

RECLAMATION

Managing Water in the West

Preliminary Avian Monitoring Study Results - 2008

Folsom Dam Safety/Flood Damage Reduction Project
Folsom, California



U.S. Department of the Interior
Bureau of Reclamation
Fisheries and Wildlife Resources
Denver, Colorado

February 2009

Mission Statements

The mission of the Department of the Interior is to protect and provide access to our Nation's natural and cultural heritage and honor our trust responsibilities to Indian Tribes and our commitments to island communities.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

Preliminary Avian Monitoring Study Results - 2008

**Folsom Dam Safety/Flood Damage Reduction Project
Folsom, California**

prepared for

**Bureau of Reclamation
Central California Area Office**

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**U.S. Department of the Interior
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Introduction

In a joint effort between the Bureau of Reclamation (Reclamation), the U.S. Army Corps of Engineers (Corps), and the Corps' non-federal sponsors, the Central Valley Flood Protection Board/Department of Water Resources and the Sacramento Area Flood Control Agency, the Folsom Dam Safety/Flood Damage Reduction (DS/FDR) project was initiated at Folsom Reservoir in December 2007. The DS/FDR project objectives are to reduce the risk of flood damage along the mainstem of the American River and to address dam safety needs at Folsom Dam and Reservoir.

In accordance with environmental commitments in both the Folsom Dam Safety and Flood Damage Reduction Joint Federal Project Record of Decision (ROD) and the Folsom Dam Safety of Dams and Security Upgrades Projects ROD, and cooperation with the U.S. Fish and Wildlife Service and California Department of Parks and Recreation, Reclamation initiated a monitoring study of the avian community utilizing the habitat adjacent to current construction activities at Folsom Dam. The Avian Nest Monitoring Plan at Folsom Dam addresses several laws, regulations, and executive orders pertaining to the protection of bird species, including the Endangered and Threatened Species Act (ESA), the California Endangered Species Act (CESA), and the Migratory Bird Treaty Act (MBTA). Biologists from Reclamation's Technical Service Center, in cooperation with Reclamation's Central California Area Office (CCAO) and Mid-Pacific Regional Office, began the bird monitoring project at Folsom Dam construction sites in late February 2008 and continued through June 2008.

Habitat potentially impacted by construction activities at Folsom Dam consists of oak woodlands, oak savanna, and a few narrow riparian corridors owned by Reclamation and managed by California Department of Parks and Recreation (CDPR). Our study area also includes the Mormon Island Wetland Preserve (MIWP), consisting of mature cottonwood and willow riparian habitat interspersed with scattered oak woodlands, grasslands and emergent marsh. Field methodologies included nest searching and monitoring, and point counts within five study plots located adjacent to either current construction activities or proposed future construction sites. Construction intensity varied between plots during the four month study. Potential impacts to breeding birds were in the form of noise and dust. However, two trees were removed by construction crews late in the bird breeding season, which were monitored to ensure no birds were nesting in them prior to removal. Otherwise, Reclamation directed construction crews to remove vegetation only in the project area between September 1 and February 28, when birds are not expected to be nesting within the project area.

Baseline data for avian nesting was not collected at Folsom Dam prior to initiation of the DS/FDR project. However, two of the five study plots are located in areas that were not impacted by construction activities during the 2008 bird breeding season; one is scheduled for construction in the fall of 2008 and continuing through the 2009 bird breeding and migration season. These plots were used as reference sites, and the data are compared from plots adjacent to construction activities to assess potential impacts to breeding bird abundance and nest success. Additionally, data from other

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breeding bird studies conducted by Reclamation in the western U.S. were also compared to data gathered at Folsom as a general reference for nesting variables.

Goals and Objectives

Primary goals of the field study performed in 2008 were:

1. Monitor the avian community utilizing the habitat adjacent to construction zones active during the bird breeding and migration season.
2. Contribute baseline data by monitoring the avian community utilizing non-construction areas that will be adjacent to construction zones next (2009) bird breeding season.

Specific objectives included:

1. Conducting nest searches and monitoring for all bird species breeding at both current and future construction areas to determine nest productivity, predation, and abandonment rates to assess potential impacts from construction activities, including whether a bird hazing program should be implemented in 2009 to reduce the likelihood of nest abandonment as a result of the construction noise and activities during the bird breeding season.
2. Conduct fixed-radius point counts to determine avian abundance and species richness within study plots as related to construction activities.
3. Complying with ESA, CESA, and MBTA regulations pertaining to the Folsom DS/FDR project.

Methods

Study Area

Folsom Dam is located near the city of Folsom, CA, about 23 miles northeast of Sacramento, CA. The study area is located along the southern end of Folsom Reservoir, within and adjacent to the Folsom DS/FDR project construction footprint (Figure 1). A total of five study plots were selected for nest searching/monitoring and each contains one point count route. Three of the study plots were adjacent to current construction areas - Right Wing Dam (RWD), Haul Road, and Folsom Point - and two of the five plots were located in areas that will be impacted by future construction - Dike 5 and Mormon Island Wetland Preserve (Figure 2). All nest monitoring and point counts were conducted by Steve Ryan and Evan Mickle, SAIC biologists under contract with Reclamation's Technical Service Center. Field research crew biographies are provided at the end of this report.

Nest Monitoring

Beginning in late February 2008, a 500 foot buffer adjacent to current and future construction zones at each of the five plots was delineated, and inside each buffer zone nest searching was conducted. Each plot was thoroughly searched at least one day per



Figure 1. General location of 2008 study area and construction activities.

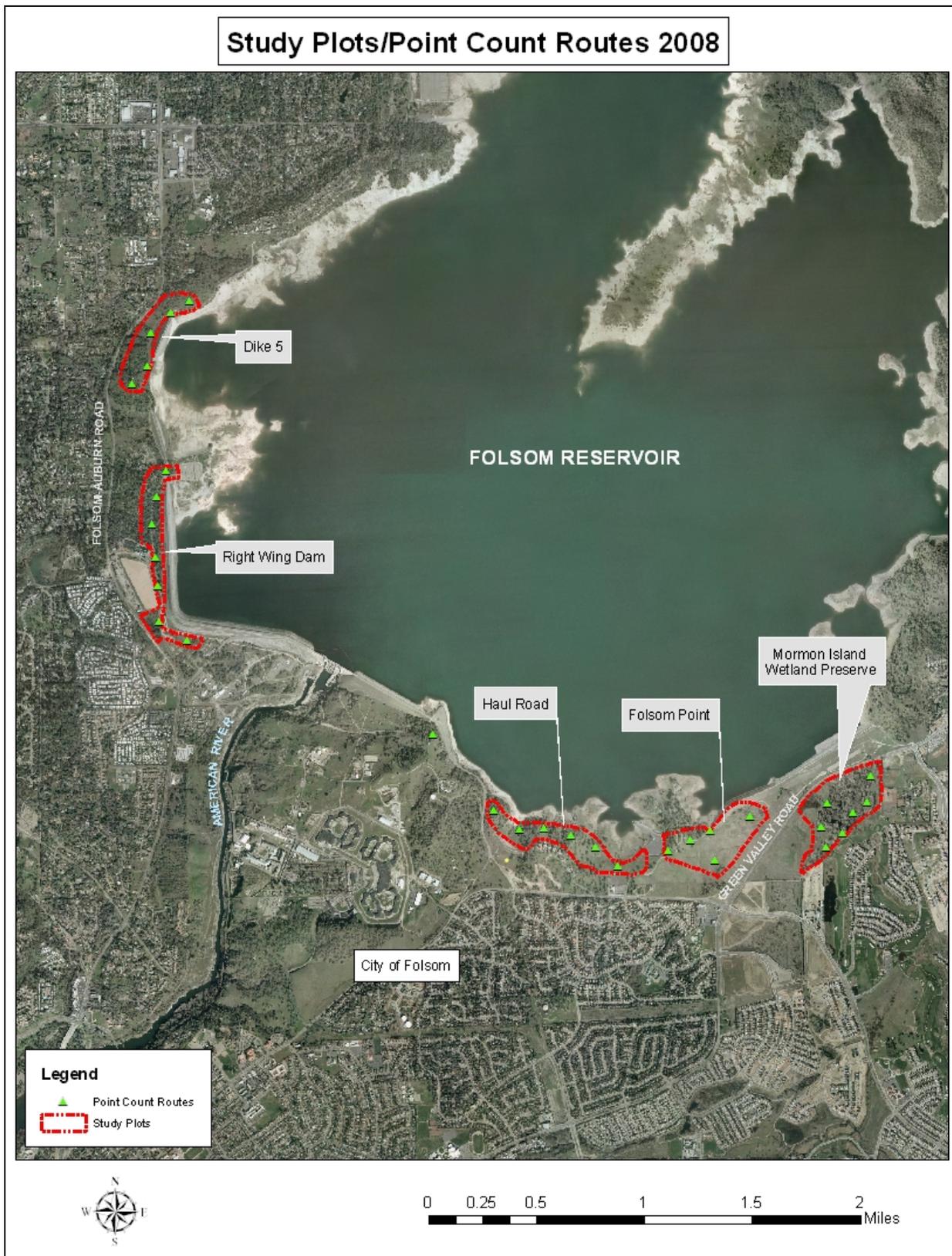


Figure 2. Location of 2008 study plots and associated point count routes.

week beginning in late February and continuing through late June. Nest monitoring was conducted according to methods outlined in the BBIRD Field Protocol (Martin et al. 1997). Nests were located by observing behaviors of the bird species known to breed in the area. Once a nest was located it was observed for a short period of time (usually less than five minutes), using binoculars if necessary. Each nest was cautiously approached to minimize disturbance, and the contents of the nests were observed, if possible. Nests were monitored to determine success or cause of failure [i.e., depredation, Brown-headed Cowbird (*Molothrus ater*) brood parasitism, abandonment]. A nest was recorded as abandoned if a pair built a nest and no additional activity occurred, or if eggs were laid and the adults never returned to the nest to incubate. When signs of depredation were observed (i.e. scattered broken egg shells, feathers scattered in and around the nest, or if nests were damaged) and no young fledged, nests were recorded as depredated. In many cases, nest height and/or cavity characteristics made observation of contents difficult or impossible (which was the case with all raptor species and several songbird nests) and visual or auditory cues (i.e. nestlings heard, adults carrying food, nestlings or fledglings observed, etc.) were used to determine nesting status. These factors also made it difficult to determine whether nests were parasitized by Brown-headed Cowbirds. However, due to the preponderance of cavity nesting species within our study area, it is assumed that parasitism rates were low. Special status bird species (i.e. federal or California threatened or endangered, California species of concern – see Appendix D) breeding in the study area were given priority for nest searching/monitoring efforts to evaluate nesting outcomes.

Three nest plots were located adjacent to current construction zones - Right Wing Dam, Haul Road, and Folsom Point. The remaining two nest plots - Dike 5 and Mormon Island Wetland Preserve - were located in areas that are in close proximity to future construction projects. The total area of the five plots was approximately 229 acres. The following is a description of location, total area monitored, habitat, and construction activity for each of the five nest plots (Figure 2). See Appendix A for maps of general vegetation types and associated acreages within each study plot.

The **Right Wing Dam** study plot was located on the southwest side of Folsom Reservoir, approximately 0.7 miles northwest of the main concrete dam. The plot was bounded on the east by the toe of the Right Wing Dam and extends 500 feet to the west. The American River Bike Trail runs through the middle of this plot, and the Beals Point campground covers much of the northern end. Construction adjacent to this site was heavy at times during the study, as construction crews were raising the dike and hauling materials along the road adjacent to the toe of the dam. Oak habitat in the northern portion of the plot consists of both interior live-oak (*Quercus wislizeni*) and blue oak (*Quercus douglasii*) trees in the upper canopy and scattered poison oak (*Toxicodendron diversilobum*) and California buckeye (*Aesculus californica*) in the understory. Vegetative composition of the southern end of the site is primarily dense oak woodlands with a fairly dense understory dominated by poison-oak and Himalayan blackberry (*Rubus discolor*). The eastern side of this site, between the bike path and the dam, is very narrow and contains a small patch of young Goodding's willow (*Salix gooddingii*) and Fremont cottonwood (*Populus fremontii*), mixed with scattered poison oak. A pond in the middle of this habitat contains water during wet periods; however, it was completely dry by early-April. The total area searched in this plot was 46 acres.

The **Haul Road** study plot was located on the southern side of Folsom Reservoir to the east of the main concrete dam and adjacent to the haul road from Dike 7 to Dike 8. This site was a high noise

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area during most of the study period, as crews were hauling materials along the road adjacent to the northern edge of this site. Habitat within this site is predominately composed of mature interior live-oak and blue oak trees, with scattered patches of Himalayan blackberry and poison oak. This plot also contains a small area of dense oak woodlands mixed with gray pine (*Pinus sabiniana*) and a well developed understory of poison-oak, Himalayan blackberry, and California buckeye. The area nest searched in this plot was approximately 47 acres.

The **Folsom Point** study plot was located on the southeast side of Folsom Reservoir between Dike 8 and the Mormon Island Auxiliary Dam (MIAD). Construction activities increased during the second month of the study, as crews installed a grade separation structure or small overpass above the haul road for continued public access to Folsom Point. Habitat throughout the majority of this site was more of an open oak savanna, consisting of mature interior live oak and blue oak trees, with scattered mature gray pines and patches of poison-oak and Himalayan blackberry. The eastern border of the site contains a narrow patch of young Goodding's willow, Fremont cottonwood, coyote willow (*Salix exigua*) and arroyo willow (*Salix lasiolepis*). The area nest searched in this plot totaled approximately 43 acres.

The **Dike 5** study plot was located on the west side of Folsom Reservoir approximately 1.5 miles northwest of the main concrete dam. Construction will begin in September 2008 and will continue into the spring of 2009 which will be the next bird breeding season. All data collected in this plot in 2008 will be used as baseline data for future monitoring. Habitat within this site is dominated by a mix of interior live oak and blue oak, with scattered gray pines making up the overstory and a poison oak/California buckeye understory. This site also contains one narrow patch of Goodding's willow and Fremont cottonwood overstory with a mix of poison oak and Himalayan blackberry understory. The total area of this plot is 34 acres.

The **Mormon Island Wetland Preserve** study plot was located just south of MIAD and Green Valley Road. Beginning in 2011, MIAD will undergo construction and Green Valley Road may be rerouted potentially impacting adjacent habitat. Therefore, data collected at this site will be used as baseline data for future monitoring. The habitat within this site is a mix of mature Goodding's willow, Fremont cottonwood, and both interior live and blue oaks, with scattered mature gray pines. The mid-level vegetation consists of arroyo willow, coyote willow, poison oak and Himalayan blackberry. Willow Creek runs through the riparian habitat and numerous ponds are scattered throughout the middle of this plot; however, both the creek and all ponds were completely dry by mid-May due to an unusually dry spring. According to the National Oceanic and Atmospheric Administration (NOAA) website, this was the driest spring (March-May) ever recorded in the state of California. The total area of this plot is approximately 59 acres.

Point Counts

To monitor the diversity, distribution and abundance of the avian community in the study plots, we conducted 5-minute, 60-meter (m) fixed-radius point counts once per week in each study plot, beginning in early March, and continuing through mid-June. Point count stations were at least 150m apart, and the number of points surveyed (stations) at each of the five routes within the study plots ranged from five to seven, with a combined total of 31 stations (Figure 2). Point count routes were established to evaluate as much of each plot as possible, with respect to current and future construction zones. Point counts began close to sunrise and were completed by no later than

9:00am, to coincide with the period of greatest avian activity and so each point count was completed prior to construction noise. If construction noise became too loud to effectively conduct counts at a particular station, the count was delayed and restarted again once the noise ceased. Each of the five point count routes was conducted 13 times over the four month study period and we assumed that the likelihood of detection for all bird species was equal. The following is a detailed description of each point count route surveyed during the spring/summer of 2008.

The **Right Wing Dam** point count route consisted of seven stations. The habitat throughout this point count route was dominated by mature oak woodlands. Construction adjacent to this point count generated high noise levels and dust, as crews were working to modify and upgrade the dike, and materials were being hauled along the road next to this point count route. Each station was located along the American River Bike Path, beginning at the southern terminus of Dike 6 and continuing south along the bike path and the western toe of the Right Wing Dam towards the CCAO office. In addition to the construction activities, the northern portion of this point count route included a portion of the Beals Point campground, which was occasionally occupied by campers.

The **Haul Road** point count route consisted of seven stations located along the Haul Road from Observation Point to the parking lot at Folsom Point. The point count station at Observation Point, which was located in a small patch of oak woodland and isolated from the remainder of the study plot, was only surveyed through May 8 as construction activities after that date increased and access to the area became unsafe. The remaining six point count stations were located just south of the Haul Road, which consists of oak woodland and oak savanna habitat.

The **Folsom Point** point count route consisted of five stations through oak woodland and oak savanna habitat from the Folsom Point parking lot to the western side of MIAD. A haul road runs through this route, and points were positioned on both sides of the road. The road was not used very heavily while conducting the point counts. However, construction was heavy near the western-most stations, as the grade separation structure was constructed for public access to the Folsom Point parking lot over the haul road.

The **Dike 5** point count route consisted of five stations parallel to the western toe of Dike 5. The two stations located on the northwest of the dike were on a hill overlooking Folsom Reservoir in an open oak savanna habitat with mature oak trees. The remaining three stations were to the south, below the dike. Habitat was dominated by smaller oak trees, with a well developed understory of Himalayan blackberry and poison oak.

The **Mormon Island Wetland Preserve** point count route was located within the preserve south of MIAD between Green Valley Road and the Empire Ranch golf course. This route consisted of seven stations beginning at the gate on Green Valley Road and continuing around the Preserve. This route was dominated by cottonwood and willow riparian habitat throughout the middle of the Preserve, with scattered oaks on the outer edges. Construction at MIAD is scheduled for 2011, along with future widening of Green Valley Road, which could potentially impact the bird community in this study plot.

Results

Nest Monitoring

During the nest searches conducted in all study plots from February 29 through June 22, a total of 196 nests of 36 species were located and monitored (Table 1). The fate of 10 nests was unknown; therefore, these nests were not included in the analyses of nesting success. Of the 186 nests, 130 (70%) were successful, 37 (20%) were depredated, and 19 (10%) were abandoned. In addition, 4 of the nests were parasitized, but because it was often impossible to observe the contents of many nests, Brown-headed Cowbird (*Molothrus ater*) brood parasitism rates were not included in our analyses. Resident species accounted for 160 of the 186 nests monitored; 12 nests were Neotropical migrant bird species (NTMBs); and 14 were European Starling (*Sturnus vulgaris*) nests (a non-native species and major competitor with native species for nesting cavities in oak woodlands). Two Cooper's Hawk (*Accipiter cooperii*) nests were monitored (a species of special concern in the state of California). Both nests were located in close proximity to construction activities and each successfully fledged juveniles. Additionally, two White-tailed Kites (*Elanus leucurus*) were occasionally observed flying above the canopy and perched on trees at the MIWP study plot. However, they were believed to have nested somewhere else, or were first year juveniles that did not nest this year. Appendix B contains a detailed nest log of all nests monitored in 2008.

A total of 133 nests were monitored adjacent to current construction zones within the Right Wing Dam, Haul Road, and Folsom Point study plots. Of these 133 nests, fates of 8 (6%) were unknown and were not included in our nesting variable analysis. Of the remaining 125 nests, 86 (69%) were successful, 26 (21%) failed due to predation, and 13 (10%) were abandoned. In the two nest plots with no current construction - Dike 5 and MIWP - a total of 63 nests were located and monitored. Of these, two had unknown fates leaving 61 nests for analysis. Of these 61 nests, 44 (72%) were successful, 11 (18%) failed due to predation, and 6 (10%) were abandoned.

Table 1. Summary of all nests monitored during the 2008 bird breeding season. Nest variable calculations do not include nests of unknown fate.

Study plot	# Nests Located	Unknown Fate	# Nests Predated (%)	# Nests Abandoned (%)	# Nests Fledged (%)
Construction plots					
Right Wing Dam	43	1	9 (21%)	2 (5%)	31 (74%)
Haul Road	36	2	4 (12%)	5 (15%)	25 (74%)
Folsom Point	54	5	13 (27%)	6 (12%)	30 (61%)
Total	133	8	26 (21%)	13 (10%)	86 (69%)
Non-construction Plots					
Dike 5	20	0	6 (30%)	1 (5%)	13 (65%)
Mormon Island WP	43	2	5 (12%)	5 (12%)	31 (76%)
Total	63	2	11 (18%)	6 (10%)	44 (72%)
Total All Nests	196	10	37 (20%)	19 (10%)	130 (70%)

Since cavity nesting species' nest outcomes are sometimes difficult to determine, we used methods outlined by Dudley and Saab (2003) to help determine nest fate. For our analyses, if fledglings were not observed, cavity nests were assumed successful when adults were observed feeding nestlings, or when nestlings vocalizing from within the cavity were heard. Therefore, our nest success rates may err on the high side for cavity nesting species as some of these nests may have failed late in the nestling period. The following is a summary of nest searching/monitoring results in each of the five study plots in 2008. Figure 3 maps all bird nests monitored during this study and a list of all nesting species is presented in Appendix D.

Right Wing Dam

A total of 43 nests from 17 species were located and monitored here, including one Cooper's Hawk nest, located approximately 5 meters from the construction zone at RWD, which successfully fledged 3 juveniles. Figure 4 shows the proximity of the Cooper's Hawk nest to Right Wing Dam construction activities. Sixteen of the 43 nests were Bushtits (*Psaltriparus minimus*), the most common bird species breeding in this plot. Other common bird species found here include Oak Titmice (*Baeolophus griseus*) with five nests and Anna's Hummingbirds (*Calypte anna*) with 4 nests. Nesting was more common through the middle of the plot in the dense oak woodlands on both sides of the bike path. Overall nesting success was 74%, with only two nests (5%) abandoned and nine (21%) predated.

Haul Road

Despite being adjacent to a high construction noise area this nest plot was productive. A total of 36 nests from 16 species were located within this plot. Twenty five (74%) of the 36 nests monitored here were successful, four (12%) failed due to predation, and five (15%) were abandoned. The most common bird species breeding in this plot was the Bushtit with seven nests, followed closely by Western Bluebird (*Sialia mexicana*) and Lesser Goldfinch (*Carduelis psaltria*) with four nests each. One Cooper's Hawk pair, which nested within approximately 10 meters to the Haul Road, successfully fledged three juveniles.

Folsom Point

A total of 54 nests from 19 species were located within this plot, the most nests of the five nest plots. Overall nest success was lowest at this plot, with 30 (61%) successfully fledging, 13 (27%) depredated, and 6 (12%) abandoned for unknown reason. House Finches (*Carpodacus mexicanus*) were abundant and built nests in colonies with Lesser Goldfinch along a narrow row of mature oak trees located at the southern boundary of the plot adjacent to Green Valley Road. Combined, these species produced 18 of the 54 total nests. One Great-horned Owl (*Bubo virginianus*) nest successfully fledged at least two juveniles, and a Red-tailed Hawk (*Buteo jamaicensis*) nest, located at the southern edge of the plot adjacent to Green Valley Road, fledged three juveniles. European starlings accounted for 7 nests.

Dike 5

A total of 20 nests from 13 species were located and monitored. Of the 20 nests, 13 (65%) were successful, 6 (30%) were depredated, and one (5%) Lesser Goldfinch nest was abandoned. Bushtits were the most abundant species, accounting for 5 of the 20 nests found in the Dike 5 plot. Overall, resident species were the most common breeders here, accounting for 18 of the 20 nests. Two nests

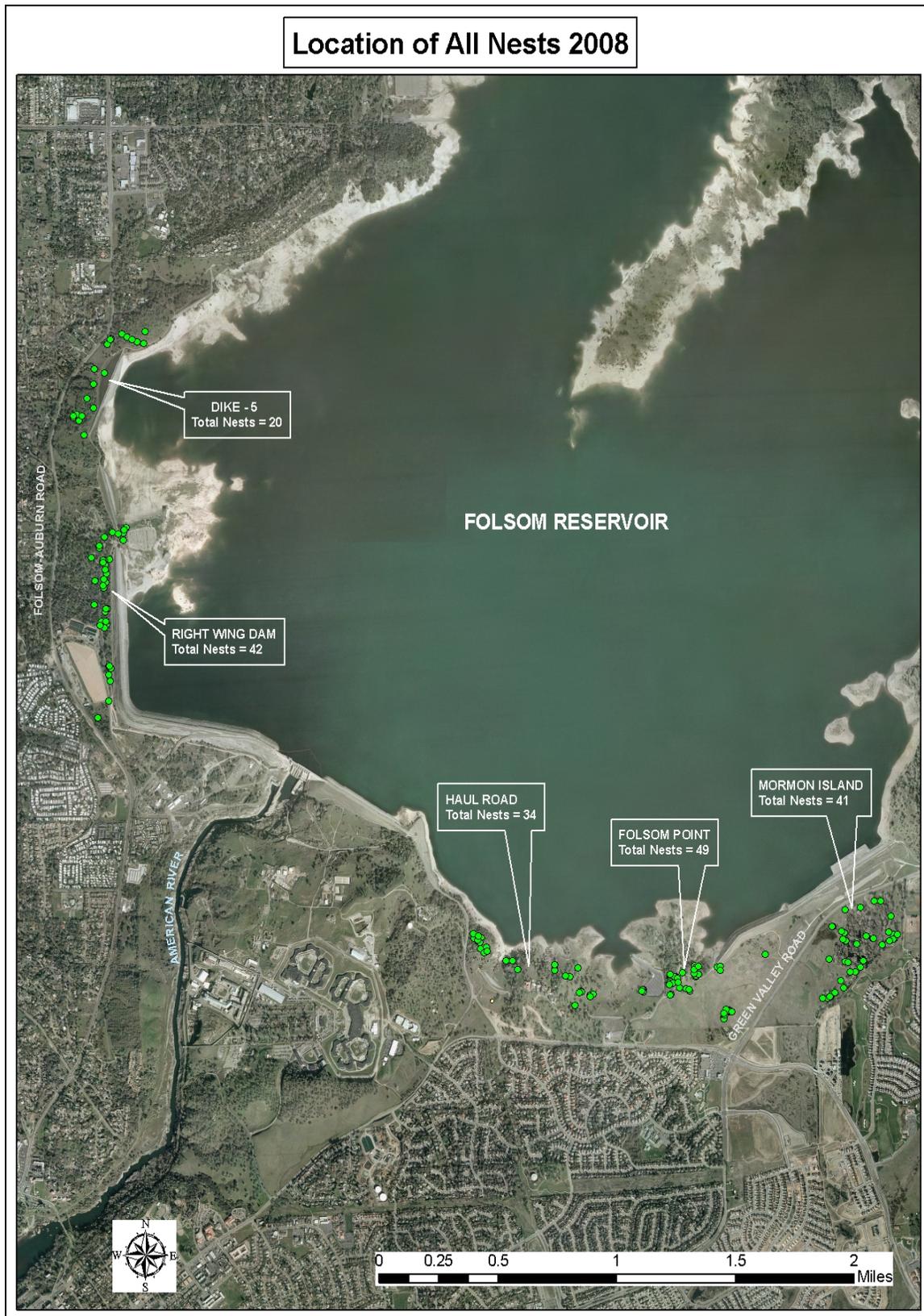


Figure 3. Bird nest locations at Folsom DS/FDR project - 2008.



Figure 4. Photo of Cooper's Hawk nest within Right Wing Dam plot showing proximity to construction activities.

were Neotropical migrant species - one Western Kingbird (*Tyrannus verticalis*) and one Black-headed Grosbeak (*Pheucticus melanocephalus*) - both successfully fledging.

Mormon Island Wetland Preserve

The MIWP study plot had the highest species richness of nesting birds of the five plots. Forty-three nests from 23 species were located and monitored. During years with normal precipitation, the creek and most of the ponds contain water much later in the bird breeding season, which could increase the number of riparian dependant species nesting here. This plot had the highest rate (76%) of nest success. Five (12%) nests were depredated and five (12%) were abandoned. Raptor nests were more abundant at Mormon Island with a total of four - one Red-shouldered Hawk (*Buteo lineatus*), one Red-tailed Hawk, a Great-horned Owl, and one American Kestrel (*Falco sparverius*) - all successfully fledged juveniles. Black Phoebe (*Sayornis nigricans*) nests were commonly found below foot bridges and signs throughout Mormon Island nest plot. Seven Black Phoebe nests were monitored, and six fledged young. Bushtits were also common here, producing 7 nests.

Statistical Analysis

Nest success, predation, and abandonment rates were grouped for construction and non-construction plots and then compared using a Chi-square test with an alpha of 0.05. No statistical difference was found for the three nesting variables. Nest success in plots adjacent to construction (69%, n=125)

Results

were not significantly less successful than those without construction activities (72%, n=61) ($\chi^2=0.22$, df=1, $P=0.64$). Predation rates were not significantly different between construction plots (21%, n=125) and non-construction plots (18%, n=61) ($\chi^2=0.20$, df=1, $P=0.66$). Abandonment rates were almost identical between construction plots (10%, n=125) and non-construction plots (10%, n=61) ($\chi^2=0.01$, df=1, $P=0.91$).

Additionally, in an effort to account for the differing species composition and abundance between study plots, a guild of commonly occurring species was selected and assessed within construction and non-construction plots. These species include three cavity nesters (Oak Titmouse, White-breasted Nuthatch, and Bewick's Wren) and three non-cavity nesting species (Anna's Hummingbird, Bushtit, Lesser Goldfinch). Four of these six species nested at least once within each study plot, and two species (Oak Titmouse and White-breasted Nuthatch) nested within four of the five plots. Although sample sizes are reduced in this analysis, the results are similar to those when all species are used. Nest success rates between construction plots (64%, n=64) and non-construction plots (64%, n=22) are almost the same ($\chi^2<0.01$, df=1, $P=0.97$). Nest abandonment rates between construction plots (8%, n=64) and non-construction plots (9%, n=22) are also very similar ($\chi^2=0.04$, df=1, $P=0.85$).

Point Counts

A total of 85 bird species were detected on the five point count routes (31 total stations) during the 4 month period. Of these, 49 were resident species (species that stay in the Folsom area year-round); 24 were Neotropical migrant species (species that breed in North America, but winter in Central or South America); and 12 were local wintering species (species that over-winter in the Folsom area, but migrate out of the area to breed elsewhere). Point count data for each of the five routes surveyed during the 2008 bird breeding and migration seasons are presented in Appendix C, and a list of all species detected is presented in Appendix D. Data on the relative abundance of individual species are presented as well as pooled for species groups including resident bird species, local wintering bird species, and Neotropical migrant bird species. Point count data for each study plot were also grouped by month (March, April, May, and June) in order to assess trends during the avian migratory and breeding seasons. As shown in Figures 5 and 6, the MIWP route was consistently among the highest in bird species richness and overall abundance, while Folsom Point was generally lowest in species richness and the Haul Road lowest in overall bird abundance.

Right Wing Dam

The most common bird species detected here were resident species including Bushtit, Lesser Goldfinch, House Finch, Anna's Hummingbird, Oak Titmouse, Bewick's Wren (*Thryomanes bewickii*), and California Towhee (*Pipilo crissalis*). Local wintering bird species most often detected include Yellow-rumped Warbler (*Dendroica coronata*), Ruby-crowned Kinglet (*Regulus calendula*), and both White-crowned (*Zonotrichia leucophrys*) and Golden-crowned Sparrows (*Zonotrichia atricapilla*), all of which migrated out of the area by the end of April. Neotropical migrant bird species most often encountered included Ash-throated Flycatcher (*Myiarchus cinerascens*), Tree Swallow (*Tachycineta bicolor*), Northern Rough-winged Swallow (*Stelgidopteryx serripennis*), and Western Kingbird (*Tyrannus verticalis*), which migrated into the area between mid-March and early May. One Bald Eagle (*Haliaeetus leucocephalus*) was detected in mid-May, which perched high on a gray pine to feed on prey. Cooper's Hawks were detected here in March,

April, and May, as one point count station was located in close proximity to their nest. Avian abundance at this point count route increased as the breeding season progressed.

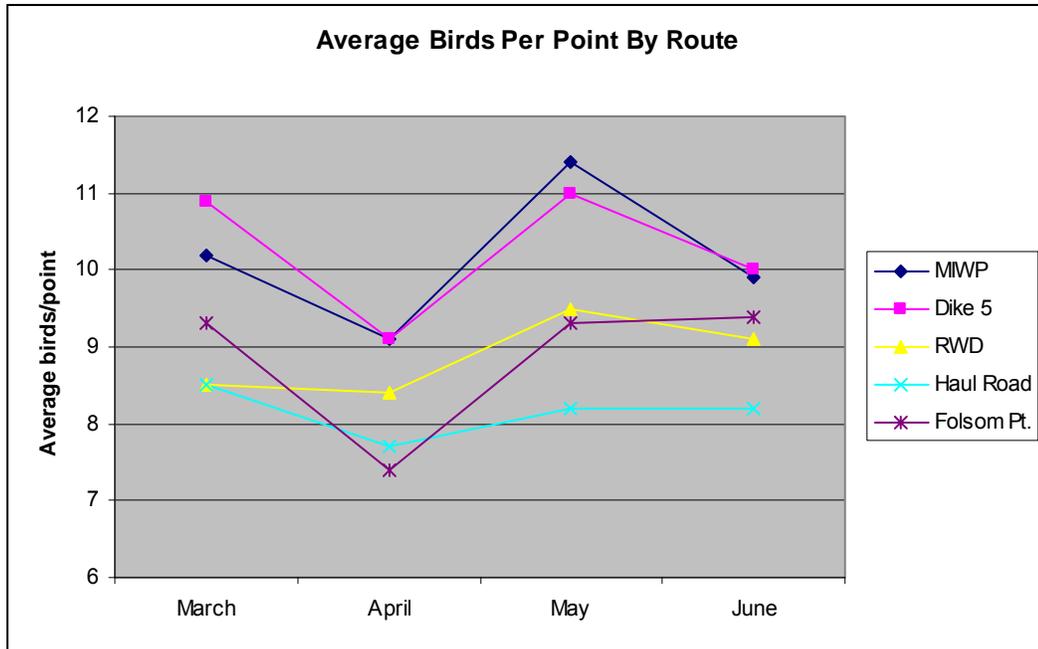


Figure 5. Average number of individual birds per point by month for all five point count routes during 2008 at Folsom DS/FDR project construction and non-construction sites.

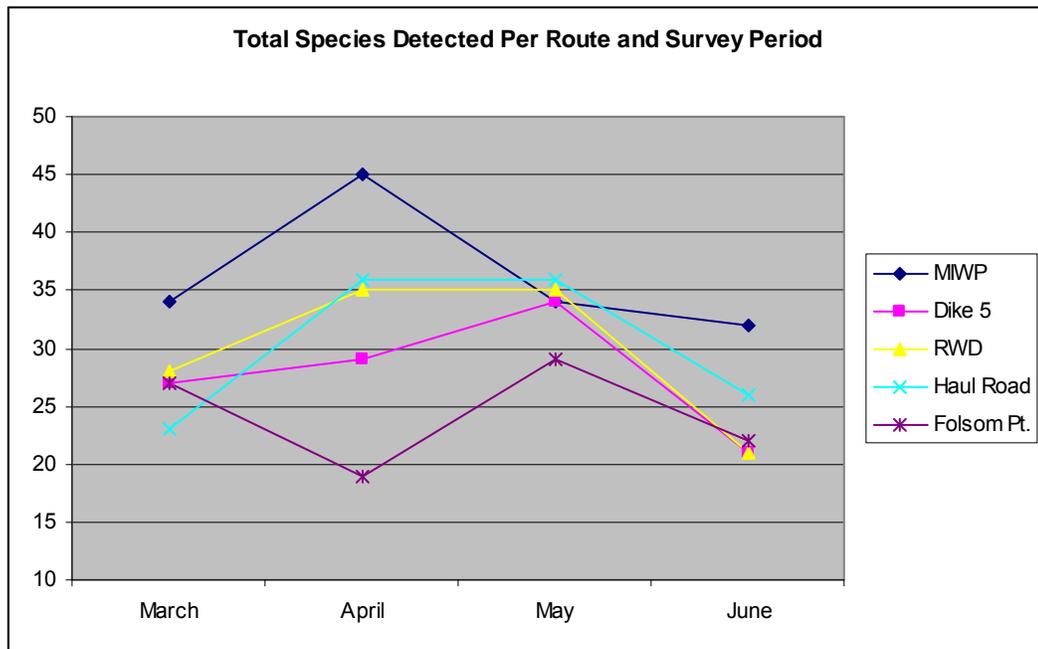


Figure 6. Bird species richness within each study plot based on point count routes by survey period.

Haul Road

Resident bird species most commonly detected along this point count included Lesser Goldfinch, Bushtit, Oak Titmouse, Anna's Hummingbird, House Finch, and Bewick's Wren. Yellow-rumped Warbler, Ruby-crowned Kinglet, and both Golden-crowned and White-crowned Sparrows were the most common local wintering species found; all departing for their breeding grounds by late-April. The most abundant Neotropical migrant bird species detected included Tree Swallow, Ash-throated Flycatcher, Bullock's Oriole (*Icterus bullockii*), and Western Kingbird. Of the five point count routes, this route had the highest number (14) of Neotropical migrant bird species detections. However, Ash-throated Flycatchers were the only Neotropical species documented nesting within the Haul Road study plot. This point count route was lowest in bird abundance but among the highest in species richness.

Folsom Point

Lesser Goldfinch and House Finch were the most abundant bird species detected at Folsom Point, often observed in large groups. Other common resident species detected include Oak Titmouse, Acorn Woodpecker (*Melanerpes lewis*), Bushtit, Red-tailed Hawk, Anna's Hummingbird, White-breasted Nuthatch (*Sitta carolinensis*), and House Wren (*Troglodytes aedon*). Red-tailed Hawks were often seen flying in vicinity of their nest, which was located approximately 40 meters from a point count station. Local wintering species most commonly found here include Golden-crowned Sparrow, White-crowned Sparrow, Savannah Sparrow (*Passerculus sandwichensis*), and Yellow-rumped Warbler. Tree Swallow, Bullock's Oriole, Western Kingbird, Cliff Swallow (*Petrochelidon fulva*), and Ash-throated Flycatcher were the most abundant Neotropical migrant bird species and, with the exception of Cliff Swallows, all nested at the Folsom Point study plot. This route was lowest in species richness.

Dike 5

Most commonly encountered resident bird species here included Lesser Goldfinch, Bushtit, Oak Titmouse, House Finch, Rufous-crowned Sparrow (*Aimophila ruficeps*), Acorn Woodpecker, and California Towhee. Abundant local wintering species detected included Yellow-rumped Warbler, Orange-crowned Warbler, Ruby-crowned Kinglet, and some large groups of American Pipits (*Anthus rubescens*) were encountered during the month of March. Ash-throated Flycatcher, Western Kingbird, and Tree Swallow were the most abundant Neotropical migrant species utilizing the habitat for nesting in the Dike 5 study plot. This route was among the highest in bird abundance.

Mormon Island Wetland Preserve

This point count route had the highest bird species richness and overall bird abundance of the five point count routes. Resident species most commonly encountered here included House Wren, Oak Titmouse, Black Phoebe, Lesser Goldfinch, Bewick's Wren, and Western Scrub-jay (*Aphelocoma californica*). Ruby-crowned Kinglet and Yellow-rumped Warbler were the most common local wintering species encountered. Tree Swallows were abundant, often observed in large flocks. Other commonly encountered Neotropical migrant species included Ash-throated Flycatcher, Bullock's Oriole, Western Kingbird, and both Wilson's (*Wilsonia pusilla*) and Yellow Warblers (*Dendroica*

petechia). In addition, an individual White-tailed Kite (a California species of concern), was detected during an April point count and occasionally observed utilizing the habitat on the eastern edge of the preserve.

Discussion

Nest Searches/Monitoring

Nest Success

Based on these study results, avian nesting success within construction-impact study plots (69%) and non-construction plots (72%) were essentially identical (Figure 7). When

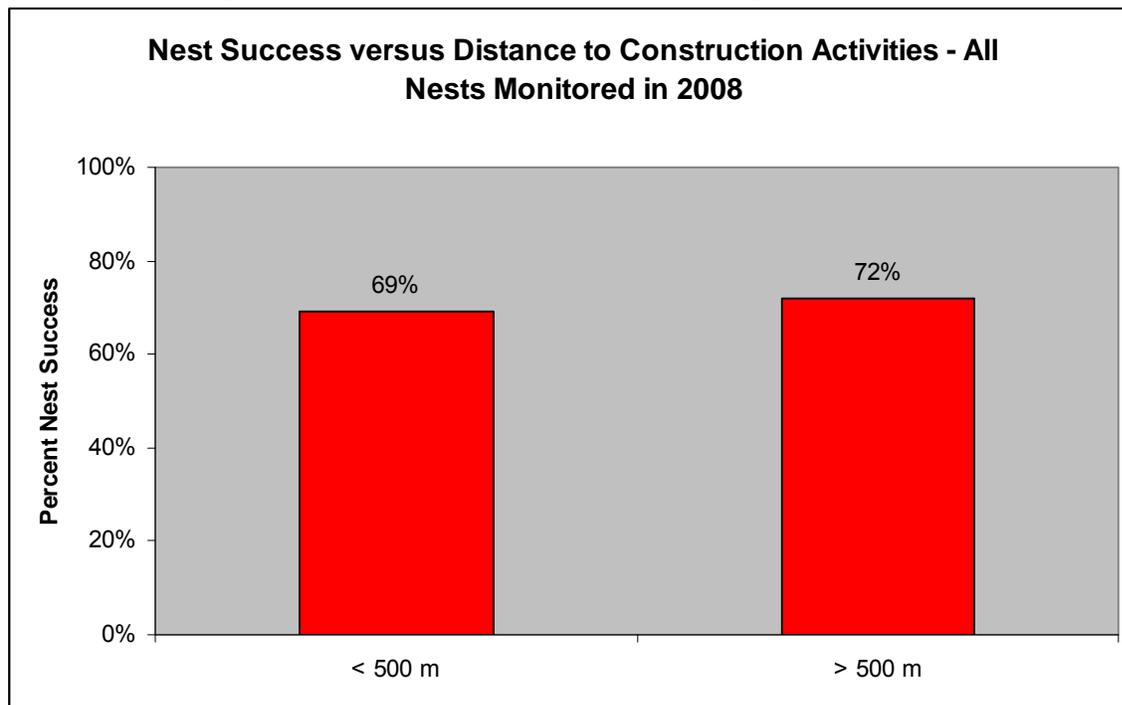


Figure 7. Percentage of successful nests versus distance to construction.

comparing the guild of commonly occurring species discussed in the Statistical Analyses section, the nesting success rates were also identical between the construction-impacted plots (64%) and the non-construction plots (64%). Additionally, when comparing nest success data to data gathered during other nest monitoring studies conducted by Reclamation, overall nest success was high at the Folsom Dam construction site. For example, in a nest monitoring study of Neotropical migrant songbirds conducted within riparian habitat of the Rio Grande, nest success averaged 39.5% during the six years of the study (Moore 2006). Nest success of Southwestern Willow Flycatcher nests in the middle Rio Grande between 1999 and 2007 averaged 55.7% success (Moore and Ahlers 2007). In addition, from 1999 to 2006 Reclamation's Technical Service Center conducted nest monitoring of potential Brown-headed Cowbird host species along the Lower Colorado River and nest success averaged 72.5% during the eight years of this study (Ryan et. al. 2006). Thus, even considering the relatively small sample sizes in this study and potentially inflated success rates (as described in Results – Nest Monitoring above), in this first year of bird monitoring it appears that indirect effects of construction activities (dust, noise) are not significantly impacting overall bird species nest

success within the Folsom DS/FDR project area. Additional data and more in-depth analyses in subsequent years will provide greater insight into any construction-related impacts.

Nest Abandonment

The mean nest abandonment rate at the three plots adjacent to construction (10%) was statistically the same as those observed at the two non-construction study plots (10%) (Figure 8). The commonly occurring guild of species mean abandonment rates between construction plots (8%) and non-construction plots (9%) are also very similar. Birds abandon nests for a variety of disturbance-related reasons. However, it appears that construction activities did not have a significant impact on nest abandonment rates of bird species overall at Folsom Dam in this first year of bird monitoring. When abandonment rates were compared with other bird nest monitoring studies conducted by Reclamation, rates observed at the Folsom project appear within the normal range. Abandonment rates observed among Southwestern Willow Flycatcher nests in the aforementioned study ranged from a low of 6% in 2002 to a high of 14% in 2007, with an overall mean of 10% over the nine years of the study (Moore and Ahlers 2007). In addition, during the eight years monitoring potential Brown-headed Cowbird host species' nests along the Lower Colorado River, nest abandonment rates ranged from a low of 4% in 2001 to a high of 22% in 1999, with a mean of 9% over the eight years of nest monitoring (Ryan et. al. 2006). As stated above, additional data during subsequent years of nest monitoring will aid in evaluating any construction-related impacts to avian nesting.

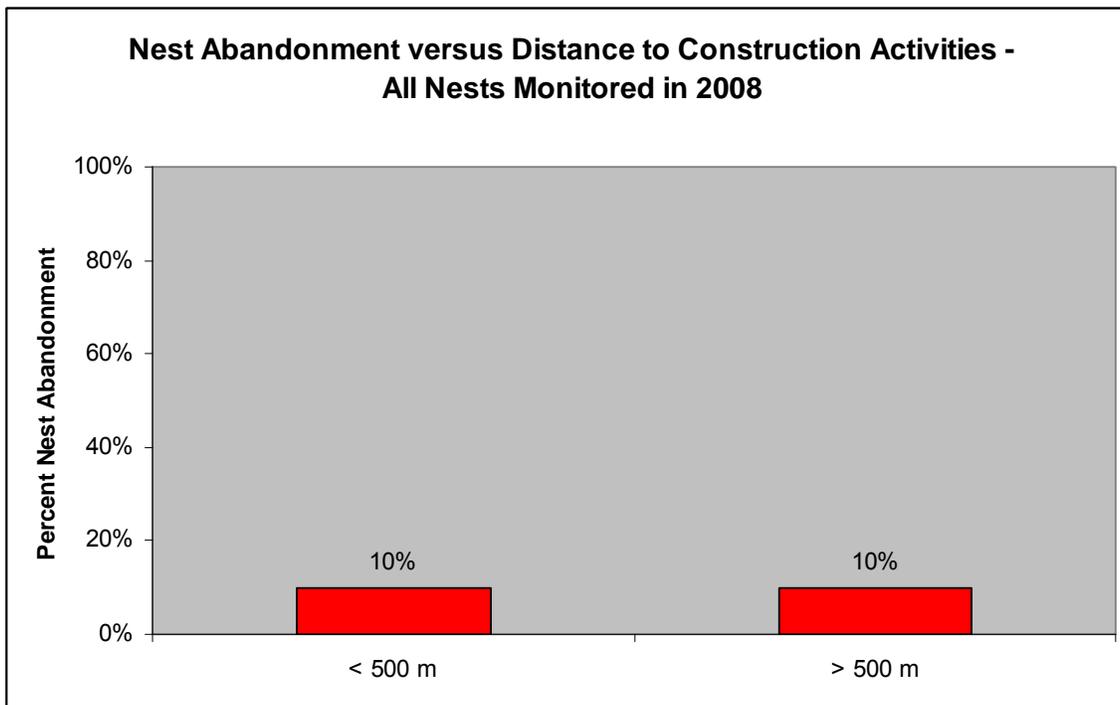


Figure 8. Percentage of nests abandoned versus distance to construction.

Avian Point Counts

Point counts at Dike 5, Right Wing Dam, the Haul Road, Folsom Point, and MIWP documented the occurrence of a diverse population of resident species, local wintering species, and spring and summer migratory bird species. Resident species were the dominant group detected within each of the five point count routes. The local wintering species utilizing the habitat were most abundant during the March and April point counts. The majority of these local wintering species migrated out of the area sometime in late-April and early-May without nesting. Neotropical migrant species were most commonly detected from late-April to mid-June, with the exception of Tree Swallows, which migrated into the area earlier than other migratory species. Migratory species detected on point counts that nested in the study area included Ash-throated Flycatcher, Black-headed Grosbeak, Bullock's Oriole, Western Kingbird, Tree Swallow, Spotted Towhee, and Violet-green Swallow. The remainder of the migratory species detected during point counts utilized the habitat as a stopover on their migration routes.

The two point count routes within non-construction plots were among the highest in overall bird abundance and species richness (Figures 5 and 6). Habitat within these two plots, particularly within the Mormon Island Wetland Preserve riparian habitat, appears to be more diverse than that present in the three other point count routes that were adjacent to construction activities. However, it is possible that the lower abundance and species richness observed within the construction plots is due to disturbance from the adjacent construction activities. In the absence of pre-construction baseline data, the reason for this remains speculative and can only be corroborated, or refuted, with successive years of bird monitoring. More in-depth data analysis in the future, including investigating species-specific and species guild impacts, will provide a better understanding of any construction impacts.

Conclusions/Recommendations

Nest monitoring and point count data gathered during the 2008 bird breeding and migration season at the Folsom DS/FDR project site was essential to initially assess potential project related impacts to the avian community. In addition, these data can be used to establish baseline conditions from which future construction activities can be evaluated. Due to the preliminary nature of the nest monitoring and point count data, it is difficult to determine if construction impacted avian nesting at the Folsom DS/FDR project site. The low nest abandonment and high nest success rates seem to indicate a limited impact to nesting due to construction activities. Conversely, the reduced bird abundance and species richness observed within the construction plots during point counts may be due to disturbance from the adjacent construction activities but, in the absence of pre-construction baseline data, will need to be corroborated, or refuted, through successive years of bird monitoring. Future monitoring efforts should be designed to provide reference study plots as well as supplemental data which will increase sample size of bird species monitored and allow greater confidence to make inferences from more robust results about potential effects of the Folsom DS/FDR construction activities on the avian community.

Hypotheses To Be Evaluated

Recommendations for the following field season include:

1. Continue to focus nest searching activities on bird species of concern. Secondly, focus nest searching on common indicator species including Bushtit, Anna's Hummingbird, Oak Titmouse, White-breasted Nuthatch, Woodpeckers, NTMBs, and all raptor species to establish a baseline of nesting productivity in a given year and allow stronger inferences about project effects. As time permits, conduct nest searches and monitoring on other species within the study plot.
2. Continue nest monitoring within existing study plots and point counts within existing routes to supplement 2008 data and monitor impacts of any future construction activities.
3. Add two reference study plots and conduct nest searches/monitoring and point count routes – to compare data with construction impacted study plots.
4. Decrease frequency of point counts from weekly to every other week in order to maximize time spent nest searching and monitoring.
5. Conduct study during the same period as 2008 - late February to the end of June, or until bird breeding season is essentially completed - to evaluate peak breeding and migration activity.
6. Conduct field status conference call every other week with CCAO and Regional Office biologists.

Hypotheses To Be Evaluated

Data collected at the Folsom DS/FDR project site in 2009 will supplement 2008 data and will aid in investigating the following hypotheses:

1. Avian nest success, depredation and abandonment rates are similar in construction-impacted and non-construction study plots.
2. Nesting success of Species of Special Concern is not negatively impacted by construction activities.
3. Overall avian nesting density is similar in construction-impacted and non-construction plots.
4. Avian species richness and overall abundance, as determined by point counts, is lower in study plots adjacent to construction activities than in study plots not impacted by construction. Individual species as well as guilds of commonly occurring and similar species will be evaluated. Habitat associations will also be investigated to determine links between avian species richness and abundance and habitat present within each study plot.

Literature Cited

- Dudley, J. and V. Saab. 2003. A Field Protocol to Monitor Cavity-Nesting Birds: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fort Collins, CO.
- Martin, M.E., C. Paine, C.J. Conway, W.M. Hochachka, P. Allen, and W. Jenkins. 1997. Breeding Biology Research & Monitoring Database: Montana Coop. Wildlife Research Unit. Biological Resources Division, University of Montana, Missoula, MT.
- Moore, D. 2006. Riparian Obligate Nesting Success as Related to Cowbird Abundance and Vegetation Characteristics Along the Middle Rio Grande, New Mexico. Bureau of Reclamation, Technical Service Center, Denver, CO.
- Moore, D. and D. Ahlers. 2007. 2007 Southwestern Willow Flycatcher Study Results: Selected sites Along the Rio Grande From Velarde to Elephant Butte Reservoir, New Mexico. Bureau of Reclamation, Technical Service Center, Denver, CO.
- Ryan, S., D. Moore, and R. Siegle. 2006. Results of Brown-Headed Cowbird Control Program Monitoring, 1999-2006 – Final Report: Alamo Lake State Wildlife Area and Bill Williams River National Wildlife Refuge, Arizona – year 2006. Bureau of Reclamation, Technical Service Center, Denver, CO.
- NOAA, U.S. Precipitation data, spring (Mar-May) 2008: 8 Dec, 2008
<<http://climvis.ncdc.noaa.gov/cgi-bin/cag3/state-map-display.pl>>

Attachment - Field Research Crew

Steve Ryan – Wildlife Biologist.

Experience: 8 years as a biologist with Reclamation's Fisheries & Wildlife Resources Group, Denver Technical Service Center. SAIC contractor with the Denver Technical Service Center. Conduct biological research associated with riparian habitats throughout the western U.S. Avian specific projects include:

- 2005 - 2008. Conducted nest searches and nest monitoring for the endangered Southwestern-willow flycatcher, as well as detailed habitat quantification and vegetation mapping along the middle Rio Grande River in New Mexico
- April - July 2007. Lead field biologist conducting avian point counts throughout the Lower Colorado River Region in Arizona, Nevada, and California for all bird species, followed by vegetation quantification for future habitat restoration goals.
- 2001 - 2006. Lead field biologist conducting nest searches/monitoring and point counts for all bird species that are potential hosts to Brown-headed Cowbird brood parasitism at the Bill Williams NWR and Alamo Lake State Park in western Arizona.

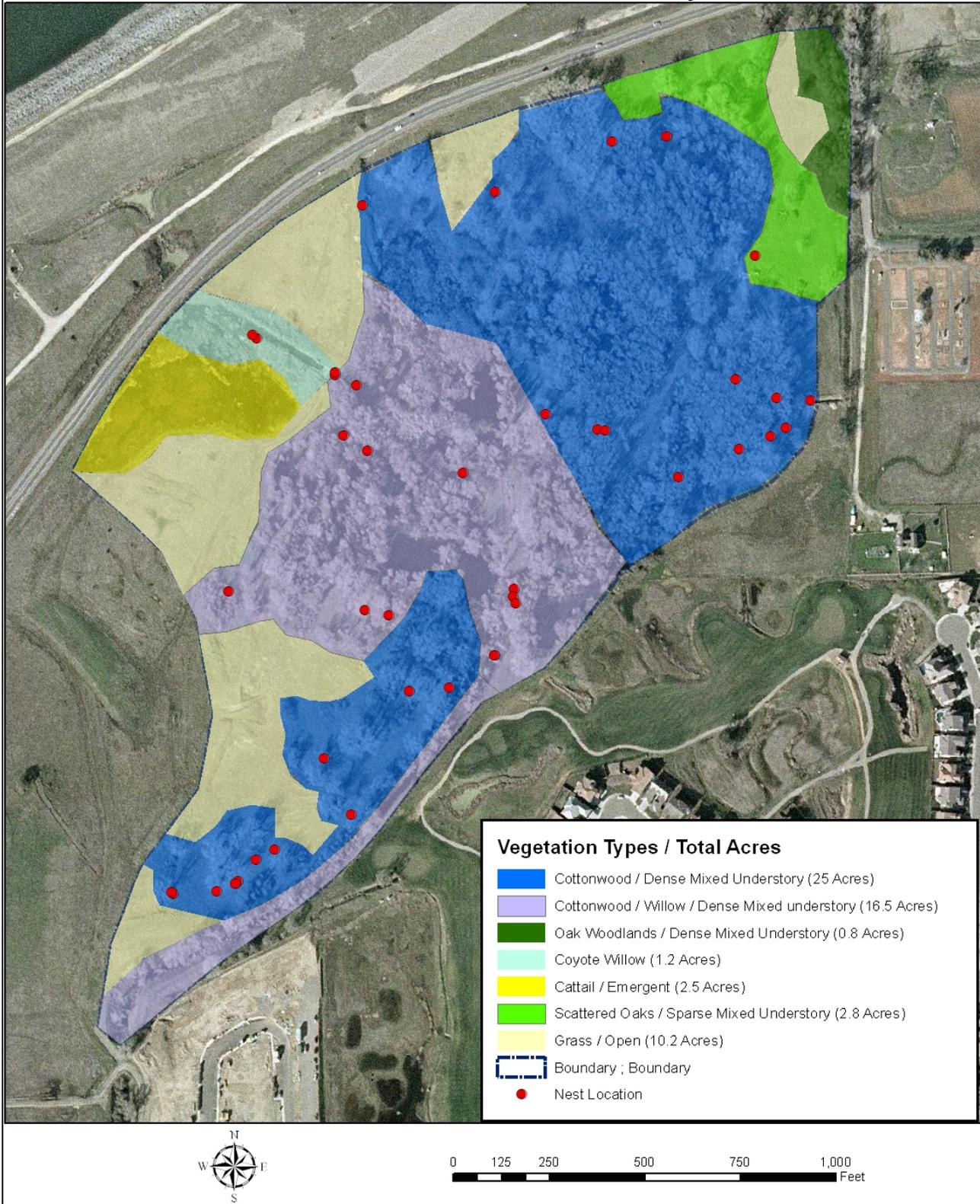
Evan Mickle – Seasonal Biologist.

Experience:

- 2006 – 2007. SAIC contractor with the Denver Technical Service Center. Field crew leader for 2 summers conducting nest searches and nest monitoring for the endangered Southwestern-willow flycatcher and vegetation quantification along the middle Rio Grande River in New Mexico.
- August 2007 – February 2007. California Dept. of Fish & Game, Sacramento, CA. Conducted various biological studies related to the Lake Davis Pike Eradication Project including electroshock sampling, and post-treatment gill netting.
- September 2005 – December 2005. Mist-netting and banding of Northern Saw-Whet Owls at Big Oaks NWR, Madison, IN.
- May 2005 – September 2005. University of Delaware Dept. of Wildlife Ecology. Assisted in a long-term study of Wood Thrush population dynamics, including nest monitoring, banding and re-sighting of adults and nestlings using color bands.

Appendix A – Vegetation Maps of Study Plots

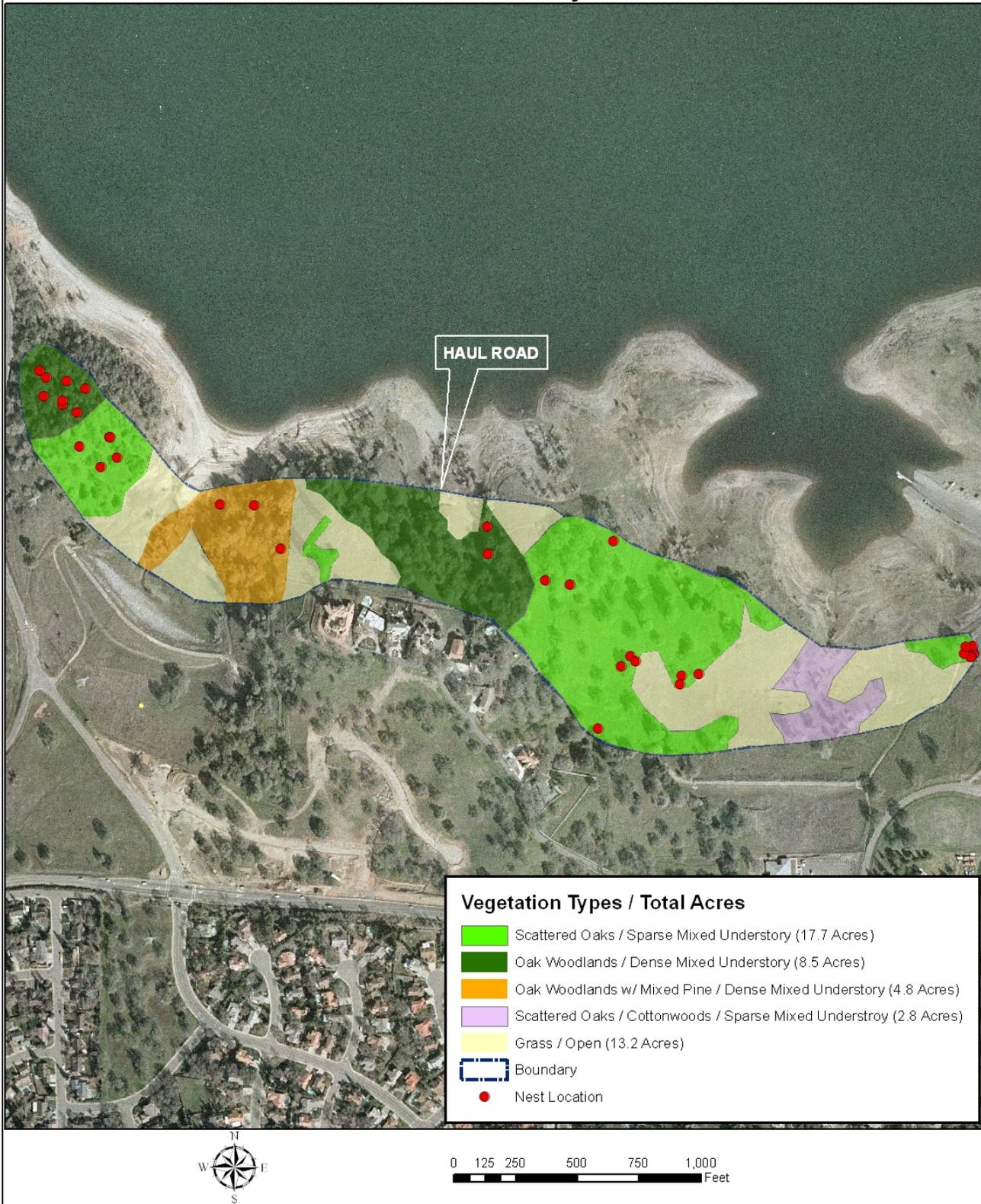
Vegetation Types & Nest Locations Mormon Island Wetland Preserve Study Plot



Vegetation Types & Nest Locations Folsom Point Study Plot



Vegetation Types & Nest Locations Haul Road Study Plot



Vegetation Types & Nest Locations Right Wing Dam Study Plot



Vegetation Types & Nest Locations Dike 5 Study Plot



**Appendix B - Nest Monitoring Log - Folsom Dam DS/FDR
Project 2008**

Appendix B

2008 Nest Monitoring Log

Nest ID	Date Found	UTM E	UTM N	Species	Nest ht.	Substrate	Substrate ht.	Nest Fate	Comments
D5-N01	3/11/2008	659072	4288623	EUST	10 ft.	California Blue Oak	20 ft.	Fledged	>1 fledged
D5-N02	3/11/2008	658997	4288592	OATI	15 ft	Interior Live Oak	30 ft	Fledged	>2 fledged
D5-N03	3/11/2008	658972	4288559	BUSH	7 ft	Interior Live Oak	23 ft	Predated	Nest predated and destroyed.
D5-N04	3/11/2008	658952	4288381	RCSP	0 ft	Ground	0 ft.	Predated	Scattered egg shells in nest, adults nearby.
D5-N05	3/19/2008	658780	4288083	BUSH	35 ft	Interior Live Oak	40 ft	Predated	On ground w/ feathers from predated chicks in nest.
D5-N06	3/19/2008	658878	4288164	BUSH	25 ft	Interior Live Oak	35 ft	Fledged	>3 fledged
D5-N07	3/25/2008	658740	4288106	LEGO	20 ft	Interior Live Oak	30 ft	Abandoned	Adults were active @ nest then activity stopped.
D5-N08	3/31/2008	659231	4288636	OATI	20 ft	California Blue Oak	30 ft	Fledged	Observed adults w/ 2-3 fledglings.
D5-N09	4/23/2008	658994	4288586	BUSH	6 ft	California Blue Oak	8 ft	Fledged	>2 fledglings observed.
D5-N10	4/23/2008	658721	4208048	ANHU	20 ft	Interior Live Oak	30 ft	Fledged	2-3 fledglings being fed.
D5N-11	4/23/2008	658836	4288224	BUSH	6 ft	Interior Live Oak	20 ft	Predated	Destroyed w/ scattered feathers in nest & on ground.
D5N-12	6/7/2008	658767	4288125	BEWR	0 ft	Dead Log	2 ft	Fledged	3-4 fledglings out of nest.
D5-N13	5/5/2008	658879	4288309	BHGR	25 ft	California Blue Oak	40 ft	Fledged	At least 2 nestlings being fed.
D5-N14	5/5/2008	659176	4288572	HOFI	20 ft	California Blue Oak	35 ft	Fledged	>2 fledged
D5-N15	5/5/2008	658814	4287997	MODO	10 ft	Interior Live Oak	18 ft	Predated	Predated, partially destroyed. No further activity.
D5-N16	5/14/2008	658883	4288405	HOWR	15 ft	Gooding's Willow	17 ft	Fledged	>1 fledgling observed.
D5-N17	5/15/2008	658803	4288115	LEGO	8 ft	Interior Live Oak	22 ft	Fledged	Observed 3-4 nestlings fled nest.
D5-N18	5/15/2008	659176	4288572	WEKI	25 ft	California Blue Oak	45 ft	Fledged	3 fledglings out of nest.
D5-N19	5/21/2008	659218	4288562	RCSP	0 ft	Underneath a log	0 ft	Fledged	Observed at least 2 chicks pop heads out of nest.
D5-N20	5/26/2008	659108	4288604	MALL	0 ft	Ground	0 ft	Predated	~9 eggs predated, adult female eaten too
FP-N01	3/4/2008	663190	4284427	RTHA	35 ft	California Blue Oak	50 ft	Fledged	2 nestlings flew out of nest.

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FP-N02	3/4/2008	663111	4284703	HOFI	25 ft	California Blue Oak	50 ft	Abandoned	Adults active for ~ 2 weeks, did not return to nest.
FP-N03	3/4/2008	662959	4284712	GHOW	60 ft	Gray Pine	65 ft	Fledged	Observed 3 nestlings in nest.
FP-N04	3/10/2008	662793	4284641	BUSH	13 ft	Interior Live Oak	30 ft	Predated	4/1 - nest on ground - 7 eggs predated.
FP-N05	3/10/2008	662799	4284641	BEWR	0 ft	Dead log	0 ft	Fledged	3-4 fledglings and adults observed.
FP-N06	3/10/2008	662849	4284609	WBNU	2 ft	Interior Live Oak	25 ft	Fledged	5-8 fledglings flew out of nest.
FP-N07	3/10/2008	662983	4284658	HOFI	10 ft	Interior Live Oak	30 ft	Abandoned	Adults never completed constructing nest-in mistletoe
FP-N08	3/21/2008	662971	4284704	WBNU	5 ft	Interior Live Oak	45 ft	Unk. Failure	Adult found dead in nest
FP-N09	3/24/2008	662799	4284536	HOFI	17 ft	Interior Live Oak	25 ft	Fate Unk.	Nest was active but never could determine fate
FP-N10	3/24/2008	662832	4284644	LEGO	12 ft	Interior Live Oak	30 ft	Predated	3 eggs all predated
FP-N11	4/1/2008	662792	4284655	ANHU	20 ft	Interior Live Oak	50 ft	Fate Unk.	Nest was difficult to monitor, fate Unk.
FP-N12	4/1/2008	662812	4284605	LEGO	30 ft	California Blue Oak	40 ft	Predated	High winds or predator destroyed nest
FP-N13	4/1/2008	662878	4284669	ANHU	20 ft	California Blue Oak	50 ft	Fledged	1or 2? fledglings out of nest.
FP-N14	4/1/2008	662971	4284704	TRES	12 ft	Interior Live Oak	45 ft	Abandoned	May have moved to a new tree cavity?
FP-N15	4/7/2008	663439	4284785	HOWR	17 ft	dead Cottonwood	27 ft	Fledged	>1 nestling vocalizing in nest
FP-N16	4/7/2008	663191	4284439	HOFI	7 ft	Interior Live Oak	30 ft	Predated	At least 1 egg in nest predated
FP-N17	4/15/2008	662968	4284646	TRES	15 ft	California Blue Oak	40 ft	Fledged	>1 fledged
FP-N18	4/15/2008	662970	4284649	OATI	6 ft	California Blue Oak	45 ft	Fledged	~ 3-6 fledged
FP-N19	4/15/2008	662824	4284644	OATI	7 ft	Interior Live Oak	45 ft	Fledged	~ 4-6 fledged
FP-N20	4/21/2008	663131	4284708	BUSH	2.5 ft	California Blue Oak	50 ft	Predated	<i>Parasitized</i> -1 host egg / 1 BHCO egg predated
FP-N21	4/21/2008	663193	4284431	HOFI	35 ft	California Blue Oak	50 ft	Predated	Nest predated and destroyed.
FP-N23	4/21/2008	662971	4284704	EUST	12 ft	California Blue Oak	50 ft	Fledged	5 chicks being fed and ready to fledge.
FP-N24	4/22/2008	662788	4284606	EUST	15 ft	California Blue Oak	35 ft	Fledged	Observed >2 fledglings heads popping out of nest.
FP-N25	4/30/2008	662983	4284658	BUSH	12 ft	California Blue Oak	40 ft	Predated	Adult killed, nest predated
FP-N26	4/30/2008	662967	4284678	WEBL	20 ft	California Blue Oak	40 ft	Fate Unk.	Active but could never tell the fate
FP-N27	4/30/2008	662958	4284664	EUST	25 ft	Gray Pine	60 ft	Fledged	>2 fledged
FP-N28	4/30/2008	662955	4284691	EUST	25 ft	Interior Live Oak	45 ft	Fledged	>3 fledged
FP-N29	4/30/2008	662983	4284708	EUST	10 ft	Interior Live Oak	30 ft	Abandoned	Adults were active at cavity w/ nest materials.
FP-N30	5/1/2008	662858	4284577	WEBL	6 ft	Interior Live Oak	23 ft	Fledged	Adults feeding 4-5 nestlings.
FP-N31	5/1/2008	662849	4284609	EUST	10 ft	Interior Live Oak	30 ft	Fledged	>1 fledged
FP-N33	5/1/2008	663199	4284432	HOFI	25 ft	California Blue Oak	45 ft	Abandoned	Never returned to constructed nest.
FP-N34	5/1/2008	663203	4284433	BUSH	7 ft	California Blue Oak	45 ft	Predated	Nest destroyed, egg shells on ground
FP-N35	5/1/2008	663184	4284434	HOFI	20 ft	California Blue Oak	45 ft	Fledged	>1 fledgling out of nest.

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FP-N36	5/1/2008	663195	4284428	HOFI	30 ft	California Blue Oak	50 ft	Fledged	Observed ~ 3 chicks being fed. Then out of nest.
FP-N37	5/1/2008	663184	4284434	WEKI	22 ft	California Blue Oak	50 ft	Predated	Nest found on ground Pair nearby.
FP-N38	5/1/2008	663171	4284427	HOFI	20 ft	California Blue Oak	50 ft	Fledged	>1 fledged
FP-N39	5/1/2008	663439	4284785	EUST	20 ft	Cottonwood	30 ft	Fledged	>2 nestlings ~ 7-10 d.o.
FP-N40	5/1/2008	662842	4284637	VGSW	10 ft	California Blue Oak	40 ft	Fledged	At least 2 flew out of nest.
FP-N41	5/9/2008	663135	4284686	HOFI	35 ft	California Blue Oak	50 ft	Fate Unk.	Never new fate, adults were active here for ~18 days.
FP-N42	5/1/2008	663160	4284393	BUSH	5 ft	California Blue Oak	50 ft	Predated	Nest found on ground, all 6 host eggs predated.
FP-N43	5/9/2008	663156	4284384	LEGO	7 ft	California Blue Oak	40 ft	Fledged	<i>Parasitized</i> - 2 hosts / 1 BHCO fledged
FP-N44	5/9/2008	663159	4284384	HOFI	8 ft	California Blue Oak	40 ft	Fledged	Adult feeding ~ 4 nestlings.
FP-N45	5/9/2008	663161	4284407	BUOR	35 ft	California Blue Oak	45 ft	Fledged	>1 fledged, difficult to tell # of fledglings.
FP-N46	5/9/2008	663212	4284430	HOFI	20 ft	California Blue Oak	50 ft	Fledged	>1 fledged
FP-N47	5/13/2008	662656	4284415	WEKI	40 ft	California Blue Oak	50 ft	Fledged	Adults feeding ~ 2-3 chicks. >1 fledgling observed.
FP-N48	5/13/2008	662534	4284309	BUSH	8 ft	California Blue Oak	55 ft	Predated	Predated, adults are next to nest.
FP-N49	5/13/2008	662794	4284529	ANHU	15 ft	Interior Live Oak	35 ft	Fate Unk.	Adults went to nest on 2 visits, but fate unknown.
FP-N50	5/13/2008	662812	4284605	LEGO	20 ft	California Blue Oak	30 ft	Fledged	>2 nestlings feeding and vocalizing.
FP-N52	5/14/2008	662925	4284557	HOWR	13 ft	California Blue Oak	25 ft	Fledged	>2 nestlings observed feeding.
FP-N53	4/22/2008	662925	4284557	BAOW	7 ft	California Blue Oak	25 ft	Fledged	3 juveniles observed sitting next to nest.
FP-N54	5/14/2008	662903	4284572	LEGO	6 ft	California Blue Oak	35 ft	Abandoned	Adults built nest then no more activity observed
FP-N55	5/14/2008	662849	4284609	ACWO	10 ft	Interior Live Oak	35 ft	Fledged	At least 2 nestlings obs. popping heads out of nest.
FP-N56	5/22/2008	662794	4284660	LEGO	8 ft	Interior Live Oak	30 ft	Predated	<i>Parasitized</i> - 1 host egg / 1 BHCO egg predated Adult feeding, at least 2 nestlings vocalizing from cavity.
FP-N57	5/28/2008	662789	4284593	ATFL	7 ft	California Blue Oak	20 ft	Fledged	3 juveniles observed out of nest.
HR-N01	2/29/2008	661466	4284902	COHA	30 ft	Interior Live Oak	40 ft.	Fledged	3 juveniles observed out of nest.
HR-N02	3/6/2008	661756	4284690	BUSH	15 ft	Interior Live Oak	30 ft	Fledged	3-5 fledglings flew out of nest.
HR-N03	3/10/2008	662356	4284593	WEBL	30 ft	dead Oak	40 ft	Abandoned	Adults entered cavity w/ nest materials more than once
HR-N04	3/17/2008	662113	4284646	BEWR	0 ft	beneath stump	0 ft	Abandoned	Adults built nest under stump but never returned.
HR-N05	3/17/2008	662611	4284561	WBNU	10 ft	Interior Live Oak	35 ft	Fledged	At least 2 nestling being fed on mutiple visits.
HR-N06	3/17/2008	662611	4284561	ANHU	15 ft	Interior Live Oak	35 ft	Fledged	2 fledglings out of nest.
HR-N07	3/17/2008	662611	4284561	TRES	10 ft	Interior Live Oak	35 ft	Fate Unk.	Was active on multiple visits but fate Unknown?
HR-N08	3/17/2008	662188	4284557	BUSH	15 ft	Interior Live Oak	45 ft	Predated	Nest partially destroyed, adults never returned.
HR-N09	3/23/2008	662082	4284651	EUST	8 ft	California Blue Oak	20 ft	Fledged	Observed adults feeding on 2 visits >1 fledged
HR-N10	3/24/2008	661463	4284879	BUSH	25 ft	California Buckeye	35 ft.	Predated	Nest predated & destroyed

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HR-N11	3/24/2008	661458	4284910	ANHU	22 ft	California Blue Oak	45 ft	Fledged	At least 1 fledged
HR-N12	3/24/2008	661514	4284888	BUSH	3.5 ft	California Blue Oak	50 ft.	Fledged	At least 2 fledglings observed out of nest.
HR-N13	3/24/2008	661507	4284816	BUSH	15 ft	Interior Live Oak	25 ft	Abandoned	Nest partially built, then abandoned.
HR-N14	3/24/2008	661544	4284828	HOFI	30 ft	California Blue Oak	40 ft	Fledged	~2 nestlings being fed, appear ready to fledge.
HR-N15	3/24/2008	661533	4284791	LEGO	35 ft	California Blue Oak	45 ft	Fledged	>1 fledged, Adults observed feeding on multiple visits.
HR-N16	3/24/2008	662251	4284533	BEWR	0 ft	Woodpile	0 ft.	Fledged	3-4 fledglings observed out of nest.
HR-N17	3/27/2008	662194	4284551	OATI	25 ft	California Blue Oak	45 ft	Fledged	Adults feeding, heard 2-4 fledglings out of nest.
HR-N18	3/30/2008	662092	4284661	EUST	11 ft	California Blue Oak	45 ft	Abandoned	Chose new tree cavity to nest in?
HR-N19	3/30/2008	661486	4284868	WITU	0 ft	Ground	0 ft	Fledged	15 eggs seen, unk. How many fledged
HR-N20	4/13/2008	662012	4284684	EUST	40 ft	California Blue Oak	55 ft	Fledged	Adults observed feeding >2 nestlings.
HR-N21	4/16/2008	661545	4284828	OATI	2.5 ft	Interior Live Oak	50 ft	Fledged	>5 fledglings observed out of nest.
HR-N22	4/16/2008	662166	4284700	WITU	0 ft	Ground	0 ft	Predated	Egg shells & feathers scattered around
HR-N24	4/21/2008	662011	4284717	HOWR	10 ft	Gooding's Willow	20 ft	Fledged	>2 fledglings out of nest.
HR-N25	4/22/2008	662608	4284556	LEGO	20 ft	Interior Live Oak	45 ft	Predated	Adult was incubating, then nest found destroyed
HR-N26	4/22/2008	662608	4284556	WEBL	10 ft	Interior Live Oak	13 ft	Fledged	>2 nestlings observed being fed at nest.
HR-N27	4/30/2008	661504	4284859	LEGO	20 ft	California Blue Oak	35 ft	Fledged	>2 nestlings feeding and vocalizing.
HR-N28	5/1/2008	662608	4284556	BUSH	18 ft	Interior Live Oak	45 ft	Abandoned	Nest constructed then abandoned.
HR-N29	5/1/2008	662148	4284468	WESJ	6 ft	Interior Live Oak	15 ft	Fledged	3-4 fledged, observed nestlings ~ 12-14 d.o.
HR-N30	4/30/2008	662272	4284535	HOWR	15 ft	Cottonwood	40 ft	Fledged	3-4 fledglings out of nest.
HR-N31	5/8/2008	661486	4284873	BUSH	25 ft	California Blue Oak	45 ft	Fledged	>5 nestlings flew into bushes near nest.
HR-N32	5/13/2008	661491	4284898	LEGO	30 ft	California Blue Oak	50 ft	Fledged	>2 nestlings observed being fed.
HR-N33	5/13/2008	662249	4284523	WEBL	12 ft	Cottonwood	45 ft	Fledged	>3 nestlings flew in/out of nest.
HR-N34	5/22/2008	661553	4284803	HUVI	30 ft	Interior Live Oak	40 ft	Fledged	Observed adults feeding 4 chicks ~8-11 d.o.
HR-N35	5/28/2008	661681	4284745	ATFL	30 ft	California Blue Oak	40 ft	Fledged	>2 nestlings ~ 10-13 d.o.
HR-N36	5/28/2008	661723	4284744	WEBL	25 ft	California Blue Oak	35 ft	Fate Unk.	Adults were in/out of nest but fate unknown.
HR-N37	6/13/2008	662176	4284545	ATFL	30 ft	Cottonwood	45 ft	Fledged	3 fledglings observed out of nest.
MI-N03	3/3/2008	664167	4284882	GHOW	45 ft	Cottonwood	50 ft	Fledged	Observed 2 juveniles out of nest
MI-N05	3/7/2008	664310	4284907	ANHU	10 ft	Grape Vine	15 ft	Fledged	Observed 1 juv. On nest & 1 juv. sitting next to nest.
MI-N06	3/7/2008	664049	4284676	WEBL	35 ft	Cottonwood	60 ft	Fledged	>1 nestling being fed & vocalizing.
MI-N07	3/7/2008	664085	4284702	BLPH	4 ft	N/A - under bridge	5 ft	Abandoned	Pair built new nest on opposite side of bridge
MI-N08	3/7/2008	664101	4284755	BLPH	4 ft	N/A - under bridge	5 ft	Fledged	All 4 fledglings obs. out of nest.
MI-N09	3/7/2008	663958	4284925	BLPH	4 ft	N/A - under bridge	5 ft	Fledged	3-4 nestlings ~ 12-15 d.o. ready to fledge.

Appendix B

MI-N10	3/12/2008	663829	4284512	TRSW	45 ft	Cottonwood	60 ft	Fledged	Adults and fledglings obs. flying near nest.
MI-N11	3/12/2008	663895	4284539	EUST	20 ft	Cottonwood	55 ft	Abandoned	Adults in/out of cavity w/ nest materials but did not return.
MI-N12	3/12/2008	664317	4284883	RSHA	65 ft	Cottonwood	75 ft	Fledged	Observed 3 fledglings; 1 on nest, 2 perched near nest.
MI-N13	3/20/2008	663980	4285060	BLPH	6 ft	N/A (on sign)	7 ft	Fledged	Observed adults feeding 5 nestlings ~2 weeks old.
MI-N14	3/21/2008	663881	4284522	EUST	15 ft	Cottonwood	40 ft	Fledged	Observed adults feeding nestlings on multiple visits.
MI-N15	3/21/2008	664126	4284894	AMKE	45 ft	Cottonwood	60 ft	Fledged	At least 2 nestlings were seen; 1 observed out of nest.
MI-N16	3/26/2008	663982	4284738	RTHA	55 ft	Cottonwood	75 ft	Fledged	2 juveniles observed flying in/out of nest.
MI-N17	3/26/2008	664001	4284734	BUSH	7 ft	Gooding's Willow	18 ft	Predated	Nest destroyed - adults near but no more activity.
MI-N18	3/26/2008	663864	4284514	BUSH	6 ft	Cottonwood	55 ft	Fledged	Adults observed feeding, >1 nestling vocalizing.
MI-N19	3/26/2008	663879	4284520	TRES	20 ft	Cottonwood	50 ft	Fledged	Both adults obs. feeding for ! 2 weeks; nestlings vocal.
MI-N20	3/26/2008	663910	4284547	WEBL	8 ft	Gooding's Willow	50 ft	Abandoned	Adults were active at nest for ~ 2 weeks.
MI-N21	3/27/2008	664222	4285115	LEGO	16 ft	Interior Live Oak	20 ft	Fledged	>2 vocal nestlings being fed.
MI-N22	4/2/2008	664337	4284905	ANHU	50 ft	Cottonwood	65 ft	Fate Unk.	Nest was active but difficult to monitor - Fate unk.
MI-N23	4/3/2008	664017	4284673	TRES	25 ft	Cottonwood	60 ft	Fledged	Adults feeding unk # of vocal nestlings.
MI-N24	4/4/2008	664293	4285020	BUSH	8 ft	Interior Live Oak	35 ft	Predated	Nest depredated, scattered egg shells.
MI-N25	4/17/2008	663984	4284865	BUSH	10 ft	Coyote Willow	15 ft	Fledged	At least 4 fledglings active out of nest and vocal
MI-N26	4/18/2008	664179	4285111	BUSH	25 ft	Gray Pine	55 ft	Abandoned	Adults were in/out of nest for ~ 1 week then abandoned.
MI-N27	4/18/2008	664305	4284876	WBNU	30 ft	Cottonwood	60 ft	Fledged	>2 fledglings & adult seen on branch near nest.
MI-N28	4/18/2008	664232	4284844	WESJ	5 ft	Poison Oak	10 ft	Predated	4 host chicks all predated, 1 shell never hatched.
MI-N29	4/10/2008	664085	4284702	BLPH	4 ft	N/A - under bridge	5 ft	Fledged	4-5 nestlings ~ 13-15 d.o. ready to fledge.
MI-N30	4/24/2008	663975	4284917	WODU	5 ft	Nest Box	5 ft	Abandoned	12 Eggs left in nest - abandoned
MI-N31	4/25/2008	663971	4284575	BUSH	12 ft	California Blue Oak	45 ft	Fledged	Adult observed entering nest w/ food, juv's vocal.
MI-N32	5/2/2008	664086	4285071	WITU	0 ft	Grass	0 ft	Fledged	~ 8 fledglings observed out of nest w/ defensive adult.
MI-N33	5/7/2008	663965	4284877	WESJ	7 ft	Gooding's Willow	35 ft	Fledged	4 nestlings ~ 7-10 days old vocalizing in nest.
MI-N34	5/7/2008	663958	4284927	BLPH	4 ft	N/A - under bridge	5 ft	Fledged	3 fledglings observed out of nest.
MI-N35	5/7/2008	663896	4284954	RWBL	12 ft	Coyote Willow	15 ft	Fledged	At least 3 nestlings 8-12 d.o. being fed.
MI-N36	5/12/2008	663892	4284957	RWBL	15 ft	Coyote Willow	18 ft	Fledged	At least 2 fledglings out of nest.
MIN-37	5/12/2008	664060	4284847	BUSH	8 ft	Gooding's Willow	40 ft	Predated	Female was incubating then was nest predated.
MIN-38	5/12/2008	664280	4284866	DOWO	17 ft	Cottonwood	22 ft	Fledged	2 fledglings observed out of nest w/ adult.
MI-N39	5/19/2008	663873	4284753	CALT	4 ft	Coyote Willow	25 ft	Fledged	4 nestlings went in/out of nest - at least 10 d.o.
MI-N40	5/19/2008	663879	4284520	HOWR	20 ft	Cottonwood	40 ft	Fledged	>2 nestlings being fed and very vocal in nest.

Appendix B

MI-N41	5/19/2008	663828	4284513	EUST	45 ft	Cottonwood	50 ft	Fate Unk.	Adults active in cavity for ~ 2 weeks but fate unknown.
MI-N42	6/2/2008	664277	4284922	ATFL	25 ft	Cottonwood	60 ft	Fledged	Adult feeding >1 nestling, then saw 1 out of nest.
MI-N43	6/6/2008	664100	4284749	BLPH	4 ft	N/A - under bridge	5 ft	Fledged	observed 3-4 fledglings leave nest.
MI-N45	6/9/2008	664173	4284881	HAWO	35 ft	Cottonwood	60 ft	Fledged	3-4 fledglings seen/heard out of nest.
MI-N46	6/19/2008	664102	4284743	BEWR	0 ft	Gooding's Willow	3 ft	Fledged	~4 fledglings flew into bushes next to nest.
MI-N47	6/6/2008	663949	4284620	MODO	8 ft	Gooding's Willow	30 ft	Predated	2 nestlings depredated, feathers scattered below nest.
RW-N02	3/5/2008	658984	4286565	BUSH	10 ft	Interior Live Oak	20 ft	Predated	Nest was active then destroyed and predated.
RW-N03	3/12/2008	658957	4286902	BUSH	25 ft	Interior Live Oak	40 ft	Fledged	Observed adult feeding, unk # of fledglings out of nest.
RW-N04	3/12/2008	658949	4287105	ANHU	20 ft	California Blue Oak	30 ft	Fledged	At least 1 fledgling observed out of nest.
RW-N05	3/13/2008	658886	4286946	BUSH	30 ft	Interior Live Oak	70 ft	Fledged	Nest was full with nestlings, approximately 4-7.
RW-N06	3/18/2008	659104	4287425	AMGO	15 ft	White Alder	25 ft	Predated	Predated or high winds destroyed nest.
RW-N07	3/18/2008	658967	4286824	BUSH	7.5 ft	Interior Live Oak	35 ft	Predated	Nest partially destroyed & predated - no further activity.
RW-N08	3/18/2008	658954	4286804	ANHU	15 ft	Interior Live Oak	30 ft	Fledged	2 fledglings out of nest, fluttering in nearby tree.
RW-N09	3/18/2008	658989	4287225	BUSH	15 ft	Interior Live Oak	25 ft	Predated	Nest on ground and predated.
RW-N10	3/25/2008	658967	4287140	COHA	25 ft	Interior Live Oak	35 ft	Fledged	Observed 3 juv's perched on branches outside of nest.
RW-N11	3/25/2008	658966	4287082	BUSH	30 ft	Interior Live Oak	45 ft	Fledged	>2 fledglings out of nest w/ adults.
RW-N12	3/28/2008	658920	4287296	BUSH	6 ft	Interior Live Oak	20 ft	Fledged	Observed adult feeding >2 nestlings.
RW-N13	3/28/2008	658864	4287235	BUSH	10 ft	Interior Live Oak	50 ft	Fledged	~4-5 fledglings active outside nest.
RW-N14	3/28/2008	658960	4287192	WBNU	5 ft	dead Oak tree	15 ft	Fledged	Adults feeding >2 vocal nestlings.
RW-N15	3/28/2008	658993	4286475	BUSH	7 ft	Interior Live Oak	25 ft	Abandoned	Abandoned nest w/ 3 eggs inside.
RW-N16	4/9/2008	658933	4286843	AMGO	11 ft	Interior Live Oak	13 ft	Predated	3 eggs all predated
RW-N17	4/9/2008	658997	4286550	BEWR	0 ft	Under log	2 ft	Predated	1 egg predated, no additional activity at nest.
RW-N18	4/9/2008	658990	4286553	TRES	10 ft	Interior Live Oak	45 ft	Fate Unk.	Adults in/out of cavity for a few days-did not return.
RW-N19	4/14/2008	658949	4287105	BUSH	6 ft	Interior Live Oak	50 ft	Fledged	>4 fledged (nest was partially built on an unk. vine).
RW-N20	4/14/2008	658949	4287105	HUVI	8 ft	Interior Live Oak	40 ft	Fledged	3 fledglings observed out of nest.
RW-N21	4/15/2008	659080	4287344	BEWR	0 ft	Beneath Rocks	1 ft	Abandoned	Adults observed constructing nest, then abandoned it.
RW-N22	4/15/2008	658949	4287221	OATI	4 ft	Interior Live Oak	40 ft	Fledged	>3 nestlings 12-15 d.o. in nest.
RW-N23	4/15/2008	659007	4287395	BUSH	10 ft	Interior Live Oak	50 ft	Fledged	~ 4 juveniles detected within 30' of nest.
RW-N24	4/15/2008	658952	4287366	OATI	3 ft	California Blue Oak	30 ft	Fledged	5 nestlings ~14-16 d.o. very vocal in nest.
RW-N25	4/15/2008	658950	4287051	OATI	13 ft	Interior Live Oak	20 ft	Fledged	Adults observed feeding >1 nestlings ~ 2 weeks old.
RW-N26	4/16/2008	658956	4287223	LEGO	7 ft	Interior Live Oak	35 ft	Fledged	3 nestlings were observed (~7-11 d.o.)
RW-N27	4/16/2008	658942	4287205	ANHU	10 ft	Interior Live Oak	25 ft	Fledged	2 fledglings within 50' of nest.

Appendix B

RW-N28	4/16/2008	658942	4287221	ANHU	10 ft	Interior Live Oak	25 ft	Predated	Nest torn up inside and all 3 eggs predated.
RW-N29	4/23/2008	658985	4286510	BUSH	8 ft	Interior Live Oak	25 ft	Fledged	Adults w/ ~5 fledglings observed.
RW-N30	4/23/2008	658974	4286921	MALL	0 ft	Ground	0 ft	Fledged	10 eggs were observed then adult w/ unk. # of juv's
RW-N31	4/23/2008	658961	4287164	BUSH	15 ft	Interior Live Oak	20 ft	Fledged	Adults observed feeding, then with >2 fledglings.
RW-N32	4/23/2008	658945	4287065	CALT	8 ft	California Blue Oak	55 ft	Predated	Parasitized. All 3 host eggs & 1 BHCO egg all predated, nest in good condition.
RW-N33	4/29/2008	658963	4286843	BUSH	6 ft	Gray Pine	15 ft	Fledged	3-4 nestlings flew out of nest and into bushes.
RW-N34	4/29/2008	658921	4287309	OATI	7 ft	California Blue Oak	30 ft	Fledged	At least 2 highly vocal nestlings being fed in nest.
RW-N35	4/29/2008	658942	4287205	HOWR	8 ft	Interior Live Oak	30 ft	Fledged	2-3 fledglings active outside of nest.
RW-N36	4/29/2008	658891	4287093	BUSH	7 ft	Interior Live Oak	27 ft	Fledged	Adults entered nest w/ food multiple visits.
RW-N37	5/6/2008	658966	4286920	SPTO	1 ft	California Blue Oak	6 ft	Predated	All 3 eggs predated
RW-N38	5/6/2008	659080	4287391	OATI	4 ft	Interior Live Oak	20 ft	Fledged	~4 fledglings obs. perched next to nest.
RW-N39	5/14/2008	658991	4286569	BUSH	4 ft	Interior Live Oak	35 ft	Fledged	>2 nestlings being fed/detected outside the nest.
RW-N40	5/15/2008	658984	4286352	ATFL	4 ft	H2O Pump	4.5 ft	Fledged	>2 fledglings observed out of nest.
RW-N41	5/15/2008	658912	4286246	NUWO	18 ft	Gooding's Willow	25 ft	Fledged	Obs. 2 nestlings pop heads out of nest at ~8-12 d.o.
RW-N42	5/15/2008	659050	4287384	CALT	2 ft	Unk Bush	8 ft	Fledged	3 nestlings flew out of nest as I approached.
RW-N43	5/27/2008	659089	4287409	TRES	20 ft	Interior Live Oak	50 ft	Fledged	At least 2 juveniles observed on branch next to nest.
RW-N44	6/13/2008	658923	4286819	BHGR	30 ft	Interior Live Oak	40 ft	Fledged	>2 nestlings being fed, then obs 2-3 out of nest.

Spp. code	Common name	Scientific name
ACWO	Acorn woodpecker	<i>Malanerpes formicivorus</i>
ANHU	Anna's hummingbird	<i>Calypte anna</i>
AMGO	American goldfinch	<i>Carduelis tristis</i>
.AMKE	American kestrel	<i>Falco sparverius</i>
*ATFL	Ash-throated flycatcher	<i>Myiarchus cinerascens</i>
BAOW	Barn owl	<i>Tyto alba</i>
BEWR	Bewick's wren	<i>Thryomanes bewickii</i>
*BHGR	Black-headed grosbeak	<i>Pheucticus melanocephalus</i>
BLPH	Black phoebe	<i>Sayornis nigricans</i>
*BUOR	Bullock's oriole	<i>Icterus bullockii</i>
BUSH	Bushtit	<i>Psaltriparus minimus</i>
CALT	California towhee	<i>Pipilo crissalis</i>
#COHA	Cooper's hawk	<i>Accipiter cooperii</i>

DOWO	Downy woodpecker	<i>Picoides pubescens</i>
EUST	European starling	<i>Sturnus vulgaris</i>
GHOW	Great-horned owl	<i>Bubo virginianus</i>
HAWO	Hairy woodpecker	<i>Picoides villosus</i>
HOFI	House finch	<i>Carpodacus mexicanus</i>
HOWR	House wren	<i>Troglodytes aedon</i>
HUVI	Hutton's vireo	<i>Vireo huttoni</i>
LEGO	Lesser goldfinch	<i>Carduelis psaltria</i>
MALL	Mallard	<i>Anas platyrhynchos</i>
MODO	Mourning dove	<i>Zenaida macroura</i>
NUWO	Nattall's woodpecker	<i>Picoides nuttallii</i>
OATI	Oak titmouse	<i>Baeolophus inornatus</i>
RCSP	Rufous-crowned sparrow	<i>Aimophila ruficeps</i>
RSHA	Red-shouldered hawk	<i>Buteo lineatus</i>
RTHA	Red-tailed hawk	<i>Buteo jamaicensis</i>
RWBL	Red-winged blackbird	<i>Aeglais phoeniceus</i>
SPTO	Spotted towhee	<i>Pipilo maculatus</i>
*TRES	Tree swallow	<i>Tachycineta bicolor</i>
*VGSW	Violet-green swallow	<i>Tachycineta thalassina</i>
WBNU	White-breasted nuthatch	<i>Sitta carolinensis</i>
WEBL	Western bluebird	<i>Sialia mexicana</i>
*WEKI	Western kingbird	<i>Tyrannus verticalis</i>
WESJ	Western scrub-jay	<i>Aphelocoma californica</i>
WITU	Wild turkey	<i>Meleagris gallopavo</i>
WODU	Wood duck	<i>Aix sponsa</i>

* = Neotropical migrant species

= Species of concern in California

Appendix C - Point Count Data - Folsom Dam DS/FDR Project 2008

2008 Point Count Results

Dike – 5 5 minute point counts Detections within 60 meters Year 2008 5 Stations (n=5)	Survey Period 1 March (4 Surveys)		Survey Period 2 April (4 Surveys)		Survey Period 3 May (3 Surveys)		Survey Period 4 June (2 Surveys)	
	Number of Individuals	Mean	Number of Individuals	Mean	Number of Individuals	Mean	Number of Individuals	Mean
	Resident Species:							
Acorn Woodpecker	4	0.20	5	0.25	4	0.27	1	0.10
American Goldfinch	2	0.10	7	0.35	0	0.00	0	0.00
American Crow	1	0.05	0	0.00	0	0.00	0	0.00
American Robin	3	0.15	0	0.00	0	0.00	0	0.00
Anna's Hummingbird	3	0.15	1	0.05	5	0.33	3	0.30
Bald Eagle	0	0.00	1	0.05	0	0.00	0	0.00
Bewick's Wren	1	0.05	0	0.00	2	0.13	4	0.40
Black Phoebe	1	0.05	0	0.00	2	0.13	0	0.00
Brown-headed Cowbird	0	0.00	2	0.10	6	0.40	3	0.30
Bushtit	7	0.35	19	0.95	11	0.73	4	0.40
California Towhee	3	0.15	4	0.20	5	0.33	0	0.00
California Quail	0	0.00	0	0.00	0	0.00	2	0.20
Cooper's Hawk	0	0.00	0	0.00	1	0.07	1	0.10
European Starling	5	0.25	3	0.15	0	0.00	4	0.40
House Finch	12	0.60	8	0.40	5	0.33	7	0.70
House Wren	0	0.00	7	0.35	2	0.13	0	0.00
Killdeer	0	0.00	0	0.00	0	0.00	2	0.20
Lark Sparrow	0	0.00	2	0.10	0	0.00	0	0.00
Lesser Goldfinch	32	1.60	26	1.30	17	1.13	15	1.50
Lewis's Woodpecker	0	0.00	1	0.05	0	0.00	0	0.00
Mourning dove	2	0.10	1	0.05	1	0.07	1	0.10
Northern mockingbird	1	0.05	0	0.00	0	0.00	0	0.00
Nuttall's woodpecker	0	0.00	1	0.05	1	0.07	2	0.20
Oak Titmouse	13	0.65	13	0.65	10	0.67	3	0.30
Purple Finch	0	0.00	1	0.05	0	0.00	0	0.00
Rufous-crowned Sparrow	10	0.50	6	0.30	7	0.47	3	0.30
Red-winged Blackbird	0	0.00	0	0.00	0	0.00	2	0.20
Song Sparrow	0	0.00	0	0.00	1	0.07	0	0.00
Spotted Towhee	1	0.05	3	0.15	3	0.20	0	0.00
Turkey Vulture	0	0.00	7	0.35	2	0.13	2	0.20
Western Bluebird	1	0.05	0	0.00	0	0.00	0	0.00
Western Meadowlark	0	0.00	6	0.30	0	0.00	0	0.00
Western Scrub-Jay	0	0.00	0	0.00	2	0.13	0	0.00
White-breasted Nuthatch	1	0.05	0	0.00	2	0.13	1	0.10
White-tailed Kite	0	0.00	0	0.00	1	0.07	0	0.00

Appendix C

Wren tit	6	0.30	0	0.00	0	0.00	0	0.00
Local Wintering Species:								
American Pipit	51	2.55	0	0.00	0	0.00	0	0.00
Golden-crowned Sparrow	0	0.00	3	0.15	0	0.00	0	0.00
Orange-crowned Warbler	2	0.10	4	0.20	0	0.00	0	0.00
Ruby-crowned kinglet	6	0.30	0	0.00	0	0.00	0	0.00
Savannah Sparrow	4	0.20	0	0.00	0	0.00	0	0.00
White-crowned Sparrow	2	0.10	0	0.00	0	0.00	0	0.00
Yellow-rumped Warbler	14	0.70	1	0.05	1	0.07	0	0.00
Neotropical Migrant Species:								
Ash-throated Flycatcher	0	0.00	8	0.40	8	0.53	8	0.80
Black-chinned Hummingbird	0	0.00	0	0.00	2	0.13	0	0.00
Black-headed Grosbeak	0	0.00	1	0.05	0	0.00	0	0.00
Bullock's Oriole	0	0.00	0	0.00	4	0.27	0	0.00
Cassin's Vireo	0	0.00	0	0.00	1	0.07	0	0.00
Cliff Swallow	0	0.00	0	0.00	6	0.40	0	0.00
Hermit Warbler	0	0.00	0	0.00	2	0.13	0	0.00
Nashville Warbler	0	0.00	1	0.05	0	0.00	0	0.00
Olive-sided Flycatcher	0	0.00	0	0.00	1	0.07	0	0.00
Say's Phoebe	0	0.00	0	0.00	2	0.13	0	0.00
Tree Swallow	2	0.10	4	0.20	4	0.27	4	0.40
Western Kingbird	0	0.00	7	0.35	8	0.53	7	0.70
Wilson's Warbler	0	0.00	0	0.00	2	0.13	0	0.00
Total Species	27	1.35	29	1.45	34	2.27	21	2.10
Total Birds	217	10.85	182	9.10	165	11.00	100	10.00
Total Resident Species	20	1.00	21	1.05	21	1.40	18	1.80
Total Resident Birds	109	5.45	124	6.20	90	6.00	60	6.00
Total Wintering Species	6	0.30	3	0.15	1	0.07	0	0.00
Total Wintering Birds	79	3.95	8	0.40	1	0.07	0	0.00
Total Neotropical Migrant Species	1	0.05	5	0.25	12	0.80	3	0.30
Total Neotropical Migrant Birds	2	0.10	21	1.05	40	2.67	19	1.90

Right Wing Dam 5 minute point counts Detections within 60 meters Year 2008 7 Stations (n=7)	Survey Period 1 March (4 Surveys)		Survey Period 2 April (4 Surveys)		Survey Period 3 May (3 Surveys)		Survey Period 4 June (2 Surveys)	
	Number of Individuals	Mean	Number of Individuals	Mean	Number of Individuals	Mean	Number of Individuals	Mean
Resident Species:								
Acorn Woodpecker	0	0.00	0	0.00	1	0.05	0	0.00
American Goldfinch	8	0.29	16	0.57	3	0.14	2	0.14
American Robin	2	0.07	1	0.04	0	0.00	1	0.07
Anna's Hummingbird	20	0.71	13	0.46	10	0.48	9	0.64
Bald Eagle	0	0.00	0	0.00	1	0.05	0	0.00
Bewick's Wren	11	0.39	10	0.36	19	0.90	5	0.36
Black Phoebe	0	0.00	0	0.00	0	0.00	1	0.07
Brown-headed Cowbird	0	0.00	16	0.57	9	0.43	4	0.29
Bushtit	15	0.54	25	0.89	20	0.95	19	1.36
California Towhee	10	0.36	8	0.29	13	0.62	11	0.79
California Quail	4	0.14	4	0.14	16	0.76	0	0.00
Cooper's Hawk	1	0.04	2	0.07	2	0.10	0	0.00
European Starling	4	0.14	2	0.07	0	0.00	0	0.00
House Finch	16	0.57	12	0.43	19	0.90	17	1.21
House Wren	0	0.00	3	0.11	1	0.05	0	0.00
Hutton's Vireo	0	0.00	1	0.04	0	0.00	2	0.14
Killdeer	0	0.00	2	0.07	0	0.00	3	0.21
Lawrence's Goldfinch	2	0.07	0	0.00	0	0.00	0	0.00
Lesser goldfinch	28	1.00	20	0.71	25	1.19	20	1.43
Mallard	0	0.00	0	0.00	1	0.05	0	0.00
Mourning Dove	4	0.14	4	0.14	5	0.24	1	0.07
Northern Mockingbird	0	0.00	6	0.21	2	0.10	1	0.07
Nuttall's Woodpecker	1	0.04	2	0.07	4	0.19	3	0.21
Oak Titmouse	16	0.57	10	0.36	13	0.62	10	0.71
Purple Finch	0	0.00	2	0.07	1	0.05	0	0.00
Rufous-crowned Sparrow	4	0.14	3	0.11	0	0.00	0	0.00
Red-tailed Hawk	0	0.00	0	0.00	1	0.05	0	0.00
Song Sparrow	0	0.00	0	0.00	1	0.05	0	0.00
Spotted Towhee	5	0.18	13	0.46	5	0.24	6	0.43
Turkey Vulture	0	0.00	0	0.00	0	0.00	2	0.14
Western Bluebird	5	0.18	11	0.39	1	0.05	0	0.00
Western Scrub-Jay	3	0.11	9	0.32	4	0.19	0	0.00
White-breasted Nuthatch	9	0.32	7	0.25	1	0.05	0	0.00
Wild Turkey	5	0.18	0	0.00	0	0.00	0	0.00
Local Wintering Species:								
Dark-eyed Junco	8	0.29	1	0.04	0	0.00	0	0.00
Golden-crowned Sparrow	7	0.25	8	0.29	0	0.00	0	0.00

Appendix C

Orange-crowned Warbler	2	0.07	3	0.11	0	0.00	0	0.00
Ruby-crowned Kinglet	17	0.61	2	0.07	0	0.00	0	0.00
White-crowned Sparrow	8	0.29	2	0.07	0	0.00	0	0.00
Yellow-rumped Warbler	20	0.71	2	0.07	0	0.00	0	0.00
Neotropical Migrant Species:								
Ash-throated Flycatcher	0	0.00	5	0.18	7	0.33	3	0.21
Black-chinned Hummingbird	0	0.00	0	0.00	1	0.05	0	0.00
Black-headed Grosbeak	0	0.00	0	0.00	1	0.05	0	0.00
Hammond's Flycatcher	0	0.00	0	0.00	2	0.10	0	0.00
Olive-sided Flycatcher	0	0.00	0	0.00	1	0.05	0	0.00
Pacific-slope Flycatcher	0	0.00	1	0.04	0	0.00	0	0.00
Northern Rough-winged Swallow	0	0.00	4	0.14	2	0.10	0	0.00
Tree Swallow	3	0.11	0	0.00	2	0.10	6	0.43
Western Kingbird	0	0.00	5	0.18	3	0.14	1	0.07
Western Tanager	0	0.00	0	0.00	1	0.05	0	0.00
Yellow Warbler	0	0.00	0	0.00	2	0.10	0	0.00
Total Species	28	1.00	35	1.25	35	1.67	21	1.50
Total Birds	238	8.50	235	8.39	200	9.52	127	9.07
Total Resident Species	21	0.75	25	0.89	25	1.19	18	1.29
Total Resident Birds	173	6.18	202	7.21	178	8.48	117	8.36
Total Wintering Species	6	0.21	6	0.21	0	0.00	0	0.00
Total Wintering Birds	62	2.21	18	0.64	0	0.00	0	0.00
Total Neotropical Migrant Species	1	0.04	4	0.14	10	0.48	3	0.21
Total Neotropical Migrant Birds	3	0.11	15	0.54	22	1.05	10	0.71

Haul Road 5 minute point counts Detections within 60 meters Year 2008 7 Stations (n=7)	Survey Period 1 March (3 Surveys)		Survey Period 2 April (4 Surveys)		Survey Period 3 May (4 Surveys)		Survey Period 4 June (2 Surveys)		
	Number of Individuals	Mean	Number of Individuals	Mean	Number of Individuals	Mean	Number of Individuals	Mean	
	Resident Species:								
Acorn Woodpecker	3	0.14	2	0.07	6	0.21	5	0.36	
American Goldfinch	0	0.00	5	0.18	0	0.00	0	0.00	
American Robin	1	0.05	0	0.00	0	0.00	0	0.00	
Anna's Hummingbird	7	0.33	14	0.50	12	0.43	6	0.43	
Bewick's Wren	4	0.19	5	0.18	7	0.25	4	0.29	
Black Phoebe	0	0.00	0	0.00	2	0.07	4	0.29	
Brown-headed Cowbird	0	0.00	12	0.43	10	0.36	6	0.43	
Bushtit	16	0.76	5	0.18	8	0.29	8	0.57	
California Towhee	4	0.19	0	0.00	4	0.14	2	0.14	
California Quail	0	0.00	2	0.07	1	0.04	0	0.00	
Cooper's Hawk	2	0.10	3	0.11	5	0.18	1	0.07	
European Starling	22	1.05	18	0.64	20	0.71	15	1.07	
Hairy Woodpecker	2	0.10	2	0.07	1	0.04	0	0.00	
House Finch	4	0.19	8	0.29	11	0.39	9	0.64	
House Wren	0	0.00	9	0.32	15	0.54	5	0.36	
Hutton's Vireo	0	0.00	2	0.07	5	0.18	0	0.00	
Killdeer	0	0.00	3	0.11	3	0.11	0	0.00	
Lesser Goldfinch	24	1.14	20	0.71	24	0.86	9	0.64	
Mourning Dove	0	0.00	2	0.07	4	0.14	1	0.07	
Northern Flicker	1	0.05	0	0.00	0	0.00	0	0.00	
Northern Mockingbird	0	0.00	2	0.07	0	0.00	0	0.00	
Nuttall's Woodpecker	1	0.05	1	0.04	0	0.00	0	0.00	
Oak Titmouse	13	0.62	17	0.61	11	0.39	8	0.57	
Red-tailed Hawk	0	0.00	1	0.04	1	0.04	0	0.00	
Rufous-crowned Sparrow	6	0.29	2	0.07	0	0.00	0	0.00	
Spotted Towhee	0	0.00	2	0.07	6	0.21	2	0.14	
Turkey Vulture	0	0.00	0	0.00	1	0.04	0	0.00	
Western Bluebird	8	0.38	6	0.21	2	0.07	2	0.14	
Western Scrub-Jay	7	0.33	6	0.21	0	0.00	3	0.21	
White-breasted Nuthatch	7	0.33	3	0.11	5	0.18	1	0.07	
Wild Turkey	0	0.00	3	0.11	5	0.18	2	0.14	
Local Wintering species:									
Dark-eyed Junco	1	0.05	0	0.00	0	0.00	0	0.00	
Golden-crowned Sparrow	0	0.00	8	0.29	0	0.00	0	0.00	
Orange-crowned Warbler	0	0.00	2	0.07	0	0.00	0	0.00	
Ruby-crowned Kinglet	17	0.81	3	0.11	0	0.00	0	0.00	
White-crowned Sparrow	6	0.29	9	0.32	0	0.00	0	0.00	

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Yellow-rumped Warbler	10	0.48	11	0.39	0	0.00	0	0.00
Neotropical Migrant Species:								
Ash-throated Flycatcher	0	0.00	4	0.14	12	0.43	3	0.21
Black-chinned Hummingbird	0	0.00	0	0.00	2	0.07	0	0.00
Black-headed Grosbeak	0	0.00	1	0.04	0	0.00	0	0.00
Bullock's Oriole	0	0.00	4	0.14	8	0.29	2	0.14
Northern Rough-winged Swallow	0	0.00	0	0.00	5	0.18	0	0.00
Townsend's Warbler	0	0.00	0	0.00	0	0.00	2	0.14
Tree Swallow	12	0.57	16	0.57	4	0.14	7	0.50
Violet-green Swallow	0	0.00	0	0.00	9	0.32	0	0.00
Western Kingbird	0	0.00	2	0.07	6	0.21	3	0.21
Western Tanager	0	0.00	0	0.00	3	0.11	0	0.00
Western Wood-pewee	0	0.00	0	0.00	5	0.18	0	0.00
Willow Flycatcher	0	0.00	0	0.00	2	0.07	0	0.00
Wilson's Warbler	0	0.00	0	0.00	2	0.07	2	0.14
Yellow Warbler	0	0.00	0	0.00	2	0.07	3	0.21
Total Species	23	1.10	36	1.29	36	1.29	26	1.86
Total Birds	178	8.48	215	7.68	229	8.18	115	8.21
Total Resident Species	18	0.86	26	0.93	24	0.86	19	1.36
Total Resident Birds	132	6.29	155	5.54	169	6.04	93	6.64
Total Wintering Species	4	0.19	5	0.18	0	0.00	0	0.00
Total Wintering Birds	34	1.62	33	1.18	0	0.00	0	0.00
Total Neotropical Migrant Species	1	0.05	5	0.18	12	0.43	7	0.50
Total Neotropical Migrant Birds	12	0.57	27	0.96	60	2.14	22	1.57

Folsom Point 5 minute point counts Detections within 60 meters Year 2008 5 Stations (n=5)	Survey Period 1 March (3 Surveys)		Survey Period 2 April (4 Surveys)		Survey Period 3 May (4 Surveys)		Survey Period 4 June (2 Surveys)	
	Number of Individuals	Mean	Number of Individuals	Mean	Number of Individuals	Mean	Number of Individuals	Mean
	Resident Species:							
Acorn Woodpecker	6	0.40	6	0.30	1	0.05	5	0.50
American Goldfinch	0	0.00	0	0.00	0	0.00	3	0.30
American Robin	2	0.13	0	0.00	0	0.00	0	0.00
Anna's Hummingbird	2	0.13	8	0.40	2	0.10	0	0.00
Bewick's Wren	1	0.07	4	0.20	4	0.20	1	0.10
Black Phoebe	0	0.00	0	0.00	1	0.05	1	0.10
Brewer's Blackbird	4	0.27	0	0.00	0	0.00	0	0.00
Brown-headed Cowbird	0	0.00	4	0.20	9	0.45	2	0.20
Bushtit	2	0.13	2	0.10	10	0.50	3	0.30
California Towhee	4	0.27	0	0.00	0	0.00	0	0.00
California Quail	3	0.20	0	0.00	2	0.10	0	0.00
Canada Goose	7	0.47	0	0.00	0	0.00	0	0.00
European Starling	14	0.93	5	0.25	9	0.45	4	0.40
House Finch	20	1.33	17	0.85	27	1.35	15	1.50
House Wren	0	0.00	5	0.25	5	0.25	1	0.10
Lesser Goldfinch	15	1.00	20	1.00	25	1.25	10	1.00
Mourning Dove	4	0.27	0	0.00	1	0.05	0	0.00
Northern Mockingbird	0	0.00	0	0.00	2	0.10	0	0.00
Nuttall's Woodpecker	2	0.13	0	0.00	2	0.10	0	0.00
Oak Titmouse	4	0.27	4	0.20	10	0.50	6	0.60
Red-shouldered Hawk	0	0.00	0	0.00	1	0.05	0	0.00
Red-tailed Hawk	2	0.13	4	0.20	2	0.10	5	0.50
Red-winged Blackbird	12	0.80	0	0.00	4	0.20	0	0.00
Rufous-crowned sparrow	2	0.13	0	0.00	0	0.00	2	0.20
Turkey Vulture	0	0.00	0	0.00	0	0.00	2	0.20
Western Bluebird	2	0.13	0	0.00	0	0.00	3	0.30
Western Scrub-Jay	3	0.20	0	0.00	0	0.00	0	0.00
White-breasted Nuthatch	2	0.13	2	0.10	5	0.25	1	0.10
Local Wintering Species:								
Golden-crowned Sparrow	2	0.13	5	0.25	2	0.10	0	0.00
Ruby-crowned Kinglet	3	0.20	0	0.00	0	0.00	0	0.00
Savannah Sparrow	2	0.13	5	0.25	0	0.00	0	0.00
Vesper Sparrow	0	0.00	0	0.00	1	0.05	0	0.00
White-crowned Sparrow	3	0.20	3	0.15	0	0.00	0	0.00
Yellow-rumped Warbler	4	0.27	3	0.15	0	0.00	0	0.00
Neotropical Migrant Species:								
Ash-throated Flycatcher	0	0.00	0	0.00	7	0.35	3	0.30

Appendix C

Bullock's Oriole	0	0.00	6	0.30	7	0.35	2	0.20
Cliff Swallow	0	0.00	0	0.00	10	0.50	6	0.60
Tree Swallow	14	0.93	39	1.95	17	0.85	16	1.60
Violet-green Swallow	0	0.00	0	0.00	1	0.05	1	0.10
Western Kingbird	0	0.00	6	0.30	14	0.70	2	0.20
Wilson's Warbler	0	0.00	0	0.00	2	0.10	0	0.00
Yellow Warbler	0	0.00	0	0.00	2	0.10	0	0.00
Total Species	27	1.80	19	0.95	29	1.45	22	2.20
Total Birds	139	9.27	148	7.40	185	9.25	94	9.40
Total Resident Species	21	1.40	12	0.60	19	0.95	16	1.60
Total Resident Birds	113	7.53	81	4.05	122	6.10	64	6.40
Total Wintering Species	5	0.33	4	0.20	2	0.10	0	0.00
Total Wintering Birds	14	0.93	16	0.80	3	0.15	0	0.00
Total Neotropical Migrant Species	1	0.07	3	0.15	8	0.40	6	0.60
Total Neotropical Migrant Birds	14	0.93	51	2.55	60	3.00	30	3.00

Mormon Island Wetland Preserve 5 minute point counts Detections within 60 meters Year 2008 7 Stations (n=7)	Survey Period 1 March (3 Surveys)		Survey Period 2 April (4 Surveys)		Survey Period 3 May (4 Surveys)		Survey Period 4 June (2 Surveys)	
	Number of Individuals	Mean	Number of Individuals	Mean	Number of Individuals	Mean	Number of Individuals	Mean
	Resident Species:							
Acorn Woodpecker	2	0.10	3	0.11	0	0.00	0	0.00
American Crow	0	0.00	0	0.00	0	0.00	1	0.07
American Goldfinch	4	0.19	0	0.00	0	0.00	0	0.00
American Kestrel	0	0.00	1	0.04	1	0.04	2	0.14
American Robin	3	0.14	5	0.18	2	0.07	0	0.00
Anna's Hummingbird	5	0.24	7	0.25	4	0.14	1	0.07
Bewick's Wren	5	0.24	9	0.32	14	0.50	4	0.29
Black Phoebe	11	0.52	8	0.29	10	0.36	11	0.79
Brown-headed Cowbird	0	0.00	4	0.14	9	0.32	4	0.29
Bushtit	6	0.29	5	0.18	8	0.29	5	0.36
California Towhee	1	0.05	3	0.11	1	0.04	0	0.00
California Quail	0	0.00	8	0.29	9	0.32	3	0.21
Downy Woodpecker	9	0.43	6	0.21	5	0.18	1	0.07
European Starling	1	0.05	9	0.32	4	0.14	4	0.29
Great-horned Owl	2	0.10	4	0.14	0	0.00	0	0.00
Hairy Woodpecker	0	0.00	4	0.14	3	0.11	2	0.14
House Finch	4	0.19	8	0.29	9	0.32	4	0.29
House Wren	10	0.48	26	0.93	22	0.79	13	0.93
Lesser Goldfinch	13	0.62	9	0.32	7	0.25	2	0.14
Mourning Dove	5	0.24	4	0.14	5	0.18	1	0.07
Northern Flicker	3	0.14	0	0.00	0	0.00	0	0.00
Northern Mockingbird	0	0.00	2	0.07	0	0.00	1	0.07
Nuttall's Woodpecker	1	0.05	8	0.29	8	0.29	5	0.36
Oak Titmouse	13	0.62	15	0.54	11	0.39	12	0.86
Purple Finch	1	0.05	0	0.00	0	0.00	0	0.00
Red-shouldered Hawk	1	0.05	1	0.04	0	0.00	2	0.14
Red-tailed Hawk	1	0.05	0	0.00	2	0.07	1	0.07
Red-winged Blackbird	18	0.86	21	0.75	15	0.54	12	0.86
Rufous-crowned Sparrow	5	0.24	1	0.04	0	0.00	0	0.00
Song Sparrow	2	0.10	4	0.14	5	0.18	5	0.36
Spotted Towhee	4	0.19	3	0.11	4	0.14	0	0.00
Western Bluebird	3	0.14	4	0.14	0	0.00	0	0.00
Western Scrub-Jay	13	0.62	5	0.18	1	0.04	7	0.50
White-breasted Nuthatch	3	0.14	5	0.18	6	0.21	2	0.14
White-tailed Kite	0	0.00	1	0.04	0	0.00	0	0.00
Wood Duck	0	0.00	2	0.07	1	0.04	0	0.00
Local Wintering Species:								

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Dark-eyed Junco	3	0.14	0	0.00	0	0.00	0	0.00
Golden-crowned Sparrow	0	0.00	2	0.07	0	0.00	0	0.00
Hermit Thrush	2	0.10	0	0.00	0	0.00	0	0.00
Lincoln Sparrow	0	0.00	2	0.07	0	0.00	0	0.00
Orange-crowned Warbler	0	0.00	1	0.04	1	0.04	0	0.00
Ruby-crowned Kinglet	18	0.86	1	0.04	0	0.00	0	0.00
White-crowned Sparrow	3	0.14	1	0.04	0	0.00	0	0.00
Yellow-rumped Warbler	17	0.81	2	0.07	0	0.00	0	0.00
Neotropical Migrant Species:								
Ash-throated Flycatcher	0	0.00	5	0.18	11	0.39	4	0.29
Black-chinned Hummingbird	0	0.00	0	0.00	0	0.00	2	0.14
Black-headed Grosbeak	0	0.00	1	0.04	1	0.04	1	0.07
Bullock's Oriole	0	0.00	4	0.14	8	0.29	1	0.07
Cliff Swallow	0	0.00	0	0.00	0	0.00	3	0.21
MacGillivray's Warbler	0	0.00	1	0.04	0	0.00	0	0.00
Tree Swallow	23	1.10	36	1.29	35	1.25	17	1.21
Warbling Vireo	0	0.00	0	0.00	2	0.07	0	0.00
Western Kingbird	0	0.00	0	0.00	4	0.14	5	0.36
Western Tanager	0	0.00	2	0.07	0	0.00	0	0.00
Wilson's Warbler	0	0.00	1	0.04	6	0.21	0	0.00
Yellow Warbler	0	0.00	1	0.04	5	0.18	1	0.07
Total Species	34	1.62	45	1.61	34	1.62	32	2.29
Total Birds	215	10.24	255	9.11	239	11.38	139	9.93
Total Resident Species	28	1.33	31	1.11	25	1.19	24	1.71
Total Resident Birds	149	7.10	195	6.96	166	7.90	105	7.50
Total Wintering Species	5	0.24	6	0.21	1	0.05	0	0.00
Total Wintering Birds	43	2.05	9	0.32	1	0.05	0	0.00
Total Neotropical Migrant Species	1	0.05	8	0.29	8	0.38	8	0.57
Total Neotropical Migrant Birds	23	1.10	51	1.82	72	3.43	34	2.43

**Appendix D – Species Detections - Folsom Dam DS/FDR
Project 2008**

Appendix D

Bird Species Detections 2008		Dike - 5		Right Wing Dam		Haul Road		Folsom Point		Mormon Island Preserve	
Species	Status	Nest Found	Point Count	Nest Found	Point Count	Nest Found	Point Count	Nest Found	Point Count	Nest Found	Point Count
Acorn Woodpecker	Resident		X		X		X	X	X		X
American Crow	Resident		X								X
American Goldfinch	Resident		X	X	X		X		X		X
American Kestrel	Resident									X	X
American Pipit	Wintering		X								
American Robin	Resident		X		X		X		X		X
Anna's Hummingbird	Resident	X	X	X	X	X	X	X	X	X	X
Ash-throated Flycatcher	Neotropical Migrant		X	X	X	X	X	X	X	X	X
Bald Eagle	Resident; Species of Special Concern		X		X						
Barn Owl	Resident							X			
Bewick's Wren	Resident	X	X	X	X	X	X	X	X	X	X
Black-chinned Hummingbird	Neotropical Migrant		X		X		X				X
Black-headed Grosbeak	Neotropical Migrant	X	X	X	X		X				X
Black Phoebe	Resident		X		X		X		X	X	X
Brewer's Blackbird	Resident								X		
Brown-headed Cowbird	Resident		X		X		X		X		X
Bullock's Oriole	Neotropical Migrant		X				X	X	X		X
Bushtit	Resident	X	X	X	X	X	X	X	X	X	X
California Towhee	Resident		X	X	X		X		X	X	X
California Quail	Resident		X		X		X		X		X
Canada Goose	Wintering								X		
Cassin's Vireo	Neotropical Migrant		X								
Cliff Swallow	Neotropical Migrant		X						X		X
Cooper's Hawk	Resident; Species of Special Concern		X	X	X	X	X				
Dark-eyed Junco	Wintering				X		X				X
Downy Woodpecker	Resident									X	X
European Starling	Resident	X	X		X	X	X	X	X	X	X
Golden-crowned Sparrow	Wintering		X		X		X		X		X
Great-horned Owl	Resident							X		X	X
Hairy Woodpecker	Resident						X			X	X
Hammond's Flycatcher	Neotropical Migrant				X						
Hermit Thrush	Wintering										X

Bird Species Detections 2008 (cont'd)		Dike - 5		Right Wing Dam		Haul Road		Folsom Point		Mormon Island Preserve	
Species	Status	Nest Found	Point Count	Nest Found	Point Count	Nest Found	Point Count	Nest Found	Point Count	Nest Found	Point Count
Hermit Warbler	Neotropical Migrant		X								
House Finch	Resident	X	X		X	X	X	X	X		X
House Wren	Resident	X	X	X	X	X	X	X	X	X	X
Hutton's Vireo	Resident			X	X	X	X				
Killdeer	Resident		X		X		X				
Lark Sparrow	Resident		X								
Lawrence's Goldfinch	Resident				X						
Lesser Goldfinch	Resident	X	X	X	X	X	X	X	X	X	X
Lewis's Woodpecker	Resident		X								
Lincoln Sparrow	Wintering										X
MacGillivray's Warbler	Neotropical Migrant										X
Mallard	Resident	X		X	X						
Mourning Dove	Resident	X	X		X		X		X	X	X
Nashville Warbler	Neotropical Migrant		X								
Northern Flicker	Resident						X				X
Northern Mockingbird	Resident		X		X		X		X		X
Northern Rough-winged Swallow	Neotropical Migrant				X		X				
Nuttall's Woodpecker	Resident		X	X	X		X		X		X
Oak Titmouse	Resident	X	X	X	X	X	X	X	X		X
Olive-sided Flycatcher	Neotropical Migrant		X		X						
Orange-crowned Warbler	Wintering		X		X		X				X
Pacific-slope Flycatcher	Neotropical Migrant				X						
Purple Finch	Resident		X		X						X
Red-shouldered Hawk	Resident								X	X	X
Red-tailed Hawk	Resident				X		X	X	X	X	X
Red-winged Blackbird	Resident		X						X	X	X
Ruby-crowned Kinglet	Wintering		X		X		X		X		X
Rufous-crowned Sparrow	Resident	X	X		X		X		X		X
Savannah Sparrow	Wintering		X						X		
Say's Phoebe	Neotropical Migrant		X								
Song Sparrow	Resident		X		X						X
Spotted Towhee	Resident		X	X	X		X				X
Townsend's Warbler	Neotropical Migrant						X				

Appendix D

Bird Species Detections 2008 (cont'd)		Dike - 5		Right Wing Dam		Haul Road		Folsom Point		Mormon Island Preserve	
Species	Status	Nest Found	Point Count	Nest Found	Point Count	Nest Found	Point Count	Nest Found	Point Count	Nest Found	Point Count
Tree Swallow	Neotropical Migrant		X	X	X	X	X	X	X	X	X
Turkey Vulture	Resident		X		X		X		X		
Vesper Sparrow	Wintering								X		
Violet-green Swallow	Neotropical Migrant						X	X	X		
Warbling Vireo	Neotropical Migrant										X
Western Bluebird	Resident		X		X	X	X	X	X	X	X
Western Kingbird	Neotropical Migrant	X	X		X		X	X	X	X	X
Western Meadowlark	Resident		X								
Western Scrub-Jay	Resident		X		X	X	X		X	X	X
Western Tanager	Neotropical Migrant				X		X				X
Western Wood-pewee	Neotropical Migrant						X				
White-breasted Nuthatch	Resident		X	X	X	X	X	X	X	X	X
White-crowned Sparrow	Wintering		X		X		X		X		X
Wild Turkey	Resident				X	X	X			X	
Willow Flycatcher	Neotropical Migrant						X				
Wilson's Warbler	Neotropical Migrant		X				X		X		X
White-tailed Kite	Resident; Species of Special Concern		X								X
Wood Duck	Resident									X	X
Wrentit	Resident		X								
Yellow-rumped Warbler	Wintering		X		X		X		X		X
Yellow Warbler	Neotropical Migrant; Species of Special Concern				X		X		X		X