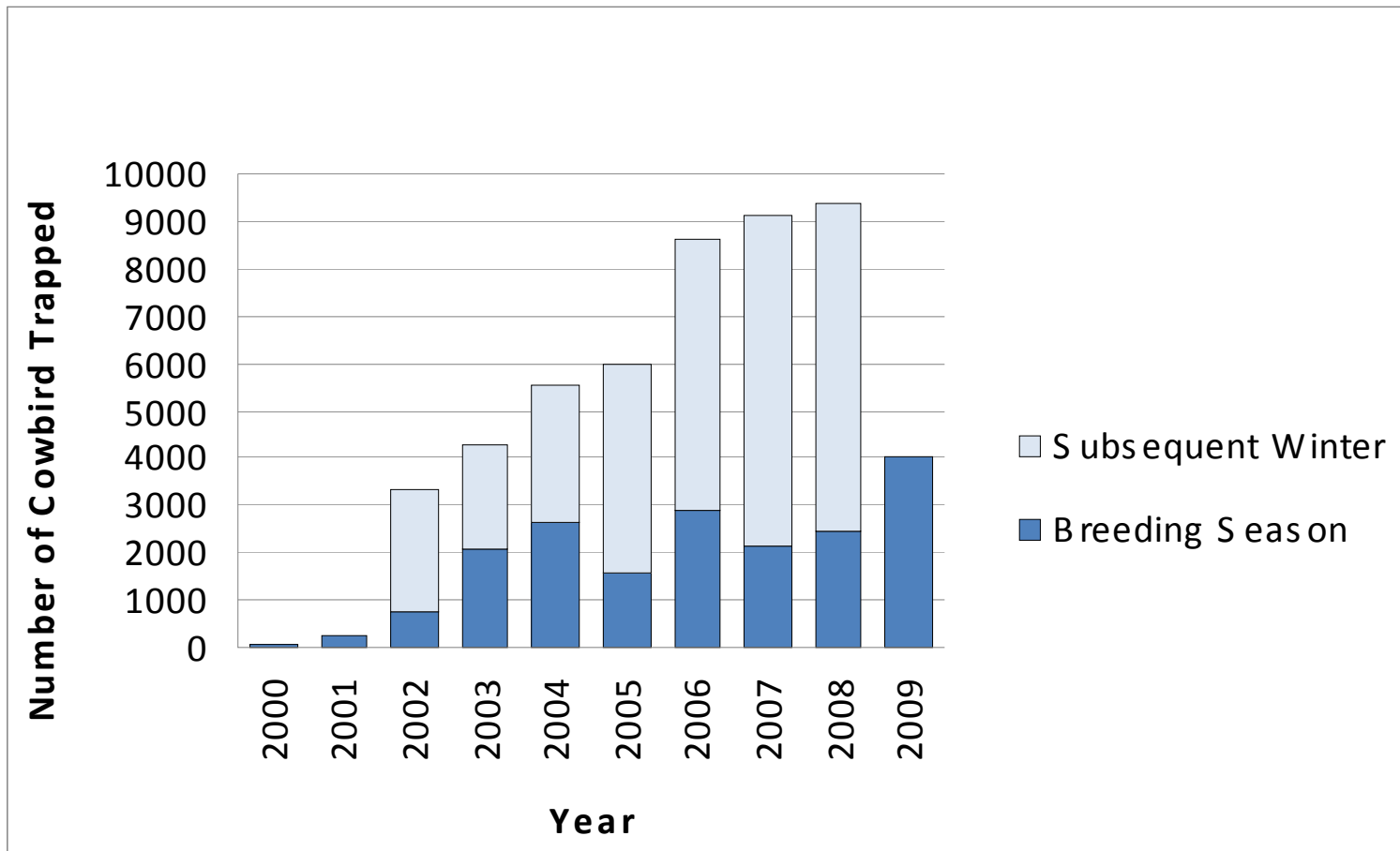
NAD 83
 1/11/10 JL TB
 LBV 09
 Map produced by IERCD & SAWA

Figure 2. Vireo Abundance in the Watershed, Prado and Outside Prado, 2000-2009



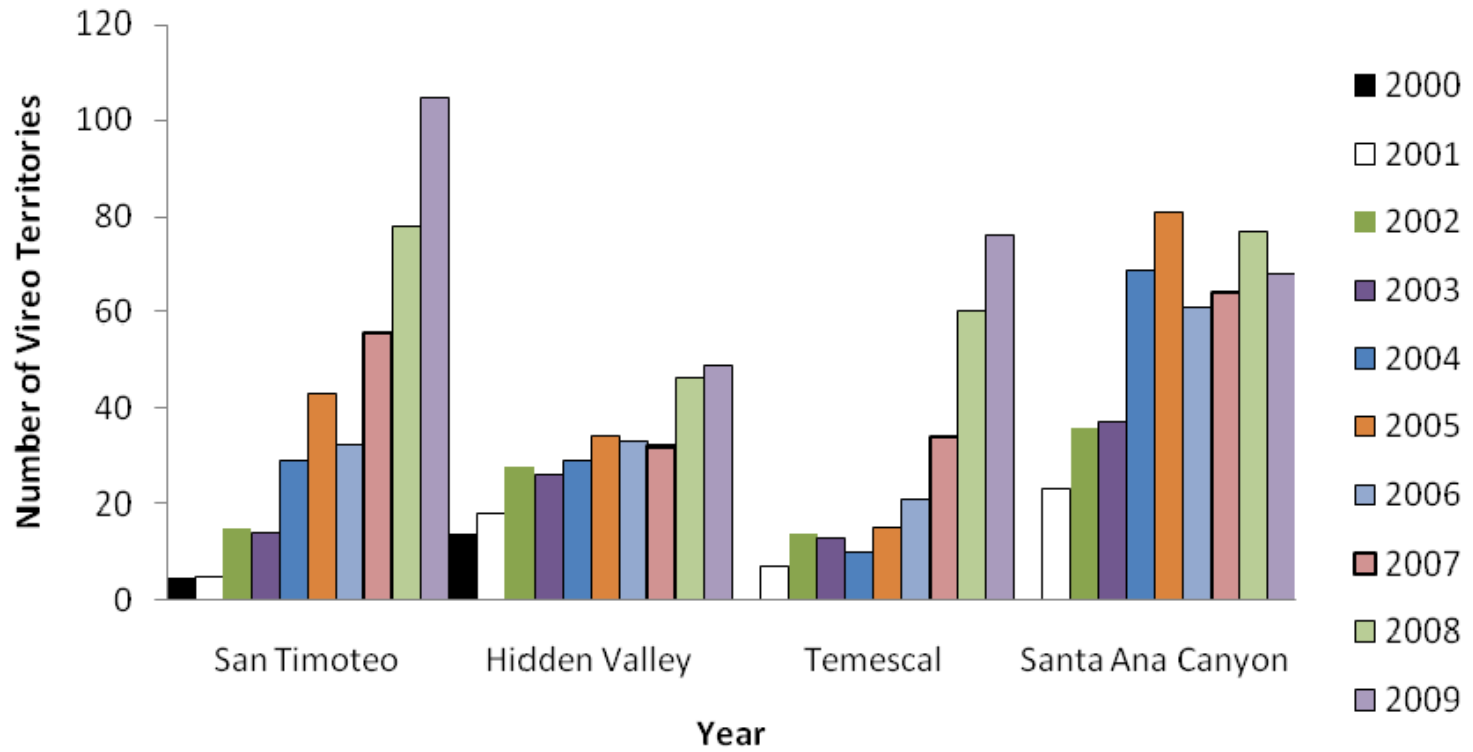
Source: Santa Ana Watershed Association

Figure 3: Number of Cowbirds Removed from SAWA Monitoring Sites in the Santa Ana Watershed, 2000-2009



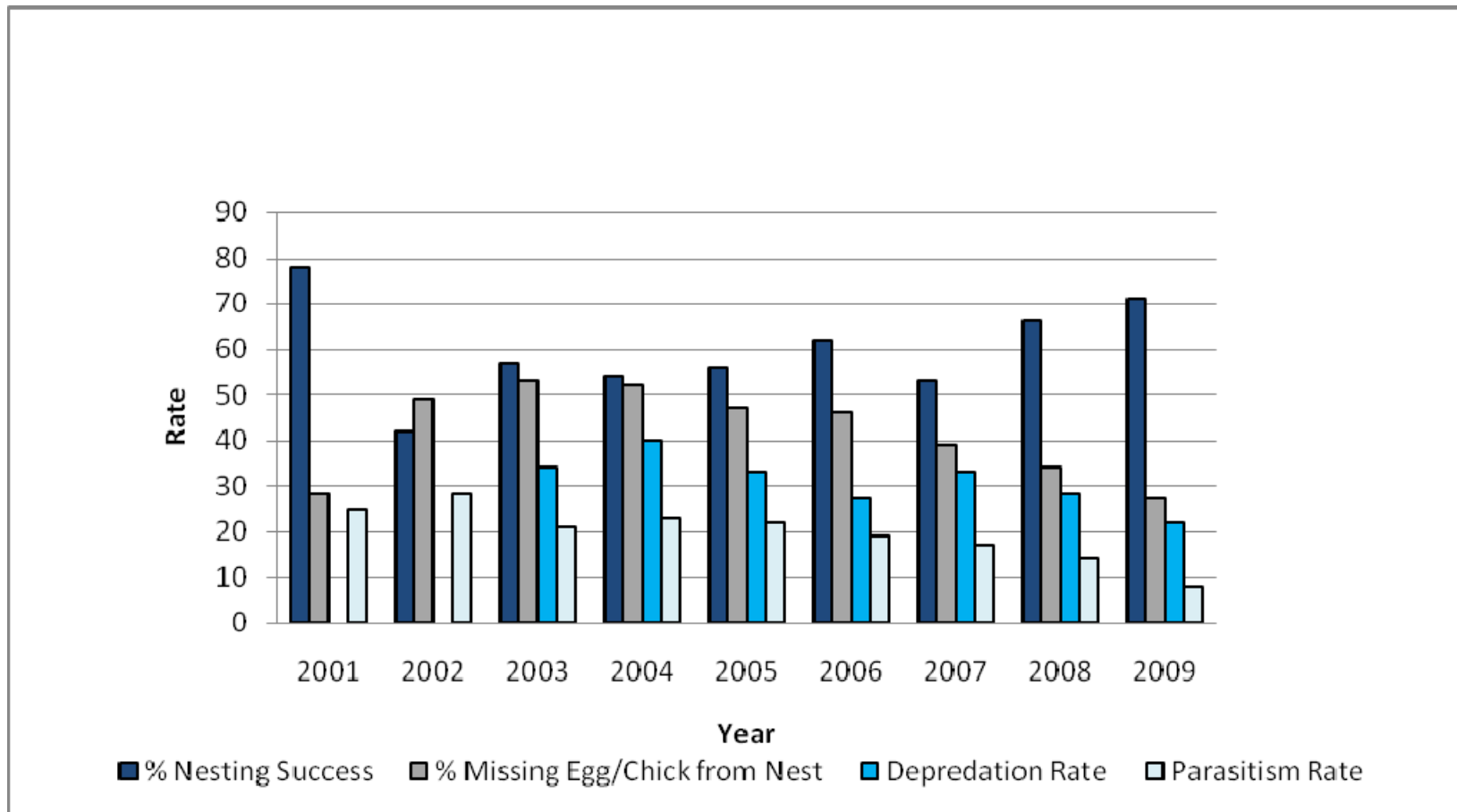
Breeding season: 15 March – 31 July
Winter: 1 Aug – 14 March
Source: Santa Ana Watershed Association

Figure 4: Number of Least Bell’s Vireo Territories at Four Sites in the Santa Ana Watershed, 2000-2009



Source: Santa Ana Watershed Association

Figure 5: Least Bell's Vireo Nesting Success, Depredation Rates, Parasitism Rate in the Santa Ana Watershed, 2001-2009



Source: Santa Ana Watershed Association

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

Assessment Locations

<u>Survey Site</u>	<u>Starting Coordinates</u>	<u>Ending Coordinates</u>
Alessandro Arroyo/Prenda Arroyo	3750512, 0471087	3754499, 0465058*
Box Springs	3756419, 0472400	3757199, 0471898
Cajon Wash	3795872, 0456115	3791800, 0457587
Carbon Canyon Regional Park	3753806, 0425027	3753071, 0422688
Carbon Canyon (Western Hills Golf Club)	3758320, 0429466	3758496, 0429755
Carbon Canyon (Chino Hills Pkwy)	3760317, 0431484	3758914, 0430579
Castleview Park	3754936, 0468185	3754970, 0468206
Chino Hills (Bayberry Dr.)	3758297, 0432335	3758507, 0431780
Chino Hills (Eucalyptus/Del Monte)	3760140, 0430160	3760276, 0430259
Chino Hills (Eucalyptus/Rancho Hills)	3759503, 0429001	3759352, 0429108
Chino Hills (Eucalyptus/Peyton)	3761262, 0432227	3761650, 0431895
Chino Hills (End of Eucalyptus)	3759298, 0428612	3759409, 0428291
Chino Hills State Park (Bane Cyn)	3757365, 0435061	3753499, 0435376
Chino Hills State Park (Lower Aliso Cyn)	3753302, 0435288	3749528, 0438033

<u>Survey Site</u>	<u>Assessment Locations (cont.)</u> <u>Starting Coordinates</u>	<u>Ending Coordinates</u>
Chino Hills State Park (Upper Aliso Cyn)	3753358, 0435216	3765039, 0433824
Chino Hills State Park (Telegraph Cyn)	3753694, 0434818	3753165, 0424101
Corona St. at Gilmore	3750572, 0448093	3750398, 0448406
Cottonwood Hills	3725415, 0475633	3724381, 0477261
Fresno Canyon	3749067, 0439703	3749370, 0440954
Gavilan Hills	3740839, 0466851	3742104, 0467107
Goldenstar	3751480, 0464626	3751466, 0464853
Kabian Park	3730880, 0475841	3732369, 0476070
Lake Perris	3747006, 0481389	3746515, 0486012
La Sierra	3747117, 0457824	3748724, 0457824
Limestone Canyon	3736548, 0434012	3735769, 0434913
Mead Valley (Cajalco/aqueduct)	3743795, 0467326	3744324, 0471767
Menifee-Paloma H. S.	3725307, 0482515	3724847, 0481557
Menifee-Haun Rd	3725045, 0483716	3724364, 0483706
Murrieta Creek	3716171, 0476609	3715809, 0476299
Norco Hills Park Mitigation	3751384, 0449570	3751225, 0448340
Oak Glen Preserve	3766841, 0505148	3766838, 0505153
Peter's Canyon	3738523, 0429409	3735641, 0428545
Poorman Reservoir	3758610, 0476434	3757320, 0477243
Porter Road (end)	3749689, 0467009	3745974, 0466170
Promenade	3749951, 0451330	3749951, 0451330
Pyrite Channel	3761369, 0455500	3761476, 0455734
Quail Run	3757379, 0470673	3757380, 0470399
Santa Rosa Mine Road	3737819, 0471840	3738146, 0471012
Santiago Canyon (Irvine Park)	3755052, 0440662	3741253, 0429119
Santiago Canyon Rd	3735740, 0434949	3736775, 0431995
Santiago Creek (above Irvine Lake)	3736263, 0437201	3737556, 0435405
Santiago Creek (Cannon Road)	3742002, 0426421	3742770, 0428079
Santiago Creek (Cambridge Road)	3737067, 0421793	3737952, 0421619
Santiago Creek (Chapman Ave.)	3738554, 0423116	3738906, 0423245
Santiago Oaks Regional Park	3742690, 0428069	3742111, 0429133
SAR (north side Hidden Valley)	3758581, 0456260	3759116, 0454885
Silverado Canyon	3734047, 0438878	3734768, 0437692
Starlight Dr. (Yorba Linda)	3750075, 0431072	3750075, 0431072
Steele Valley	3736485, 0471322	3735608, 0471266
Sun Canyon Park	3749211, 0454614	3749119, 0454788
Tequesquite Arroyo	3756303, 0467671	3756586, 0467760
Van Buren Blvd. (Bountiful)	3750024, 0469933	3749882, 0469376
Van Buren Blvd. (Plummer Rd-So.)	3749514, 0471776	3749439, 0473308
Wardlow Wash	3747252, 0443306	3749262, 0441873
Woodcrest	3751501, 0465362	3751271, 0465419
Wyle Labs (at El Paso only)	3751818, 0450068	3751818, 045006
Yorba Park Dry Lake Bed	3748301, 0424530	3749091, 0424909

<u>Survey Site</u>	<u>Other Sites</u> <u>Starting Coordinates</u>	<u>Ending Coordinates</u>
East Coyote Hills Preserve	3750601, 0415417	3751214, 0417337
Riverview Golf Course	3737568, 0417803	3736197, 0416927
San Diego Creek at Wild Rivers	3723194, 0430086	3722183, 043066
Irvine Co. across from Peter's Cyn	3738403, 0429808	3738403, 0429808

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 gooddingi</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-leaved Willow (<i>Salix exigua</i>)		1	2	6	6	4	4	10	23	56
Shining Willow (<i>Salix lucida</i> spp. <i>lasianдра</i>)				1	1	2	3		1	8
Willow species (<i>Salix</i> spp.)		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 girdana</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 luteum</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 Current (<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
Arrowweed (<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>Plantanus racemosa</i>)			1					1		2
Pepperweed (<i>Lepidium</i> <i>latifolium</i>)			1	1			1	1		4
Four-winged Saltbrush (<i>Atriplex candescens</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 annus</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 x100) (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	589.9
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	2.5
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	0.03	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	

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	2.2* (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 2005, 2008 (120.5/56 = 2.2)

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	2.0	n/a	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) %= $K/I \times 100$ (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 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)
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/I 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, 2001-2009, 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 goodingi</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 gooddingi</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 girdana</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 girdana</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, 2001-2009, BY MANAGED SITE

MARCH SKR PRESERVE

Host Plant Species	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Totals
Black Willow (<i>Salix gooddingi</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

SYCAMORE CANYON

Host Plant Species	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Totals
Black Willow (<i>Salix gooddingi</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	Totals
Black Willow (<i>Salix gooddingi</i>)					2		2	1			5
Arroyo Willow (<i>Salix lasiolepis</i>)						1		1			2
Elderberry (<i>Sambucus mexicana</i>)					1						1
Fig								1			1
Totals					3	1	2	3			9

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 gooddingi</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 girdana</i>)						4	1	1			6
Mulefat (<i>Baccharis salicifolia</i>)				1			1	1	1	1	5
Peruvian Pepper Tree (<i>Schinua molle</i>)						1		1			2
Emory's Baccharis (<i>Emory baccharis</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>Plantanus 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 gooddingi</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										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 gooddingi</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 girdana</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 gooddingi/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 gooddingi</i>)	2		6		1		2		2	2	15
Wild Grape (<i>Vitis girdana</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 gooddingi</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 fremonti</i>)									1	1	2
Sycamore (<i>Plantus 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>Utica dioica</i>) (dead)									1		1
<i>B. salicifoia</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 gooddingi</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 girdana</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 (Brassica 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 spp.</i>)							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>Schinua 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 gooddingi/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 gooddingi</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 girdana</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										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 gooddingi</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-leafed 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

Host Plant Species	CHINO HILLS										Totals
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	
Black Willow (<i>Salix gooddingi</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 girdana</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, 2000-2009, 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, 2000-2009, 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, 2000-2009, 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% (141/338)
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% (151/338)
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)

Table C-3. Least Bell's Vireo reproductive success and breeding biology data, monitored sites, in the Santa Ana River watershed, 2000-2009, 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)	(11/21) 52%	65% (20/31)	3% (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

Table C-3. Least Bell's Vireo reproductive success and breeding biology data, monitored sites, in the Santa Ana River watershed, 2000-2009 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, 2000-2009, 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, 2000-2009, 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 x 100 (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, 2000-2009, 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, 2000-2009, 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, 2000-2009, 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, 2000-2009, 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, 2000-2009, 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, 2000-2009, BY MANAGED SITE

SANTA ANA RIVER (RIVER RD. TO NORCO)

Parameter		2000	2001*	2002*	2003*	2004	2005	2006	2007	2008	2009	Totals
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, 2000-2009, 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, 2000-2009, 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, 2000-2009, 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, 2000-2009, 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 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% (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, 2000-2009, 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, 2000-2009, 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, 2000-2009, 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, 2000-2009, 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 (n=8 yrs)
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 (n=8 yrs)
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 (n=8 yrs)
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 (n=8 yrs)
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, 2000-2009, 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, 2000-2009, 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, 2000-2009, 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, 2000-2009, 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, 2000-2009, 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, 2000-2009, 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, 2000-2009, 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