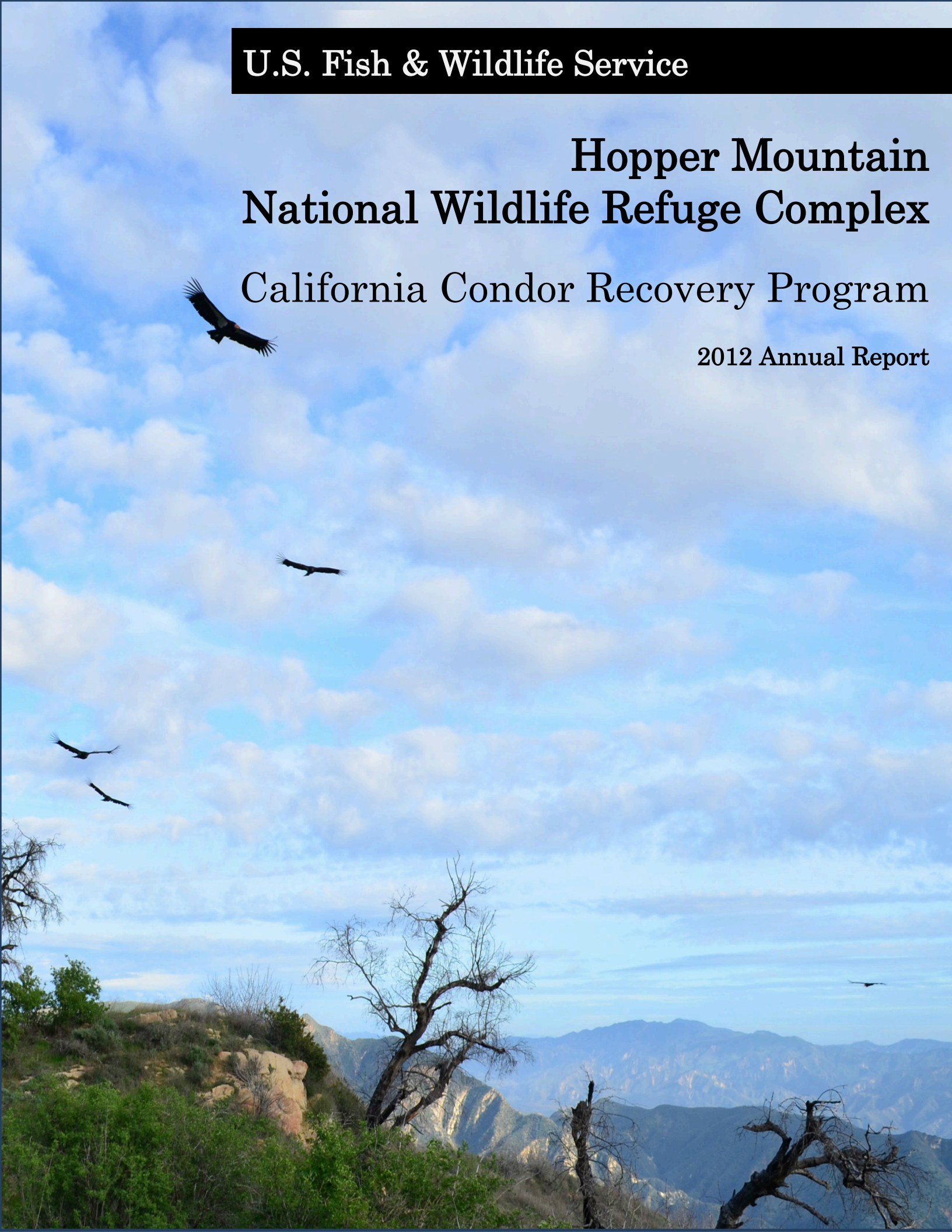
U.S. Fish & Wildlife Service

Hopper Mountain National Wildlife Refuge Complex

California Condor Recovery Program

2012 Annual Report



On the Cover: Condors soaring near Hopper Mountain NWR
Photo Credit: Ben Teton, USFWS Volunteer, 2012-2013

Prepared By

Joseph Brandt, Supervisory Wildlife Biologist, USFWS
Geoff Grisdale, Wildlife Biologist, USFWS
Laura Mendenhall, Wildlife Biologist, USFWS
Devon Lang Pryor, Biological Science Technician, USFWS
Josh Felch, Biological Science Technician, USFWS
Kathryn Chaplin, Pathways Biological Science Technician, USFWS

U.S. Fish and Wildlife Service
2493 Portola Road, Suite A
Ventura, CA 93003
Telephone: (805) 644-5185

Acknowledgements

The California Condor Recovery Program would not be possible without the support of our partners, volunteers, Hopper Mountain National Wildlife Refuge Complex staff, and others. Santa Barbara Zoo staff, Molly Astell and Ria Boner, located nests, observed nests, trained volunteers and staff on nest protocol, and assisted with camera system observations. Santa Barbara Zoo also provided the use of X-Ray equipment for non-proffered carrion studies, ongoing public outreach and California condor nesting behavior research. The Los Angeles Zoo condor keepers and veterinary staff including Mike Clark, Chandra David, Debbi Ciani, Jenny Schmidt, Nick Carey, Karl Hill and Curtis Eng provided treatment to the wild condor population, training of Service personnel on chick handling, and assistance with nest entries. Tejon Ranch (Rob Peterson and Chris Niemela), and Wind Wolves Preserve (David Clendenen) provided land access and condor sighting reports. The University of California Davis and Santa Cruz continued research on lead in California condors. James Rasico assisted the Service in tracking and monitoring of California condors, as well as locating non-proffered food sources. Ben Smith and Leland Brown with the Institute for Wildlife Studies led multiple lead-free hunter education events. Fred Workman, Law Enforcement with the Service conducted law enforcement activities on the refuges during hunting season. Volunteer efforts provided by Bill Langford, Carol Saunders, Julian Lange, Julie Kummel, Peggy Burbank, Rachel Wing, Roderick E. Lang, Stephanie Herrera, Vince Gerwe, Debbie Parisi, Amethyst Yale, Helen Johnson, Ron Dow, Steve Goltra, Suzanne Ruffner, Zac Hamber, Will Reed, Jan Hamber, Mike Matejcek, and Anthony Prieto. The Friends of the California Condor Wild and Free provided assistance with work projects and outreach. Volunteer interns, Sam Simmons, Matt Landever, Danny Raleigh, Caitlin Bowman, Ryane Cox, Chris Smith, Angela Woodside, Marian Wahl, Corinne Ross, Christina Varian, Marie McCann, Ben Teton, and Jerry Cole assisted in field management actions. Hopper Mountain NWR staff members Mike Brady, Ken Convery, Dan Tappe, Steve Kirkland, Irma Barraza, Min Windhorst, Ivett Plascencia, Janet Garcia, and Michael Woodbridge as well as California Condor Recovery Coordinator, John McCamman, assisted in various aspects supporting the field program. Barry Angel, Lee Hamrick, Daniel Chaplin, Charles Eldermire, and Tom Brooks assisted with the development of the remote camera systems. The Bear Valley Springs Home Association, Police and Fire Department, and Les and Millet Robinson assisted during behavioral modification actions at Bear Valley Springs. Ventura County Search and Rescue provided a helicopter to evacuate a California condor chick to Los Angeles Zoo veterinary staff for treatment and return it to its nest cavity. Nick Echevarrias allowed access across Wildlands Conservancy leased land during a condor trapping effort. James and Victoria Van Trees allowed biologists access their property to perform nest entries on adjacent lands. Benz Ranch, King's Ranch, Snedden's Ranch, Temescal Ranch, and Johanson's Ranch provided information regarding condor activity. Habitat Works and Los Padres Forest Watch conducted microtrash cleanups. Producer of Shadow of the Condor, Jeff McLoughlin, created a thorough documentary on the California condor recovery effort. We would also like to acknowledge all hunters using lead-free ammunition for proving a clean and safe food source for condors across their range.

Executive Summary

The Hopper Mountain National Wildlife Refuge Complex manages a reintroduced California condor population in Southern California. The Bitter Creek and Hopper Mountain National Wildlife Refuges are used as the primary management locations for the release, monitoring, and recapturing of condors in this region.

As of December 31, 2012 the condor population managed directly by the Service consisted of 69 free-flying condors. Four wild chicks fledged in 2012 with assistance from the Service and the Santa Barbara Zoo's Nest Guarding Program. In addition to the wild reproduction, 7 captive-bred condors were successfully released by the Service at Bitter Creek National Wildlife Refuge. The reintroduced condor population continues to recolonize its former habitat, exemplified by increased condor activity in the Northern Tehachapi and Southern Sierra Nevada Mountains.

The field team trapped the population twice during the year to monitor for lead exposure from lead shot carrion or gut piles and maintain transmitters on each condor. As a result, 10 condors, including one chick, required treatment for elevated blood lead levels.

There were 3 condor deaths in 2012 including a free-flying condor that was euthanized after becoming entangled on a large radio antenna and suffering a serious wing injury in 2011, and 2 chicks that died prior to fledging.

A significant event involving interactions between condors and humans took place in the Bear Valley Springs Community of the Northern Tehachapi Mountains. This event was mitigated through community outreach and hazing without having to capture any condors for behavioral reasons.

A remote nest camera system was developed and successfully installed into an active condor nest allowing for the first video archive of condor nesting activity to be used for behavioral research and outreach, including a new Service Facebook page entitled The Condor Cave. Other outreach activities included lead-free shooting demonstrations in partnership with the Institute for Wildlife Studies. This was the first time a lead-free shooting demonstration was conducted in Southern California.

Table of Contents

List of Figures

List of Tables

Introduction

The California condor is a federally listed endangered species. The current recovery priority ranking for the California condor is 4C. The "4" designation indicates that the California condor is a monotypic genus that faces a high degree of threat and has a low potential for recovery. The "C" indicates conflict with construction, development projects, or other forms of economic activity.

California condors are among the largest flying birds in the world, with a wingspan measuring up to 2.9 meters (9.5 feet). Condors are a long-lived species with an estimated lifespan of 60 years. They are slow to mature and typically begin to reproduce at 6 years of age. Condors often form long-lived pairs and fledge one chick every other year. If a nestling fledges relatively early (in late summer or early fall), its parents may nest again the following year (Snyder and Hamber 1985).

California condor habitat can be categorized into nesting, foraging, and roosting components (USFWS 1975). Condors forage in the open terrain of foothill grassland, oak savanna, and woodland habitats, and on the beaches of steep mountainous coastal areas when available. Condors maintain wide-ranging foraging patterns throughout the year, which is an important adaptation for a species that may be subjected to an unpredictable food supply (Meretsky and Snyder 1992). Condors at interior locations feed on the carrion of mule deer, tule elk, pronghorn antelope, feral hogs, domestic ungulates, and smaller mammals, while the diet of condors feeding on the coast also includes the carrion of whales, sea lions, and other marine species (Koford 1953; USFWS 1984; Emslie 1987; USFWS, unpubl. data). California condors are primarily a cavity nesting species and typically nest in cavities located on steep rock formations or in the burned out hollows of old-growth conifers (coastal redwood [*Sequoia sempervirens*] and giant sequoia trees [*Sequoiadendron giganteum*]) (Koford 1953; Snyder et al. 1986). Less typical nest sites include cliff ledges, cupped broken tops of old-growth conifers, and in several instances, nests of other species (Snyder et al. 1986; USFWS 1996). Condors repeatedly use roosting sites on ridgelines, rocky outcrops, steep canyons, and in tall trees or snags near foraging grounds or nest sites (USFWS 1984).

The U.S. Fish & Wildlife Service (Service) Hopper Mountain National Wildlife Refuge Complex (Complex) serves as the lead office for the California Condor Recovery Program (Recovery Program) and is one of many partners that support this multi-state and international recovery effort. Since 1992, the Complex has participated in the California condor reintroduction effort. The Service operated a number of different release sites both on refuges and on U.S. Forest Service lands and has released condors from the captive breeding facilities annually. Over time,

these releases led to the establishment of the Southern California condor population, the group of condors directly managed by the Complex's condor field team. Over the last 20 years, the field team has been responsible for the continued monitoring and management of the reintroduced population, working both on and off refuge. Today, 2 of the wildlife refuges from the Complex, Bitter Creek National Wildlife Refuge (Bitter Creek NWR) and Hopper Mountain National Wildlife Refuge (Hopper Mountain NWR) are the primary management locations for the Southern California condor population, which currently inhabits portions of Santa Barbara, Ventura, Los Angles, Kern, and Tulare Counties.

The California Condor Recovery Plan (Recovery Plan) provides the overarching guidance for field activities. The primary objective driving the reintroduction effort is the establishment of one of the 2 wild, self-sustaining populations of 150 individuals with 15 breeding pairs (USFWS 1996). The Recovery Plan consists of 5 key actions: 1) establish a captive breeding program, 2) reintroduce California condors into the wild, 3) minimize mortality factors, 4) maintain condor habitat, and 5) implement condor information and educational programs (USFWS 1984). In accordance with the Recovery Plan, "Released California condors should be closely monitored by visual observation and electronic telemetry" (USFWS 1984).

To support the second key action in the Recovery Plan, biologists monitor the free-flying population of condors to identify threats and reduce adverse effects to condors, including minimizing mortality factors. Each refuge provides facilities designated for trapping and holding condors, which is necessary for attaching tags and transmitters to condors and performing routine health checks. Another key action in the Recovery Plan is to minimize mortality factors in the natural environment. In accordance with the Recovery Plan, "Condor blood, feathers, eggshells, and other tissues will be collected opportunistically and analyzed for heavy metals, pesticides, and other potential contaminants" (USFWS 1984).

The field team is comprised of a number of different positions including Service employees, partner employees, and volunteers. In 2012, the Service employed one full-time permanent supervisory wildlife biologist, 2 full-time term wildlife biologists, 2 full-time term biological science technicians, and 1 part-time student biological science technician. The Santa Barbara Zoo employed 1 full-time nesting technician and the University of California, Davis funded a full-time junior specialist; both positions worked as members of the field team and assisted in conducting condor monitoring and management. In addition to the various staff positions, the Complex has 4 volunteer intern positions that are filled throughout the year. Individuals who volunteered for these positions committed to working 40 hours a week for 6 months for a stipend for each day worked. The field program also utilized a number of unpaid volunteers who primarily assisted with monitoring nests during the 8 month nesting season. A variety of support also came from other program partners. The

Los Angeles Zoo provided assistance in caring for sick and injured condors and helped during handling events and nest entries. The Friends of the California Condor Wild and Free helped with outreach events and project work such as building blinds or flight pen maintenance.

This annual report describes the activities conducted by the field team. Primary management operations undertaken by the field team are described in detail. The staff resources attributed to each operation are reported for the year. The outcomes of these activities are described and discussed.

1.0 Funding

In 2012, the Hopper Mountain Wildlife Refuge Complex Office received $523,924.00 in USFWS Recovery funds (1113). These resources were used to fund the field team and their activities as well as a programmatic condor coordinator position.
Refuge management funds (126x) were also used and contributed significantly to condor related activities.

2.0 Actions

2.1 Monitoring Resource Use

The loss and modification of California condor foraging, roosting and nesting habitat has been identified as a historic threat to the recovery of the species. As noted in the 1979 Recovery Plan (USFWS 1979), adequate nest sites, roost sites, and foraging habitat with adequate food are the basic habitat needs of the condor. The 1996 Recovery Plan (USFWS 1996) acknowledges the presence of sufficient remaining condor habitat in the Southwestern states but notes that maintaining this habitat is a key recovery action (USFWS 1996). The field team monitors nesting, roosting, and foraging habitat use across Southern California using data from global positioning system (GPS) transmitters attached to condors.

GPS transmitter locations are produced by solar-powered, patagial-mounted GPS transmitters (Argos/GPS PTT; Microwave Telemetry, Inc. ©, Columbia, Maryland) that are attached to a subset of individual condors during routine handling. Units are assigned to individuals of different sexes and age classes while also considering breeding status or captive release circumstances. Data from these transmitters show locations accurate to tens of meters for each condor at a frequency of 1-hour intervals. GPS transmitter locations are used to understand condor resource use over a large geographic and temporal scale. All California condors in Southern California are equipped with either 2

very high frequency (VHF) transmitters attached to a central rectrix (Kenward 1978) or a combination of one VHF and one patagial-mounted (Wallace 1994) GPS transmitter unit to ensure each condor can be tracked.

The field team monitors GPS transmitter locations daily in order to target locations of immediate interest for on-the-ground investigation, a process referred to as ground-truthing. Non-proffered feeding events and potential threats are prioritized for ground-truthing. A feeding event is confirmed by the presence of carrion. When possible, carrion is collected for further examination, including radiographing and dissection, at the Santa Barbara Zoo. Any metallic objects, including lead or other metals detected in this process are recovered and analyzed for ongoing research by the University of California, at Santa Cruz and Davis (Appendix I). When the field team identifies potential threats such as a lead exposure source, microtrash source, or habituation event, these areas can be targeted with outreach or management actions.

GPS transmitter locations also inform program-wide objectives via long-term research projects. Some of the ongoing research using this data includes evaluating the success of the Ridley-Tree Condor Preservation Act (Appendix I), monitoring condor distribution and activity across the landscape (Johnson et al. 2010; Cogan et al. 2012), and informing condor population viability analyses (Appendix I). Findings from these studies may inform management strategies and policy aimed at addressing lead-based ammunition and other threats to condor survival.

2.2 Lead Monitoring and Mitigation

Lead poisoning is an ongoing major concern for all condors, including those in the Southern California population. The Ridley-Tree Condor Preservation Act (2008) regulates the use of lead ammunition in California and may reduce the amount of lead-contaminated carrion available to scavengers throughout condor range. However, there is still potential for condors to encounter lead fragments from animals shot with lead ammunition (Finkelstein et al. 2012). The purpose of monitoring and mitigating lead exposure in California condors is to inform management and policymaking and prevent lead related mortalities.

Twice each year, the field team traps and handles the entire Southern California condor population to monitor blood lead levels and treat condors for lead exposure. Handling occurs once in early summer (starting in June) and again in late fall (starting in November). Some condors are tested opportunistically at additional times throughout the year when a lead exposure is suspected or when they are handled for other purposes and obtaining a blood lead level is possible. The field team also samples the blood lead levels of wild condor chicks during routine nest entries (see: Nest Management section). While handling each condor, biologists collect 3 blood samples from the medial metatarsal vein using blood vials containing EDTA. One sample is used immediately for field blood lead testing

using a portable lead analyzer. Condors with a field blood lead value below 35 µg/dL are released into the wild and all condors with a field blood lead value greater than or equal to 35 µg/dL are transported to the Los Angeles Zoo for treatment.

Treatment at the Los Angeles Zoo consists of radiographing the condor to identify possible metallic objects in the digestive system and chelation treatment to remove lead from the bloodstream. Chelation treatment consists of daily intramuscular injections of Calcium EDTA (calcium edetate) in conjunction with subcutaneous fluids. Treatment time varies between weeks to months depending on the level of lead exposure. Zoo technicians are able to identify metallic objects in radiographic images but are not able to determine the type or composition of these objects unless recovered. Los Angeles Zoo staff closely monitor condors with metallic-positive radiographs; they recover castings and fecal material and, when possible, remove metallic objects for analysis.

Additional blood samples collected from handling condors are refrigerated and sent to the California Animal Health and Food Safety Laboratory System at UC Davis for lab analysis of lead concentrations and the Microbiology and Environmental Toxicology Department at the University of California Santa Cruz for lead isotope analysis. In addition, feather samples collected from trapped condors are used to monitor lead exposure over long periods of time.

2.3 Detecting Mortalities

Identifying the causes of California condor mortalities is an important aspect of California condor recovery. Despite decades of research, the reasons for the species' decline in historic populations are poorly documented. Understanding the factors contributing to mortalities in the reintroduced wild populations is essential to the conservation of the species (Rideout et al. 2012). It is important to quickly identify and locate dead condors in order to determine the cause of death and detect any immediate threats. Detection of mortalities by radio telemetry and GPS monitoring is one of the highest priority operations occurring in the field program.

The field team usually detects condor mortalities using VHF transmitters attached to each condor. All deployed VHF transmitters have an automatic mortality signal function. After a 12-hour period of inactivity, the VHF transmitter will emit a beep with a frequency about twice as fast as the normal rate, also called a mortality signal. When a mortality signal is detected it can indicate the VHF transmitter has fallen off the condor via a molted feather, the condor has not moved for some time (mortality signals can occur in the morning before the condor has moved from its roost), or the condor is dead. When reviewing condor GPS transmitter locations, stationary GPS transmitter locations for a single condor over an unusually long period may indicate a mortality.

Condors are monitored throughout the day using radio telemetry at both

Hopper Mountain NWR and Bitter Creek NWR. If a condor is undetected for more than one week, the field team will expand their search for the missing condor by mobile tracking. Mobile tracking involves driving to various off-refuge locations within Southern California condor range to detect a signal for the missing condor.

Condor chick mortalities are detected during routine nest monitoring (see: Nest Management section). Monitoring nests regularly allows biologists to identify chick mortalities immediately or shortly after they occur. Condor chick carcasses are transferred to the San Diego Zoo Pathology Lab for postmortem examination in order to determine cause of death.

2.4 Nest Management

Nesting in the Southern California condor population of began in 2001. Between 2001 and 2006, only 2 condor chicks fledged from 16 nests. The field team identified the leading cause of nest failure as the consumption of small, human-made materials, also called microtrash, brought to nests by parent condors. Documented microtrash items include nuts, bolts, washers, copper wire, plastic, bottle caps, glass, and spent ammunition cartridges (Mee et al. 2007; Walters et al. 2010). When chicks ingest large quantities of these items it can result in digestive tract impaction, evisceration, internal lesions, and death (Grantham 2007; Snyder 2007; Rideout et al. 2012). In 2007, the Service partnered with the Santa Barbara Zoo to create an intensive nest management strategy, the California Condor Nest Guarding Program. This program is modeled after a nest guarding program for the endangered Puerto Rican Parrot (Lindsey 1992). Nest guarding combines monitoring nests to detect threats to thwart nest failure. The goals of the California Condor Nest Guarding Program are to identify the leading causes of nest failure and to increase the number of wild fledged condor chicks in Southern California.

The field team locates nests using visual observations, radio telemetry, and ground-truthing GPS transmitter locations of breeding age condors early in the nesting season (Mee et al. 2007; Snyder et al. 1986). The field team first identifies pairs by tracking courtship behaviors. Existing pairs will often re-nest in previously used cavities or in cavities located nearby. A nest is identified by visual confirmation of an egg. In the case of difficult-to-view cavities, nests are not confirmed until biologists enter the cavity to check the fertility of the egg.

Nests are observed at frequencies based on their accessibility and visibility. Typically, each nest is observed for 2 hours 3 to 4 times per week. More remote nests are observed less frequently or not at all. Nest cavities that are not fully visible are monitored for attendance using radio telemetry or GPS transmitter locations. While nests are primarily monitored through direct field observations, a nest camera system was piloted this season to facilitate closer and more frequent monitoring (see: Appendix II).

Active nests are routinely entered by specially trained biologists to monitor the status of the egg or chick, and to sift for and remove microtrash. Biologists enter nests once during the egg stage to check the egg's fertility. During the chick stage, the nest is entered when the chick is 30, 60, 90, and 120 days old. During each nest entry, biologists give the chick a health exam. The chick's stomach and crop are palpated for foreign bodies or blockages. Biologists take a blood sample, weight, and tail feather length measurement to assess the chick's development and overall health. In addition to the health exam, the nest is sifted for any foreign material. At 30, 60, and 120 days of age, the chick is vaccinated for West Nile virus. The 120-day nest entry is normally the last nest entry to discourage possible premature-fledging. During this entry, the chick is fitted with a patagial tag and VHF transmitter.

Nest interventions take place when problems arise or when pair history dictates preventative measures should be taken to ensure success. During the egg stage, nonviable eggs are removed and replaced with dummy eggs until a captive-laid viable egg can be switched with the dummy egg prior to hatching. Additional interventions occur as needed to mitigate threats detected during observations. In the event of a nest failure, biologists enter the nest to recover the remains of the egg or chick. Chick carcasses are submitted to the San Diego Zoo Pathology Lab for necropsy.

When chicks fledge, they are closely monitored much like newly released captive-bred condors (see: Captive Releases and Transfers section), to ensure they are integrating into the population and displaying normal behavior.

2.5 Captive Releases and Transfers

During the fall season of each year, the field team releases captive-bred juvenile California condors into the wild at Bitter Creek NWR. The purpose of releasing captive-bred condors is to augment the wild population, offset mortalities that occur in the wild, and ensure genetic diversity in the Southern California population of condors.

The California condor is one of many endangered species managed to maximize the genetic diversity present in the original population, minimize genetic loss, and emphasize optimal productivity (Ralls and Ballou 2004; USFWS 1996). As outlined in the 1996 Condor Recovery Plan (USFWS 1996), productivity must be increased beyond the California condor intrinsic rate of reproduction through a captive breeding program (USFWS 1996). Captive-bred California condors selected for release in the wild must be physically and behaviorally healthy, have been successfully socialized with other release candidates, have been kept in isolation from humans to prevent taming, and have undergone aversion training to condition avoidance of humans and manmade structures (USFWS 1996). In addition to juvenile captive-bred releases, the field team releases adult California condors deemed no longer valuable as breeders or mentors.

Prior to release, condors spend time in a flight pen (or captive enclosure) at Bitter Creek NWR to allow time to transition from the breeding facility into the wild. Pre-release condors will spend at least 6 weeks in a flight pen on the refuge. This extended period in the flight pen allows the pre-release condors to become familiar with their new surroundings and interact with wild condors perching or feeding nearby. During this time, the field team monitors pre-release condors 2 to 4 days per week during 4-hour observations in order to examine and record social behavior and physical health. On the day prior to release, biologists place identification tags and VHF transmitters on each condor and move condors into a secondary enclosure within the flight pen.

The field team typically releases California condors during the fall months because the weather is cooler and there are fewer thermal updrafts of air. These weather conditions are conducive to keeping newly released condors close to the release site and to supplemental food and water sources while they are learning to fly.

Condors are usually released in pairs to encourage socialization. Supplemental carrion is provided near the release pen in order to lure other free-flying condors in to feed and interact with the new releases. The newly released condors are monitored closely for a minimum of 30 days. Additional releases take place only after the previously introduced condors roost appropriately off the ground and become familiar with the location of water and supplemental feeding sites. Supplemental feeding is an integral component of the condor release program (USFWS 1996). Supplemental food and water act as a substitute for the parental care that the released condors would have received had they fledged from a wild nest.

The field team will trap a newly released condor and return it to captivity (temporarily or permanently) if it exhibits unfavorable or dangerous behavior in the wild. This behavior includes approaching humans, not socializing with other condors, and/or the inability to locate supplemental carrion.

2.6 Behavioral Modification

The California condor is an inquisitive species whose range overlaps with human development. The inevitability of this overlap leads to the potential for isolated incidences of habituation. Condors that have become overly habituated to human activity and structures are at greater risk to behavioral conditioning, which ultimately affects their ability to survive in the wild. A habituated condor may also cause other condors to become habituated given the social nature of the species. In some cases, condors have caused property damage at habituation sites. Condors can also jeopardize human safety in the event a habituated condor approaches people.

Cade et al. (2004) grouped undesirable behavior into 3 categories. Type I behavior is considered normal and is categorized by condors remaining at least 15 meters from people, exploring anthropogenic objects infrequently, landing on manmade structures limited

to those that resemble natural perches or offer adequate protection from predators, and abandoning the undesirable behavior after 1-2 deterrence activities, i.e., "hazing" or "aversion training" (Cade et al. 2004). Hazing is defined as "an activity directed at a condor by humans in attempt to discourage a behavior" while aversion training is defined as "making an undesirable activity or behavior unpleasant without direct human interaction" (Grantham 2007).

Type II behavior is an "intermediate category", and is exemplified by condors "landing or flying closer than 15 meters to humans, but maintaining an 'individual distance' when approaching or being approached by humans" and "circumventing humans when investigating their belongings, allowing close human approach only when a clear escape route is present" and "fleeing when hazed" (Cade et al. 2004).

Type III behavior is of utmost concern, and "consists of condors allowing close human approach when no escape route is present (no fear of being boxed in), seeking out and initiating contact with humans, allowing touching and handling (including capture)" and "not responding to hazing, and showing no fear of humans" (Cade et al. 2004). These types of behaviors have been observed in similar vulture species in the United States including the black vulture [*Coragyps atratus*] (Lowney 1999).

While Type I and Type II behavior are considered normal exploratory and play activities that may be adaptations related to foraging and the social nature of the species, these behaviors may lead to the development of Type III behaviors. In turn, case studies have shown that Type III behavior can be changed to Type I or Type II behavior by hazing the individual or temporarily removing the offending individual from the population, though this is not effective in every situation (Cade et al. 2004).

Although lowest on the undesirable behavior spectrum, even Type I behaviors can cause risks to condors. While this category is not associated with approaching humans, it does result in condors approaching or landing on human structures. In many cases, these structures are hazardous because condors can become entangled or entrapped on or in structures or ingest poisonous household or industrial items, leading to injury or death (Figures 2.6.1 & 2.6.2).

Figure 2.6.1: Photo of condor #412 entangled and hanging from a communications tower in May 2011. The injuries from this incident were so severe the condor was euthanized.

The field team employs aversion training, hazing, and trapping of habituated condors as a means to

manage Type I and II behaviors and prevent Type III behaviors and subsequent injury to condors.

In the early stages of reintroducing condors into the wild, a number of mortalities were attributed to power line collisions and electrocution. As a result, mock power poles that delivered nonfatal electric shocks to any condor landing on the structure were constructed in pre-release flight pens. This aversion training has proved very effective in conditioning pre-release condors to avoid these structures once they join the free-flying population.

Field staff identify habituation sites and habituated condors using radio telemetry, GPS transmitter data, and visual monitoring, and responding to reports of condors engaged in undesirable behavior. Hazing, in combination with removing any potential attractants, has been effective at discouraging condor activity at many locations.

Figure 2.6.2: Photo of condor #63 covered in motor oil at Rancho la Cruz.

Hazing techniques include making loud noises, clapping and waving hands, using slingshots with non-injurious food items (e.g. grapes and gumdrop candies), spraying streams of water from hoses and water guns, and using restrained dogs. Hazing is an effective deterrent only when biologists are able to respond quickly and haze consistently. Inconsistent hazing can allow condors to develop a tolerance of the hazing techniques thereby making them less effective.

The capture of condors due to habituation issues is considered a last resort, but on rare occasions, is necessary for the safety of the individual condor or the benefit of the population. The capture of an individual is deemed necessary if the condor exhibits Type III behavior, exhibits Type II behavior and no longer responds to deterrence activities, or exhibits Type II behavior and the recurring stimulus presents an immediate risk of physical harm or death.

Access to the location where the undesired behavior is occurring is also an important factor. Without access to the affected individual, the only course of action to correct persistent or harmful undesirable behavior is to capture and remove that individual from the wild in an attempt to break the pattern of behavior. Often times, the captive condor is given a "time out" period, usually lasting a few months or longer, and then released back into the wild, on other occasions, the habituated condor's behavior warrants a permanent return to captivity.

2.7 Outreach

The field team performs outreach in order to create awareness and educate the public about issues pertaining to California condor conservation in Southern California. Performing outreach for condors also helps further the Service's national goals of connecting people with nature and broadening awareness of endangered species conservation and the National Wildlife Refuge System.

The field team targets outreach to inform and educate the local hunting community about potential sources of lead exposure in the condor food supply and how these sources can be eliminated using lead-free ammunition. The field team coordinates with the Institute for Wildlife Studies (IWS) to conduct shooting demonstrations of lead-free ammunition, staff informational booths, and perform presentations at hunter education classes. In addition, the field team works with IWS to identify locations for events, organize outreach materials, setup demonstrations and displays, and attend events.

In other cases, outreach is targeted to help resolve an immediate management issue. A common example of this is providing information to communities and local residents within condor range where the potential for condor habituation with humans and human structures is likely. In these cases, the field team communicates need to the community, coordinates with residents to prevent habituation, organizes and prepares presentations, and travels to the community to present and discuss issues with residents.

The preservation of condor foraging habitat is a priority for condor conservation according to the Recovery Plan and the Complex's Comprehensive Conservation Plan (USFWS 1996; CCP). The field team strives to contact land managers within the species' range to encourage the use of lead-free ammunition when dispatching animals and to allow dead livestock to remain on their property. The field team also continues to provide outreach and information to government agencies in order to ensure they integrate information on condor biology and habitat use into land planning documents.

The field team performs a number of additional outreach activities with the intention of creating awareness and educating the public about condor conservation issues. The Service authorizes refuge tours, co-hosts events with program partners such as the Friends of the Condor Wild and Free, and presents to local schools. When possible, the Service accommodates media requests and contributes to several social media outlets and scientific publications.

3.0 Outcomes

3.1 Monitoring Resource Use

In 2012, almost 1/2 (n = 31) of the Southern California condor population wore GPS transmitters for at least part of the year. This number was lower than in 2011 (n = 36) because several transmitters failed and were not replaced. GPS transmitter locations included over 80,000 observations for 2011 and over 117,000 observations for 2012.

Relative condor activity across the landscape based on this subset of California condors spanned approximately 10,500 square miles. Condors ranged from the San Gabriel Mountains in the south to the lower Sierra Nevada Range in the north with concentrated activity around Hopper Mountain NWR, Bitter Creek NWR, Bear Valley Springs, and Tejon Ranch (Figure 3.1.1).

Relative condor activity across the landscape changed from 2011 both in expanse and areas most frequented. (Figure 3.1.1). Of particular note, the Northern Tehachapi Mountains were heavily used in 2012. Exploratory flights of condors wearing GPS transmitters were most common to the Southern Sierra Nevada and Sierra Madre Mountains. Nesting activity in 2012 was concentrated primarily near Hopper Mountain NWR (n = 4) with one nest on Hopper Mountain NWR and one nest near Bitter Creek NWR (Figure 3.1.2).

The field team confirmed 31 non-proffered feeding events in 2012 (Figure 3.1.3). Carrion items were collected from 17 of these feeding events. Thus far 9 carrion items have been radiographed and dissected. Metal fragments recovered from these items are being analyzed and the results are pending. The most common types of carrion were cow, deer, and pig (Figure 3.1.4). A junior conservation specialist employed by the University of California at Davis assisted in locating non-proffered feeding events and spent 20 hours per week ground-truthing suspected non-proffered feeding events. This position located 23 of the 31 feeding events.

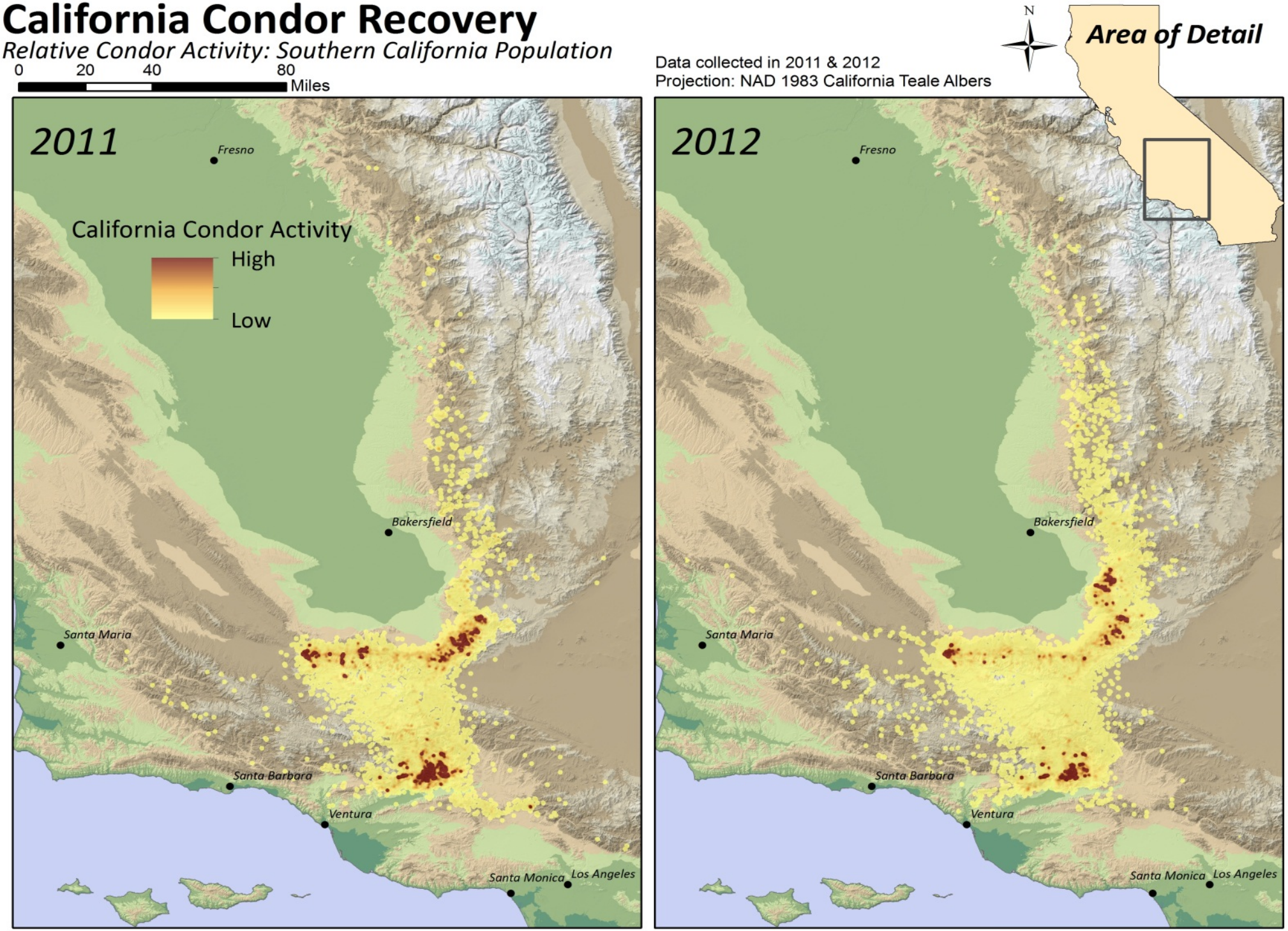


Figure 3.1.1: Relative condor activity in 2011 and 2012. Relative condor activity estimated using a fixed kernel density estimate (KDE) for all California condor wearing GPS transmitters in their respective years. KDE averaged across individuals for 2011 (n=36) and 2012 (n=31) using a neighborhood of one kilometer (cell size = 100

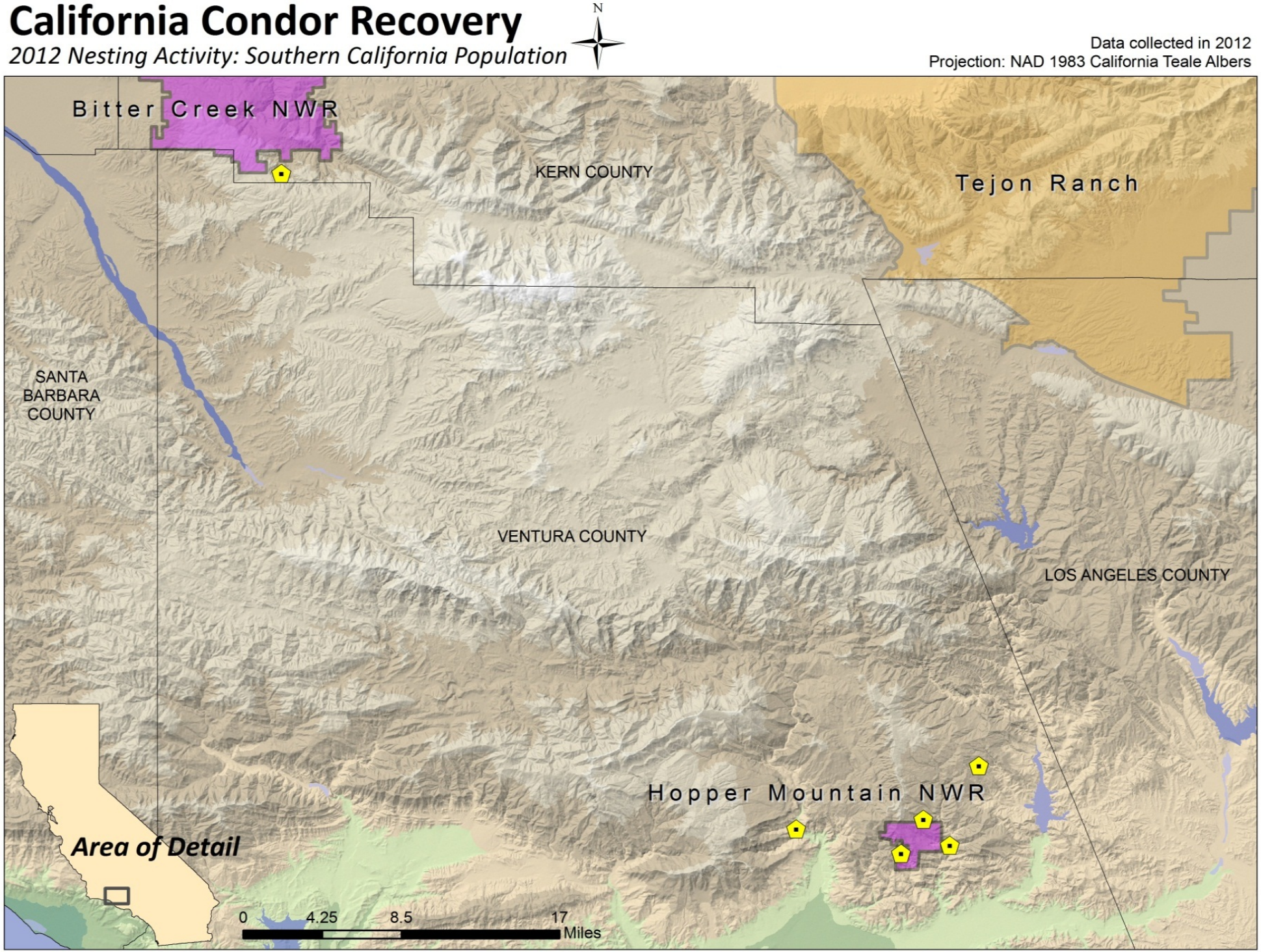


Figure 3.1.2: Nesting activity (n = 6) in 2012 for the Southern California population of California condors. The yellow pentagons represent nests.

California Condor Recovery

2011 and 2012 Non-Proffered Feeding Events: Southern California Population

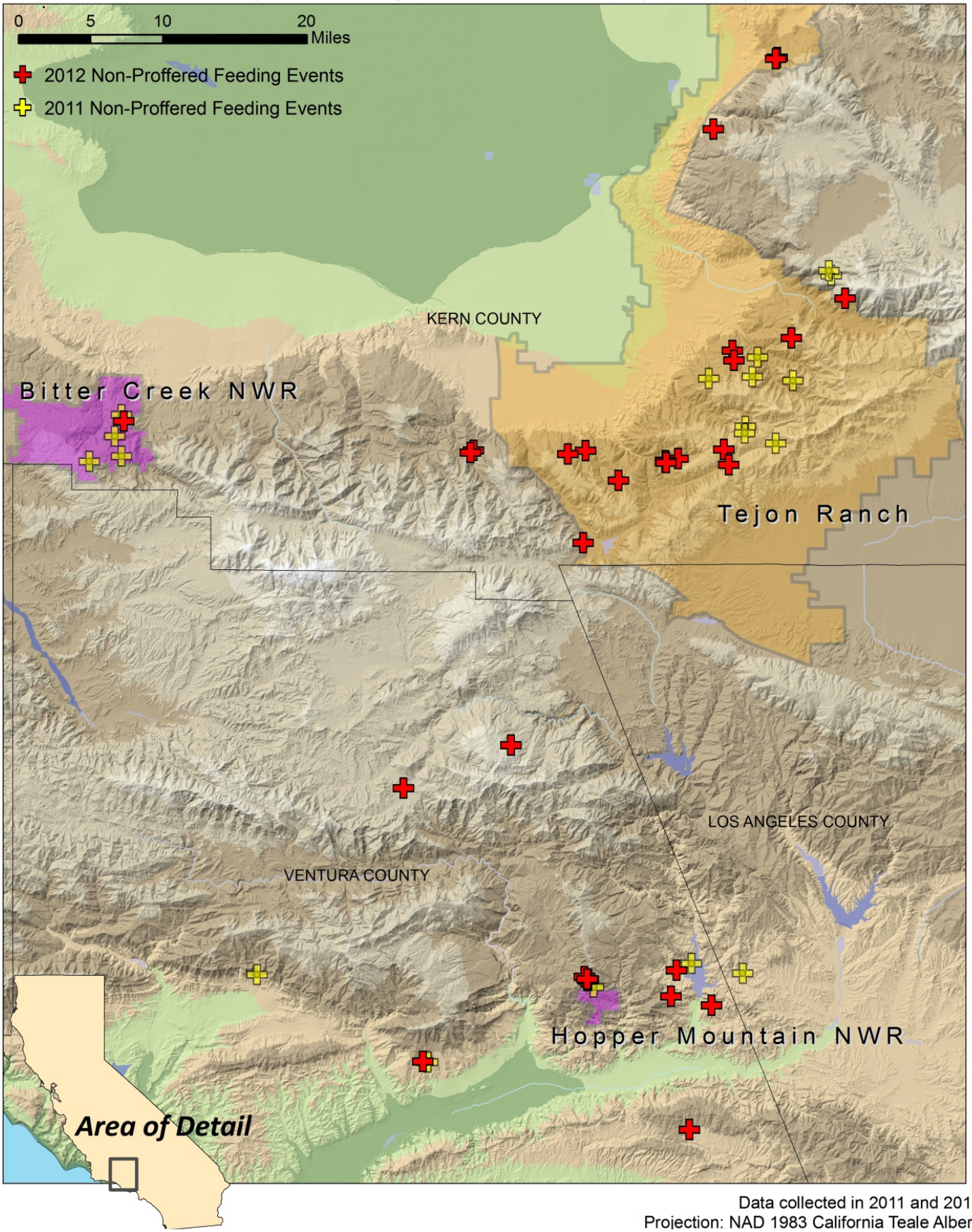


Figure 3.1.3: Non-proffered feeding events in 2011 (n = 18) and 2012 (n = 31). Note: locations ground-truthed using handheld GPS transmitters or estimated based on clustering of GPS transmitter locations characteristic of a feeding event from California condors wearing GPS transmitters. Contact with private landowners was sometimes used to identify locations of feeding events.

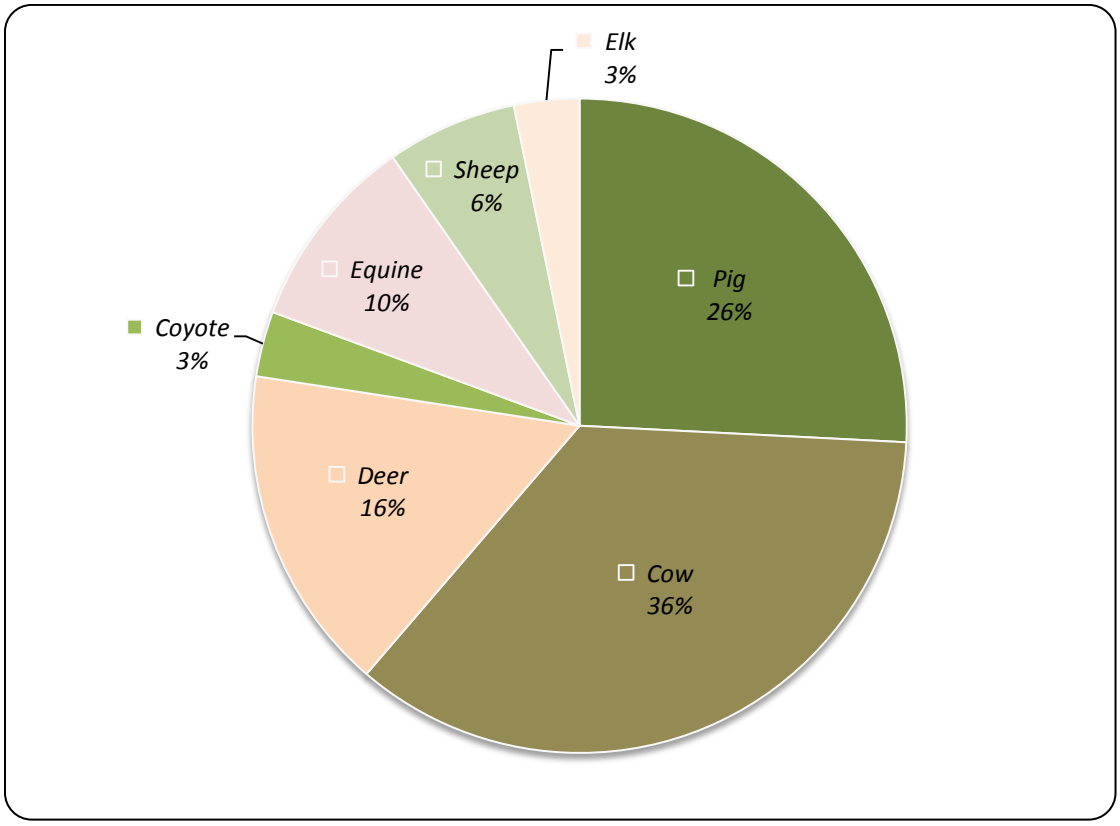


Figure 3.1.4: Non-proffered feedings in 2012 by type of carrion (n = 31).

3.2 Lead Monitoring and Mitigation

Fifty-seven out of 58 condors were trapped at least twice during 2012, once in the summer and then again in the fall. One condor was only trapped a single time. Condors were trapped and handled 131 times, not including chicks and pre-release condors. Each trapping season lasted 2 months, June and July in the summer and November and December in the fall. Trapping condors required biologists and volunteers to spend about 4 to 5 days per week in a blind trapping. The field team handled condors on a weekly basis with each condor requiring about 30-45 minutes of handling time and, depending on the number of condors, between 2 to 10 biologists assisting at each handling event.

The field team transported 10 individual condors to the Los Angeles Zoo for chelation treatment in 2012 (using the treatment threshold of 35 µg/dL in the field test kit). Of the 10 condors, one condor was a chick from the DG12 nest, and one adult, condor #289, was treated twice. Condor #289 was the only treated condor with a radiograph that came back positive for metallic densities that Los Angeles Zoo technicians suspected were related to the lead poisoning. Castings and fecal material were collected and radiographed but the metal fragments were never recovered. There were no condor mortalities associated with lead toxicosis in Southern California in 2012.

Using this criterion of ≥ 10 ug/dL for exposure, 42 condors in the Southern California population had blood lead levels above background levels in 2012.

The results for blood lead levels in 2012 were similar to values for the previous several years (Figure 3.2.1). There is no indication of a clear trend towards an overall increase or decrease in exposure.

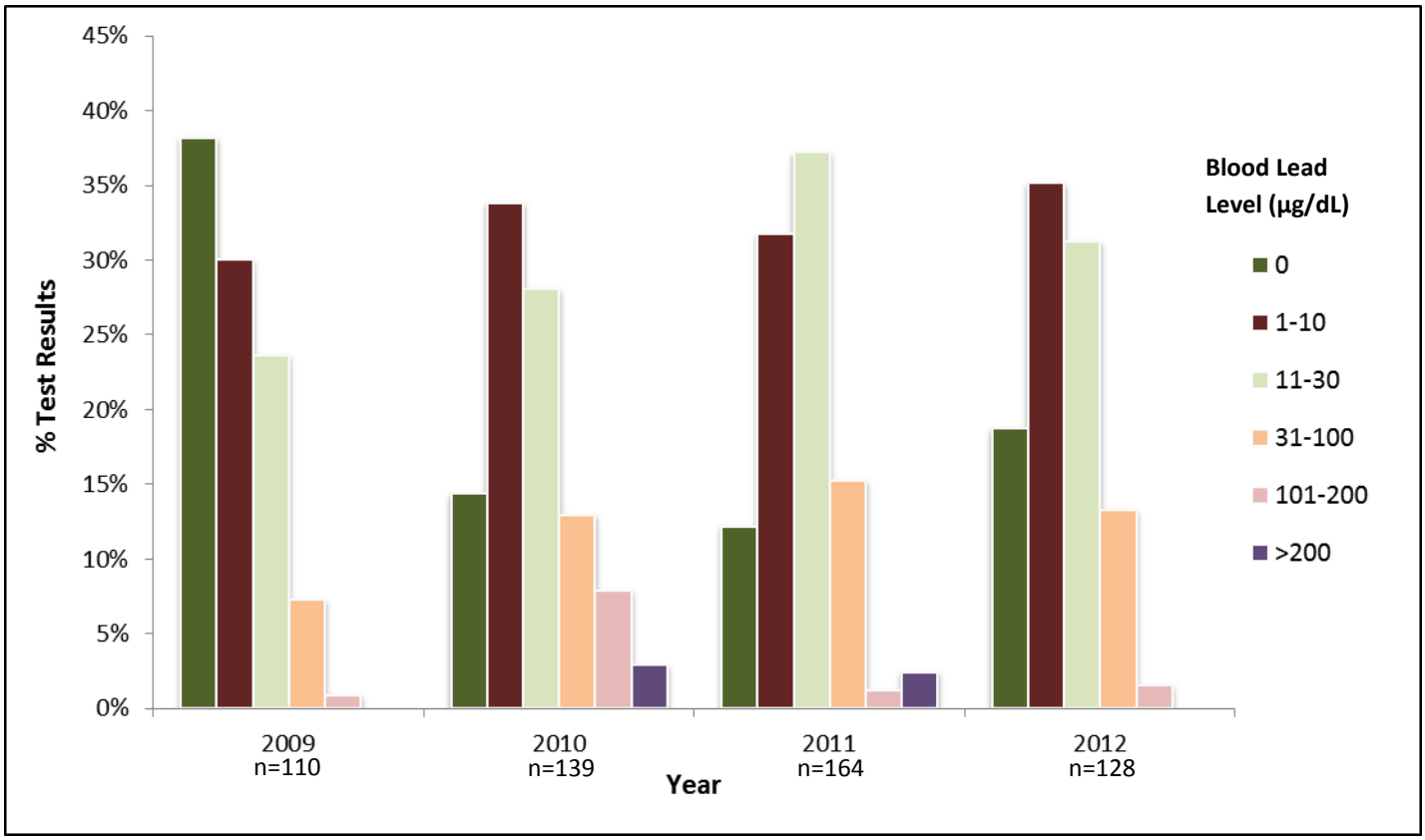


Figure 3.2.1: Summary of blood lead levels in the Southern California population of California condors by year. All of the lead values given represent lab blood lead values. Values returned as "not detected" are indicated by 0. Number of tests performed each year represented as "n" for each year.

3.3 Detecting Mortalities

The field team spent 30 to 40 hours each week attempting to detect the VHF signal of each condor. There were no deaths of free-flying condors detected in Southern California during 2012.

In 2012, there were 3 California condor mortalities outside of the free-flying population (Table 3.3.1). Condor #412 was the only adult mortality. This condor was injured in May 2011 and euthanized in January 2012. His injuries were the result of entanglement in a human-made structure and required amputation of one of his wings.

Condors #671 and #672 were chicks from wild laid eggs that died at their nests. During a period of observation at condor #671's nest, a volunteer became alarmed when the chick was not visible in its open nest cavity. Biologists discovered the carcass below the nest; the cause of death was trauma and the chick likely died on impact from falling out of the nest (Necropsy Report #RP19128).

The cause of death of condor #672 has not yet been determined. Before discovering the chick in poor condition, observers noted that parental attendance was lower than normal for a 3-month-old chick. Biologists entered the nest for the 90-day physical exam and discovered the chick was underweight and lethargic. The chick died before an evacuation could be performed. Condor #672's carcass went to the San Diego Zoo Pathology Lab for postmortem examination; results are pending.

Table 3.3.1: California condor mortalities in 2012.

Studbook Number	Sex	Hatch Date	Mortality Date	Cause of Death	Location of Death
412	Male	1-May-06	24-Jan-12	Euthanasia	Los Angeles Zoo
671	Unknown	28-May-12	16-Aug-12	Trauma	Santiago Canyon nest site
672	Male	23-Jun-12	28-Sep-12	Unknown	Koford's Ridge nest site

3.4 Nest Management

The 2012 nesting season spanned over 10 months, with active nests occurring from March until December. There were 6 active nests during the season, 4 of which fledged chicks and 2 of which failed (Table 3.4.1). Nest guarding has been effective at increasing the number of wild fledged chicks in the Southern California population. Nesting success, defined as the total number of chicks to fledge out of the total number of nests, has increased dramatically since nest guarding was implemented across all nests in 2007 (Figure 3.4.1).

Table 3.4.1: Nesting attempts and outcomes for the 2012 breeding season. Sire Studbook Number is the studbook number of the male attending the nest. Dam Studbook Number represents the studbook number of the female attending the nest. Foster Eggs were captive laid eggs used to replace the wild laid egg when it was not viable. Chick Studbook number is the studbook number of the chick that hatched in the wild nest.

Nest Identification	Date Nest Located	Sire Studbook Number	Dam Studbook Number	Egg Identification	Lay Date	Foster Egg Used	Foster Egg Identification	Date Hatch	Chick Studbook Number	# of Nest Entries	Nest Fate
DG12	15-Mar	206	370	FW112	1-Mar	no	NA	27-Apr	658	9	Fledged by 4-Dec
RC12	2-May	239	289	FW212	9-Mar	no	NA	5-May	670	3	Fledged by 20-Nov
TC12	20-Mar	374	180	FW312	13-Mar	yes	12TAKI1	23-Apr	648	6	Fledged on 5-Oct
SP12	19-Mar	247	79	FW412	15-Mar	yes	12TENE1	25-Apr	654	6	Fledged on 24-Oct
SC12	2-Apr	328	216	FW512	1-Apr	no	NA	28-May	671	3	Failed on 16-Aug
KR12	30-Apr	125	111	FW612	27-Apr	no	NA	23-Jun	672	6	Failed on 29-Sep

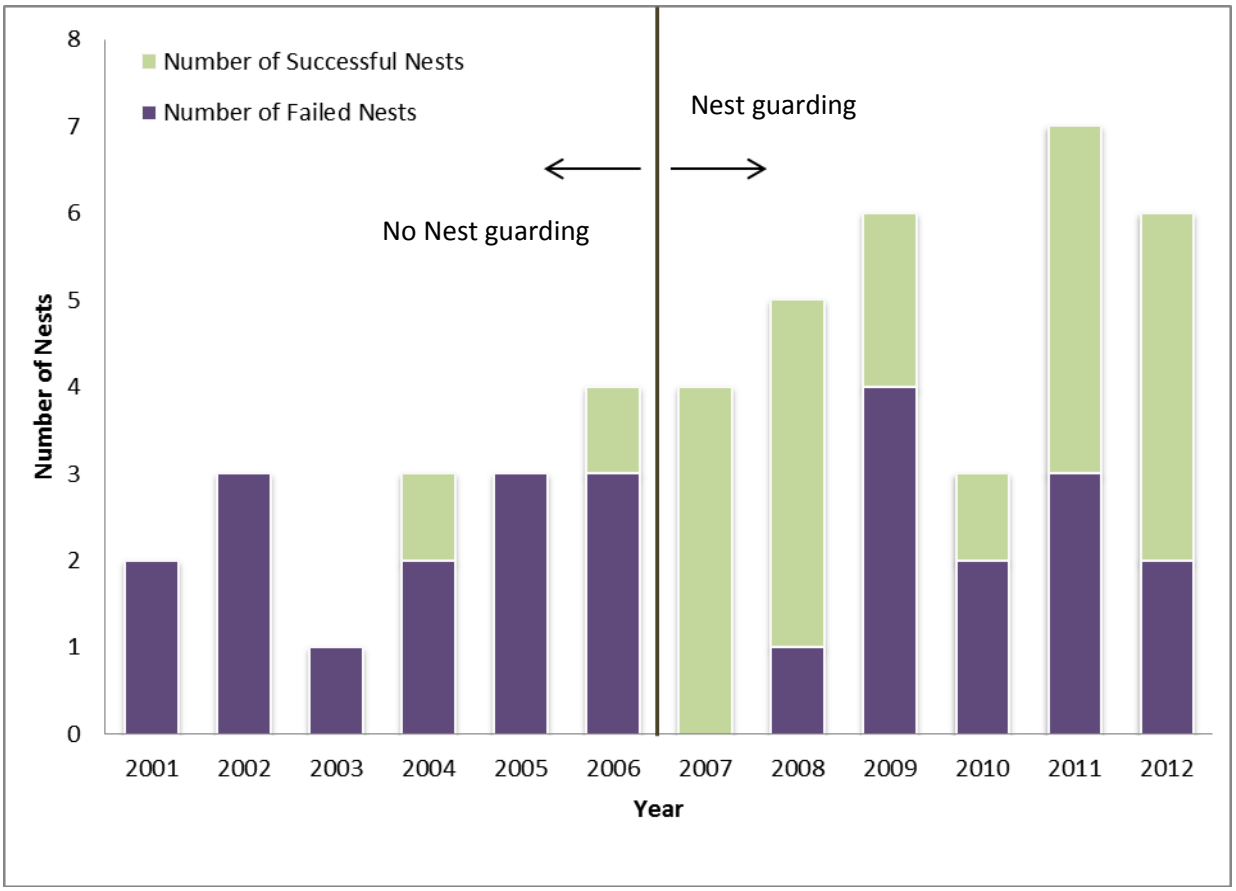


Figure 3.4.1: Condor nesting outcomes from 2001 through 2012. The Nest Guarding Program was implemented on a single nest in 2006 then across all nests starting in 2007.

In 2012, each nest was monitored over the course of the season using direct observation and periodic nest entries. The field team performed 33 nest entries over the course of the year. Each entry required 2 to 4 personnel for 8 to 12 hours. RC12 required an overnight camp in the backcountry to reach the nest. Los Angeles Zoo staff provided assistance on 12 of the nest entries. Nests were observed for a total of 1,034 hours taking place over 387 observer days. DG12 and RC12 were observed less due to their remote locations. Unpaid volunteer nest observer hours accounted for a quarter of all observation hours (Table 3.4.2).

Table 3.4.2: Hours spent observing nests during 2012.

Personnel Type	Observation Hours
Service Staff	78.5
Santa Barbara Zoo Staff	338.5
Volunteer Interns	354.5
Unpaid Volunteers	263
Total Observation Hours	1034.5

A nest camera was successfully installed in the SP12 nest during 2012 to record the behaviors of the parent condors and their chick at the nest site. Footage was successfully reviewed and archived after wireless transmission from the nest site to the facilities at Hopper Mountain NWR. The archived footage is being used for The Condor Cave Facebook page (see: Outreach section and Appendix II).

The field team performed interventions on 3 nests this season. Interventions in 2 of those nests took place during the egg stage when the eggs were found to be nonviable during routine nest entries. Both of these eggs were replaced first with dummy eggs and later with 2 eggs from the condor breeding facility at the World Center for Birds of Prey in Boise, Idaho. The eggs were first transported to the Los Angeles Zoo prior to placement into the wild nests. The third intervention took place when condor chick #658, at nest DG12, was found to have an elevated blood lead level. This chick was temporarily evacuated from the nest to be radiographed and to initiate chelation treatment. The radiographs revealed a metallic item requiring the contents of the chick's stomach and crop to be surgically removed. The metallic item found was microtrash but not the source of the lead exposure. After surgery, condor chick #658 spent the night at the Los Angeles Zoo and was returned to the nest within 23 hours. To perform this temporary evacuation the Ventura County Sheriff's Air Unit provided Helicopter Support. Their crew assisted the field team in long-lining the chick directly to and from the nest. After treatment at the Los Angeles Zoo, additional chelation treatments occurred during follow up exams. The chick's development was slower than normal but the chick was eventually tagged at 150 days of age and fledged in December.

Preventative interventions were also taken at each nest. At 30, 60, and 120 days of age, biologists vaccinated chicks for West Nile virus. The substrate of each nest was sifted and microtrash was found to be present in all 6 nests in 2012 (Table 3.4.3).

The amount of microtrash collected from nests can be compared across years to help determine the degree to which microtrash collection continues to be a problem (Table 3.4.3). The average amount of microtrash collected per nest was less during 2010-2012 than 2002-2009.

Table 3.4.3: Microtrash recovered from nesting attempts during 2002-2012 nesting seasons. Values represent the total number of items collected from the chick and substrate. (*Nest failed prior to the chick being 90 days of age, value was not included in the average or nest count.)

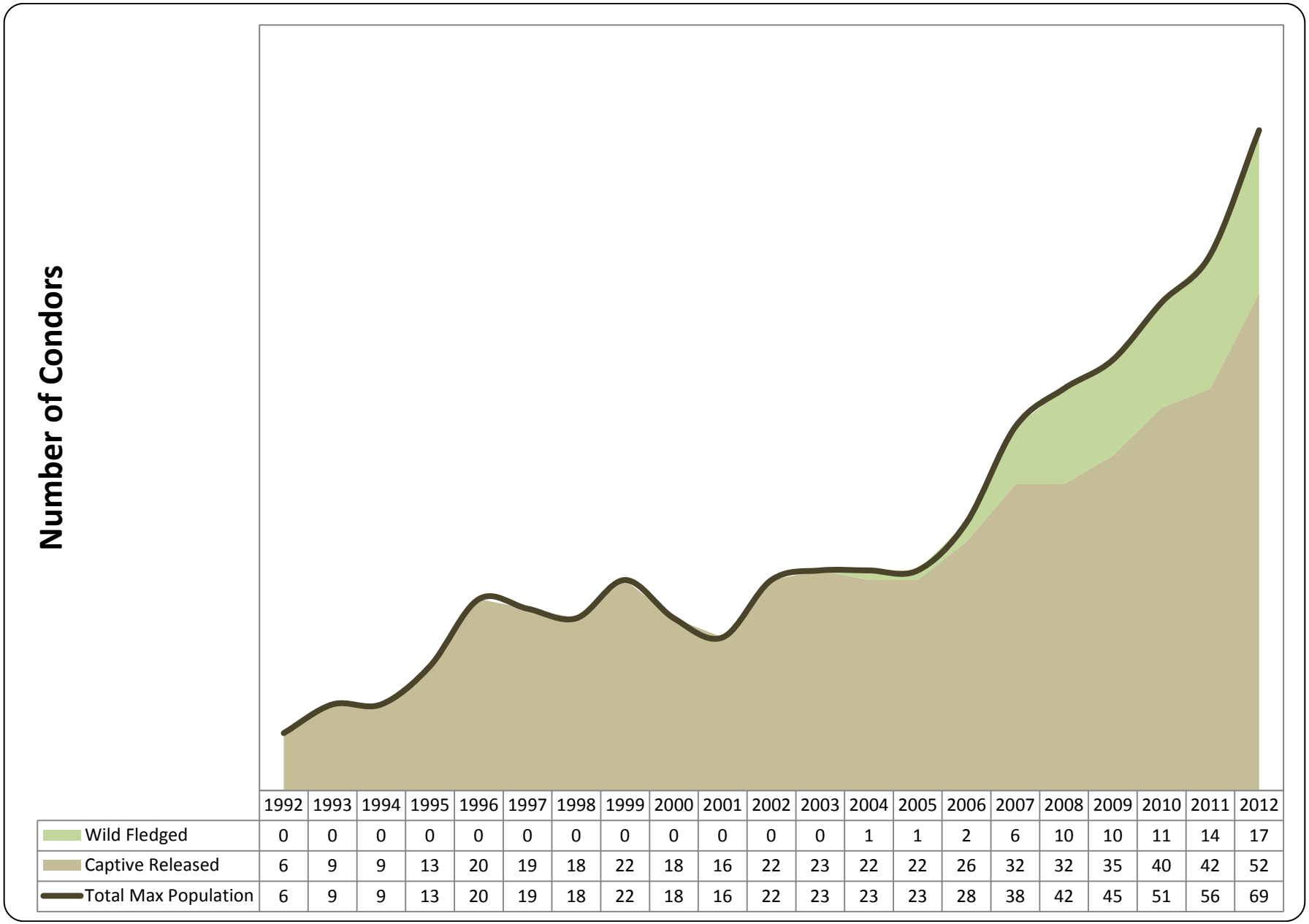
Nest	Year										
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
AB	-	-	143	321	1*	233	-	60	-	3*	-
DG	-	-	-	-	-	38	-	52	32*	-	31
HB/SP	-	-	-	-	-	-	0	?*	-	10	1
HC	20	-	?	-	46	19	26	103	-	55	-
HW	86	-	-	-	-	-	-	-	-	-	-
HW/3C	-	-	-	-	-	-	322	12*	-	-	-
KR	0	44	53	41	-	43	11	10*	26	3	9*
LC-PC	53	-	-	-	-	-	-	-	-	-	-
LP	-	-	-	5*	-	-	-	-	-	-	-
PC[1]	-	-	-	-	48	-	115	-	-	-	-
PC[2]	-	-	-	-	-	-	-	-	-	32	-
SC	-	-	-	-	-	-	-	-	-	21	1*
GF	-	-	-	-	-	-	-	-	-	0*	-
RC	-	-	-	-	-	-	-	-	-	-	3
TC	-	-	-	-	-	-	-	-	-	-	71
Average	40	44	98	184	47	95	95	72	26	24	27

3.5 Captive Releases and Transfers

In 2012, the field team released 7 California condors resulting in an approximate 11% increase to the Southern California population (Figure 3.5.1).

In the fall of 2012, the field team released 6 juvenile captive-bred condors and re-released condor #137 over the span of 1.5 months (Table 3.5.1). Releases required an average of 2 personnel daily, per week, from October 3 to December 15, 2012. Staff closely monitored newly released condors every day, for approximately 10 hours per day, for a minimum of 30 days after release (Table 3.5.2). One of these releases, condor #137, was recaptured and placed back into captivity after he failed to integrate into the wild population. While the annual captive-bred releases occur in the fall, the Service released condor #137 in January at Bitter Creek NWR. This condor's mate, condor #147, had been released in late 2011 just prior to the release of condor #137. After spending a number of years in the captive breeding program at the Oregon Zoo, it was determined that the pair was genetically less valuable and should no longer be used for captive breeding. Condor #147 successfully integrated into the wild population, but biologists had to trap condor #137 and return him to the release pen for failing to find food and socialize with other condors. After spending 8 months in the release pen and regularly feeding and perching with other condors, the field team decided to re-release condor #137 in the fall with the juvenile cohort. Unfortunately, the field team had to re-trap him 1.5 months after his second release. Although he successfully interacted and fed with the wild flock, he approached humans at Wind Wolves Preserve in December. This behavior led the field team to decide to return condor #137 to captivity permanently.
From February to October 2012, the Service held several captive-bred juvenile condors in the release pen with adult condor #137 before releasing any condors into the wild.

For those approximately 8 months, the field team checked on the health of pre-release condors daily and conducted intensive 4-hour observations 2 to 4 days a week. While held in captivity, these condors required regular fresh food and water, which necessitated at least one person on duty daily at the refuge.



	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Wild Fledged	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	6	10	10	11	14	17
Captive Released	6	9	9	13	20	19	18	22	18	16	22	23	22	22	26	32	32	35	40	42	52
Total Max Population	6	9	9	13	20	19	18	22	18	16	22	23	23	23	28	38	42	45	51	56	69

Figure 3.5.1: Annual maximum population size for the Southern California population of condors. "Wild fledged" represents any condors that fledged from a wild nest since 1992.

Table 3.5.1: Captive-bred releases in 2012. Note: SDZSP=San Diego Zoo Safari Park; WCBP=World Center for Birds of Prey; NA=not applicable.

Studbook Number	Sex	Hatch date	Hatch location	Transfer date	Release date	Fate	Re-trap date	Age at Release (in years)
137	male	4-May-96	SDZSP	16-Nov-11	1-Jan-12	retrapped	6-Feb-12	15.7
137	male	4-May-96	SDZSP	7-Mar-12	25-Oct-12	retrapped	12-Dec-12	16.5
590	male	14-Mar-11	SDZSP	15-Mar-12	3-Oct-12	successful	NA	1.6
591	male	16-Mar-11	SDZSP	15-May-12	25-Oct-12	successful	NA	1.6
594	female	29-Mar-11	SDZSP	15-May-12	15-Nov-12	successful	NA	1.6
596	female	1-Apr-11	SDZSP	15-May-12	3-Oct-12	successful	NA	1.5
604	female	18-Apr-11	SDZSP	15-May-12	25-Oct-12	successful	NA	1.5
625	male	21-May-11	WCBP	14-Aug-12	15-Nov-12	successful	NA	1.5

Table 3.5.2: Condor field team release effort. Note: proffered carrion = still born calf carcasses.

	January	February	March	April	May	June	July	August	September	October	November	December
Number condors Released	1	0	0	0	0	0	0	0	0	5	2	0
Approx. Employee Hours	620	120	0	0	0	0	0	0	0	744	600	300
Number Proffered Carrion Provided	39	34	26	21	19	10	17	16	16	23	34	27

3.6 Behavioral Modification

In 2012, condors frequented 4 areas of human development. Most condor activity centered on residential homes in a gated community in the Northern Tehachapi Mountains called Bear Valley Springs (See: Appendix III). Condors also visited 3 other developed areas, but much less frequently: Rancho de La Cruz (UTM 11S 285955.92 E 3861633.18N), Cazador Cabin on Tejon Ranch (UTM 11S 345347E 3873191N, and ITT Towers on the Angeles National Forest (UTM 11S 370417.41E 3801603.47N. After Bear Valley Springs, Rancho de La Cruz had the highest number of associated GPS transmitter locations with condor visits beginning in February and ending in August. Only 2 condors wearing GPS transmitters (condors #237 and #255) had GPS transmitter locations within 100 meters of ITT Towers this year in April. Condor #98 visited Cazador Cabin on Tejon Ranch once in June.

Bear Valley Springs required the greatest amount of field team hours as it necessitated daily monitoring. Field team staff spent 60 to 100 hours each week, from July to October, to monitor and haze condors from 28 confirmed private homes. This level of coverage required numerous trips per week from Ventura, Bitter Creek NWR or Hopper Mountain NWR. Each trip required 4 to 6 hours of driving per round trip.

3.7 Outreach

The field team led or co-hosted several outreach events in 2012. Biologists participated in 7 hunter outreach events in conjunction with the Institute for Wildlife Studies, reaching an estimated 380 people. These events targeted hunters and gun enthusiasts in an attempt to share information about lead-free ammunition (Figure 3.7.1).

Figure 3.7.1: Photo of participants inspecting fragments from a bullet during a lead-free shooting demonstration.

Five events were co-hosted with the Friends of the California Condor Wild and Free, reaching an estimated 110 people. These events targeted local members of the public in an effort to foster condor conservation. They included tours of Bitter Creek NWR to a Boy Scout group, a tribal youth organization, and a minority student group. Biologists gave a 20-minute presentation about condors to a local nature organization that reached 30 people and 3 school outreach presentations about condors that reached approximately 170 students and parents.

Two outreach events were conducted for the residents of Bear Valley Springs due to the potential for condor habituation. Biologists discussed condor biology, the risk of habituation, and solutions. These

events reached approximately 225 people.

The field team utilized several media outlets for outreach by conducting interviews and hosting television and movie crews on refuge lands. A French production company shot footage for a mini-series featuring the condor in an episode. A British Broadcasting Corporation (BBC) children's show entitled Naomi's Nightmares filmed biologists handling condors during spring handling at Bitter Creek NWR. A representative from the American Public Media show, Marketplace, interviewed members of the field team for a radio broadcast. Biologists were also interviewed for an article that appeared in Forbes Magazine in January.

The field team launched a Facebook page called The Condor Cave in cooperation with the Santa Barbara Zoo in December (Figure 3.7.2).

Figure 3.7.2: A screenshot from The Condor Cave Facebook page.

This page has the potential to educate thousands of people on condor conservation.
Intra-agency outreach and presentations to partner programs also spread awareness of condor conservation in 2012. The field team gave a presentation about condors to approximately 200 people at a Marsh Management Workshop hosted by Sacramento NWR Complex. Two field staff members wrote articles for the FWS journal, Field Notes. One article documented the evacuation of a condor chick from a nest site and a second article documented a successful condor handling day. In addition, the field team welcomed members of Kern NWR Complex and Don Edwards San Francisco Bay NWR to participate in the handling of 8 condors during the fall.

4.0 Discussion

The management of condors in Southern California during 2012 raised a number of events worthy of discussion. The future direction of field activities should take into account changes in funding, the growing condor population, and results from recent research. Topics related to monitoring resource use, lead monitoring and mitigation, nest management, and captive releases and transfers are of particular interest.

Monitoring Resource Use

In 2012, the majority of non-proffered carrion sampling to determine lead contamination was carried out by a junior conservation specialist employed through U.C. Davis and funded by the Cooperative Endangered Species Conservation Fund (16 USC § 1536). This funding is no longer available and raises the question whether sufficient data exists to cease the collection and analysis of non-proffered carrion and, if not, whether enough staff, time, funding, and training will be available in the future to continue ground-truthing feeding events.

In addition, the ability to radiograph carrion for metallic object recovery relies on the use of the Santa Barbara Zoo necropsy room and radiographing equipment. This process is often slow due to proximity from freezers, scheduling conflicts, and lack of available time and personnel. The purchasing of radiographing equipment for the Complex office could expedite this process.

Lead Monitoring and Mitigation

A study by Finkelstein et al. (2012) estimates the current practice of biannual blood lead monitoring may only be capturing ~10% of a condor's annual exposure history. The field team should consider how these results affect the current lead monitoring and treatment strategy. Changing the sampling regime could allow the field team to provide information on the trends in condor lead exposure. These changes should be weighed against the potential for an increase in trapping and handling activity.

Nest Management

Nest guarding activities treat the proximate threats of nest failure and not the underlying causes. As such, this nest management approach is not a long-term solution to the recurring causes of nest failure. Nest guarding tracks the changes in particular nest threats such as the quantity of microtrash sifted from the nests. The decrease in microtrash found in nests may be related to the time budget of individual breeders as their home ranges have expanded or because newly formed pairs have not developed

the propensity to collect trash items. Continuing to monitor the abundance of microtrash by periodically entering nests is necessary to determine if the level of microtrash is significantly decreasing and to understand if that decrease has any correlation with the history of breeding pairs and their movements.

The successful development and installation of a nest camera system in 2012 exemplifies the effort to improve nest observations. The camera system captures a greater amount of activity that can be reviewed in a shorter amount of time and archived for more detailed research. As the number of nests increases and as nests become more dispersed and remote, the nest camera system will be an invaluable tool for continuing observations of parent and chick activity. Real-time nest observation by volunteers can be used in conjunction with camera data to provide information about condor activity that takes place outside of the view of the nest camera and after the chick has left the nest but remains close by.

Captive Releases and Transfers

The release of adult condors typically requires a greater effort by the field team when compared to 1-2 year old condors. Adult condors take longer to assimilate into the wild population, and when unsuccessful require extensive effort to recapture. Although condor #137 failed as a release candidate this past year, the field team has successfully released other long-term captive condors. In the future, available adult condors should still be considered for release despite the risks involved, but with the knowledge that these individuals will require more resources such as GPS transmitters and additional monitoring.

Holding and releasing condors tends to create larger than normal groups of condors around the release site; these congregations can create vulnerability to predation. Releases are necessary to reach an appropriate population size for recovery, but to mitigate this potential threat, the field team should develop a predator management plan for the release site.

Works Cited

Cade, T.J., S.A.H. Osborn, W.G. Hunt, and C.P. Woods. 2004. Commentary on released California condors Gymnogyps californianus in Arizona. Pp. 11–25 in R.D. Chancellor and B.-U. Meyburg, [eds.]. Raptors Worldwide. World Working Group on Birds of Prey and Owls/MME-Birdlife, Budapest, Hungary.

Cade, T.J. 2007. Exposure of California condors to lead from spent ammunition. Journal of Wildlife Management 71:2125–2133.

Clark, M., M. Wallace, C. David. 2007 Rearing California condors for release using a modified puppet-rearing technique. Pp. 213-226 in A. Mee and L.S. Hall (eds.), California condors in the 21st century. Nuttall Ornithological Club Series in Ornithology no. 2. Nuttall Ornithological Club, Cambridge, MA, and American Ornithologists' Union, Washington, D.C.

Cogan, C. B., J. D'Elia, K. Convery, J. Brandt, T. Bulgerin. 2012. Analysis of California condor (*Gymnogyps californianus*) activity using satellite telemetry data. The Open Ornithology Journal. 5: 82-93.

Emslie, S.D. 1987. Age and diet of fossil California condors in Grand Canyon, Arizona. Science 237: 768-770.

Finkelstein M.E., D.F. Doak, D. George,J. Burnett, J. Brandt, M. Church, J. Grantham, D. Smith.2012. Lead poisoning and the deceptive recovery of the critically endangered California condor. Proceedings of the National Academy of Sciences. 109(28): 11449-11454.

Fry, D. M. 2003. Assessment of lead contamination sources exposing California condors. Final Report. California Department of Fish and Game, Habitat Conservation Planning Branch, Sacramento, USA.

Grantham, J. 2007. Reintroduction of California condors into their historic range: the recovery program in Southern California. Pp. 123-138 in A. Mee and L.S. Hall (eds.), California condors in the 21st century. Nuttall Ornithological Club Series in Ornithology no. 2. Nuttall Ornithological Club, Cambridge, MA, and American Ornithologists' Union, Washington, D.C.

Johnson, M., J. Kern, and S.M. Haig. 2010. Analysis of California condor (*Gymnogyps californianus*) use of six management units using location data from global positioning system transmitters, Southern California, 2004–09. Initial report: U.S. Geological Survey Open-File Report 2010-1287, 64 pp.

Kelly TR, P.H Bloom, S.G. Torres, Y.Z. Hernandez, R.H. Poppenga, W.M Boyce, C.K. Johnson. 2011. Impact of the California lead ammunition ban on reducing lead exposure in golden eagles and turkey vultures. PLoS ONE 6(4):e17656.

Koford, C.B. 1953. The California condor. National Audubon Society Research Report No. 4:1-154.

Lindsey, G. D. 1992. Nest guarding from observation blinds: strategy for improving PuertoRican parrot nest success. J. Field Ornithol. 63:466–472

Lowney. M. S. 1999. Damage by Black and Turkey Vultures in Virginia, 1990-1996 Wildlife Society Bulletin , Vol. 27, No. 3, pp. 715-719

Mee, A., J.A. Hamber, and J. Sinclair. 2007. Low nest success in a reintroduced population of California condors. Pp. 163–184. in A. Mee and L.S. Hall [eds.]. California condors in the 21st Century. Nuttall Ornithological Club, Cambridge, MA, and American Ornithologists' Union, Washington, DC.

Meretsky V.J, and N.F.R. Snyder. 1992. Range use and movements of California condors. The Condor 94:313-335.

Parish, C. N., W. R. Heinrich, and W. G. Hunt. 2007. Lead exposure, diagnosis, and treatment in California condors released in Arizona. Pages 97–108 in A. Mee and L. S. Hall, editors. California condors in the 21st century. Series in Ornithology no. 2. Nuttall Ornithological Club and American Ornithologists' Union, Cambridge, Massachusetts, USA.

Ralls, K. and J. Ballou. 2004. Genetic status and management of the California condors. The Condor 106: 215-228.

Rideout B.A.,I. Stalis, R. Papendick, A. Pessier, B. Puschner, M.E. Finkenstein, D.R. Smith, M. Johnson, M. Mace, R. Stroud, J. Brandt, J. Burnett, C. Parish, J. Petterson, C. Witte, C. Stringfield, K. Orr, J. Zuba, M. Wallace, J. Grantham. 2012. Patterns of mortality in free-ranging California condors (*Gymnogyps californianus*). Journal of Wildlife Diseases 48:95-112.

Ridley-Tree Condor Preservation Act (2008). *In Assembly Bill No. 821* (California State Assembly, Sacramento, CA). Available at http://www.leginfo.ca.gov/bilinfo.html.

Snyder, N.F.R., and J.A. Hamber. 1985. Replacement-clutching and annual nesting of California condors. The Condor 87:374-378.

Snyder, N.F.R, R.R.Ramey, and F.C. Sibley. 1986. Nest-site biology of the California condor. The Condor 88:228-241.

U.S. Fish and Wildlife Service (USFWS). 1975. Recovery Plan for The California condor, First Edition. Region 1, Portland, OR.

U.S. Fish and Wildlife Service (USFWS). 1984. California Condor Recovery Plan. Portland, Oregon. Approved July 31, 1984.

U.S. Fish and Wildlife Service (USFWS). 1996. California Condor Recovery Plan, Third Revision. Portland, Oregon. 62pp.

U.S. Fish and Wildlife Service. 2012. Draft Comprehensive Conservation Plan and Environmental Assessment (CCP). Hopper Mountain NWR Complex, Ventura, CA.

Wallace, M.P, M.R. Fuller, and J. Wiley. 1994. Patagial transmitters for large vultures and condors. Pages 381-387 in B.U. Meyerburg and R.D. Chancellor, editors. Raptor conservation today. Pica Press, East Sussex, United Kingdom.

Walters, J.R., S.R. Derrickson, D.M. Fry, S.M. Haig, J.M. Marzluff, and J.M. Wunderle. 2010. Status of the California condor (*Gymnogyps californianus*) and efforts to achieve its recovery. Auk 127:969-1001.

Appendix I. Contributions to Ongoing Research

Data collected over the course of 2012 will contribute to ongoing research within the Service, various universities, and other federal agencies. Examples of this ongoing research include:

Genetic map and whole genome sequences of California condors

Years: 2006-present

Study Objective: Utilize robust genetic and genomic approaches, construct a complete genome-based database of genetic variation in California condors, and make findings available for population management and recovery. Anticipated findings include: detailed analysis of kinship among founder California condors, detailed characterization of variation at the single nucleotide polymorphism (SNP) level, assessment of retention of genetic variation in the species pedigree, identification of the mutation causing chondrodystrophy, identification of carriers of chondrodystrophy allele.

Principal Researchers: Oliver A. Ryder, Stephan C. Schuster (P.I.), Webb Miller, Michael Romanov.

Sponsor: U.S. Fish and Wildlife Service California Condor Recovery Program, San Diego Zoo Global.

Funding Source: San Diego Zoo Global, Seaver Institute, John and Beverley Stauffer Foundation, other private foundations.

Results to Date: A genetic map for California condors based on comparison to chicken and zebra finch genomes has been published. A microsatellite-based linkage map is in development. Sequencing of 30 California condor genomes utilizing Illumina technology has been proposed and funding is pending. This study would identify all extant genetic variation at the nucleotide level and affords the opportunity to identify the mutation associated with heritable chondrodystrophy.

Anticipated Completion: If current funding proposals are approved, the reference genome and initial descriptions of species variation would be completed within one year. More detailed analyses of demography and evolutionary population genetics would follow. Priority will be given to reporting recovery-relevant findings.

California condor West Nile virus vaccination study

Years: 2009 -2012

Study Objective: To determine the range of serological responses in chicks to a commercial canary pox vectored recombinant West Nile virus vaccine.

Principle Researcher(s): Donald L. Janssen, Michael Mace.

Sponsor: San Diego Zoo Global.

Funding Source: San Diego Zoo Global, Los Angeles Zoo, Oregon Zoo, USFWS Hopper Mountain NWRC.

Results to Date: Three zoos (Oregon Zoo, Los Angeles Zoo, San Diego Zoo Safari Park, and one field site combined efforts in 2011 and 2012 to vaccinate 21 (2011) and 22 (2012) California condor chicks with a canary-pox vectored WNV vaccine. The Cornell University WNV laboratory analyzed the serum samples from the 2011 and 2012 chick seasons. Statistical analysis was performed for the 2011 cohort. The chicks had significant maternal antibodies that persisted for up to 75 days of age. Follow up samples at about 5 months of age showed that up to 94% of condors were immune. No condors became sick or died from West Nile virus disease during this study. For the 2012 season, post vaccine titers were in general higher than in 2011, but statistical analysis is still pending.

Anticipated Completion: June 2012.

An assessment of the biological impact of contaminants and management actions that influence the long-term persistence of the California condor

Years: 2011-2016

Study Objectives: Synthesize existing data and collect new data on the risks of contaminant exposure to California condors. We will also identify the suitability of existing and proposed future habitat with respect to changes in contaminant exposure, human demographics, and climate. Quantify baseline measures of individual condor performance (e.g., survival, reproductive success) and how these rates are influenced by the effects of contaminants (e.g., lead, organochlorines, microtrash) and future habitat suitability from changes in human demographics, climate. Develop demographic modeling approaches for each condor population in California that allows estimation of how contaminants, global climate change, future habitat suitability, and management efforts will impact population recovery.

Principal Researchers: Donald R. Smith, Daniel F. Doak, Myra Finkelstein, Vickie Bakker

Sponsors: Department of Environmental Toxicology University of California, Santa Cruz; US Fish & Wildlife Service, Hopper Mountain NWRC, National Park Service, Pinnacles National Monument; US Geological Survey, Forest and Rangeland Ecosystem Science Center; US Fish & Wildlife Service Water Pollution Control Laboratory CA Dept. of Fish and Game, Office of Spill Prevention and Response; University of Wyoming, USFWS Ventura Ecological Service Office

Funding Sources: Montrose Settlement Restoration Funds, USFWS Environmental Contaminants Program On-Refuge Investigations Sub-Activity

Anticipated Completion: 2016

Examining the long-term transport of Montrose DDE via marine mammals: Evaluating risks to California condors.

Years: 2011-2013

Study Objective: To examine the risk to scavenging California condors from DDE discharged from the Montrose site in the Southern California Bight and transported via marine mammals along the California coast.

Principal Researchers: Myra Finkelstein , Don Smith

Sponsors: UC Santa Cruz, US Fish & Wildlife Service California Condor Recovery

Program Funding Source: Montrose Settlement Restoration Funds

Results to date: Pending

Anticipated Completion:2013

Monitoring post-ban lead exposure in the California condor (*Gymnogyps californianus*)

Years: 2010-2012

Study Objectives: Monitor lead exposure in condors over a 3-year period during various hunting activities and evaluate the effectiveness of the lead ammunition regulations by comparing historic lead exposure to lead exposure following the July 2008 ban on lead ammunition in condor range. Investigate sources of continued lead exposure in condors by a) using satellite telemetry and radio telemetry to track

condors and identify habitat use, foraging patterns, movements and behaviors associated with lead exposure, b) evaluating stable isotope composition of lead in condor samples and c) evaluating lead availability in hunted animal carrion recovered in condor range and microtrash recovered from condor nests. Evaluate the health effects of ongoing lead exposure on condors by assessing individual animal clinical outcomes and survival. Develop an on-line Data Management System for the California Region of the Condor Recovery Program.

Principal Researcher: Christine Johnson

Sponsors: Wildlife Health Center, University of California, Davis; Department of Environmental Toxicology University of California, Santa Cruz; US Geological Survey, Forest and Rangeland Ecosystem Science Center; US Fish & Wildlife Service Hopper Mountain NWRC; Pinnacles National Monument , California Department of Fish and Game, Ventana Wildlife Society

Funding Source: US Fish & Wildlife Service Endangered Species Act (Section-6) Grant-in-Aid Program

Results to date: Pending

Anticipated Completion: 2013

Turbine early warning system for approaching condors and other large birds.

Years: 2012-2013

Study Objective: Development of GSM/GPS transmitter to communicate condor distances to wind turbine array managers to stop blades as a condor approaches to nearest turbines.

Principal Researcher(s): Mike Wallace and Paul Howey.

Sponsor: Institute for Conservation Research, SanDiego Zoo Global.

Funding Source: San Diego Zoo Global, SEMPRA and Microwave Telemetry.

Results to Date: Preliminary tests with the GSM component are positive. One prototype GSM/ GPS transmitter deployed on a Baja condor is functioning okay and an upgrade transmitter is done and being programed.

Anticipated Completion: Within a year 2013

California condor Nest Guarding Project

Years: 2007- 2016

Study objective: Analysis of nest success in Southern California's reintroduced population of California condors along with the trends of breeding effort and nest success within this population in response to changes in foraging, demographics and management strategy (tentative plan).

Principal Researchers: Estelle Sandhaus and Joseph Brandt.

Sponsors: Santa Barbara Zoo; US Fish & Wildlife Service Hopper Mountain NWRC; Los Angeles Zoo.

Funding Source: Hopper Mt NWR base funds, SB Zoo base funds.

Results to date: 6% Nesting Success (2001-2006) increased to 60% nesting Success (2006-2011), Brandt et al. 2008 (presentation), Brandt et al. 2010 (poster), Sandhaus et al. (2012) Wynn & Stringfield 2011(?).

Anticipated completion: 2016

California Condor Movement and Space Use Relative to Wind Energy Potential

Years: 2009-2012

Study Objectives: Determining historic and current California condor space use and movement patterns. Development of a metapopulation model for condors throughout their historic range.

Principal Researchers: Jim Rivers

Sponsors: US Fish & Wildlife Service; US National Park Service, Pinnacles National Monument; US Geological Survey, Forest and Rangeland Ecosystem Science Center; Ventana Wildlife Society.

Funding Source: USFWS Hopper Mountain NWRC & Ventura ES Office.

Results to date: Development, maintenance, and distribution of Condor movement KML files for use by condor managers in CA.

Anticipated completion: 2012

Analysis of California condor (*Gymnogyps californianus*) activity using satellite telemetry data

Years: 2005-2012

Study Objectives: Predict different types of behaviors in California condors through the analysis of GPS Transmitter Data.

Principal Researcher: Chris Cogan, Jesse De'lia, Joseph Brandt, Ken Convery

Sponsors: California State University, Channel Islands;

Funding Source: USFWS and CSU Channel Islands

Results to date: Manuscript submitted for publication.

Anticipated Completion: 2013

Eggshell thinning and depressed hatching success of California condors reintroduced to Central California.

Years: 2006-2012

Study Objective: Compare condor hatching success and eggshell thickness between reintroduced populations of California condors in Central and Southern California. Evaluate the cause of egg failure in wild laid eggs and assess the potential sources of organochlorine contamination and determine its impact of the condor population in Central California.

Principal Researchers: Joe Burnett, Kelly Sorenson, Joseph Brandt, Bob Risebrough Sponsors; Ventana Wildlife Society, US Fish & Wildlife Service Hopper Mountain National Wildlife Refuge Complex, The Bodega Bay Institute, Los Angeles Zoo and Botanical Gardens, Santa Barbara Zoo.

Funding Source: Ventana Wildlife Society and USFWS Hopper Mountain NWRC

Results to date: Burnett et al. 2009 (presentation), Manuscript has been submitted to Condor and is currently in revision.

Anticipated Completion: 2012

Appendix II. Camera Project Description

Surveillance camera systems have become more accessible in recent years; technology has greatly improved and prices have dropped. As a result, digital imagery and video surveillance is increasingly being incorporated into wildlife research, management, and outreach in the form of game cameras, critter cameras (i.e. cameras worn by an animal), and nest cameras.

Archived and streaming video can be shared with the public to increase awareness, and include them in research such as online citizen science projects. Examples of online cameras include the Decorah Eagles (http://www.ustream.tv/decoraheagles), Red-Tailed Hawks and Herons hosted by Cornell University (http://cams.allaboutbirds.org/live-cams/), and webcams run by individuals such as the Hummingbird Cam located on Channel Islands (http://phoebeallens.com/). Wild Birds Unlimited Minnesota maintains a comprehensive list of active wildlife cameras (http://saintpaul.wbu.com/content/show/47639).

The current California condor nest management strategy implemented by the U.S. Fish and Wildlife Service (Service) involves frequent and detailed real-time observations of wild nests, and periodic nest entries to assess egg fertility and monitor the chick's development. If problems are detected biologists may intervene to prevent nest failure, or to understand the potential cause of failure. This hands-on approach is referred to as the Nest Guarding Program.

The Nest Guarding Program has been successful at increasing the number of wild-fledged chicks , there are however a number of limitations in the way nests are observed. Observation coverage is limited by accessability, observer's physical abilities, and weather. Some nests are more difficult to observe due to their location, size, and orientation.

A remote camera system increases quality observations while reducing time and money spent monitoring nests. Camera system footage can be collected during all daylight hours and can be reviewed at an accelerated rate allowing observers to watch nests more frequently and efficiently. As the condor population's distribution expands, nest-use in remote areas will increase and nest cameras may be the only feasible way to observe these nests.

Two remote camera systems were piloted during 2011 and 2012. In 2011, the Santa Barbara Zoo (SB Zoo) partnered with the Service in a cost share grant to pilot a nest camera system at Bitter Creek NWR. The second system was

deployed in a condor nest near Hopper Mountain National Wildlife Refuge (Hopper Mountain NWR) in 2012. The SB Zoo has continued their involvement in the project, pledging to purchase hard drives for video archiving and software for the cameras. A camera and database systems specialist with SB Zoo has provided some expertise and review of the current and future systems.

System Description

The cost of the equipment needed to run one camera and stream it to a computer for archiving was roughly $4,000. In addition to a camera, the system also required 4 antennas: one at the camera, 2 functioning as repeaters, and one at the archive computer (Figure 1). Paired transmitting and receiving antennas must have line of sight with each other in order to establish a link. Multiple repeaters can be used to transmit the signal over long distances or around topography. Each location required solar power and batteries to keep the system running during periods of reduced sunlight. A computer and hard drives were needed for archiving.

Table 1. The general cost of a solar powered camera system with a single repeater

Item	Cost $	Description
Camera and Lens	872	Captures video
Solar Panel and Batteries	1320	Power and backup power
Antenna	315	Transmitting video stream
1000' Cat5e cable and plugs	115	Power and data transfer
Primary wire and terminal ends	77	For connecting solar panels to batteries
Hard drives and enclosure	400	For archiving data
Fiberglass enclosure supplies	200	For housing the camera
Masts and mounting hardware	200	Mounting equipment
500' aluminum conduit	350	Protecting Cat5e from environment and condors
Total	3849	

Power consumption must be taken into consideration when selecting camera system equipment, because the system is powered by solar panels. Additionally, weight, size, and ease of setup were considered because the camera and its equipment were hiked by staff through rugged terrain. Other equipment considerations also included how well it could be camouflaged and protected from the elements and wildlife such as ravens and condors. Guy wires and large masts were not used as a precaution for the condors and other wildlife. Two to 3 personnel were needed during the nest camera installation for carrying equipment to the site and system setup. A laptop was required at the site during installation to assist with camera angle positioning and focus. A trained staff member was needed for troubleshooting and further system expansion planning. Batteries and hard drives may need to be replaced every few years. Costs may decrease with each similar

installation, building upon previous infrastructure when possible.

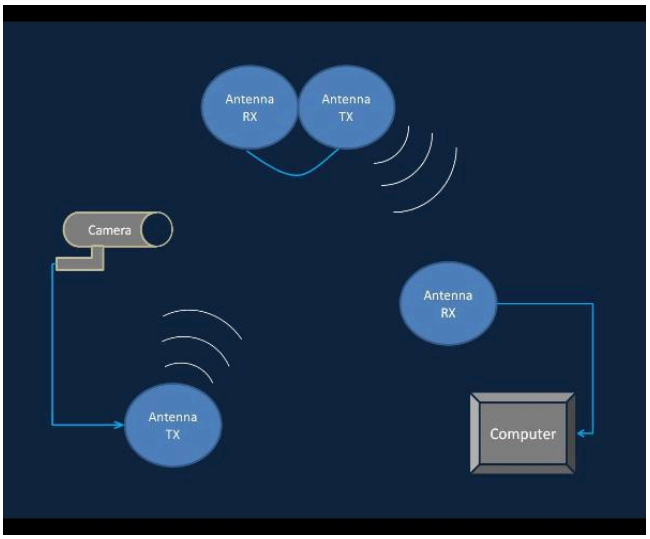


Figure 1. **Diagram of a remote wireless camera system. From the camera, a transmitting (TX) antenna sends digital footage to a repeater's receiving (RX) antenna. Data is then relayed to the archive using additional TX-RX**

The camera selected was an Arecont MP5115DN, which is a Power Over Ethernet (POE) Internet Protocol (IP) H.264 compression fixed high resolution digital Pan Tilt Zoom (PTZ) (http://www.arecontvision.com/). When the project was first researched and proposed in 2009, low power mechanical PTZ cameras were not cost effective. Generally, this type of camera required 15 watts or more. The antennas used were Ubiquiti Nanobridge M2 (2.4GHz) antennas (http://www.ubnt.com/). Ubiquiti products have a good reputation, offer product support via customer service and online community forums, and are inexpensive. Sixty watt polycrystalline solar panels and 36Ah high rate valve regulated sealed lead acid (VRLA) batteries were used from Tycon Power Systems (http://tyconpower.com/).

Deploying the System

The first camera system was installed at Bitter Creek NWR in 2011. This location was selected to test the feasibility of the system, and to learn how to install and use the equipment where it would be more accessible. A camera in a protective housing was attached to the flightpen at Bitter Creek NWR, and positioned to record activity at a supplemental feeding site adjacent to the flightpen. Power over Ethernet (Cat5e) cable was run along the flightpen in flexible aluminum conduit and then underground in PVC pipe approximately 300 feet away. The solar panel, batteries and transmitting antenna were placed at this distance as a precaution against destruction from condors. The signal was broadcast to a nearby hill (0.33 miles) where a repeater relayed the information to the archive computer (0.73 miles). The camera system functioned as expected and was not tampered with by condors visiting the flightpen.

Following the successful installation at the Bitter Creek NWR, a camera was installed in a nest cavity near Hopper Mountain NWR in April 2012. The

camera was installed in the SP12 nest cavity when the nest entry team entered to check the egg's fertility. The camera was housed in a camouflaged fiberglass enclosure, protecting it from direct weather, and potential destruction by condors (Figure 2). Similar to the Bitter Creek NWR installation, the SP12 camera system used 4 antennas to relay the digital video stream recorded within the nest cavity to an on-site archive computer.

The nest camera received power and sent video via Cat5e cable from a remote power and antenna station, which was positioned roughly 250 feet above the nest cavity. The Cat5e was protected by flexible aluminum conduit which was camouflaged with spray paint. The signal from the camera was wirelessly broadcast to a repeater on a ridge above (0.37 miles). The repeater relayed the signal towards the receiving antenna, which was connected to an archive computer located at the refuge facilities (1.3 miles). There, the video signal was decoded and archived, and live video was viewable by biologists.

The camera ran daily from sunrise to sunset, but experienced some power issues, especially during stormy weather. Hopper Mountain NWR is a dusty environment, and dust often finds its way inside the facilities; this dust creates potential problems for computer and camera equipment. As a precaution for drive failure and data loss, the current video archive setup consists of many smaller drives, each storing less data. Photo and video data was archived in real time by the Service on external hard drives, and physically transported to the office for storage.

The fiberglass camera housing in the nest cavity was originally installed with a plexiglass window; this quickly scratched, catching the dust and sunlight making footage suboptimal. During the 60 day nest entry to check the health of the chick, the housing's plexiglass window was switched for a slightly thicker glass window. The footage through the glass window was an improvement, although issues still persist due to dust from the cavity and periods of the day with direct sunlight.

While the video footage was recorded and viewable from the Hopper Mountain NWR facilities, daily nest observations were not conducted from this location. Biologists reviewed video footage on a weekly basis, but traditional eye-to-scope observations were still conducted at the nest site.

Figure 2. **The camouflaged housing and camera in the corner of the SP12 nest cavity near Hopper Mountain NWR.**

In 2012, the camera was only used to check the general status of the chick and not for data collection. Santa Barbara Zoo staff helped to review and create video clips, and to ensure the computer and camera were running correctly. Near the end of 2012, a Facebook page was approved by the Service's regional office, and in December 2012 the page was published. The Facebook page shared at least 2 video clips per week, focusing on the life of a condor chick in the nest. Santa Barbara Zoo staff is largely responsible for posting clips, with posts reviewed by Service staff.

Figure 3. Pictures taken by the camera since its installation in the nest near Hopper Mountain NWR. Condor #247 with newly hatched chick (top left). Condor #247 with 75 day chick (top middle). Condor #247 interacts with 75 day old chick (top right). 5 ½ month old chick (now condor #654) sunning 2 weeks prior to fledging (bottom left). The breeding pair (condor #79 and #247) continue to return to the nest cavity after the chick fledges (bottom middle). The pair just prior to copulation on February 18, 2013 (bottom right). An egg was laid 9 days later. This photo and the associated video represents the first close-up wild pair copulation caught on film.

Conclusions / Recommendations

Several things were learned following the first installation of a nest camera in to a wild condor nest. The system as a whole and individual equipment worked as expected. Power consumption and backup battery power were underestimated, because usable sunlight in a canyon is much less than the average recorded sunlight for a given area. Although only transmitting a black screen, power consumption by equipment at night is still a considerable draw on the backup batteries, and additional power and batteries must be added. A secondary switch to power down most of the system would result in considerable power savings, and extend battery life.

Problems with the nest camera system in 2012 revealed ways to improve the system for future years. There was a lack of data storage redundancy. Nest camera protocols lacked structure which led to camera system connection errors going unreported when the system went down, and personnel leaving the computer off during the day. Increased training, solar power, battery capacity and improved data storage should resolve many of these issues.

There are several additional equipment recommendations. Mounting the camera on the wall of the cavity off the ground could reduce dust on the housing window and result in higher quality images for a longer period of time. Enterprise brand hard drives have increased security and should be considered for archiving footage. To facilitate larger data transfers hard drives should include a USB 3 or eSata interface. A third party video viewing and archiving software, which is compatible with multiple camera manufacturers, should be used for long-term system expandability and ease of use by personnel. An additional camera located outside the nest cavity for viewing the chick after fledging may prove beneficial for management and outreach uses. The nest camera system should also be incorporated into weekly nest observation regimes, and protocols should be developed to instruct system users on data collection and the creation of clips.

During 2012, the Service worked to establish a partnership with the Cornell Lab of Ornithology (Cornell). The partnership aimed towards getting a live video stream of a California condor nest hosted on the Bird Cams website (http://cams.allaboutbirds.org/live-cams/). Additionally, selected footage will be uploaded and archived at the Macaulay Library (http://macaulaylibrary.org/). The Service hopes to provide footage to the public to increase appreciation and excitement in the recovery of the California condor, with hopes of continuing a long-term partnership with Cornell. By partnering with Cornell, the Service's condor camera gains access to the university's outreach channels. Cornell's Facebook page has 120,000 members, print publications are sent out to 100,000 individuals, 320,000 eNewsletters are sent to individuals, and 9 million unique visitors view their websites per year.

Because the Hopper Mountain NWR is without adequate internet or cell coverage, the nest video must be broadcast to a different location 13 miles away before it is able to be uploaded to the internet. Near the end of 2012, the development of a long distance link from Hopper Mountain NWR to the town of Fillmore began. Cornell will loan the Service the necessary long distance link equipment, pay for any software fees, and build and manage a page on the Bird Cams webpage with input from Service staff.

A partnership with California State University of Channel Islands (CSUCI) has also been established. CSUCI will be housing the receiving antenna and the host computer, which will receive the incoming data stream from Hopper Mountain NWR. CSUCI will also cover the bandwidth costs of uploading the footage onto the internet.

The 2013 live-streaming video project will expand our current camera system, with the installation of a POE IP H.264 PTZ (optical zoom) camera from Canon (http://www.usa.canon.com/cusa/professional/products/security_video_solutions) in a new cavity. This camera requires little additional power draw compared to the digital PTZ Arecont,which is currently used in the SP12 cavity. The optical PTZ will ease the installation process, obtain a closer view of the egg and chick, and allow the camera angle to be changed if the egg or chick moves from view for an extended period of time.

In 2013, the condor program also applied for a grant to involve the Fillmore Unified School District in a condor-related biology curriculum. The curriculum would include the use of footage from condor nest cameras, presentations from Service biologists, and field trips to the Santa Barbara Zoo's condor exhibit and Hopper Mountain NWR. Additionally, the grant will cover the cost of an information kiosk at Santa Barbara Zoo, which would house a monitor showing streaming video of the nest.

The camera system supports the Service's Nest Guarding Program, and may be the only available tool used to monitor nesting California condors as their range expands and their nest cavities become more remote. Video footage is capable of capturing highly detailed images that are often not possible through traditional observations with a scope. Video clips can be archived and shared with personnel to help guide management decisions. The system is capable of being adapted for remote or local applications with available AC power. The camera system has a potential to reduce the long-term cost of monitoring the California condor, and is applicable for many other wildlife species.

Appendix III. Bear Valley Springs Situation Report

Background

An unforeseen hurdle in the reintroduction of California condors has been undesirable behaviors related to condors coming into close proximity with human structures and humans. Each reintroduced population has dealt with condors landing on radio towers, telephone poles, houses and other structures. Condors can engage in these situations for a variety of reasons. In some cases, the availability of food is the attractant, but other factors may also play a role. Sometimes, the close proximity has resulted in humans directly feeding a condor, which has led to the association of human activity with food or a complete lack of wariness around people. In these cases, the affected condor is deemed habituated as it no longer has a fear for humans and will approach them, usually seeking them out as a source of food. Habituation increases the risk of injury to condors and results in abnormal foraging and feeding behaviors. Furthermore, human safety is jeopardized in the event that a condor may injure an individual that is approached. Periodically, condors will come across a structure or collection of structures that serves as an attractant. Their social nature usually means that more than one condor will engage in the activity simultaneously. Condors perching on houses or other human structures increases the likelihood of condor/human interactions that can lead to habituation. These events were exhibited at a much higher frequency during early years following the establishment of condor release sites and persist, to a lesser degree, in each of the wild populations.

In June 2012, condors began to perch and roost on and around the homes in the upper elevations of Bear Valley Springs (BVS), a gated community just outside the city of Tehachapi in Kern County, California. This situation involved a large number of the population of condors in Southern California that had recently expanded into the northern portions of the Tehachapi Mountains. The foothills of these mountains are actively ranched with cattle and it appears (as indicated by GPS

Figure 1. Condors loafing on a front porch of a BVS home.

transmitter data) that these condorss are now regularly finding carrion in the area. After a feeding, condors will typically roost in nearby roosting habitat. The homes that condors visited in Bear Valley Springs are interspersed among high quality roosting habitat, which appeared to be the attractant in this situation.

Timeline of Situation

On June 19, 2012 a single condor was detected via GPS in the vicinity of houses at BVS. Since that time, the number of condors in the area increased with about 40% to 50% of the population present on most days. The GPS transmitter locations correspond with the visual data collected during the same time. The first report from BVS residents of condors in the area came on the 28th of June. A number of homes are not lived in year-round or are only inhabited during weekends. This could explain the delay in the initial report of condors observed in BVS. Condor Field Staff responded to reports, searched the surrounding area, and found condors perched on the roofs of houses. Staff were present the great majority of the days since the initial investigation with complete coverage (i.e. a person on site from sunrise to sunset) since July 10th when a campground was provided by the community. From July 1st to October 18th, 57 out of the 58 condors or 97% of the entire southern CA population free-flying were observed at BVS. Condor activity in BVS peaked in July and slowly tapered off in conjunction with hazing and the changing of the season (Figure 2). In total, condors were observed on 28 houses in BVS with the highest density of GPS occurring in the northwest portion of BVS (Figure 3).

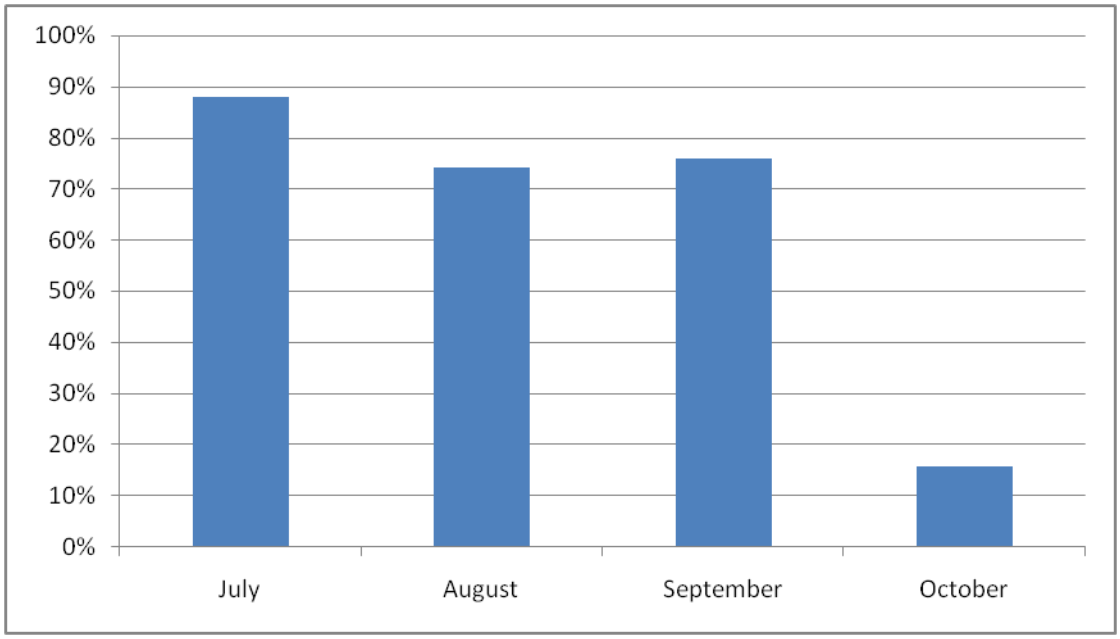


Figure 2. The percentage of the Southern California free-flying condor population observed at BVS between July 1, 2012 and October 18, 2012.

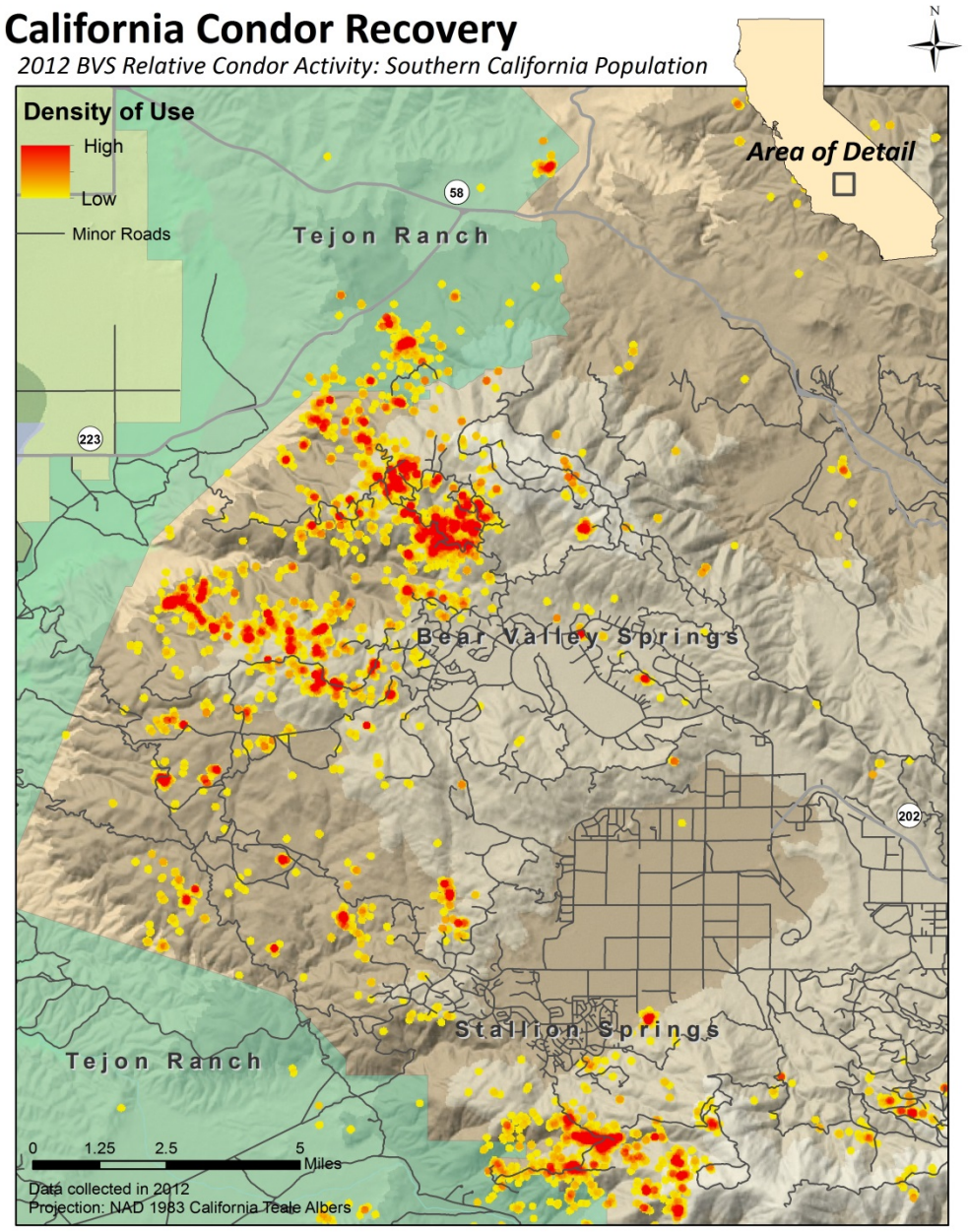


Figure 3. Relative condor activity at Bear Valley Springs and the surrounding area by California condors in 2012.

Staff Effort

The initial response to condors visiting BVS was delayed. In the recent past, we have seen similar small numbers of condors visit the outskirts of residential areas without cause for concern. As the number of condors increased in the area and we received a report of condors on homes, we deployed staff to investigate. The community is 3.5 hours from Ventura and 2.5 hours from Bitter Creek NWR, making response to the situation without a nearby base camp difficult. After making contact with the BVS Home Owners' Association, we were able to procure a

campsite without cost and subsequently stationed 1-2 people on site monitoring and hazing condors from sunrise to sunset.

Staff spent roughly 60 to 100 hours each week at BVS to monitor and haze condors from July 6th to October 18th. This level of coverage required numerous trips per week from Ventura, Bitter Creek NWR, or Hopper NWR to relieve staff members in order to avoid a single person having to work multiple 10 to 12 hour days. This effort was in addition to normal operations required for condors, including the concurrent trapping season, the monitoring and care of prerelease condors held in the flight pen at the Bitter Creek NWR, the monitoring and management of 6 active nests, and the regular weekly monitoring, maintenance, and supplemental feeding that occurs on Hopper Mountain NWR and Bitter Creek NWR.

Hazing consisted of using slingshots to shoot grapes or pieces of potatoes at the condors when they were perched on or near a house or using water guns when they were perched in closer proximity. The hazing practices have changed overtime and staff have found this technique to be effective at displacing condors while maintaining a low risk of injury to the condors. There was some discussion on whether it was appropriate to allow homeowners to haze condors on their own. We did not condone this approach because condors could be potentially injured by people who are untrained and who may exaggerate hazing methods at the expense of condor safety. In addition, many of the homes were vacant or only received periodic use, thus making staff presence a necessity. We expressed the desire to set up automated hazing devices on a few homes shown to have the most condor activity. The automated hazing system we proposed using were motion-activated sprinklers that are known as scarecrows. These devices were effective in the past in central California. Four homeowners accepted the offer and allowed such devices to be installed by staff members (Figure 4), while another household declined the offer. Some other neighbors that received condor visitation voiced interest in obtaining these devices in the future if they proved effective and the condors became a persistent issue at their property. Other systems such as motion activated alarms

Figure 4. Newly installed scarecrow sprinkler at a BVS with high condor visitation.

and electric fencing were discussed with specific homeowners, however, these ideas were abandoned due to a condor's ability to deactivate the alarm and the low feasibility of fence installation. In both cases, scarecrow sprinklers were deployed instead.

In addition to corresponding with individual homeowners, we also performed outreach in the community at large. There were 2 public presentations to inform the residents of BVS about condor activity in the area. These presentations were focused on informing the residents about the need to keep condors away from people and homes and what actions to take and not to take if they see a condor on or near a residence. These presentations were well received with many positive comments following the reception. About 150 to 200 people attended these events in total. We also created a flyer (attached) for residents with these basic instructions if a condor is seen:

- Record wing tag # and color whenever possible
- Do not approach or feed condors
- Discourage condors from landing on your house by removing objects condors may be interested in (e.g. open trash containers, wires, seat cushions).
- Contact the USFWS California Condor Recovery Program at (805) 644-5185

The flyers were available at both public presentations and the BVS Home Owners' Association posted the flyer on their website.

Direct Costs

The direct operational costs related to this event have primarily consisted of person hours and gas to travel the 2-3 hours 10 to 15 times a week.
Other than these costs, we purchased additional hazing equipment (slingshots, additional slingshot bands, grapes/potatoes, and water guns) totaling about $200 to $250 dollars. We had 6 scarecrow sprinklers in our field equipment inventory available for use. A volunteer, Jan Hamber, donated 2 more scarecrow sprinklers to the California Condor Recovery Program.

Known property damage

In addition to the threat of injury and behavioral modification that condors face from perching on homes and being in close proximity to humans, there is also a high potential for property damage. Condors are a large species with a curious nature. They will often explore their environment with their large and powerful beak. Like many other species of wildlife, including the closely related Black Vulture (*Coragyps atratus*), condors can cause property damage by pulling on objects until they are damaged or torn apart. These exploratory activities create further risk to condors because these items can be eaten as microtrash or cause entrapment or entanglement.

The damage caused in this situation was difficult to assess because it is unclear what damage was caused by condors and what might have been caused by other wildlife in the area such as raccoons, which are also known to be a nuisance at BVS. Assuming the majority of the damage was caused by condors, damage to property consisted of torn/damaged window screens, deck furniture cushions, roofing tiles, boat and car covers, insulation around air conditioning unit pipes and water pipes, weather stripping around exterior doors and garage doors (Figure 5), grill covers, patio umbrellas, hot tub covers, tarps, wires, hoses, doormats and other small items picked at or torn apart around residences.

Figure 5. Condors congregated at a home in BVS and picking at the weather stripping around the basement

Media Coverage

The only known coverage of the condor activity in BVS is from the local newspaper, The Tehachapi News. The article was published on July 5, 2012 (http://www.tehachapinews.com/news/local/x918350531/CondorCondor-sightings-in-Tehachapi-area-expected-to-become-more-common). In the article, Joseph Brandt, the supervisory wildlife biologist for the USFWS California Recovery Program, answered a number of questions about the number of condors in the area and what residents should do in the event that a condor is seen. The article also quoted a local naturalist, Jon Hammond, who advised not to notify USFWS in the event of a condor sighting. This section prompted an immediate follow-up by Joseph Brandt in order to provide more information on why not reporting condor sightings could lead to dangerous situations for condors and property damage for home owners. It is unknown as to whether or not the author of the article printed an editorial response of Joseph's follow-up. The local community newsletter also included a write-up on the condor activity in Bear Valley Springs.

Closing comments

The condor activity in BVS is not unique. Over the years, there have been a number of situations similar to this incident where condors, after recolonizing an area, have perched on human structures and come into close proximity with people. There has been much debate and speculation in the past as to why these events have occurred and whether they will diminish or cease as the population matures. These events are likely the result of condors' innately curious nature coupled with increased human presence in their range. With the successful reestablishment of a condor population and its continued recolonization into the available habitat throughout the region, it is evident that these interactions will continue into the future. It is

likely that the situation at BVS will continue seasonally into the indefinite future as condors find food in the surrounding ranchlands and return there to roost. The expanding population and natural feedings are positive signs that the population has become more independent from the intensive management that occurs to allow the species to survive. While positive for long-term recovery goals, the movement into habitat with human civilization will present managers with more challenges prior to the recovery of the species.

Please contact Joseph Brandt, Supervisory Wildlife Biologist, for additional information.

Appendix IV. Condor Monthly Activity Reports

Condor Field Program Monthly Activity Report January 2012

Prepared by Joseph Brandt (Supervisory Wildlife Biologist)

Categories:

Personnel:

Staff

1/29/2012, G. Grisdale (Wildlife Biologist) promoted to GS 9 (Full Performance.)
1/16/2011, K. Chaplin (STEP Bio Sci Tech) resumed school back to working part time under new schedule.
Feb 6-17, 2012, Announcement for Wildlife Biologist (Vice Massey) will be posted on to USA Jobs. Joseph Brandt (Sup. Wildlife Biologist) worked with Jessica Clarkson (HR) to draft an announcement. Position will be advertised as a GS 7/9. Announcement was posted on to USA Jobs for two weeks

Interns

Feb 8, 2012 Angela Woodside's (Intern) last day. Angela was intern for 12 months.
Feb 17 or 21, 2012 Chris Smith (Intern) start date. Chris will intern for 3 months

PU:

1/15/2012 Vince Gerwe (Friends of Condor Wild & Free) led tour for Audubon Morrow Bay Bird Festival at Bitter Creek NWR. SUP deliverable was Condor IDs and Bird list.
1/25/2012 Joseph Brandt (Sup. Wildlife Biologist) & Devon Lang (Bio Sci Tech). Attend Condor Genetics Master Planning Meeting at LAZ. Joseph chaired meeting.
1/26/2012 Joseph Brandt (Sup. Wildlife Biologist), Geoff Grisdale (Wildlife Biologist), Josh Felch (Bio Sci Tech), Katie Chaplin STEP Bio Sci Tech), Mike Brady (Project Leader), Angela Woodside (Intern), Marian Wahl (Intern) attended the Condor program field team meeting. Joseph, Geoff, & Katie were presenters. Meeting was at LAZ.
1/27/2012 Joseph Brandt (Sup. Wildlife Biologist) attended Condor program keeper meeting. Meeting was at LAZ.
1/28 & 30/2012 "The Non-lead Hunter" was shown at SB international film festival.
This is a 23 minute film hunter education film by Anthony Prieto highlighting the benefits of using lead-free ammo for wildlife HMNWRC was a contributor.

Condors:

12/29/2011 Josh Felch (Bio Sci Tech) & Katie Chaplin (STEP Bio Sci tech) release condors 137 & 147 at Bitter Creek NWR. This was an older breeding pair most recently held at Oregon Zoo. The pair spent 6 weeks in the Bitter Creek Flight Pen prior to release. Condor 147 making good progress and becoming integrated into the wild flock after about 1 month she began feeding and roosting with other condors. 137 failed to make progress, after about 3 weeks on refuge he flew off refuge and failed to return, was trapped via net gun on 2/6/2012 by Joseph Brandt (Sup. Wildlife Biologist) and Katie in Tecuya Cyn on the Wind Wolves Preserve.

1/1/2012 Joseph Brandt (Sup. Wildlife Biologist) & Jesse Grantham (Condor Program Coordinator) were coauthors of PATTERNS OF MORTALITY IN FREE-RANGING CALIFORNIA CONDORS (*GYMNOGYPS CALIFORNIANUS*) with Rideout et al. in Journal of Wildlife Diseases 48(1).
1/15/2012 Katie Chaplin (STEP Bio Sci Tech) & Joseph Brandt (Sup. Wildlife Biologist) Flight Pen Feeding Site Camera is operational at Bitter Creek NWR. Camera will be used by field staff to improve feeding observations at flight pen feeding site and as a system proof of design for a nest camera to be installed in 2012. Footage collected will be archived and analyzed by Santa Barbara Zoo partners for behavioral research.

Maintenance:
Geoff Grisdale Setting dates with the Friend of the Condor Wild and Free to assist in repairing the floor of the flight Pen blind at Bitter Creek Flight Pen. (ETA Mid-March) The recapture of 137 will make scheduling a little more critical.

Condor Field Program Monthly Activity Report February 2012
Prepared by Joseph Brandt (Supervisory Wildlife Biologist)

Categories:
Personnel:
Staff
Feb 17, 2012, Announcement for Wildlife Biologist (Vice Massey) closed. Currently reviewing resumes checking references. Deadline is 4/08/2012.
Interns
Feb 8, 2012 Angela Woodside's (Intern) last day. Angela was intern for 12 months.
Feb 17 or 21, 2012 Chris Smith (Intern) start date. Chris will intern for 3 months.
Geoff is posting a new announcement. Christina and Chris are leaving in leaving in the middle of April.

PU:
2/10/2012 Joseph Brandt (Sup. Wildlife Biologist) Participated in call to discuss the Los Padres NF Oil and Gas Lease project. Concerns about hazing as it relates to project.
2/6-10/2012 Geoff Grisdale attends Refuge Biological Conservation at NCTC.
2/27-3/2/2012 Joseph Brandt (Sup. Wildlife Biologist) Attended 40 hour DOI Supervisors training in Sacramento.
2/18/2012 Joseph Brandt (Sup. Wildlife Biologist) & Geoff Grisdale (Wildlife Biologist) visit the Wes Thompson Piru Shooting Range. Met Wes and discussed possibility of doing a shooting event. Will follow up next time Leland (IWS) is in town (May.)
2/21/2012 Joseph Brandt (Sup. Wildlife Biologist) Attended meeting to discuss the Barron Ridge Power line project with ES. Project is overhauling of large transmission line the runs through the western side of the Los Angeles NF.
2/23/2012 Geoff Grisdale (Wildlife Biologist), Ria Boner (SBZ) and Molly Astell (SBZ) hosted the volunteer nest observer training. 15 attendees. Alternate training date is 3/26/2012 will train an additional ~10 people.
2/27-3/1/2012 Geoff Grisdale (Wildlife Biologist) & Devon Lang (Bio Tech) Attend Intro to GIS training in Ventura.

3/29/2012 Joseph Brandt (Sup. Wildlife Biologist) is scheduled to give 20 minute talk at the Ventura Birding Club's monthly meeting.

Condors:

2012 Nests *Nest has not confirmed but strongly indicated by GPS data

Nest ID	Male	Female	Egg ID	Location	Lay Date
DG12*	206	370	FW112	Devil's Gate (Lower Sespe)	3/1/2012
RC12*	239	289	FW212	Reasoner Cyn (West of Lake Piru)	3/9/2012

2/6/2012 by Joseph Brandt (Sup. Wildlife Biologist) and Katie Chaplin (STEP Bio Tech) Net gun condor #137 in Tecuya Cyn on the Wind Wolves Preserve. Condor #480 and condor #489 trapped to allow for 137 to socialize. 137 will be held until next fall and re-released with 2012 cohort.
2/10/2011 Katie Chaplin (Bio Tech) discovers horse near Lebec, CA. Horse is suspected to have been shot. Trapped condor #107, condor #156, and condor #161 (all three fed on horse) at Hopper Mt NWRC to determine if potential lead exposure. Lead levels came back low and condors were released.

Maintenance:
Setting dates with the Friend of the Condor Wild and Free to assist in repairing the floor of the flight Pen blind at Bitter Creek Flight Pen. (ETA Mid-March) The recapture of condor #137 and training in Feb delayed project. 137 will be moved to Hopper Mt to be housed with first condors of 2012 in mid-march this should give friends group about a month to complete project.

Condor Field Program Monthly Activity Report March 2012
Prepared by Joseph Brandt (Supervisory Wildlife Biologist)

Categories:
Personnel:
Staff
Mar 30, 2012, Selection made for Wildlife Biologist (Vice Massey.) Laura Mendenhall has been tentatively offered the position. Start date TBA (~May 21,2012.)
Interns
No changes in intern staff. All will be leaving in mid-April.

PU:
3/24/2012 Mike Clark gives talk for Friends or the CA Condor W&F
3/25/2012 Joseph Brandt (Sup. Wildlife Biologist) 30 minute talk at the Ventura Birding Club's monthly meeting.
3/16-24/2012 French Film Crew filming condor work at HM & BC.
3/30/2012 Devon Lang (Biological Technician) & Josh Felch (Biological Technician) attend San Caytano Elementary School Career day.

Condors:

2012 Nests *Nest has not confirmed but strongly indicated by GPS data

Nest ID	Male	Female	Egg ID	Location	Lay Date
DG12	206	370	FW112	Devil's Gate (Lower Sespe)	3/1/2012
RC12*	239	289	FW212	Reasoner Cyn (West of Lake Piru)	3/9/2012
TC12	374	180	FW312	Tom's Cyn	3/13/2012
SP12	247	79	FW412	South Potrero	3/15/2012
SC12	328	216	FW512	Santiago Cyn (Near Bitter Creek)	4/2/2012

3/5-6/2012 Joseph Brandt (Sup. Wildlife Biologist) & Geoff Grisdale (Wildlife Biologist) Basic Chain saw training at Tijuana Slough NWR.
3/7-8/2012 Geoff Grisdale (Wildlife Biologist), Devon Lang (Biological Technician), Josh Felch (Biological Technician), Katie Chaplin (Step Biological Technician) attend nest entry ropes training, Joseph Brandt (Sup. Wildlife Biologist) was instructor.
3/14/2012 Joseph Brandt (Sup. Wildlife Biologist) attends Sec 6 research meeting.
3/16/2012 Received two prerelease Condors form SDSP (condor #590, condor #597.)
3/20/2012 Worked up and released condor #63, condor #480, condor #489. Transferred condor #137 to HMFP.
3/24/2012 Joseph Brandt (Sup. Wildlife Biologist) and Katie Chaplin (Step Bilogical Technician) perform Fertility Check of FW112. Egg was fertile and correct age for estimated lay date.

Maintenance:

3/23 & 30/2012 Friends Group BCFP repairs. (Blind floor, Pond and Gravel)

Condor Field Program Monthly Activity Report April 2012

Prepared by Joseph Brandt (Supervisory Wildlife Biologist)

Categories:

Personnel:

Staff

Mar 30, 2012, Selection made for Wildlife Biologist (Vice Massey.) Laura Mendenhall will start May 28th.

Interns

Christina Varian left April 11th
Marian Wahl left April 16th
Chis Smith left April 18th
Corrine Ross April left April 25th
Matt Landever started April 30th
Sam Simmons Started May 7th

Geoff has an additional intern lined up to start on the 29th (Danny Raleigh) and is working to hire one more.

PU:

4/18/2012 Devon Lang met with Leland Brown (IWS) at the Piru shooting range. Owner agreed to host a shooting event this summer. We will also set up a both at Savage Arms demo day on May 19th and 20th.
4/24/2012 Michael Woodbridge, Josh Felch, Katie Chaplin spoke with reporter from APM about Condors in a wind energy related story.
4/16-5/4/2012 Joseph Brandt attends Refuge Managers Academy at NCTC.

Condors:

2012 Nests *Egg was swapped with foster egg; **Not yet confirmed

Nest ID	Male	Female	Egg ID	Location	Lay Date	Hatch Date
DG12	206	370	FW112	Devil's Gate	3/1/2012	4/27/2012
RC12	239	289	FW212	Reasoner Cyn	3/9/2012	5/5/2012**
TC12	374	180	FW312/12Taki1	Tom's Cyn	3/13/2012	4/23/2012*
SP12	247	79	FW412/12Tene1	South Potrero	3/15/2012	4/25/2012*
SC12	328	216	FW512	Santiago Cyn	4/2/2012	Tba
KR12	125	111	FW612	Koford's Ridge	4/27/2012	Tba

4/11/2012 Geoff Grisdale met with Mona Iannelli and Robert Fenwick at Rancho del la Cruz. Area cleaner than before but still a concern.
4/12/2012 Joseph Brandt and Devon Lang enter TC12. FW312 was not viable and replaced with a dummy
4/13/2012 Joseph Brandt, Devon Lang, and Katie Chaplin enter SP12. FW412 was not viable and replaced with a dummy. Nest camera installed!
4/19/2012 Devon Lang and Mike Clark place replacement egg into TC12.
4/23/2012 Geoff Grisdale and Josh Felch place replacement egg into SP12
4/25/2012 Geoff Grisdale and Mike Clark check SC12. FW512 was fertile.
5/1/2012 Geoff Grisdale and James Rasico climb into DG12. Egg hatched there is a chick!

Maintenance:

Started mowing trails and creating fire clearings with ATV pull behind mower.

Condor Field Program Monthly Activity Report May 2012

Prepared by Joseph Brandt (Supervisory Wildlife Biologist)

Categories:

Personnel:

Staff

May 29, 2012, Laura Mendenhall joined the team May 29th.

Interns

Matt Landever started April 30th
Sam Simmons started May 7th
Danny Raleigh started May 29th
Caitly Bowman started June 4th

Thanks to Geoff who to on the responsibility for recruiting and hiring the most recent group of interns!

PU:

5/16-17/2012 Joseph Brandt (16th, 17th), Devon Lang (16th), and Geoff Grisdale (17th) attended the CCP public comment meetings in Ventura and Taft.
5/19-20/2012 Joseph Brandt (19th), Geoff Grisdale (19th, 20th), and Katie Chaplin (20th) helped with lead-free outreach at the Savage Arms Demo Days at Piru Shooting Range on May 19th and 20th.A booth was set up by Leland Brown and Ben Smith of IWS.
5/20/2012 Joseph Brandt led Ojai Cub Scout Troop on tour of Bitter Creek NWR. Group of 10 Cub Scouts with their parents attended.
5/21-25/2012 Devon Lang attended Basic Bird Biology at NCTC.
5/22-24/2012 Joseph Brandt attended the Condor Stewardship Outreach Workshop in Zion National Park. This event focused on teaching interpreters and environmental educators the effects of lead on condors and other wildlife and techniques and messaging for lead-free outreach. The final day explored the possibility a national wildlife lead awareness group tentatively titled Wildlife Unleaded.

Condors:

2012 Nests *Egg was swapped with foster egg

Nest ID	Male	Female	Egg ID	Location	Lay Date	Hatch Date
DG12	206	370	FW112	Devil's Gate	3/1/2012	4/27/2012
RC12	239	289	FW212	Reasoner Cyn	3/9/2012	5/5/2012
TC12	374	180	FW312/12Taki1	Tom's Cyn	3/13/2012	4/23/2012*
SP12	247	79	FW412/12Tene1	South Potrero	3/15/2012	4/25/2012*
SC12	328	216	FW512	Santiago Cyn	4/2/2012	4/28/2012
KR12	125	111	FW612	Koford's Ridge	4/27/2012	Tba

5/2/2012 Josh Felch and Molly Astell discover the location of RC12 after many weeks attempting to locate the nest.
5/14/2012 Geoff Grisdale transferred condors 137, 590, and 597 from Hopper Mountain Flight Pen to Bitter Creek Flight Pen.
5/15/2012 Geoff Grisdale received condors 591, 594, 596, and 604 from the Debbie Marlow (SDSP)
5/24/2012 Geoff Grisdale and Jenny Thule (LAZ) enter TC12 for 30 day chick exam.
5/25/2012 Joseph Brandt and Mike Clark (LAZ) enter KR12 to check fertility of FW612. Egg was fertile
5/25/2012 Joseph Brandt and Mike Clark (LAZ) enter SP12 for 30 day chick exam.
5/29/2012 Joseph Brandt and Debbie Ciani (LAZ) enter DG12 for 30 day chick exam.
5/30/2012 Joseph Brandt, Geoff Grisdale, Laura Mendenhall, Devon Lang, Josh Felch, and Katie Chaplin attend 30 day chick handling training at LAZ.

Maintenance:

K. Chaplin and Josh Felch completed mowing trails at Hopper Mt NWR.
Bitter Creek Flight Pen Area should be mowed this month and NRFS road needs to be scraped.

Condor Field Program Monthly Activity Report June 2012

Prepared by Joseph Brandt (Supervisory Wildlife Biologist)

Categories:

Personnel:

Staff

6/17/2012 Katie Chaplin now on a FT summer schedule: Sun off; M,Tu office; Th-Fri Field; Sat off

Interns

Matt Landever started April 30th

Sam Simmons started May 7th

Danny Raleigh started May 29th

Caitly Bowman started June 4th

PU:

6/2/2012 Joseph Brandt attended the CDFG Southern Zone Advanced Hunter Education Course with Leland Brown and Ben Smith (IWS) to man a lead-free outreach booth and perform a shooting demo

6/13/2012 Joseph Brand, Michael Glen (FWS ES), and Colleen Melberg (FWS ES) provide tour to the Bishop Paiute Tribal Youth Summer Camp. 15 students attended ranging from elementary to high school ages.

6/20/2012 Joseph Brandt hosted the BBC Kids program Natalie's Nightmare of Nature Children's Program to film a condor work up for one of their episodes.

6/25/2012 Joseph Brandt coauthored **Lead poisoning and the deceptive recovery of the critically endangered California condor** (Finkelstein et al. 2012) which was released as an early addition at the PNAS website (pnas.org)

6/27/2012 Geoff Grisdale, Laura Mendenhall, Devon Lang, Josh Felch, and Katie Chaplin attended the Wilderness First Aid/CPR/AED Training held at Hopper Mountain NWR. SB Zoo and UC Davis field staff also attended.

6/28/2012 Joseph Brandt attended a Condor/Wind Energy research meeting at the Regional Office in Sacramento.

Condors:

2012 Nests *Egg was swapped with foster egg

Nest ID	Male	Female	Egg ID	Location	Lay Date	Hatch Date
DG12	206	370	FW112	Devil's Gate	3/1/2012	4/27/2012
RC12	239	289	FW212	Reasoner Cyn	3/9/2012	5/5/2012
TC12	374	180	FW312/12Taki1	Tom's Cyn	3/13/2012	4/23/2012*
SP12	247	79	FW412/12Tene1	South Potrero	3/15/2012	4/25/2012*
SC12	328	216	FW512	Santiago Cyn	4/2/2012	4/28/2012
KR12	125	111	FW612	Koford's Ridge	4/27/2012	6/23/201

6/4-5/2012 Joseph Brandt and Josh Felch entered RC12 for 30 day exam of chick which was confirmed via the nest entry.

6/13/2012 Joseph Brandt, Geoff Grisdale, Laura Mendenhall, Devon Lang, Josh Felch, and Katie Chaplin perform condor work up day at Bitter Creek NWR 18 condors processed. Interns and SB Zoo Staff also assisted. No condors required treatment

6/20/2012 Joseph Brandt, Geoff Grisdale, Laura Mendenhall, Devon Lang, Josh Felch, and Katie Chaplin perform condor work up day at Bitter Creek NWR 14 condors processed. Interns and SB Zoo Staff also

assisted. Two condors (condor #289 and condor #360) required treatment for elevated Pb levels and were transported to LAZ.
6/21/2012 Devon Land and Mike Clark (LAZ) perform 60 day exam at TC12 nest.
6/22/2012 Joseph Brandt and Devon Lang perform 60 day exam at SP12 nest.
6/25/2012 Katie Chaplin picked up condors (condor #289 and condor #360) following chelation treatment for Pb at LAZ.
6/25/2012 Geoff Grisdale and Josh Felch perform hatch confirmation at KR12 nest.
6/25/2012 Joseph Brandt and Jenny Thule (LAZ) perform 60day exam at the DG12 nest
6/28/2012 Geoff Grisdale and Laura Medenhall perform 30 day exam at the SC12 nest.

Maintenance:
6/15/2012 Katie Chaplin mowed/weeded around Bitter Creek Bunkhouse and out buildings
6/21-22/2012 Josh Felch, Katie Chaplin, Dan Tappe (Thanks Dan) and interns mowed the Bitter Creek Flight Pen area.

Condor Field Program Monthly Activity Report July 2012
Prepared by Joseph Brandt (Supervisory Wildlife Biologist)
Categories:
Personnel:
Staff
No Changes
Interns
Matt Landever started April 30th
Sam Simmons Final Day was Aug 1st
Danny Raleigh started May 29th
Caitly Bowman started June 4th

PU:
7/7/2012 Devon Lang and Katie Chaplin attended a lead-free shoot out in Kernville with Ben Smith (IWS) to setup a lead-free outreach booth and perform a shooting demo. ~10 people attended
7/10/2012 Joseph Brandt spoke at Bear Valley Springs Town Hall Meeting about condor/human interactions and the dangers of habituation. ~150 people attended
7/14/2012 Joseph Brandt spoke at the Bear Valley Springs Women's Club monthly social. ~75 people attended.
7/14/2012 Luara Mendenhall attended a Hunter Education Class out in San Louis Obispo with Ben Smith (IWS) performed a shooting demo. ~50 people attended
7/15/2012 Joseph Brandt and Katie Chaplin attended a lead-free shoot out in Kernville with Ben Smith (IWS). Setup a lead-free outreach booth to hand out boxes of free nonlead ammo and perform a shooting demo. ~60 people attended, ~30 boxes of ammo were given out.
7/21/2012 Geoff Grisdale attended a lead-free shoot out in Visalia with Ben Smith (IWS). Setup a lead-free outreach booth to hand out boxes of free nonlead ammo and perform a shooting demo. ~60 people attended, ~30 boxes of ammo were given out.

Condors:

2012 Nests *Egg was swapped with foster egg

Nest ID	Sire SB#	Dam SB#	Egg ID	Chick SB#	Location	Lay Date	Hatch Date
DG12	206	370	FW112	658	Devil's Gate	3/1/2012	4/27/2012
RC12	239	289	FW212	670	Reasoner Cyn	3/9/2012	5/5/2012
TC12	374	180	FW312→12Taki1	648	Tom's Cyn	3/13/2012	4/23/2012*
SP12	247	79	FW412→12Tene1	654	South Potrero	3/15/2012	4/25/2012*
SC12	328	216	FW512	671	Santiago Cyn	4/2/2012	4/28/2012
KR12	125	111	FW612	678	Koford's Ridge	4/27/2012	6/23/201

Bear Valley Springs: A large portion of the flock has been visiting Bear Valley Springs, a community in the northern Tehachapi Mountains. Many condors have been observed on and around residencies and have required day time surveillance of the area and frequent hazing activities. 1 to 2 members of the condor team have been camping at the community for most of the month. See BVS situation report for further detail.

7/11/2012 Geoff Grisdale, Katie Chaplin, Josh Felch, and Laura Mendenhall Worked up 7 condors at Bitter NWR. Two condors (#369 & #428) blood lead level tested greater than 35µg/dL and were transported to LAZ for treatment.
7/19/2012 Joseph Brandt, Devon Lang and Katie Chaplin trapped and worked up condor 627 at Hopper Mountain NWR.
7/20/2012 Joseph Brandt picks up #428 and #369 from LAZ and transports them to Bitter Creek NWR for re-release.
7/20/2012 Joseph Brandt and Katie Chaplin work up #239 at Bitter Creek NWR.
7/23/2012 Joseph Brandt and Curtis Eng (LAZ) perform 90 day exam at TC12 nest.
7/24/2012 and Curtis Eng (LAZ) perform 90 day exam at SP12 nest.
7/25/2012 Geoff Grisdale, Devon Lang, and Laura Mendenhall 30 day exam at KR12 nest.
7/25/2012 Joseph Brandt, Josh Felch, and Katie Chaplin perform 60 day exam at SC12 nest.
7/26/2012 Joseph Brandt, Chandra David (LAZ), and Karl Hill (LAZ) perform 90 day exam at DG12 nest
7/31/2012 Geoff Grisdale, Laura Mendenhall, Josh Felch, James Rasico (UCDavis) worked up 7 condors at Bitter Creek NWR. All were released

Maintenance:
Not a lot of maintenance. The Hopper Peak Trail was weed-whacked this month by condor team.

Condor Field Program Monthly Activity Report Aug 2012
Prepared by Joseph Brandt (Supervisory Wildlife Biologist)
Categories:
Personnel:
Staff
8/27/2012 Katie Chaplin begins school and has a new TOD. She will be working Thursday- Sunday.
8/21-9/5/2012 Devon Lang was off. She got married! Congratulations Devon!

Interns
Matt Landever started April 30th
Sam Simmons Final Day was Aug 1st
Danny Raleigh started May 29th
Caitly Bowman started June 4th
Ryane Cox started September 10th
PU:
8/2-3/2012 Joseph Brandt & Ken Convery attended California Condor Program Partners meeting in Portland Oregon.
8/9/2012 Dan Tappe & Josh Felch provided tour of Bitter Creek NWR for a minority focused career group sponsored by the FWS.

Condors:

2012 Nests *Egg was swapped with foster egg

Nest ID	Sire SB#	Dam SB#	Egg ID	Chick SB#	Location	Lay Date	Hatch Date
DG12	206	370	FW112	658	Devil's Gate	3/1/2012	4/27/2012
RC12	239	289	FW212	670	Reasoner Cyn	3/9/2012	5/5/2012
TC12	374	180	FW312→12Taki1	648	Tom's Cyn	3/13/2012	4/23/2012*
SP12	247	79	FW412→12Tene1	654	South Potrero	3/15/2012	4/25/2012*
~~**SC12***~~	~~328~~	~~216~~	~~FW512~~	~~671~~	~~Santiago Cyn~~	~~4/2/2012~~	~~4/28/2012~~
KR12	125	111	FW612	678	Koford's Ridge	4/27/2012	6/23/201

*SC12 failed on ~16 Aug with the chick apparently falling from the nest and suffering multiple broken bones. Any underlining causes of the fall have not been determined.

Bear Valley Springs: 1 to 2 members of the condor team continue to camp at the community to monitor the condor activity in the area. We have have been successful installing motion activated sprinklers at a number of houses and are looking to expand the use of these sprinklers. We are also working to provide a presentation to the BVS PD and to look into the potential for more community involvement to assist with monitoring and hazing efforts.

8/6-7/2012 Joseph Brandt, Katie Chaplin, Devon Lang, & Geoff Grisdale participate in the temporary evacuation of the DG12 Chick in order to treat for an elevated blood lead level. Katie spent the night in the nest.
8/12-14/2012 Katie Chaplin, Molly Astell (SBZ), Vince Gerwe (FOCWF) & David Moen (VWS) travel to Boise, ID to pick up 8 condors from the World Center of Birds of Prey and transfer them to Bitter Creek NWR.
8/15/2012 Joseph Brandt, Geoff Grisdale, Katie Chaplin, Davod Moen & Interns work up condors at Bitter Creek Flight Pen
8/15/2012 Joseph Brandt & Katie Chaplin drive from Bitter Creek to LAZ to transfer 2 condors to LAZ and 2 condors to SDSP. (4 condors picked up from Bosie, ID)
8/19/2012 Joseph Brandt & Geoff Grisdale confirm the failure of SC12 and recover the chick about 200 feet below the nest.

8/21/2012 Joseph Brandt, Laura Mendenhall, & Katie Chaplin perform 120 day exam at TC12 nest. Chick is tagged! No more entries.
8/22/2012 Joseph Brandt & Laura Mendenhall perform 60 day exam at KR12 nest.
8/23/2012 Joseph Brandt & Jenny Thule (LAZ) perform 120 day exam at SP12 nest.
8/24/2012 Joseph Brandt & Chandra David (LAZ) perform 119 day exam at DG12 nest due to previous lead exposure chick is delayed and was not tagged will attempt to tag the chick next month.

Maintenance:
None

Condor Field Program Monthly Activity Report Sept 2012
Prepared by Joseph Brandt (Supervisory Wildlife Biologist)
Categories:
Personnel:
Staff
No changes
Interns
Matt Landever started April 30th
Sam Simmons Final Day was Aug 1st
Danny Raleigh started May 29th
Caitly Bowman started June 4th
Ryane Cox started September 10th
PU:
9/10-14/2012 Joseph Brandt attended training in Fort Collins: Designing a Biological Monitoring Program.
9/30/2012 Friends of the California Condor provided tour of Hopper NWR. ~20 people attended.

Condors:
2012 Nests *Egg was swapped with foster egg

Nest ID	Sire SB#	Dam SB#	Egg ID	Chick SB#	Location	Lay Date	Hatch Date
DG12	206	370	FW112	658	Devil's Gate	3/1/2012	4/27/2012
RC12	239	289	FW212	670	Reasoner Cyn	3/9/2012	5/5/2012
TC12	374	180	FW312→12Taki1	648	Tom's Cyn	3/13/2012	4/23/2012*
SP12	247	79	FW412→12Tene1	654	South Potrero	3/15/2012	4/25/2012*
~~**SC12***~~	~~328~~	~~216~~	~~FW512~~	~~671~~	~~Santiago Cyn~~	~~4/2/2012~~	~~4/28/2012~~
~~**KR12****~~	~~125~~	~~111~~	~~FW612~~	~~678~~	~~Koford's Ridge~~	~~4/27/2012~~	~~6/23/201~~

*SC12 failed on ~16 Aug with the chick apparently falling from the nest and suffering multiple broken bones. Any underlining causes of the fall have not been determined.
**KR12 failed on 9/28 after chick died during nest entry. Chick appeared to be sick and under fed.

Bear Valley Springs: 1 to 2 members of the condor team continue to camp at the community to monitor the condor activity in the area. We have been successful installing motion activated sprinklers at a

number of houses and are looking to expand the use of these sprinklers. September has had a drop in condor activity on houses while still in area the condors have required less hazing perching in trees.

9/18-19/2012 Joseph Brandt and Geoff Grisdale Enter RC12 for 135 day exam. Chick was health and tagged. Final entry for this nest.
9/20/2012 Joseph Brandt travels to SB Zoo to train keeper staff andassist with retagging their exhibit condors.
9/21/2012 Joseph Brandt, Steve Kirkland, and Jenny Thule (LAZ) enter KR12. Chick appeared to be undersized but acting healthy and entry is planned to re-check on 9/28/2012.
9/25/2012 Joseph Brandt and Jenny Thule (LAZ) enter DG12. 150 day old chick is healthy and is tagged. Final entry for this nest.
9/28/2012 Joseph Brandt and Geoff Grisdale enter KR12. Chick is still under sized and has not been fed. Chick appeared very sick and dies during nest entry.

Condor Field Program Monthly Activity Report Oct 2012

Prepared by Joseph Brandt (Supervisory Wildlife Biologist)

Categories:

Personnel:

Staff

No changes

Interns

Matt Landever last day was Oct 30th
Marie McCann starts Nov 13th
Danny Raleigh started May 29th
Caitlyn Bowman started June 4th
Ryane Cox started September 10th

PU:

10/01-5/2012 *Geoff Grisdale* assisted with Small Mammal Trapping at Bitter Creek NWR.
10/3-4/2012 *Joseph Brandt, Steve Kirkland, & Mike Brady* attended Alta East Wind Farm VHF detection and avoidance demonstartion
10/9-11/2012 *Josh Felch* assisted with small mammal trapping at Bitter Creek NWR.
10/18/2012 *Laura Mendenhall* assisted with Friends talk in Sequoia NF headquarters ~20 people attended.
10/20/2012 *Laura Mendenhall* assisted with Friends tour at Bitter Creek NWR. ~30 people attended.
10/30/2012 *Joseph Brandt* presented to the Tehachapi Audubon Chapter. ~20 people attended.

Condors:

2012 Nests *Egg was swapped with foster egg

Nest ID	Sire SB#	Dam SB#	Egg ID	Chick SB#	Location	Lay Date	Hatch Date
DG12	206	370	FW112	658	Devil's Gate	3/1/2012	4/27/2012
RC12	239	289	FW212	670	Reasoner Cyn	3/9/2012	5/5/2012
TC12	374	180	FW312→12Taki1	648	Tom's Cyn	3/13/2012	4/23/2012*

SP12	247	79	FW412→12Tene1	654	South Potrero	3/15/2012	4/25/2012*
~~**SC12****~~	~~328~~	~~216~~	~~FW512~~	~~671~~	~~Santiago Cyn~~	~~4/2/2012~~	~~4/28/2012~~
~~**KR12****~~	~~125~~	~~111~~	~~FW612~~	~~678~~	~~Koford's Ridge~~	~~4/27/2012~~	~~6/23/201~~

* Eggs replaces with captive laid eggs.

** SC12 failed on ~16 Aug with the chick apparently falling from the nest and suffering multiple broken bones. Any underlining causes of the fall have not been determined. KR12 failed on 9/28 after chick died during nest entry. Chick appeared to be sick and under fed.

Bear Valley Springs: Condor activity at Bear Valley Springs has waned with only a few condors visiting periodically. Staff is no longer stationed there daily. We expect the activity to resume in the spring but have many motion activated sprinklers in place.

10/03/2012 *Laura Mendenhall & Josh Felch* released condor #590 & 596.
10/05/2012 *Molly Astell (SBZ)* observed the fledge of 648 (TC12).
10/13/2012 Hunting season opened at Hopper Mt NWR.
10/24/2012 *Bill Langford (Vol)* observed fledge of 654 (SP12).
10/25/2012 *Geoff Grisdale & Devon Lang* released condor #137, 591, & 604. (Two more condors left to release.)

Condor Field Program Monthly Activity Report Nov 2012

Prepared by Joseph Brandt (Supervisory Wildlife Biologist)

Categories:

Personnel:

Staff
No changes
Interns
Ryane Cox started September 10th
Matt Landever last day Nov 7th
Marie McCann started Nov 13th
Danny Raleigh last day 21th
Jerry Cole started Nov 26th
Caitlyn Bowman last day Nov 28th
Ben Teton starts Dec 6th

PU:

11/09/2012 Joseph Brandt participates on Section 6 Database call with VWS, PNM, & CDFG.
11/23/2012 Laura Mendenhall, Josh Felch, Marie McCann receive ATV/UTV training. (Thanks Dan!)

Condors:

2012 Nests *Egg was swapped with foster egg

Nest ID	Sire SB#	Dam SB#	Egg ID	Chick SB#	Location	Lay Date	Hatch Date
DG12	206	370	FW112	658	Devil's Gate	3/1/2012	4/27/2012
RC12	239	289	FW212	670	Reasoner Cyn	3/9/2012	5/5/2012

TC12	374	180	FW312→12Taki1	648	Tom's Cyn	3/13/2012	4/23/2012*
SP12	247	79	FW412→12Tene1	654	South Potrero	3/15/2012	4/25/2012*
~~**SC12****~~	~~328~~	~~216~~	~~FW512~~	~~671~~	~~Santiago Cyn~~	~~4/2/2012~~	~~4/28/2012~~
~~**KR12****~~	~~125~~	~~111~~	~~FW612~~	~~678~~	~~Koford's Ridge~~	~~4/27/2012~~	~~6/23/201~~

* Eggs replaces with captive laid eggs.

** SC12 failed on ~16 Aug with the chick apparently falling from the nest and suffering multiple broken bones. Any underlining causes of the fall have not been determined. KR12 failed on 9/28 after chick died during nest entry. Chick appeared to be sick and under fed.

11/08/2012 Geoff Grisdale kenneled 159, 602, 606 & 626 and transferred to Pinnacles Nat'l Monument
11/11/2012 Last Day of Big Game Rifle Season for zone D-10 (Hoppper and Bitter Creek), Fall trap up begins.
11/15/2012 Laura Mendenhall and Josh Felch release 594 and 625 at Bitter Creek NWR.
11/15/2012 Josh Felch traps 21 condors at Bitter Creek NWR
11/19/2012 RC12 nest successful, 670 observed flying above nest (fledge date unknown.)
11/20/2012 All condor staff with assistance from SB Zoo and LA Zoo processed 21 condors at Bitter Creek NWR. 3 condor (98, 125, & 462) were transported to the LAZ for elevated lead levels. One condor (483) held in Bitter Creek NWR flight pen for beak maintenance.
11/21/2012 Caitlyn Bowman trapped 12 condors at the Bitter Creek NWR.
11/23/2012 Caitlyn Bowman trapped 6 condors at the Bitter Creek NWR.
11/27/2012 Condor Staff with assistance from SB Zoo worked up 18 condors. All were released.

Maitenece:

11/30/2012 Hill Top O.P. shade structure collapsed.

Condor Field Program Monthly Activity Report DEC 2012

Prepared by Joseph Brandt (Supervisory Wildlife Biologist)

Categories:

Personnel:

Staff

No changes

Interns

Ryane Cox started September 10th
Marie McCann started Nov 13th
Jerry Cole started Nov 26th
Ben Teton starts Dec 6th

PU:

12/04/2012 Geoff Grisdale, Devon Lang, and Ben Teton receive ATV/UTV training. (Thanks Dan!)
12/04/2012 Joseph Brandt presents about condors to Will Rogers Elementary School 1st Grade Class (49 Students)
12/12/2012 Devon Lang presents about condors to the Thurgood Marshall Elementary School 3rd Grade Class (90 students)
12/18/2012 The Condor Cave is published on Facebook. There were 14 posts and 296 likes in December

Condors:

2012 Nests *Egg was swapped with foster egg

Nest ID	Sire SB#	Dam SB#	Egg ID	Chick SB#	Location	Lay Date	Hatch Date
DG12	206	370	FW112	658	Devil's Gate	3/1/2012	4/27/2012
RC12	239	289	FW212	670	Reasoner Cyn	3/9/2012	5/5/2012
TC12	374	180	FW312→12Taki1	648	Tom's Cyn	3/13/2012	4/23/2012*
SP12	247	79	FW412→12Tene1	654	South Potrero	3/15/2012	4/25/2012*
~~**SC12****~~	~~328~~	~~216~~	~~FW512~~	~~671~~	~~Santiago Cyn~~	~~4/2/2012~~	~~4/28/2012~~
~~**KR12****~~	~~125~~	~~111~~	~~FW612~~	~~678~~	~~Koford's Ridge~~	~~4/27/2012~~	~~6/23/201~~

* Eggs replaces with captive laid eggs.

** SC12 failed on ~16 Aug with the chick apparently falling from the nest and suffering multiple broken bones. Any underlining causes of the fall have not been determined. KR12 failed on 9/28 after chick died during nest entry. Chick appeared to be sick and under fed.

12/05/2012 Geoff Grisdale Transported condor #483 to LAZ for beak repair and picked up and released condor #98. Both condors were released at HMNWR.
12/05/2012 Molly Astell confirmed condor #658 fledged from the DG12 Nest.
12/05/2012 Condor Field Team worked up 8 condors at Bitter Creek NWR. Kern NWR Staff and John Bradley (Deputy Project Leader at San Francisco NWR) assisted with work up. 7 condors were released. Joseph Brandt transported condor #568 to LAZ for Pb treatment.
12/07/2012 Condor Staff trapped and worked up 4 condor at HMNWR. Condor # 627 was transported to Ventura.
12/08/2012 Katie Chaplin transported condor #627 to LAZ for Pb treatment. She picked up condor #125 and #462 and released them at BCNWR.
12/12/2012 Condor staff worked up 7 condors at the BCFP. Joseph Brandt transported condor #289 to Ventura.
12/12/2012 Ben Teton trapped condor #137 for behavioral reasons.
12/13/2012 Katie Chaplin transported condor #289 to LAZ for Pb Treatment.
12/19/2012 Devon Lang picked up condor #289 and condor #568 released them at HMNWR
12/21/2012 Joseph Brandt picked up condo #627 and released him at Tar Creek Trailhead.
12/29/2012 Laura Mendenhall transported condor #137. #137 will act as a mentor for LAZ and not be returned to the wild. Bitter Creek NWR Flight Pen in now empty.
12/31/2012 Josh Felch and Joseph Brandt work up a condor at HMNWR. Condor is released. Only a single condor left to be trapped and tested for fall/winter trap up.

Appendix V. 2012 Volunteer Hours

In 2012 the California Condor Field Team at the Hopper Mountain National Wildlife Refuge Complex utilized unpaid volunteers and volunteer interns (which are provided a stipend of $42 per day). Interns and unpaid volunteers assist with condor field activities at Bitter Creek NWR and Hopper Mountain NWR. In 2012, interns also provided assistance at the Bear Valley Springs Community monitoring condors and hazing them when necessary. Sixty-five unpaid volunteers and fifteen volunteer interns were used in total during the year.

The following table summarizes the number of unpaid volunteer hours and intern volunteer hours spent at each site for each month of the year.

Month	Bitter Creek NWR Unpaid Volunteer Hours	Hopper Mountain NWR Unpaid Volunteer Hours	Total Unpaid Volunteer Hours	Bitter Creek Volunteer Intern Hours	Hopper Mountain NWR Volunteer Intern Hours	Bear Valley Springs Volunteer Intern Hours	Total Volunteer Intern Hours
January	24	48	72	450	450	0	900
February	0	32	32	504	180	0	684
March	0	112	112	360	360	0	720
April	24	144	168	270	270	0	540
May	64	240	304	360	90	0	450
June	72	136	208	360	360	0	720
July	24	104	128	360	360	90	810
August	32	128	160	90	180	270	540
September	48	96	144	180	360	180	720
October	24	40	64	180	450	270	900
November	0	56	56	351	351	0	702
December	0	24	24	387	270	0	657
Grand Total	312	1160	1472	3852	3681	810	8343