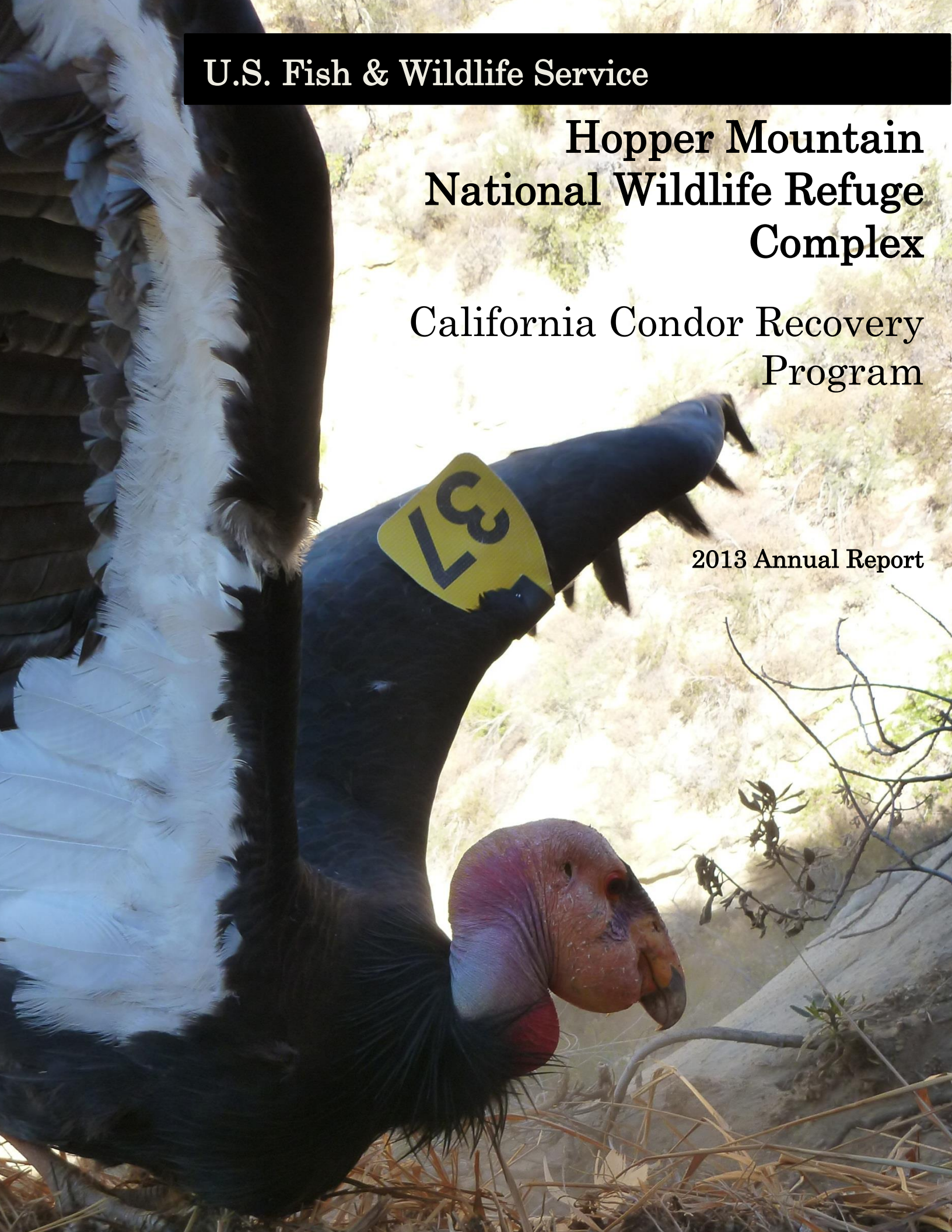
U.S. Fish & Wildlife Service

Hopper Mountain National Wildlife Refuge Complex

California Condor Recovery Program

2013 Annual Report



On the Cover: Breeding male, condor #237, at his nest site in 2013.
Photo Credit: Joseph Brandt, U.S. Fish and Wildlife Service

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Acknowledgements

The California Condor Recovery Program would not be possible without the continued support of our partners, volunteers, Hopper Mountain National Wildlife Refuge Complex staff, and others. We are grateful to The Friends of the California Condor Wild and Free; Habitat Works; The Institute for Wildlife Studies; The Los Angeles Zoo; Los Padres Forest Watch; The Santa Barbara Museum of Natural History; The Santa Barbara Zoo; Seneca Resources; Tejon Ranch Company; The University of California Davis and Santa Cruz; The Ventura County Sheriff's Office Search and Rescue Team; Wind Wolves Preserve; and myriad volunteers who provided invaluable help and cooperation without which the California Condor Recovery Program would not function as effectively as it does. We would also like to acknowledge hunters using non-lead ammunition for their help keeping condors and other wildlife safe from the perils of lead toxicosis.

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Executive Summary

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

As of December 31, 2013, the California condor population managed directly by the U.S. Fish and Wildlife Service (Service) consisted of 72 free-flying condors, up from 69 condors in 2012. Wild reproduction, mortalities and captive releases for 2013 resulted in a four percent increase to the Southern California population (Figure 3.5.1). Four wild chicks fledged from seven nests in 2013 with assistance from the Service and the Santa Barbara Zoo's Nest Guarding Program. Three of these nests were monitored using the remote nest camera system developed in 2012. In addition to wild reproduction, the Service released six captive-bred condors 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 and the expansion of the overall area of activity for the population.

The Service attempted to trap all individuals in the population twice during the year to monitor for lead exposure, which is the result of condors ingesting carrion or gut piles that have been shot with lead ammunition. Twenty-five condors (37% of the condors tested) required treatment for elevated blood lead levels in 2013. This is an increase in lead exposures from 2012 when 10 condors (14% of the condors tested) were treated for lead. As the population's range has expanded and individuals have become more independent, trapping has become more difficult with five condors (7% of the population) having evaded trapping in 2013. This becomes relevant for maintaining VHF and/or GPS transmitters on each condor and for monitoring and mitigating lead exposure.

Nine condors from the Southern California population died in 2013. This included seven free-flying condors and two chicks that died prior to fledging.

Condors continued to inhabit the Northern Tehachapi Mountains and interact with humans in the residential montane communities of Bear Valley Springs, Stallion Springs and Alpine Forest Park. The Service, with the support of the Friends of the California Condor Wild and Free, continued community outreach and hazing as a means to mitigate these interactions. A number of the individual condors believed to have been the protagonists of these interactions were also trapped and temporarily held to decrease the level of undesirable behavior.

The Service, with considerable support from the Santa Barbara Zoo, continued showcasing condor nesting behavior and management on the Facebook page, "The Condor Cave", which increased its following by 334% to 1,006 followers at the end of 2013. Other outreach activities included tours of each wildlife refuge, presentations to interest groups and elementary, high school, and college students, and interviews with media outlets including KGET NBC17 of Bakersfield, CNN News, and Al Jazeera America.

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Introduction

The California condor [*Gymnogyps californianus*] 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) (Photo 0.0.1).

Photo 0.0.1: California condor #591 flying over Bitter Creek NWR. *Photo credit: Lisa Cox, USFWS*

Condors are a long-lived species with an estimated lifespan of 60 years. They are slow to mature and typically begin to reproduce at six 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 is categorized into nesting, foraging, and roosting components (USFWS 1996). 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 typically choosing cavities located on steep rock formations or in the burned out hollows of old-growth conifers such as coastal redwood and giant sequoia (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 1996).

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. The Complex has participated in the California condor reintroduction effort since 1992. The Service operated a number of different release sites both on refuges and on U.S. Forest Service lands and since 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 (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, two 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 (Photo 0.0.2), which currently inhabits portions of Santa Barbara, Ventura, Los Angles, Kern, Tulare and Inyo 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 two wild, self-sustaining populations of 150 individuals with 15 breeding pairs (USFWS 1996). The Recovery Plan consists of five 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 1996). In accordance with the Recovery Plan, "Released California condors should be closely monitored by visual observation and electronic telemetry" (USFWS 1996).

Photo 0.0.2: Hopper Mountain National Wildlife Refuge. *Photo credit: USFWS*

To support the second key action in the Recovery Plan, the field team monitors the free-flying population of condors to identify threats and reduce adverse effects to condors. Each refuge provides facilities designated for trapping and holding condors, which are 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 1996).

The field team is comprised of a number of different positions including Service employees, partner employees, and volunteers. In 2013, the Service employed one full-time permanent

supervisory wildlife biologist, two full-time term wildlife biologists, two full-time term biological science technicians, and one part-time student biological science technician (eight months of the year). The Santa Barbara Zoo employed one full-time nesting technician and a research coordinator who spent about a third of her time assisting the condor field team. In addition to the various staff positions, the Complex has four volunteer intern positions that are filled throughout the year. Individuals who volunteered for these positions worked approximately 40 hours a week for six months; interns were provided a stipend as a living allowance. The field team also utilized a number of unpaid volunteers who primarily assisted with monitoring nests during the eight month nesting season. All volunteer hours are summarized in Appendix IV. 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 (Friends Group) helped with outreach events and project work such as building observation blinds and flight pen maintenance.

This annual report describes the activities conducted by the field team with primary management operations described in detail. In addition, staff resources attributed to these operations and the biological outcomes are described and discussed.

1.0 Funding

In 2013, the Hopper Mountain National Wildlife Refuge Complex Office received $691,047 in U.S. Fish and Wildlife Service Recovery funds (1113). The Complex used these resources to fund the field team and their activities as well as a programmatic condor coordinator position. Refuge management funds (126x) also contributed significantly to condor related activities.

2.0 Actions

The condor field team at the Hopper Mountain National Wildlife Refuge Complex performs seven actions with the goal of achieving a self-sustaining population of condors in California (Figure 2.0.1). The actions performed are: Monitoring Resource Use, Lead Monitoring and Mitigation, Detecting Mortalities, Nest Management, Captive Releases & Transfers, Behavioral Modification, and Outreach. These actions are meant to address the major threats condors face in the wild (Figure 2.0.1). For more information on the Hopper Mountain NWRC Condor Program structure, Appendix II describes the Program's conceptual work plan in detail. This plan describes how each action is implemented to achieve condor program objectives.

2.1 Monitoring Resource Use

The loss and modification of California condor foraging, roosting and nesting habitat is recognized 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 acknowledges the presence of sufficient remaining condor habitat in the Southwestern United 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 (Photo 2.1.1). Transmitters 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 one-hour intervals. GPS transmitter locations are used to understand condor resource use over a large geographic and temporal scale.

Photo 2.1.1: Example of a patagial-mounted Microwave Telemetry, Inc. Argos GPS unit. *Photo credit: USFWS.*

All California condors in Southern California are equipped with either two very high frequency (VHF) transmitters attached to a central rectrix (Kenward 1978) or a combination of one VHF transmitter and one patagial-mounted (Wallace 1994) GPS transmitter. (*continued on page 6*)…

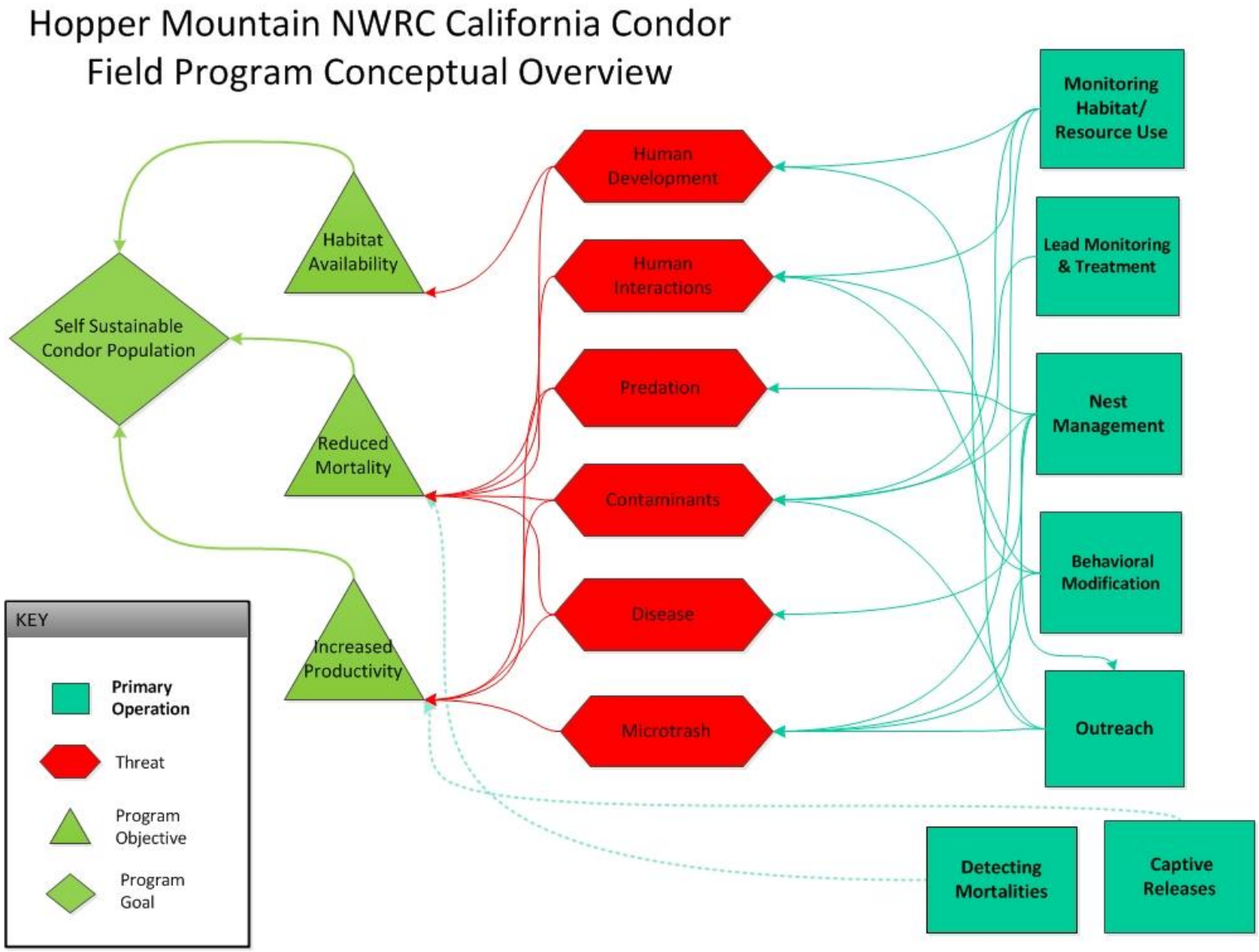


Figure 2.0.1: A conceptual model for the Hopper Mountain NWRC California Condor Field Program. The program's goal is to establish a wild self-sustaining population of condors. The three program objectives are limited by one or more of the six identified threats, which are in turn addressed by the seven primary operations.

Starting in November of 2013, the field team deployed four GSM (Global System for Mobile Communications) transmitters (GSM; Microwave Telemetry, Inc. ©, Columbia, Maryland; GSM; Cellular Tracking Technologies, LLC, Somerset, Pennsylvania). This technology uses cellular towers to transmit GPS data and enables the collection of locations at frequencies up to every 30 seconds. The feasibility of these units will be tested throughout 2014 in order to assess the possibility of complete transition to this technology.

The field team monitors GPS transmitter locations daily in order to target locations of interest for on-the-ground investigation, an action referred to as ground-truthing. Non-proffered feeding events and potential threats are prioritized for ground-truthing. A non-proffered feeding event occurs when condors find carrion or other food items that are not provided by the condor field team. When possible, this carrion is collected for further examination, including radiographing and dissection, at the Santa Barbara Zoo (Photo 2.1.2).

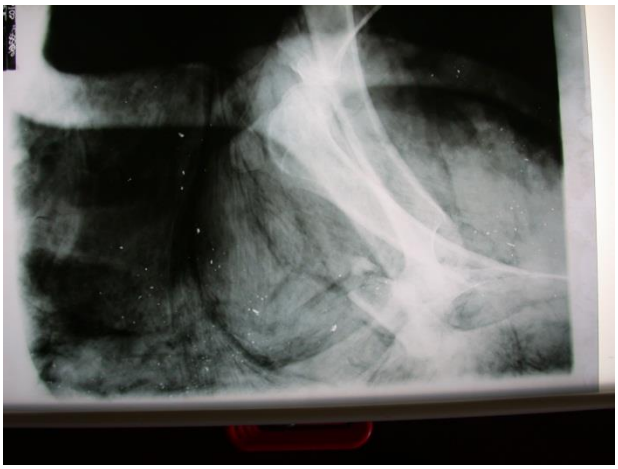


Photo 2.1.2: Radiograph image of carrion. The bright spots throughout the radiograph are metallic densities. *Photo credit: USFWS.*

Any metallic objects, including lead or other metals detected in this process are recovered and analyzed for ongoing research. 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 including efforts to map condor habitat (Cogan et al. 2012), assess the impact and distribution of lead on the landscape (Kelly et al. in press), and monitor the impacts of the Ridley-Tree Condor Preservation Act (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 a major ongoing concern for all California 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, despite this 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 to prevent lead related mortalities.

Twice each year, the field team attempts to trap and handle the entire Southern California condor population to monitor blood lead levels and, if necessary, 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 three 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 while 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 involves radiographing the condor to identify possible metallic objects in the digestive system and administering chelation treatment to remove lead from the bloodstream (Photo 2.2.1).

Chelation treatment consists of daily intramuscular injections of Calcium EDTA (calcium edetate) given in conjunction with subcutaneous fluids. Lead toxicosis can result in crop-stasis, or the inability to transfer food past the crop, which can result in severe weight loss. 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 monitors condors with metallic-positive radiographs. When possible, they recover castings and fecal material and remove metallic objects for analysis. A condor's treatment ends when its lab blood lead level is less than35 µg/dL and it is no longer showing clinical signs of lead toxicosis.

Photo 2.1.1: Los Angeles Zoo Condor Keepers prepare a condor with lead toxicosis for radiographing. *Photo credit: Jon Myatt, USFWS.*

Additional blood samples collected from 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.

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 that may affect other condors. Detection of mortalities by radio telemetry and GPS monitoring is one of the highest priority operations conducted by 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.

GPS transmitters can also alert the field team to a potential condor mortality. 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 goes 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 throughout Southern California condor range to search for the signal of the missing condor (Photo 2.3.1).

Photo 2.3.1: Mobile tracking at Wind Wolves Preserve. *Photo Credit: USFWS*.

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.

Starting in September of 2013, all condor carcasses recovered from the wild population were transferred to the National Fish and Wildlife Forensics Laboratory in Ashland, Oregon for postmortem examination in order to determine cause of death.

Carcasses recovered prior to September were sent 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 began in 2001. Between 2001 and 2006, only two 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) (Photo 2.4.1).

Photo 2.4.1: Microtrash removed from a wild chick in 2008. *Photo Credit: USFWS*.

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. The program is modeled after a nest guarding program for the endangered Puerto Rican Parrot (Lindsey 1992) and combines monitoring nests with direct intervention 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 following 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. Observers will travel to a designated nest observation point and watch for activity from that location. Typically, each nest is observed for two hours, three to four times per week from the nest observation point. 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.

The field team also uses footage from nest cameras to assist with nest observation. Nests with cameras are not watched from a nest observation point but instead all nest camera footage is reviewed every three to four days.

Each condor nest is 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, biologists enter the nests when the chick is 30, 60, 90, and 120-days old (Photo 2.4.2).

Photo 2.4.2: Wildlife Biologist Geoff Grisdale sifts through nest substrate as a hooded wild chick awaits its 90-day health check. *Photo Credit: Devon Pryor, USFWS.*

During each nest entry, biologists give the chick a health exam, which includes palpating the chick's stomach and crop for foreign bodies or blockages and taking 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 so as to discourage possible premature-fledging. During this entry, the chick is fitted with a patagial tag and VHF transmitter.

Nest interventions transpire when problems arise or when pair history dictates preventative measures should be taken to ensure success of the nest. During the egg stage, nonviable eggs are removed and replaced with dummy eggs, which are later switched with viable captive-laid eggs. Additional interventions occur as needed to mitigate threats detected through observations such as chick injuries or microtrash impactions.

Nest cameras are advantageous for interventions as they allow close monitoring of an egg or chick following an intervention that otherwise might not have been attempted because of the inability to conduct such monitoring via traditional direct observations. Program veterinarians are able to remotely assess a chick's status and recovery via recorded video clips of the chick and its behavior that would not be possible without nest cameras.

When chicks fledge, they are monitored closely 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.

In the event of a nest failure, biologists enter the nest to recover the remains of the egg or chick. Recovered eggs are collected and frozen in a conventional freezer for use in contaminants research. Chick carcasses are submitted to the

U.S. Fish and Wildlife Service Wildlife Forensics Laboratory in Ashland, Oregon for necropsy.

2.5 Captive Releases and Transfers

During the fall 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, it is necessary to increase productivity 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 human-made structures (Bukowinski et al. 2007, Clark et al. 2007, USFWS 1996).

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 (Photo 2.5.1). These pre-release condors will spend at least six weeks in the flight pen to allow familiarization with the new surroundings and interactions with wild condors perching or feeding nearby. During this time, the field team monitors pre-release condors two to four days per week during four-hour observations 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.

Photo 2.5.1: Captive-bred California condors await release in a flight pen. *Photo Credit: Angela Woodside, USFWS.*

The field team typically releases California condors during the fall months (September-November) because the weather is cooler and there are fewer thermal updrafts. 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 newly released condors. The field team monitors the newly released condors for a minimum of 30 days paying careful attention to social interactions, feeding, and roost selection. 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 otherwise 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 undesirable behavior in the wild. This behavior includes approaching humans, not socializing with other condors, poor roost selection and/or the inability to locate supplemental carrion.

2.6 Behavioral Modification

The California condor is an inquisitive species whose habitat overlaps with human development. The frequency with which the condor encounters human activity and development has led to 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 three 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 human-made structures limited to those that resemble natural perches or offer adequate protection from predators, and abandoning the undesirable behavior after one to two 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). Some of 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 might 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 (Photos 2.6.1 and 2.6.2).

The field team employs aversion training, hazing, and trapping of habituated condors as 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, pre-release flight pens feature mock power poles that deliver nonfatal electric shocks to any condor landing on the structure. This aversion training has proven very effective in conditioning pre-release condors to avoid these structures once they join the free-flying population.

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

Photo 2.6.2: Condor #63 covered in motor oil at Rancho la Cruz. *Photo credit: USFWS*

The field team identifies habituation sites and habituated condors using radio telemetry, GPS transmitter data, 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.

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, setting up motion-activated sprinklers, and using restrained dogs. Hazing is an effective deterrent only when done quickly and consistently. Inconsistent hazing can allow condors to develop a tolerance of the hazing techniques thereby lessening their effect.

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 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 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. In some circumstances, however, the habituated condor's behavior warrants a permanent return to captivity.

2.7 Outreach

The field team performs outreach 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 (Photo 2.7.1).

Photo 2.7.1: Supervisory Wildlife Biologist, Joseph Brandt, educates local Boy Scout group on condor conservation at Bitter Creek NWR. *Photo Credit: USFWS.*

Outreach is often targeted to help resolve immediate management issues. 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 (USFWS 1996) and the Complex's Comprehensive Conservation Plan (USFWS 2012). When possible, land managers within the species' range are encouraged to use lead-free ammunition when dispatching animals and allow dead livestock to remain on their properties. The field team also continues to provide outreach and information to government agencies to ensure they integrate information on condor biology and habitat use into land planning documents.

The field team performs a number of additional types of 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 Group, 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 2013, almost one half (n = 29 of 72) of the Southern California condor population wore GPS transmitters for at least part of the year. This number was lower than in 2012 (n = 31) because two transmitters failed and were not replaced. GPS transmitter data included over 88,000 locations[1].

Condor activity across the landscape based on this subset of California condors spanned approximately 13,500 square miles (the area of a polygon containing all GPS locations). 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).

Condor activity across the landscape increased from 2012 by approximately 3,000 square miles in 2013. A single condor (#513) wearing a GPS transmitter flew hundreds of miles into Inyo and Fresno counties over the course of several days during July. Individual monthly home ranges for condors are

[1] *This includes data generated from four GSM units and subsampled to one location per hour within daylight hours to match Argos GPS unit sampling rate.*

typically bigger during this time (Rivers et al 2014).

The field team observed frequent foraging and roosting in the Northern Tehachapi Mountains, including Tejon Ranch and adjacent lands to the northeast. Exploratory flights of condors wearing GPS transmitters were most common to the Southern Sierra Nevada and Sierra Madre Mountains with one exceptional flight to the Sierra National Forest.

Nesting activity in 2013 occurred primarily on public land with two nests on Bureau of Land Management parcels (one adjacent to Hopper Mountain NWR and one adjacent to Bitter Creek NWR), four nests on Los Padres National Forest, and two nests on private land (Figure 3.1.2).

The field team confirmed 20 non-proffered feeding events in 2013 (Figure 3.1.3), all on private land, and collected carrion items from 10 of these feeding events. Thus far, at least one carrion item has been radiographed and dissected with no metal fragments recovered. The most common types of carrion observed at non-proffered feedings were pig, cow, and deer (Table 3.1.1). This is similar to carrion types from years prior (2008 – 2012) where cow, pig, and deer were also the most common types of carrion found at non-proffered feedings (Table 3.1.1).

Table 3.1.1: Non-proffered feeding events in 2013, 2008-2012, and in total by type of carrion. Non-proffered carrion is any food item that is not provided for condors by the condor field team.

Carrion Type	Current 2013		Years Prior 2008-2012		All Years 2008-2013	
cow	6	30%	48	38%	54	37%
pig	7	35%	46	36%	53	36%
deer	4	20%	15	12%	19	13%
horse	1	5%	7	6%	8	5%
sheep	0	0%	3	2%	3	2%
unknown	1	5%	2	2%	3	2%
coyote	0	0%	2	2%	2	1%
bison	0	0%	2	2%	2	1%
goat	1	5%	0	0%	1	1%
donkey	0	0%	1	1%	1	1%
elk	0	0%	1	1%	1	1%
Total	20		127		147	

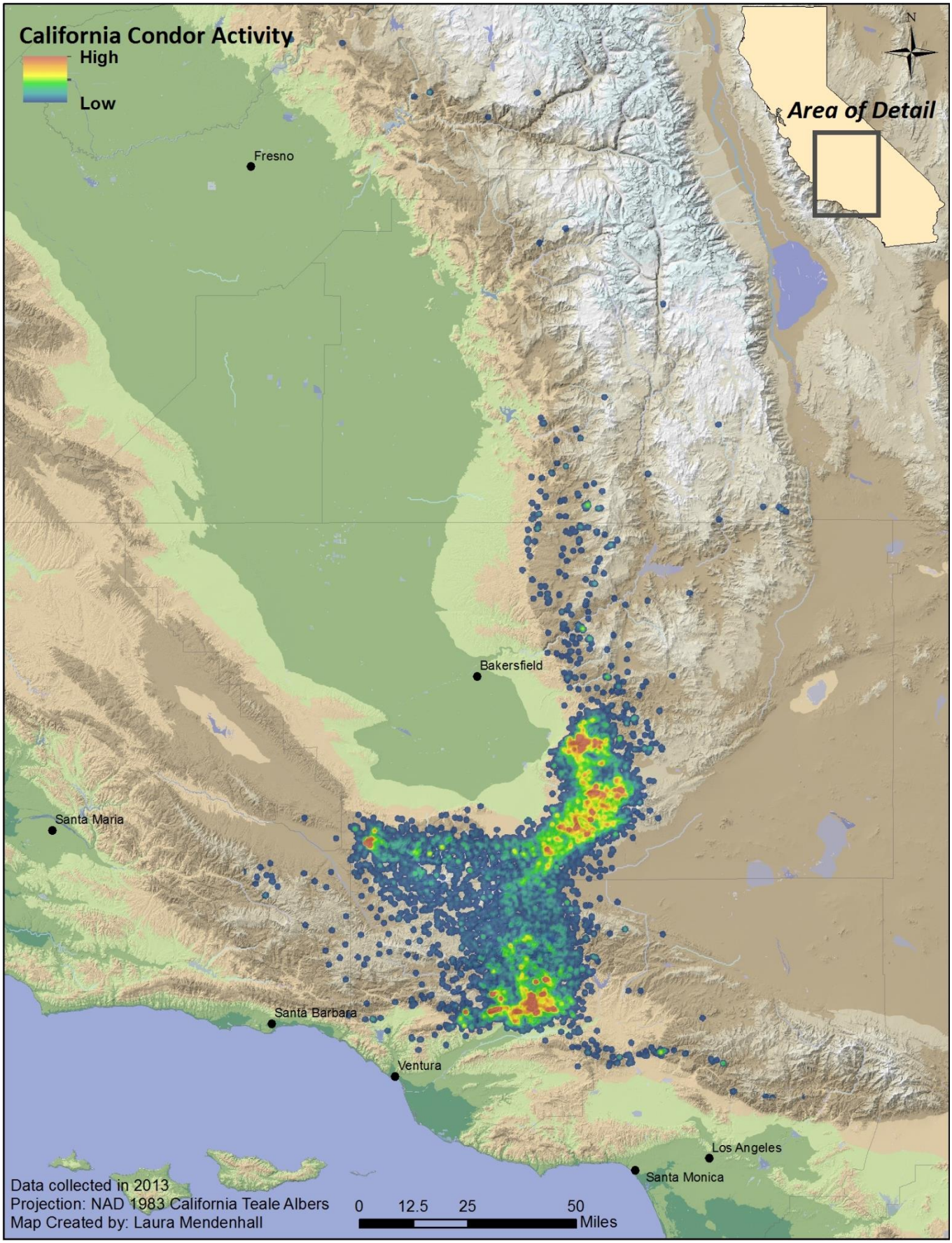


Figure 3.1.1: Condor activity in 2013 estimated using a fixed kernel density estimate (KDE) for all California condors wearing GPS transmitters. KDE averaged across individuals (n=29) using a neighborhood of one kilometer (cell size = 100 meters) and stretched using five standard deviations.

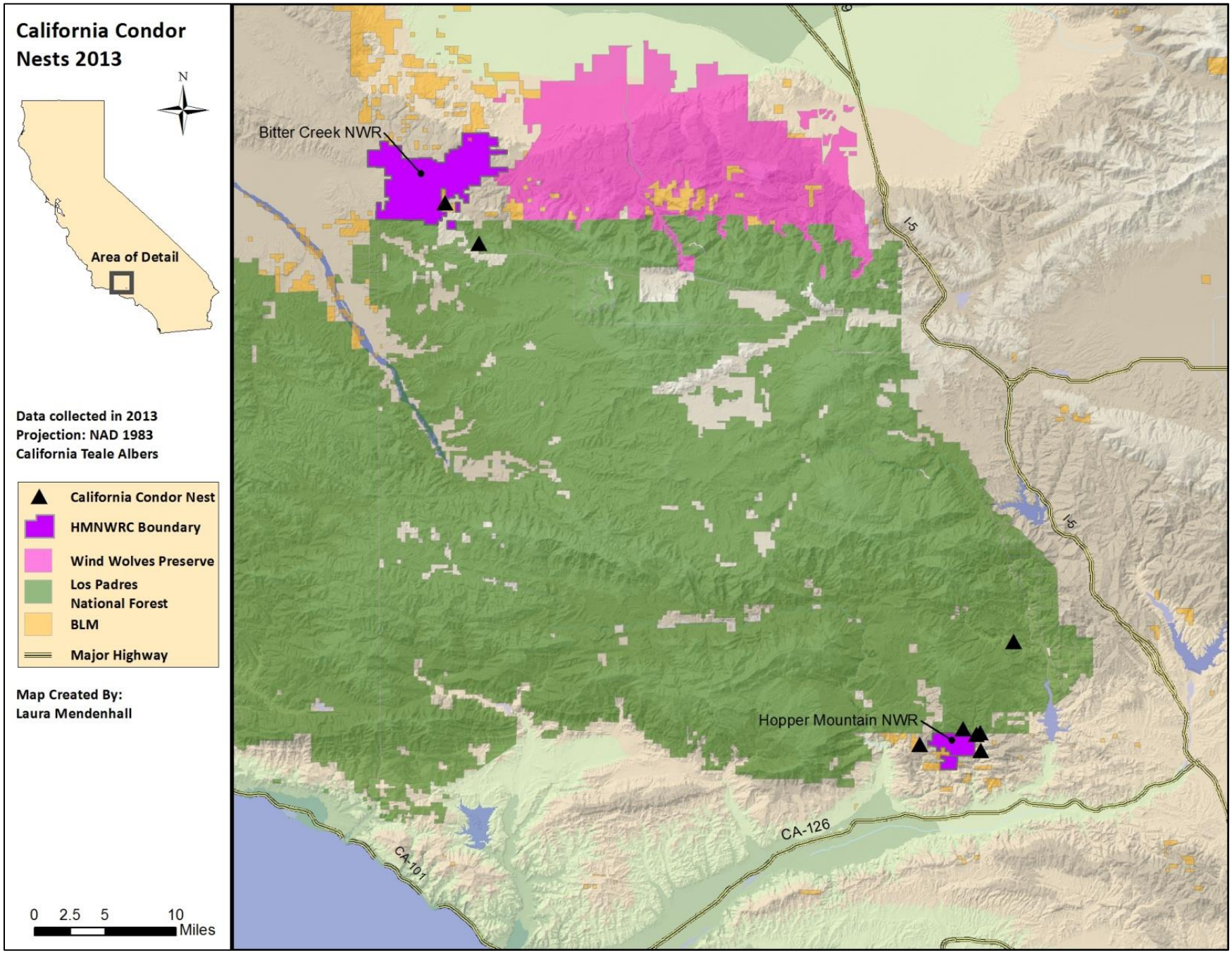


Figure 3.1.2: Locations of condor nests in 2013 (n = seven nests and one extra-pair egg).

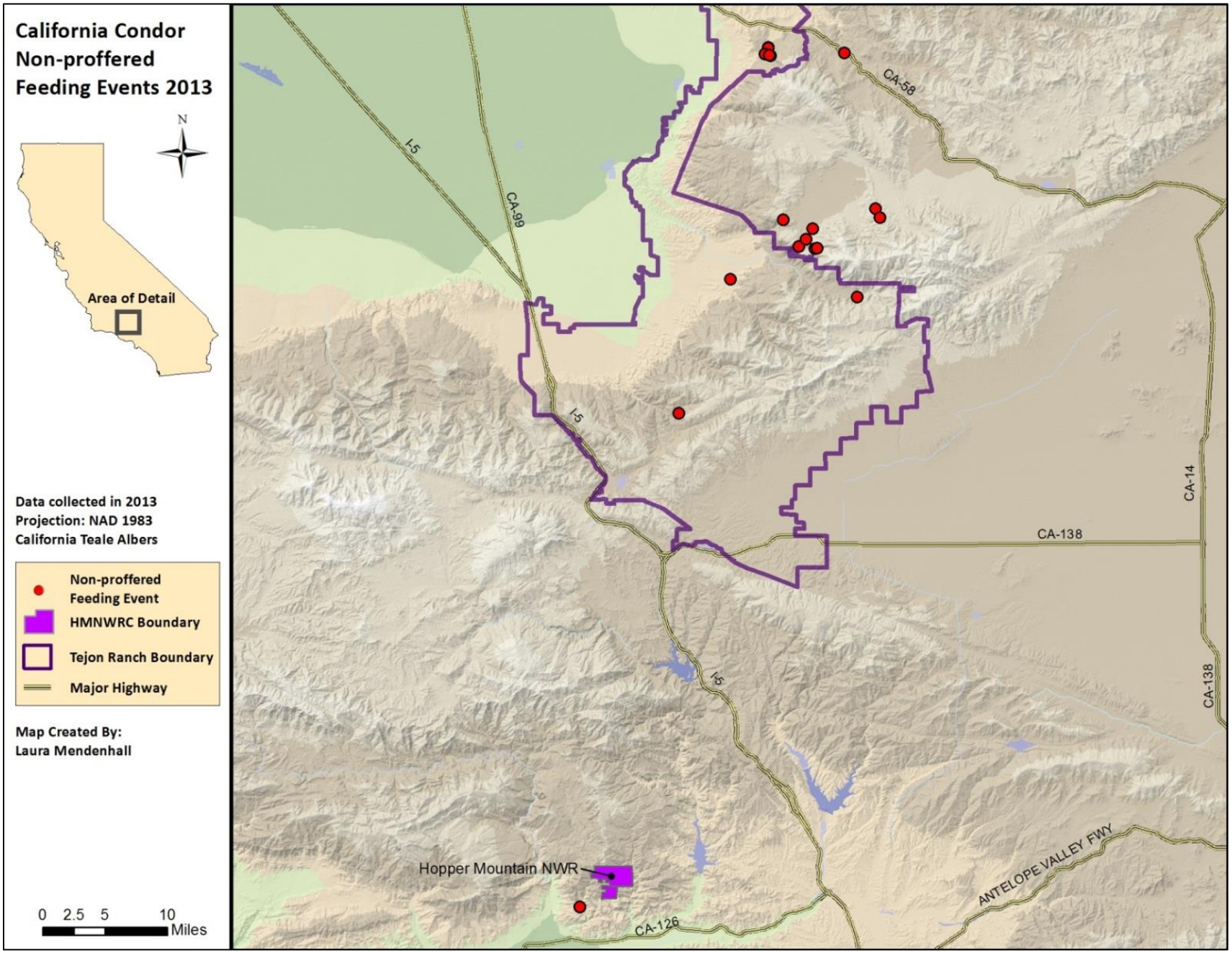


Figure 3.1.3: Locations of confirmed non-proffered feeding events (n=20), all on private land, in 2013. Non-proffered carrion is any food item that is not provided for condors by the condor field team

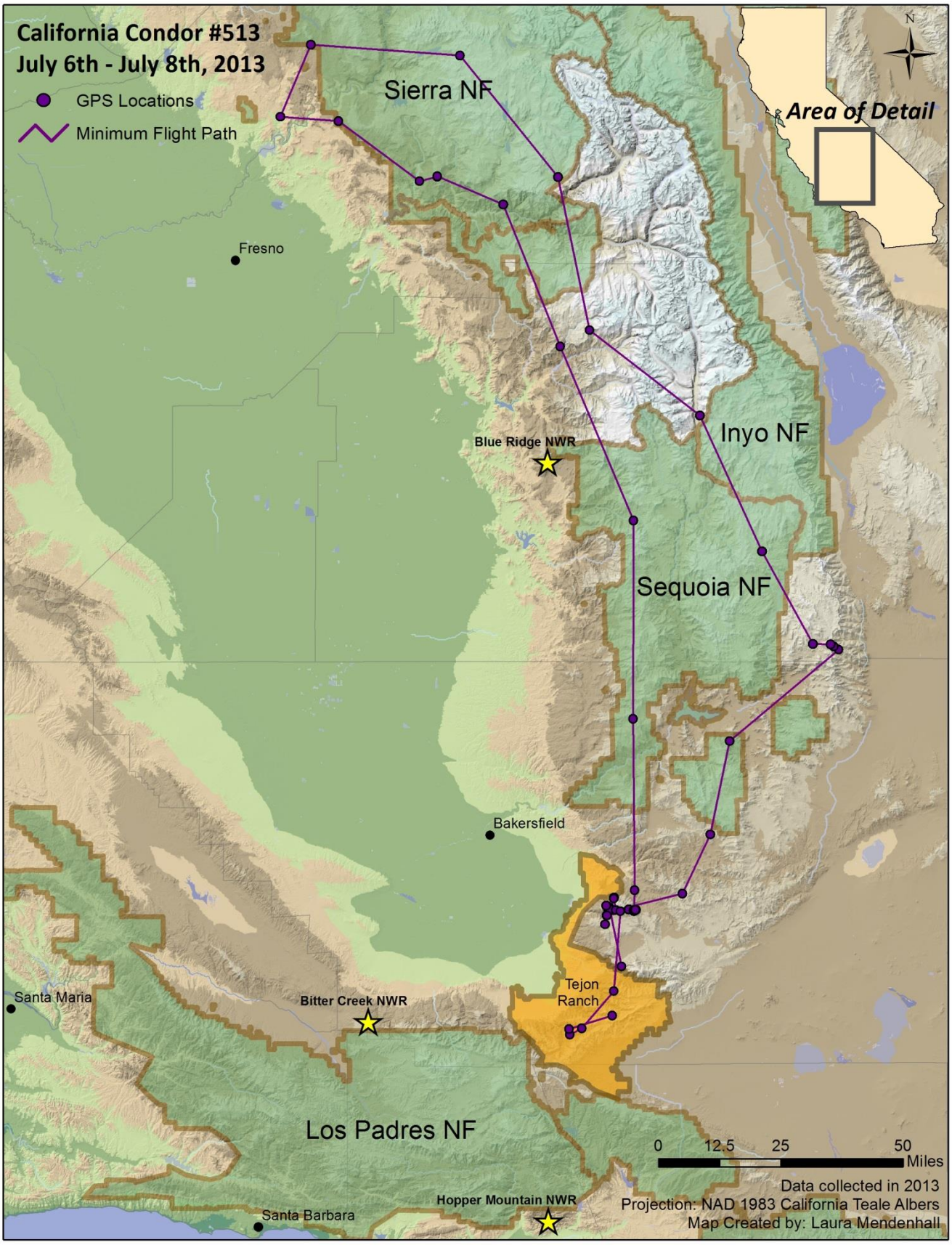


Figure 3.1.4: Exceptional flight by condor #513. This condor flew approximately 74 miles on July 6th and 186 miles on July 7th, roosting in Inyo Country and the Sierra National Forest. At the time, this condor was the furthest north of all condors wearing GPS units across the three California release sites**.**

3.2 Lead Monitoring and Mitigation

The field team trapped 62 out of 67 condors in 2013. This represents the first time since 2008 that every condor in the population was not trapped at least once during the year (Table 3.2.1). In total, the field team handled condors 114 times, not including chicks and pre-release condors. Each trapping season normally lasts two months, June and July in the summer and November and December in the fall, though an exposure event in October prompted the start of fall trapping season one month early, in the beginning of October. Had the field team not been exempted from the government furlough in October this lead exposure event would have gone unmanaged.

Trapping success varied between trapping seasons with a total trapping success rate of 93% for 2013 (Table 3.2.1)

Service biologists and volunteers spent approximately four to five days per week in a blind trapping during each season. 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 two to 10 biologists assisting at each handling event.

The field team transported 25 individual condors to the Los Angeles Zoo for 28 chelation treatments in 2013 (using the treatment threshold of 35 µg/dL on the field test kit). Of the 25 treated condors, three condors #482, #483, and #568 received chelation treatment on two separate occasions. No wild condor chicks received chelation treatment in 2013. The SP13 chick, condor #690, had one elevated lead test during the 150-day nest entry but was not treated due to its age. When compared to previous year's results, the percentage of tests greater than 30 µg/dL was higher, indicating that the level of exposure increased (Figure 3.2.1).

Radiographs detected metal fragments in four condors: condor #482 had multiple tiny metal fragments in its GI tract; condors #206 and #584 had multiple round metallic objects throughout their bodies but not in the GI tract; and condor #428 had 11 small, uniform lead objects in its GI tract (Photo 3.2.1).

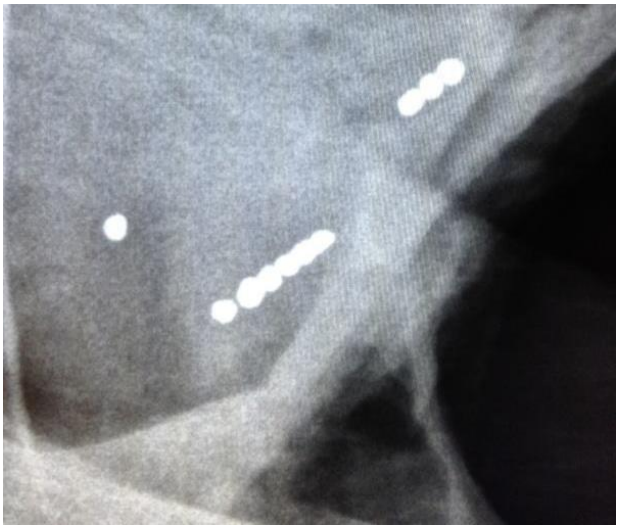


Photo 3.2.1: Radiograph image of condor #428's GI tract. *Photo Credit: Los Angeles Zoo.*

One condor mortality was the result of lead toxicosis in 2013: after becoming very ill, condor #428 died during surgery to remove lead pellets from its GI tract. Condor #289, was treated for severe lead toxicosis after transfer to the Los Angeles Zoo on September 24. She suffered severe weight loss as a result of crop-stasis and was hand fed for several

months before beginning her slow recovery. She reached a low weight of 10.8 lbs. and was not fit for re-release into the wild at the end of 2013.

Using the criteria of greater than or equal to 10 ug/dL for exposure (Cade 2007), 52 condors in the Southern California population had blood lead levels above background levels in 2013. This represents 84% of the population.

Table 3.1.1: Comparison of condors trapped between seasons and in total for 2013. The number of condors to be trapped reflects the number of wild condors in the population that are scheduled to be trapped for each season. Condors that are newly released in the fall are typically not re-trapped during the fall trapping season.

Season	Number of Condors to be trapped	Number of Condors Trapped	Percentage of condors trapped
Summer	67	50	75%
Fall	51	33	65%
2013	67	62	93%

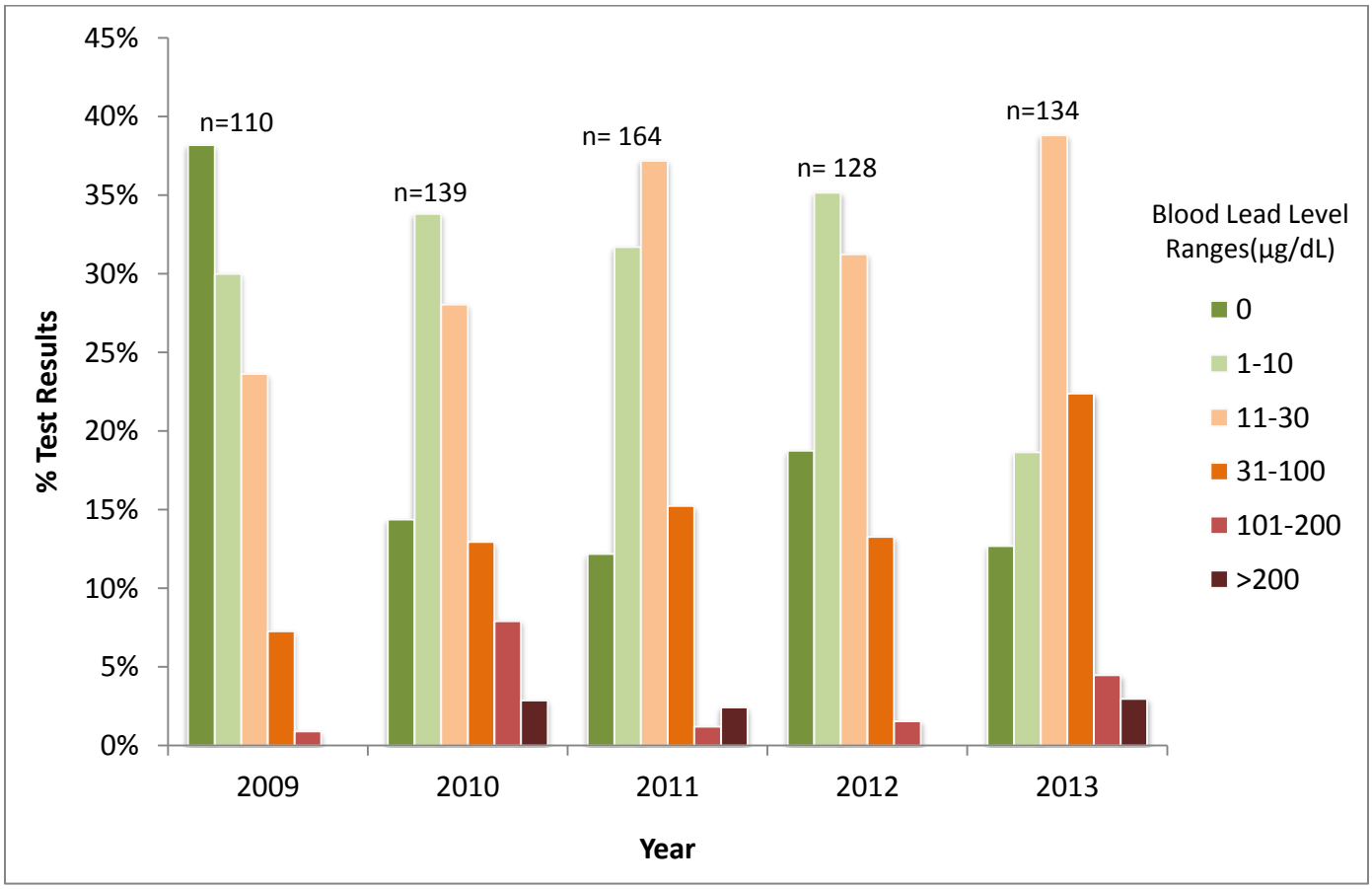


Figure 3.2.1: Summary of blood lead levels in the Southern California population of California condors from 2009-2013. All of the lead values given represent lab blood lead values. Values returned as "not detected" are indicated by zero. Number of tests performed each year represented as "n" for each year.

3.3 Detecting Mortalities

Seven free-flying condors died in Southern California during 2013 (Table 3.3.1). One condor died of lead toxicosis, two condors are missing in the wild and presumed dead, four condors died for reasons related to various types of trauma, and two condors were discovered dead in open-topped water tanks used to supply firefighting helicopters. The field team spent 30 to 40 hours each week attempting to detect the VHF signal of each condor in order to monitor for mortalities.

Juvenile condor #512 was found dead in the Bitter Creek Canyon drainage. Postmortem examination revealed wounds in the skull and neck, vertebral fracture, and spinal canal hemorrhage. Death was caused by trauma from a presumed predator attack, the most likely culprit of which is a golden eagle (Necropsy Report #RP19467).

Male condor #239 and his fledgling, condor #670, went missing in the wild with last detection via VHF signal on June 19, 2013 and August 12, 2013, respectively. Female condor #289, condor #239's mate and condor #670's mother, was transported to the Los Angeles Zoo for chelation treatment due to severe lead toxicosis in September (see: Lead Monitoring and Mitigation section). Without carcasses, the causes of death remain unknown.

Condor #536 died in a dip tank in the community of Stallion Springs (see: Behavioral Modification section) in early September. Condor #630 died in a dip tank in nearby Bear Valley Springs (see: Behavioral Modification section) later that same month. In both cases, the water level was greater than 2.5 feet below the top of the tank and too deep for a condor to stand. A postmortem examination indicated condor #630 became entrapped in the dip tank and subsequently drowned (Necropsy Report #13-000321) (Photo 3.3.1). Drowning was also suspected for condor #536, however, the definitive cause of death could not be determined during the postmortem examination because of extensive decomposition (Necropsy Report #13-000320). The danger that dip tanks pose to condors resulted in the Service working with the local operators of each tank to prevent further condor deaths by keeping the tanks drained when not in use or covered when in use.

Photo 3.3.1: California condor carcass found in dip tank in 2013. *Photo Credit: USFWS.*

Condor #428 was transported to the Los Angeles Zoo in late August for lead toxicosis. Radiographs showed 11 small, round, radio-opaque objects within her GI tract (see: Lead Monitoring and Mitigation Results section). She died during surgery to remove the objects in early September. Subsequent analysis confirmed the pellets were composed of lead (Necropsy Report #13-000309). The proximate cause of death was determined to be lead toxicosis as the removal of the pellets was the impetus behind the surgery and lead was present in the bone and liver in amounts

considered toxic to raptors at the time of death (Necropsy Report #13-000309).

The field team received a report on September 20, 2013 that condor #591 was severely injured on the shoulder of State Route 223 near the Bakersfield National Cemetery Maintenance Facility. The condor died before field team personnel arrived on the scene. Preliminary postmortem examinations revealed considerable trauma including broken bones, muscle and organ tears, and significant bruising along with evidence of ingested metal (Necropsy Report #13-000311). The cause of death was blunt force trauma consistent with impact from a car or truck (Necropsy Report #13-000311).

Condors #689 and #690 were chicks from a wild-laid and captive-laid egg, respectively, that died at their nests. The partially scavenged remains of condor #689 were discovered by a biologist and intern below its nest after a volunteer nest observer noticed its absence during two-hour evening and morning observation periods on consecutive days. The proximate cause of death was a traumatic event, such as an interspecific conflict or a fall from the nest (Necropsy Report #13-000299).

In early November, the field team detected a mortality signal from condor #690's VHF transmitter. This condor was found deceased below its nest cavity by Santa Barbara Zoo staff. Postmortem examination determined the cause of death was trauma associated with sharp force inter/intraspecific conflict with a raptor as the presumed executer of such injuries (Necropsy Report #13-000338).

Table 2.3.1: California condor mortalities in 2013. Seven of these condors were free-flying members of the population; two (#689, #690) were chicks that died before fledgling.

Studbook ID	Sex	Hatch Date	Mortality Date	Cause of Death	Location of Death
239	male	11-Apr-01	19-Jun-13	unknown-missing in the wild	unknown
428	female	26-Mar-07	04-Sep-13	lead toxicosis surgery	Los Angeles Zoo
512	male	16-Apr-09	09-Jan-13	predator trauma	Bitter Creek Canyon
536	female	23-May-09	02-Sep-13	unknown-advanced decomposition	Stallion Springs
591	male	16-Mar-11	20-Sep-13	vehicular collision trauma	SR 223 near Bakersfield National Cemetery
630	female	08-Jun-11	27-Sep-13	drowning/entrapment	Bear Valley Springs
670	female	27-Apr-12	12-Aug-13	unknown-missing in the wild	unknown
689	unknown	16-Apr-13	30-Aug-13	trauma	Los Padres National Forest
690	unknown	17-Apr-13	04-Nov-13	trauma	Private Land near Hopper Mountain NWR

3.4 Nest Management

The 2013 nesting season spanned over 10 months, with nests active from February until November. There were seven active nests during the season, four of which fledged chicks and three of which failed (Table 3.4.1).

The HC13 nesting attempt involved two females, #161 and #156, and a male, #107. While not common, nesting attempts involving trios have been observed since 2001. In this case, each female laid an egg in a separate cavity. The fertile egg of the second female, condor #156 was removed at eight days of age to prevent condor #107 from attempting to incubate both eggs, which would have likely resulted in inadequate incubation of both eggs. Condor #156's egg was artificially incubated at the Los Angeles Zoo until it failed at approximately 30 days of age.

The field team suspected the presence of an eighth nesting attempt for the season between condors #326 and #428. GPS activity suggested failure very early on in the incubation period. However, further evidence suggested that the female, #428, likely did not lay an egg due to a mass thought to be a partially developed egg found inside her body during an unrelated surgical procedure. The supposed nesting attempt was not counted as an official nesting attempt because of this information.

Nest guarding has proven 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 3.3.1: Nesting attempts and outcomes for the 2013 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 are 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	Number of Nest Entries	Nest Fate
AB13	27-Feb	21	192	FW113	12-Feb	no	NA	10-Apr	683	6	Fledged on 29-Aug
HC13	22-Feb	107	161	FW213	14-Feb	yes	LA713	25-Apr	694	7	Fledged on 28-Sep
HC13*	20-Feb	107	156	FW313	19-Feb	no	NA	NA	NA	1	NA
SP13	2-Mar	247	79	FW413	27-Feb	yes	13Sixu1	17-Apr	690	7	Failed on 04-Nov
KR13	2-Mar	125	111	FW513	18-Feb	no	NA	16-Apr	689	6	Failed on 30- Aug
SC13	14-Mar	328	216	FW613	12-Mar	no	NA	NA	NA	2	Failed on 18-Apr
OD13	27-Mar	63	247	FW713	23-Mar	no	NA	19-May	712	6	Fledged on 06-Nov
PC13	3-Apr	237	255	FW913**	03-Apr	no	NA	30-May	717	5	Fledged on 17-Nov

** HC13 was a trio with two females and one male. The second female laid a second egg in a separate cavity. This egg was pulled and brought into captivity but subsequently failed during captive incubation. Both eggs are counted as a single nesting attempt*

*** FW813 was used for a suspected egg from female condor #428 paired with male condor #326. Later evidence collected during a surgical procedure ruled out the likelihood of this unconfirmed egg.*

In 2013, each nest was monitored over the course of the season using direct observation and periodic nest entries. Nest cameras were used for monitoring three of the nests. One nest camera was installed the previous year and two additional cameras were installed in 2013.

Nests were directly observed for a total of 993 hours taking place over 297 observer days. Observations of DG12 and RC12 were less frequent due to their remote locations. Unpaid volunteer nest observer hours accounted for a quarter of all observation hours (Table 3.4.2). Each week observers spent two to three days reviewing nest camera footage. In total 125 days were spent reviewing nest camera footage. In that period 5,738 hours of nest camera footage was reviewed.

Nest cameras allow observers to review 14 hours of nesting activity for every hour of watching nests directly because of the ability to speed up the video during times of inactivity. Nest cameras record during all or most of the daylight hours, which allows them to capture infrequent events that are often missed by less comprehensive direct observations. The level of detail is also greatly increased because of the proximity of the camera to the egg, chick, and/or parents.

The field team performed 40 nest entries over the course of the year. Each entry required two to four personnel for eight to 12 hours. Los Angeles Zoo staff provided assistance on 12 of these nest entries.

The field team attempted five interventions on four nests in 2013. Four of these attempts were successful. Three interventions took place during the egg stage. Two eggs were found to be nonviable during routine nest entries. Both of these eggs were replaced first with dummy eggs and later with two viable eggs from captivity. Captive egg LA713, from the Los Angeles Zoo was used in the HC13 nest. Captive egg 13Sixu1, from the World Center for Birds of Prey in Boise, Idaho was used in the SP13 nest. The eggs were first transported to the Los Angeles Zoo prior to placement into the wild nests. A third intervention was attempted during the egg stage after a raven predated the egg of SC13. The field team responded by placing a dummy egg into the nest which the male, condor #328, began to incubate. Shortly after resuming incubation, however, condor #328 knocked the dummy egg out of the shallow cavity while trying to defend his nest from ravens.

Table 3.4.2: Nest observation hours by personnel type.

Personnel Type	Observation Hours
Service Staff	36
Santa Barbara Zoo Staff	62
Volunteer Interns	294
Unpaid Volunteers	601
Total Observation Hours	993

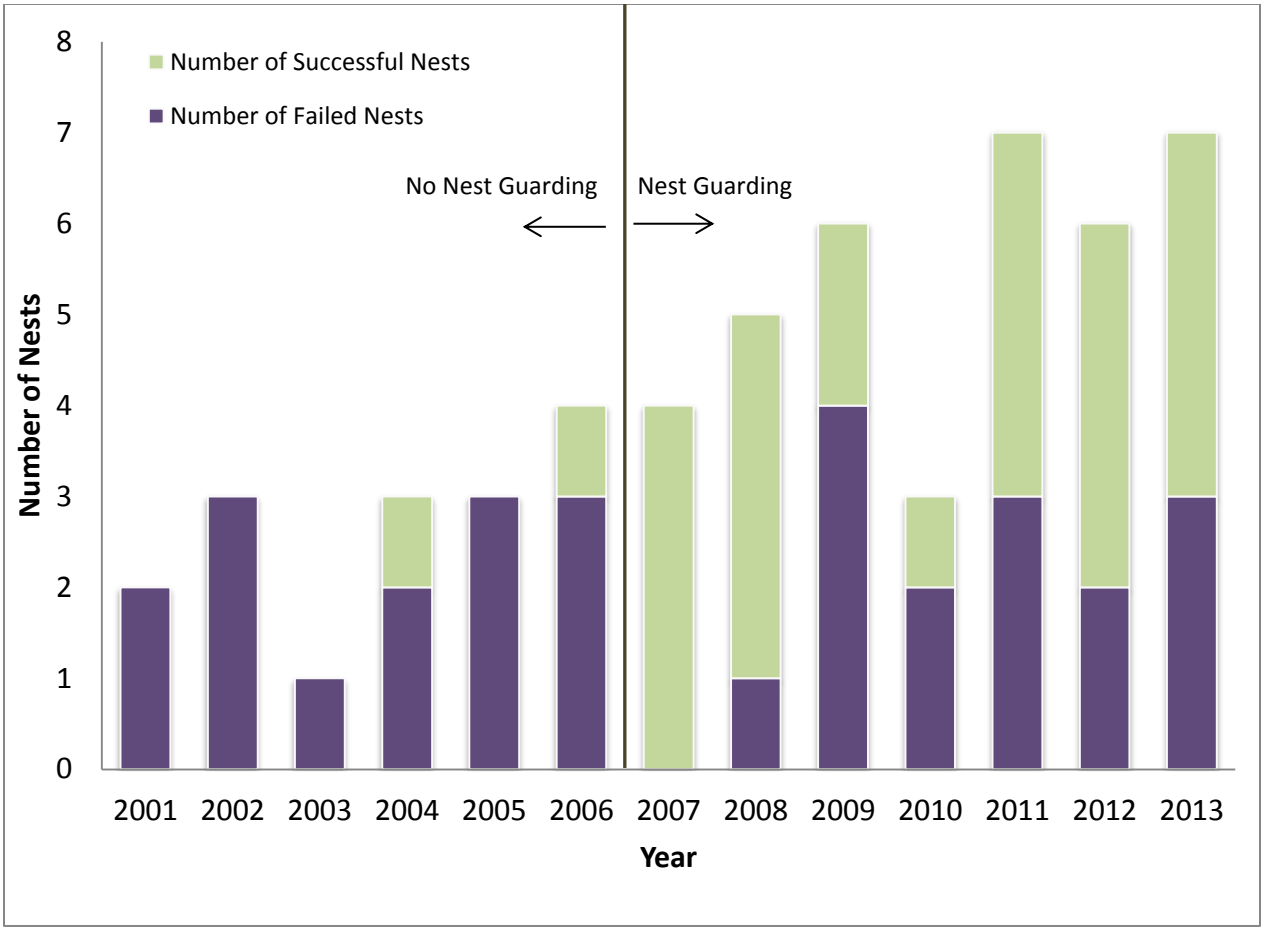


Figure 3.4.1: Nesting success before and after implementation of Nest Guarding Program.

Two interventions took place during the chick stage when chicks were found to be in need of medical attention. Condor chick #690, at the SP13 nest, sustained a leg injury while in the nest and condor chick #689, at the KR13 nest, suffered a trash impaction that affected its development (Photo 3.4.1). Both chicks were temporarily evacuated from their nests and treated at the Los Angeles Zoo Health Center. After their respective exams and treatment, both chicks spent the night at the Los Angeles Zoo and were returned to the nests within 23 hours. A helicopter facilitated transport of the chicks directly to and from their respective nests for this temporary evacuation.

In addition to interventions, a number of preventative measures were also taken at nests. Biologists removed a viable egg from the nest of a first time pair (#63 and # 147) and temporarily replaced it with a dummy egg because of raven activity around the cavity. The egg was returned once it had externally pipped and hatched in the wild without any complications. At 30, 60, and 120 days of age, biologists vaccinated chicks for West Nile virus. The substrate of each nest was sifted for microtrash, which was found in six of the seven nests in 2013.

The amount of microtrash found in nests can be compared across years to help determine the degree to which microtrash collection continues to be a problem (Table 3.4.3)

Photo 3.4.1: Trash removed from KR13 condor chick #689 following evacuation. *Photo Credit: Los Angeles Zoo.*

Table 3.4.3: Microtrash recovered from nests during 2002-2013 seasons. Values represent the total number of trash items collected from each nest or associated chick each year (*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	2013
AB	-	-	143	321	1*	233	-	60	-	3*	-	167
DG	-	-	-	-	-	38	-	52	32*	-	31	-
HB/SP	-	-	-	-	-	-	0	?*	-	10	1	31
HC	20	-	?	-	46	19	26	103	-	55	-	55
HW	86	-	-	-	-	-	-	-	-	-	-	-
HW/3C	-	-	-	-	-	-	322	12*	-	-	-	-
KR	0	44	53	41	-	43	11	10*	26	3	9*	153
LC-PC	53	-	-	-	-	-	-	-	-	-	-	-
LP	-	-	-	5*	-	-	-	-	-	-	-	-
OD	-	-	-	-	-	-	-	-	-	-	-	0
PC[1]	-	-	-	-	48	-	115	-	-	-	-	-
PC[2]	-	-	-	-	-	-	-	-	-	32	-	51
SC	-	-	-	-	-	-	-	-	-	21	1*	3*
GF	-	-	-	-	-	-	-	-	-	0*	-	-
RC	-	-	-	-	-	-	-	-	-	-	3	-
TC	-	-	-	-	-	-	-	-	-	-	71	-
Average	40	44	98	184	48	95	95	72	26	24	27	76

3.5 Captive Releases and Transfers

In 2013, the field team released six California condors during the months of October, November, and December with two condors released each month (Table 3.5.1).

Releases were delayed due to the government furlough that took place in October. Prior to release, these condors were held in the flight pen at Bitter Creek NWR.

The pre-release condors from San Diego Safari Park were transferred to the Refuge in April while the pre-release condors from the World Center for Birds of Prey and Oregon Zoo were transferred to the Refuge in August. The Final pre-release condor was transferred from the Los Angeles Zoo in October. All pre-release condors spent a minimum of six weeks in the flight pen prior to release.

During the 8.5 months pre-release condors were housed in the flight pen, the field team checked on their health daily and conducted additional, intensive four-hour observations two to four days a week. While held in captivity, these condors were given regular fresh food and water, which necessitated at least one person on duty daily at the Refuge. Releases required an average of two personnel daily, per week, from October 23 to December 11. The field team 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).

Wild reproduction, mortalities and captive releases for 2013 netted a four percent increase to the Southern California population (Figure 3.5.1).

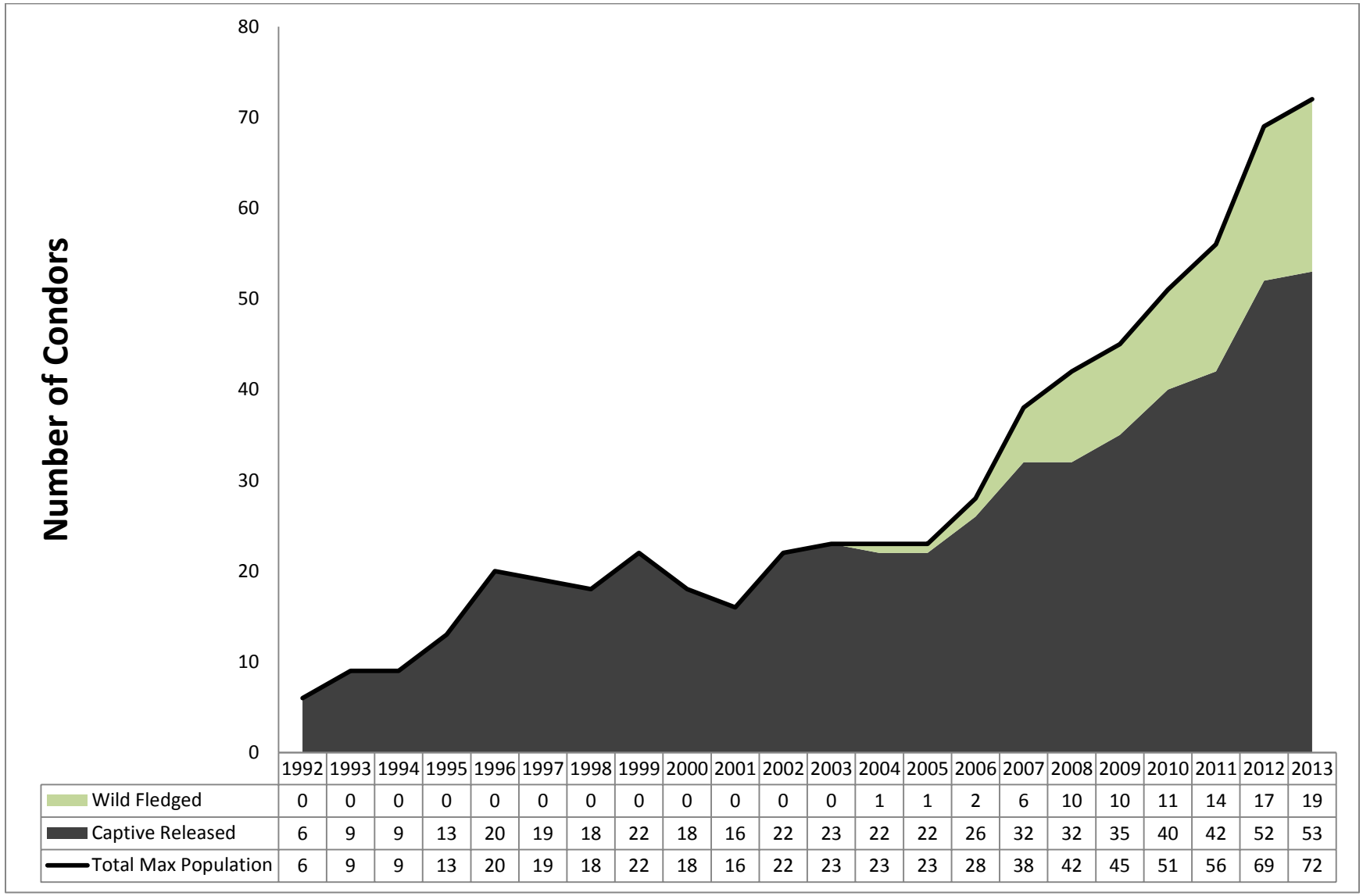
A number of condors from the Southern California population were also trapped and held for extended periods. A group of sub adult condors were trapped as a means to reduce undesirable behavior at the Bear Valley Springs community in the spring of 2013 (see: Behavioral Modification section) and held in the Bitter Creek Flight Pen until the fall of 2013. Condor #289 was trapped in September of 2013 and held at the Los Angeles Zoo through the end of the year due to extreme lead toxicosis (see: Lead Monitoring and Mitigation section).

Table 3.5.1: Captive releases in 2013. SB# = Studbook #; SDZSP=San Diego Zoo Safari Park; WCBP=World Center for Birds of Prey; NA=not applicable. A successful fate indicates that the released condor was alive and remained in the wild population without having to be recaptured for 90 days following its initial release.

SB#	Sex	Hatch date	Hatch location	Transfer date	Release date	Fate	Age at Release (in years)
628	female	2-Jun-11	WCBP	21-Aug-13	20-Nov-13	Successful	2.5
632	female	21-Jun-11	LAZ	30-Oct-13	11-Dec-13	Successful	2.5
636	male	10-Mar-12	SDSP	11-Apr-13	20-Nov-13	Successful	1.7
637	male	15-Mar-12	SDSP	11-Apr-13	23-Oct-13	Successful	1.6
642	female	30-Mar-12	ORZ	21-Aug-13	11-Dec-13	Successful	1.7
643	male	2-Apr-12	SDSP	11-Apr-13	23-Oct-13	Successful	1.6

Table 3.5.2: Captive release efforts in 2013. BCNWR = Bitter Creek NWR.

	January	February	March	April	May	June	July	August	September	October	November	December
Number of condors released at BCNWR	0	0	0	0	0	0	0	0	0	2	2	2
Approximate staff hours tracking new releases	0	0	0	0	0	0	0	0	0	300	600	600
Total number of calf carcasses provided	24	20	21	15	17	10	13	11	15	17	16	18



	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Wild Fledged	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	6	10	10	11	14	17	19
Captive Released	6	9	9	13	20	19	18	22	18	16	22	23	22	22	26	32	32	35	40	42	52	53
Total Max Population	6	9	9	13	20	19	18	22	18	16	22	23	23	23	28	38	42	45	51	56	69	72

Figure 3.5.1: Number of wild California condors from 1992 through 2013. Annual populations are the maximum number of condors in the population each year.

3.6 Behavioral Modification

In 2013, condors visited eight areas of human development. Of these, the most frequented areas were the communities of Bear Valley Springs (BVS), Stallion Springs, and Alpine Forest Park in the Northern Tehachapi Mountains and an oil pad near Lake Piru (Figure 3.6.1).

Nine condors showed persistent and/or harmful undesirable behavior warranting a "time-out" period in captivity. Condors #493, #518, #542, #560, #570, #585, #599, #616, and #648 were trapped during the summer and released back into the wild in the fall and early winter after a "time-out" period of several months. Condor #493 remained in captivity the longest due to the severity of her undesirable behaviors, which included approaching residents and not responding to repeated hazing.

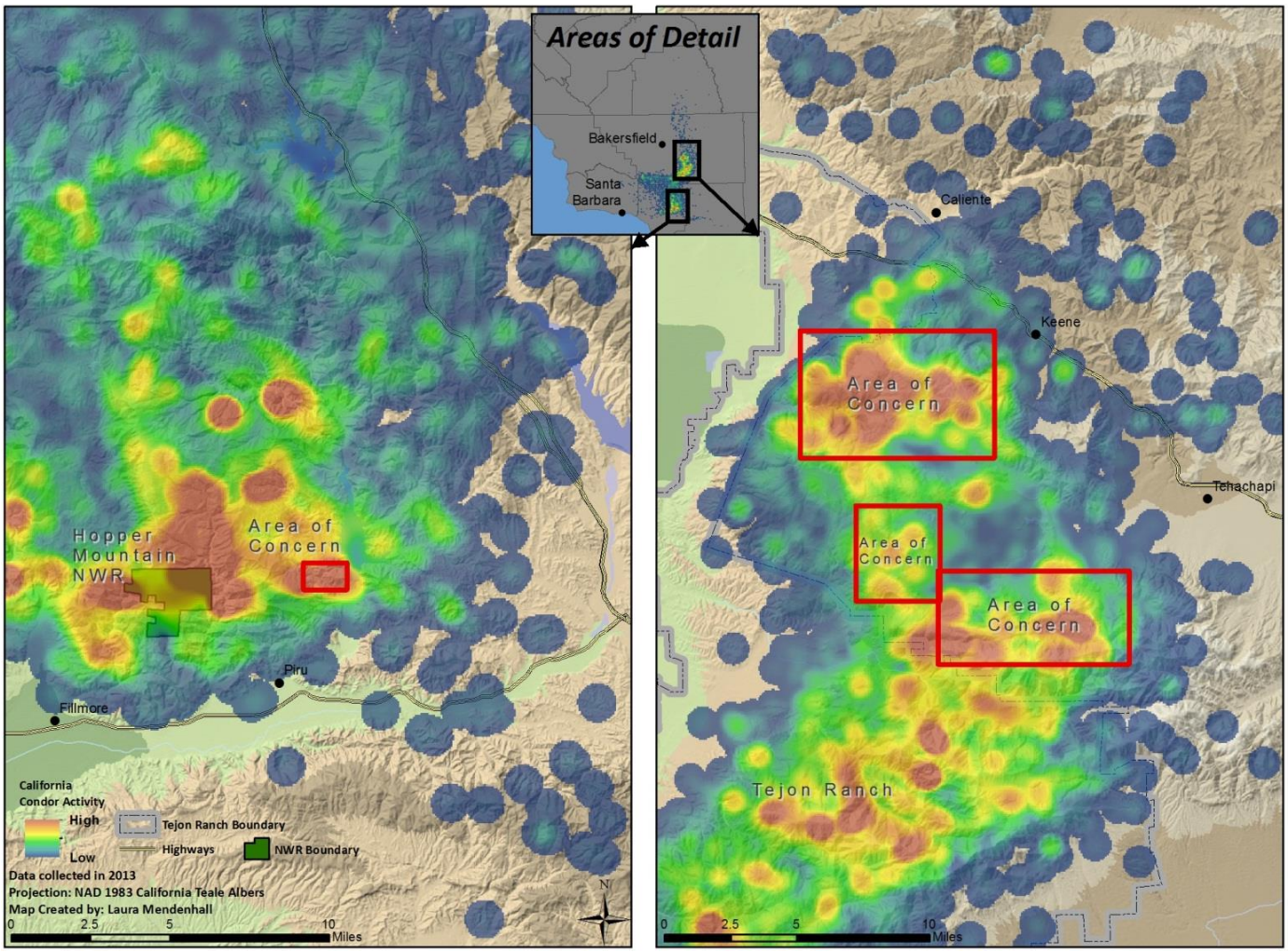


Figure 3.6.1: Condor activity in areas of greatest concern in 2013. The left panel shows the oil pad near Lake Piru. The right panel shows the communities in the Northern Tehachapi Mountains (counterclockwise from top: Bear Valley Springs, Stallion Springs, and Alpine Forest Park). Relative condor activity estimated using a fixed kernel density estimate (KDE) for all California condor wearing GPS transmitters. KDE averaged across individuals (n=29) using a neighborhood of one kilometer (cell size = 100 meters) and stretched using five standard deviations.

Condors visited the other four developed areas, a private inholding on Winter's Ridge of Tejon Ranch, Cazador Cabin on Tejon Ranch, ITT Towers on the Angeles National Forest, and a church, Rancho de la Cruz, near Bitter Creek NWR, much less frequently.

After the residential communities in the Northern Tehachapi Mountains and the oil pad near Lake Piru, the private inholding on Tejon Ranch had the highest number of associated GPS transmitter locations with condor visits occurring often between late July and early August. Five condors wearing GPS transmitters visited Cazador Cabin on Tejon Ranch in January, March, and December. Three condors wearing GPS transmitters visited ITT in June and July. Rancho de la Cruz experienced a substantial drop in condor activity from last year with only one condor wearing a GPS transmitter visiting in late March.

The three Northern Tehachapi Mountains communities required the greatest amount of field team hours as they necessitated near daily monitoring. The field team spent 40 to 100 hours each week, from May to late September, monitoring and hazing condors from private homes in the communities, educating residents, and providing both technical and direct assistance with automated hazing devices (e.g., motion-activated sprinklers) and other deterrents. This level of coverage required numerous trips per week from the Complex's Ventura office, Bitter Creek NWR, or Hopper Mountain NWR. Each round trip required four to six hours of driving.

The field team, in cooperation with the Friends Group, used outreach and education as the primary means of addressing behavioral modification in the Northern Tehachapi Mountains communities. Educational flyers were posted at the BVS Police Department, Post Office, and Bear Valley Market and distributed via the BVS Community Services District website, community newsletter, and residents' mailboxes. The field team also fielded questions from concerned residents via regular phone calls and emails.

The Service held a meeting with the BVS Police Department, Community Services District, and Homeowners' Association, along with the Friends Group to develop a long-term community based solution which is still in development as of 2014 (Photo 3.6.1).

Photo 3.6.1: The Service and Bear Valley Springs hold a meeting in July of 2013. *Photo credit: Josh Felch, USFWS*

Two additional outreach events targeted BVS residents including a 4th of July educational booth and a public presentation at a town council meeting.

Reports and observations of condors perching on power poles in BVS prompted the Service to contact Southern California Edison (SCE) about possible electrocution of condors in the area. SCE scheduled a site assessment using information provided by the Service and determined retrofitting the power poles with covers would minimize the possibility of electrocution. This project was nearing completion by the end of 2013.

3.7 Outreach

The field team educated the public during a variety of events and presentations in 2013. Presentations to the San Fernando Valley and Kern County Audubon Societies and a California State University Channel Islands ecology class described condor conservation in detail (Table 3.7.1) (Photo 3.7.1).

Photo 3.7.1: Biological Science Technician Devon Pryor with a California State University, Channel Islands ecology class. *Photo credit: Devon Pryor, USFWS*

Ten events co-hosted with the Friends Group reached over 200 people. These events targeted local members of the public in an effort to foster condor conservation and included tours of Bitter Creek NWR for a group from the Morro Bay Winter Bird Festival, a U.C. Santa Barbara professor and students, a teacher and students from the Sierra School, and board members from the National Wildlife Refuge Association (Table 3.7.2). Other Friends Group events included a presentation at the California Living Museum and an outreach booth at the Bear Valley Springs 4th of July Celebration. Biologists responded to media interviews about various aspects of condor conservation with KGET NBC17 of Bakersfield, CNN News, Santa Barbara Zoo, and Al Jazeera America

The Facebook page launched in 2012 in cooperation with the Santa Barbara Zoo called "The Condor Cave" increased its following by 334% to 1,006 followers at the end of 2013.

The increase of condor activity in the Northern Tehachapi Mountains necessitated several outreach events during 2013 (see: Behavioral Modification section).

The Complex was featured in a documentary film titled "The Condor's Shadow" which debuted in January 2013. The documentary follows the efforts of the California Condor Recovery Program, focusing on the story of a breeding pair, condors #79 and #247, and their chick, condor #599. The documentary screened in numerous locations and aired on the Public Broadcasting Service (PBS) in 2013, reaching thousands of people.

Intra-agency outreach and presentations to partner programs also spread awareness of condor conservation in 2013. Two field team members wrote articles for U.S. Fish and Wildlife Service Field Notes. One article, written by a volunteer intern, documented the removal of an egg from a nest and the other article, written by a staff person, described a high school classroom's visit to Bitter Creek NWR for a tour and condor handling observation (Photo 3.7.2).

Photo 3.7.2: Biological technician Devon Lang Pryor giving a presentation to the Santa Monica Crossroads School for the Arts and Sciences at Bitter Creek in April of 2013. *Photo credit: Devon Lang Pryor, USFWS*.

Table 3.7.1: Outreach presentations given in 2013.

Description	Location	Date	# of Attendees
Biological science technician Josh Felch presented on California condors to the San Fernando Valley Audubon Society	San Fernando Valley	28-Feb-13	35
Biological science technician Devon Pryor presented on California condors to a university ecology class	California State University Channel Islands	5-Apr-13	30
Supervisory wildlife biologist Joseph Brandt presented on California condors to the Kern County Audubon Society	Bakersfield, CA	3-Sep-13	30
Wildlife biologist Geoff Grisdale and biological science technician Devon Pryor attended a Connecting People with Nature event with the Ojai Raptor Center at a local middle school	Rio Vista Middle School Oxnard, CA	12-Nov-13	45

Table 3.7.2: Outreach tours performed in 2013. BCNWR=Bitter Creek NWR; HMNWR=Hopper Mountain NWR; UCSB=University of California Santa Barbara.

Description	Location	Date	# of Attendees
Supervisory wildlife biologist Joseph Brandt conducted a tour of HMNWR with the Friends Group for UCSB students	Hopper Mountain NWR	29-Mar-13	13
Biological science technician Devon Pryor conducts tour to a class of students from Wind Wolves Preserve	Bitter Creek NWR	26-Apr-13	28
Supervisory wildlife biologist Joseph Brandt and biological science technical Devon Pryor conduct tour of HMNWR with USFWS Ecological Services office to The Sierra School	Hopper Mountain NWR	30-May-13	20
National Wildlife Refuge Association toured BCNWR and observed a condor handling event	Bitter Creek NWR	1-Jun-13	15
Supervisory wildlife biologist Joseph Brandt and Intern Richard Wilks assist with a Friends Group tour at HMNWR	Hopper Mountain NWR	28-Jun-13	20
Biological science technician Josh Felch assist with Friengs Group tour at BCNWR	Bitter Creek NWR	26-Jul-13	20

4.0 Discussion

Consequences of the Government Shutdown

From October 1, 2013 through October 17, 2013, the majority of federal employees were furloughed due to a lapse in appropriations. This included the vast majority of those employed by the Service.

The five Service employees on the condor field team were exempted from the furlough in order to care for the six condors held at the Bitter Creek NWR flight pen and to respond to condor related emergencies.

During the furlough only these employees were allowed to assist with condor management activities in the Southern CA region. The four volunteer interns, staff from the Santa Barbara Zoo, and all other volunteers were not permitted to assist the Service and the refuges were closed except to exempted employees.

The result of this limited staffing meant that all normal activities other than the aforementioned husbandry of captive condors were suspended. This delayed the fall release of captive reared condors into the wild. A refuge tour at Bitter Creek NWR offered by the Friends Group was also canceled.

The most significant event that occurred during the furlough was a condor related emergency in the form of a lead exposure event. Prior to the furlough on September 23, 2013, a volunteer intern observed condor #289 falling off the top of the flight pen to the ground where she then appeared to have poor motor control. This condor was trapped that day and found to have severe clinical lead toxicosis. Another condor, #591, was struck by a car and died while feeding on a road-killed feral hog on September 20, 2013. The carcass for this condor was recovered and sent to the Wildlife Forensics lab in Ashland, OR. The necropsy for #591 revealed metal fragments within the body that were consistent with lead ammunition. Suspecting that other condors in the population might also have been exposed to lead, the condor field team began trapping other condors just as the furlough began. Twenty-five of these condors were trapped during the furlough and 17 were treated for lead toxicosis. Fortunately, the exempted employees were able to trap these condors and transport them to the Los Angeles Zoo for treatment.

Monitoring Resource Use

With the completion of the U.C. Davis study on lead contamination and the termination of the Cooperative Endangered Species Conservation Funding (16 USC § 1536) in early 2013, the field team no longer had the assistance of the junior conservation specialist whose primary focus was ground-truthing non-proffered feeding events. The loss of this position in addition to increased constraints on field team resources meant less time allotted for ground-truthing suspected feeding

events in 2013. Time and resources allotted to ground-truthing in 2014 is expected to remain the same.

Towards the end of 2013, the field team deployed four GSM (Global System for Mobile Communications) transmitters (GSM; Microwave Telemetry, Inc. ©, Columbia, Maryland; GSM; Cellular Tracking Technologies, LLC, Somerset, Pennsylvania). This technology uses cellular towers to transmit GPS data and enables the collection of locations at frequencies up to every 30 seconds. Access to this higher resolution spatial data has the potential to allow researchers to elucidate further the relationship between condors and their habitat.

Lead Monitoring and Mitigation

The results of blood lead tests in 2013 indicate similar but slightly higher rates of lead exposure for the condor population. This may be the result of normal variation from year to year. The slight increase in lead exposure could also be due to an increased amount of foraging activity on non-proffered carrion. Non-proffered carrion has a much higher chance of being contaminated with lead than supplemental food and an increased reliance on this type of food source could increase the possibility of lead exposures.

The inability of the field team to trap the entire free-flying condor population in 2013 may have affected the ability to monitor exposure rates and treat lead-exposed condors. This trend could continue as condors spend more time away from trap sites. The field team might increase their trapping success by installing a new trap site in the Tehachapi Mountains, a location proximal to where the condors have been spending more time.

Two condors, #206 and #584, had multiple round metallic objects throughout their bodies but not in the GI tract, which is evidence that these birds were shot. In the past condors have been shot and killed (Rideout et al. 2012) while others have survived shooting injuries (Finkelstein et al. 2014). These finding demonstrate that shooting still remains a threat for condors.

Detecting Mortalities

Identifying and understanding causes of mortality is a critical component of condor recovery. The inability of the field team to trap the entire free-flying condor population in 2013 has direct implications for detecting mortalities. The maintenance of VHF and/or GPS transmitters on each condor is essential to the task of finding and recovering dead condors and cannot occur without the regular trapping of the entire population.

Behavioral Modification

The removal of a condor demonstrating undesirable behavior from the wild for a "time out" period in captivity is not a new course of action in condor recovery. However, the removal of nine condors for a "time out" period in 2013 represents the largest number of condors temporarily returned to captivity in Condor Recovery Program history.

Each of these condors exhibited Type II undesirable behavior (Cade et al. 2004) (Photo 4.0.1.).

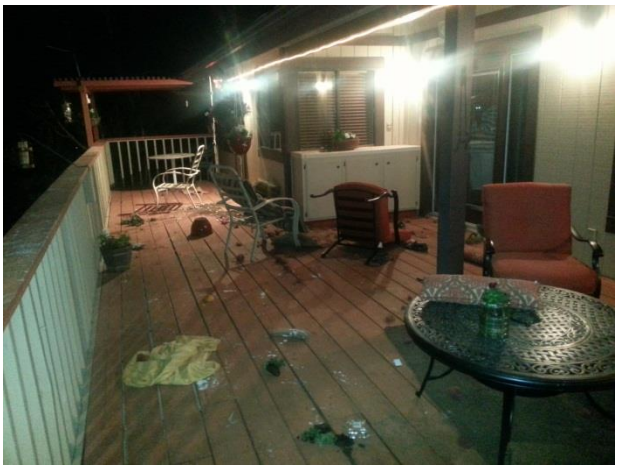


Photo 4.0.1: Example of California condor damage to a house. *Photo credit: Bear Valley Springs resident.*

Condor #493 showed the most severe case of habituation and was held in captivity longer as a result. Following their capture and subsequent release, undesirable behavior decreased sharply in the areas of concern. This may relate more to seasonal movements of the population and less to the "time out" period in captivity, however.

Outreach

Assembly Bill No. 711 was signed into law in 2013. This bill will require the use of nonlead ammunition for the taking of all wildlife in California. The field team sees the five-year implementation period of this bill as an opportunity to coordinate with partner organizations in lead-free outreach.

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Appendix I Contributions to Ongoing Research

Data collected over the course of 2013 will contribute to ongoing research within the Service, various universities, and other federal agencies. Examples of this ongoing research include:

Species Tracking Optimization: Pilot Test of an Improved Capture and Delivery of California Condor Location Information
Years: 2013-2014

Study Objective: Alternatives for monitoring wildlife populations now exist that can significantly improve wildlife monitoring and management. Projects have the potential to track and alert in near real time wildlife mortality, track sick or injured wildlife, implement location-aware alerts (termed geofencing), and enable users to access these data though traditional desktop computing and mobile environments (e.g. smartphones). This proposal is investigating new and emerging technologies that will improve condor science and management.

Principle Researchers: David Douglas, Robert Waltermire, Tim Kern, and Chris Emmerich from USGS; Gil Bohrer, Rolf Weinzerl, and Sarah Davidson from Movebank.org; Richard Kearney, Pat Lineback, Joseph Brandt, and Laura Mendenhall from USFWS; Andrew McGann from Cellular Tracking Technologies, LLC.

Sponsor: U.S. Fish and Wildlife Service, U.S. Geological Survey, Movebank.org

Funding Source: Science Support Partnership Fund

Results to Date: Development of a new GPS data model; manufacture of a custom GSM unit, progress on establishing a condor daily map using data from FISMA-compliant repository.

Anticipated Completion: September 2014

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.

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
2012 HMNWRC California Condor Recovery Program Annual Report 35

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

Funding Source: Montrose Settlement Restoration Funds

Results to date: Pending

Anticipated Completion: 2013

Eggshell thinning and depressed hatching success of California condors reintroduced to Central California.
Years: 2006-2014

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); Burnett, L. Joseph, Kelly J. Sorenson, Joseph Brandt, Estelle A. Sandhaus, Deborah Ciani, Michael Clark, Chandra David, Jenny Schmidt, Susie Kasielke, and Robert W. Risebrough. 2013. Eggshell Thinning and Depressed Hatching Success of California Condors Reintroduced to Central California The Condor 115 (3), 477-491

Anticipated Completion: 2012

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

Potential Implications of Puma (Puma concolor) specializing on California Condors (Gymnogyps californianus)
Years: 2013-2014

Study Objective: To elucidate the implications of a predator species specializing on a slow-reproducing, highly endangered species.

Principal Researchers: Marc Kenyon, Joseph Brandt, Carie Battistone, Josh Felch

Sponsors: USFWS, CDFW

Funding Source: USFWS, CDFW

Results to date: Pending

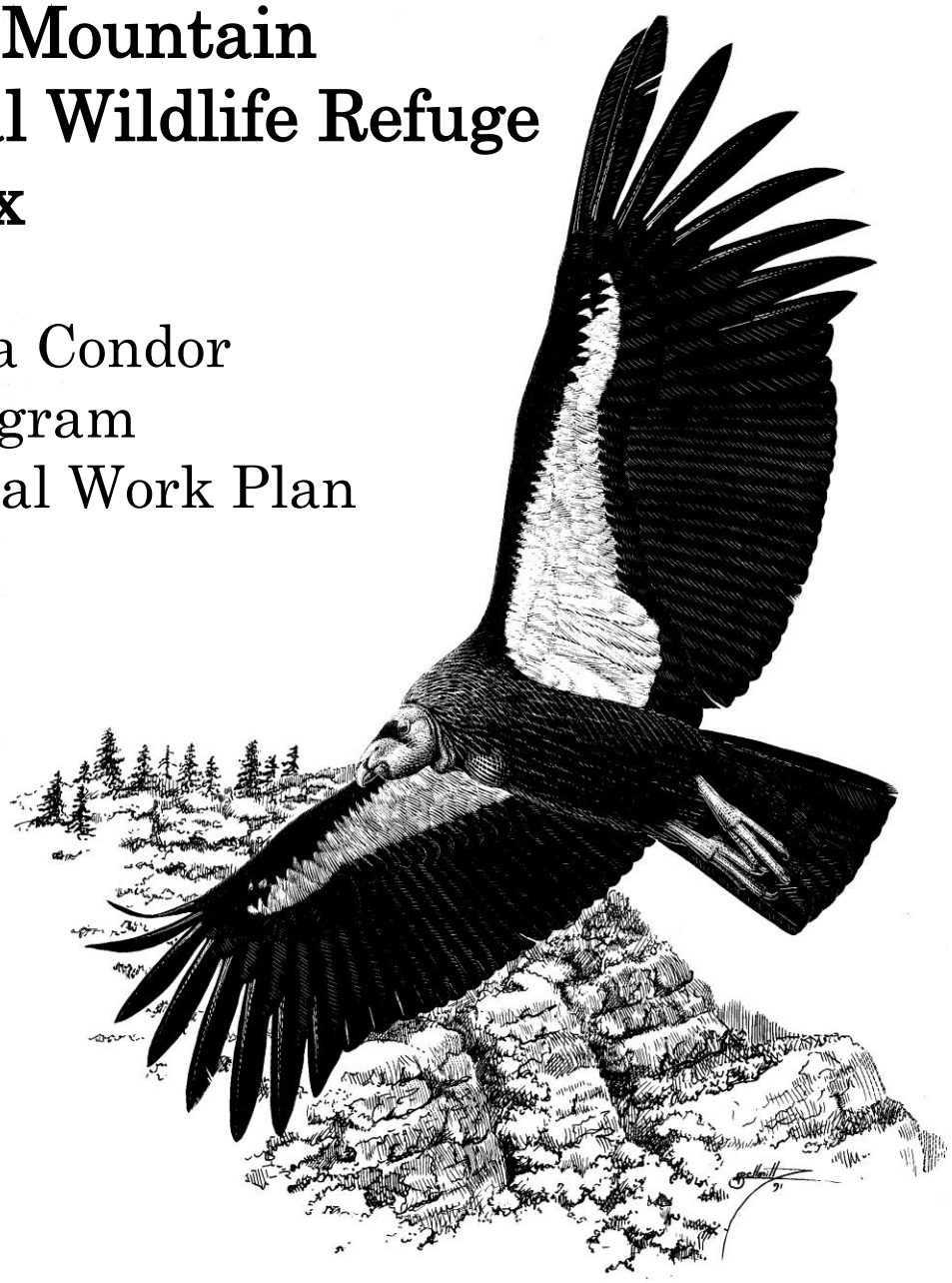
Anticipated completion: 2014

Appendix II Condor Work Plan Report

U.S. Fish & Wildlife Service

Hopper Mountain National Wildlife Refuge Complex

California Condor Field Program Conceptual Work Plan



Introduction

BACKGROUND

Since 1992, the U.S. Fish & Wildlife Service (Service) Hopper Mountain National Wildlife Refuge Complex (Complex) has worked to reintroduce the California condor in Southern California. Over the last 2 decades, the Complex's condor field team has operated 4 different release sites located on refuge and U.S. Forest Service lands and has released condors from the captive breeding facilities annually. 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. The core of the field team is comprised of Complex employees: one full-time permanent supervisory wildlife biologist, 2 full-time term wildlife biologists, and 2 full-time term biological science technicians. The Complex has 4 volunteer intern positions that are filled throughout the year. The field program also utilizes a number of unpaid volunteers who primarily assist with monitoring nests during the 8 month nesting season. In addition to Service personnel and volunteers, the Santa Barbara Zoo employs one full-time nesting technician and the Zoo's conservation research associate and director also assist with field activities. A variety of support also comes from other program partners. The Los Angeles Zoo provides assistance in caring for sick and injured condors and helps during handling events and nest entries. The Friends of the California Condor Wild and Free help with outreach events and project work such as building blinds or flight pen maintenance. 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 but field activities can occur anywhere within the range of the Southern California Condor population which currently includes portions of Santa Barbara, Ventura, Los Angles, Kern, Tulare, Inyo, and Fresno Counties.

RATIONALE

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. 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. In accordance with the Recovery Plan, "Released California condors should be closely monitored by visual observation and electronic telemetry" (USFWS 1996).

While the current recovery plan provides overall programmatic goals for the down-listing of the condor, it does not provide the conceptual framework necessary for managing a reintroduced population of condors. A conceptual model that illustrates the desired outcomes and the major factors that affect those outcomes is important in designing a sound operational structure in endangered species recovery field programs. They act as the foundation for adaptive management, improve continuity of operations, and serve as a powerful tool in understanding and communicating the specific effects each field activity has on achieving specific objectives related to the goal of species recovery. Operational models are highly beneficial when developing training materials,

organizing reports, and establishing data management structure. The condor management activities carried out by the Complex has occurred without this type of conceptual framework. Early in the program, when the condor population was relatively small and most actions were aimed at establishing a condor population in the wild, a conceptual framework may not have been necessary. With the established population reproducing successfully and recolonizing much of recent historic range, developing a conceptual model will be of great benefit to the Complex's condor management activities.

Conceptual Overview

GOALS & OBJECTIVES

A comprehensive conceptual model of condor management activities includes 4 components: an overarching goal, underlying objectives, threats, and actions. Simply put, the overarching goal of the field program is to establish a self-sustaining condor population that would act as one of the 2 wild populations referenced in the Recovery Plan.

Three underlying objectives need to be met in order to achieve the goal of establishing a wild, self-sustaining condor population. The first is to ensure that suitable habitat is available for a wild population. California condor habitat can be categorized into nesting, foraging, and roosting components (USFWS 1996). Condor activity is distributed widely across the Southern California region and its range continues to expand. As of 2013 the condor population in Southern California has inhabited an area of 14,500 square miles and includes Monterey, San Luis Obispo, Santa Barbara, Ventura, Los Angles, Kern, Tulare, Inyo, and Fresno Counties. The second and third objectives address self-sustainability. Wild condor populations currently suffer from anthropogenic impacts resulting in high levels of mortality (Rideout et al. 2012, Finklestien et al. 2012) and depressed reproduction (Mee et al. 2007a, Grantham 2007). Reduced mortality and increased productivity rates are objectives necessary to reach a self-sustaining condor population.

THREATS

Each objective is negatively affected by one or more threats. Six principal threats have been identified for the Southern California condor population:

Human Development: Activities such as urban development, oil and gas extraction, farming, and wind energy development have transformed formerly suitable foraging habitat into areas that may not be compatible with California condor recovery. Not all human land use is incompatible with condor habitat. Livestock grazing and hunting both provide food sources for condors throughout their range.

Human Interactions: The frequency with which condors encounter human activity and development within their range has led to isolated incidences of habituation. Condors that have become overly habituated to human activity and structures are at greater risk of behavioral conditioning, which ultimately affects their ability to survive in the wild. Condors that have become overly habituated

must be removed from wild populations. In Southern California there are a number of locations and mountain residential areas where condors are known to engage in activities that have led to habituation.

Predation: From 1992 through 2013 predation accounted for 19% (7 out of 36) of known causes of death in the free flying Southern California condor population. Predators have included coyotes (*Canis latrans*), mountain lions (*Puma concolor*) and golden eagles (*Aquila chrysaetos*). Newly released condors are far more susceptible to predation, with 4 of the 7 predated condors having been in the wild less than a year.

Contaminants: Lead from spent ammunition is the primary contaminant of concern in the Southern California population. As of January 2014, 23% of deaths with an identified cause have been due to lead poisoning in Southern CA (8 out of 35 deaths).

Disease: West Nile Virus is the only known disease to have affected condors in the Southern California population. To date only one out of the 15 (6%) nestlings where the cause of death is known died from West Nile Virus. There have been no West Nile Virus deaths in the free flying population in Southern California.

Microtrash: Breeding California condors sometimes ingest small human-made materials (microtrash) and feed these items to their nestlings (Grantham 2007, Mee et al. 2007b, Rideout et al. 2012). Trash items recorded include nuts, bolts, washers, copper wire, plastic, bottle caps, glass, and spent ammunition cartridges (Mee et al. 2007a, Walters et al.2010). While nestlings are able to tolerate these items in small amounts, large quantities can result in digestive tract impaction, evisceration, internal lesions, and death (Grantham 2007, Snyder 2007, Rideout 2012). To date, of the known causes of death in wild nestlings from Southern California, 40% (6 out of 15) have been the result of microtrash ingestion.

ACTIONS

The condor field team carries out 7 major actions as means to mitigate the various threats and accomplish the 3 objectives of the field program. Certain actions will directly impact objectives in a positive manner and others will abate one or more of the identified threats thereby indirectly impacting objectives.

Monitoring Habitat Use: The field team monitors how condors use nesting, roosting, and foraging habitat in Southern California. Global positioning system (GPS) transmitters attached to condors allow the team to locate feeding activity, nesting territories, and roost locations. The field team uses these transmitters to identify potential threats such as sources of lead exposure, areas where microtrash is being collected, or habituation events. These areas can be targeted with outreach or management actions. Monitoring habitat use also informs program-wide objectives via long-term research. Findings from these studies may inform management strategies and policy aimed at addressing lead-based ammunition and other threats to condor survival.

Lead Monitoring and Mitigation: 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 attempts to trap and handle the entire Southern California condor population to monitor blood lead levels and treat condors for lead exposure.

Detecting Mortalities: Understanding the factors contributing to mortalities in the reintroduced wild populations is essential to the conservation of the species (Rideout et al. 2012). This is most directly accomplished by locating condors that have died in the wild and determining cause of death. The field team uses VHF and GPS transmitters to locate condors that have died in the wild and recover their carcasses for examination.

Nest Management: The complex partnered with the Santa Barbara Zoo to create the intensive nest management plan known as the California Condor Nest Guarding Program. Nest guarding combines monitoring nests with direct intervention 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.

Captive Release & Transfers: The field team releases captive-bred juvenile California condors into the wild annually 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.

Behavioral Modification: In order to prevent habituation and reduce the risk of injury and death related to interacting with humans and human structures, condors are closely monitored throughout their range. Field staff identify habituation sites and habituated condors using radio telemetry, GPS transmitter data, and visual monitoring, and by 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.

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.

Action Diagrams

Understanding the work flow for each of the major actions is also a valuable tool for developing training materials, organizing reports, establishing data management structure, and allotting resources. Each action is comprised of 3 types of components: operations, operational objectives, and resulting data. Operations are the various activities needed to be performed to complete each action. These activities accomplish operational objectives, which often initiate the subsequent operation in the work flow of the action. The resulting data is the information that is collected to help track the overall effectiveness of the action or assist with action logistics.

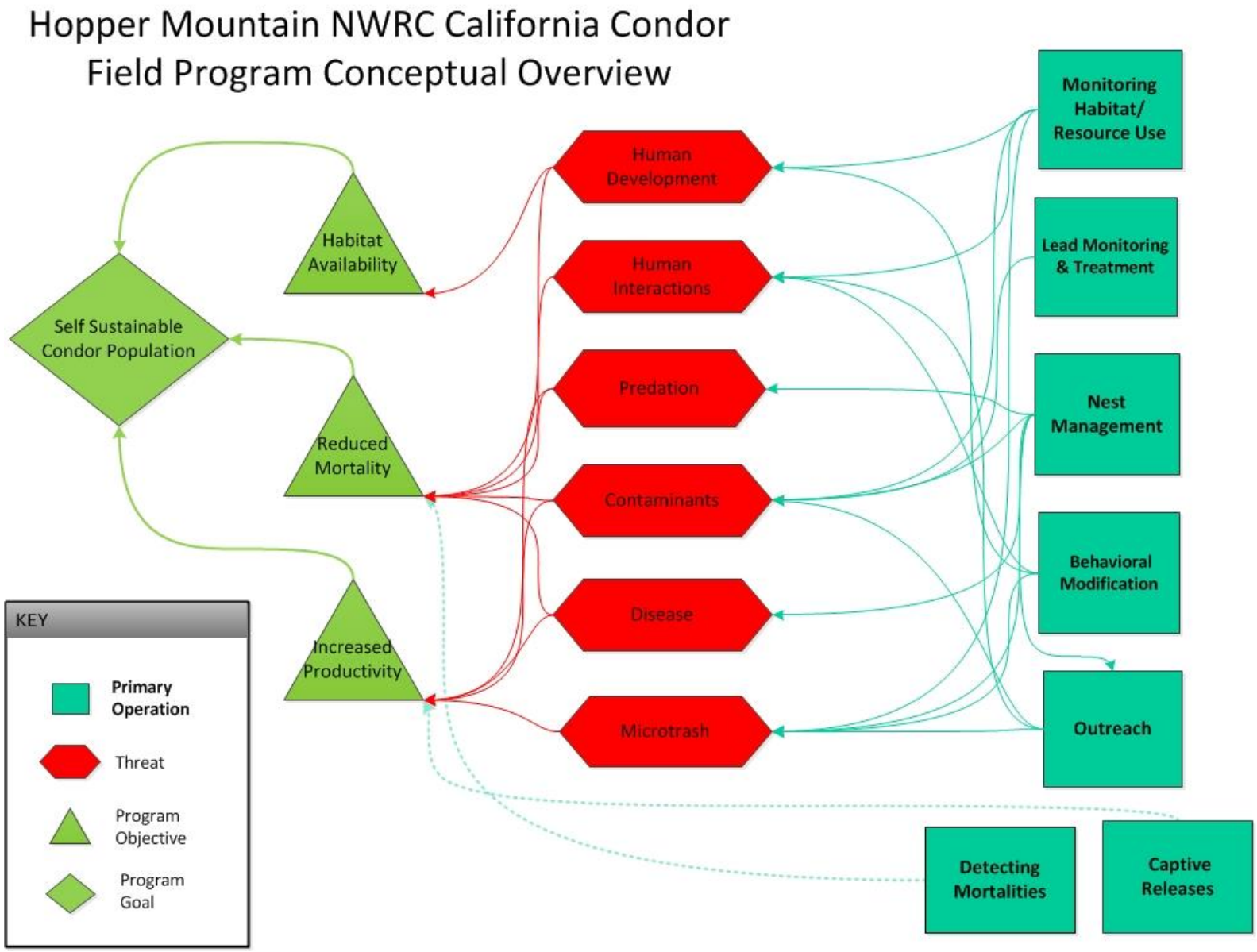


Figure 1: A conceptual model for the Hopper Mountain NWRC California Condor Field Program. The program's goal is to establish a self-sustaining population of condors. The three program objectives are limited by one or more of the 6 identified threats which are in turn addressed by the 7 primary operations.

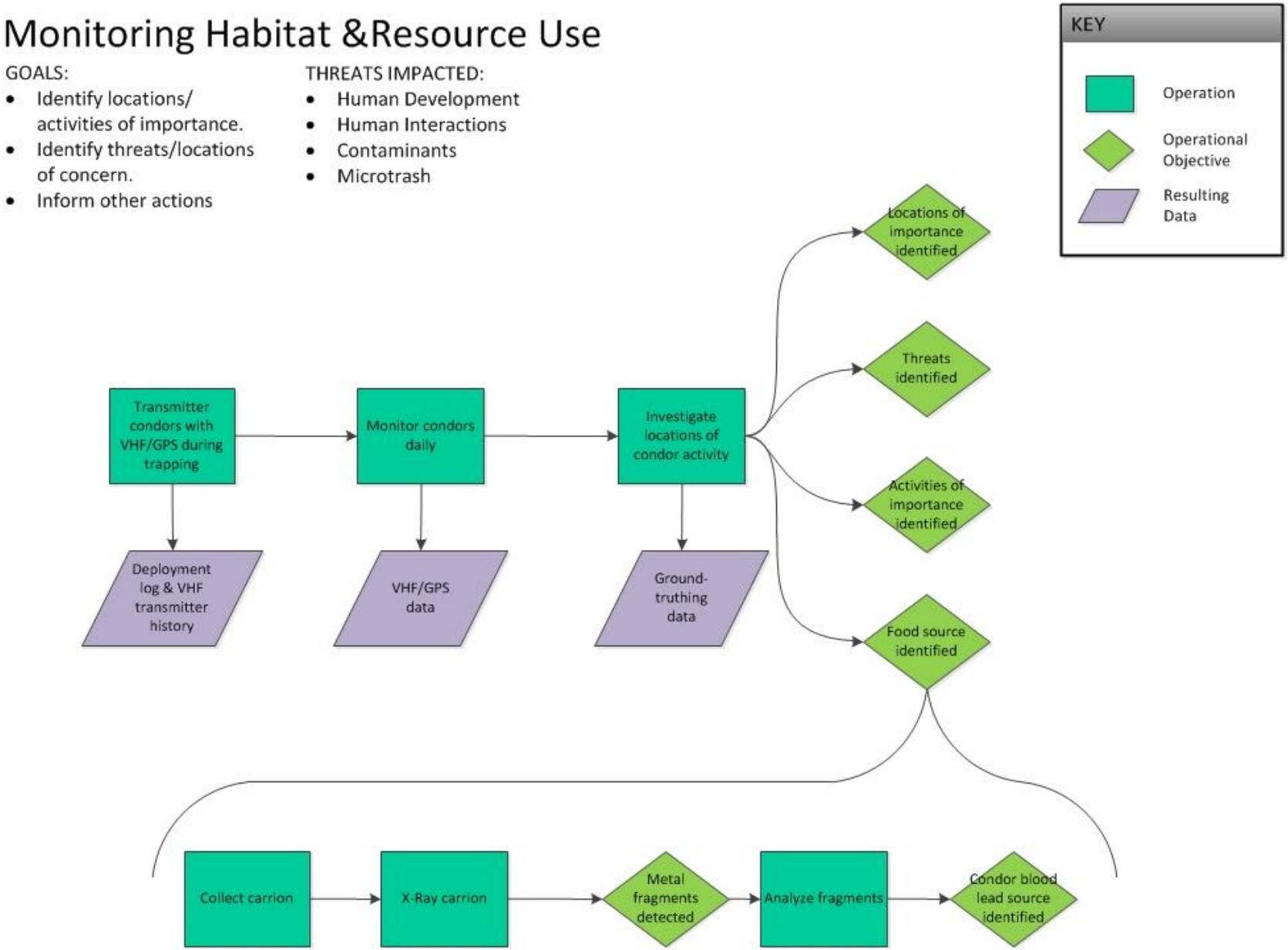


Figure 2: Action diagram for monitoring condor habitat and resource use. This action requires trapping condors so that they can be fitted with GPS and VHF transmitters. Condor activity is monitored daily in order to locate geographic areas and activities of importance, identify food sources, and identify potential threats to condors.

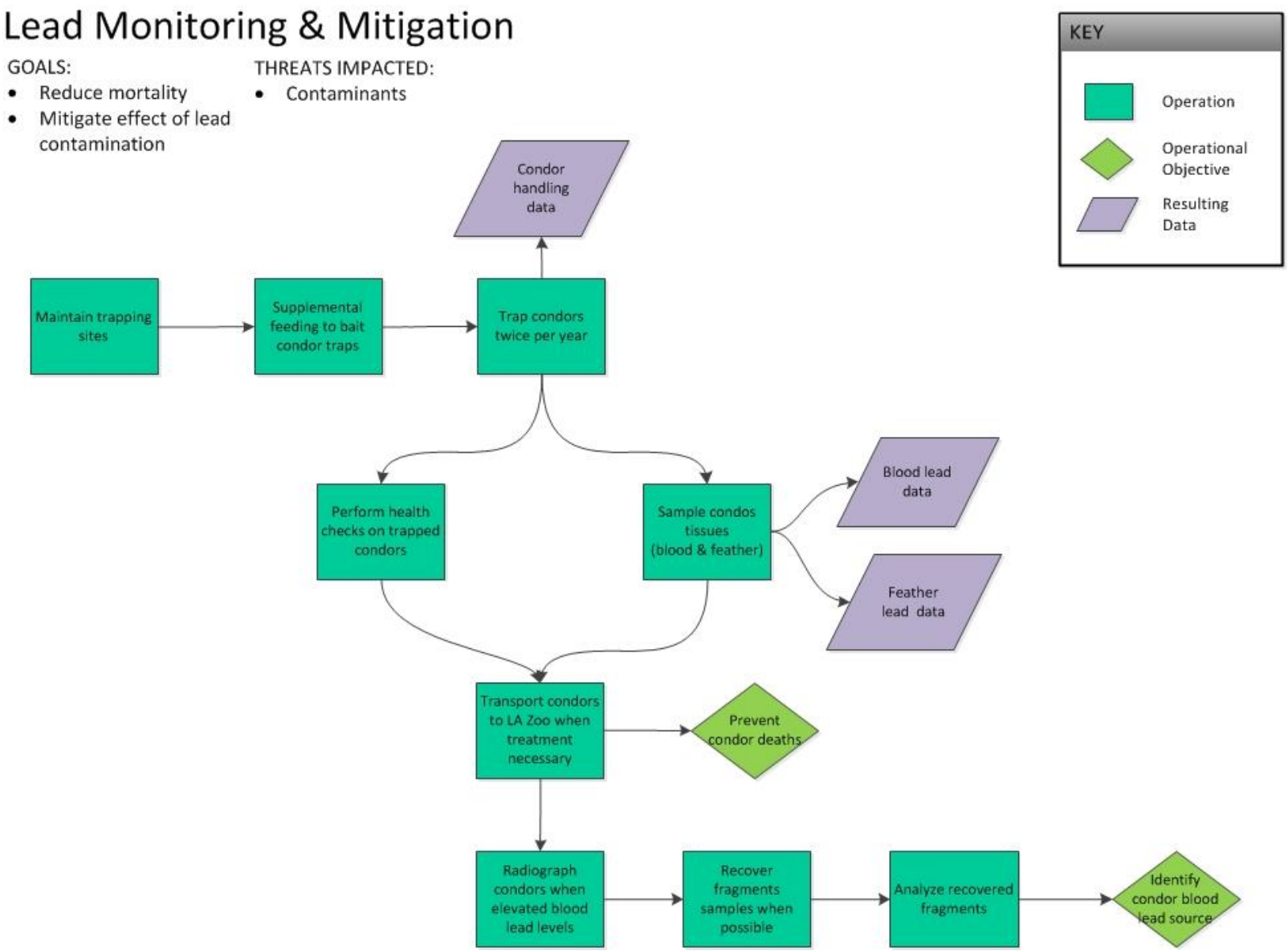


Figure 3: Action diagram for lead monitoring and mitigation. This action requires trapping condors twice a year to perform health exams and for sampling blood and feathers. Blood samples are tested for lead in the field to provide a simple and practical cue for treatment. Feather and blood samples are also analyzed in a lab setting along with any fragments that might be recovered from condors while in treatment.

Detecting Mortalities

GOALS:

- Provide information about condor threats.
- Measure of mortality rate.
- Identify immediate/ ongoing hazard.

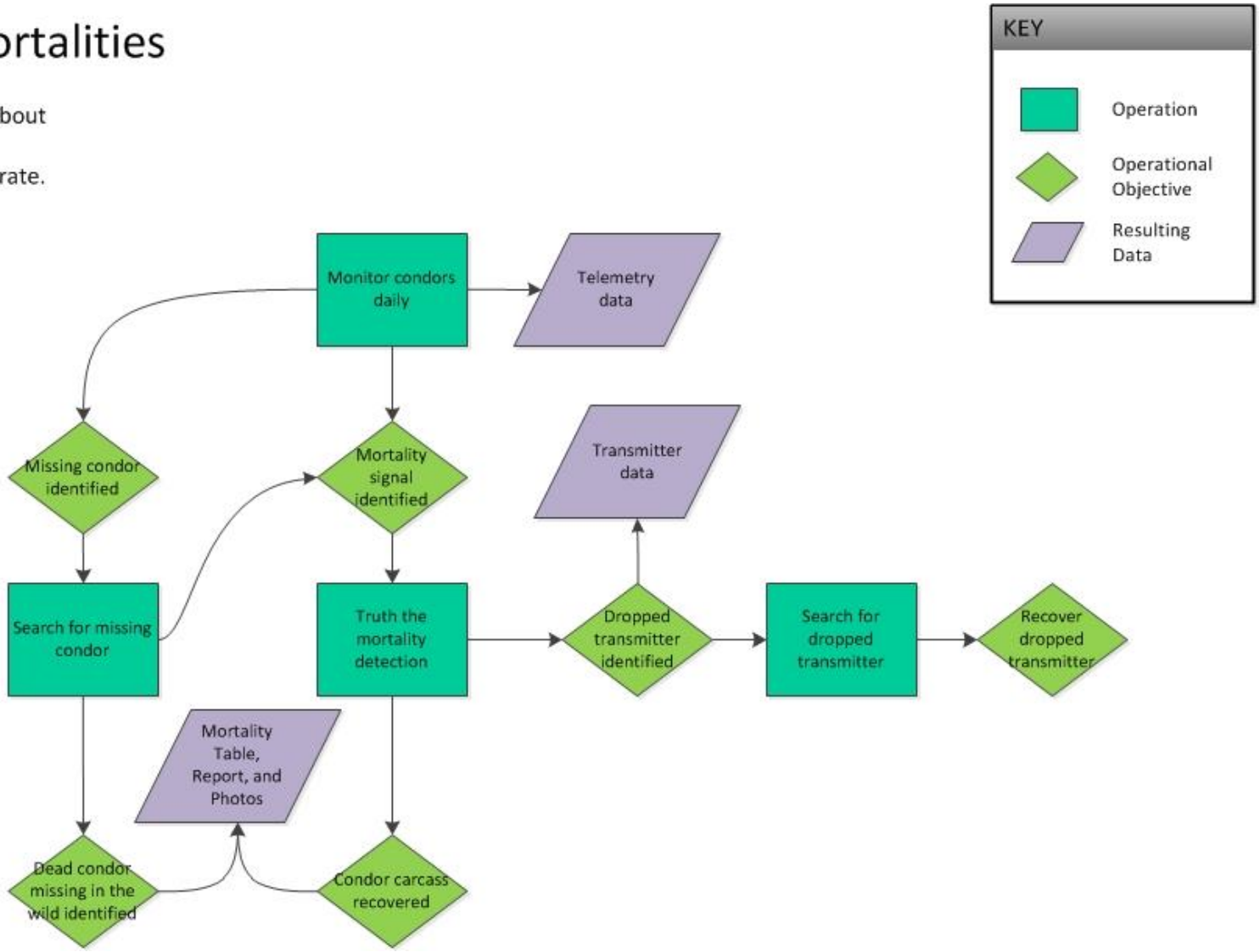


Figure 4: Action diagram for detecting mortalities. This action involves using radio telemetry to monitor condors from pre-established observation points multiple times each day. The VHF transmitters in use will emit a different signal when stationary for more than 12 hours. This signal is known as a mortality signal. When detected, the field team will determine if the source of the mortality signal is a dropped transmitter or dead condor and then attempt to locate and recover the condor or transmitter. The field team will also actively search for condors that have not been detected for long periods of time. This involves mobile tracking throughout condor range. In some instances radio telemetry flights are used to assist in these searches.

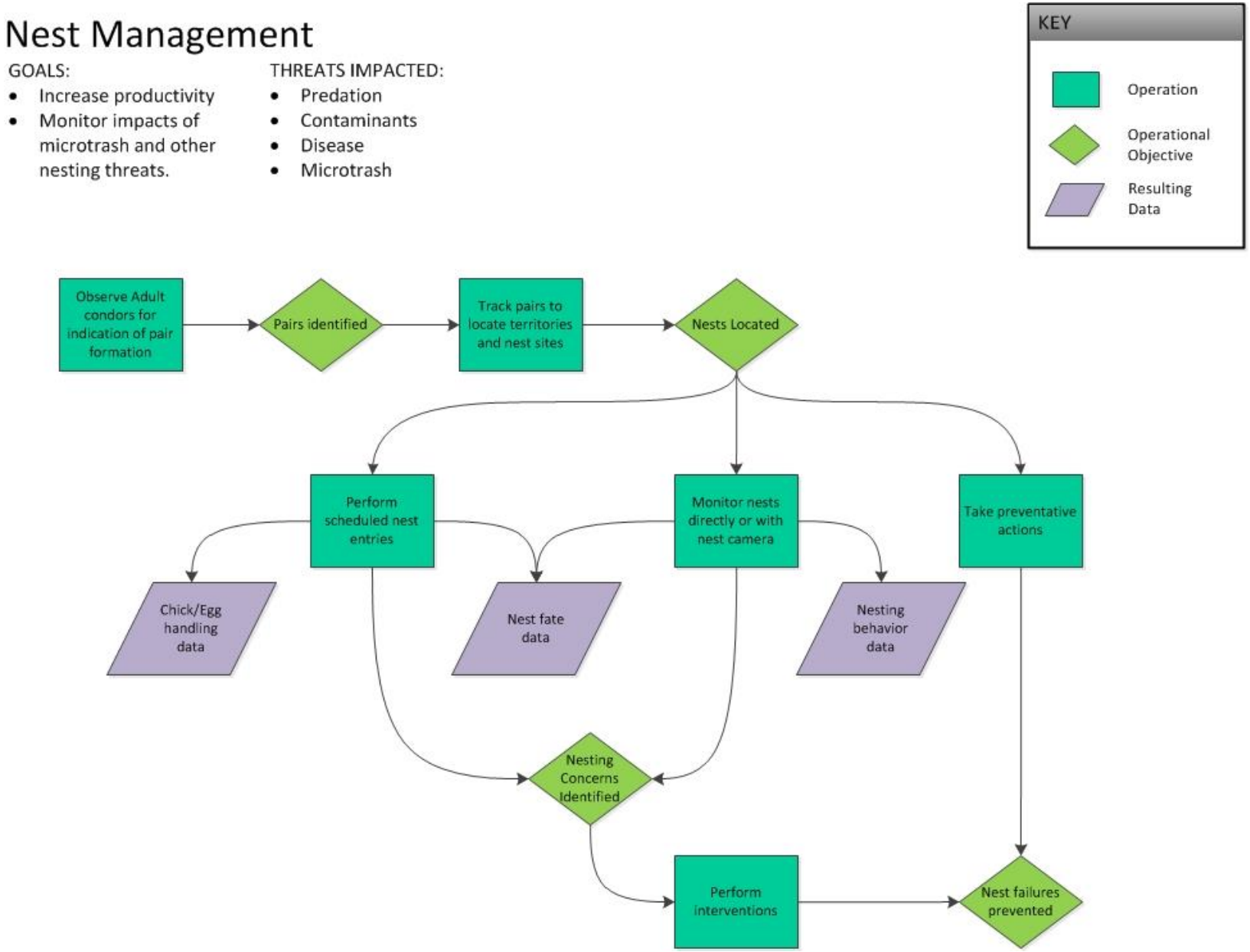


Figure 5: Action diagram for condor nest management. This action uses nest observations and regularly scheduled physical exams to identify and correct potential causes of nest failure and maximize nesting success. Data related to chick development, nesting behavior, microtrash, and nest outcome is collected to assess the longer term trends in nesting success in relation to the degree of management.

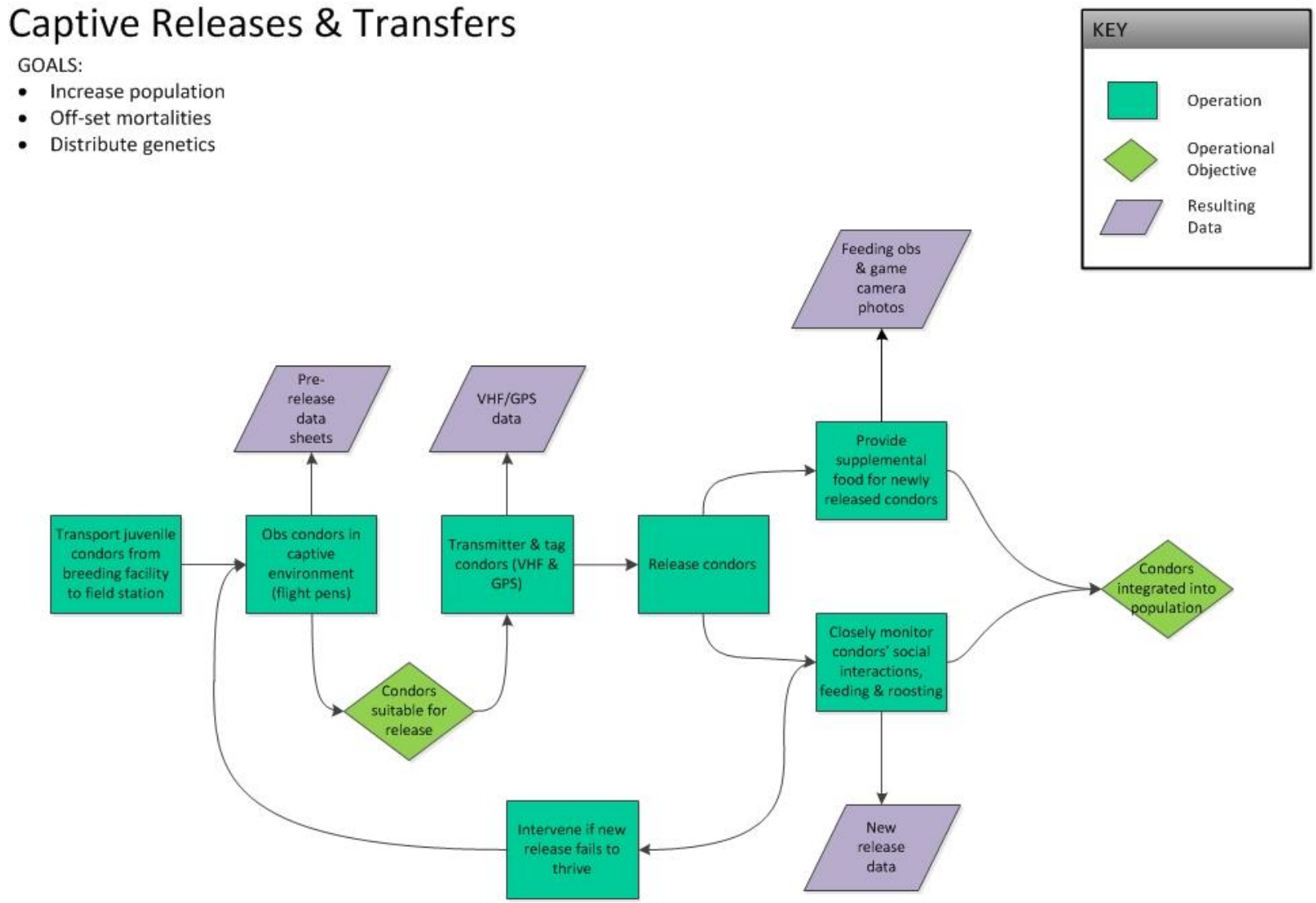


Figure 6: Action diagram for captive releases. This action requires the transport of juvenile captive bred condors from one of 4 captive breeding facilities to the release site where they are held for a minimum 6 weeks in a large flight pen. While held in the flight pen, the pre-release condors are observed for appropriate behaviors and placed with an older condor that acts as a mentor. Condors are released one or two at a time from September until December. They are closely monitored after release until they are observed roosting off the ground and feeding with other condors at a supplemental feeding station. Supplemental food is provided to newly released condors for their first year to substitute the parental care they would have received had they fledged in the wild.

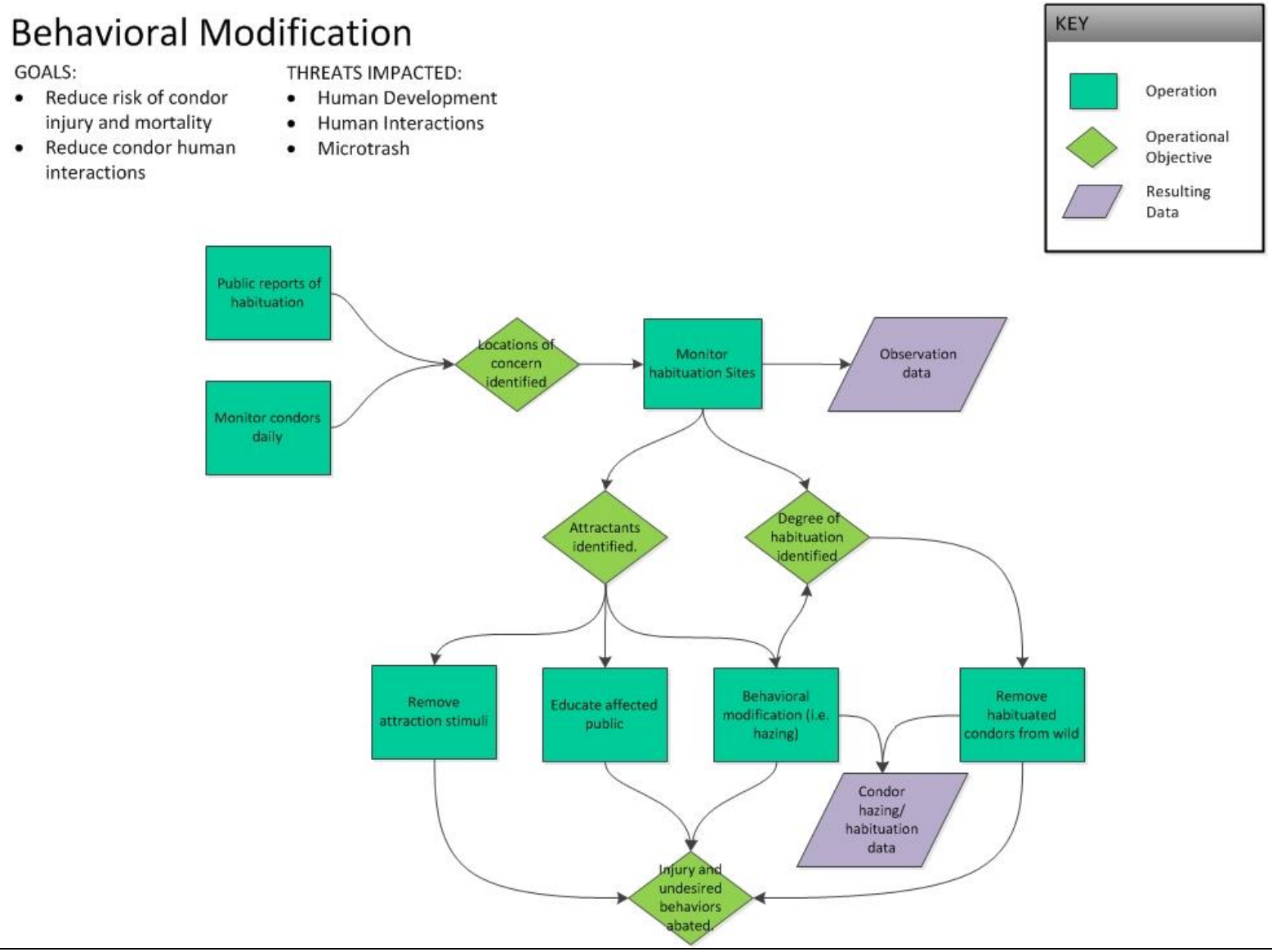


Figure 7: Action diagram for behavioral modification. This action addresses undesirable condor behaviors detected through daily monitoring efforts and reported by the public. Once identified, the areas where these behaviors have been observed or reported are monitored to determine if there are any attractants and the degree of undesirable behavior/habituation occurring. Depending on the specific set of circumstances, sites and behaviors of concern will be addressed by removing any attractants, educating the affected public, and hazing condors from the area . Condors that do not respond to hazing or are overly habituated will be removed from the wild temporarily or permanently depending on the level of habituation and the threat posed to the condor.

Outreach

GOALS:

- Increase awareness about California Condor Conservation.
- Educate public/policy makers on threats to condors.

THREATS IMPACTED:

- Human Interactions
- Contaminants
- Microtrash

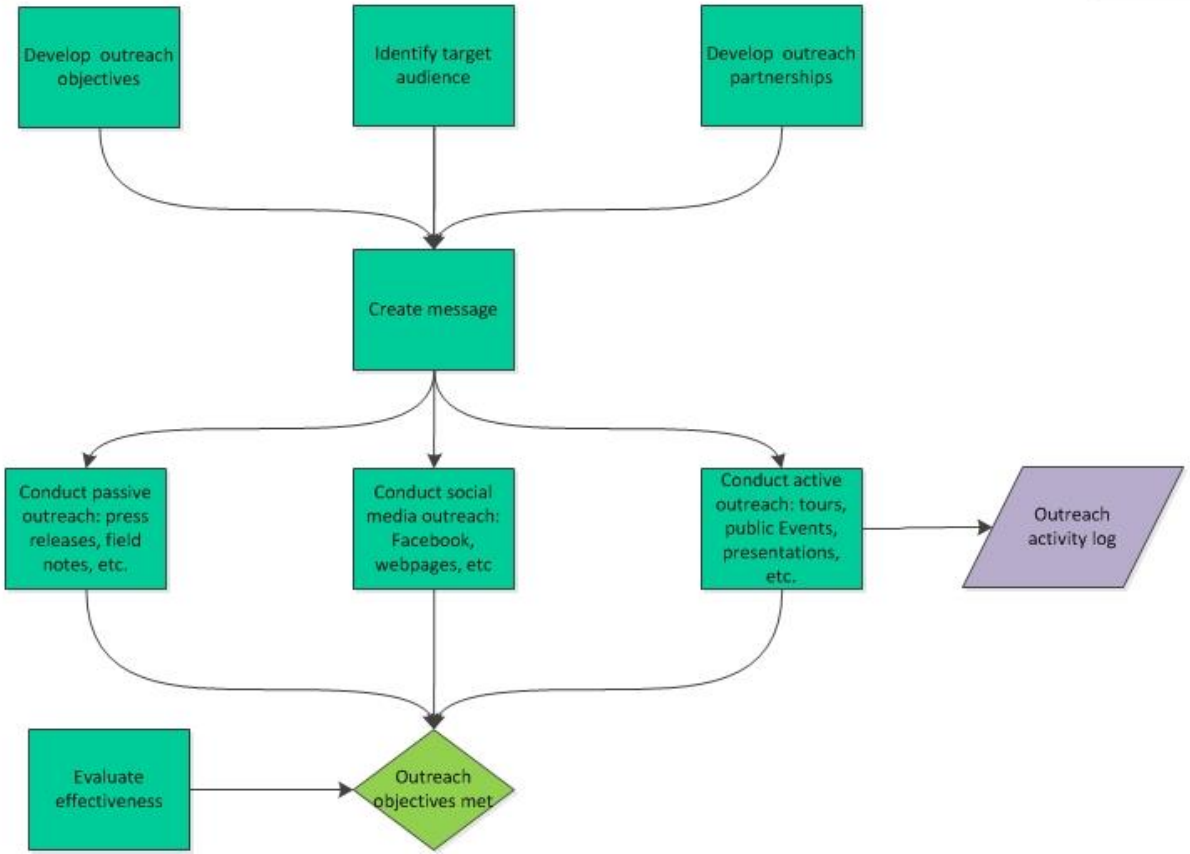


Figure 8: Action diagram outreach. This action covers a broad array of activities meant to increase awareness about general condor conservation as well as provide information and education on specific condor related topics, such as the use of non-lead ammunition. Various types of outreach techniques are used depending on the target audience and the specific message. Outreach often occurs with the assistance of program partners and can involve directly engaging target groups, utilizing social media, or communicating messages through other media outlets.

Population Level Effects from Management

While the impact of each action plays a role in establishing a self-sustaining condor population, 3 of these actions have a direct and immediate impact on the condor population's trajectory in Southern California.

Monitoring and Mitigating for Lead: The treatment of lead exposed condors decreases the annual mortality rate of the condor population. An average annual mortality rate of 6% under current management was calculated by dividing the number of annual deaths over the maximum population size for each year and averaged for 2009-2013. Without treating lead exposed condors we predict an increased mortality rate of 13%. This was calculated using the estimate recently published in Finkelstein et al. 2012 where condors with blood lead levels greater than 100ug/dL would die without treatment. These additional assumed deaths were added to the actual number of deaths and then divided by the maximum population size for each year and averaged for 2009-2013. Individuals were only allowed to die once if they had numerous lead exposures that were greater than 100ug/dL

Nest Management: This action has had a dramatic impact on the success of wild nests. 23% (17 of 71 condors) of the current total wild population has fledged from managed nests. Prior to implementing the current nest management program, the nesting success rate was 6.6%. Under the current nest management program, 61.5% of nests have been successful. Nesting success was calculated by dividing the total number of chicks to fledge from unmanaged nests by the total number of unmanaged nests (1 chick from 15 nests). Nesting success for current management was calculated by dividing number of chicks to fledge successfully from managed nests by the total number of managed nests (24 chicks from 39 nests). Annual Breeding effort (the ratio of the population actively nesting) was calculated as 20%, which was an average for 2009-2013.

Captive Releases: On average, 7 captive bred condors are released into the wild each year at the Bitter Creek National Wildlife Refuge. Under the current rates of mortality, captive releases have been necessary to increase the Southern California population of condors each year.

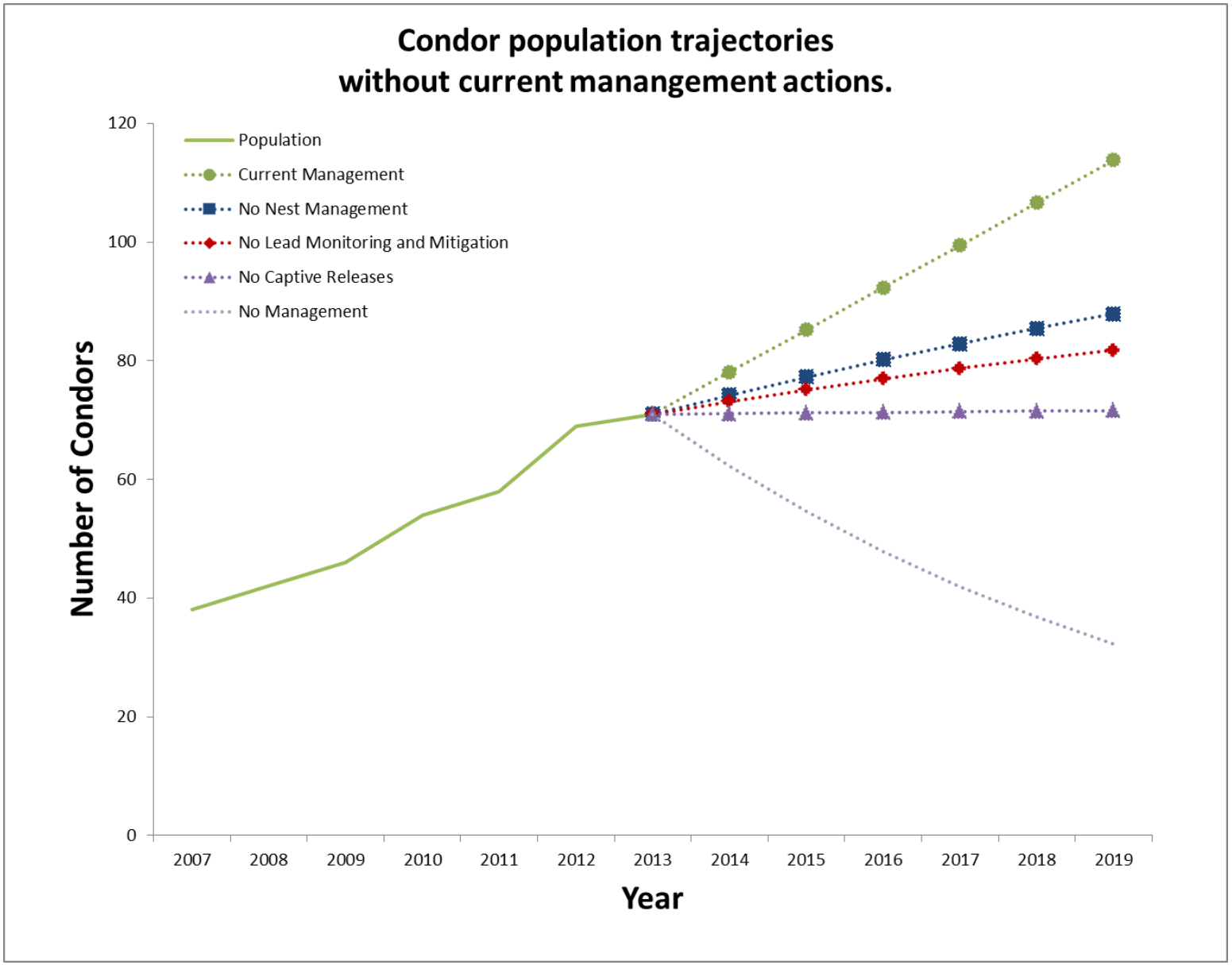


Figure 9: The California condor population in Southern California has increased over the last 5 years. The trajectory of the population is shown under current management, without nest management, without lead monitoring and mitigation, without captive releases, and without any management.

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Appendix III Monthly Activity Reports

Condor Field Program Monthly Activity Report JAN 2013

Prepared by Joseph Brandt (Supervisory Wildlife Biologist)

Categories:

Personnel:

Staff

No changes

Interns

Ryane Cox last Day was Feb 1st

Marie McCann started Nov 13th

Jerry Cole started Nov 26th

Ben Teton starts Dec 6th

PU:

01/17/2013 Friends of California Condor Wild and Free condor presentation at California Living Museum in Bakersfield.

01/20/2013 Friend of the California Condor Wild and Free toured Bitter Creek with a group from the Morro Bay Winter Bird Festival ~24 people attended.

01/27/2012 FWS/SB Zoo Volunteer appreciation barbeque at Arroyo Verde Park in Ventura ~35 people attended.

01/30/2013 HMNWRC office attended the premier of The Condor's Shadow at the Santa Barbara International Film Festival.

01/31/2013 Condor Cave Update: 165 New likes for a total of 487. 18 posts. We were also shared by the USFWS National Wildlife Refuge System Facebook page.

Condors:

01/09/2013 Joseph Brandt works up one condor at Bitter Creek. Last Condor to be worked up in for the fall trap up.

01/11/2013 Josh Felch recovers condor #512. Bird was found dead at Bitter Creek. Gross necropsy suggests predation as a possible cause of death.

Maitenence

Condor field team has been removing old electric fences at feeding sites and flight pen and restringing them.

Interns performed some trail maintenance on the Hopper Peak ATV Trail.

Condor Field Program Monthly Activity Report FEB 2013

Prepared by Joseph Brandt (Supervisory Wildlife Biologist)

Categories:

Personnel:

Staff

No changes

Interns

Ryane Cox last Day was Feb 1st

Marie McCann started Nov 13th

Jerry Cole started Nov 26th

Ben Teton started Dec 6th

Laura McMahon started Feb 25th

PU:

02/02/2013 Joseph Brandt attended The Condor's Shadow screening at the SBIFF for Q&A. The show was sold out. ~150 attended.

02/11/2013 Josh Felch attended the class *Migratory Bird Conservation: A trust responsibility* at NCTC.

02/22/2013 Joseph Brandt participated on the career panel for the Central Coast Chapter Wildlife Society/Cal Poly SLO Wildlife Round Table. ~80 people attended.

02/24/2013 John McCammon presented for the Friends of the Condor Wild and Free. ~50 people attended.

02/25/2013 Joseph Brandt, Ria Boner (SBZ), & Molly Astel (SBZ) put on the Volunteer Nest Observer training in the Annex. ~40 people attended.

02/28/2013 Josh Felch presented about the condor program to San Fernando Valley Audubon and ~35 people attended.

02/28/2013 Condor Cave Update: 93 New likes for a total of 580. 13 posts for month of FEB.

Condors:

2013 Nests

Nest ID	Sire SB#	Dam SB#	Egg ID	Chick SB#	Location	Lay Date	Hatch Date
AB13	21	192	FW113	tbd	Agua Blanca	2/12/2013	tbd
HC13	107	161	FW213	tbd	Hopper Cyn	2/14/2013	tbd
HC13x	107	156	FW313*	tbd	Hopper Cyn	2/19/2013	tbd
SP13	247	79	FW413	tbd	South Potrero	2/27/2013	tbd
KR13	125	111	FW512	tbd	Koford's Ridge	2/27/2012	tbd

*FW313 was laid by an HC13 nest extra pair female, 156. Egg was located in a separate cavity close to actual nest site. Egg was pulled and transported to LAZ. It was fertile and is being incubated at the zoo.

2/27/2013 Joseph and Devon entered the HC13x to pull egg laid by extra pair female. Egg was fertile and transported to LAZ to be incubated.

Maitenence

2/27/2013 Friends of the California Condor assisted removing old electric fences around Hopper Mountain Flight Pen.

Condor Field Program Monthly Activity Report MAR 2013

Prepared by Joseph Brandt (Supervisory Wildlife Biologist)

Categories:

Personnel:

Staff

No changes

Interns

Marie McCann started Nov 13th

Jerry Cole started Nov 26th

Ben Teton last day Mar 20th

Laura McMahon started Feb 25th

Natasha Peters started Mar 25th

PU:

03/02/2013 Joseph Brandt attended the Condor's Shadow screening in Los Olivos, ~120 people attended.

03/05/2013 Joseph Brandt instructed Geoff Grisdale, Laura Mendenhall, Josh Felch, Katie Chaplin, Ria Boner (SBZ), Jenny Schmidt (LAZ), and Debbie Ciani (LAZ) in nest entry ropes training at Stony Point.

03/10/2013 Joseph Brandt attended the Condor's Shadow screening at the SLO Film festival. ~50 people attended.

03/26/2013 Joseph Brandt instructed Devon Lang, Katie Chaplin, Molly Astell (SBZ), Chandra David (LAZ), and Mike Clark (LAZ) in nest entry ropes training at Stony Point.

03/28/2013 Joseph Brandt Joseph Brandt attended the Condor's Shadow screening at the SBNHM. ~310 people attended.

03/29/2013 Joseph Brandt and the FOCCWF toured with UCSB professors and students at Hopper Mountain NWR. 13 people attended.

03/31/2013 Condor Cave Update: 105 New likes for a total of 666 likes. 15 posts for month of MAR.

Condors:

2013 Nests

Nest ID	Sire SB#	Dam SB#	Egg ID	Chick SB#	Location	Lay Date	Hatch Date
AB13	21	192	FW113	tbd	Agua Blanca	2/12/2013	Tbd
HC13	107	161	FW213	tbd	Hopper Cyn	2/14/2013	Tbd
HC13x	107	156	FW313*	tbd	Hopper Cyn	2/19/2013	Tbd
SP13	247	79	FW413>Dummy	tbd	South Potrero	2/27/2013	Tbd
KR13	125	111	FW513	tbd	Koford's Ridge	2/27/2013	Tbd
SC13	328	216	FW613	tbd	Santiago Cyn	3/12/2013	Tbd
OD13	63	147	FW713>Dummy	tbd	Orchard Draw	3/23/2013	tbd
GF13	326	428	FW813	tbd	Grassy Flats	3/30/2013	Tbd
PC13	237	255	FW913	tbd	Pole Cyn	04/03/2013	Tbd

*FW313 was laid by an HC13 nest extra pair female, 156. Egg was located in a separate cavity close to actual nest site. Egg was pulled and transported to LAZ. It was fertile and is being incubated at the zoo.

03/13/2013 Joseph Brandt, Devon Lang, and Laura Mendenhall performed the nest entry on the AB13 to check egg's fertility. Egg was Fertile
03/27/2013 Joseph Brandt and Geoff Grisdale performed the nest entry on KR13 to check egg's fertility. Egg was Fertile
03/28/2013 Joseph Brandt and Geoff Grisdale performed the nest entry on SP13 to check egg's fertility. Egg was not viable and replaced with a dummy.
03/29/2013 Geoff Grisdale trapped two condors at HMNWR
03/30/2013 Joseph Brandt and Geoff Grisdale worked up 493 and 568 at Hopper Mt NWR. Both condors had elevated blood lead levels and were sent to LAZ for treatment.

Maitenence

03/16-17/2013 FOCCWF assisted removing fence posts at Hopper Mountain Flight Pen.
03/23/2013 Vince Gerwe assisted with trail clearing on the Hopper Cyn OP trail.
3/28,30/2013 FOCCWF assisted in fencing the BC flight pen.

Condor Field Program Monthly Activity Report APR 2013

Prepared by Joseph Brandt (Supervisory Wildlife Biologist)

Categories:

Personnel:

Staff

No changes

Interns

Marie McCann last day May 24th

Jerry Cole started May 17th

Laura McMahon started Feb 25th

Natasha Peters started Mar 25th

PU:

04/4/2013 Josh Felch and Steve Kirkland traveled to Bear Valley Springs to speak with the BVW Police department, provide them flyers to distribute and talk with residents.

04/5/2013 Devon Lang presents at CSUCI Ecology Class Talk 30 people reached.

04/9/2013 Marie McCann wrote and submitted Field Notes Entry.

04/10/2013 Joseph Brandt, Laura Mendenhall, Geoff Grisdale, and Devon Lang traveled to the LA Zoo to attend a 30day condor chick handling training.

04/26/2013 Devon Lang gives tour to Wind Wolves Class group 28 people attended.

Condors:

2013 Nests

Nest ID	Sire SB#	Dam SB#	Egg ID	Chick SB#	Location	Lay Date	Hatch Date
AB13	21	192	FW113	683	Agua Blanca	2/12/2013	4/10/2013
HC13	107	161	FW213→LA713	tbd	Hopper Cyn	2/14/2013	4/25/2013
HC13x	107	156	FW313*	na	Hopper Cyn	2/19/2013	na
SP13	247	79	FW413→13Sixu1	690	South Potrero	2/27/2013	4/17/2013
KR13	125	111	FW513	689	Koford's Ridge	2/27/2013	4/17/2013
SC13	328	216	FW613	na	Santiago Cyn	3/12/2013	Na
OD13	63	147	FW713>Dummy	tbd	Orchard Draw	3/23/2013	Tbd
GF13	326	428	FW813	na	Grassy Flats	3/30/2013	na
PC13	237	255	FW913	tbd	Pole Cyn	04/03/2013	Tbd

*FW313 was laid by an HC13 nest extra pair female, 156. Egg was located in a separate cavity close to actual nest site. Egg was pulled and transported to LAZ. It was fertile and is being incubated at the zoo.

04/03/2013 Joseph Brandt, Josh Felch, and Mike Clark (LA Zoo) performed fertility check on FW713 at OD13. Egg was fertile but replaced with a dummy egg due to high levels of raven activity around the nest. Will be returned when eggs is close to hatch.

04/04/2013 Marie McCann trapped 560 and 584 at Bitter Creek NWR.

04/10/2013 Josh Felch traveled to Bear Valley Springs to setup motion activated sprinklers on residents home.

04/11/2013 Debbie Marlow and Ron Webb (SD Safari Park) dropped 4 prerelease condor (636, 637, & 643) off at the Bitter Creek flight pen to be released in the fall.

04/11/2013 Joseph Brandt and Geoff Grisdale Worked up 560 & 584. 560 was transported to the Zoo for elevated lead (Field test was 'High') by Ron Webb and Debbie Marlow from SD safari Park.
04/11/2013 Joseph Brandt and Geoff Grisdale performed nest entry on SC13 to check the fertility of FW613. Egg was Fertile.
04/12/2013 Joseph Brandt and Devon Lang entered AB13 to confirm the hatch of FW113.
04/13/2013 Laura McMahon trapped 21, 591, 596, & 625 at Bitter Creek NWR.
04/13/2013 Joseph Brandt and Josh Felch performed the nest entry on HC13 to confirm hatch of FW213. Egg failed to hatch and was not viable and replaced with a dummy.
04/13/2013 Laura McMahon observers a raven predate FW613 at SC13.
04/14/2013 Joseph Brandt enters SC13 to place a dummy in the recently failed nest. Male resumed incubating but nest was found without the dummy egg on 04/17/2013.
04/15/2013 Geoff Grisdale and Josh Felch worked up 4 condors at Bitter Creek (21, 591, 596, & 625). All birds were released.
04/15/2013 Joseph Brandt placed egg, 13Sixu1, into SP13. Egg Hatched on 04/17/2013.
04/17/2013 Marie McCann trapped 482 at Bitter Creek.
04/22/2013 Marie McCann trapped 563 and 585 at Bitter Creek.
04/23/2013 Joseph Brandt and Laura Mendenhall place egg, LA713, into HC13. Egg presumed to have hatched was 04/25/2013.
04/25/2013 Devon Lang trapped 483 at Bitter Creek.
04/26/2013 Geoff Grisdale and Devon Lang worked up 3 birds at Bitter Creek (482, 483, 563, & 585). 483 tested 'High' for lead and was transported to the LA Zoo the following day.
04/27/2013 Devon Lang picked up 493, 560, 568 from LA Zoo and released them on the Dough Flat Road.

Condor Field Program Monthly Activity Report MAY 2013

Prepared by Joseph Brandt (Supervisory Wildlife Biologist)

Categories:

Personnel:

Staff

No changes

Interns

Laura McMahon started Feb 25th

Natasha Peters started Mar 25th

Nadya Seal started May 13th

Rich Wilks started May 28th

PU:

05/09/2013 Joseph Brandt attended screening of the Condor's Shadow by the Cal Poly SLO Wildlife Club and the Central Coast Chapter of the Wildlife Society. ~50 people attended.

05/13/2013 Joseph Brandt, Ria Boner(SB Zoo), Molly Astell (SB Zoo), and Estelle Sandhaus (SB Zoo) provide the condor chick stage nest observer training to ~40 Volunteers in the annex.

05/18/2013 Joseph Brandt attended screening of the Condor's Shadow at the California Living Museum. ~20 people attended.

05/19/2013 Joseph Brandt attended screening of the Condor's Shadow at the Worldfest Animal Film Pavilion. ~20 people attended.

05/21/2013 Geoff Grisdale, Laura Mendenhall, and Devon Lang attended condor chick handling training at the LA Zoo.

05/22/2013 Condor Field team (minus J. Felch) attended Wildfire Awareness training at Hopper Mt NWR.

05/23/2013 Joseph Brandt attended screening of the Condor's Shadow at the Santa Ynez Band of Chumash Tribal Center. ~35 people attended.

05/30/2013 Joseph Brandt and Devon Lang with Michael Glen, Colleen Mehlberg, and Rachel (FWS Ventura ES) provided tour to of Hopper Mt NWR to the Sierra School. ~20 students and teachers attended.

05/31/2013 Condor's Shadow was screened at the NWRA Board meeting. Joseph Brandt attended and provided Q&A following the film. Tour of BC was the following day (see June Monthly Activity Report.)

Condors:

2013 Nests

Nest ID	Sire SB#	Dam SB#	Egg ID	Chick SB#	Location	Lay Date	Hatch Date
AB13	21	192	FW113	683	Agua Blanca	2/12/2013	4/10/2013
HC13	107	161	FW213→LA713	tbd	Hopper Cyn	2/14/2013	4/25/2013
HC13x	107	156	FW313*	na	Hopper Cyn	2/19/2013	Na
SP13	247	79	FW413→13Sixu1	690	South Potrero	2/27/2013	4/17/2013
KR13	125	111	FW513	689	Koford's Ridge	2/27/2013	4/17/2013
SC13	328	216	FW613	na	Santiago Cyn	3/12/2013	Na
OD13	63	147	FW713>Dummy	tbd	Orchard Draw	3/23/2013	5/19/2013
GF13	326	428	FW813	na	Grassy Flats	3/30/2013	Na
PC13	237	255	FW913	tbd	Pole Cyn	04/03/2013	5/30/2013

*FW313 was laid by an HC13 nest extra pair female, 156. Egg was located in a separate cavity close to actual nest site. Egg was pulled and transported to LAZ. It was fertile and is being incubated at the zoo.

05/02/2013 Joseph Brandt and Jenny Schmidt entered PC13 for fertility check and camera install. Egg was fertile and camera install went well. Katie Chaplin, Laura Mendenhall, Matt Hillman, Molly Astell and Cornell Ornithology Lab and staff also present and assisted with the camera install.
05/10/2013 Geoff Grisdale trapped SB#591 after birds was observed limping. SB#591 was transported to LAZ and radiographed. And was found with a hair line fracture on his right leg.
05/15/2013 Joseph Brandt, Jenny Schmidt, and Josh Felch entered AB13 for 30 day chick exam. Chick was healthy and a good weight.
05/17/2013 Joseph Brandt and Katie Chaplin entered OD13 to return the hatching egg to nest. Camera install was incomplete but entry went well.
05/22/2013 Devon Lang traveled to LA Zoo to pick up SB# 483 after cleared for lead. Bird was transported to Hopper Mt NWR and released that same day.
05/30/2013 Geoff Grisdale and Josh Felch entered KR13 for a ~40 day health exam. Chick was healthy and a good weight.
05/31/2013 Nadya Seal Trapped SB#594 at Bitter Creek NWR.

Maintenance:
05/21/2013 SB Zoo and Friends organized a trail mowing day at Hopper Mt NWR. All trails clear except the last 200 meters of the Condor Ridge trail.

Condor Field Program Monthly Activity Report June 2013

Prepared by Joseph Brandt (Supervisory Wildlife Biologist) & Geoff Grisdale

Categories:

Personnel:

Staff

No changes

Interns

Laura McMahon started Feb 25th

Natasha Peters started Mar 25th

Nadya Seal started May 13th

Rich Wilks started May 28th

PU:

6/1/2013 NWRA Board toured BCNWR. 4 Condors worked up during tour.

6/6/2013 Josh Felch was interviewed by KGET NBC17 Bakersfield.

6/12/2013 Joseph Brandt, Laura Mendenhall, Devon Lang, Josh Felch attended a chick handling training at the L.A. Zoo

6/19/2013 Joseph Brandt, Josh Felch, Jason Storlie, Vince Gerwe, Martin Fletcher met with BVSD

6/19/2013 Joseph Brandt was interviewed by CNN news.

6/18-20/2013 Laura Mendenhall attended Section 7 training at ES office.

6/28/2013 Friends Tour at Hopper Mountain. Joseph Brandt and Richard Wilks attended.

Condors:

2013 Nests

Nest ID	Sire SB#	Dam SB#	Egg ID	Chick SB#	Location	Lay Date	Hatch Date
AB13	21	192	FW113	683	Agua Blanca	2/12/2013	4/10/2013
HC13	107	161	FW213→LA713	tbd	Hopper Cyn	2/14/2013	4/25/2013
HC13x	107	156	FW313*	na	Hopper Cyn	2/19/2013	Na
SP13	247	79	FW413→13Sixu1	690	South Potrero	2/27/2013	4/17/2013
KR13	125	111	FW513	689	Koford's Ridge	2/27/2013	4/17/2013
SC13	328	216	FW613	na	Santiago Cyn	3/12/2013	Na
OD13	63	147	FW713>Dummy	tbd	Orchard Draw	3/23/2013	5/19/2013
GF13	326	428	FW813	na	Grassy Flats	3/30/2013	Na
PC13	237	255	FW913	tbd	Pole Cyn	04/03/2013	5/30/2013

6/1/2013 Joseph Brandt, Laura Mendenhall, and Josh Felch worked up 4 birds (SB#s 63, 568,694, 625) NWRA Tour observed/ assisted with the work up.

6/4/2013 Three condors trapped at BCNWR (SB#s 216, 370, 658)

6/6/2013 Joseph Brandt and Chandra David (LAZ) entered HC13 for first chick exam

6/12/2013 One condor trapped at BCNWR (SB# 596)

6/13/2013 Joseph Brandt, Laura Mendenhall, and Mike Clark (LAZ) entered SP13 for first chick exam.

6/13/2013 Josh Felch Released SB#591 at BCNWR (Picked up prior at LAZ for treatment for broken leg)

6/14/2013 Joseph Brandt and Chandra David entered AB13 for second chick exam

6/18/2013 Two condors trapped at BCNWR (SB#s 147 and 206)

6/19/2013 One condor trapped at BCNWR (SB# 489)
6/19/2013 Geoff Grisdale, Devon Lang, Katie Chaplin worked up 5 condors at BCNWR (SB#s 147, 216, 489, 596, 658)
6/20/2013 Geoff Grisdale, Devon Lang, Katie Chaplin worked up 2 condors at BCNWR (SB# 206, 370)
6/20/2013 1 Condor trapped at BCNWR (SB# 542)
6/21/2013 13 Condors trapped at BCNWR (SB#s 237, 262, 328, 482, 487, 493, 560, 563, 570, 590, 591, 654)
6/21/2013 Joseph Brandt, Molly Astell, and Ria Boner entered KR13 for second chick exam.
6/22/2013 2 Condors trapped at BCNWR (SB#s 289, 526)
6/23/2013 2 Condors trapped at BCNWR (SB#s 480, 584)
6/24/2013 5 Condors trapped at BCNWR (SB#s 462, 483, 507, 616, 627)
6/25/2013 Joseph Brandt, Laura Mendenhall, and Molly Astell entered OD13 for first chick exam
6/25/2013 Joseph Brandt and Laura Mendenenhall worked up 10 condors at BCNWR (SB#s 262, 289, 480, 507, 542, 563, 570, 584, 616, 627)
6/26/2013) Laura Mendenhall and team worked up 12 condors (Sb#s 237, 328, 462, 482, 483, 487, 493, 526, 560, 590, 591, 654)
6/26/2013 482 transported to LAZ for high lead (62.9 ug/dL)
6/26/2013 Joseph Brandt and Molly Astell entered HC13 for second chick exam
6/27/2013 3 Condors trapped at BCNWR (SB#s 449, 536, 585)
6/28/2013 1 Condor trapped at BCNWR (SB# 648)
6/28/2013 Joseph Brandt, Chandra David, Molly Astell entered PC13 for first chick exam
6/29/2013 2 Condors trapped at BCNWR (SB#s 374, 576)
6/30/2013 1 Condor trapped at BCNWR (SB# 369)

Maintenance:
OD13 nest camera installed and working
Weed wacking at Hopper Mountain NWR: STOP, CROP, LPFS, CROP ATV Trail to SNRI.

Condor Field Program Monthly Activity Report July 2013

Prepared by Joseph Brandt (Supervisory Wildlife Biologist) & Laura Mendenhall

Categories:

Personnel:

Staff

No changes

Interns

Laura McMahon started Feb 25th

Natasha Peters started Mar 25th

Nadya Seal started May 13th

Richard Wilks started May 28th

PU:

7/5/2013 Ventana Wildlife Society collected 5 calves from intern, Laura McMahon

7/5-7/7/2013 Friends Booth at Bear Valley Springs 4th of July Celebration. Geoff Grisdale attended. 100+ visitors

7/8/2013 Rachel Wolstenholme (PNP) attended a CACO work-up and short tour at BCNWR

7/9/2013 Joseph Brandt, Josh Felch, Vince Gerwe, Martin Fletcher presented at BVS Association Meeting

7/10/2013 Geoff Grisdale, Laura Mendenhall, Devon Lang Pryor, Josh Felch, Katie Chaplin attended a chick handling training at the L.A. Zoo

7/10/2013 Pinnacles National Park Condor Team visited BCNWR to collect 4 frozen calves from Laura Mendenhall

7/19/2013 Camping and hazing equipment stolen from BVS campsite (later returned)

7/26/2013 Friends Tour at Bitter Creek. Josh Felch attended

Condors:

2013 Nests

Nest ID	Sire SB#	Dam SB#	Egg ID	Chick SB#	Location	Lay Date	Hatch Date
AB13	21	192	FW113	683	Agua Blanca	2/12/2013	4/10/2013
HC13	107	161	FW213→LA713	tbd	Hopper Cyn	2/14/2013	4/25/2013
HC13x	107	156	FW313*	na	Hopper Cyn	2/19/2013	Na
SP13	247	79	FW413→13Sixu1	690	South Potrero	2/27/2013	4/17/2013
KR13	125	111	FW513	689	Koford's Ridge	2/27/2013	4/17/2013
SC13	328	216	FW613	na	Santiago Cyn	3/12/2013	Na
OD13	63	147	FW713>Dummy	tbd	Orchard Draw	3/23/2013	5/19/2013
GF13	326	428	FW813	na	Grassy Flats	3/30/2013	Na
PC13	237	255	FW913	tbd	Pole Cyn	04/03/2013	5/30/2013

7/01/2013 One CACO trapped at BCNWR (SB#: 21)

7/02/2013 Joseph Brandt, Geoff Grisdale, and Devon Lang Pryor worked up 8 CACO (SB#s: 369, 374, 449, 493, 536, 576, 585, 648); 585 and 648 held in BCFP for bad behavior

7/06/2013 Four CACO trapped at BCNWR (SB#: 107, 125, 247, 255)

7/08/2013	Joseph Brandt, Laura Mendenhall, Steve Kirkland, Rachel Wolstenholme (PNP) worked up 4 CACO (SB#: 107, 125, 247, 255)
7/10/2013	Laura Mendenhall transported 482 from LAZ to BCNWR for release into wild
7/11/2013	One CACO trapped at BCNWR (SB#: 518)
7/11/2013	Joseph Brandt and Josh Felch entered AB13 for 3rd chick exam
7/12/2013	Two CACO trapped at BCNWR (SB#: 326, 467)
7/16/2013	Two CACO trapped at BCNWR (SB#: 509, 630)
7/17/2013	Geoff Grisdale and Chandra David (LAZ) entered KR13 for 3rd chick exam
7/18/2013	Geoff Grisdale and Jenny Schmidt (LAZ) entered SP13 for 3rd chick exam
7/18/2013	Devon Lang Pryor, Katie Chaplin, and Molly Astell worked up 5 CACO (SB#: 326, 467, 509, 518, 630); 518 held in BCFP for bad behavior
7/19/2013	Devon Lang Pryor, Katie Chaplin, and Mike Clark (LAZ) entered OD13 for 2nd chick exam
7/20/2013	Geoff Grisdale collected paint chips from Contractor's Point, ITT West (Angeles National Forest)
7/24/2013	Geoff Grisdale, Laura Mendenhall, and Dr. Karl Hill (LAZ) entered HC13 for 3rd chick exam
7/29/2013	Laura Mendenhall and Katie Chaplin entered SP13 for chick helicopter evacuation; Katie Chaplin remained in SP13 overnight
7/29/2013	Joseph Brandt entered KR13 for chick helicopter evacuation; Molly Astell entered KR13 and remained there overnight
7/30/2013	Joseph Brandt entered SP13 for chick helicopter return
7/30/2013	Josh Felch entered KR13 for chick helicopter return
7/30/2013	Two CACO trapped at BCNWR (SB#: 98, 192)
7/31/2013	Three CACO trapped at BCNWR (SB#: 111, 513, 604)

Maintenance:

Unclogged BCFP interior pool drain
TC12 observation blind moved to HC13 observation point
Dan Tappe and Vince Gerwe leveled ATV container at HMNWR, though not yet usable

Condor Field Program Monthly Activity Report **August 2013**

Prepared by Joseph Brandt (Supervisory Wildlife Biologist) & Laura Mendenhall

Categories:

Personnel:

Staff

Katie Chaplin **Last Day Sept 23rd**

Interns

Laura McMahon **Last Day Sept 4th**

Natasha Peters **Last Day Aug 21th**

Nadya Seal started May 13th

Richard Wilks started May 28th

PU:

8/7/2013 Devon Lang had a call with John McCammon and Ashland Forensic Lab to discuss condor necropsies.

8/14/2013 Friends of the CA Condor toured Hopper Mt. 24 people attended.

8/19/2013 Joseph Brandt, Geoff Grisdale, Laura Mendebhall, & Josh Felch sat in on the Concur Trave system Web-Ex.

8/20/2013 Joseph Brandt, Laura Mendnehall, Geoff Grisdale, & Josh Felch met with Derek Abbott & Tony Mattias of Tejon Ranch to discuss condor activity on Tejon Ranch. Group also toured the ranch.

8/26/2014 Disney World Wide Conservation Fund grant was awarded to SB Zoo for Nest Guarding Proposal ($25,000)

8/28/2013 Joseph Brandt had a call with Joe Burnett (VWS), Rachel Wolstenholme (NPS), and Curtios Eng (LAZ) to discuss coordination and implementation of the CAHFS blood contract.

8/29/2014 Awarded SSP/QRP Condor Telemetry Proposal was awarded for FY14 ($93,261)

Condors:

2013 Nests

Nest ID	Sire SB#	Dam SB#	Egg ID	Chick SB#	Location	Lay Date	Hatch Date
AB13	21	192	FW113	683	Agua Blanca	2/12/2013	4/10/2013
HC13	107	161	FW213→LA713	tbd	Hopper Cyn	2/14/2013	4/25/2013
~~**HC13x**~~	~~107~~	~~156~~	~~FW313*~~	~~na~~	~~Hopper Cyn~~	~~2/19/2013~~	~~Na~~
SP13	247	79	FW413→13Sixu1	690	South Potrero	2/27/2013	4/17/2013
~~**KR13**~~	~~125~~	~~111~~	~~FW513~~	~~689~~	~~Koford's Ridge~~	~~2/27/2013~~	~~4/17/2013~~
~~**SC13**~~	~~328~~	~~216~~	~~FW613~~	~~na~~	~~Santiago Cyn~~	~~3/12/2013~~	~~Na~~
OD13	63	147	FW713>Dummy	tbd	Orchard Draw	3/23/2013	5/19/2013
PC13	237	255	FW913	tbd	Pole Cyn	04/03/2013	5/30/2013

8/8/2013 Joseph Brandt, Josh Felch, Mike Clark (LAZ), Curtis Eng (LAZ) entered AB13 for 120 day Health Check. Chick was tagged.

8/9/2013 Richard Wilks trapped Condor #161 at BCNWR

8/14/2013 Geoff Grisdale, Katie Chaplin, & Cindy Stadler (LAZ) entered KR13 for 120 exam. Chick's Suture site is healed but will wait another month to tag.
8/15/2013 Geoff Grisdale, Mike Clark (LAZ), & Curtis Eng (LAZ) entered SP13 for 120 exam. Check's leg looks good, but will wait another month to tag.
8/15/2013 Devon Pryor, Katie Chaplin, and Geoff Grisdale worked up SB#161.
8/16/2013 Katie Chaplin released SB#161 at HMNWR.
8/18/2013 Natasha Peters trapped #493 at BCNWR for behavioral concerns.
8/19/2013 Natasha Peters trapped #428 at BCNWR for transmitter issues and lead test.
8/19-21/2013 Devon Pryor, Molly Astell (SBZ), Nadya Seal, & Laura McMahon transported 9 condors from Oregon Zoo to Bitter Creek NWR(2 Condors, Josh Felch also assited) and Ventura Office (7 Condors).
8/22/2013 Joseph Brandt & Josh Felch put #628 & #642 in the BCFP for pre-release.
8/22/2013 Joseph Brandt, Josh Felch, Matthew Hillman, Mike Clark (LAZ), & Curtis Eng (LAZ) entered OD13 nest for 90 exam.
8/22/2013 Nadya Seal & Min Winhorst transported 7 Condors to LAZ from Ventura Office. 6 of these birds will be released in Baja California, MX and 1 is for captive breeding at LAZ . SB# 513 was also picked up from LAZ and transported to Ventura Office.
8/23/2013 Josh Felch & Nadya Seal released #513 post lead treatment at LAZ
8/23/2013 Joseph Brandt & Laura Mendenhall entered HC13 for 120 exam, Chick #694 was tagged.
8/29/2013 Will Reed (Vol) & Julian Lange (Vol) observed AB13 chick, #683, fledged.
8/29/2013 Geoff Grisdale worked up #428 at BCNWR. High lead level on field test.
8/30/2013 Laura McMahone transported 428 to LAZ for treatment. Radiograph showed 11 birdshot pellets inside bird. (428 died on 9/4/2013 while trying to surgically remove pellets after her condition worsened.)
8/29/2013 Joseph Brandt and Curtis Eng (LAZ) entered PC13 for 90 day exam.
8/30/2013 Geoff Grisdale and Laura McMahone recovered KR13 chick, #689, from below the nest. Chick fell from nest and died.

Maintenance:
8/8/2013 Josh Felch fixed holes in the wall at the HMNWR ranch house.

Condor Field Program Monthly Activity Report Sept 2013

Prepared by Joseph Brandt (Supervisory Wildlife Biologist)

Personnel:

Staff

No Changes

Interns

Laura McMahon **Last Day Sept 4th**

Nadya Seal started May 13th

Richard Wilks started May 28th

Matt Blois started Sept 9th

Amy List started Sept 23rd

Public Use:

9/3/2013 SWB Joseph Brant presented talk on CA Condors to Kern County Audubon in Bakersfield, CA.

9/5/2013 Friend of the California Condor toured Hopper Mt NWR.

9/24/2013 Joseph Brandt attends the screening of the Condor's Shadow at UC Davis as a benefit for the California Raptor Center.

Condors:

2013 Nests

Nest ID	Sire SB#	Dam SB#	Egg ID	Chick SB#	Location	Lay Date	Hatch Date
AB13	21	192	FW113	683	Agua Blanca	2/12/2013	4/10/2013
HC13	107	161	FW213→LA713	tbd	Hopper Cyn	2/14/2013	4/25/2013
~~**HC13x**~~	~~107~~	~~156~~	~~FW313*~~	~~na~~	~~Hopper Cyn~~	~~2/19/2013~~	~~Na~~
SP13	247	79	FW413→13Sixu1	690	South Potrero	2/27/2013	4/17/2013
~~**KR13**~~	~~125~~	~~111~~	~~FW513~~	~~689~~	~~Koford's Ridge~~	~~2/27/2013~~	~~4/17/2013~~
~~**SC13**~~	~~328~~	~~216~~	~~FW613~~	~~na~~	~~Santiago Cyn~~	~~3/12/2013~~	~~Na~~
OD13	63	147	FW713>Dummy	tbd	Orchard Draw	3/23/2013	5/19/2013
PC13	237	255	FW913	tbd	Pole Cyn	04/03/2013	5/30/2013

9/3/2012 Condor #428 died while in surgery to remove lead pellets from her ventriculous at the Los Angeles Zoo Center.

9/12/2013 SWB Joseph Brandt and BT Devon Pryor perform SP13 nest entry at HMNWR. Chick was healthy and tagged.

9/18/2013 SWB Joseph Brandt, BT Josh Felch, Mike Clark (LAZ), Curtis Eng (LAZ), and Intern Nadya Seal perform OD13 nest entry at BCNWR. Chick was healthy and tagged.

9/18/2013 SWB Joseph Brandt, BT Josh Felch, Mike Clark (LAZ) fit condor #493 with Cellular Tracking Solutions Inc. prototype dummy transmitter at BCNWR.

9/20/2013 BT Josh Felch recovered condor #591 near national cemetery on Highway 223 after being reported dead by DFW warden as being hit by a car. FWS LE contacted. Also collected nearby road kill feral hog.

9/23/2013 Intern Nadya Seal trapped condor #289 after observing an uncoordinated fall from flight pen at BCNWR.

9/24/2013 SWB Joseph Brandt transported condor #289 after testing "High" on field blood lead test kit. #289 also showing clinical signs of lead toxicosis (crop stasis, lethargy, weakness, poor body condition

9/24/2013 Intern Nadya Seal trapped condor #625.
9/25/2013 SWB Joseph Brandt and WB Geoff Grisdale perform PC13 nest entry at HMNWR. Chick is healthy and tagged. (Final nest entry of the 2013 nesting season.)
9/30/2013 Gross necropsy of condor # 591 received. Reports that metal fragments were found in the crop and ventriculous. Prompting target trapping of 13 other condors detected (via GPS) near road kill carcass with #591 prior to being found dead.

Maintenance

9/27/2013 WB Geoff Grisdale completes double door trap at the Hopper Mountain Flight Pen at HMNWR.

Condor Field Program Monthly Activity Report Oct 2013

Prepared by Joseph Brandt (Supervisory Wildlife Biologist)

Personnel:

Staff

No changes

Interns

Nadya Seal started May 13th

Richard Wilks **last day Oct 16th**

Matt Blois started Sept 9th

Amy List started Sept 23rd

Public Use:

10/1/2013 Government shutdown all public use canceled for Oct 2013.

Condors:

2013 Nests

Nest ID	Sire SB#	Dam SB#	Egg ID	Chick SB#	Location	Lay Date	Hatch Date
AB13	21	192	FW113	683	Agua Blanca	2/12/2013	4/10/2013
HC13	107	161	FW213→LA713	Tbd	Hopper Cyn	2/14/2013	4/25/2013
~~**HC13x**~~	~~107~~	~~156~~	~~FW313*~~	~~Na~~	~~Hopper Cyn~~	~~2/19/2013~~	~~Na~~
SP13	247	79	FW413→13Sixu1	690	South Potrero	2/27/2013	4/17/2013
~~**KR13**~~	~~125~~	~~111~~	~~FW513~~	~~689~~	~~Koford's Ridge~~	~~2/27/2013~~	~~4/17/2013~~
~~**SC13**~~	~~328~~	~~216~~	~~FW613~~	~~Na~~	~~Santiago Cyn~~	~~3/12/2013~~	~~Na~~
OD13	63	147	FW713>Dummy	Tbd	Orchard Draw	3/23/2013	5/19/2013
PC13	237	255	FW913	Tbd	Pole Cyn	04/03/2013	5/30/2013

10/2/2013 WB Geoff Grisdale and BT Devon Pryor recover condor #536 from dip tank at Stallion Springs. #536 was highly decomposed. FWS LE contacted.

10/2/2013 BT Josh Felch traps condors #156 and #483 at BCNWR.

10/3/2013 BT Josh Felch traps condors #216, #328, #482, and #568 at BCNWR.

10/3/2013 SWB Joseph Brandt, WB Laura Mendenhall, BT Josh Felch, and PL Mike Brady handle condors at BCNWR. #625 and #216 are released. #156, #483, #328, #482, and #568 are held to be transported to LAZ for elevated blood lead levels.

10/4/2013 SWB Joseph Brandt and PL Mike Brady transport #156, #483, #328, #482, and #568 to LA Zoo for chelation.

10/4/2013 BT Josh Felch trapped condors #98, #107, #147, #369, #449, #480, #518, #594, #627, and #658 at BCNWR.

10/7/2013 SWB Joseph Brandt traps condor #63 at BCNWR.

10/7/2013 SWB Joseph Brandt, PL Mike Brady, WB Geoff Grisdale, BT Josh Felch, BT Devon Pryor handle 11 condors at BCNWR. Condors #63, #98, #107, #147, #658 were released. Condors #369, #449, #480, #518, #594, and #627 were held for elevated blood lead levels.

10/8/2013 SWB Joseph Brandt and BT Josh Felch transported condors #369, #449, #480, #518, #594, and #627 to LA Zoo for chelation.

10/8/2013 WB Geoff Grisdale traps condors #206, #216, #462, #563, #584, #596 at BCNWR.

10/8/2013 WB Geoff Grisdale traps condors #21 and #604 at BCNWR.

10/8/2013 SWB Joseph Brandt and WB Laura Mendenhall radiograph carcass collected on 9/20/2013 at SB Zoo. Carcass was clean.
10/9/2013 SWB Joseph Brandt, PL Mike Brady, WB Geoff Grisdale, BT Josh Felch handled 8 condors at BCNWR. Condors #216 and #563 was released. Condors #21, #206, #462, #596, #584, and #604 were held for elevated blood lead levels.
10/10/2013 SWB Joseph Brandt and WB Geoff Grisdale transported condors #21, #206, #462, #596, #584, and #604 to LAZ for chelation. #206 and # 584 both had bird shot located in their body cavity from being shot but survived.
10/10/2013 WB Geoff Grisdale picks up condors #328 and #568 from LAZ for re-release.
10/11/2013 WB Geoff Grisdale re-releases condors #328 and #568 at BCNWR.
10/16/2013 SWB Joseph Brandt picks up condors #21, #480, #526, and #594 from LA Zoo and re-releases them at the HMNWR.
10/17/2013 BT Josh Felch recovers condor #630 from dip tank in Bear Valley Springs after being reported by BVSPD. #630 is decomposed but intact. FWS LE contacted.
10/19/2013 Volunteer Will Reed observed condor #694 fledge from HC13. Second chick to fledge in 2013.
10/22/2013 WB Geoff Grisdale, BT Josh Felch, Intern Matt Blois, and Intern Amy List at BCNWR prep new releases, condors #637 and #643 and place in double door trap with #542. Condors #599 and #560 re-released after being held for behavior (power pole.)
10/23/2013 WB Geoff Grisdale releases condors #637 and #643. Condor #542 re-released after being held for behavior (BVS.) All condors released at BCNWR.
10/29/2013 Intern Matt Blois trapped condors #370 and #590 at BCNWR.
10/30/2013 Intern Nadya Seal trapped condor #576 at BCNWR.
10/30/2013 BT Devon Pryor picked up condors #156, #369, #584, and #596 from LA Zoo. All birds were re-released at HMNWR.
10/30/2013 WB Laura Mendenhall picked up condors #462 and #632 from LA Zoo. #462 was re-released at BCNWR. Condor #632 is held in BCNWR flight pen as a pre-release.
10/31/2013 WB Laura Mendenhall, BT Josh Felch, Intern Nadya Seal handle 3 condors at BCNWR. Condor #590 was re-released. Condors #370 and #576 were transported to LA Zoo for chelation due to elevated blood lead levels. Condor #627 was picked up from LA Zoo for re-release.

Condor Field Program Monthly Activity Report Nov 2013

Prepared by Joseph Brandt (Supervisory Wildlife Biologist)

Personnel:

Staff

No changes

Interns

Nadya Seal last day Nov 6th

Matt Blois started Sept 9th

Amy List started Sept 23rd

Public Use:

11/6-7/2013 Condor Field Team attends the California Condor Field Team Meeting at LA Zoo.

11/14/2013 Joseph Brandt met with Estelle Sandhuas, Julia McHugh, with writer and photographer at HM for a Zoo News article on the SB Zoo's involvement in the condor conservations. #370, #576, and #604 were photographed (see condor section for transport information of these condors).

11/19/2013

Condors:

2013 Nests

Nest ID	Sire SB#	Dam SB#	Egg ID	Chick SB#	Location	Lay Date	Hatch Date
AB13	21	192	FW113	683	Agua Blanca	2/12/2013	4/10/2013
HC13	107	161	FW213→LA713	Tbd	Hopper Cyn	2/14/2013	4/25/2013
~~**HC13x**~~	~~107~~	~~156~~	~~FW313*~~	~~Na~~	~~Hopper Cyn~~	~~2/19/2013~~	~~Na~~
SP13	247	79	FW413→13Sixu1	690	South Potrero	2/27/2013	4/17/2013
~~**KR13**~~	~~125~~	~~111~~	~~FW513~~	~~689~~	~~Koford's Ridge~~	~~2/27/2013~~	~~4/17/2013~~
~~**SC13**~~	~~328~~	~~216~~	~~FW613~~	~~Na~~	~~Santiago Cyn~~	~~3/12/2013~~	~~Na~~
OD13	63	147	FW713>Dummy	Tbd	Orchard Draw	3/23/2013	5/19/2013
PC13	237	255	FW913	Tbd	Pole Cyn	04/03/2013	5/30/2013

11/4/2013 Molly Astell (SB Zoo) and Ria Boner (SB Zoo) detect mortality signal for condor #690 (SP13 Chick). Rebecca Roca (FWS LE) was contacted by SWB Joseph Brandt. They found #690 dead below the nest and collected the remains. Condor was shipped to National F&W Forensics Lab same.

11/6/2013 Interns Matt Blois & Amy List observe condor #712 Fledge form OD13.

11/7/2013 WB Geoff Grisdale transports condors #206 & #452 from LA Zoo to the HM flight pen.

11/9/2013 Intern Amy List released #206 and #452 from HM flight pen.

11/10/2013 Intern Matt Blois trapped condor #125 at BC.

11/13/2013 SWB Joseph Brandt, WB Laura Mendehall, Intern Matt Blois, and Volunteer Nick Hubeek handled condor #125 at the BC flight pen. #125 was released into the wild.

11/14/2013 SWB Joseph Brandt picked up condors #370, #576, and #604 at the LA Zoo. #576 was released at HM. #370 and #604 were held in the HM flight pen.

11/14/2013 Volunteer Nick Hubeek trapped condor #625 at BC flight pen.

11/19/2013 SWB Joseph Brandt, BT Devon Lang, BT Josh Felch, and Intern Matt Blois prepped condors #628 and #636 for release. Condors #570, #585, #616, and #625 were also handled and released from the BC flight pen. Al Jazera English was present and filmed handling for broadcast about condor recovery.

Condor Field Program Monthly Activity Report DEC 2013

Prepared by Joseph Brandt (Supervisory Wildlife Biologist)

Personnel:

Staff

No changes

Interns

Matt Blois started Sept 9th

Amy List started Sept 23rd

Public Use:

12/11/2013 Geoff Grisdale (WB) and Devon Lang (BT) attended a Connecting People with Nature/Ojai Raptor Center event at Rio Vista Middle School in Oxnard.

12/17-18/2013 Joseph Brandt (SWB), Laura Mendenhall (WB), and Josh Felch (BT) attended SSP Condor GPS Data Management Project kick-off meeting. Second day

Condors:

12/3/2013 Geoff Gridale (WB), Devon Lang (BT), Amy List (intern), and Matt Blois (intern) worked up condors 262, 648 & 654. Prepped pre-release CACOs 632 & 642 for release the following week. (At BC)

12/4/2013 Geoff Grisdale transferred 482 from LAZ to HM.

12/04/2013 D.Pryor trapped 480 due to transmitter malfunction at BC.

12/05/2013 A.List & M.Blois (interns) carcass run collected 13 calves for BC freezer.

12/10/2013 Josh Felch (BT) and Matt Blois (Intern) handled condors #632 and #642 and placed them in DDT of BC flight pen for release next day.

12/11/2013 Josh Felch (BT) released Captive Bred Condors #632 and 642 released at BC.

12/11/2013 Josh Felch (BT) released condors #632 and #642 into wild at BC.

12/11/2013 Josh Felch (BT) trapped condors #79 and #509 at BC.

12/12/2013 Laura Mendenhall (WB) trapped condor #247 at BC.

12/18/2013: Goeff Grisdale (WB), Jospeh Brandt (SWB), Laura Mendenhall (WB), worked condors: 79, 247, 493, 509, and 518 at BC. Re-released 247, 509, and 518. Geoff Grisdale transported Condor 79 to the zoo with a field blood lead level of 35 ug/dL and 493 for patagium repair.

12/18/2013: M.Blois (Intern) A.List (Intern), carcass run +14.

12/27/2013: Josh Felch (BT) picked up condor 79 from LAZ and re-released her at HM.

Maintenance:

12/06/2013 BC freezer broken for a few days but fixed (Thanks Matt.)

Appendix IV Volunteer Hours

In 2013, the California condor field team at the Hopper Mountain National Wildlife Refuge Complex utilized unpaid volunteers and volunteer interns (who 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. Thirty-seven unpaid volunteers and 10 volunteer interns assisted the Service in 2013.

The following table summarizes the number of unpaid volunteer hours and intern volunteer hours spent at each refuge 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	Total Volunteer Intern Hours
January	0	32	32	459	414	873
February	0	0	0	270	360	630
March	56	216	272	351	360	711
April	40	248	288	387	270	657
May	0	304	304	441	171	612
June	16	224	240	360	360	720
July	32	240	272	441	450	891
August	32	152	184	360	270	630
September	8	120	128	414	171	585
October	8	40	48	225	72	297
November	16	96	112	351	90	441
December	0	128	128	243	18	261
Grand Total	208	1800	2008	4302	3006	7308

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