Status and Management of the Least Bell's Vireo and Southwestern Willow Flycatcher in the Santa Ana River Watershed, 2010, and Summary Data by Site and Watershed-wide, 2000-2010

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ABSTRACT

The 2010 monitoring effort for the least Bell's vireo, *Vireo belli pusillus*, documented a continued increase in abundance from the low level in 2006. In 2010, 863 territories, 543 pairs and 679 fledglings were documented in the Santa Ana Watershed outside the Prado Basin by SAWA and cooperating agencies. This abundance represents a 20% increase from 2009 and 172/% recovery from the low 2006 count of 317 territories. Combined with the 569 territories documented in the Prado Basin (Pike et al, 2010), 1,432 territorial Least Bell's Vireos were documented in the watershed. The number of known pairs increased 7% from 2009. The number of fledglings decreased 30% from 2009 probably due both to decreased reproductive success and decreased monitoring effort.

Productivity based on well-monitored pairs was 2.7, a decrease from 2008 and 2009 levels over 3.0. Nesting success decreased from 71% in 2009 to 65% in 2010. The depredation rate increased from 22% in 2009 to 28% in 2010.

The parasitism rate decreased to 5%, the lowest rate since SAWA began its cowbird management and nest monitoring program. The last two years have seen rates dramatically lower than the previous rates which ranged between 14 and 28%.

Eight vireos fledged from five manipulated nests; Two nests were repaired, one was successful and fledged two young.

Thirty-nine percent of nests (n=168) were placed in five species of willow, *Salix spp*. and 39% were placed in mulefat, *Baccharis salicifolia*.

Brown-headed cowbirds, *Molothrus ater*, were also managed throughout the watershed. Over 3,000 cowbirds were removed from 54 traps over 6,992 trap days between 3/15/10 and 8/8/10. An additional 7,700 cowbirds were removed from the watershed during the winter of 2009-2010 over 1,509 trap days.

No breeding Southwestern Willow Flycatchers, *Epidonax trailli extimus*, or Yellow-billed Cuckoos, *Coccyzus americianus occidentalis*, were detected outside the Prado Basin in 2010. Incidental sightings of other sensitive birds were made. A minimum of 603 Yellow Warblers, *Dendroica petechia*, and 255 Yellow-breasted Chats, *Icteria virens*, were detected throughout the watershed. Continued degradation of riparian vegetation due to human intrusion occurred in 2010. Continued drought conditions led to sparse understories in many areas.

Since the Santa Ana Watershed Program began vireo and cowbird management, over 3,900 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.

In addition to the above intensive monitoring, abbreviated surveys were made of other riparian habitat in the watershed. Since 2005, biologists have identified habitat not regularly monitored. Fifty-six sites were surveyed during the 2010 season, usually three times, mainly during the first weeks of May, June and July (called assessment surveys). Surveys were conducted by walking next to or through habitat along trails. Surveys began about 7 a.m. and usually ended by 1 p.m. Territories were mapped and reproductive status was assessed if possible on the brief visits. Some surveys took place outside of the scheduled dates due to conflicting schedules. While three surveys were done for most sites, some sites received only one or two visits (Tables 10 and 11).

Successful nesting is defined as fledging at least one bird. Pairs for 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.

The field biologists worked under the direction of the Principal Field Investigators and all surveys and nest manipulations were performed under, and in compliance with, all terms and conditions of Federal Endangered Species Permit #TE-839480-3 and a Memorandum of Understanding with the California Department of Fish and Game.

Fifty-four 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.

In 2010, SAWA decreased the amount of time spent on intensive nest monitoring by 20% due to funding restrictions and so that biologists could work with other sensitive species. With the increasing vireo population in the watershed, sampling procedures must be implemented, especially given funding limitations. SAWA will rotate nest monitoring throughout sites in the watershed. Monitoring for detection of all territories will continue throughout all historically monitored sites: San Timoteo Canyon, Mockingbird Canyon, the Santa Ana River from Mission to River Road, including Hidden Valley Wildlife Preserve and Norco, Temescal Canyon, and the Santa Ana Canyon. In 2010, no nest monitoring was done in Mockingbird Canyon. No changes are expected for monitoring the peripheral sites; hours spent on the assessment surveys in peripheral riparian habitat increased by 23% in 2010.

A minimum of 8,543 field hours was spent in 2010 for the vireo management program including 2,589 on vireo monitoring and nest management, 515 hours on the vireo assessment surveys, and 3,239 hours on the spring/summer cowbird trapping program and over 1,000 hours for winter cowbird trapping. Over 1,200 hours were spent surveying and managing sensitive species; over 600 of these hours were spent in

unreimbursed participation in the Western Riverside County Multi-species Habitat Plan monitoring program.

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

The Santa Ana Canyon was surveyed from Prado Dam to Weir Canyon Road, a distance of approximately nine miles (14 km). The width of the habitat is often less than 200 m. A private golf course covers approximately two miles (3.5 km) of the habitat and about 4.4 miles (7 km) 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 surveyed from Cooper's Creek to approximately 15 miles (24 km) - new 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 and chaparral. A railroad and a two-lane road border the canyon. Development of portions of the uplands for homes and an utility substation -new 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, Giovanni Arechavaleta, and Talula Barbee; Hidden Valley, south side, was surveyed by Sue Hoffman; Hidden Valley, north side was surveyed by Giovanni Arechavaleta, 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 Melody Aimar, Sycamore Canyon was surveyed by Allyson Beckman, March SKR Preserve was surveyed by Giovanni Arechavaleta, Chino Hills was surveyed by Terry Reeser; San Jacinto was surveyed by Allyson Beckman.

The summary of results from the assessment surveys (presence/absence surveys) are listed in Table 10. Results for each survey visit are listed in Table 11. Patch sizes ranged from 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 2010, 863 territories were detected throughout the watershed by SAWA and cooperating agencies. This abundance is the highest to date and represents a 20% increase from 2009. In 2010, 508 pairs were detected, an increase of 7% from 2009. The number of fledglings documented decreased 31% from 976 to 679.

All historically monitored sites showed increases in abundance in 2010 except for the Upper Canyon area in the Santa Ana Canyon which lost one territory. In 2010, the San Jacinto River showed a 47% increase, San Timoteo, 20%, Sycamore Canyon, 33%, March SKR Preserve, 40%, Mockingbird Canyon, 5%, the Santa Ana River between Mission Blvd. and Van Buren Blvd., 15%, Hidden Valley, 22%, the Santa Ana River between River Rd. and Hidden Valley-Norco, 11%, Temescal Canyon, 9%, Santa Ana Canyon (SAC) at Green River Golf Club, 9%, SAC at Featherly Park, 18%, and Chino Hills, 22%. San Bernardino County reported that the number of vireos detected on the Santa Ana River between Riverside Dr. and Waterman remained stable at 42 territories, a loss of one territory. Fledgling numbers are lower this year possibly due to the decreased amount of time spent nesting monitoring, although reproductive success was decreased this year; the majority of fledglings are counted as nestlings ready to fledge from the nest and with the decreased nest monitoring, numbers were down at most sites. Six hundred thirteen fledglings were detected at monitored sites over 2,589 field hours, or .24 fledglings detected per hour of field work (Table 3). In 2009, .27 fledglings were detected. The biologists at the County of San Bernardino reported a 25% increase in fledglings along the Santa Ana River in San Bernardino County.

California State Parks and Recreation Department data was unavailable for this report. It reported four territories in the periphery of Chino Hills State Parks and Carbon Canyon in 2009. In 2010, MSHCP reported two vireos detected at Potrero. SAWA biologists also monitored the vireos at East Coyotes Hills Preserve in Fullerton for the

Center for Natural Lands Management and documented three pairs and three fledglings (not included in watershed totals).

Results – Abundance - Vireo Assessment Surveys

One hundred fifty-nine vireo territories were detected at 56 sites in the Santa Ana watershed during the 2010 assessment surveys (Table 10 and 11). This count represents a 14% increase over 2009 at the same sites visited last year, with a few exceptions (see below). These surveys were conducted in patches of riparian habitat isolated from the larger tracts of habitat where biologists manage vireos. Vireos were detected at 30 sites for an occupation rate of 54%, a rate comparable to the 53% occupancy rate in 2009. Juveniles were detected at 13 sites in 2010. Sixty-five pairs and 41 juveniles were documented in 2010. The same number of pairs were found last year, however 69 fledglings were detected at 15 sites in 2009.

Some changes to the sites surveyed included the addition of Little Sand Mine and City Creek, both of which hold two vireos. Hidden Valley Golf Club was surveyed for the first time in 2010 and holds three vireos. Because of the increase in the vireo population at Irvine Regional Park, that site was intensively nest monitored and so its numbers (n=29 in 2009) are not included in these assessment survey totals. Funding for nest monitoring became available for Hidden Valley on the north side of the river so it is not included in the above totals; six vireos were detected there during the 2009 assessment surveys.

After six years of unsuccessful surveys, two vireos were finally detected in Cottonwood Hills in Lake Elsinore. However, the single vireos found last year on Van Buren Blvd. at Bountiful and at the entrance to Western Hills Golf Club at Carbon Canyon Rd. were missing this year. Fresno Canyon near the epicenter of car fires and highway construction seems to be losing its appeal. The vireo territory in a ravine off of Jamboree Rd. east of Peter's Canyon on land owned by the Irvine Company was again detected.

Brown-headed cowbirds were observed at 23 sites in 2010. In 2010, cowbirds were detected at 24 sites, an increase from the 15 sites in 2008.

SAWA also surveyed one site where the number of birds was known through intensive monitoring. A monitor unfamiliar with the current status of the vireo at Featherly Park walked the site as if it was an assessment site in May and June. Only one territory out of five was detected. Interestingly, on both visits, the same two fledglings were detected while fledgling numbers were down throughout Featherly Park in general in 2010.

The following people participated in the surveys: Melody Aimar (MA), Giovanni Arechavaleta (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, Arcenio Hernandez and Sameh El Morsy.

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
2010	17	159**	515

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

Chronology of Breeding Activity

Surveys began throughout the watershed between 3/12 and 4/8 and ended between 7/26 and 9/22 (Table 2). The first vireos were detected 3/15 at Green River Golf Club in the Santa Ana Canyon. The earliest dates for the arrival of 50% of the subpopulation at the larger population sites were 4/8 and 4/9 at Green River Golf Club, San Timoteo Canyon, the north side of the river at Hidden Valley, Chino Hills (Butterfield Ranch environs), and the San Jacinto River. All sites showed 50% occupancy by 5/11. Fifty percent of all birds were paired at all sites by 5/25. The first nest was found on 4/5 on the Santa Ana River in Norco although first nests were also found that week at San Timoteo Canyon, the Santa Ana River at Norco, and Temescal Canyon. The last nest was found on 7/9 at the Green River Golf Club.

The first fledgling occurred at the March SKR Preserve on 5/8. The first fledgling occurred in May at all sites. The last nest fledged on 7/29 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 39% of the nests (n=168) in 2010. Arroyo willow, *Salix lasiolepis*, was the most preferred of the willows holding 27 nests. Mulefat, *Baccharis salicifolia*, held 39% of the all nests. Average nest height was 37.7 in. for 129 nests.

Other nest-host species in 2010 included: wild grape, *Vitis girdiana*, Mexican elderberry, *Sambucus mexicana,* Fremont cottonwood, *Populus fremonti,* black walnut, *Juglans californica*, black mustard, *Brassica niger*, Tamarisk, *Tamarix ramosissima*, Peruvian Pepper, *Schinus molle*, false Indigo, *Amorpha futicosa*, and sugarbush, *Rhus ovata*. Two nests were also placed in dead vegetation. Two nests were placed in deadfall and dead arroyo willow.

Over the past eight years, 48% of all nests have been found in willow species with arroyo willow and black willow predominating. Mulefat has held 30%. Seven nests have been found in the black walnut. 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 decreased as measured by productivity of well-tracked pairs. The productivity rate for 87 well-tracked pairs was 2.7. This rate is lower than the last two years when the rates was over 3.0 but increased from the 2.0 in 2007 (Table 5 and Appendix B). Nesting success was 65% based on 138 nests. See Appendix B for watershed-wide summary data. Average clutch size was 3.5, unchanged from 2008.

See Appendix C, Site Summaries, for individual site data over time.

Results - Predation Rates

In 2010, the depredation rate (complete nest loss due to missing eggs or chicks before the expected fledge date) was 28% (Table 5, row M.c.). Predation rates varied with site and ranged between 0% and 71%. Three sites, Hidden Valley, Green River Golf Club and the upper canyon, just below Prado dam, had depredation rates above 50%. Historically, watershed-wide, nest loss due to depredation has varied between 27% to 40%. (Appendix B, Table B-3, row M.c.).

In 2010, most nest losses were due to unknown predators. The nesting success was extremely poor at the El Casco construction project relative to the rest of San Timoteo (see San Timeoteo Site Summary). A vireo nest was lost to Argentine ants in San Timoteo. A nest in Hidden Valley was mostly likely was depredated by a brown-headed cowbird; a vireo was incubating a late nest with three eggs on 6/30; on 7/6 the vireo was incubating one cowbird egg. In 2010, San Timoteo Canyon continued to be plagued with habitat disturbances. Since 2007, sheep and cattle caused much damage to the habitat. In 2010, 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 jab 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, *Polioptila californica*, was observed chasing a scrub-jay in Mockingbird Canyon. In 2002, in the Santa Ana Canyon, there were several sightings during a single day of scrub jays carrying eggs in their bills. 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 2010 to 5%, a historical low. Parasitism was documented at only three sites in 2010: Hidden Valley, both on the north and south sides of the river, and San Timoteo.

Parasitism occurred at seven sites in 2009 an increase from five 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 three pairs which had unsuccessful parasitized first nests were successful after the trap was put up.

Parasitism occurred at five sites in 2008. These sites included San Timoteo, the Santa Ana River at Norco, and Temescal, all of which usually have parasitism. San Timoteo accounted for 54% of all parasitized nests this year. Sycamore Canyon and Mockingbird Canyon, which have episodic occurrences, also had parasitism this year. No parasitism was detected in Hidden Valley or San Jacinto in 2008. Both sites had parasitism in 2007. The placement of traps at strategic locations near the vireo populations probably helped to prevent parasitism at these sites. At Hidden Valley a trap hidden on the west end of the preserve and a trap on a levee at the San Jacinto River next to the vireo population have been successful in catching cowbirds.

Parasitism occurred at six sites in 2007 up from four sites in 2006 and including those same sites: San Timoteo, the Santa Ana River between River Road and Norco, Temescal and San Jacinto. The two additional sites parasitized in 2007 were Hidden Valley and Chino Hills. All the parasitized nests (n=4) at Hidden Valley were located downstream of the equestrian parking lot. Traps in that location had been repeatedly vandalized and were shut down. It was later asked that two of these traps be removed from public view so as not to detract from the atmosphere promoted by the development of the bike trail through Hidden Valley Wildlife Preserve. The successful trap in Hidden Valley was hidden from view of the public.

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 the loss or abandonment of vireo eggs in the presence of a cowbird egg.

In 2010, five manipulated nests had a 60% success rate and fledged eight vireos. In 2009, 18 manipulated nests had a 39% success rate and fledged 16 vireos. In 2008, 30 vireos, or 5% of the fledglings observed, fledged from 21 manipulated nests; all of these fledglings fledged from nests in San Timoteo and Temescal. Fifty-seven percent of manipulated nests were successful in 2008. In 2007, 19 nests were manipulated with a 43% success rate and produced 16 vireos. In 2006, 16 nests were manipulated with a 69% success rate and produced 24 young. In 2005, 26 nests were manipulated with a 54% success rate and produced 25 young. In 2004, 40% of the manipulated nests successfully fledged 18 young.

Results - Repaired Vireo Nests

Two nests were repaired in 2010 and one of the nests fledged two young. A sagging branch holding a nest was zipped tied to another branch to bring the nest level.

The two eggs that hatched probably received the heat from incubation while the nest was tilted, two other eggs did not hatch. A nest hanging from a branch in San Timoteo was reattached with thread but the nest failed.

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

No nests were repaired in 2008. Five nests were repaired during the 2007 season with a 60% success rate. Five young fledged from repaired nests. Two nests were repaired in San Timoteo; one successfully produced a fledgling. The repaired nest along the river in Norco failed. The two nests repaired at the Green River Golf Club and Featherly Park successfully fledged four young. Three nests were repaired during the 2006 season with a 67% success rate and fledging four young. One nest was repaired in Mockingbird Canyon and fledged one young. Two nests were repaired in the Santa Ana Canyon at the Green River Golf Club; one nest was successful and fledged three young. The two nests at the Green River Golf Club were repaired by securing the side of the nest to the branch with white zip ties. The nest in *Arundo* was eventually depredated. The second nest, in willow, was dangling from the branch with the three nestlings on the verge of tumbling out. The parents were very actively feeding the nestlings. A second repair was also made on the second nest. After both repairs, the parents returned to the nest and seemed oblivious to the new material. At Mockingbird, the nest was braced with a branch to keep it upright.

Five nests were repaired during the 2005 season. Four nests were repaired in the Santa Ana Canyon and one in San Jacinto. The nests needing support were built in hemlock, cocklebur, narrow-leaf willow, black willow, and mulefat. The nest in narrow-leaf willow successfully fledged four vireos. The nest in hemlock lost its three eggs to either depredation or to the branch failing. The nest in cocklebur was depredated with the loss of four eggs. The nest in black willow was secured to its branches with thread (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, 2000-2010

San Jacinto Summary

In 2010 twenty-two vireo territories were detected, up from 15 in 2009. Most of the vireos were clustered on the San Jacinto River upstream of State Street adjacent to Soboba Road. No vireos had been detected at this location prior to 2004. This sub-population has steadily increased from three in 2004 (first year detected) to 20 in 2010. Two territories were also occupied in the San Jacinto Wildlife Area in 2010 that had not been documented since 2007. In 2004, two vireo territories were detected in the San Jacinto River upstream of Bridge Street. A reduced monitoring effort has failed to detect these birds in recent years. 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% (n=1) in 2004 to 100% in 2006 (n=2) and 2010 (n=3). Parasitism and/or predation were documented at most nests visited from 2004 to 2006.

SAWA initiated cowbird trapping in 2003 at several local dairies. Over 1,000 cowbirds were removed from San Jacinto in the first year of trapping. A trap was deployed in 2006 on a levee near the sub-population of vireos in the river with the assistance of the Eastern Municipal Water District. Overall, 13,758 have been removed from San Jacinto during the vireo breeding season. Cowbird trapping has most likely played a large role in the increased vireo population size. Parasitism rates have steadily decreased from a high of 50% in 2006 to 13% in 2007 and 0% 2008, respectively. However, the parasitism rate increased to 11% in 2009. No parasitism was documented in 2010; however, only three nests were well-monitored.

It should be noted that the monitoring effort at this site was greatly reduced in 2010 due to time constraints and police activity. As a result, no pairs were intensively monitored and only seven nests discovered. The three well-tracked nests were all successful and produced 10 fledglings. Overall, a total of 28 fledglings were detected in the San Jacinto river in 2010. Since 2004, nesting success is 61% based on 57 well-tracked nests. Depredation has been the major cause of nest loss in the last seven years; 26% of all nests have been lost due to depredation. Productivity rate has increased dramatically from a low of 1.8 in 2007, based on five well-tracked pairs, to a high of 4.5 in 2008, based on six well-tracked pairs. Two pairs successfully double-clutched in 2008 (fledging a total of 13 vireos). Productivity rate in 2009 was 3.8, dropping only slightly from the previous year. Four pairs successfully double-clutched in 2009 and fledged 27 vireos, just over half of the total fledglings confirmed that year (n=53). In the last six years, 132 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. Mulefat (45%) and narrow-leaf willow (42%) have been the primary plant species used for nest placement in San Jacinto since 2004 (n= 66 nests). Black willow held another 8% of the nests. Only three of the 66 nests found from 2004-2010 were placed in non-native vegetation, two in Tamarisk and one in black mustard.

San Timoteo Summary

The vireo population in San Timoteo has increased dramatically over the past 10 years, from five territories in 2000 to 126 territories in 2010, an overall increase of over 2400%. This increase can be attributed to the removal of invasive species and subsequent restoration of native vegetation, nest monitoring, and cowbird management. San Timoteo originally contained many invasive plant species, most notably giant reed (*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 2010, 126 vireo territories were detected, up 20% from the 105 territories found in 2009. Ninety-five known pairs and 137 fledglings were detected. Nesting success was 62% in 2010, down from 65% in 2009. Nest losses were primarily due to predation (27%); however 11% were lost due to reproductive failure compared to only 1% in 2009.Five hundred and five field hours were spent on vireo monitoring; 503 field hours were spent on cowbird management.

Twenty-four well-monitored pairs had a 2.8 reproductive success rate. Nesting success is 44% over ten years of monitoring (n=375 well-tracked nests), ranging from a low of 29% in 2004 (n=31 nests) to a high of 100% in 2001 (n=4 nests). Depredation has been the major cause of nest loss in the last 10 years; 33% of all nests have been lost due to depredation. Overall reproductive success based on productivity of well-tracked pairs in the last 10 years is 2.7 and has ranged from a low in 2004 of 0.8 to a high of 3.9 in 2009.

One of the sample areas was adjacent to ongoing construction activities, produced atypical data which lowered breeding success rates in San Timoteo in 2010. The Edison El Casco Project construction activities in Norton Younglove Preserve continued throughout the nesting season. The vireo adjacent to construction activities suffered an unusually low reproductive success rate (0.86) due to high depredation (50%, n=14) and reproductive failure (21%, n=14) rates, and have negatively skewed the overall success rate for vireo in San Timoteo this year. In comparison, other closely monitored vireo in San Timoteo during 2010 (excluding the seven closely monitored pairs at the construction area) had a 3.6 reproductive success rate (n=17), with only 13% depredation and 4% reproductive failure.

A SAWA biologist monitoring the vireo adjacent to construction activities was in close contact with project consultants and every possible precaution, short of stopping work, was taken to avoid impacts to nesting birds. These include building and extensive

sound-wall and visual barrier between the construction footprint and the riparian area, as well as sound monitoring. Although the SAWA biologist could not identify any direct impacts to the vireo from construction activities, the extremely low success rate of these particular vireos is suspect as to the cause and deserves further examination.

There are a multitude of factors that could have caused limited success at this location. Observer bias is a common factor in differing data results. Although, it is unlikely in this case since the same biologist monitoring this sample has monitored San Timoteo for the past six years. Another possible cause could be some unknown site-specific reason. However, data extracted from pairs in the same territories in prior years does not show atypical results. Decreased monitoring throughout San Timoteo in 2010 could have resulted in skewed data. However, the 2010 results from other areas in San Timoteo are within historical expectations. The overall reproductive rate of well-tracked vireo pairs in San Timoteo over the last 10 years is 2.7 (n=207), with a range of 0.8 to 3.9 (Appendix C-31). The low rate of 0.8 occurred in 2005, which was also an El Nino influenced year. However, the more likely cause for the low reproductive rate in 2005 was an extremely high parasitism rate of 74%. There was no parasitism of the Younglove sample in 2010. The depredation rate (50%) was also much higher at this location as compared to the others (13%) in San Timoteo this year. Over the last 10 years the depredation rate in San Timoteo has ranged from 0 to 65%, with an overall rate of 34% (n=375). However, the most alarming finding was the rate of reproductive failure (21%) at this location. The reproductive failure rate was only 4% among all other well tracked vireo pairs in San Timoteo this year. In the last 10 years, this rate ranged from 0 to 6%, with an overall rate of 3% (n=375) in San Timoteo. In fact, the highest reproductive failure rate recorded watershed-wide in the last nine years was only 9%. The three nests considered reproductive failure in this sub-sample were all caused by abandonment during the normal incubation period. Three additional nest attempts were abandoned during the building stage in this sub-sample. Both types of nest abandonment suggest some type of disturbance as the cause. Clearly, something is going on with the vireo at this location that may be difficult to determine, but likely has to do with the construction activities. Further examination of the remaining factors that could be affecting reproductive success at this location is suggested. Specifically, disturbance caused by construction activities (e.g. continual noise and other human disturbances) and resource deficit due to the direct loss of, and restricted access to, upland habitat. Vireo often utilize habitat adjacent to riparian vegetation for foraging and nesting, especially in narrow riparian strips such as those at this location (Kus 1989), and have been shown to have significantly lower nesting success where adjacent habitat was absent (RECON 1989).

Cowbird trapping has occurred in San Timoteo since 2001, and a total of 1,660 cowbirds have been removed from San Timoteo Canyon during this time. In 2010, the parasitism rate was at an all time low of 8% (3 of 37 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 28% over ten years (106 of 375 nests), only 7% of nests (25 of 375) have failed due to parasitism. There was no failure of nests due to parasitism in 2010. This low failure rate is primarily a result of intensive nest monitoring efforts. Although cowbird trapping has occurred since 2001, parasitism rates remained very high through 2006. Literature suggests that cowbirds have different regional dialects

and female cowbirds tend to prefer older males that use local flight whistles, to younger males or older males that have a foreign dialect (O'Loghlen and Rothstein 1995 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 2009, and 35% in 2010. We continued this protocol in 2010 and added three more traps in locations where parasitism was localized in prior years. Trapping efforts incorporating this new protocol will hopefully continue to control the rate of parasitism throughout the canyon. In the last four years, the parasitism rate has been below 20%, which may be a result of these additional efforts.

Mulefat (28%), arroyo willow (19%) and red willow (17%) have been the primary plant species used for nest placement in San Timoteo since 2001 (n= 419 nests). Black willow held another 13% of the nests. Only four nests found from 2001-2010 were placed in non-native vegetation. Although the riparian area is protected under existing laws, residential and utility development continues in San Timoteo Canyon. Current threats to the riparian habitat include removal of vegetation by landowners, human encroachment (i.e. paintball and all terrain vehicle activities), and sheep and cattle grazing. During 2008, a new threat arose in the form of feral pig rooting. While it has long been know that feral pigs were present in the canyon, their growing presence and resulting habitat destruction increased throughout the canyon in 2008 and increased in 2010. 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.

References used:

RECON (Regional Environmental Consultants). 1989. Comprehensive species management plan for the least Bell's vireo (Vireo bellii pusillus). Prepared for San Diego Association of Governments, San Diego.

Kus, B. E. and K. L. Miner. 1989. Use of non-riparian habitats by least Bell's vireos. USDA Forest Service Gen Tech. Rep. PSW-110.

Sycamore Canyon Summary

In 2010, twelve vireo territories were detected, up from nine in both 2008 and 2009. Nests were not monitored in 2010, however eight pairs and 11 fledglings were detected over 53.5 hours of monitoring (average number of fledglings/pair = 1.4). Nesting success in 2008 was 50% (n=4 nests), down from 100% in 2007 (n=2 nests). The vireos in this canyon are notoriously silent and therefore difficult to monitor. Vireos have never been observed feeding cowbird fledglings.

Due to the low parasitism rate, Sycamore Canyon has not been intensively managed except mainly to document the number of territories and pairs. No breeding data were gathered in 2003 or 2006. In 2004, three nests of two breeding pairs were monitored, producing an average of 2.0 fledglings/pair. One nest was parasitized,

however only one nest loss occurred due to depredation. In 2005 only one fledgling was observed from seven pairs but this low number can be attributed to the lack of monitoring effort. In 2008, 13 fledglings were observed from eight pairs. Cowbird trapping occurred in Sycamore Canyon from 2004-2009, and 81 cowbirds were removed from the canyon during this time (42 of these captures occurred in 2004). No cowbirds were removed from the area in 2009. No cowbird trapping was done at the site in 2010.

March SKR Preserve Summary

Fourteen vireo territories, twelve paired, and 25 fledglings were detected in March SKR Preserve in 2010. Since SAWA began monitoring in 2004, seven to 14 vireos have been documented in March SKR Preserve annually. A total of 100 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%, (n = 6 nests), in 2010 and 77% over six years. Reproductive success of tracked pairs was 6.3 in 2010 and 4.8 over five years. This year, a cowbird egg was found in one nest after nestlings fledged and did not have an effect on the reproductive outcome. Black willow (43%) has been the primary choice for nest placement at this site along with red willow (26%) and arroyo willow (26%). Vireos at this site have nested mostly in willow species, probably due to availability.

Willow Flycatchers, *Empidonax traillii*, are detected routinely in the riparian habitat at the March SKR Preserve. In 2008, multiple sightings of a flycatcher were made in the same area on 5/18 (one bird), 5/29 (two birds), 6/9 and 6/11 (one bird) but no breeding was confirmed. In 2009 one sighting of willow flycatchers included two birds on 5/27. Willow Flycatchers were not detected in 2010. 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 in 2009. In 2010, two Cooper's Hawks were observed courting.

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 2010, multiple coyotes, *Canis latrans*, were observed and in 2009 a pair with pups was observed. In addition, three Red-tailed Hawks, *Buteo jamaicensis*, were observed; two of the hawks had active nests with three nestlings in one nest and one juvenile in the other. Also this year, a Lawrence's Goldfinch, *Carduelis lawrencei* (Federal Species of Concern) was observed in addition to a Long-tailed Weasel, *Mustela frenata*, two Downey Woodpeckers, *Picoides pubescens*, and over one-hundred Western Spadefoot Toad tadpoles, *Spea hammondii*. In 2009, a Western Bluebird, *Sialia mexicana*, a Loggerhead Shrike, *Lanius ludovicianus* (Federal and California Species of Concern and Federal Bird of Conservation Concern), a Lark

Sparrow, *Chondestes grammacus* (Federal Species of Concern), and a Black-throated Gray Warbler, *Dendroica nigrescens*, were also observed. Sightings of interest, in 2008, in addition to Willow Flycatchers mentioned above, include a pair of Black-headed Grosbeaks, *Pheucticus melanocephalus*, and a male Blue Grosbeak, *Guiraca caerulea*, seen multiple times in the same location as well as four Western Kingbirds, *Tyrannus verticalis*. In 2005, incidental sightings included a pair of White-tailed Kites, *Elanus leucurus* (a USFWS Migratory Nongame Bird of Management Concern and DFG Fully Protected Species), and a Long-tailed Weasel. In 2004, a Cooper's Hawk perched on a cowbird trap, was observed taking an endangered Stephen's Kangaroo Rat, *Dipodomys stephensii*. Miscellaneous observations of species in riparian habitat at March SKR Preserve in 2004 included a pair of Loggerhead Shrikes, nesting Great Horned Owls, *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. In 2010, adjacent habitat along Van Buren Blvd. support additional for vireo territories; two to four vireos have been documented in the habitat since 2005. 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-three vireo territories, 34 pairs, and 25 fledglings were detected in Mockingbird Canyon in 2010. In 2003, the first year vireos were monitored in Mockingbird Canyon, parasitism was 62% and caused nest failure in four of 13 nests (31%). Beginning in 2004, an intensive cowbird management program was initiated. The parasitism rate decreased sharply after this management program began, and occurs episodically, but seems to be controlled. Several land owners have allowed traps on their property which has facilitated our program. The monitoring effort was greatly reduced in 2010 due to time constraints. While enough effort was spent to hopefully detect every territory, no nesting data can be reported this year.

The vireo population in Mockingbird has increased 378% since 2003 from nine territories in 2003 and 2004 to 43 territories in 2010.

Nesting success has also increased over the years. In 2003, nesting success was a low 15%. Over seven years (2003-2009), 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 (32%) has been the primary choice for nest placement at this site, along with black willow (26%) and Mexican elderberry (13%). However, some nests have been successfully placed in non-native vegetation, such as perennial pepperweed

and Peruvian pepper trees. As of 2009 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 6% have been placed in mulefat, one of the preferred vireo nesting substrates elsewhere.

Although the reservoir and basin are protected from development at this time, residential development continues throughout Mockingbird Canyon. Most of the adjacent upland habitat will soon be lost and the creek is becoming more fragmented by culverts and bridges. The riparian habitat throughout the entire site is continually threatened by ATV and paintball activities, as well as large amounts of trash dumping and other illegal activities. Additionally, because most of the property boundaries extend to the middle of the creek, landowners freely alter the vegetation structure on their property in the floodplain to make "park-like" areas. This removal of understory vegetation eliminates valuable nesting habitat for the vireo and other songbird species. Mockingbird Canyon is a prime candidate for the development and implementation of an open space management plan. SAWA recently acquired an 11 acre easement in Mockingbird Canyon at Roosevelt and Markham, and will continue to work with local property owners to enhance the canyon's natural resources.

Santa Ana River – Fairmount Park/Mission Boulevard to Van Buren Boulevard Summary

Sixty-eight vireo territories, 50 pairs, and 58 fledglings were documented along the Santa Ana River between Fairmount Park and Hidden Valley in 2010, exclusive of Hidden Valley (See Appendix A). During the 2010 season, 13 nests were discovered and 11 were closely monitored. The success rate for these tracked nests was 55%. One nest (9%) failed as a result of reproductive failure, and 4 nests (36%) failed as a result of predation.

In the winter of 2007-2008, the IERCD and SAWA removed 106 acres of *Arundo* from the Martha McLean Anza Narrows Park. Herbicide application, in the presence of monitors, occurred during each following year, through the 2010 breeding season. In 2010, 11 territories were found within the park, an increase of six since 2007. Four territories were located directly across the river from the park, and seven territories were located along the river upstream from the park to Mission Blvd. One vireo was detected approximately 1/4 mile upstream of Mission Blvd by the biologists at the Multi Species Habitat Conservation Plan. The remaining 45 territories were located 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 over 270% from 18 territories in 2002 to 68 territories in 2010. Nesting success has varied over the years. The lowest success rate was 11% in 2002, which was 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, and 55% in 2010. Nesting success is 66% over all years. Since monitoring began a minimum of 341 fledglings have been documented at this site. Cowbird trapping has occurred at private business and homeowner locations since 2002, and a total of 519 cowbirds have been removed from the site during that time. Since trapping began, the rate of cowbird nest parasitism on least Bell's vireo has decreased from 67% in 2002 to 0% from 2006 to 2009. In 2010

no parasitism occurred in well-tracked nests, however one pair that was not monitored was observed feeding a cowbird fledgling. A Yellow Warbler pair was also observed feeding a cowbird fledgling.

Mulefat (32%) and Arroyo willow (31%) have been the primary choices for nest placement at this site. Some nests have been successfully placed in non-native vegetation, such as Tamarisk. To date, vireos at this site have nested in 15 different plant species or combination of species. Overall, 53% nests have been placed in willow species or combinations with willow species.

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

Santa Ana River – Hidden Valley Wildlife Preserve Summary

(south and north side of river)

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

North side of the river

The Hidden Valley Wildlife Preserve on the north side of the river held 15 territories . Twelve males were paired and 18 fledglings were observed. Nine of 10 nests found were monitored for a 56% success rate and a 33% parasitism rate. All parasitized nests failed. The lack of cowbird trapping shown in the area as shown by the Table 5 is somewhat misleading. One trap was placed on private property near Van Buren Blvd. (at Riverdale St.) and another six were placed between Van Buren Blvd. and Hwy 15. Data for traps in this trap route are found under "SAR - Jurupa Park to Hidden Valley" and "SAR -Hidden Valley to River Rd".

South side of the river

The Hidden Valley vireo population on the south side of the river continues to climb, slowly. In 2010, 60 territories and 43 pairs were documented which is an increase from 49 territories and 37 pairs in 2009. Large increases in abundance (by at least 10 territories) took place between 2001-2002, 2007-2008 and 2009-2010. Fifty-

three fledglings were detected in 2010. The monitoring effort over the last two years has included a permitted biologist and a field assistant.

In 2010 a pair of vireos were documented in a ravine above Hidden Valley to the south at Rancho La Sierra West. This territory is not included in the data for Hidden Valley Wildlife Preserve but is listed on Tables 1A and 1B.

The productivity rate for well-tracked pairs in 2010 was 2.1, the lowest rate ever observed. This low rate was also observed in 2007. The productivity rate over 11 years is 2.5.

Nesting success returned to the low rate of 41%, a rate comparable to those of 2007 and 2008. The high success rate of 69% in 2009 was not duplicated even though a similar number of nests were monitored. Of the ten nests lost in 2010, nine were lost due to depredation and one was lost due to parasitism; a cowbird egg was being incubated after four vireo eggs were documented in the nest the week before. Hidden Valley has a 64% nesting success rate over the last 11 years. Depredation remains the main cause of nest failure.

Willow species, *Salix* spp., are the most common plant species used for nest placement. Sixty percent of all nests found in the last 11 years were placed in willows, mainly arroyo willow, *Salix lasiolepis*, and black willow, *Salix gooddingi.* Mulefat, *Baccharis salicifolia*, has held 30% of all nests.

Management strategies at Hidden Valley include cowbird trapping as well as nest manipulation. Since 2000, 661 cowbirds have been removed from Hidden Valley over 4,550 trap days.

Review of parasitism in the watershed in 2010 reveals parasitism documented in only the Hidden Valley area and San Timoteo Canyon. Only two cowbird traps were deployed on the south side of the river at Hidden Valley this year but there were five other traps deployed on the river between Van Buren Blvd. and Hwy 15. Traps at Hidden Valley (south side) are often vandalized so fewer traps were deployed this year. However, traps placed near nesting vireos often prevent parasitism by capturing the few females parasitizing nests in the area so, in 2011, SAWA will try to place a trap at a secure location on the north side of the river closer to the center of the Hidden Valley vireo population.

Parasitism is detected sporadically in Hidden Valley. Parasitism was not detected in Hidden Valley until 2005 when one nest was parasitized. Parasitism occurred again in 2007 when four of nine 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 three years and has trapped 59% of the cowbird caught in Hidden Valley those years. Parasitism again occurred in 2009 and 2010. Overall there is a 7% parasitism rate in Hidden Valley. In 2010 in addition to the vireo found incubating a cowbird egg, a cowbird egg was found in a nest without eggs that had earlier been depredated. This nest was not incubated and would not have hatched so it is not included in the data for parasitism rates. The occurrence is noted on Table 5, row O.

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 and halted at the beginning of the 2010 season. A small amount of hand work cutting arundo began again in August 2010 and the final cutting was completed in November 2010. Herbicide applications will continue for at least the next five years. With the completion of the project more habitat will be opened up for monitoring and increases in the extent of native habitat and vireo population are expected.

The opening up of the habitat at Hidden Valley has had other benefits. 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 but failed during the 2010 season.

Incidental surveys for other species of concern take place during vireo monitoring. In 2010, 76 Yellow Warbler*, Dendroica petechia*, and 67 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 and 2010 when a few years previously, before the 2005 flooding, 50 territories were estimated.

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

Summary

In 2002, this site on the Santa Ana River at Hwy 15 in Norco was heavily infested with the invasive *Arundo donax*. A fire in 2002 burned much of the biomass, and SAWA took advantage of the opportunity to begin spraying the remaining *Arundo*. Vireo nest monitoring and cowbird management began in 2004. Now in its seventh year of management by SAWA, the native vegetation at the site is successfully recolonizing, vireo abundance has increased from 28 territories in 2004 to 101 territories in 2010. Cowbird trapping has removed 431 Brown-headed cowbirds from the habitat.

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

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

In 2010, 101 territorial males were detected. Sixty-four of these males were paired and 113 fledglings were detected. Nesting success for 18 well-tracked nests was 89%. This is an increase from 80% in 2009, and 79% in 2008 and a substantial increase from 44% and 41% in 2007 and 2006 respectively. In 2010, nest failures were due to depredation; there was no nest loss due to parasitism or reproductive failure. Twelve pairs monitored throughout the 2010 season had a 3.3 productivity rate. Since monitoring began at least 602 fledglings have been produced at this site.

The vireo population on the Santa Ana River in Corona-Norco almost doubled between 2004 and 2005 from 28 territories to 42. In 2006 there was a decrease in vireo numbers, but a decrease in abundance was detected throughout the watershed. In 2007 and 2008, the population grew again to 45 and 65 respectively. In 2009, the number of territorial males reached a total of 91. In 2010, the number of territorial males has reached an all time high of 101. Data on vireo territories near River Road Bridge was supplied by John Green.

Overall nesting success from 2001 through 2010 for the site is 67% (n= 195 nests, range= 33%-100%). Depredation has been the main cause of nest loss, although it only occurred at a rate of 11% this year, which is the lowest rate since 2005.

Cowbird trapping has occurred at Norco annually since 2004. Four hundred and thirty one Brown-headed Cowbirds have been removed from Norco over 1,371 trap days. Parasitism has occurred on the site in six out of the nine years surveyed. In 2006, the parasitism rate was 22% and mostly concentrated in the habitat adjacent to the Goose Creek Golf Club. A trap was placed in this area late in the season to alleviate the parasitism with no success. In 2007, a trap was put out in the same location earlier in the season and it captured 68 cowbirds during the first three weeks it was open; there was no parasitism in the targeted area by the golf course, however parasitism still occurred in other parts of the site at a rate of 16%. In 2008, parasitism decreased again, at a rate of 7% (2/29 nests). In 2009, the rate dropped to 2% (1/45 nests). In 2010, no parasitism occurred on the site.

Mulefat has held 33% of all vireo nests (n=232) since 2001. Arroyo willow and Black willow have held 32% and 17% of nests respectively. The riparian vegetation overall is greater than 50% native.

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

Temescal Canyon Summary

In 2010, 83 territorial least Bell's vireo males were detected. Forty-nine of these males were paired and 73 fledglings were detected. This count represents a 9% increase from the count of 76 territorial vireos in 2009 and an increase of over 1000% from the seven territorial vireos in 2001.

Nesting success for 15 well-tracked nests was 87%, an increase from last year's 69% success rate. Eleven pairs monitored throughout the season had a 3.1 reproductive rate. Nest loss was due to depredation; two of the 15 nests (13%) tracked were lost to depredation. No nests were lost due to parasitism or reproduction failure.

SAWA has surveyed Temescal Canyon since 2001 when it began its arundo removal program. Habitat is surveyed along approximately 26 miles (42 km) of Temescal Canyon, from Railroad Canyon to approximately two miles upstream of the intersection of Magnolia Avenue and Temescal Creek. Miscellaneous sightings of three pairs near Cajalco Creek were included. 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 2010 is 64%. Overall productivity of well-tracked pairs is 2.7.

Cowbird trapping has occurred at Temescal annually since 2001. Over 7,003 trap days 1,484 Brown-headed Cowbirds have been removed from Temescal. Parasitism has been documented in Temescal in sevenout of the 10 years surveyed, reaching its highest rate in 2007 (42%). The 2010 rate was 0%.

Mulefat has held 38% of all vireo nests since 2001. Arroyo willow has held another 36% of all nests. Riparian vegetation is fairly healthy throughout the canyon and includes mostly native species but it is heavily fragmented. In 2001, SAWA began removing the invasive *Arundo donax* from the entire canyon. It is currently being managed for non-native plant species such as *Arundo* regrowth and habitat is being allowed to reestablish itself.

Chino Hills Summary

Patchy habitat in Chino Hills has been surveyed annually since 2003. These sites include two ravine drainages on both sides of Butterfield Ranch Road, Slaughter Canyon Creek at Butterfield Park and a flood basin at Brookwood Lane. Another small ravine off Butterfield Ranch Road was added to the survey in 2009. Nine territories were found in these patches in 2009, five of these vireos were paired and produced six fledglings. In 2010, eleven territories were found with seven of these paired producing seven fledglings. Numbers of vireo territories usually detected in these patches range from seven to 12. Potential development, human activity and cattle grazing impact these sites. Vireos and their nests are highly susceptible to depredation in such small patches of habitat. The suitability of these patches of habitat for vireo occupancy is tenuous.

Three nests were monitored in 2010 with a nesting success rate of 67% (n= 2/3). Predation caused the one nest failure. Nest monitoring was not done in Chino Hills in 2009. However, since 2004, nesting success for well-tracked nests has been poor with an overall success rate of only 36% (n= 8/22 nests). Nest failure is due mainly to depredation (50%) and parasitism (9%).

Cowbird trapping had not been conducted in Chino Hills until 2008. Working with the City of Chino Hills a suitable location for a trap was found and the site was used again this season. The trap was open for 129 trap days and 16 cowbirds were removed, an increase from eight for last year. It is worth noting that removing 16 cowbirds from the habitat can be extremely advantageous to nesting birds. Often one female cowbird

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

All of the habitat monitored in Chino Hills exhibited signs of drought-like conditions in 2007 with a lack of ground cover and thin under story vegetation. This condition abated somewhat in 2010 with under story remaining somewhat dense until late in the breeding season.

Small, peripheral patches of habitat are surveyed three times during the season. These patches have episodic occupancy. In 2008 two additional patches of habitat were surveyed in addition to the five patches usually monitored. These sites are isolated by past and current development that continues to fragment the habitat. The habitat patches surveyed are listed in Table 11. In 2008 five new vireo territories were found at a patch of habitat next to a large ballpark, Chino Hills Community Park. In 2010, ten territories were detected at this site. 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 is 2006, when grading was being done within 100 feet of the habitat. In 2007, a pair of vireos successfully fledged at least one fledgling. In 2008 construction was completed. One vireo territory was detected in 2008, 2009 and again for 2010 with a successful nest with two fledglings. Another site, a riparian drainage through private property at Carbon Canyon Road and the Western Hills Country Club, has been surveyed since 2005 without any vireo detections. In May 2008 a small wildfire burned the entire drainage except for a narrow strip along the road directly across from the country club. In 2009 the drainage's vegetation was slowly recovering and the first detection of a vireo pair was made. The pair foraged in the riparian habitat and nested in the vegetation surrounding the Club's pool area. Unfortunately the nest was unsuccessful due to parasitism. Surveys in 2010 failed to detect any vireos despite the native vegetation's improvement in the past year. This drainage is slated for development which has been delayed probably due to the poor economy. How much of the native vegetation will be protected or replaced is unclear at this time.

Santa Ana River – Santa Ana Canyon Summary

Seventy-five territories were detected in the Santa Ana Canyon in 2010, an increase of seven from the 68 territories that were detected in 2009, but still two less that the 77 territories that were detected in 2008. In 2009, two of the three sections of the canyon, Featherly Park and the Upper Canyon, saw decreases of 10 territories. In 2010 only one section, the Upper Canyon saw a decrease of one territory. The number of pairs also decreased slightly in 2010 to 44 from 45 in 2009 and 48 in 2008. The number of fledglings observed, 47, decreased 17 from the 64 in 2009 and 12 less than the 59 in 2008. Fledgling abundance in 2010 is the lowest of the nine seasons that SAWA has been monitoring the Santa Ana Canyon. 2009 represented the highest survey count in the last three years but still 22% lower than the highest count in 2005 (n=82).

The fire of November 15, 2008 destroyed habitat over an estimated 50% of the Santa Ana Canyon's vireo population, habitat for an estimated 43 territories was

destroyed. However, most of the Canyon's vireo numbers were not as affected as feared with only moderate decreases in 2009 at the Upper Canyon and Featherly Park. The Army Corps of Engineers riverbank stabilization project started in the winter of 2009/2010 around and through the western half of Green River Golf Club, taking out over 16 acres of mature riparian habitat that survived the fire. This particular project directly affected six territories by the massive excavations that were needed to reconstruct the riverbed and banks in order to protect the 91 Freeway. Habitat loss from the two events will continue to create great pressure on the remaining habitat for the next few years, however, the 2010 vireo numbers actually increased by two territories at the golf course.

Cowbird trapping began in the Santa Ana Canyon in 2001 when parasitism was detected in five of 19 nests (26%). Since 2001, over 1,500 cowbirds have been removed from the canyon over 8,011 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 deployed two traps within a mile of that location in 2010 and removed over 90 cowbirds; no parasitism was recorded for the season.

Nesting success in the canyon for the last nine years is 61.6%, in 2010 it was 40%. Since monitoring began in 2001, 622 fledglings have been produced in the Santa Ana Canyon. The upper canyon has produced a minimum of 214 fledglings, the Green River Golf Club has produced at least 211 fledglings and Featherly Park has produced at least 197 vireo fledglings since vireos were first detected there in 2002. Depredation rates at the three sites have been rather low only going above 50% in a few years, however the rate was 60% for 2010.

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

This section of the Santa Ana Canyon had another year of decreased vireo abundance with 11 territories, one territory less than in 2009. This number represents a 45% decrease 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. Heavy construction around Prado Dam occurred from 2005 to 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 three vireo territories in this habitat, in 2006, one territory was detected and in 2007 through 2010 no territories were detected. Part of the decrease in territories in areas down river from the afore-mentioned construction could 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, 214 fledglings have been produced, but the numbers are seriously trending downward.

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 24 territories from the 22 territories in 2009, despite approximately half of the riparian habitat having been destroyed in the wildfire November 2008. The 2010 count is the highest count recorded by SAWA since monitoring began in 2001, the 23 vireos detected in 2005 was the next highest count. The vireo population at Green River Golf Club has more than doubled since monitoring began in 2001 when only ten vireos were detected. Two hundred eleven fledglings have been observed at the golf club since 2001.

Habitat at the golf club is slowly re-growing after the devastating wildfire that swept through the Santa Ana Canyon November 15, 2008, however, very few of the mature trees touched by the fire survived. The Army Corp of Engineers Bank Stabilization project removed almost 16 acres of habitat that the fire did not touch; the habitat removed had doubled its vireo occupancy from three in 2008 to six in 2009 and was gone in 2010.

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

Featherly Regional Park

In 2009, the first season after the wildfire of November 2008, 34 vireos were detected in Feathery Park, a decrease of only two territories from 2008. In 2010, 40 vireo territories were detected. This habitat is slowly re-growing after the devastating fire in 2008, in which 80 to 90% of the riparian habitat was destroyed. An estimated 70% of Featherly Park's 2008 vireo population had occupied this habitat a few months before. In 2009, many vireos returned 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, B*rassica niger*, cockleburr, *Xanithum strumarium,* wax leaf privet, *Ligustrum* sp., and a small Orange tree, *Rutaceae citrus sinensis,* on the edge of a burned area. In 2010 of the 11 nests that were detected only one used non-native vegetation, black mustard, one nest was in non-burned native vegetation and the remaining nine nests were in well-established re-growth. The surprisingly higher than expected number of vireo returning to this area is a testament to the species site tenacity.

Nesting success in 2010 was only 29%, down from 55% in 2009 and considerably lower than the overall 47.2% success rate over nine years. All nests lost were due to depredation. One dangling nest in mulefat was secured by attaching the nest branch to an adjacent branch using plastic ties. Two vireos fledged from this nest.

The vireo population in Featherly Park is a success story over the last decade given that no vireos were detected in 2001, the first year of monitoring. The population's major increase came in 2004 when it quadrupled from six to 24. No fledglings were detected in the first two years of monitoring. Then in 2003, nine fledglings were observed. Since then, over 20 fledglings are counted every year for a total of 197 fledglings produced over the last eight 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 A*rundo 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, and then working with SAWA biologists, contractors sprayed and cut trails to the remaining stands of *Arundo*. This same process continued into 2010 and it has produced great progress in stopping the *Arundo* from rebounding and has given the native habitat a much better chance at recovery.

Irvine Regional Park Summary

Twenty-four male territories were detected in 2010. Fourteen of these males were confirmed paired and 18 fledglings were observed. The nesting success was 75% with four well tracked nests resulting in three successful nests. Nest losses were due to a depredation rate of 25%. The number of territories is down from 2009 and attributed to loss of breeding habitat due to high water levels behind the Villa Park Dam.

SAWA has monitored Irvine Regional Park for least Bell's vireo since 2003 in conjunction with an Arundo removal project along Santiago Creek. The first year of monitoring in 2003 showed six male territories, followed by nine, eleven, and five for 2004-2006. This site was kept on survey schedule consisting of three breeding season visits from 2007-2009. Surveys after 2006 showed a significant increase in singing males from previous post Arundo visits. The highest male territory count was recorded in 2009 with 29 male territories.

Post Arundo restoration activities had greatly increased the biodiversity in plant species upstream of Villa Park Dam. Black willow with mulefat understory is abundant in the riparian zone and recent restoration efforts are improving upland coastal sage habitat. In 2010 mulefat was chosen for 50% of nesting attempts whereas elderberry and false indigo each had 25% of the total attempts.

Results - Southwestern Willow Flycatcher

In 2010, SAWA biologists detected ten single willow flycatchers within the watershed. No breeding pairs were found. Two birds were seen and heard whitting to each other in the Norco Burn area on 5/5. Two males were heard singing about 40 yards apart in a ravine on the west side of the Hidden Valley Wildlife Area on 5/25. A single male was heard singing at the San Jacinto Wildlife Refuge on 6/17.

During our 2010 assessment surveys, five singing males were detected. Locations include Lake Perris on 6/2, Carbon Canyon Regional Park (CCRP) on 6/3, two males heard at Kabian Park on 6/3, and Box Springs on 6/4. Additional visits were made using playback to CCRP on 6/10 and to Box Springs on 6/11, but no birds were detected on these visits.

No breeding southwestern willow flycatchers were documented in the watershed by SAWA biologists in 2009. We were unable to confirm a report of three to four

possible pairs willow flycatchers sightings in San Timoteo. We documented 10 single birds in the watershed. In San Timoteo, a minimum of two willow flycatchers were documented. There were four sightings and two males were heard on 6/8 and 6/11 in different locations. We documented six other single willow flycatchers within the watershed. There were two males singing and fighting on the Santa Ana River in Norco on 5/14 at the same location that a willow flycatcher has been detected in 2006, 2007, and 2008. Two more singing males were heard at March SKR Preserve on 5/27. Two willow flycatchers were detected at Goldenstar, in Riverside County, on 6/4. The birds were not detected on subsequent visits; however, the first least Bell's vireo heard at the site was documented on a follow-up visit.

In Prado Basin in 2009, only one 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 UTMs 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 May23. 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. Below are major population centers. See Table 12 for a listing of all sightings by species and site.

In 2010, 603 Yellow Warblers, *Dendroica petechia* were observed at 55 sites. Major subpopulations were found at Hidden Valley Wildlife Preserve (n=76), the Santa Ana River at Norco (n=56), Mockingbird Canyon (n=22), San Timoteo Canyon (n= 74), Santa Ana River (Mission to Van Buren) (n=52), Santa Ana Canyon (n = 74), and Temescal Canyon (n=73). Yellow Warblers were detected at 49 other sites, see Table 12.

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), Castleview (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

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, 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 a 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 2010, 255 Yellow-breasted Chats, *Icteria virens*, were detected at 29 sites. Subpopulations over 15 chats included Hidden Valley Wildlife Preserve (n=67), Santa Ana Canyon (n=32), Santa Ana River (Mission to Van Buren Blvd.) (n=49), San Timoteo Canyon (n=15), and the Santa Ana River at Norco (n=17). See Table XX.

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 Allesandra 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), Frenso (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 2010, California Gnatcatchers, *Polioptila californica,* were detected at 3 sites. One territory with two fledglings was documented at Carbon Canyon Regional Park, 2 territories, each with fledglings at Mockingbird Canyon, and one individual at Suicide Canyon.

In 2009, one pair and three 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 detected at 11 sites. A pair was seen at Mockingbird Canyon with one fledgling. Nests were seen at Featherly Park and Green River Golf Club, and a pair was detected at Chino Hills at Eucalyptus at Peyton.

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 three 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 2010, Loggerhead Shrikes, *Lanius ludovicianus,* were detected at five sites. Three individuals and a possible pair were observed at Lake Perris, one individual was seen at Kabian Park, Mockingbird Canyon, and San Timoteo. A possible pair was observed at San Jacinto.

In 2009, Loggerhead Shrikes, *Lanius ludovicianus*, were detected at Norco Burn (n=1) and their presence was noted at March SKR Preserve, 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.

Over 300 Tri-colored Blackbirds, *Aegelaius tricolor*, were seen at Estelle Mountain in 2010. Tri-colored Blackbirds were also caught in SAWA's cowbird cages, See Tables 7 and 9.

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 2010, Rufous-crowned Sparrows, *Aimophila ruficeps,* were detected at four sites: one individual and one territory was seen at Estelle Mountain Preserve, four territories were detected at Mount Rubidoux, three territories at San Jacinto, and five territories at Sycamore Canyon.

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 Rufuos-crowned Sparrows were detected at Sycamore Canyon.

SAWA joined the multi-county-wide Cactus Wren Working Group in 2008 and is responsible for tracking current and historical sites of cactus wren occupancy. Please contact Melody Aimar at SAWA for more information. Only two territories were documented in 2010, one in Chino Hills State Park and one in Chino Hills.

Numbers of Cactus Wrens, *Campylorrhynchus brunneicapillus,* in Chino Hills State Park have remained low in 2009. In 2008, eight occupied Cactus Wren 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 Club 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.

Burrowing Owls, *Athene cunicularia,* were again seen at Kabian Park, Mead Valley, Mockingbird Canyon (adults and juveniles seen) and Chino Creek Wetlands Park at the Inland Valley Utilities Agency detention pond where a pair and a fledgling were documented.

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

A possible family of Greater Roadrunners, *Geococcyx californianus,* was observed throughout the breeding season at Hidden Valley Wildlife Preserve in 2010.

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. In 2010, there was a 61% utilitization rate of 28 boxes; one hundred and six fledglings were confirmed. 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 Feathery Park.

There were no documented sightings of White-throated Swifts, *Aeronautes saxatalis*, in 2009 or 2010. In 2008, they were observed foraging in Featherly Park.

Lawrence's Goldfinch, *Carduelis lawrencei,* were observed in several sites in 2010. Large flocks, over 65 birds, were seen at Mockingbird in addition two breeding pairs with fledglings. One individual was observed at March SKR Preserve, and one territory at San Timoteo, two individuals at Chino Hills State Park, and in mixed species flocks at Lake Perris and Poorman Reservoir with Lesser Goldfinches, *Carduelis psaltria*, and American Goldfinch, *Carduelis tristis*.

In 2009, an adult Lawrence's Goldfinch, *Carduelis lawrencei*, was observed with a fledging in Chino Hills at Carbon Canyon Rd at Chino Hills Parkway. A pair with three 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 2010 a pair of Warbling Vireo, *Vireo gilvus*, was observed 4/26 at Goldenstar. Another pair was observed at Hidden Valley Golf Club on 5/7/10. In 2009, the only documented sighting of a Warbling Vireo, V*ireo 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).

A Wilson's Warbler, *Wilsonia pusilla*, was detected at Hidden Valley Wildlife Preserve on 8/16/10. 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 2010, Blue Grosbeaks, *Guiraca caerulea*, were detected: 8 territories were observed at Hidden Valley Wildlife Preserve, one territoriy at Norco Burn, and one territory at Santiago Oaks Regional Park.

In 2009, Blue Grosbeaks, *Guiraca caerulea*, were documented at Chino Hills State Park with three pairs in Upper Aliso Canyon. An adult male was seen at Dos Lagos, a pair was observed at Frenso Creek. Three were observed in Hidden Valley, two 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 Grosbecks 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 2010, Ash-throated Flycatchers, *Myriarchus cinerascens*, were documented at Hidden Valley Wildlife Preserve, two territories, and Santiago Oaks Regional Park, fiveterritories.

In 2009 Ash-throated Flycatchers were documented. A pair was observed at Fresno Canyon. Three flycatchers were documented at Cajon Wash, two at Hidden Valley, one in Featherly Park, an adult and a juvenile at Green River Golf Club, and two 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.

Black Headed Grosbeaks, *Pheucticus melanocephalus*, were documented at Featherly Park (7 territories), Hidden Valley Wildlife Preserve (9 territories), and Norco Burn (5 territories).

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.

A Vermillon Flycatcher, *Pyrocephalus rubinus*, was observed in 2010 at Green River Golf Club. In 2009, a male Vermillon Flycatcher, *Pyrocephalus rubinus,* was observed several days in January on the Santa Ana River in Norco. In 2008, a male Vermilion Flycatcher, was observed at Carbon Canyon Regional Park and one juvenile was observed at Reid Park in Riverside. Although two Vermilion Flycatchers were documented in the Santa Ana Canyon in 2005, none was documented in 2006, 2007, 2008, or 2009.

Wood Ducks, *Aix sponsa*, were documented at Hidden Valley Wildlife and multiple broods were documented during surveys along the Santa Ana Canyon (see sawatershed.org, levee surveys, spring 2010, report in progress).

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 2010, Chino Creek Wetlands Park held two American Bittern, *Botaurus lentiginosus*, territories, Santiago Oaks Regional Park held two territories, and one individual was observed at the Green River Golf Club.

In 2009, American Bitterns, *Botaurus lentiginosus,* were documented in Dos Lagos (two sightings), Norco (three sightings), Santiago Oaks Regional Park (one 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 2010, one sighting of a Black-crowned Night Heron, *Nycticorax nycticorax*, was documented at Lake Perris.

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.

Red-tail hawk, *Buteo jamaicensis*, nests detected in 2010, included one at Carbon Canyon and Chino Hills Parkway with one nestling, two at Hidden Valley Wildlife Preserve one with three nestlings and one with two fledglings, two nests at March SKR Preserve, one with three nestlings, and one with two fledglings. A pair was observed with three juveniles at Little Sand Basin. One pair fledged two young at Mockingbird Canyon and an active nest was detected at the Santa Ana River near Van Buren Blvd. but no results were documented.

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 two 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 two 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 two nestlings was documented. A nest and two 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.

Cooper's Hawks, *Accipiter cooperii*, were present throughout the watershed. Nests observed in 2010 included a nest with one fledgling at Norco Burn, two nests at San Timoteo, one nest that fledged four at Featherly Park, a nest at the Santa Ana River at Van Buren Blvd., and a nest on the north side of Hidden Valley Wildlife Preserve.

In 2009 Cooper's Hawks, *Accipter 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 2010, White-tailed Kites, *Elanus leucurus*, were documented at Chino Hills, Hidden Valley, Irvine Regional Park, and a family group of 4 at San Timoteo.

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

Two adult Bald Eagles, *Haliaeetus leucocephalus*, and a juvenile were documented at Lake Perris, one individual at Mount Baldy, and one individual at San Jacinto in 2010.

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. There were two sightings of Golden Eagles at Chino Hills in 2010, one at Mount Baldy, one at Norco Hills Park, and one at San Jacinto. 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. There were two sightings in 2010, one at Santiago Creek upstream of Irvine Lake, and one at Temescal.

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. No Peregrine Falcons were documented in 2010.

In 2010, numerous sightings of Ferruginous Hawks, *Buteo regalis*, were documented during driving raptor surveys in San Jacinto and San Timoteo Canyon. (see sawatershed.org). In 2008 an adult Ferruginous Hawk, *Buteo regalis*, was documented in San Timoteo Canyon. In 2009, they were observed in Lake Perris, San Jacinto, and Sycamore Canyon.

In 2010, an adult American Kestrel, *Falco sparverius*, with two fledglings were documented at Hidden Valley Wildlife, two individuals were documented at Lake Perris, and one individual at Poorman Reservoir. In 2009, American Kestrels, 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.

A Merlin, *Falco columbarius*, was documented at San Jacinto in 2010.

Twp nesting Red-shouldered Hawks, *Buteo linneaeus*, were documented in 2010. A pair with a nest was detected at Mockingbird Canyon, a pair building a nest at Canyon Crest.

In 2009, Red-shouldered Hawk, *Buteo linneaeus*, nest with chicks was documented in Carbon Canyon Regional Park. A pair with two 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.

2010 nesting hummingbirds included: Allen's Hummingbird, *Selasphorus sasin*, female with a nest at East Coyote Hills Golf Club and two females both with nests at Green River Golf Club. A male Allen's Hummingbird at the superfund site Wyle Labs.

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 2010, SAWA biologists put up tree swallow/western blue bird boxes at XXX. One territory at City Creek, a nest box was used in Featherly Park, and two pair were detected at Hidden Valley Wildlife Preserve.

Other interesting bird sightings include a Costa's Hummingbird, *Calypte costae,* at Plunge Creek, a Hairy Woodpecker, *Picoides villosus*, at Norco Burn, a Hermit Thrush, *Catharus guttatus,* at Green River Golf Club, two Hutton's Vireos, *Vireo huttoni*, at Green River, and two males at Anza Narrows. One Marsh Wren, *Cistothorus palustris*, was documented at Hidden Valley; they are declining at that site with the silting of the ponds.

In 2010, the Coast Horned Lizards, *Phrynosoma coronatum blainvillii*, was documented at Estelle Mountain Preserve, the north side of the river at Hidden Valley, San Jacinto, and Norco Burn.

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 2010 Orange-throated Whiptails, *Aspidoscelis hyperythra beldingi,* were observed off of Van Buren Blvd at the end of Porter St., near Kabian Park, Mockingbird Canyon and Sycamore Canyon.

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 at Lake Perris, Box Springs, Little San Basin, March SKR Preserve, Wardlow Wash, and a mating pair were detected at Estelle Mountain Preserve in 2010. They were documented in Frenso 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.

Many Granite Spiny Lizards, *Sceloporus orcutti*, were seen at Porter St., Mockingbird, Sycamore, Temescal, and Mount Rubidoux in 2010.

Western Spadefoot Toads, *Spea hammondii,* tadpoles were found at March SKR Preserve, Reche Canyon, and San Timoteo Canyon in 2010 after the wet winter of 2009-2010. Due to the drought conditions, Western Spadefoot Toads, *Spea hammondii*, 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 only observed at Sycamore Canyon in 2010. They 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 hammondii*, 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 and three documented at Sycamore in 2010.

There were several sightings of Long-tailed Weasel, *Mustela frenata*, in 2010. They were documented at Hidden Valley, on both the north and south sides of the river, San Timoteo, Temescal, March SKR Preserve, Plunge Creek and Santa Ana River downstream of Anza Narrows.

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.

Small mammals reported from herp arrays at March SKR Preserve and Sycamore in 2010 included the San Diego Pocket Mouse, *Chaetodipus fallax.* Black-tailed jackrabbits, *Lepus californicus,* were documented at March SKR Preserve and its environs in 2010.

Large mammals detected in 2010 included bobcats , *Lynx rufus,* at Featherly Park below Gypsum Canyon, Carbon Canyon Regional Park, and Norco Burn. Mule deer, *Odocoileus hemionus,* were seen at Chino Hills State Park and Estelle Mountain Preserve. A Coyote, *Canis latrans*, den was found at Poorman Reservoir.

Bobcats and mule deer were sighted in 2009. Mule deer 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 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.

An estimated 150 Matilija Poppies, *Romneya coulteri,* were documented at Temescal in 2010 and they continue at Featherly Park.

Woolly star, *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.

Woolly star 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 2010

Fifty-four traps were deployed during the vireo season in 2010 and 3,093 cowbirds were removed from all sites over 6,992 trap days (Table 6, Figure 1). The sex and ages of the cowbirds removed in 2010 were 1,915 males, 918 females, and 260 juveniles. SAWA biologists and field assistants spent approximately 3,239 field hours servicing traps during the vireo season and another 1,000 hours on winter trapping.

The areas trapped and the number of traps in each area are as follows: San Jacinto, seven; San Timoteo, nine; Mockingbird Canyon, eight; Hidden Valley, two; Temescal Canyon, ten; Santa Ana Canyon, nine; Chino Hills, one; March Air Reserve Base, two; and Santa Ana River from Jurupa Park to River Road, six. All of the traps were opened by 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 8). Trapping results after July 2010 will be reported in winter trapping results in 2011.

In 2010 cowbird captures decreased 23% (n=938), the decrease primarily being male captures which were 27% less than 2009 (n=722), female captures were 9% less (n=91), and juveniles trapped were 32% less (n=125). These decreased capture rates were despite a 5.5 % increase in trap days (n=367). The largest decreases in captures occurred at six of the dairy traps in San Jacinto and two traps in Temescal Canyon.

In 2010 three traps were vandalized, one was repaired and put back into service with no down time. One trap was closed before season's end and the other was relocated to a more secure location but its capture rate was 90% less than 2009.

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Results - Non-Target Avian Species Caught in Cowbird Traps, March – July 2010

Twenty-nine non-target species, consisting of 6,398 individual trapping occurrences, were trapped in 54 cowbird traps (Table 7). The most common species were European Starling, *Sturnus vulgaris,* California Towhee, *Melozone crissalis*, Red-winged Blackbird, *Agelaius phoeniceus,* House Finch, *Carpodacus mexicanus,* House Sparrow, *Passer domesticus*, Song Sparrow, *Melospiza melodia,* Lark Sparrow,

Chondestes grammacus, Yellow-headed Blackbird, *Xanthocephalus xanthocephalus*, Tri-colored Blackbird, *Agelaius tricolor,* Brewer's Blackbird, *Euphagus cyanocephalus,* House Wren, Troglodytes aedon, Northern Mockingbird, *Mimus ployglottos,* Common Ground Dove, *Columbina passerina.* Non-target captures decreased by 7% from 2009. The mortality rate was 0.89%.

Results - Winter 2009-2010 Brown-headed Cowbird Trapping and Non-Target Captures

Cowbird trapping took place at San Jacinto and the Santa Ana Canyon at Green River Road during the non-breeding season (i.e., winter) of 2009-2010. These traps were left open after the breeding season because they were still catching cowbirds. They are closed as the winter trapping success decreases. A total of 7,775 cowbirds were removed over 1,509 trap days Table 8), (This represents an 13% increase in cowbirds removed over a total of 13 fewer trap days than the winter of 2008-2009. Thirty-two percent fewer non-targets (n= 1,478) were caught than last winter. The overall mortality rate was 0.41%, down from 0.50% for last winter.

Six traps were open in San Jacinto for a total of 1,306 trap days between 8/3/09 and 3/14/10. The six traps were located at dairies. A total of 7,247 cowbirds were removed (2,936 males, 3,209 females, and 1,102 juveniles). The total Non-targets caught and released were 1,345 a 37% decrease (777) from 2008/2009 (n=2,122), the mortality rate was 0.37%. The three most abundant non-targets caught were European starlings, Red-winged Blackbirds and Tri-colored Blackbirds (Table 9).

In the Santa Ana Canyon, two horse stable traps at Green River Road were open for 154 trap-days from 8/3/09 to 11/20/09 and one trap was open at the Green River Golf Club for 49 trap-days from 8/3/09 to 10/9/09. These traps caught 528 cowbirds (25 males, 25 females, and 478 juveniles) (Table 8). This represents a 544% increase in number of cowbirds caught over last winter; only 82 cowbirds were caught in 2009. The increase was due to the increased capture of juveniles. Non-target captures also increased but by only 122% (n=133 in 2009-2010 vs. n=60 in 2008-09). The mortality rate was 0.75%. The majority of the non-targets were California Towhees (Table 9).

DISCUSSION

Vireo abundance has increased annually since 2000 except for the decline in 2006 and we now have a population of over 1,400 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 126 in 2010, Temescal Canyon has shown similar increases with a vireo population increasing from seven in 2001 to 83 in 2010. The Santa Ana River at Norco, at Hwy 15,

is also showing explosive growth. After a major Arundo burn in 2005, the population has grown to 101 territories in five years.

SAWA has removed over 90,000 cowbirds from the watershed since 2000 and the 5% 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 declined to 65% from its high of 71% in 2009, the highest rate since 2001. The nesting failure at the El Casco construction site is evidence that currently accepted safeguards to habitat and wildlife during disturbances are not foolproof.

Nest loss due to depredation was 28%. Nest losses from reproductive failure was 4%; examples of nest loss due to reproductive failure are egg abandonment, failure of all eggs to hatch, or failure of the vegetation to support the nest to a successful hatching. Only 3% of nests were lost to parasitism in both 2010 and 2009.

The parasitism rate declined for the fifth straight year to 5%. Parasitism is episodic throughout the watershed. It continues to be a problem at San Timoteo and returned to Hidden Valley in 2010. 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 2001-2010.

The lack of documented nesting southwestern willow flycatchers in the watershed is not surprising given the continuing low numbers and absence in 2010 in the Prado Basin (Pike et al in progress). 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 off-highway vehicle (OHV) tracks and the activity is damaging habitat, willows and cottonwoods, in areas such as Mockingbird Canyon, San Timoteo Canyon, the San Jacinto River, and the Santa Ana River. The effect of rampant off-road vehicle use is the destruction of significant riparian resources. The lands with these high wildlife values are very limited in extent and cannot be meaningfully protected or restored in consort with OHV activity. SAWA is attempting to initiate a program of law enforcement in San Timoteo in conjunction with State Parks and the Department of Fish and Game.

Laws meant to prevent other human disturbances such as laws against streambed alteration must be enforced. There are too many examples of the devastating effects of the lack of enforcement. A positive development in this area is the County of Riverside's code enforcement program that targets illegal dumping. Enforcement of these laws is sorely needed to protect riparian habitat from degradation.

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

SAWA has had unprecedented success in the scale of riparian habitat restoration that has been achieved on the Santa Ana River. The vireo is truly on the road to recovery in our watershed with ample habitat developing for occupation. However, we will not be ultimately successful without rallying more support from the people living next to and using the river. Too little of the riparian resources on the river are in public ownership. Setting aside and enhancing habitat does little good when that land is transformed for other uses by trespassers. Although existing laws should protect these resources, even on private land, the ability to enforce the laws and regulations is inadequate and untimely. As we continue to recover our natural resources, we will endeavor to confront this, perhaps our greatest challenge. We must strive to invest the public in these resources and identify effective ways to ensure that the floodplains are put only to appropriate human uses. We will attempt this through a combination of

public education, public involvement thorough volunteerism, and partnerships with enforcement agencies and landowners.

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Table 1A: Least Bell's vireo status and distribution in the Santa Ana Watershed, 2000-2010. 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 Table10
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, 2000-2010. 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

Table 1A: Least Bell's vireo status and distribution in the Santa Ana Watershed, 2000-2010. Numbers of territories, pairs, and fledglings detected										
SUBPOPULATION	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**
--Yorba Dry Lake Bed Park	-	-	-	-	-	-	-	1/0/0	(see table 10)	(see Table 10)
--Black Gold Golf Club									2/0/0 [11]	2/0/0 [11]
--Riverview Golf Club									1/0/0	not surveyed
--Pulte Wetlands, adjacent to Chino Hills State Park										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 Ana Watershed	376/294/674	505/380/826	546/406/730	597/450/923	837/616/1077	991/636/892	740/427/733	857/523/ 738	1013/584/ 1031	1259/781/ 1433

(a.) Entries correspond to numbers of territorial males/pairs/'known fledged young' for designated time and locale.
(b.) The "--" symbol indicates that no data were available.
(c.) The "+" symbol indicates that actual count may have been somewhat higher; field census efforts were started late or were otherwise deemed to be incomplete
(1) Reported by John Konecny
(2) Reported by biologists, San Bernardino County Flood Control
(3) Reported by biologists, California State Parks and Recreation
(4) Reported by Loren Hays, James Pike
(5) Reported by MSCHP biologists
(6) Chino Hills State Park surveyed as an assessment site and data are included in LBVI Assessment Totals.
(7) Data from Pike et al. 2007
(8) River surveyed from Van Buren Boulevard to Hidden Valley only, In 2003, survey area extended from Fairmount Park/Mission Boulevard to Hidden Valley.
(9) From 2000-2003 area surveyed included on south side of river from River Road to Hamner Road See Pike et al 2003 for north side surveys. Beginning in 2004, SAWA surveyed and reported both sides of river from River Rd to Norco/Hidden Valley
(10) Outside Santa Ana Watershed, not included in totals
(11) Reported by Alisa Ing, California State Parks.

Table 1A: Least Bell's vireo status and distribution in the Santa Ana Watershed, 2010. Numbers of territories, pairs, and fledglings detected										
SUBPOPULATION	**2010**									
San Jacinto	22/18/28									
San Timoteo Canyon	126/95/137									
Sycamore Canyon	12/8/11									
March SKR Preserve (March ARB)	14/12/25									
Allessandro Arroyo	Assessment Survey									
Mockingbird Canyon	43/34/25									
Harrison Reservoir	1/0/0									
La Sierra Blvd., Riverside County	Assessment Survey									
Santa Ana River - Fair-mount Park/Mission to (u/s of) Hidden Valley)	68/50/58									
Hidden Valley	60/43/53									
Hidden Valley (north side of river) (new area)	15/12/18									
Santa Ana River - (d/s of) Hidden Valley-Norco to River Rd.	101/64/113									
Temescal Canyon (from Railroad Canyon to approx. Cajalco Rd.)	83/49/73									
Chino Hills (Butterfield Ranch)	11/7/7									

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

Table 1A: Least Bell's vireo status and distribution in the Santa Ana Watershed, 2010. Numbers of territories, pairs, and fledglings detected										
SUBPOPULATION	**2010**									
Rancho La Sierra West, Riverside	1/1/0									
Estelle Mountain Preserve	0/0/0[5]									
Yorba Dry Lake Bed Park	Assessment Survey									
Black Gold Golf Club	Not available									
--Riverview Golf Club	Not surveyed									
--Pulte Wetlands, adjacent to Chino Hills State Park CHSP)	Not available									
--Rim Crest Dr. & Blue Gum Dr., adjacent to CHSP	Not available									
Plunge Creek, San Bernardino	Assessment survey									
Subtotal # LBVI	662/452/614									
# LBVI from SAWA Assessment Sites	159/65/41									
Total # LBV for all sites	821/517/655									
# LBV on Santa Ana River in San Bernardino County	42/26/24									
# LBV Chino Hills State Park	(51/23/14)[6]									
Total for Santa Ana Watershed- excl. Prado Basin	863/543/679									
Prado Basin [7]	569/286/479									
Total Number LBVI in Santa Ana Watershed	1432/829/1158									

(a.) Entries correspond to numbers of territorial males/pairs/'known fledged young' for designated time and locale.
(b.) The "--" symbol indicates that no data were available.
(c.) The "+" symbol indicates that actual count may have been somewhat higher; field census efforts were started late or were otherwise deemed to be incomplete
(1) Reported by John Konecny
(2) Reported by biologists, San Bernardino County Flood Control
(3) Reported by biologists, California State Parks and Recreation
(4) Reported by Loren Hays, James Pike
(5) Reported by MSCHP biologists
(6) Chino Hills State Park surveyed as an assessment site and data are included in LBVI Assessment Totals.
(7) Data from Pike et al. 2007
(8) River surveyed from Van Buren Boulevard to Hidden Valley only, In 2003, survey area extended from Fairmount Park/Mission Boulevard to Hidden Valley.
(9) From 2000-2003 area surveyed included on south side of river from River Road to Hamner Road See Pike et al 2003 for north side surveys. Beginning in 2004, SAWA surveyed and reported both sides of river from River Rd to Norco/Hidden Valley
(10) Outside Santa Ana Watershed, not included in totals
(11) Reported by Alisa Ing, California State Parks.
(12) Reported by Dave Telford

Table 1B: Least Bell's vireo status and distribution in the Santa Ana Watershed, 2000-2010. 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, 2000-2010. 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, 2000-2010. 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, 2000-2010. 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 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 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, 2000-2010. 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, 2000-2010. 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 1B: Least Bell's vireo status and distribution in the Santa Ana Watershed, 2010. Numbers of territories, pairs and fledglings detected. By Sub-watershed										
Santa Ana Watershed	**2010**									
Santa Ana River and Tributaries										
Cajon Wash	0/0/0									
Plunge Creek, Highland	1/1/0									
City Creek, Highland	2/1/0									
Little Sand Basin, Highland	2/0/0									
Oak Glen Preserve	0/0/0									
San Timoteo Canyon	126/95/137									
Box Springs	5/2/1									
Poorman Reservoir	6/1/0									
Quail Run	0/0/0									
Sycamore Canyon	12/8/11									
March SKR Reserve	14/12/25									
Golden Star	0/0/0									
Woodcrest	0/0/0									
Mead Valley at Cajalco & Calif. Aqueduct	8/0/0									
Gavilan Hills	0/0/0									
Menifee - Paloma Valley High School	0/0/0									

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

Santa Ana Watershed	**2010**									
Menifee - Huan Rd.	0/0/0									
Steele Valley	0/0/0									
Santa Rosa Mine Rd.	Not surveyed									
Van Buren Blvd - Village West to Orange Terrace	4/3/2									
Van Buren Blvd. at Bountiful	0/0/0									
Van Buren Blvd @ Porter (end).	0/0/0									
Canyon Crest	0/0/0									
Mockingbird Canyon	43/34/25									
Alessandro Arroyo/Prenda Arroyo	6/2/0									
Castleview Park	0/0/0									
Tequesquite Arroyo	0/0/0									
Pyrite Ravine (environs of Van Buren/Limonite)	3/0/0									
SAR mainstem at Van Buren Blvd.	n/a									
SAR Mainstem - Mission to Hidden Valley	68/50/58									
SAR Mainstem - North side at Hidden Valley	15/12/18									
SAR - Hidden Valley	60/43/53									
Hidden Valley Golf Club	3/0/0									
Wyle Labs at El Paso Rd.	1/1/2									

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

Santa Ana Watershed	**2010**									
Norco Hills Park - mitigation area	0/0/0									
Promenade Ave, Norco	2/2/4									
Corona St./Gilmore, Norco	0/0/0									
SAR Mainstem - Hidden Valley to River Rd., so. side	n/a									
SAR Mainstem-Goose Creek Golf Course (Norco) to River Rd.	101/64/113									
Temescal Canyon	83/49/73									
Harrison Reservoir	1/0/0									
La Sierra Ave./Lyon St.	3/0/0									
Cajalco Canyon	See Temescal									
Chino Hills - Butterfield Ranch	11/7/7									
Chino Hills - Eucalyptus at Rancho Hills	1/1/2									
Chino Hills - Eucalyptus at Del Monte	2/1/0									
Chino Hills - End of Eucalyptus (s/o Rancho Hills)	0/0/0									
Carbon Canyon Blvd. at Western Hills Golf Club	0/0/0									
Carbon Canyon Blvd at Chino Hills Pkwy.	0/0/0									
NW c/o Eucalyptus and Peton Dr., Chino Hills	10/4/1									
Bayberry Dr., Chino Hills	0/0/0									

Table 1B: Least Bell's vireo status and distribution in the Santa Ana Watershed, 2010. Numbers of territories, pairs and fledglings detected. By Sub-watershed										
Santa Ana Watershed	**2010**									
Carbon Canyon Regional Park & Carbon Canyon Rd.	8/6/3									
Black Gold Golf Club, Yorba Linda	Not available									
Sun Canyon Park	0/0/0									
Wardlow Wash	0/0/0									
Fresno Canyon	1/0/0									
Santa Ana Canyon - Upper Canyon-Prado Dam to Green River Golf Club	11/4/6									
Santa Ana Canyon - Green River Golf Club	24/17/19									
Santa Ana Canyon - Featherly Park	40/23/22									
Starlight Dr. & Hidden Hills Rd., Yorba Linda	2/0/0									
Santa Ana River mouth - Talbert Park and environs	Not surveyed									
Chino Hills State Park	51/23/14									
Pulte Wetlands, adjacent to Chino Hills State Park (CHSP)	Not available									
Rim Crest Dr & Blue Gum Dr, adjacent to CHSP	Not available									
SAR - Miscellaneous Sightings/Reporting										
Potrero***	2/0/0									
SAR Mainstem at Woolly star Preserve	Not surveyed									

Table 1B: Least Bell's vireo status and distribution in the Santa Ana Watershed, 2010. Numbers of territories, pairs and fledglings detected. By Sub-watershed										
Santa Ana Watershed	**2010**									
Estelle Mountain Reserve***	0/0/0									
Yorba Linda Dry Lake Bed Park	1/1/1									
Shipley Nature Center	0/0/0									
Etiwanda Wildlife Preserve	1/0/0									
Chino Creek Park at Inland Empire Utilities Agency	2/1/1									
Coyote Hills East Reserve (Fullerton)##	3/3/3									
Rancho La Sierra West, Riverside	1/1/0									
(Chula Vista, CA)##	1/0/0									
River View Golf Course, Santa Ana	Not surveyed									
San Jacinto Sub Watershed										
Kabian Park	3/3/0									
San Jacinto	22/18/28									
Lake Perris	6/4/4									
East of Canyon Lake	Not surveyed									
Cottonwood Canyon	2/0/0									
Santiago Creek Sub Watershed										
Silverado Canyon	0/0/0									
Santiago Creek u/s of Irvine Lake	6/0/0									
Santiago Creek (unnamed tributary to Irvine Lake)	0/0/0									

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

Santa Ana Watershed	**2010**									
Limestone Canyon (including Old Haul Rd./Blue Diamond Rd.)	3/3/5									
Peter's Canyon	14/5/1									
Irvine Regional Park	24/14/18									
Irvine Trust Mngmt Area Irvine Company Land (across from Peter's Canyon)	1/0/0									
Santiago Oaks Regional Park	1/1/1									
Santiago Creek at Cannon Rd. (includes reservoir)	1/0/0									
Santiago Creek at Chapman Ave.	0/0/0									
Santiago Creek at Cambridge Ave.	0/0/0									
SUBTOTAL	821/517/655									
Santa Ana River - San Bernardino County****	42/26/24									
TOTAL FOR SANTA ANA WATERSHED EXCLUDING PRADO BASIN	863/543/679									
PRADO BASIN (Pike et al)	569/286/479									
TOTAL FOR SANTA ANA WATERSHED	1432/829/1158									
Santa Marguerita Watershed - Murrieta Creek	Not surveyed									

* Reported for private property not managed
*** Reported by MSCHP
**** Reported by San Bernardino County Flood Control
[#] Reported by Alisa Ing, California State Parks
[##] 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
[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, 2010, Part **I**

	Survey Start Date	Survey End Date	First Arrival Date	50% Arrived	50% Paired	Date Last Detected
Santa Ana River and Tributaries (n=79)						
San Timoteo Canyon	3/15/10	9/14/10	3/24/10	4/8/10 (n=79)	4/26 (n=51)	9/10/10
Sycamore Canyon	3/29/10	9/8/10	3/29/10	5/6/10	5/19/10	7/28/10
March SKR Reserve	4/6/10	8/23/10	4/6/10	4/22/10	5/14/10	8/23/10
Mockingbird Canyon	3/31/10	9/7/10	n/a	n/a	n/a	9/7/10
SAR Mainstem: Mission Blvd. To Van Buren Blvd.	3/25/10	9/10/10	3/25/10	5/11/10	5/25/10	8/5/10
SAR Mainstem: Hidden Valley Wildlife Preserve						
Hidden Valley (area monitored since 2000, south side of river)	3/16/10	8/18/10	3/25/10	4/14/10	5/18/10	8/30/10
North side of river in Hidden Valley Wildlife Preserve	3/24/10	9/10/10	3/24/10	4/8/10	4/23/10	8/6/10
SAR Mainstem: Norco: Goose Creek Golf Course to River Rd.	3/12/10	8/19/10	3/19/10	4/14/10	5/25/10	9/3/10
Temescal Canyon	3/17/10	7/29/10	3/22/10	4/14/10	5/14/10	7/29/10
Chino Hills (Butterfield Ranch environs)	4/8/10	9/22/10	4/8/10	4/9/10	5/13/10	8/24/10
Santa Ana River - Upper Canyon, Santa Ana Canyon	3/19/10	7/28/10	4/22/10	4/28/10	4/28/10	7/28/10
Santa Ana River - Green River Golf Club, Santa Ana Canyon	3/4/10	8/30/10	3/15/10	4/8/10	5/19/10	8/30/10
Santa Ana River - Featherly Park, Santa Ana Canyon	3/15/10	9/1/10	3/24/10	4/15/10	5/7/10	9/1/10
Irvine Regional Park, Santiago Creek, Orange County	4/1/10	7/26/10	4/1/10	4/30/10	6/10/10	7/26/10
San Jacinto River Sub Watershed						
San Jacinto River	3/12/10	9/9/10	3/26/10	4/9/10	4/19/10	8/13/10
San Jacinto Wildlife Refuge	n/a	n/a	n/a	n/a	n/a	n/a

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	4/26/10 (n=51)	4/8/10	7/1/10	5/10/10	7/29/10
Sycamore Canyon	5/19	n/a	n/a	n/a	n/a
March SKR Reserve	5/14/10	4/6/10	6/28/10	5/8/10	7/21/10
Mockingbird Canyon		n/a	n/a	n/a	n/a
SAR Mainstem (Mission Blvd. To Van Buren Blvd.)	5/25/10	4/16/10	6/18/10	5/13/10	7/7/10
SAR Mainstem: Hidden Valley Wildlife Preserve					
Hidden Valley (area monitored since 2000, south side of river)	5/18/10	4/22/10	6/15/10	5/18/10	6/25/10
North side of river in Hidden Valley Wildlife Preserve	4/23/10	4/16/10	6/8/10	5/16/10	7/1/10
SAR Mainstem - Norco - Goose Creek Golf Course to River Rd.	5/25/10	4/5/10	6/25/10	5/13/10	7/16/10
Temescal Canyon	5/14/10	4/7/10	6/16/10	5/11/10	7/7/10
Chino Hills (Butterfield Ranch environs)	5/13/10	5/11/10	5/13/10	5/19/10	5/26/10
Santa Ana River - Upper Canyon, Santa Ana Canyon	4/28/10	4/28/10	5/12/10	5/13/10	6/27/10
Santa Ana River - Green River Golf Club, Santa Ana Canyon	5/19/10	4/19/10	7/9/10	5/12/10	7/24/10
Santa Ana River - Featherly Park, Santa Ana Canyon	5/7/10	4/23/10	6/8/10	5/13/10	6/3/10
Irvine Regional Park, Santiago Creek, Orange County	6/10/10	5/6/10	5/28/10	5/28/10	6/15/10
San Jacinto River Sub Watershed					
San Jacinto River	4/19/10	4/19/10	6/23/10	n/a	7/7/10
San Jacinto Wildlife Refuge	n/a	n/a	n/a	n/a	n/a

Table 3: Least Bell's vireo status and management and Brown-headed Cowbird management data, at closely monitored sites in the Santa Ana River Watershed, California, 2010.
As of 2006, page 1 of this table lists only those sites closely monitored; see Tables 1A & 1B for complete listings.

	Parameter	San Jacinto	San Timoteo	March SKR Preserve (ARB)	Sycamore Canyon	Mockingbird Canyon	SAR-\Mission Blvd. to Van Buren Blvds.	Hidden Valley (so side of SAR)_	Hidden Valley (no side of SAR)	SAR- -Norco (River Rd to Hidden Valley)	Temescal Canyon**	Santa Ana Canyon			(Butterfield Ranch environs)	Irvine Regional Park	**Total**
												Upper Canyon*	Green River Golf Club	Featherly Reg. Park			
A.	Number of territorial males	22	126	14	12	43	68	60	15	101	83	11	24	40	11	24	654
B.	Number of known pairs (breeding and non-breeding)	18	95	12	8	34	50	43	12	64	49	4	17	23	7	14	450
C.	Number of fledged young observed	28	137	25	11	25	58	53	18	113	73	6	19	22	7	18	613
D.	Projected total recruitment of vireo young (a)	n/a	266	75.6	n/a	n/a	100	90.3	27.6	211.2	151.9	n/a	30.6	46	11.9	50.4	1061.5
E.	Average number of fledglings per pair (C/B)	1.6	1.4	2.1	1.4	0.7	1.2	1.2	1.5	1.8	1.5	1.5	1.1	1.0	1.0	1.3	1.4
F.	Projected number of fledglings per pair (D/B)	n/a	2.8	6.3	n/a	n/a	2.0	2.1	2.3	3.3	3.1	n/a	1.8	2.0	1.7	3.6	2.8***
G.	Rate of missing eggs/chicks from nests (successful &unsuccessful	0% (0/3)	65% (24/37)	0% (0/6)	n/a	n/a	36% (4/11)	65% (11/17)	11% (1/9)	28% (5/18)	20% (3/15)	0% (0/1)	71% (5/7)	71% (5/7)	33% (1/3)	25% (1/4)	43% (60/138)
H.	Rate of cowbird nest parasitism	0% (0/3)	8% (3/37)	0% (0/6)	n/a	n/a	0% (0/11)	6% (1/17)	33% (3/9)	0% (0/18)	0% 0/15	0% (0/1)	0% (0/7)	0% (0/7)	0% (0/3)	0% (0/4)	5% (7/138)

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, 2010.
As of 2006, page 1 of this table lists only those sites closely monitored; see Tables 1A & 1B for complete listings.

	Parameter	San Jacinto	San Timoteo	March SKR Preserve (ARB)	Sycamore Canyon	Mockingbird Canyon	SAR-\Mission Blvd. to Van Buren Blvds.	Hidden Valley (so side of SAR)_	Hidden Valley (no side of SAR)	SAR- -Norco (River Rd to Hidden Valley)	Temescal Canyon**	Santa Ana Canyon			(Butterfield Ranch environs)	Irvine Regional Park	**Total**
												Upper Canyon*	Green River Golf Club	Featherly Reg. Park			
I.	Numbers of cowbirds removed from study area	2,136	173	13	n/a	149	58	24	n/a	49	134	341			16	n/a	3093
K.	Number of trap days (1 operative trap in the field for one day = 1 trap day)	993	1113	280	n/a	1028	530	252	n/a	269	1191	1207			129	n/a	6992
L.	Average number of cowbirds trapped per trap day (I/K)	2.15	0.16	0.05	n/a	0.14	0.11	0.10	n/a	0.18	0.11	0.28			0.12	n/a	0.44
M.	Number of field hours –LBV (+)	79	497	62	54	96	335	330	210	183	335	35	117	172	59	25	2,589
N.	Number of field hours – BHCO (+)	525	503	153	n/a	312	277	196	n/a	252	467	425			129	n/a	3,239

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

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

* Includes horse stable traps at Green River Road and Interstate Hwy 91. **Harrison BHCO included in Temescal for this table

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

Table 4: Least Bell's vireo nest placement preferences, monitored sites in the Santa Ana River Watershed, 2010

Host Plant Species	San Jacinto	San Timoteo	March SKR Preserve	Sycamore Canyon	Mockingbird Canyon	SAR-\Mission Blvd. to Van Buren Blvds.	Hidden Valley (so side of SAR)_	Hidden Valley (no side of SAR)	SAR- -Norco (River Rd to Hidden Valley)	Temescal Canyon	Chino Hills	Santa Ana Canyon			Irvine Regional Park	Total
												Upper Canyon	Green River Golf Club	Featherly Regional Park		
Black Willow *(Salix gooddingi)*		4	1				1		1	2			2	1		12
Arroyo Willow *(Salix lasiolepis)*		4	1			4	6		5	7						27
Red Willow *(Salix laevigata)*		8	3		2	1	1	2		1	2			2		22
Narrow-leafed Willow/ (*Salix exigua)*	2								1							3
Yellow Willow *(Salix lucida spp. lasiandra)*										1						1
Fremont Cottonwood *(Populus fremontii)*		1							1			1		3		6
Mulefat (Baccharis salicifolia)	4	15	1		1	7	9	4	13	6	1		1	1	3	66
Elderberry *(Sambucus mexicana)*		2						2		3		1		3	1	12
Wild Grape *(Vitis girdiana)*		5				1		2								8
Peruvian Pepper (*Schinus molle*)													3			3
Black mustard *(B. nigra)*														1		1
Black Walnut,*(Juglans californica)*		1											1			2
Tamarisk, *(Tamarix ramosissima)*	1															1
False Indigo (*Amorpha futicosa*)															1	1

Table 4: Least Bell's vireo nest placement preferences, monitored sites in the Santa Ana River Watershed, 2010

Host Plant Species	San Jacinto	San Timoteo	March SKR Preserve	Sycamore Canyon	Mockingbird Canyon	SAR-\Mission Blvd. to Van Buren Blvds.	Hidden Valley (so side of SAR)_	Hidden Valley (no side of SAR)	SAR- -Norco (River Rd to Hidden Valley)	Temescal Canyon	Chino Hills	Santa Ana Canyon			Irvine Regional Park	Total
												Upper Canyon	Green River Golf Club	Featherly Regional Park		
Deadfall										1						1
Dead Arroyo Willow									1							1
Sugarbush										1						1
Total	7	40	6	0	3	13	17	10	22	22	3	2	7	11	5	168

Table 5: Least Bell's vireo reproductive success and breeding biology data, monitored sites in the Santa Ana River Watershed, 2010

		San Jacinto	San Timoteo	March SKR Preserve	Sycamore Canyon	Mockingbird Canyon	SAR-\Mission Blvd. to Van Buren Blvds.	Hidden Valley (so side of SAR)	Hidden Valley (no side of SAR)	SAR- -Norco (River Rd to Hidden Valley)	Temescal	Santa Ana Canyon			Chino Hills-Butterfield Ranch environs	Irvine Regional Park	**Total**
												Upper Canyon	Green River Golf Club	Featherly Reg. Park			
A.	Number of known pairs	18	95	12	8	34	50	43	12	64	49	4	17	23	7	14	450
B.	Number of breeding (nesting) pairs	15	76	8	6	26	39	36	9	60	38	3	14	18	4	9	361
C.	Number of breeding pairs that were well-monitored throughout the breeding season	0	24	3	0	0	9	9	6	12	11	0	4	3	3	3	87
D.	Number of 'known fledged young' OBSERVED	28	137	25	11	25	58	53	18	113	73	6	19	22	7	18	613
E.	Number of known fledged young produced by pairs monitored throughout the breeding season	n/a	67	19	n/a	n/a	18	19	14	39	34	n/a	7	6	5	11	239
F.	Average number of fledglings produced per breeding pair (minimum; D/B = 'productivity or breeding success')	1.9	1.8	3.1	1.8	n/a	1.5	1.5	2.0	1.9	1.9	2.0	1.4	1.2	1.8	2.0	1.7
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)	n/a	2.8	6.3	n/a	n/a	2.0	2.1	2.3	3.3	3.1	n/a	1.8	2.0	1.7	3.6	2.7
H.	Number of nests that were discovered	7	55	6	0	3	13	18	10	22	22	2	7	11	3	5	184

Table 5: Least Bell's vireo reproductive success and breeding biology data, monitored sites in the Santa Ana River Watershed, 2010

		San Jacinto	San Timoteo	March SKR Preserve	Sycamore Canyon	Mockingbird Canyon	SAR-\Mission Blvd. to Van Buren Blvds.	Hidden Valley (so side of SAR)	Hidden Valley (no side of SAR)	SAR- -Norco (River Rd to Hidden Valley)	Temescal	Santa Ana Canyon			Chino Hills-Butterfield Ranch environs	Irvine Regional Park	**Total**
												Upper Canyon	Green River Golf Club	Featherly Reg. Park			
I.	Number of nests that were regularly monitored or 'tracked'	3	37	6	n/a	0	11	17	9	18	15	1	7	7	3	4	138
J.	Number of 'tracked' nests that were successful l (% = J/I x 100)	100% (3/3)	62% (23/37)	100% (6/6)	n/a	n/a	55% (6/11)	41% (7/17)	56% (5/9)	89% (16/18)	87% (13/15)	100% (1/1)	43% (3/7)	29% (2/7)	67% (2/3)	75% (3/4)	65% (90/138)
K.	Rate of missing eggs/ chicks from nests (successful and unsuccessful) (%=K/I x100) (b)	0% (0/3)	65% (24/37)	0% (0/6)	n/a	n/a	36% (4/11)	65% (11/17)	11% (1/9)	28% (5/18)	20% (3/15)	0% (0/1)	71% (5/7)	71% (5/7)	33% (1/3)	25% (1/4)	43% (60/138)
L.	Number of 'tracked' nests that were parasitized by cowbirds (%=L/I x 100)	0% (0/3)	8% (3/37)	0% (0/6)	n/a	n/a	0% (0/11)	6% (1/17)	33% (3/9)	0% (0/18)	0/15	0% (0/1)	0% (0/7)	0% (0/7)	0% (0/3)	0	5% (7/138)
M.	A. Number of 'tracked' nests that failed as a result of reproductive failure	0% (0/3)	11% (4/37)	0% (0/6)	n/a	n/a	9% (1/11)	0% (0/17)	0% (0/9)	0% (0/18)	0/15	0% (0/1)	0% (0/7)	0% (0/7)	0% (0/3)	0	4% (5/138)
	B. Number of 'tracked" nests that failed as a result of parasitism	0% (0/3)	0% (0/37)	0% (0/6)	n/a	n/a	0% (0/11)	6% (1/17)	33% (3/9)	0% (0/18)	0/15	0% (0/1)	0% (0/7)	0% (0/7)	0% (0/3)	0	3% (4/138)
	C. Number of 'tracked' nests that failed as a result of predation- Predation Rate according to Vireo Working Group	0% (0/3)	27% (10/37)	0% (0/6)	n/a	n/a	36% (4/11)	53% (9/17)	11% (1/9)	11% (2/18)	13% (2/15)	0% (0/1)	57% (4/7)	71% (5/7)	33% (1/3)	25% (1/4)	28% (39/138)
N	Average clutch size	3.3	3.4	3.5	n/a	3.0	3.2	3.4	3.5	3.7	3.7	4.0	4.0	4.0	3.7	3.5	3.5

Table 5: Least Bell's vireo reproductive success and breeding biology data, monitored sites in the Santa Ana River Watershed, 2010

		San Jacinto	San Timoteo	March SKR Preserve	Sycamore Canyon	Mockingbird Canyon	SAR-\Mission Blvd. to Van Buren Blvds.	Hidden Valley (so side of SAR)	Hidden Valley (no side of SAR)	SAR- -Norco (River Rd to Hidden Valley)	Temescal	Santa Ana Canyon			Chino Hills-Butterfield Ranch environs	Irvine Regional Park	**Total**
												Upper Canyon	Green River Golf Club	Featherly Reg. Park			
	(number of clutches)	3	36	6	0	1	9	16	4	20	16	1	5	5	3	4	129
O.	Number of cowbird eggs found in or near vireo nests	0	3	1	n/a	1	0	2	4	0	0	0	0	0	0	0	11
P.	Number of cowbird nestlings removed from 'tracked' nests	0	0	0	n/a	n/a	0	0	0	0	0	0	0	0	0	0	0
Q.	Number of cowbird young fledged by vireos	0	0	0	n/a	n/a	1	0	0	0	0	0	0	0	0	0	1
R.	Number of 'manipulated' parasitized nests	0	8% (3/37)	0	n/a	n/a	0	0	22% (2/9)	0	0	0	0	0	0	0	4% (5/138)
S.	Number of 'successful, manipulated' nests (%=S/R x100)	n/a	100% (3/3)	n/a	n/a	n/a	n/a	n/a	0% (0/2)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	60% (3/5)
T.	Number of vireos fledged from "manipulated' parasitized nests	n/a	8	n/a	n/a	n/a	n/a	n/a	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	8
U.	Number of repaired nests	0	1	0	n/a	n/a	0	0	0	0	0	0	0	1	0	0	2
V.	% successful repaired nests	n/a	0% (0/1)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	100% (1/1)	n/a	n/a	50% (1/2)
W.	Number of vireos fledged from repaired nests	n/a	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	2	n/a	n/a	2

(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, 2010

Monitored Site	Trap/Location	2010 Dates of Operation	Number of Trap Days	Cowbirds Removed				Daily Removed Averages	
				Total	Male	Female	Juveniles	Adults	All
San Jacinto	Scott Bros.	3/15-8/8	144	1042	754	227	61	7.24	7.24
	R&J-Tuls 1	3/15-8/8	144	129	72	34	23	0.90	0.90
	R&J- Tuls 2	3/15-8/8	144	167	80	67	20	1.16	1.16
	CB#1	3/15-8/8	144	61	53	6	2	0.42	0.42
	CB#2	3/15-8/8	144	387	217	160	10	2.69	2.69
	CB#3	3/15-8/8	144	322	231	74	17	2.24	2.24
	Alessandro Ponds	3/15-8/8	129	28	12	7	9	0.22	0.22
Subtotal			993	2136	1419	575	142	2.01	2.15
San Timoteo									
	FISH	3/26-8/8	118	19	5	10	4	0.16	0.16
	San Tim. I-18	3/25-8/8	119	7	6	-1	2	0.06	0.06
	Bee's	3/31-7/21	110	9	6	2	1	0.08	0.08
	ESR	3/26-8/8	135	18	7	6	5	0.13	0.13
	St Park	3/25-8/8	127	3	0	2	1	0.02	0.02
	English	3/26-8/8	133	1	4	-4	1	0.01	0.01
	Headlee	3/26-8/8	133	61	30	26	5	0.46	0.46
	Younglove #1	3/31-8/8	128	46	20	21	5	0.36	0.36
	Younglove #3	3/25-7/12	110	9	3	5	1	0.08	0.08
Subtotal			1113	173	81	67	25	0.13	0.16
Mockingbird									
Canyon	Reservoir	3/15-8/5	141	50	26	18	6	0.35	0.35
	Tobin	3/15-4/30	44	11	9	2	0	0.25	0.25
	Dale	3/15-8/5	141	12	5	3	4	0.09	0.09
	MBC Estates	3/15-8/4	140	17	8	5	4	0.12	0.12
	Ungerer	3/15-8/5	141	9	3	6	0	0.06	0.06
	Dak	3/15-8/5	141	-1	0	-2	1	-0.01	-0.01
	Cajalco Rd.	3/15-8/4	140	49	27	14	8	0.35	0.35
	Markham	3/15-8/4	140	2	0	0	2	0.01	0.01
Subtotal			1028	149	78	46	25	0.12	0.14
Hidden Valley									
	HV Gate 3	3/22-8/4	124	7	2	5	0	0.06	0.06
	HV West Trailhead	3/22-8/4	128	17	8	6	3	0.13	0.13
Subtotal			252	24	10	11	3	0.08	0.10
Temescal									
	Railroad Cyn. WM facility	3/24-8/5	132	19	11	8	0	0.14	0.14
	Marina	3/24-8/5	120	7	8	-1	0	0.06	0.06

Table 6: Brown-headed cowbird trapping summary, monitored sites in the Santa Ana Watershed, 2010

Monitored Site	Trap/Location	2010 Dates of Operation	Number of Trap Days	Cowbirds Removed				Daily Removed Averages	
				Total	Male	Female	Juveniles	Adults	All
	Baker St.	3/24-8/5	132	59	22	21	16	0.45	0.45
	New Sump	3/24-8/4	131	20	6	7	7	0.15	0.15
	Dos Lagos 1	3/22-8/4	133	4	0	3	1	0.03	0.03
	Dos Lagos 2	3/22-8/4	133	4	3	1	0	0.03	0.03
	Dos Lagos 3	3/22-6/23	91	0	5	-5	0	0.00	0.00
	3M	3/24-8/4	94	7	3	4	0	0.07	0.07
	3M Ag	3/24-8/4	95	2	1	1	0	0.02	0.02
	Harrison	3/24-8/3	130	12	12	-3	3	0.09	0.09
Subtotal			1191	134	71	36	27	0.09	0.11
Chino Hills									
Butterfield Ranch	CH Water-tank	3/18-7/28	129	16	6	10	0	0.12	0.12
Subtotal			129	16	6	10	0	0.12	0.12
Santa Ana Canyon									
Upper Canyon									
Horse Stables at	Horse Stables Full	3/17-8/8	143	155	77	63	15	1.08	1.08
Green River	Horse Stables 1/2	3/17-8/8	143	10	6	4	0	0.07	0.07
Green River Golf Club	G. C. Maintenance	3/17-8/8	143	56	33	20	3	0.39	0.39
	GC Path	3/17-7/28	134	2	0	2	0	0.01	0.01
	GC Orange T-Box 5	3/17-7/28	130	0	0	0	0	0.00	0.00
Featherly Park	Featherly Park RV#1	3/18-8/2	138	26	15	11	0	0.19	0.19
	Featherly Park RV#2	3/18-7/30	132	0	0	0	0	0.00	0.00
	Yorba Reg. Pk #1	3/31-7/30	122	87	52	35	0	0.71	0.71
	Yorba Reg. Pk #2	3/31-7/30	122	5	3	2	0	0.04	0.04
Santa Ana Cyn. Subtotal			1207	341	186	137	18	0.27	0.28
SKR Preserve	March SKR 1	3/15-8/4	140	10	7	3	0	0.07	0.07
	March SKR 2	3/15-8/4	140	3	2	1	0	0.02	0.02
Subtotal			280	13	9	4	0	0.05	0.05
Santa Ana River--	Jurupa Park	3/24-8/3	133	16	5	6	5	0.12	0.12
Jurupa Park to	Acorn 1	3/24-8/2	132	13	8	4	1	0.10	0.10
Hidden Valley	Acorn 2	3/24-8/2	132	8	3	2	3	0.06	0.06
	Riverdale	3/24-8/3	133	21	16	2	3	0.16	0.16
Subtotal			530	58	32	14	12	0.09	0.11

Table 6: Brown-headed cowbird trapping summary, monitored sites in the Santa Ana Watershed, 2010

Monitored Site	Trap/Location	2010 Dates of Operation	Number of Trap Days	Cowbirds Removed				Daily Removed Averages	
				Total	Male	Female	Juveniles	Adults	All
Santa Ana River –									
River Road to Hidden Valley	Norco Horse Stables	3/22-8/4	135	36	18	15	3	0.27	0.27
	Goose Creek 1	3/24 - 8/4	134	13	5	3	5	0.10	0.10
Subtotal			269	49	23	18	8	0.15	0.18
GRAND TOTALS			**6,992**	**3,093**	**1,915**	**918**	**260**	**0.41**	**0.44**

Table 7: Number of times non-target bird species trapped in 55 Brown-headed Cowbird traps in the Santa Ana River watershed, 2010

(Mortalities are in parentheses and are included in the number stated, e.g., in Mockingbird 3 BEWR were caught, 1 of those died.)

Species	San Jacinto		San Timoteo		March SKR Preserve		Mockingbird Canyon		Santa Ana River-Norco		SAR-Jurupa to Hidden Valley		Hidden Valley		Temescal		Santa Ana Canyon		Chino Hills		2010 Total	
	caught	died	caught	died	caught	died	caught	died	caught	died	caught	died	caught	died	caught	died	caught	died	caught	died	caught	died
EUST	**1736**		**7**				**13**		**3**						**7**		**83**		**2**		1851	0
CALT	**2**		**455**	**1**	**3**		**391**	**5**	**218**		**4**		**42**		**189**	**4**	**147**	**4**	**132**	**1**	1583	15
RWBL	**189**	**5**	**84**		**2**		**184**				**2**				**269**		**47**				777	5
HOFI	**3**		**206**	**3**	**20**		**43**	**2**			**7**		**7**		**474**	**4**	**8**		**1**		769	5
HOSP	**10**		**27**		**3**		**40**	**1**	**20**		**323**				**7**		**5**		**2**		437	9
SOSP	**157**	**2**	**6**				**13**						**48**		**164**						388	1
LASP	**5**		**16**		**179**		**2**								**3**						205	2
YHBL	**82**																				82	0
TRBL	**7**		**72**																		79	0
BRBL	**59**		**1**												**1**						61	0
HOWR			**6**	**1**					**3**	**2**	**9**		**13**	**7**	**2**	**1**	**1**				34	11
NOMO			**2**								**7**	**1**			**13**	**1**	**5**				27	2
COGD			**4**						**19**												23	0
HOOR							**5**	**3**							**9**	**1**	**3**				17	4
BEWR			**3**				**3**	**1**	**2**	**1**					**8**	**2**					16	4
BUOR			**13**	**2**			**3**														16	2
COHA	**1**				**1**		**1**								**6**						9	0
CATH							**2**	**1**							**5**						7	1
MODO			**3**						**1**												4	0
GTGR	**3**																				3	0
SPTO			**2**										**1**								3	0
BLGR					**1**												**1**				2	0
BHGR															**1**						1	0
LOVE															**1**						1	0
NOCA																	**1**				1	0
NUWO			**1**																		1	0
Un-identified	1	1																			1	1
TOTALS	2255	8	908	7	209	0	700	13	266	3	352	1	111	7	1159	13	301	4	137	1	6398	57

Table 7: Number of times non-target bird species trapped in 55 Brown-headed Cowbird traps in the Santa Ana River watershed, 2010

(Mortalities are in parentheses and are included in the number stated, e.g., in Mockingbird 3 BEWR were caught, 1 of those died.)

Species	San Jacinto		San Timoteo		March SKR Preserve		Mockingbird Canyon		Santa Ana River-Norco		SAR-Jurupa to Hidden Valley		Hidden Valley		Temescal		Santa Ana Canyon		Chino Hills		2010 Total	
	caught	died	caught	died	caught	died	caught	died	caught	died	caught	died	caught	died	caught	died	caught	died	caught	died	caught	died
#/trap day	2.27		0.82		0.75		0.68		0.99		0.66		0.44		0.97		0.25		1.06		0.92	
Mortality %		0.35 %		0.77 %		0.00 %		1.86 %		1.1 3%		0.28 %		6.31 %		1.1 2%		1.33 %		0.73 %		0.89 %
Mortality/ trap day		0.0008		0.006		0.000		0.013		0.011		0.002		0.028		0.011		0.003		0.008		0.008
# BHCO removed/ trap day	2.15		0.16		0.05		0.14		0.18		0.11		0.10		0.11		0.28		0.12			

* Abbreviations used in Table 7.

BEWR: Bewick's Wren; BHGR: Black-headed Grosbeak; BLGR: Blue Grosbeak; BRBL: Brewer's Blackbird; 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; GTGR: Great-tailed Grackle; HOFI: House Finch; HOOR: Hooded Oriole; HOSP: House Sparrow; HOWR: House Wren; LASP: Lark Sparrow; LOVE: Lovebird sp.; MODO: Mourning Dove; NOCA: Northern Cardinal; NOMO: Northern Mockingbird; NUWO: Nuttal's Woodpecker; RWBL: Red-wing Blackbird; SOSP: Song Sparrow; SPTO: Spotted Towhee; TRBL: Tricolored Blackbird; YHBL: Yellow-headed Blackbird

Table 8: Winter 2009-2010 SAWA Cowbird Trapping Results

Monitored Site	Trap/Location	2009/2010 Dates of Operation	Number of Trap Days	Cowbirds Removed				Daily Removed Averages	
				Total	Male	Female	Juveniles	Adults	All
San Jacinto									
	Scott Bros.	8/3/09-3/14/10	215	2689	1039	1112	538	12.51	12.51
	R&J-Tuls 1	8/3/09-3/14/10	216	935	396	489	50	4.33	4.33
	R&J- Tuls 2	8/3/09-3/14/10	216	615	411	193	11	2.85	2.85
	CB#1	8/3/09-3/14/10	216	377	142	214	21	1.75	1.75
	CB#2	8/3/09-3/14/10	216	908	343	509	56	4.20	4.20
	CB#3	8/3/09-3/14/10	216	1705	595	688	422	7.89	7.89
	Alessandro Ponds	8/3/09-8/13/09	11	18	10	4	4	1.64	1.64
Subtotal			1306	7247	2936	3209	1102	4.71	5.55
Santa Ana Canyon									
	Horse Stables Full	8/3/09 - 11/20/09	77	459	23	18	418	5.96	5.96
	Horse Stables 1/2	8/3/09 - 11/20/09	77	35	0	4	31	0.45	0.45
	G. C. Maintenance	8/3/09 - 10/9/09	49	34	2	3	29	0.69	0.69
Subtotal			203	528	25	25	478	0.25	2.60
GRAND TOTALS			**1509**	**7775**	**2961**	**3234**	**1580**	4.11	5.15

Table 9: Non-targets removed from SAWA cowbird traps during the winter 2009-2010

Species	San Jacinto		Santa Ana Canyon		**Total**	**Total**
	caught	died	caught	died	caught	died
EUST	782		4		786	0
RWBL	344	4			344	4
CALT	29		123		152	0
TRBL	102				102	0
BRBL	26				26	0
SOSP	25				25	0
HOSP	13				13	0
MODO	8	1			8	1
COHA	6				6	0
HOFI	3		1		4	0
YHBL	3				3	0
LASP	2				2	0
LOSH	1		1		2	0
BRCO			1		1	0
CATH			1		1	0
LEGO			1	1	1	1
ROPI	1				1	0
WCSP			1		1	0
TOTALS	1345	5	133	1	1478	6
#/trap day	1.03		0.66		0.98	
Mortality %		0.37%		0.75%		0.41%
Mortality/trap day		0.004		0.005		0.004
# BHCO removed/ trap day	5.55		2.60		5.15	

Abbreviations used in Table 9:
BRBL: Brewer's Blackbird; BRCO: Bronzed Cowbird; CALT: California Towhee; CATH: California Thrasher; COHA: Cooper's Hawk; EUST: European Starling; HOFI: House Finch; HOSP: House Sparrow; LASP: Lark Sparrow; LEGO: Lesser Goldfinch; LOSH: Loggerhead Shrike; MODO: Mourning Dove; ROPI: Rock Pigeon; 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, 2005-2010

Site	# LBVI Territories					
Santa Ana River & Tributaries	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**
Cajon Wash	-	0	0	0	0	0
Oak Glen Preserve	-	0	0	0	0	0
Box Springs	0	2	2	1	3	5
Poorman Reservoir	0	1	1	1	2	6
Motte-Rimrock Preserve	-	-	0	-	-	-
Quail Run (behind UCR)	0	0	0	0	0	0
City Creek (Highland)	-	-	-	-	-	2
Little Sand Basin (Highland)	-	-	-	-	-	2
Plunge Creek (Highland)	-	-	-	-	-	1
Goldenstar	-	0	0	0	1	0
Woodcrest	-	0	0	0	0	0
Mead Valley @ Cajalco & Calif. Aqueduct	-	2	5	6	5	8
Gavilan Hills	0	0	0	0	0	0
Menifee - Paloma Valley High School	0	0	0	0	-	0
Menifee - Huan Rd.	0	0	0	0	-	0
Steele Valley	0	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	4
Van Buren Blvd. @ Bountiful	0	0	0	0	1	0
Van Buren Blvd. @ Porter	0	0	0	0	0	0
Canyon Crest	-	0	-	-	-	0
Alessandro Arroyo and Prenda Arroyo	See Table 1		3	5	4	6
Castleview Park	1	0	1	0	0	0
Tequesquite Arroyo	0	0	0	0	0	0
La Sierra			1	2	2	3
North SAR - across from Hidden Valley	5	3	6	1	6	-
Pyrite Ravine	-	-	-	1	1	3
Wyle Labs @ El Paso only	0	1	1	0	1	1
Norco Hills Park-mitigation area	2	0	0	0	0	0
Promenade	-	0	0	0	3	2
Corona St. @ Gilmore	0	0	0	0	0	0
Cajalco Canyon	1	1	1	See Temescal		
Chino Hills, Eucalyptus @ Rancho Hills	1	0	1	1	1	1
Chino Hills, Eucalyptus @ Del Monte	3	1	1	0	1	2
Chino Hills, Eucalyptus-end (s/o Rancho Hills)	0	0	0	0	0	0
Carbon Canyon Rd. at entrance to Western Hills Golf Club	0	0	0	0	1	0
Carbon Canyon Rd. at Chino Hills Pkwy	0	0	1	0	0	0
Eucalyptus and Peyton Dr., Chino Hills	-	-	-	5	8	10
Bayberry Dr., Chino Hills	-	-	-	0	0	0
Carbon Canyon Reg. Park and Carbon Canyon Rd.	6	5	7	5	3	8
Chino Hills State Park						
Upper Aliso Creek	-	-	7	8	6	10
Lower Aliso Creek	-	-	10	12	13	24

Table 10: Results of the Least Bell's Vireo Assessment Surveys in the Santa Ana River Watershed, 2005-2010

Site	# LBVI Territories					
Santa Ana River & Tributaries	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**
Chino Hills State Park continued						
Bane Canyon	-	-	5	5	6	7
Telegraph Canyon	-	-	2	6	10	10
Sun Canyon Park	0	0	0	0	0	0
Wardlow Wash	0	0	1	0	0	0
Fresno Canyon	2	4	2	1	0	1
Starlight Dr. @ Hidden Hills Rd., Yorba Linda	1	0	0	0	-	2
Yorba Dry Lake Bed	-	-	-	0	1	1
Hidden Valley Golf Club	-	-	-	-	-	3
Kabian Park	2	4	4	3	4	3
Lake Perris	1	1	3	2	4	6
East of Canyon Lake	2	-	-	-	-	-
Cottonwood Hills	0	0	0	0	0	2
Lamb's Canyon	-	-	0	-	-	-
Santiago Creek Sub-Watershed						
Silverado Canyon	0	0	0	0	0	0
Santiago Creek (u/s of Irvine Lake)	0	-	0	4	4	6
Limestone Canyon (includes Old Haul Rd./Blue Diamond Rd.)	See Table 1		2	2	2	3
Santiago Cyn Rd (unnamed trib to Irvine Lake	-	-	0	0	0	0
Irvine Trust Management Area	-	-	-	-	1	1
Peter's Canyon	4	4	5	5	8	14
Irvine Regional Park	See Table 1		14	19	29	See tables 1A & 1B
Santiago Oaks Regional Park (SORP)	0	0	0	0	0	1
Santiago Creek at Cannon Rd (including reservoir)	2	3	4	2	3	1
Santiago Creek at Chapman & Hwy 55, City of Orange	-	-	0	0	0	0
Santiago Creek at Cambridge Ave., City of Orange	-	1	0	0	0	0
Total number least Bell's vireos detected in the Santa Ana. Watershed during Assessment Surveys	**36**	**35**	**92**	**100**	**139**	**159**
S. Marguerita Watershed - Murrieta Creek	-	-	1	3	-	-
Total number least Bell's vireos detected during Assessment Surveys	36	35	93	103	139	159

Note: "-" indicates sites not surveyed

Table 11: Results of the Least Bell's Vireo Assessment Surveys in the Santa Ana River Watershed, 2010

Surveyor	Site Santa Ana River & Tributaries	SURVEY 1 4/19/10-5/27/10			SURVEY 2 5/25/10-7/08/10			SURVEY 3 6/29/10-7/30/09			TOTAL # VIREOS			# Visits	# Hours	Cowbirds 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	11.5	Y
NH	Oak Glen Preserve	n.s			0	0	0	n.s.			0	0	0	1	1.5	N
GA	Box Springs	4	1	0	4	1	1	1	0	0	5	2	1	3	5.5	N
NH	Poorman Reservoir	6	0	0	3	0	0	2	1	0	6	1	0	3	7	Y
	Motte-Rimrock Preserve															
GA	Quail Run (behind UCR)	0	0	0	0	0	0	0	0	0	0	0	0	3	3	N
GA, NH	City Creek (Highland)	0	0	0	2	1	0	2	0	0	2	1	0	3	9	N
GA, NH	Little Sand Basin (Highland)	1	0	0	2	0	0	0	0	0	2	0	0	3	8	Y
GA, NH	Plunge Creek (Highland)	0	0	0	1	1	0	1	1	0	1	1	0	3	7	N
NH	Goldenstar	0	0	0	0	0	0	0	0	0	0	0	0	3	3	N
NH	Woodcrest	0	0	0	0	0	0	0	0	0	0	0	0	3	2.25	N
Tro, AH, NM, SE	Mead Valley @ Cajalco & Calif. Aqueduct	8	0	0	7	0	0	6	0	0	8	0	0	3	52	N
Tro, AH, NM, SE	Gavilan Hills	0	0	0	0	0	0	0	0	0	0	0	0	3	30	N

Table 11: Results of the Least Bell's Vireo Assessment Surveys in the Santa Ana River Watershed, 2010

Surveyor	Site Santa Ana River & Tributaries	SURVEY 1 4/19/10-5/27/10			SURVEY 2 5/25/10-7/08/10			SURVEY 3 6/29/10-7/30/09			TOTAL # VIREOS			# Visits	# Hours	Cowbirds Detected
		Terr	Pairs	Juv.	Terr.	Pairs	Juv.	Terr.	Pairs	Juv.	Terr.	Pairs	Juv.			
SD	Menifee - Paloma Valley High School	0	0	0	0	0	0	n.s.			0	0	0	2	1.25	Y
SD	Menifee - Huan Rd.	0	0	0	0	0	0	n.s.			0	0	0	2	1.5	Y
SD	Steele Valley	0	0	0	n.s			0	0	0	0	0	0	2	4	Y
	Santa Rosa Mine Rd.															
GA	Van Buren Blvd. @ Orange Terrace to Village West	4	0	0	3	3	2	1	0	0	4	3	2	3	6.5	N
GA	Van Buren Blvd. @ Bountiful	0	0	0	0	0	0	0	0	0	0	0	0	3	2.5	N
GA	Van Buren Blvd. @ Porter	0	0	0	0	0	0	0	0	0	0	0	0	3	3	N
HA	Canyon Crest	0	0	0	0	0	0	0	0	0	0	0	0	3	4	Y
RZ	Allesandro Arroyo & Prenda Arroyo	6	2	0	n.s			n.s.			6	2	0	1	3.5	N
SD	Castleview Park	n.s			0	0	0	0	0	0	0	0	0	2	3	Y
HA	Tequesquite Arroyo	0	0	0	0	0	0	0	0	0	0	0	0	3	1.75	N
HA	La Sierra/Lyon St.	2	0	0	3	0	0	2	0	0	3	0	0	3	6.25	Y

Table 11: Results of the Least Bell's Vireo Assessment Surveys in the Santa Ana River Watershed, 2010

Surveyor	Site Santa Ana River & Tributaries	SURVEY 1 4/19/10-5/27/10			SURVEY 2 5/25/10-7/08/10			SURVEY 3 6/29/10-7/30/09			TOTAL # VIREOS			# Visits	# Hours	Cowbirds Detected
		Terr	Pairs	Juv.	Terr.	Pairs	Juv.	Terr.	Pairs	Juv.	Terr.	Pairs	Juv.			
	North SAR - across from Hidden Valley															
Tro, AH, NM, SE	Pyrite Ravine	3	0	0	3	0	0	1	0	0	3	0	0	3	44	Y
HA	Wyle Labs @ El Paso only	1	0	0	1	1	1	1	1	2	1	1	2	3	1.25	N
HA	Norco Hills Park-mitigation area	0	0	0	0	0	0	0	0	0	0	0	0	3	1.75	Y
HA	Promenade	2	0	0	2	1	2	2	1	2	2	2	4	3	4.5	Y
HA	Corona St. @ Gilmore	0	0	0	0	0	0	0	0	0	0	0	0	3	1.75	N
	Cajalco Canyon															
TR	Chino Hills, Eucalyptus @ Rancho Hills	1	1	0	1	1	0	1	0	2	1	1	2	3	2.5	Y
TR	Chino Hills, Eucalyptus @ Del Monte	1	1	0	2	0	0	0	0	0	2	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	2.5	N

Table 11: Results of the Least Bell's Vireo Assessment Surveys in the Santa Ana River Watershed, 2010

Surveyor	Site Santa Ana River & Tributaries	SURVEY 1 4/19/10-5/27/10			SURVEY 2 5/25/10-7/08/10			SURVEY 3 6/29/10-7/30/09			TOTAL # VIREOS			# Visits	# Hours	Cowbirds Detected
		Terr	Pairs	Juv.	Terr.	Pairs	Juv.	Terr.	Pairs	Juv.	Terr.	Pairs	Juv.			
TR	Carbon Canyon Rd. at entrance to Western Hills Golf Club	0	0	0	0	0	0	0	0	0	0	0	0	3	1.75	Y
TR	Carbon Canyon Rd. at Chino Hills Pkwy	0	0	0	0	0	0	0	0	0	0	0	0	3	4.75	N
TR	N/W c/o Eucalyptus and Peyton Dr., Chino Hills	10	3	0	7	1	1	6	0	0	10	4	1	3	11.25	Y
TR	Bayberry Dr., Chino Hills	0	0	0	0	0	0	0	0	0	0	0	0	3	2	N
JC	Carbon Canyon Reg. Park and Carbon Canyon Rd.	4	3	0	6	3	1	6	2	2	8	6	3	3	17.5	Y
	Chino Hills State Park															
TR, SH	- Upper Aliso Creek	7	2	0	9	2	2	5	2	4	10	5	5	3	24	Y
MA, AB	- Lower Aliso Creek	12	4	0	21	6	6	6	4	2	24	13	7	3	23.5	N
TR, SH	- Bane Canyon	4	0	0	7	3	0	0	0	0	7	3	0	3	17.5	N
TB, DMc	- TelegraphCyn	7	1	0	6	2	0	2	1	2	10	2	2	3	12.5	N
HA	Sun Canyon Park	0	0	0	0	0	0	0	0	0	0	0	0	3	3.75	N

Table 11: Results of the Least Bell's Vireo Assessment Surveys in the Santa Ana River Watershed, 2010

Surveyor	Site Santa Ana River & Tributaries	SURVEY 1 4/19/10-5/27/10			SURVEY 2 5/25/10-7/08/10			SURVEY 3 6/29/10-7/30/09			TOTAL # VIREOS			# Visits	# Hours	Cowbirds Detected
		Terr	Pairs	Juv.	Terr.	Pairs	Juv.	Terr.	Pairs	Juv.	Terr.	Pairs	Juv.			
TR	Wardlow Wash	0	0	0	0	0	0	0	0	0	0	0	0	3	5.75	N
TR	Fresno Canyon	1	0	0	0	0	0	0	0	0	1	0	0	3	15	N
SH	Starlight Dr. @ Hidden Hills Rd., Yorba Linda	0	0	0	2	0	0	2	0	0	2	0	0	3	5.75	N
SH	Yorba Dry Lake Bed	1	1	0	1	0	0	1	1	1	1	1	1	3	7.5	N
SH	Hidden Valley Golf Club	3	0	0	n.s.			0	0	0	3	0	0	2	13	N
San Jacinto Sub-Watershed																
MA, BN	Kabian Park	3	0	0	3	2	0	2	1	0	3	3	0	3	27	Y
NH	Lake Perris	5	0	0	6	4	4	6	0	0	6	4	4	3	15	Y
TB	Cottonwood Canyon	2	0	0	1	0	0	2	0	0	2	0	0	3	7.25	Y
Santiago Creek Sub-Watershed																
DM	Silverado Canyon	0	0	0	0	0	0	0	0	0	0	0	0	3	3.25	Y
	Santiago Creek (u/s of Irvine Lake)	5	0	0	5	0	0	2	0	0	6	0	0	3	11	N

Table 11: Results of the Least Bell's Vireo Assessment Surveys in the Santa Ana River Watershed, 2010

Surveyor	Site Santa Ana River & Tributaries	SURVEY 1 4/19/10-5/27/10			SURVEY 2 5/25/10-7/08/10			SURVEY 3 6/29/10-7/30/09			TOTAL # VIREOS			# Visits	# Hours	Cowbirds Detected
		Terr	Pairs	Juv.	Terr.	Pairs	Juv.	Terr.	Pairs	Juv.	Terr.	Pairs	Juv.			
	Limestone Canyon (includes Old Haul Rd./Blue Diamond Rd.)	2	1	0	2	1	3	3	1	3	3	3	5	3	4.25	Y
DM	Santiago Cyn Rd (unnamed trib to Irvine Lake	0	0	0	0	0	0	0	0	0	0	0	0	3	1.25	N
DM	Irvine Trust Management Area	0	0	0	1	0	0	0	0	0	1	0	0	3	0.75	N
DM	Peter's Canyon	14	3	0	14	4	1	5	0	0	14	5	1	3	11.5	Y
	Irvine Regional Park	See tables 1A & 1B														
JC	Santiago Oaks Regional Park (SORP)	0	0	0	1	1	1	1	1	0	1	1	1	3	5.75	N
SH	Santiago Creek at Cannon Rd (including reservoir)	0	0	0	1	0	0	1	0	0	1	0	0	3	11.25	N

Table 11: Results of the Least Bell's Vireo Assessment Surveys in the Santa Ana River Watershed, 2010

Surveyor	Site Santa Ana River & Tributaries	SURVEY 1 4/19/10-5/27/10			SURVEY 2 5/25/10-7/08/10			SURVEY 3 6/29/10-7/30/09			TOTAL # VIREOS			# Visits	# Hours	Cowbirds 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	0	0	0	3	2.5	N
SH	Santiago Creek at Cambridge Ave., City of Orange	n.s.			0	0	0	n.s.			0	0	0	1	1	N
# Vireos Detected in Santa Ana Watershed during Assessment Surveys		**119**	**23**	**0**	**127**	**38**	**25**	**70**	**17**	**20**	**159**	**65**	**41**	**166**	**506.5**	
Control Transects																
HA	Featherly Park	1	1	2	1	0	0	0	0	0	1	2	2	3	8.25	N

**** Carbon Canyon Regional Park: Included 2 birds on 6/3/10 that were detected just outside survey window**

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

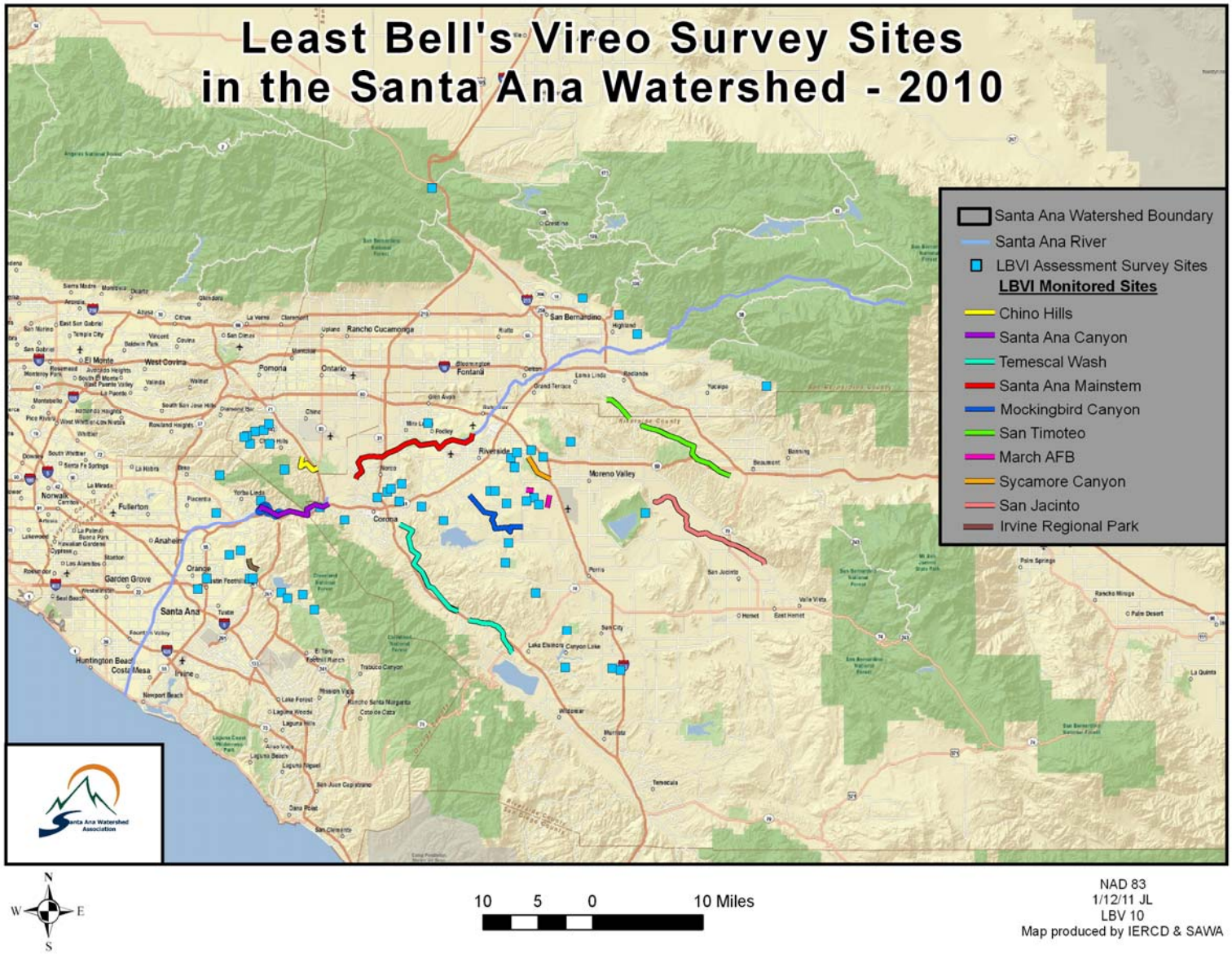
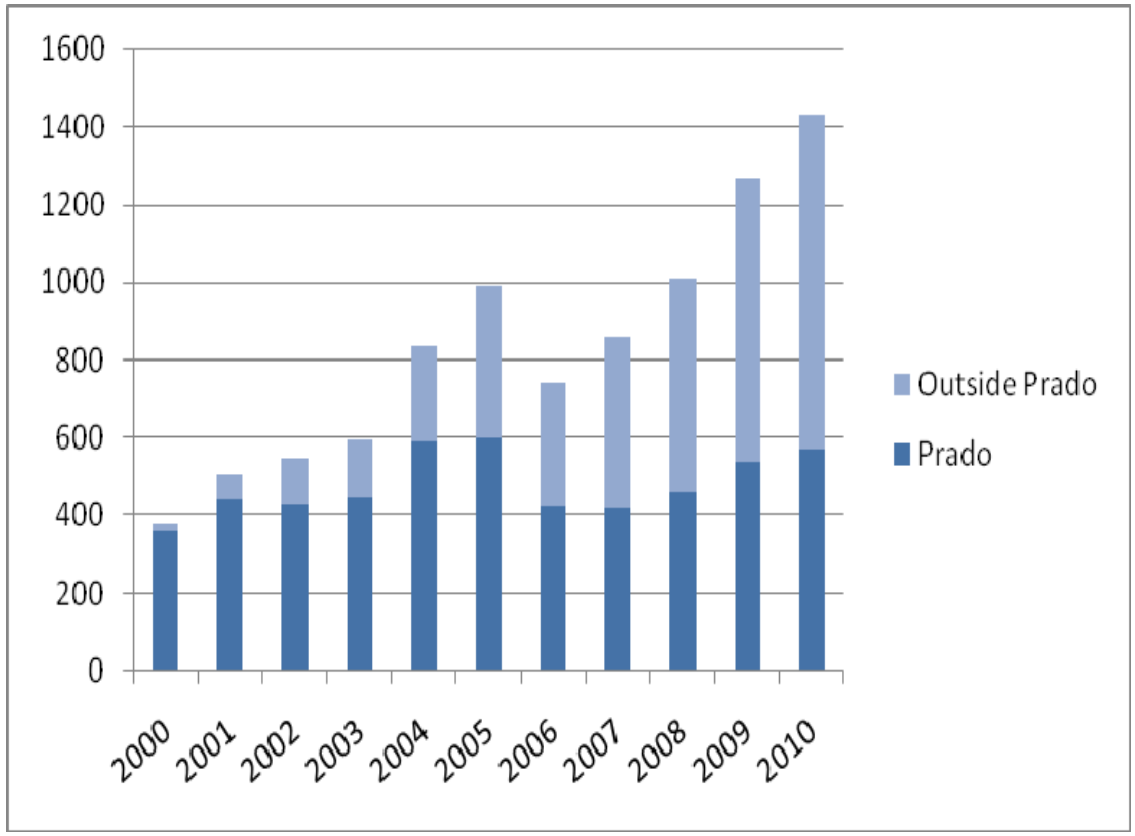
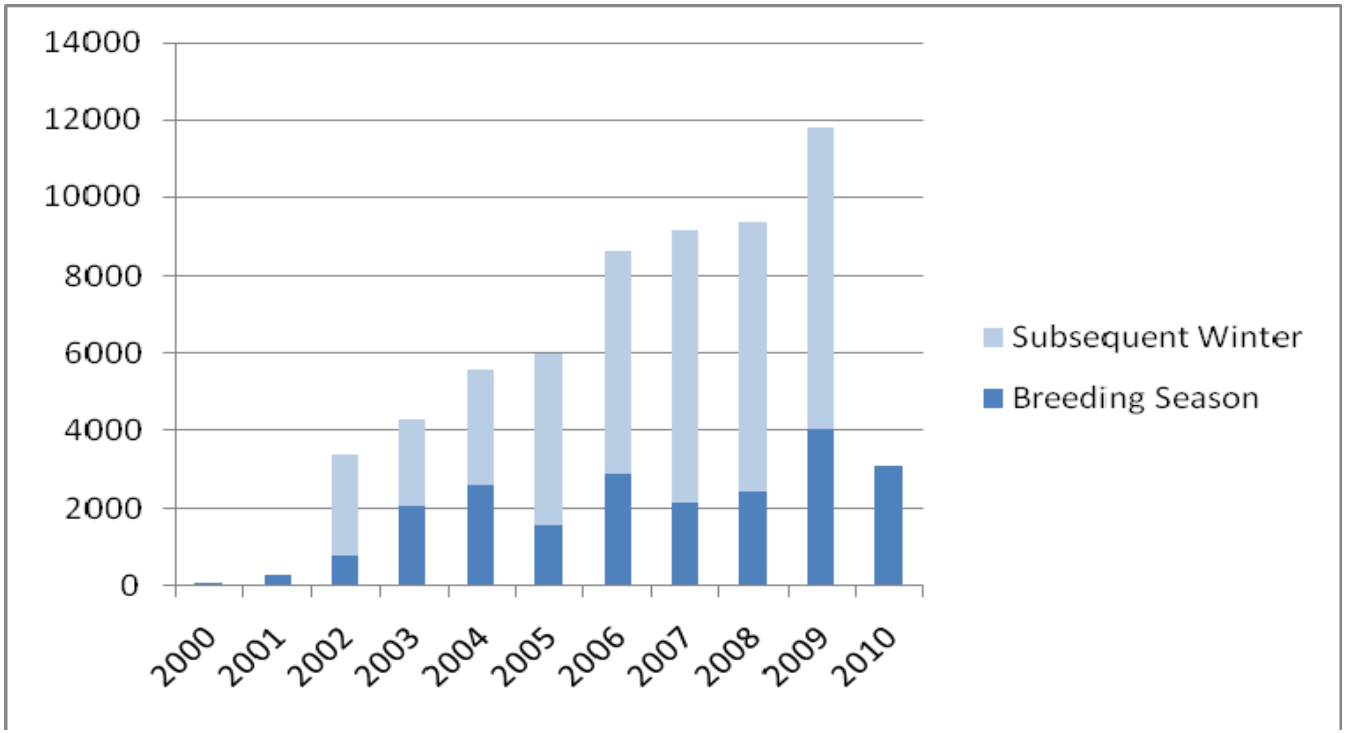


Figure 2: Vireo Abundance in the Watershed, Prado and Outside Prado, 2000-2010.



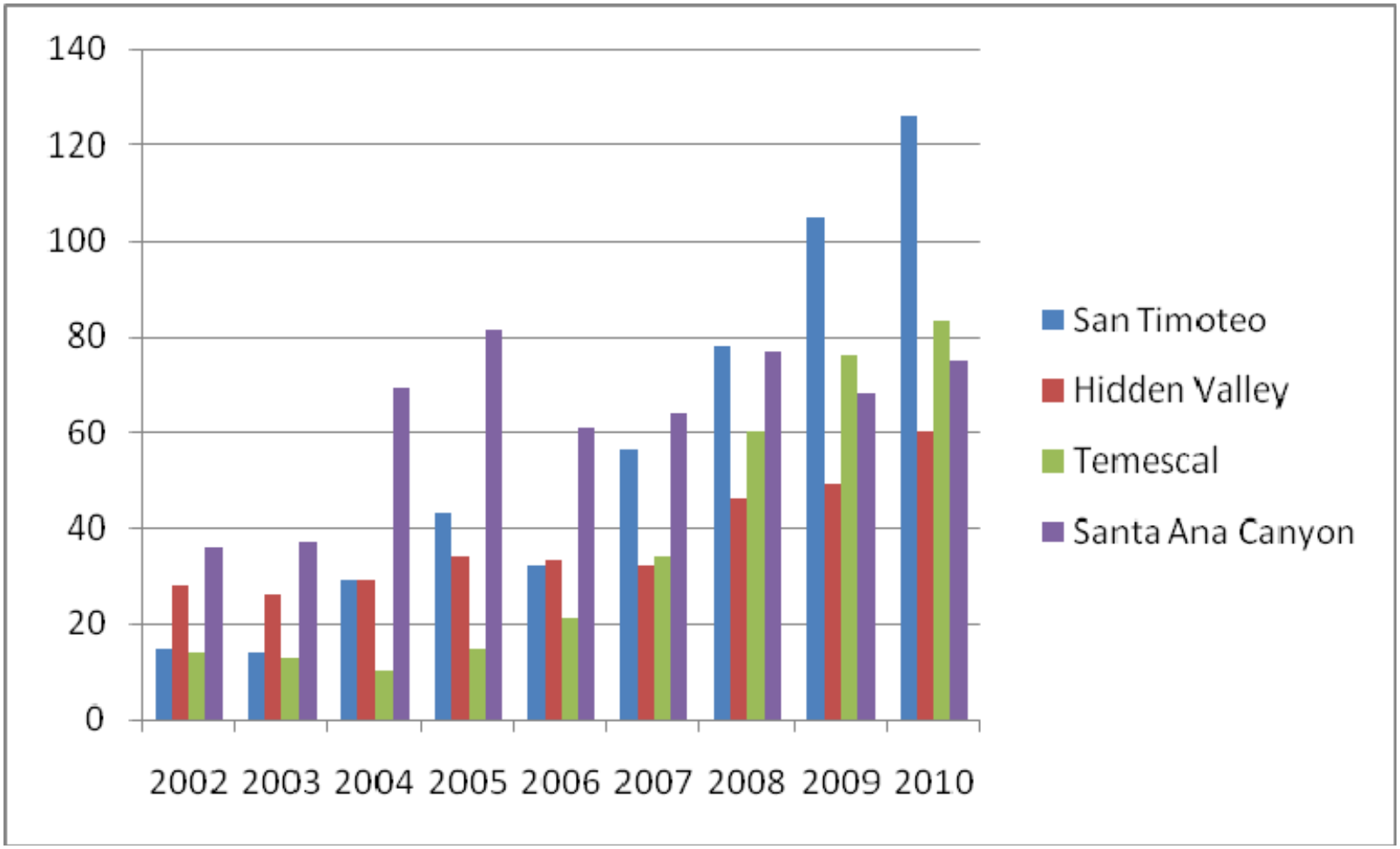
Source: Santa Ana Watershed Association

Figure 3: Number of Cowbirds Removed from SAWA Monitoring Sites in the Santa Ana Watershed, 2000-2010



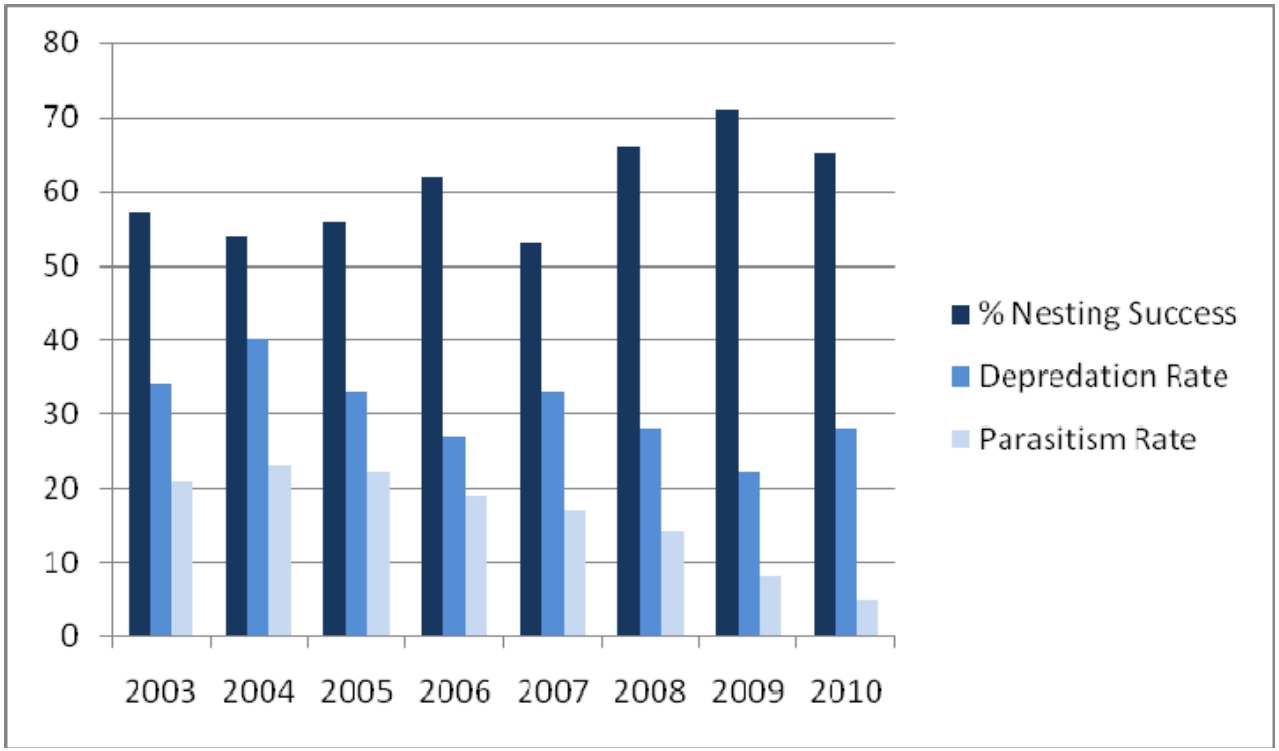
Breeding season: 15 March – 31 July
Winter: 1 Aug – 14 March
Source: Santa Ana Watershed Association
dates approximate

Figure 4: Number of Least Bell's Vireo Territories at Four Sites in the Santa Ana Watershed, 2002-2010.



Source: Santa Ana Watershed Association

Figure 5: Least Bell's Vireo Nesting Success, Depredation Rates, Parasitism Rate in the Santa Ana Watershed, 2003-2010



Source: Santa Ana Watershed Association

Table 12: Observations of Sensitive Species by Location

Common Name	Scientific Name	San Timoteo Canyon	San Jacinto River	Mockingbird Canyon	March SKR Preserve	Sycamore Canyon	SAR (Mission-HV)	SAR (HV)	SAR (HV-North)	SAR (HV - River Rd)	Temescal	Chino	SAC (Upper Cyn)	SAC (Green River)	SAC (Featherly Pk)	Santiago Cyn Irvine Park	Other*	Total
Mammal																		
San Diego Pocket Mouse	Chaetodipus fallax				observed	observed												
Long-tailed Weasel	Mustela frenata	observed			observed		observed	observed	observed		observed						observed	observed
Bobcat	Lynx rufus									observed					observed		observed	observed
Avian																		
Double-Crested Cormorant	Phalacrocorax auritus																observed	observed
Great Blue Heron	Ardea herodias																observed	observed
Black-crowned Night Heron	Nycticorax nycticorax																observed	observed
American Bittern	Botaurus lengtiginosus													1			4	5
Turkey Vulture	Cathartes aura																28	28
Merlin	Falco columbarius		1															1
White-tailed Kite	Elanus leucurus	4							1								8	13
Bald Eagle	Haliaeetus leucocephalus		1														4	5
Golden Eagle	Aquila chrysaetos		1														4	5
Osprey	Pandion haliaetus																1	1
Cooper's Hawk	Accipiter cooperii	4		2		2	4	2	3	3						8	3	31
Red-shouldered Hawk	Buteo lineatus			2			1	2	2	2							5	14
Ferruginous Hawk	Buteo regalis	4	5														4	13
Burrowing Owl	Athene cunicularia			10													22	32
Costa's Hummingbird	Calypte costae																1	1
Allen's Hummingbird	Selasphorus sasin													4			3	7
Nuttall's Woodpecker	Picoides nuttallii						several										8	8
Downy Woodpecker	Picoides pubescens			3	2		1			3	1			2	5		5	22
Vermilion Flycatcher	Pyrocephalus rubinus													1				1
Loggerhead Shrike	Lanius ludovicianus	1	2	1													6	10
Tree Swallow	Tachycineta bicolor						observed							observed			observed	n/a
Cactus Wren	Campylorhynchus brunneicapillus																2	2
California Gnatcatcher	Polioptila californica			2													2	4
Yellow-breasted Chat	Icteria virens	15	1			2	39	67	10	29	7		5	7	20	10	43	255
Yellow Warbler	Dendroica petechia	74	6	22		10	38	76	14	56	73	3	11	26	37	12	145	603
Rufous-crowned Sparrow	Aimophila ruficeps canescens		3			5											6	14
Lawrence's Goldfinch	Carduelis lawrencei	1		130	1												2	134
Amphibian																		
Western Spadefoot Toad	Spea hammondii	100			100												50	250+
Reptiles																		
Granite Spiny Lizard	Sceloporus orcutti			6		25					5						2	38+
Orange-throated whiptail	Aspidoscelis hyperythrus			4		several											2	6+
Coastal Western Whiptail	Aspidoscelis tigris				2												6	8+
Rosy Boa	Lichanura orcutti					3												3
Red Diamond Rattlesnake	Crotalus ruber					2												2

Other* - Includes all assessment areas and incidental sightings other than those within managed areas
Sensitive species are those that are listed as endangered, threatened, or species of concern by the resource agencies and those that are covered by the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP).

APPENDIX A – SURVEY SITES, STARTING AND ENDING COORDINATES

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

Monitored Locations

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

Assessment Locations

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

Assessment Locations (cont.)

Survey Site	Starting Coordinates	Ending Coordinates
Chino Hills State Park (Upper Aliso Cyn)	435216, 3753358	433824, 3765039
Chino Hills State Park (Telegraph Cyn)	434818, 3753694	424101, 3753165
City Creek	483528, 3777209	482595, 3777631
Corona St. at Gilmore	448093, 3750572	448406, 3750398
Cottonwood Hills	475633, 3725415	477261, 3724381
Fresno Canyon	439703, 3749067	440954, 3749370
Gavilan Hills	466851, 3740839	467107, 3742104
Goldenstar	464626, 3751480	464853, 3751466
Hidden Valley Golf Club	451644, 3752551	452349, 3753225
Irvine Trust Management Land	429845, 3738585	429845, 3738585
Kabian Park	475841, 3730880	476070, 3732369
Lake Perris	481389, 3747006	486012, 3746515
La Sierra	457824, 3747117	457824, 3748724
Limestone Canyon	434012, 3736548	434913, 3735769
Little Sand Basin	478169, 3779701	478365, 3779815
Mead Valley (Cajalco/aqueduct)	467326, 3743795	471767, 3744324
Menifee-Paloma H. S.	482515, 3725307	481557, 3724847
Menifee-Haun Rd	483716, 3725045	483706, 3724364
Murrieta Creek	476609, 3716171	476299, 3715809
Norco Hills Park Mitigation	449570, 3751384	448340, 3751225
Oak Glen Preserve	505148, 3766841	505153, 3766838
Peter's Canyon	429409, 3738523	428545, 3735641
Plunge Creek	486209, 3774394	487048, 3775342
Poorman Reservoir	476434, 3758610	477243, 3757320
Porter Road (end)	467009, 3749689	466170, 3745974
Promenade	451330, 3749951	451330, 3749951
Pyrite Channel	455500, 3761369	455734, 3761476
Quail Run	470673, 3757379	470399, 3757380
Santa Rosa Mine Road	471840, 3737819	471012, 3738146
Santiago Canyon (Irvine Park)	440662, 3755052	429119, 3741253
Santiago Canyon Rd	434949, 3735740	431995, 3736775
Santiago Creek (above Irvine Lake)	437201, 3736263	435405, 3737556
Santiago Creek (Cannon Road)	426421, 3742002	428079, 3742770
Santiago Creek (Cambridge Road)	421793, 3737067	421619, 3737952
Santiago Creek (Chapman Ave.)	423116, 3738554	423245, 3738906
Santiago Oaks Regional Park	428069, 3742690	429133, 3742111
SAR (north side Hidden Valley)	456260, 3758581	454885, 3759116
Silverado Canyon	438878, 3734047	437692, 3734768
Starlight Dr. (Yorba Linda)	431072, 3750086	430990, 3749851
Steele Valley	471322, 3736485	471266, 3735608
Sun Canyon Park	454614, 3749211	454788, 3749119
Tequesquite Arroyo	467671, 3756303	467760, 3756586
Van Buren Blvd. (Bountiful)	469933, 3750024	469376, 3749882

Van Buren Blvd. (Plummer Rd-So.)	471776, 3749514	473308, 3749439
Wardlow Wash	443306, 3747252	441873, 3749262
Woodcrest	465362, 3751501	465419, 3751271
Wyle Labs (at El Paso only)	450068, 3751818	450068, 3751818
Yorba Park Dry Lake Bed	424530, 3748301	424909, 3749091

APPENDIX B – WATERSHED-WIDE ANNUAL RESULTS

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, 2001-2010. (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-1: Least Bell's Vireo status and management and Brown-headed Cowbird management data, at closely monitored sites in the Santa Ana River Watershed, California, 2010. (See Tables 1A and 1B for total abundance.)

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

(**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, 2001-2010

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

*corrected value

Table B-2 (cont). Least Bell's Vireo nest placement preferences, monitored sites in the Santa Ana River watershed, 2001-2010.

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

Table B-2 (cont.) Least Bell's Vireo nest placement preferences, monitored sites in the Santa Ana River watershed, 2001-2010.

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

Table B-2 (cont.) Least Bell's Vireo nest placement preferences, monitored sites in the Santa Ana River watershed, 2001-2010.

Host Species	2001	2002	2003	2004	2005	2006	2007	2008	2009	TOTAL
Red Willow/dead Stinging Nettle (*S. lasiolepsis* /*U. dioica)*								1		1
Red Willow/Fresh Water Reed								1		1
Rose (*Rosa californicus*) & Wild Grape (*Vitis girdiana*)									1	1
S. lasiolepsis & Fennel *(Foeniculum vulgare)*									1	1
Orange Tree (*Rutaceae citrus sinensis)*									1	1
Elderberry (*S. mexicanus*) & Wild Grape (*V. girdiana*)									1	1
Wax Leaf Pivet *(Ligustrum sp.)*									1	1
Dead Black Willow (*S. gooddingii*) & Nettle (*U. dioica*)									1	1
Arroyo Willow (*S. lasiolepsis*) & Black Mustard (*Brassica nigra*)									1	1
Dead Black Willow (*S. gooddingii*) covered with living Black Willow									1	1
Deadfall									2	2
Dead *Salix sp*.								1	1	2
Dead *L. latifolium*								1		1
Dead *B. salicifolia*								3	2	5
Total	**44**	**94**	**125**	**184**	**174**	**145**	**168**	**211**	**285**	**1,430***

*includes corrected 2007 total value

Table B-2. Least Bell's Vireo nest placement preferences, monitored sites in the Santa Ana River watershed, 2001-2010

Host Plant Species	2010									Total
Black Willow *(Salix gooddingi)*	12									236
Arroyo Willow *(Salix lasiolepis)*	27									318
Red Willow *(Salix laevigata)*	22									140
Narrow-leafed Willow *(Salix exigua)*	3									59
Shining (Yellow) Willow *(Salix lucida spp. lasiandra)*	1									9
Willow species (*Salix spp.*)										6
Fremont Cottonwood *(Populus fremontii)*	6									55
Mulefat *(Baccharis salicifolia)*	66									484
Elderberry *(Sambucus mexicana)*	12									79
Black Walnut *(Juglans californica)*	2									7
Stinging Nettle (*Urtica dioica*)										1
Mugwort (*Artemisia douglasiana*)										18
Toyon (*Heteromeles arbutifolia*)										17
Poison Hemlock (*Conium maculatum*)										10
Wild Grape *(Vitis girdana)*	8									46
Wild Rose (*Rosa californica*)										5
Cockleburr (*Xanthium strumarium*)										2
Myoporum (*Myoporum luteum*)										1
Laurel Sumac (*Malosma laurina*)										6

Table B-2. Least Bell's Vireo nest placement preferences, monitored sites in the Santa Ana River watershed, 2001-2010

Host Plant Species	2010									Total
Black mustard (Brassica nigra)	1									9
Peruvian Pepper Tree (Schinus molle)	3									8
Golden Current (*Ribes aureum*)										1
Yellowspine Thistle (*Circium ochrocentrum*)										2
Coast Live Oak (*Quercus agrifolia*)										1
Giant Reed (*Arundo donax*)										1
Milk Thistle (*Sylybum marianum*)										1
Arrowweed (*Pluchea sp.*)										1
California Sagebrush (*Artemisia californica*)										1
Scrub Oak (*Quercus spp.*)										4
Poison Oak (*Toxicodendron diversilobum*)										9
Ash (*Fraxinus sp.*)										1
Coyote Bush (*Baccharis pilularis*)										5
Broom Baccharis (*Baccharis sarothroides*)										1
Black Willow (dead) (*Salix goodingii*)										1
Tamarisk (*Tamarix ramosissima*)	1									4
Willow species/Pepperweed (*Salix sp./Lepidium latifolium*)										1

Table B-2. Least Bell's Vireo nest placement preferences, monitored sites in the Santa Ana River watershed, 2001-2010

Host Plant Species	2010									Total
Blackberry/Willow sp. (*Rubus ursinus/Salix sp.*)										1
Sycamore (*Plantanus racemosa*)										2
Pepperweed (*Lepidium latifolium*)										4
Four-wing Saltbush (*Atriplex candescens*)										1
Castor bean (*Rincus communis*)										1
Pepperweed (*Lepidium latifolium*) and Black Willow (*Salix goodingii*)										1
Common Sunflower (*Helianthus annus*)										1
Black Willow (*Salix goodingii*) and Grape (*Vitis girdiana*)										1
Mulefat/Black Mustard (*Baccharis salicifolia/Brassica nigra*)										1
Black Willow/Poison Hemlock (*Salix goodingii/Conium maculatum*)										1
Mulefat/Wild Grape (*Baccharis salicifolia/Vitis girdiana*)										2
Red Willow/Wild Grape (*S. lasiolepsis/V. girdiana*)										1
Emory Baccharis (*Baccharis emoryii*)										3
Wild Celery (*Apium graveolens*)										1
Fig (*Ficus sp*)										1
White Alder (*Alnusrhombifolia*)										1
Box Elder (*Acer megundo*)										1

Table B-2. Least Bell's Vireo nest placement preferences, monitored sites in the Santa Ana River watershed, 2001-2010

Host Plant Species	2010									Total
Red Willow/dead Stinging Nettle (*S. lasiolepsis/U. dioica*)										1
Red Willow/Fresh Water Reed										1
Rose (*Rosa californicus*) & Wild Grape (*Vitis girdiana*)										1
S. lasiolepsis & Fennel (*Foeniculum vulgare*)										1
Orange Tree (*Rufaceae citrus sinesnsi*)										1
Elderberry (*S. mexicanus*) & Wild Grape (*V. girdiana*)										1
Wax Leaf Pivet (*Ligustrum sp.*)										1
Dead Black Willow (*S. goodingii*) & Nettle (*U. dioica*)										1
Arroyo Willow (*S. lasiolepsis*) & Black Mustard (*Brassica nigra*)										1
Dead Black Willow (*S. goodingii*) covered with living Black Willow										1
Deadfall	1									3
Dead *Salix sp.*										2
Dead *L. laifolium*										1
Dead *B. salicifolia*										5
Dead *S. lasiolepsis*	1									1
Sugarbush (*Rhus ovata)*	1									1
False Indigo (*Amorpha futicosa*)	1									1
Total	**168**									**1,598**

Table B-3. Least Bell's Vireo reproductive success and breeding biology data, closely monitored sites in the Santa Ana River watershed, 2001- 2010 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

Table B-3. Least Bell's Vireo reproductive success and breeding biology data, closely monitored sites in the Santa Ana River watershed, 2001- 2010. Please see Table 1 for total watershed numbers of territories, pairs, and fledglings observed.

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

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

APPENDIX C – SUMMARY TABLES BY MANAGED SITE, FROM INCEPTION, 2010

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 Jacinto

Parameter		2010										Totals
A.	Number of territorial males	22										n/a
B.	Number of pairs (breeding and non-breeding)	18										61
C.	Number of fledged young observed	28										132
D.	Projected total of recruitment of vireo young (a)	n/a										122.1*
E.	Average number of fledglings per pair (C/B)	1.6										2.2
F.	Projected number of fledglings per pair (D/B)	n/a										2.8*
G.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)	0% (0/3)										31.6% (18/57)
H.	Rate of cowbird nest parasitism	0										10.5% (6/57)
I.	Numbers of cowbirds removed from study area	2136										13,758
K.	Number of trap days (1 operative trap in the field for one day = 1 trap day)	993										7,398
L.	Average number of cowbirds trapped per trap day (I/K)	2.15										1.8
M.	Number of field hours -LBVI	79										5,029
N.	Number of field hours - BHCO	525										

*Excludes 2010 data

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

SAN TIMOTEO

	Parameter	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

SAN TIMOTEO

	Parameter	2010										Totals
A.	Number of territorial males	126										n/a
B.	Number of pairs (breeding and non-breeding)	95										418
C.	Number of fledged young observed	137										772
D.	Projected total of recruitment of vireo young (a)	266										856
E.	Average number of fledglings per pair (C/B)	1.4										1.9
F.	Projected number of fledglings per pair (D/B)	2.8										2.0
G.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)	65% (24/37)										47% (175/375)
H.	Rate of cowbird nest parasitism	8% (3/37)										28% (106/375)
I.	Numbers of cowbirds removed from study area	173										1.660
K.	Number of trap days (1 operative trap in the field for one day = 1 trap day)	1113										7,576
L.	Average number of cowbirds trapped per trap day (I/K)	0.16										0.22
M.	Number of field hours -LBVI	505										7,533
N.	Number of field hours - BHCO	503										

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

MARCH SKR PRESERVE

	Parameter	2010										Totals
A.	Number of territorial males	14										n/a
B.	Number of pairs (breeding and non-breeding)	12										45
C.	Number of fledged young observed	25										100
D.	Projected total of recruitment of vireo young **(a)**	75.6										196.1
E.	Average number of fledglings per pair (C/B)	2.1										2.2
F.	Projected number of fledglings per pair (D/B)	6.3										4.4
G.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)	0% (0/6)										27% (6/22)
H.	Rate of cowbird nest parasitism	0% (0/6)										0% (0/22)
I.	Numbers of cowbirds removed from study area	13										164
K.	Number of trap days (1 operative trap in the field for one day = 1 trap day)	280										1,483
L.	Average number of cowbirds trapped per trap day (I/K)	0.05										0.11
M.	Number of field hours -LBVI	62										519
N.	Number of field hours - BHCO	153										657

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)
H.	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

SYCAMORE CANYON

	Parameter	2010										Totals
A.	Number of territorial males	12										n/a
B.	Number of pairs (breeding and non-breeding)	8										43
C.	Number of fledged young observed	11										51
D.	Projected total of recruitment of vireo young **(a)**	n/a										39.6
E.	Average number of fledglings per pair (C/B)	1.4										1.2
F.	Projected number of fledglings per pair (D/B)	n/a										1.6*
G.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)	n/a										33.3% (3/9)
H.	Rate of cowbird nest parasitism	n/a										22.2% (2/9)
I.	Numbers of cowbirds removed from study area	n/a										81
K.	Number of trap days (1 operative trap in the field for one day = 1 trap day)	n/a										635
L.	Average number of cowbirds trapped per trap day (I/K)	n/a										0.13
M.	Number of field hours -LBVI	54										528
N.	Number of field hours - BHCO	n/a										469

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

MOCKINGBIRD CANYON

	Parameter	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 x100) (b)				85% (11/13)	33% (3/9)	53% (8/15)	25% (3/12)	22% (2/9)	25% (3/12)	8% (1/12)	37.8% (31/82)
H.	Rate of cowbird nest parasitism				62% (8/13)	0% (0/9)	7% (1/15)	0% (0/12)	0% (0/9)	17% (2/12)	8% (1/12)	14.6% (12/82)
I.	Numbers of cowbirds removed from study area				83	281	230	183	101	224	156	1,258
K.	Number of trap days (1 operative trap in the field for one day = 1 trap day)				300	966	861	769	638	829	1,032	5,395
L.	Average number of cowbirds trapped per trap day (I/K)				0.28	0.29	0.3	0.24	0.16	0.27	0.15	0.23
M.	Number of field hours -LBVI				447.0	122.0	181.0	166.0	338.4	352	368	3,661
N.	Number of field hours - BHCO					300.0	293.0	177.0	228.6	350	338	

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

MOCKINGBIRD CANYON

	Parameter	2010										Totals
A.	Number of territorial males	43										n/a
B.	Number of pairs (breeding and non-breeding)	34										154
C.	Number of fledged young observed	25										243
D.	Projected total of recruitment of vireo young **(a)**	n/a										417.7
E.	Average number of fledglings per pair (C/B)	0.7										1.6
F.	Projected number of fledglings per pair (D/B)	n/a										3.5*
G.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)	n/a										37.8% (31/82)
H.	Rate of cowbird nest parasitism	n/a										14.6% (12/82)
I.	Numbers of cowbirds removed from study area	149										1,407
K.	Number of trap days (1 operative trap in the field for one day = 1 trap day)	1028										6,423
L.	Average number of cowbirds trapped per trap day (I/K)	0.14										0.22
M.	Number of field hours -LBVI	96										4,069
N.	Number of field hours - BHCO	312										

* no 2010 data

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

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 x100) (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 (Fairmount Park to Hidden Valley)

	Parameter	2010										Totals
A.	Number of territorial males	68										n/a
B.	Number of pairs (breeding and non-breeding)	50										217
C.	Number of fledged young observed	58										341
D.	Projected total of recruitment of vireo young **(a)**	100										429.4
E.	Average number of fledglings per pair (C/B)	1.2										1.6
F.	Projected number of fledglings per pair (D/B)	2.0										2.0
G.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)	36% (4/11)										32.6% (28/86)
H.	Rate of cowbird nest parasitism	0% (0/11)										14.0% (12/86)
I.	Numbers of cowbirds removed from study area	58										519
K.	Number of trap days (1 operative trap in the field for one day = 1 trap day)	530										4,264
L.	Average number of cowbirds trapped per trap day (I/K)	0.11										0.12
M.	Number of field hours -LBVI	335										2,945
N.	Number of field hours - BHCO	277										

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

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

	Parameter	2010										Totals
A.	Number of territorial males	101										n/a
B.	Number of pairs (breeding and non-breeding)	64										297
C.	Number of fledged young observed	113										602
D.	Projected total of recruitment of vireo young **(a)**	211.2										655.8
E.	Average number of fledglings per pair (C/B)	1.8										2.0
F.	Projected number of fledglings per pair (D/B)	3.3										2.2
G.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)	28% (5/18)										40% (78/195)
H.	Rate of cowbird nest parasitism	0% (0/18)										7.2% (14/195)
I.	Numbers of cowbirds removed from study area	49										431
K.	Number of trap days (1 operative trap in the field for one day = 1 trap day)	269										1371
L.	Average number of cowbirds trapped per trap day (I/K)	0.18										0.31
M.	Number of field hours -LBVI	183										2,520
N.	Number of field hours - BHCO	252										876

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

Hidden Valley

	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

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

	Parameter	2010										Totals
A.	Number of territorial males	60										n/a
B.	Number of pairs (breeding and non-breeding)	43										273
C.	Number of fledged young observed	53										460
D.	Projected total of recruitment of vireo young **(a)**	90.3										601.9 (10 yrs)
E.	Average number of fledglings per pair (C/B)	1.2										1.7
F.	Projected number of fledglings per pair (D/B)	2.1										2.4*
G.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)	64.7% (11/17)										41% (42/102)
H.	Rate of cowbird nest parasitism	5.8% (1/17)										6.9% (7/102)
I.	Numbers of cowbirds removed from study area	24										661
K.	Number of trap days (1 operative trap in the field for one day = 1 trap day)	252										4,550
L.	Average number of cowbirds trapped per trap day (I/K)	0.10										0.15
M.	Number of field hours -LBVI	330										4683
N.	Number of field hours -BHCO	196										

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

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

Hidden Valley (north side)

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

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

TEMESCAL CANYON

	Parameter	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

TEMESCAL CANYON

	Parameter	2010										Totals
A.	Number of territorial males	83										n/a
B.	Number of pairs (breeding and non-breeding)	49										213
C.	Number of fledged young observed	73										412
D.	Projected total of recruitment of vireo young **(a)**	151.9										599.6
E.	Average number of fledglings per pair (C/B)	1.5										1.9
F.	Projected number of fledglings per pair (D/B)	3.1										2.8
G.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)	20% (3/15)										37% (55/148)
H.	Rate of cowbird nest parasitism	0										18% (27/148)
I.	Numbers of cowbirds removed from study area	134										1,484
K.	Number of trap days (1 operative trap in the field for one day = 1 trap day)	1191										7,003
L.	Average number of cowbirds trapped per trap day (I/K)	0.11										0.21
M.	Number of field hours -LBVI	335										6,492
N.	Number of field hours - BHCO	467										

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 – UPPER CANYON BELOW PRADO DAM

	Parameter	2010										Totals
A.	Number of territorial males	11										n/a
B.	Number of pairs (breeding and non-breeding)	4										130
C.	Number of fledged young observed	6										214
D.	Projected total of recruitment of vireo young **(a)**	n/a										309.1 (n=8 yrs)
E.	Average number of fledglings per pair (C/B)	1.5										1.6
F.	Projected number of fledglings per pair (D/B)	n/a										2.7 (n=8 yrs)
G.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)	0% (0/1)										40% (26/65) (n=9 yrs)
H.	Rate of cowbird nest parasitism	0										6.2% (4/65) (n=9 yrs)
I.	Numbers of cowbirds removed from study area	165										466
K.	Number of trap days (1 operative trap in the field for one day = 1 trap day)	286										2,398
L.	Average number of cowbirds trapped per trap day (I/K)	0.58										0.19
M.	Number of field hours -LBVI	324*										7,542
N.	Number of field hours - BHCO	425*										

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 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)
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 - GREEN RIVER GOLF CLUB

	Parameter	2010										Totals
A.	Number of territorial males	24										n/a
B.	Number of pairs (breeding and non-breeding)	17										118
C.	Number of fledged young observed	19										211
D.	Projected total of recruitment of vireo young **(a)**	30.6										309.9
E.	Average number of fledglings per pair (C/B)	1.2										1.8
F.	Projected number of fledglings per pair (D/B)	1.8										2.6
G.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)	71% (5/7)										30.9% (21/68)
H.	Rate of cowbird nest parasitism	0% (0/7)										5.9% (4/68)
I.	Numbers of cowbirds removed from study area	58										860
K.	Number of trap days (1 operative trap in the field for one day = 1 trap day)	407										3,508
L.	Average number of cowbirds trapped per trap day (I/K)	0.14										0.25
M.	Number of field hours -LBVI	See Upper Canyon Summary Sheet for all Santa Ana Canyon hours										
N.	Number of field hours - BHCO											

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

SANTA ANA CANYON – FEATHERLY PARK

	Parameter	2000	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 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)
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

SANTA ANA CANYON – FEATHERLY PARK

	Parameter	2010										Totals
A.	Number of territorial males	40										n/a
B.	Number of pairs (breeding and non-breeding)	23										154
C.	Number of fledged young observed	22										197
D.	Projected total of recruitment of vireo young **(a)**	46										353.1
E.	Average number of fledglings per pair (C/B)	1.0										1.3
F.	Projected number of fledglings per pair (D/B)	2.0										2.3
G.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)	71% (5/7)										50% (36/72)
H.	Rate of cowbird nest parasitism	0% (0/7)										6.9% (5/72)
I.	Numbers of cowbirds removed from study area	118*										245
K.	Number of trap days (1 operative trap in the field for one day = 1 trap day)	514*										2,105
L.	Average number of cowbirds trapped per trap day (I/K)	0.23										0.12
M.	Number of field hours –LBVI	See Upper Canyon Summary Sheet for all Santa Ana Canyon hours										
N.	Number of field hours - BHCO											

*Includes 2 traps at Yorba Linda Regional Park

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

CHINO HILLS

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

CHINO HILLS

	Parameter	2010										Totals
A.	Number of territorial males	11										n/a
B.	Number of pairs (breeding and non-breeding)	7										52
C.	Number of fledged young observed	7										61
D.	Projected total of recruitment of vireo young **(a)**	11.9										64.9 (n=5 yrs)
E.	Average number of fledglings per pair (C/B)	1.0										1.2
F.	Projected number of fledglings per pair (D/B)	1.7										1.2 (n=5 yrs)
G.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)	67% (2/3)										63.6% (14/22) (n=5 yrs)
H.	Rate of cowbird nest parasitism	0% (0/3)										27.3% (6/22) (n=5 yrs)
I.	Numbers of cowbirds removed from study area	16										27
K.	Number of trap days (1 operative trap in the field for one day = 1 trap day)	129										343
L.	Average number of cowbirds trapped per trap day (I/K)	0.12										0.08
M.	Number of field hours -LBVI	59										447
N.	Number of field hours - BHCO	129										308

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

Irvine Regional Park

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

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 (*Baccharis salicifolia*)					2	2	1	2	10	9	26
Black Willow (*Salix goodingi*)								5			5
Narrow-leafed Willow (*Salix exigua*)						1	1	2	4	18	26
Tamarisk (*Tamarix ramosissima*)								1			1
Black Mustard (*Brassica nigra*)							1				1
Totals:				0	2	3	3	10	14	27	59

SAN JACINTO

Host Plant Species	2010										Totals
Mulefat (*Baccharis salicifolia*)	4										30
Black Willow (*Salix goodingii*)											5
Narrow-leafed Willow (*Salix exigua*)	2										28
Tamarisk (*Tamarix ramosissima*)	1										2
Black Mustard (*Brassica nigra*)											1
Totals:	7										66

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 (*Salix lasiolepis*)		1	4	3	11	11	11	11	9	15	76
Mulefat (*Baccharis salicifolia*)		1	12	9	16	5	2	3	21	32	101
Black Willow (*Salix gooddingi*)				1	1	6	8	14	11	11	52
Red Willow (*Salix laevigata*)						9	7	11	23	14	64
Mugwort (*Artemisia douglasiana*)		1	1	5	6	1					14
Elderberry (*Sambucus mexicana*)			1			7	1		2	1	12
Narrow-leafed Willow (*Salix exigua*)					1	5	2		4	1	13
Fremont Cottonwood (*Populus femontii*)			2	2	1	1		2	2	6	16
Wild Grape (*Vitis girdana*)						1	3	2	2	2	10
Toyon (*Heteromeles arbutifolia*)		1				1		2	2	2	8
Mustard (*Brassica sp.*)				3							3
Shining Willow (*Salix lucida spp. lasiandra*)							2			1	3
Emory baccharis (*Baccharis emoryii*)								1			1
Black Mustard (*Brassica nigra*)						1					1
Golden Current (*Ribes aureum*)						1					1
Four-wing Saltbush (*Atriplex candescens*)				1							1
Arroyo Willow *(S. lasiolepsis*) & Wild Grape (*Vitis girdana*)									1		1
Box Elder *(Acer negundo*)									1		1
Arroyo Willow (*Salix lasiolepis*) & Fennel (*Foeniculum vulgare*)										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, 2001-2010, BY MANAGED SITE SAN TIMOTEO CANYON

Host Plant Species	2010										Totals
Arroyo Willow (*Salix lasiolepis*)	4										80
Mulefat (*Baccharis salicifolia*)	15										116
Black Willow (*Salix gooddingi*)	4										56
Red Willow (*Salix laevigata*)	8										72
Mugwort (*Artemisia douglasiana*)											14
Elderberry (*Sambucus mexicana*)	2										14
Narrow-leafed Willow (*Salix exigua*)											13
Fremont Cottonwood (*Populus femontii*)	1										17
Wild Grape (*Vitis girdana*)	5										15
Toyon (*Heteromeles arbutifolia*)											8
Mustard (*Brassica sp.*)											3
Shining Willow (*Salix lucida spp. lasiandra*)											3
Emory baccharis (*Baccharis emoryii*)											1
Black Mustard (*Brassica nigra*)											1
Golden Current (*Ribes aureum*)											1
Four-wing Saltbush (*Atriplex candescens*)											1
Arroyo Willow *(S. lasiolepsis*) & Wild Grape (*Vitis girdana*)											1
Box Elder *(Acer negundo*)											1
Arroyo Willow (*Salix lasiolepis*) & Fennel (*Foeniculum vulgare*)											1
Black Walnut (*Juglans californica*)	1										1
Totals	40										419

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 (*Salix gooddingi*)					3	5				1	9
Arroyo Willow (*Salix lasiolepis*)								2		3	5
Red Willow (*Salix laevigata*)						1				2	3
Totals					3	6	0	2		6	17

MARCH SKR PRESERVE

Host Plant Species	2010										Totals
Black Willow (*Salix gooddingi*)	1										10
Arroyo Willow (*Salix lasiolepis*)	1										6
Red Willow (*Salix laevigata*)	3										6
Mulefat (*Baccharis salicifolia*)	1										1
Totals	6										23

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

SYCAMORE CANYON

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

HARRISON RESERVOIR/RAVINE

Host Plant Species	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Totals
Black Willow (*Salix gooddingi*)					2		2	1				5
Arroyo Willow (*Salix lasiolepis*)						1		1				2
Elderberry (*Sambucus mexicana*)					1						1	2
Fig								1				1
Totals					3	1	2	3			1	10

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

Host Plant Species	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Totals
Black Willow (*Salix gooddingi*)				2	5	11	5	1		2	26
Red Willow (*Salix laevigata*)				6	1		2	4	6	11	30
Elderberry (*Sambucus mexicana*)				3	1	3	3	1	2		13
Wild Grape (*Vitis girdana*)						4	1	1			6
Mulefat (*Baccharis salicifolia*)				1			1	1	1	1	5
Peruvian Pepper Tree (*Schinua molle*)						1		1			2
Emory's Baccharis *(Emory baccharis)*									2		2
Pepperweed (*Lepidium latifolium*)					1			1	1		3
Willow species/Pepperweed (*Salix sp./Lepidium latifolium*)				1							1
Arroyo Willow (*Salix lasiolepis*)				1					1		2
Willow species (*Salix spp.*)				1							1
Sycamore (*Plantanus racemosa*)				1							1
Wild Celery (*Apium graveolens*)								1			1
Pepperweed (*Lepidium latifolium)* and Black Willow (*Salix gooddingii*)					1						1
Black Willow (*Salix gooddingi*) and Grape (*Vitis girdiana*)					1						1
Dead *Salix sp*.									1		1
Dead *L. latifolium*									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, 2001-2010, BY MANAGED SITE

MOCKINGBIRD CANYON

Host Plant Species	2010										Totals
Black Willow (*Salix goodingii*)											26
Red Willow (*Salix laevigata*)	2										32
Elderberry (*Sambucus Mexicana*)											13
Wild Grape (*Vitis girdana*)											6
Mulefat (*Baccharis salicifolia*)	1										6
Peruvian Pepper Tree (*Schinua molle*)											2
Emory's Baccharis (*Baccharis emoryi*)											2
Pepperweed (*Lepidium latifolium*)											3
Willow species/Pepperweed (*Salix* sp./*Lepidium latifolium*)											1
Arroyo Willow (*Salix lasiolepis*)											2
Willow species (*Salix* sp)											1
Sycamore (*Platanus racemosa*)											1
Wild Celery (*Apium graveolens*)											1
Pepperweed (*Lepidium latifolium*) and Black Willow (*Salix goodingii*)											1
Black Willow (*Salix goodingii*) and Grape (*Vitis girdana*)											1
Dead Salix sp.											1
Dead *L. latifolium*											1
Black Walnut (*Juglans californica*)											1
Totals	3										101

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 (*Salix lasiolepis*)			1		5	6	5	7		4	28
Mulefat (*Baccharis salicifolia*)			2	3	6	5	3	2		5	26
Black Willow (*Salix gooddingi*)			4	3		2				1	10
Fremont Cottonwood (*Populus femontii*)			1			3				3	7
Elderberry (*Sambucus mexicana*)					1	2					3
Red Willow (*Salix laevigata*)				2						4	6
Scrub Oak (*Quercus spp.*)							1	1			2
Narrow-leafed Willow (*Salix exigua*)				1						1	2
Yellow Willow (*Salix lucida spp. lasiandra*)					1						1
Willow species (*Salix spp.*)			1								1
Stinging Nettle (*Urtica dioica*)						1					1
Wild Rose (*Rosa californica*)				1							1
Black Willow (dead) (*Salix gooddingii*)				1							1
Dead Black Willow (*Salix goodingii*) & Nettle (*Urtica dioica*)										1	1
Tamarisk (*Tamarix ramosissima*)				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, 2001-2010, BY MANAGED SITE

SANTA ANA RIVER – FAIRMOUNT PARK TO HIDDEN VALLEY

Host Plant Species	2010										Totals
Arroyo Willow (*Salix lasiolepis*)	4										32
Mulefat (*Baccharis salicifolia*)	7										33
Black Willow (*Salix goodingii*)											10
Fremont Cottonwood (*Populus fremontii*)											7
Elderberry (*Sambucus Mexicana*)											3
Red Willow (*Salix laevigata*)	1										7
Scrub Oak (*Quercus* spp.)											2
Narrow-leafed Willow (*Salix exingua*)											2
Yellow Willow (*Salix lucida* spp. *Lasiandra*)											1
Willow species (*Salix* spp.)											1
Stinging Nettle (*Utica dioica*)											1
Wild Rose (*Rosa californica*)											1
Black Willow (dead) (*Salix goodingii*)											1
Dead Black Willow (*Salix goodingii*) & Nettle (*Urtica dioica*)											1
Tamarisk (*Tamarix ramosissima*)											1
Wild Grape (*Vitis girdiana*)	1										1
Totals	13										104

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 (*Salix lasiolepis*)				2	7	5	16	13	11	16	70
Black Willow (*Salix gooddingi*)		1	1	3	18	2	7	4	1	2	39
Mulefat (*Baccharis salicifolia*)			2	3	10	1	3	8	12	24	63
Wild Grape (*Vitis girdana*)		1		1			3	2	1	1	9
Narrow-leafed Willow (*Salix exigua*)					4			1	2	1	8
Poison Hemlock (*Conium maculatum*)					1	3					4
Fremont Cottonwood (*Populus femontii*)						1	2	1	4	3	11
Elderberry (*Sambucus mexicana*)				1	1						2
Ash (*Fraxinus sp.*)		1									1
Dead *B. salicifolia*									2		2
Black Willow/Poison Hemlock (*Salix gooddingi/Conium maculatum*)							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, 2001-2010, BY MANAGED SITE

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

Host Plant Species	2010										Totals
Arroyo Willow (*Salix lasiolepis*)	5										75
Black Willow (*Salix gooddingi*)	1										40
Mulefat (*Baccharis salicifolia*)	13										76
Wild Grape (*Vitis girdana*)											9
Narrow-leafed Willow (*Salix exigua*)	1										9
Poison Hemlock (*Conium maculatum*)											4
Fremont Cottonwood (*Populus femontii*)	1										12
Elderberry (*Sambucus mexicana*)											2
Ash (*Fraxinus* sp.)											1
Dead *B. salicifolia*											2
Black Willow (*Salix goodingii*) & Poison Hemlock (*Conium maculatum*)											1
Dead Arroyo Willow	1										1
Totals	22										232

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 (*Salix lasiolepis*)	4	3	4	2	10	2	5	4	2	7	43
Mulefat (*Baccharis salicifolia*)	1	5	3	3	5	2	1	2	1	6	29
Black Willow (*Salix gooddingi*)	2		6		1		2		2	2	15
Wild Grape (*Vitis girdana*)			2			1	1	1	1		6
Red Willow (*Salix laevigata*)	1	1			1			1			4
Willow species (*Salix spp.*)				1		1					2
Narrow-leafed Willow (*Salix exigua*)								1			1
Yellow Willow (*Salix lucida spp. lasiandra*)						1					1
Elderberry (*Sambucus mexicana*)				1					1	1	3
Poison Oak (*Toxicodendron diversilobum*)		1									1
Coyote Bush (*Baccharis pilularis*)		1									1
Blackberry/Willow sp. (*Rubus ursinus/Salix sp.*)				1							1
S. lasiolepsis/fresh water reed									1		1
Rose (*Rosa californica*) & Wild Grape (*Vitis girdiana*)										1	1
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, 2001-2010, BY MANAGED SITE

HIDDEN VALLEY

Host Plant Species	2010										Totals
Arroyo Willow (*Salix lasiolepis*)	6										49
Mulefat (*Baccharis salicifolia*)	9										38
Black Willow (*Salix gooddingi*)	1										16
Wild Grape (*Vitis girdana*)											6
Red Willow (*Salix laevigata*)	1										5
Willow species (*Salix spp.*)											2
Narrow-leafed Willow (*Salix exigua*)											1
Yellow Willow (*Salix lucida spp. lasiandra*)											1
Elderberry (*Sambucus mexicana*)											3
Poison Oak (*Toxicodendron diversilobum*)											1
Coyote Bush (*Baccharis pilularis*)											1
Blackberry/Willow sp. (*Rubus ursinus/Salix sp.*)											1
S. lasiolepsis/fresh water reed											1
Rose (*Rosa californica*) & Wild Grape (*Vitis girdiana*)											1
Totals	17										126

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

HIDDEN VALLEY (north side)

Host Plant Species	2010										Totals
Mulefat (*Baccharis salicifolia*)	4										4
Wild Grape (*Vitis girdana*)	2										2
Red Willow (*Salix laevigata*)	2										2
Elderberry (*Sambucus mexicana*)	2										2
Totals	10										10

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 (*Baccharis salicifolia*)		1	4	7	7	14	2	2	13	15	65
Arroyo Willow (*Salix lasiolepis*)				1	2	6	8	6	18	20	61
Black Willow (*Salix gooddingi*)		1		3	4		6	3	1		18
Yellow Willow (*Salix lucida spp. lasiandra*)								3			3
Mugwort (*Artemisia douglasiana*)				1							1
Toyon (*Heteromeles arbutifolia*)								1			1
Poison Oak (*Toxicodendron diversilobum*)								1			1
Arrowweed (*Pluchea sp.*)							1				1
Coyote Bush (*Baccharis pilularis*)			1								1
Pepperweed (*Lepidium latifolium*)				1							1
Common Sunflower (*Helianthus annus*)					1						1
Cottonwood (Populus fremonti)									1	1	2
Sycamore (Plantus racemosa)									1		1
Elderberry (*Sambucus mexicana*)										1	1
Dead *Salix sp.*										1	1
*S. lasiolepsis/*Stinging Nettle *(Utica dioica) (*dead)									1		1
B. salicifoia (dead)									1	2	3
Tamarisk (*Tamarix ramosissima*)										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, 2001-2010, BY MANAGED SITE

TEMESCAL CANYON

Host Plant Species	2010										Totals
Mulefat (*Baccharis salicifolia*)	6										71
Arroyo Willow (*Salix lasiolepis*)	7										68
Black Willow (*Salix gooddingi*)	2										20
Yellow Willow (*Salix lucida spp. lasiandra*)	1										4
Mugwort (*Artemisia douglasiana*)											1
Toyon (*Heteromeles arbutifolia*)											1
Poison Oak (*Toxicodendron diversilobum*)											1
Arrowweed (*Pluchea* sp.)											1
Coyote Bush (*Baccharis pilularis*)											1
Pepperweed (*Lepidium latifolium*)											1
Common Sunflower (*Helianthus annus*)											1
Cottonwood (*Populus fremontii*)											2
Sycamore (*Plantanus racemosa*)											1
Elderberry (*Sambucus mexicana*)	3										4
Dead *Salix* sp.											1
S. lasiolepsis & Stinging Nettle (*Utica dioica*) (dead)											1
B. salicifolia (dead)											3
Tamarisk (*Tamarix ramosissima*)											1
Deadfall	1										3
Red Willow (*Salix laevigata*)	1										1
Sugarbush	1										1
Totals	22										188

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 (*Baccharis salicifolia*)		4	7	11	5	3	1	2			33
Elderberry (*Sambucus mexicana*)		3		5		2	1	2	1		14
Black Willow (*Salix gooddingi*)			2	3			1	3		1	10
Poison Oak (*Toxicodendron diversilobum*)			5								5
Fremont Cottonwood (*Populus femontii*)		2	1	1						1	5
Wild Grape (*Vitis girdana*)		1	3								4
Wild Rose (*Rosa californica*)			1			2					3
Red Willow (*Salix laevigata*)		1	1					1			3
Arroyo Willow (*Salix lasiolepis*)			2								2
Mustard (Brassica spp.)		1		1							2
Poison Hemlock (*Conium maculatum*)			1			1					2
Toyon (*Heteromeles arbutifolia*)						1					1
Scrub Oak (*Quercus berberidifolia*)								1	1		2
Willow species (*Salix spp.*)							1				1
Cockleburr (*Xanthium strumarium*)						1					1
Narrow-leafed Willow (*Salix exigua*)				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 (*Schinua molle*)					1						1
Coast Live Oak (*Quercus agrifolia*)						1					1
Milk Thistle (*Silybum marianum*)				1							1
Coyote Bush (*Baccharis pilularis*)			1								1
Broom Baccharis (*Baccharis sarothroides*)			1								1
Castor Bean (*Rincus communis*)					1						1
Black Willow/Poison Hemlock (*Salix gooddingi/Conium maculatum*)		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, 2001-2010, BY MANAGED SITE

SANTA ANA CANYON – UPPER CANYON

Host Plant Species	2010										Totals
Mulefat (*Baccharis salicifolia*)											33
Elderberry (*Sambucus mexicana*)	1										15
Black Willow (*Salix goodingii*)											10
Poison Oak (*Toxicodendron diversilobum*)											5
Fremont Cottonwood (*Populus femontii*)	1										6
Wild Grape (*Vitis girdana*)											4
Wild Rose (*Rosa californica*)											3
Red Willow (*Salix laevigata*)											3
Arroyo Willow (*Salix lasiolepsis*)											2
Mustard (*Brassica* spp.)											2
Poison Hemlock (*Conium maculatum*)											2
Toyon (*Heteromeles arbutifolia*)											1
Scrub Oak (*Quercus berberidifolia*)											2
Willow Species(*Salix* spp.)											1
Cockleburr (*Xanthium strumarium*)											1
Narrow-leafed Willow (*Salix exigua*)											1
Peruvian Pepper Tree (*Schinua molle*)											1
Coast Live Oak (*Quercus agrifolia*)											1
Milk Thistle (*Silybum marianum*)											1
Coyote Bush (*Baccharis pilularis*)											1

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

SANTA ANA CANYON – UPPER CANYON (continued)

Broom Baccharis (*Baccharis sarothroides*)											1
Castor Bean (*Rincus communis*)											1
Black Willow (*Salix goodingii*) & Poison Hemlock (*Conium maculatum*)											1
Totals	2										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 CANYON – GREEN RIVER GOLF CLUB

Host Plant Species	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Totals
Mulefat (*Baccharis salicifolia*)		6	3	4	3	5		4	4	6	35
Black Willow (*Salix gooddingi*)			1		1		2		1		5
Fremont Cottonwood (*Populus femontii*)		1	2							1	4
Elderberry (*Sambucus mexicana*)			2	1					1		4
Laruel Sumac (*Malosma laurina*)				1	1	1					3
Arroyo Willow (*Salix lasiolepis*)				2							2
Red Willow (*Salix laevigata*)		1	1						1	1	4
Poison Hemlock (*Conium maculatum*)		1				1					2
Coyote Bush (*Baccharis pilularis*)		1	1								2
Narrow-leafed Willow (*Salix exigua*)							1				1
Toyon (*Heteromeles arbutifolia*)							1				1
Wild Grape (*Vitis girdana*)		1									1
Myoporum (*Myoporum luteumi*)						1					1
Peruvian Pepper Tree (*Schinua molle*)							1		1		2
Giant Reed (*Arundo donax*)							1				1
California Sagebrush (*Artemisia californica*)			1								1
Poison Oak (*Toxicodendron diversilobum*)					1						1
Elderberry and Wild Grape										1	1
Wax Leaf Privet (*Ligustrum sp*.)										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, 2001-2010, BY MANAGED SITE

SANTA ANA CANYON – GREEN RIVER GOLF CLUB

Host Plant Species	2010										Totals
Mulefat (*Baccharis salicifolia*)	1										36
Black Willow (*Salix gooddingi*)	2										7
Fremont Cottonwood (*Populus fremontii*)											4
Elderberry (*Sambucus mexicana*)											4
Laurel Sumac (*Malosma laurina*)											3
Arroyo Willow (*Salix lasiolepis*)											2
Red Willow (*Salix laevigata*)											4
Poison Hemlock (*Conium maculatum*)											2
Coyote Bush (*Baccharis pilularis*)											2
Narrow-leafed Willow (*Salix exigua*)											1
Toyon (*Hetermeles arbutifolia*)											1
Wild Grape (*Vitis girdana*)											1
Myoporum (*Myoporum luteumi*)											1
Peruvian Pepper Tree (*Schinua molle*)	3										5
Giant Reed (*Arundo donax*)											1
California Sagebrush (*Artemisia californica*)											1
Poison Oak (*Toxicodendron diversilobum*)											1
Elderberry (*Sambucus mexicana*) & Wild Grape (*Vitis girdana*)											1
Wax Leaf Privet (*Ligustrum* sp.)											1
Black Walnut (*Juglans californica*)	1										1
Totals	7										79

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 (*Baccharis salicifolia*)			3		3	7	2	1	6	1	23
Elderberry (*Sambucus mexicana*)				1	2	2	4		1	1	11
Black Walnut (*Juglans californica*)				1		1	2				4
Black Willow (*Salix gooddingi*)					1	2		5	1	4	13
Laruel Sumac (*Malosma laurina*)					1	1	1				3
Arroyo Willow (*Salix lasiolepis*)					2				1		3
Red Willow (*Salix laevigata*)			1	1							2
Narrow-leafed Willow (*Salix exigua*)			1		1					2	4
Poison Hemlock (*Conium maculatum*)			1			1					2
Fremont Cottonwood (*Populus femontii*)					1		1	1	1		4
Yellowspine Thistle (*Circium ochrocentrum*)					1	1					2
Mulefat (*Baccharis salicifolia*) and Wild Grape (*Vitis girdiana*)								2			2
Willow species (*Salix spp.*)					1						1
Poison Oak (*Toxicodendron diversilobum*)								1			1
Toyon (*Heteromeles arbutifolia*)							1				1
Wild Grape (*Vitis girdiana*)									1		1
While Alder (Alnus rhombifolia)									1		1
Dead Black Willow (*S. gooddingii*) (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 (*S. lasiolepsis*) & Black Mustard (*Brassica nigra*)										1	1
Black Mustard (*Brassica nigra*)										1	1
Orange Tree (*Rutaceae citrus sinensis*)										1	1
Cockleburr (*Xanithum strumaritum)*										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, 2001-2010, BY MANAGED SITE

SANTA ANA RIVER – FEATHERLY PARK

Host Plant Species	2010										Totals
Mulefat (*Baccharis salicifolia*)	1										24
Elderberry (*Sambucus mexicana*)	3										14
Black Walnut (*Juglans californica*)											4
Laurel Sumac (*Malosma laurina*)											13
Arroyo Willow (*Salix lasiolepis*)											3
Red Willow (*Salix laevigata*)	2										4
Narrow-leafed Willow (*Salix exigua*)											2
Poison Hemlock (*Conium maculatum*)											4
Fremont Cottonwood (*Populus femontii*)	3										7
Yellowspine Thistle (*Circium ochrocentrum*)											4
Mulefat (*Baccharis salicifolia*) & Wild Grape (*Vitis girdana*)											2
Willow species (*Salix* sp.)											2
Poison Oak (*Toxicodendron diversilobum*)											1
Toyon (*Heteromeles arbutifolia*)											1
Wild Grape (*Vitis girdana*)											1
White Alder (*Alnus rhombifolia*)											1
Dead Black Willow (*Salix goodingii)* (covered w/ living Black Willow)											1
Arroyo Willow (*Salix lasiolepsis*) & Black Mustard (*Brassica nigra*)											1
Black Mustard (Brassica nigra)	1										2

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

SANTA ANA RIVER – FEATHERLY PARK (continued)

Orange Tree (*Rutaceae citrus sinensis*)											1
Cockleburr (*Xanithum strumaritum*)											1
Black Willow (*Salix gooddingi*)	1										1
Totals	11										94

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

CHINO HILLS

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

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

CHINO HILLS

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

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

Irvine Regional Park

Host Plant Species	2010										Totals
Mulefat (*Baccharis salicifolia*)	3										3
Elderberry (*Sambucus mexicana*)	1										1
False Indigo (*Amorpha futicosa*)	1										1
Totals	5										5

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

SAN JACINTO

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

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

SAN JACINTO (CONT.)

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

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

SAN JACINTO

	Parameter	2010										Totals
A.	Number of pairs	18										n/a
B.	Number of breeding (nesting) pairs	15										54
C.	Number of breeding pairs that were well-monitored throughout the breeding season	0										29
D.	Number of 'known fledged young' OBSERVED	28										132
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season	n/a										93
F.	Average number of fledglings produced per breeding pair (minimum; D/B = 'productivity or breeding success')	1.9										2.4
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)	n/a										3.2
H.	Number of nests that were discovered	7										66
I.	Number of nests that were regularly monitored or 'tracked'	3										57
J.	Number of 'tracked' nests that were successful (% = J/I x 100)	100% (3/3)										61% (35/57)
K.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)	0% (0/3)										32% (18/57)
L.	Number of 'tracked' nests that were parasitized by cowbirds (% = L/I x 100)	0										10.5% (6/57)

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

SAN JACINTO (CONT.)

	Parameter	2010										Totals
M.	A. Number of 'tracked' nests that failed as a result of reproductive failure	0% (0/3)										1% (3/57)
	B. Number of 'tracked' nests that failed as a result of parasitism	0% (0/3)										1% (3 or 4/57)
	C. Number of 'tracked' nests that failed as a result of predation – Predation Rate according to Vireo Working Group	0% (0/3)										26% (15/57)
N.	Average clutch size	3.3										n/a
O.	Number of cowbird eggs found in or near vireo nests	0										9
P.	Number of cowbird nestlings removed from 'tracked' nests	0										0
Q.	Number of cowbird young fledged by vireo	0										2
R.	Number of 'manipulated' parasitized nests	0										4
S.	Number of 'successful, manipulated' nests (% = S/R x 100)	n/a										40% (2/5)
T.	Number of vireo fledged from 'manipulated' parasitized nests	n/a										4
U.	Number of repaired nests	0										2
V.	% successful repaired nests	n/a										100% (2/2)
W.	Number of vireo fledged from repaired nests	n/a										6

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

	Parameter	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Totals
A.	Number of pairs	2	4	13	13	28	35	29	50	65	84	n/a
B.	Number of breeding (nesting) pairs	n/d	4	12	12	26	27	28	48	60	70	287
C.	Number of breeding pairs that were well-monitored throughout the breeding season	n/d	2	11	10	22	13	23	29	32	41	183
D.	Number of 'known fledged young' OBSERVED	2	11	15	28	18	36	66	102	165	192	635
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season	n/d	6	12	28	17	25	59	76	114	160	497
F.	Average number of fledglings produced per breeding pair (minimum; D/B = 'productivity or breeding success')	n/d	2.8	1.3	2.3	0.7	1.3	2.4	2.1	2.8	2.7	2.2
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)	n/d	3	1.1	2.8	0.8	1.9	2.6	2.6	3.6	3.9	2.7
H.	Number of nests that were discovered	n/d	4	20	24	41	49	36	47	78	89	388
I.	Number of nests that were regularly monitored or 'tracked'	n/d	4	17	21	31	34	33	44	75	79	338
J.	Number of 'tracked' nests that were successful (% = J/I x 100)	n/d	100% (4/4)	35% (6/17)	48% (10/21)	29% (9/31)	44% (15/34)	64% (21/33)	61% (27/44)	65% (49/75)	65% (51/79)	57% (141/338)
K.	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% (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, 2000-2010, BY MANAGED SITE

SAN TIMOTEO CANYON (CONT.)

	Parameter	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Totals
M.	A. Number of 'tracked' nests that failed as a result of reproductive failure	n/d	0% (0/4)	0% (0/17)	0% (0/21)	0% (0/31)	6% (2/34)	0% (0/33)	2% (1/44)	4% (3/75)	1% (1/79)	2% (7/338)
	B. Number of 'tracked' nests that failed as a result of parasitism	n/d	0% (0/4)	29% (5/17)	0% (0/21)	6% (2/31)	15% (5/34)	12% (4/33)	9% (4/44)	5% (4/75)	1% (1/79)	7% (25/338)
	C. Number of 'tracked' nests that failed as a result of predation – Predation Rate according to Vireo Working Group	n/d	0% (0/4)	35% (6/17)	(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, 2000-2010, BY MANAGED SITE SAN TIMOTEO CANYON

	Parameter	2010										Totals
A.	Number of pairs	95										n/a
B.	Number of breeding (nesting) pairs	76										363
C.	Number of breeding pairs that were well-monitored throughout the breeding season	24										207
D.	Number of 'known fledged young' OBSERVED	137										772
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season	67										564
F.	Average number of fledglings produced per breeding pair (minimum; D/B = 'productivity or breeding success')	1.8										2.1
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)	2.8										2.7
H.	Number of nests that were discovered	55										443
I.	Number of nests that were regularly monitored or 'tracked'	37										375
J.	Number of 'tracked' nests that were successful (% = J/I x 100)	62% (23/37)										44% (164/375)
K.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)	65% (24/37)										47% (175/375)
L.	Number of 'tracked' nests that were parasitized by cowbirds (% = L/I x 100)	8% (3/37)										28% (106/375)

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

SAN TIMOTEO CANYON (CONT.)

	Parameter	2010										Totals
M.	A. Number of 'tracked' nests that failed as a result of reproductive failure	11% (4/37)										3% (11/375)
	B. Number of 'tracked' nests that failed as a result of parasitism	0% (0/41)										7% (25/375)
	C. Number of 'tracked' nests that failed as a result of predation – Predation Rate according to Vireo Working Group	27% (10/37)										33% (124/375)
N.	Average clutch size	3.4										n/a
O.	Number of cowbird eggs found in or near vireo nests	3										121
P.	Number of cowbird nestlings removed from 'tracked' nests	0										6
Q.	Number of cowbird young fledged by vireo	0										2
R.	Number of 'manipulated' parasitized nests	8% (3/37)										87
S.	Number of 'successful, manipulated' nests (% = S/R x 100)	100% (3/3)										51% (44/87)
T.	Number of vireo fledged from 'manipulated' parasitized nests	8										96
U.	Number of repaired nests	1										4
V.	% successful repaired nests	0% (0/1)										50% (2/4)
W.	Number of vireo fledged from repaired nests	0										5

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

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

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

MARCH SKR PRSERVE (CONT.)

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

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

Parameter		2010										Totals
A.	Number of pairs	12										n/a
B.	Number of breeding (nesting) pairs	8										38
C.	Number of breeding pairs that were well-monitored throughout the breeding season	3										12
D.	Number of 'known fledged young' OBSERVED	25										100
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season	19										57
F.	Average number of fledglings produced per breeding pair (minimum; D/B = 'productivity or breeding success')	3.1										2.6
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)	6.3										4.8
H.	Number of nests that were discovered	6										23
I.	Number of nests that were regularly monitored or 'tracked'	6										22
J.	Number of 'tracked' nests that were successful (% = J/I x 100)	100% (6/6)										77% (17/22)
K.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)	0% (0/6)										27% (6/22)
L.	Number of 'tracked' nests that were parasitized by cowbirds (% = L/I x 100)	0% (0/6)										0%

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

MARCH SKR PRSERVE (CONT.)

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

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

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

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

SYCAMORE CANYON (CONT.)

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

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

Parameter		2010										Totals
A.	Number of pairs	8										n/a
B.	Number of breeding (nesting) pairs	6										25
C.	Number of breeding pairs that were well-monitored throughout the breeding season	0										6
D.	Number of 'known fledged young' OBSERVED	11										51
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season	n/a										12
F.	Average number of fledglings produced per breeding pair (minimum; D/B = 'productivity or breeding success')	1.8										2.0
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)	n/a										2.0
H.	Number of nests that were discovered	0										10
I.	Number of nests that were regularly monitored or 'tracked'	n/a										9
J.	Number of 'tracked' nests that were successful (% = J/I x 100)	n/a										66.7% (6/9)
K.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)	n/a										33.3% (3/9)
L.	Number of 'tracked' nests that were parasitized by cowbirds (% = L/I x 100)	n/a										22.2% (2/9)

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

SYCAMORE CANYON (CONT.)

	Parameter	2010										Totals
M.	A. Number of 'tracked' nests that failed as a result of reproductive failure	n/a										0% (0/9)
	B. Number of 'tracked' nests that failed as a result of parasitism	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	n/a										22.2% (2/9)
N.	Average clutch size	n/a										n/a
O.	Number of cowbird eggs found in or near vireo nests	n/a										2
P.	Number of cowbird nestlings removed from 'tracked' nests	n/a										0
Q.	Number of cowbird young fledged by vireo	n/a										0
R.	Number of 'manipulated' parasitized nests	n/a										1
S.	Number of 'successful, manipulated' nests (% = S/R x 100)	n/a										100% (1/1)
T.	Number of vireo fledged from 'manipulated' parasitized nests	n/a										1
U.	Number of repaired nests	n/a										0
V.	% successful repaired nests	n/a										n/a
W.	Number of vireo fledged from repaired nests	n/a										n/a

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

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

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

MOCKINGBIRD CANYON (CONT.)

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

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

Parameter		2010										Totals
A.	Number of pairs	34										n/a
B.	Number of breeding (nesting) pairs	26										136
C.	Number of breeding pairs that were well-monitored throughout the breeding season	0										37
D.	Number of 'known fledged young' OBSERVED	25										243
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season	n/a										113
F.	Average number of fledglings produced per breeding pair (minimum; D/B = 'productivity or breeding success')	1.0										1.8
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)	n/a										3.1
H.	Number of nests that were discovered	3										102
I.	Number of nests that were regularly monitored or 'tracked'	0										82
J.	Number of 'tracked' nests that were successful (% = J/I x 100)	n/a										54.9% (45/82)
K.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)	n/a										37.8% (31/82)
L.	Number of 'tracked' nests that were parasitized by cowbirds (% = L/I x 100)	n/a										14.6% (12/82)

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

MOCKINGBIRD CANYON (CONT.)

	Parameter	2010										Totals
M.	A. Number of 'tracked' nests that failed as a result of reproductive failure	n/a										8.5% (7/82)
	B. Number of 'tracked' nests that failed as a result of parasitism	n/a										7.3% (6/82)
	C. Number of 'tracked' nests that failed as a result of predation – Predation Rate according to Vireo Working Group	n/a										29.3% (24/82)
N.	Average clutch size	3.0										n/a
O.	Number of cowbird eggs found in or near vireo nests	1										23
P.	Number of cowbird nestlings removed from 'tracked' nests	n/a										2
Q.	Number of cowbird young fledged by vireo	n/a										1
R.	Number of 'manipulated' parasitized nests	n/a										10
S.	Number of 'successful, manipulated' nests (% = S/R x 100)	n/a										10% (1/10)
T.	Number of vireo fledged from 'manipulated' parasitized nests	n/a										2
U.	Number of repaired nests	n/a										1
V.	% successful repaired nests	n/a										100% (1/1)
W.	Number of vireo fledged from repaired nests	n/a										1

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

HARRISON RESERVOIR

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

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

HARRISON RESERVOIR (CONT.)

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

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

SANTA ANA RIVER (RIVER RD. TO NORCO)

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

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

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

	Parameter	2000	2001*	2002*	2003*	2004	2005	2006	2007	2008	2009	Totals
M.	A. Number of 'tracked' nests that failed as a result of reproductive failure		0% (0/1)	0% (0/3)	0% (0/9)	3% (1/34)	0% (0/4)	6% (1/27)	12% (3/25)	0% (0/29)	2% (1/45)	3.4% (6/177)
	B. Number of 'tracked' nests that failed as a result of parasitism		0% (0/1)	0% (0/3)	0% (0/9)	0% (0/34)	0% (0/4)	25% (4/27)	0% (0/25)	0% (0/29)	0% (0/45)	2.3% (4/177)
	C. Number of 'tracked' nests that failed as a result of predation – Predation Rate according to Vireo Working Group		0% (0/1)	67% (2/3)	33% (3/9)	32% (11/34)	0% (0/4)	69% (11/27)	44% (11/25)	21% (6/29)	16% (7/45)	28.8% (45/177)
N.	Average clutch size		3.0	4.0	3.3	3.0	3.4	3.7	3.3	3.8	3.7	n/a
O.	Number of cowbird eggs found in or near vireo nests		0	1	0	0	3	7	5	3	1	20
P.	Number of cowbird nestlings removed from 'tracked' nests		0	0	0	0	0	1	0	0	0	1
Q.	Number of cowbird young fledged by vireo		0	0	0	0	0	0	0	0	0	0
R.	Number of 'manipulated' parasitized nests		0	1	0	0	3	3	4	2	1	13
S.	Number of 'successful, manipulated' nests (% = S/R x 100)		n/a	0% (0/1)	n/a	n/a	67% (2/3)	100% (3/3)	75% (3/4)	0% (0/2)	100% (1/1)	64.3% (9/14)
T.	Number of vireo fledged from 'manipulated' parasitized nests		n/a	0	n/a	n/a	2	4	4	0	3	13
U.	Number of repaired nests		n/d	n/d	0	0	0	0	1	0	1	2
V.	% successful repaired nests		n/d	n/d	n/d	n/a	n/a	n/a	0% (0/1)	n/a	100% (1/1)	50% (1/2)
W.	Number of vireo fledged from repaired nests		n/d	n/d	n/d	n/a	n/a	n/a	0	n/a	4	n/a

*River Rd to Hidden Valley, south side

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

SANTA ANA RIVER (RIVER RD. TO NORCO)

Parameter		2010										Totals
A.	Number of pairs	64										n/a
B.	Number of breeding (nesting) pairs	60										284
C.	Number of breeding pairs that were well-monitored throughout the breeding season	12										117
D.	Number of 'known fledged young' OBSERVED	113										602
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season	39										354
F.	Average number of fledglings produced per breeding pair (minimum; D/B = 'productivity or breeding success')	1.9										2.12
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)	3.3										3.03
H.	Number of nests that were discovered	22										234
I.	Number of nests that were regularly monitored or 'tracked'	18										195
J.	Number of 'tracked' nests that were successful (% = J/I x 100)	89% (16/18)										67.2% (131/195)
K.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)	28% (5/18)										40% (78/195)
L.	Number of 'tracked' nests that were parasitized by cowbirds (% = L/I x 100)	0% (0/18)										7.7% (15/195)

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

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

	Parameter	2010										Totals
M.	A. Number of 'tracked' nests that failed as a result of reproductive failure	0% (0/18)										3.1% (6/195)
	B. Number of 'tracked' nests that failed as a result of parasitism	0% (0/18)										2.1% (4/195)
	C. Number of 'tracked' nests that failed as a result of predation – Predation Rate according to Vireo Working Group	11% (2/18)										24.1% (47/195)
N.	Average clutch size	3.7										n/a
O.	Number of cowbird eggs found in or near vireo nests	0										20
P.	Number of cowbird nestlings removed from 'tracked' nests	0										1
Q.	Number of cowbird young fledged by vireo	0										0
R.	Number of 'manipulated' parasitized nests	0										13
S.	Number of 'successful, manipulated' nests (% = S/R x 100)	n/a										64.3% (9/14)
T.	Number of vireo fledged from 'manipulated' parasitized nests	n/a										13
U.	Number of repaired nests	0										2
V.	% successful repaired nests	n/a										50% (1/2)
W.	Number of vireo fledged from repaired nests	n/a										n/a

Table C-3. Least Bell's Vireo reproductive success and breeding biology data, monitored sites, in the Santa Ana River watershed, 2000-2010, BY MANAGED SITE **SANTA ANA RIVER (FAIRMOUNT PARK TO HIDDEN VALLEY)**

	Parameter	2000	2001	2002*	2003**	2004	2005	2006	2007	2008	2009	Totals
A.	Number of pairs			12	13	21	19	14	21	21	46	n/a
B.	Number of breeding (nesting) pairs			11	13	16	18	14	15	19	43	149
C.	Number of breeding pairs that were well-monitored throughout the breeding season			0	0	8	15	9	9	0	10	51 (n=5 yrs)
D.	Number of 'known fledged young' OBSERVED			4	13	30	35	36	27	31	107	283
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season			0	n/a	26	35	23	19	n/d	30	133 (n=5 yrs)
F.	Average number of fledglings produced per breeding pair (minimum; D/B = 'productivity or breeding success')			0.4	1.0	1.9	1.9	2.6	1.8	1.6	2.5	1.9
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)			0	n/a	3.3	2.3	2.6	2.1	n/d	3.0	2.6 (n=5 yrs)
H.	Number of nests that were discovered			9	16	13	19	9	10		18	94
I.	Number of nests that were regularly monitored or 'tracked'			9	5	10	19	9	9		14	75
J.	Number of 'tracked' nests that were successful (% = J/I x 100)			11% (1/9)	60% (3/5)	80% (8/10)	63% (12/19)	89% (8/9)	67% (6/9)		93% (13/14)	68.0% (51/75)
K.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)			33% (3/9)	40% (2/5)	40% (4/10)	47% (9/19)	33% (3/9)	22% (2/9)		7% (1/14)	32.0% (24/75)
L.	Number of 'tracked' nests that were parasitized by cowbirds (% = L/I x 100)			67% (6/9)	20% (1/5)	20% (2/10)	16% (3/19)	0% (0/9)	0% (0/9)		0% (0/14)	16.0% (12/75)

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

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

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

*Van Buren Blvd to Hidden Valley
**Fairmount Park to Van Buren Blvd

Table C-3. Least Bell's Vireo reproductive success and breeding biology data, monitored sites, in the Santa Ana River watershed, 2000-2010, BY MANAGED SITE **SANTA ANA RIVER (FAIRMOUNT PARK TO HIDDEN VALLEY)**

Parameter		2010										Totals
A.	Number of pairs	50										n/a
B.	Number of breeding (nesting) pairs	39										188
C.	Number of breeding pairs that were well-monitored throughout the breeding season	9										60
D.	Number of 'known fledged young' OBSERVED	58										341
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season	18										151
F.	Average number of fledglings produced per breeding pair (minimum; D/B = 'productivity or breeding success')	1.5										1.8
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)	2.0										2.5
H.	Number of nests that were discovered	13										107
I.	Number of nests that were regularly monitored or 'tracked'	11										86
J.	Number of 'tracked' nests that were successful (% = J/I x 100)	55% (6/11)										66.3% (57/86)
K.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)	36% (4/11)										32.6% (28/86)
L.	Number of 'tracked' nests that were parasitized by cowbirds (% = L/I x 100)	0										14.0% (12/86)

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

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

	Parameter	2010										Totals
M.	A. Number of 'tracked' nests that failed as a result of reproductive failure	9% (1/11)										3.5% (3/86)
	B. Number of 'tracked' nests that failed as a result of parasitism	0% (0/11)										7.0% (6/86)
	C. Number of 'tracked' nests that failed as a result of predation – Predation Rate according to Vireo Working Group	36% (4/11)										23.2% (20/86)
N.	Average clutch size	3.2										n/a
O.	Number of cowbird eggs found in or near vireo nests	0										15
P.	Number of cowbird nestlings removed from 'tracked' nests	0										0
Q.	Number of cowbird young fledged by vireo	1										2
R.	Number of 'manipulated' parasitized nests	0										10
S.	Number of 'successful, manipulated' nests (% = S/R x 100)	n/a										20.0% (2/10)
T.	Number of vireo fledged from 'manipulated' parasitized nests	n/a										5
U.	Number of repaired nests	0										1
V.	% successful repaired nests	n/a										n/a
W.	Number of vireo fledged from repaired nests	n/a										n/a

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

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, 2000-2010, BY MANAGED SITE

HIDDEN VALLEY (CONT.)

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

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

HIDDEN VALLEY

	Parameter	2010										Totals
A.	Number of pairs	43										n/a
B.	Number of breeding (nesting) pairs	36										248
C.	Number of breeding pairs that were well-monitored throughout the breeding season	9										65
D.	Number of 'known fledged young' OBSERVED	53										460
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season	19										161
F.	Average number of fledglings produced per breeding pair (minimum; D/B = 'productivity or breeding success')	1.5										1.9
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)	2.1										2.5
H.	Number of nests that were discovered	18										132
I.	Number of nests that were regularly monitored or 'tracked'	17										102
J.	Number of 'tracked' nests that were successful (% = J/I x 100)	41% (7/17)										64% (65/102)
K.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)	65% (11/17)										41% (42/102)
L.	Number of 'tracked' nests that were parasitized by cowbirds (% = L/I x 100)	6% (1/17)										7% (7/102)

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

HIDDEN VALLEY (CONT.)

	Parameter	2010										Totals
M.	A. Number of 'tracked' nests that failed as a result of reproductive failure	0% (0/17)										3% (3/102)
	B. Number of 'tracked' nests that failed as a result of parasitism	6% (1/17)										5% (5/102)
	C. Number of 'tracked' nests that failed as a result of predation – Predation Rate according to Vireo Working Group	53% (9/17)										28% (29/102)
N.	Average clutch size	3.4										N/A
O.	Number of cowbird eggs found in or near vireo nests	2										6
P.	Number of cowbird nestlings removed from 'tracked' nests	20										2
Q.	Number of cowbird young fledged by vireo	0										0
R.	Number of 'manipulated' parasitized nests	0										2
S.	Number of 'successful, manipulated' nests (% = S/R x 100)	n/a										100% (2/2)
T.	Number of vireo fledged from 'manipulated' parasitized nests	n/a										6
U.	Number of repaired nests	0										0
V.	% successful repaired nests	n/a										n/a
W.	Number of vireo fledged from repaired nests	n/a										n/a

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

HIDDEN VALLEY (north side)

	Parameter	2010										Totals
A.	Number of pairs	12										12
B.	Number of breeding (nesting) pairs	9										9
C.	Number of breeding pairs that were well-monitored throughout the breeding season	6										6
D.	Number of 'known fledged young' OBSERVED	18										18
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season	14										14
F.	Average number of fledglings produced per breeding pair (minimum; D/B = 'productivity or breeding success')	2.0										2.0
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)	2.3										2.3
H.	Number of nests that were discovered	10										10
I.	Number of nests that were regularly monitored or 'tracked'	9										9
J.	Number of 'tracked' nests that were successful (% = J/I x 100)	56% (5/9)										56% (5/9)
K.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)	11% (1/9)										11% (1/9)
L.	Number of 'tracked' nests that were parasitized by cowbirds (% = L/I x 100)	33% (3/9)										33% (3/9)

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

HIDDEN VALLEY (north side) (CONT.)

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

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

TEMESCAL CANYON

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

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

TEMESCAL CANYON (CONT.)

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

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

TEMESCAL CANYON

Parameter		2010										Totals
A.	Number of pairs	49										n/a
B.	Number of breeding (nesting) pairs	38										184
C.	Number of breeding pairs that were well-monitored throughout the breeding season	11										92
D.	Number of 'known fledged young' OBSERVED	73										412
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season	34										251
F.	Average number of fledglings produced per breeding pair (minimum; D/B = 'productivity or breeding success')	1.9										2.2
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)	3.1										2.7
H.	Number of nests that were discovered	22										188
I.	Number of nests that were regularly monitored or 'tracked'	15										148
J.	Number of 'tracked' nests that were successful (% = J/I x 100)	87% (13/15)										64% (95/148)
K.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)	20% (3/15)										37% (55/148)
L.	Number of 'tracked' nests that were parasitized by cowbirds (% = L/I x 100)	0% (0/15)										18% (27/148)

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

TEMESCAL CANYON (CONT.)

	Parameter	2010										Totals
M.	A. Number of 'tracked' nests that failed as a result of reproductive failure	0/15										3% (5/148)
	B. Number of 'tracked' nests that failed as a result of parasitism	0/15										3% (4/148)
	C. Number of 'tracked' nests that failed as a result of predation – Predation Rate according to Vireo Working Group	13% (2/15)										30% (44/148)
N.	Average clutch size	3.7										n/a
O.	Number of cowbird eggs found in or near vireo nests	0										33
P.	Number of cowbird nestlings removed from 'tracked' nests	0										2
Q.	Number of cowbird young fledged by vireo	0										2
R.	Number of 'manipulated' parasitized nests	0										29
S.	Number of 'successful, manipulated' nests (% = S/R x 100)	0										41% (12/29)
T.	Number of vireo fledged from 'manipulated' parasitized nests	na										26
U.	Number of repaired nests	0										0
V.	% successful repaired nests	na										n/a
W.	Number of vireo fledged from repaired nests	na										n/a

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

SANTA ANA CANYON – UPPER CANYON

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

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

SANTA ANA CANY0N – UPPER CANYON (CONT.)

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

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

SANTA ANA CANYON – UPPER CANYON

	Parameter	2010										Totals
A.	Number of pairs	4										n/a
B.	Number of breeding (nesting) pairs	3										113
C.	Number of breeding pairs that were well-monitored throughout the breeding season	0										46
D.	Number of 'known fledged young' OBSERVED	6										214
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season	n/a										118
F.	Average number of fledglings produced per breeding pair (minimum; D/B = 'productivity or breeding success')	2.0										1.9
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)	n/a										2.6
H.	Number of nests that were discovered	2										99
I.	Number of nests that were regularly monitored or 'tracked'	1										65
J.	Number of 'tracked' nests that were successful (% = J/I x 100)	100% (1/1)										65% (42/65)
K.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)	0% (0/1)										40% (26/65)
L.	Number of 'tracked' nests that were parasitized by cowbirds (% = L/I x 100)	0% (0/1)										6.2% (4/65)

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

SANTA ANA CANY0N – UPPER CANYON (CONT.)

	Parameter	2010										Totals
M.	A. Number of 'tracked' nests that failed as a result of reproductive failure	0% (0/1)										4.6% (3/65)
	B. Number of 'tracked' nests that failed as a result of parasitism	0% (0/1)										3.1% (2/65)
	C. Number of 'tracked' nests that failed as a result of predation – Predation Rate according to Vireo Working Group	0% (0/1)										27.7% (18/65)
N.	Average clutch size	4.0										n/a
O.	Number of cowbird eggs found in or near vireo nests	0										3
P.	Number of cowbird nestlings removed from 'tracked' nests	0										1
Q.	Number of cowbird young fledged by vireo	0										0
R.	Number of 'manipulated' parasitized nests	0										1
S.	Number of 'successful, manipulated' nests (% = S/R x 100)	n/a										100% (1/1)
T.	Number of vireo fledged from 'manipulated' parasitized nests	n/a										1
U.	Number of repaired nests	0										2
V.	% successful repaired nests	n/a										0% (0/2)
W.	Number of vireo fledged from repaired nests	n/a										0

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

SANTA ANA CANYON – GREEN RIVER GOLF CLUB

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

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

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

	Parameter	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Totals
M.	A. Number of 'tracked' nests that failed as a result of reproductive failure		11% (1/9)	0% (0/10)	0% (0/8)	25% (1/4)	17% (1/6)	0% (0/6)	0% (0/3)	0% (0/6)	11% (1/9)	6.6% (4/61)
	B. Number of 'tracked' nests that failed as a result of parasitism		11% (1/9)	0% (0/10)	0% (0/8)	0% (0/4)	0% (0/6)	0% (0/6)	0% (0/3)	0% (0/6)	0% (0/9)	1.6% (1/61)
	C. Number of 'tracked' nests that failed as a result of predation – Predation Rate according to Vireo Working Group		22% (2/9)	50% (5/10)	25% (2/8)	0% (0/4)	0% (0/6)	17% (1/6)	0% (0/3)	0% (0/6)	22% (2/9)	19.7% (12/61)
N.	Average clutch size		3.6	3.6	3.5	3.0	3.6	4.0	3.7	3.6	3.5	n/a
O.	Number of cowbird eggs found in or near vireo nests		4	0	0	0	0	0	0	0	0	4
P.	Number of cowbird nestlings removed from 'tracked' nests		0	0	0	0	0	0	0	0	0	0
Q.	Number of cowbird young fledged by vireo		0	0	0	0	0	0	0	0	0	0
R.	Number of 'manipulated' parasitized nests		2	0	0	0	0	0	0	0	0	2
S.	Number of 'successful, manipulated' nests (% = S/R x 100)		100% (2/2)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	100% (2/2)
T.	Number of vireo fledged from 'manipulated' parasitized nests		6	0	n/d	n/a	n/a	0	n/a	n/a	n/a	6
U.	Number of repaired nests		n/d	n/d	1	0	0	2	1	0	0	4
V.	% successful repaired nests		n/d	n/d	100% (1/1)	n/a	n/a	50% (1/2)	100% (1/1)	n/a	n/a	75.0% (3/4)
W.	Number of vireo fledged from repaired nests		n/d	n/d	3	n/a	n/a	3	1	n/a	n/a	7

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

SANTA ANA CANYON – GREEN RIVER GOLF CLUB

Parameter		2010										Totals
A.	Number of pairs	17										n/a
B.	Number of breeding (nesting) pairs	14										106
C.	Number of breeding pairs that were well-monitored throughout the breeding season	4										48
D.	Number of 'known fledged young' OBSERVED	19										211
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season	7										125
F.	Average number of fledglings produced per breeding pair (minimum; D/B = 'productivity or breeding success')	1.4										2.0
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)	1.8										2.6
H.	Number of nests that were discovered	7										80
I.	Number of nests that were regularly monitored or 'tracked'	7										68
J.	Number of 'tracked' nests that were successful (% = J/I x 100)	43% (3/7)										69.1% (47/68)
K.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)	71% (5/7)										30.9% (21/68)
L.	Number of 'tracked' nests that were parasitized by cowbirds (% = L/I x 100)	0% (0/7)										5.9% (4/68)

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

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

	Parameter	2010										Totals
M.	A. Number of 'tracked' nests that failed as a result of reproductive failure	0% (0/7)										5.9% (4/68)
	B. Number of 'tracked' nests that failed as a result of parasitism	0% (0/7)										1.5% (1/68)
	C. Number of 'tracked' nests that failed as a result of predation – Predation Rate according to Vireo Working Group	57% (4/7)										23.5% (16/68)
N.	Average clutch size	4.0										n/a
O.	Number of cowbird eggs found in or near vireo nests	0										4
P.	Number of cowbird nestlings removed from 'tracked' nests	0										0
Q.	Number of cowbird young fledged by vireo	0										0
R.	Number of 'manipulated' parasitized nests	0										2
S.	Number of 'successful, manipulated' nests (% = S/R x 100)	n/a										100% (2/2)
T.	Number of vireo fledged from 'manipulated' parasitized nests	n/a										6
U.	Number of repaired nests	0										4
V.	% successful repaired nests	n/a										75.0% (3/4)
W.	Number of vireo fledged from repaired nests	n/a										7

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

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

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

SANTA ANA RIVER – FEATHERLY PARK (CONT.)

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

*corrected value

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

Parameter		2010										Totals
A.	Number of pairs	23										n/a
B.	Number of breeding (nesting) pairs	18										127
C.	Number of breeding pairs that were well-monitored throughout the breeding season	3										39
D.	Number of 'known fledged young' OBSERVED	22										197
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season	6										79
F.	Average number of fledglings produced per breeding pair (minimum; D/B = 'productivity or breeding success')	1.2										1.6
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)	2.0										2.0
H.	Number of nests that were discovered	11										94
I.	Number of nests that were regularly monitored or 'tracked'	7										72
J.	Number of 'tracked' nests that were successful (% = J/I x 100)	29% (2/7)										47.2% (34/72)
K.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)	71% (5/7)										50% (36/72)
L.	Number of 'tracked' nests that were parasitized by cowbirds (% = L/I x 100)	0% (07)										6.9% (5/72)

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

SANTA ANA RIVER – FEATHERLY PARK (CONT.)

	Parameter	2010										Totals
M.	A. Number of 'tracked' nests that failed as a result of reproductive failure	0% (0/7)										4.2% (3/72)
	B. Number of 'tracked' nests that failed as a result of parasitism	0% (0/7)										2.8% (2/72)
	C. Number of 'tracked' nests that failed as a result of predation – Predation Rate according to Vireo Working Group	71% (5/7)										45.8% (33/72)
N.	Average clutch size	4.0										n/a
O.	Number of cowbird eggs found in or near vireo nests	0										4
P.	Number of cowbird nestlings removed from 'tracked' nests	0										1
Q.	Number of cowbird young fledged by vireo	0										0
R.	Number of 'manipulated' parasitized nests	0										3
S.	Number of 'successful, manipulated' nests (% = S/R x 100)	n/a										33.3% (1/3)
T.	Number of vireo fledged from 'manipulated' parasitized nests	n/a										2
U.	Number of repaired nests	1										5
V.	% successful repaired nests	100% (1/1)										100% (5/5)
W.	Number of vireo fledged from repaired nests	2										16

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

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

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

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

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

Parameter		2010										Totals
A.	Number of pairs	7										n/a
B.	Number of breeding (nesting) pairs	4										41
C.	Number of breeding pairs that were well-monitored throughout the breeding season	3										18 (n=5 yrs)
D.	Number of 'known fledged young' OBSERVED	7										61
E.	Number of 'known fledged young' produced by pairs monitored throughout the breeding season	5										24 (n=5 yrs)
F.	Average number of fledglings produced per breeding pair (minimum; D/B = 'productivity or breeding success')	1.8										1.5
G.	Average number of fledglings produced by pairs monitored throughout the breeding season (E/C)	1.7										1.3
H.	Number of nests that were discovered	3										27
I.	Number of nests that were regularly monitored or 'tracked'	3										22
J.	Number of 'tracked' nests that were successful (% = J/I x 100)	67% (2/3)										36.4% (8/22)
K.	Rate of missing eggs/chicks from nests (successful and unsuccessful nests) %=K/I x100) (b)	33% (1/3)										59.1% (13/22)
L.	Number of 'tracked' nests that were parasitized by cowbirds (% = L/I x 100)	0% (0/3)										27.3% (6/22)

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

	Parameter	2010										Totals
M.	A. Number of 'tracked' nests that failed as a result of reproductive failure	0% (0/3)										4.5% (1/22)
	B. Number of 'tracked' nests that failed as a result of parasitism	0% (0/3)										9.1% (2/22)
	C. Number of 'tracked' nests that failed as a result of predation – Predation Rate according to Vireo Working Group	33% (1/3)										50% (11/22)
N.	Average clutch size	3.7										n/a
O.	Number of cowbird eggs found in or near vireo nests	0										9
P.	Number of cowbird nestlings removed from 'tracked' nests	0										0
Q.	Number of cowbird young fledged by vireo	0										0
R.	Number of 'manipulated' parasitized nests	0										6
S.	Number of 'successful, manipulated' nests (% = S/R x 100)	n/a										0% (0/6)
T.	Number of vireo fledged from 'manipulated' parasitized nests	n/a										0
U.	Number of repaired nests	0										0
V.	% successful repaired nests	n/a										n/a
W.	Number of vireo fledged from repaired nests	n/a										n/a

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

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

Table C-3. Least Bell's vireo reproductive success and breeding biology data, monitored sites, in the Santa Ana River watershed, 2010, BY MANAGED SITE Irvine Regional Park (CONT.)

	Parameter	2010										Totals
M.	A. Number of 'tracked' nests that failed as a result of reproductive failure	0										0
	B. Number of 'tracked' nests that failed as a result of parasitism	0										0
	C. Number of 'tracked' nests that failed as a result of predation – Predation Rate according to Vireo Working Group	25% (1/4)										25%
N.	Average clutch size	3.5										3.5
O.	Number of cowbird eggs found in or near vireo nests	4										4
P.	Number of cowbird nestlings removed from 'tracked' nests	0										0
Q.	Number of cowbird young fledged by vireo	0										0
R.	Number of 'manipulated' parasitized nests	0										0
S.	Number of 'successful, manipulated' nests (% = S/R x 100)	0%										0
T.	Number of vireo fledged from 'manipulated' parasitized nests	0										0
U.	Number of repaired nests	0										0
V.	% successful repaired nests	0										0
W.	Number of vireo fledged from repaired nests	0										0