

Pinnacles National Park California Condor Reestablishment – Annual Report 2015



Pinnacles National Park Report
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Cover photo: Scott Scherbinski at Pinnacles National Park releasing an adult condor following handling. NPS Photo by Arianna Punzalan.

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Danielle Powell, Rose Fielding, Patrick Frusetta, Richie King, Diana Muñoz, and Kathy Whyte

Photo: Richie King, radio-tracking condors at Pinnacles National Park. NPS photo by Gavin Emmons.



Photo: Arianna Punzalan, radio-tracking condors at Pinnacles National Park, NPS photo by Richie King.



INTRODUCTION

California condors are one of the rarest birds in the world and biologists have been committed to their recovery for over three decades. The Condor Reestablishment Program at Pinnacles National Park (PNP) has several objectives, with the goal of species recovery in the wild.

Project objectives include:

- 1) monitoring central California condor foraging, movements, nesting, reproduction, and population trends;
- 2) detecting mortalities and recovering condor carcasses so cause of death can be determined;
- 3) managing threats to condors;
- 4) increasing public awareness of threats to condors; and
- 5) conducting cooperative research to aid condor recovery.

Together with the Ventana Wildlife Society (VWS), PNP manages a flock of approximately 80 condors in central California. During 2015, the Pinnacles condor program monitored all birds using the central CA area, as well as monitoring PNP-managed condors that traveled beyond their typical range. PNP-managed condors and VWS-managed condors make up a single flock, overlap in range, feed together, and are captured at both release sites (located in the park and in Big Sur, CA). This report focuses on Pinnacles Condor Program management of birds released from the park but also includes some VWS-managed condor data.

METHODS

Population Monitoring

Condors are monitored year-round to document reproduction, mortality, and movements. Condor health, foraging, interactions, and breeding behavior are monitored through visual observations. Biologists use standard equipment to radio-track, locate, and monitor condors. A detailed equipment list is available in: *Pinnacles National Park California Condor Reestablishment – Annual Report 2013. Pinnacles National Park, National Park Service, Paicines, California. Pp. 20.*

Survival Monitoring

Over one quarter of the condors in central California are monitored remotely via GPS wing tags, Photo 1. Argos GPS data are downloaded daily from CLS America and mapped in ESRI ArcGIS version 10.3. In 2015, PNP also deployed GSM (cell technology) GPS tags manufactured by Microwave Telemetry (MT) and Cellular Tracking Technology (CTT). Data from MT GSM tags are received via email when a tagged condor flies within range of a cellular tower. Data from CTT GSM tags are downloaded from the CTT website. In addition, US Fish and Wildlife Service (USFWS) coordinated with Movebank (an online database of animal tracking data) and USGS to have both traditional satellite and GSM data available through Movebank's online interface as

well as in a daily Google Earth file. PNP staff uses ArcGIS and Google Earth to map and view all condor location data daily.

Radio tracking within and around PNP is conducted five to seven days per week. Biologists use high points to increase probability of hearing a signal. Monitoring outside of the park is conducted along public roads in San Benito County, portions of western Fresno County, northern San Luis Obispo County, and eastern to southern Monterey County. Prolonged stationary GPS locations or mortality signals (triggered by a radio transmitter that is inactive for four to ten hours) are tracked down using a handheld receiver and an antenna to confirm dropped tags or the presence of sick or deceased condors. This activity takes priority above most others to maximize the chance of treating a sick or injured bird or retrieving a carcass before it decomposes. PNP follows USFWS condor carcass collection procedures. Data from daily tracking and monitoring, and all other field activities are entered into Access databases and Excel spreadsheets.



Photo 1. Microwave Telemetry Satellite GPS Tag. NPS photo by Gavin Emmons.

Trapping

Trapping condors is critical to maintain vinyl identification tags and functioning VHF radio and GPS tags on as many individuals as possible. In coordination with VWS, PNP conducted two trapping seasons in 2015 to measure condor blood lead levels, perform transmitter maintenance, and conduct sampling for on-going research studies. The spring trapping season spanned early May through early July. The autumn trapping season was conducted from early October through mid-November. Opportunistic trapping occurred throughout the year for transmitter maintenance or other needs, particularly focused on birds not captured during the spring or autumn efforts.

Before handling condors, biologists receive extensive training in handling, collecting samples, and processing birds from highly experienced LA Zoo keepers and PNP co-workers who are already listed on PNP's USFWS recovery permit as approved handlers. Personal protective equipment (PPE) during handling includes eye protection, long-sleeved shirts and pants, closed-toe boots, and leather and nitrile gloves.

Nest monitoring

Biologists monitor active nest sites from survey locations 300-800 meters from the nest depending on topography. They look for egg incubation, hatching, nestling health, behavioral interactions, adult-nestling feeding events, and fledging of young. Where feasible, biologists enter active nests following standard procedures for egg candling as well as nestling checks, conducted at 30, 60, 90, and 120 days of age. Once a nest site is confirmed, biologists enter the nest when an egg is approximately 30 days old to check if it is fertile, Photo 2. They use a high-

powered flashlight in a dark space to view inside the egg. If an egg is fertile, it is weighed, measured, and left in the nest. If an egg is not fertile, it is removed from the nest and replaced with an artificial egg until an egg laid in captivity is available to replace the artificial one.

During nest entries PPE includes all appropriate climbing equipment, eye protection, and leather and nitrile gloves to ensure staff and condor safety. Biologists and/or a veterinarian check a nestling's blood lead levels, general health, and vaccinate it against West Nile Virus, following scheduled protocols. If a nestling has high lead exposure it is evacuated from the nest for emergency care. Biologists sift nest sites for egg-shell fragments and micro-trash, which are removed when found. Annual nest entry trainings are conducted at PNP and additional technical ropes trainings are planned year-round to keep staff experienced with relevant technical skills.



Photo 2. Nest entry. NPS photo by Gavin Emmons.

Baiting

Biologists use “clean” food supplies acquired from organic dairies and place these carcasses approximately twice per week at one or two of the established bait stations in the park. Other carcasses may also be fed to condors after they are radiographed to ensure there are no foreign or metallic objects in the carcass, such as spent ammunition. Bait stations include the captive pen and Hilltop semi-permanent bait site. Established safety requirements include proper PPE, four-wheel drive training, and placement of carcasses by at least two biologists. Carcass placements are conducted at night to minimize interactions with condors and any associations with humans as food suppliers.

Remote Monitoring

Remote video cameras stationed at the captive facility and Hilltop bait site record real-time data that biologists review to observe individual birds. In addition, memory cards from motion-sensitive cameras at the Hilltop bait site are retrieved each time food is placed and the photographs are reviewed for presence of birds. Weight data are collected using scales with perches mounted near bait. Still photos and video allow biologists to track the general condition of condors.

Non-proffered Food

Non-proffered food is defined as any carcass that PNP or VWS biologists have not placed for the condors at a bait site. When condors are observed feeding on non-proffered food, biologists identify the species of the carcass when possible. Observing condors feeding on private land from public roads means carcass species identification is not always possible. Landowners are only contacted about a carcass on their property when there is a specific concern.

Monitoring Captive Birds

Captive condors are held at PNP's captive pen (also referred to as the flight pen or captive facility), Photo 3, to minimize interactions with humans. An electrified power pole at the flight pen delivers negative reinforcement to modify condor behavior and discourage them from landing on or near power poles when they are in the wild. During handling and prior to initial releases of young juveniles, biologists monitor captive condor health and interactions at the captive pen and through the use of remote video. When captive-reared young condors first arrive at PNP from zoos, they will spend at least 60 days in the facility prior to their release into the wild.



Photo 3. Captive pen (facility), Pinnacles National Park. NPS photo by Gavin Emmons.

Missing Birds

When a condor goes completely undetected by any of our monitoring methods (visual observation, VHF radio signals, remote camera/video images, or GPS locations) for over a week, monitoring efforts increase, such as extending the radio-tracking search area and planning aerial telemetry flights through partner organizations. If staff are unable to locate the bird after an extensive and coordinated search, the bird's status is 'missing.' Following USFWS guidance, missing birds not detected for 12 months are considered dead.

Management

The main threat to central California condors is lead exposure, predominantly from ammunition fragments in scavenged carcasses. Other risk factors may include micro-trash consumption, West Nile Virus exposure, electrocution at or near power poles, and human interactions. PNP biologists adhere to standard procedures and established protocols to study and reduce the impact of these risks.

Treatment

Lead exposure treatment

Trapping condors allows for tag and transmitter maintenance as well as managing risk factors that affect condor survival. Biologists take blood samples to determine blood lead levels each time a bird is captured from the wild. LeadCare Analyzers, suitable for field use, were used to collect immediate results that determined whether a condor needed treatment for high blood

lead levels, Photo 4. The threshold used to initiate chelation treatment was a blood lead value of 35 μ g/dL or greater. In addition to blood sampling, a radiograph at PNP was used to help inform treatment decisions. Condors with blood lead levels between 35 and 65 μ g /dL on a LeadCare Analyzer were radiographed in the Condor Care Unit (CCU) at the park. Radiographs were then emailed to LA Zoo for veterinarian review. Birds with possible metallic densities in their gastrointestinal tract, or any bird with blood lead levels above 65 μ g/dL, were transported to the Oakland Zoo for treatment. Condors with clear radiographs and blood lead levels between 35-65 μ g/dL were treated at PNP when staffing allowed. Some condors with clear radiographs and blood lead levels between 25 and 35 μ g/dL were monitored in the captive facility at PNP for a lead depuration study.



Photo 4. Testing blood sample using LeadCare Analyzer. NPS photo by Gavin Emmons.

Veterinary care

PNP biologists are permitted to conduct basic first aid for superficial wounds discovered during handling. Any treatment requiring veterinary care is conducted by or under the guidance of a permitted veterinarian in the field, at a clinic, or at a zoo.

Vaccination

PNP biologists administer West Nile Virus vaccinations and boosters on a schedule provided by veterinarians. In 2015, the protocol remained the same as recent years, with a goal of

vaccinating 100% of the flock on an annual basis. This protocol was followed for all birds captured in 2015.

Hazing

Hazing is needed when condors endanger themselves by staying in close proximity to humans or human infrastructure. Hazing methods vary depending on location and include clapping and running, clapping wood blocks together, spraying water using a water cannon, using an air horn, and throwing pebbles near, but not at, a condor.

Collaborative Research

In 2015, PNP biologists continued to work closely with researchers at US Geological Survey (USGS) and the University of California at Santa Cruz (UCSC) to gather scientific data measuring condor responses to environmental risk factors. Biologists sent blood samples collected during handling, emergency responses, and nest entries to UCSC to measure isotopic signatures of lead in condors. Feather samples were also sent to UCSC to measure lead exposure events in individual condors over time. The data continued to build clear links between condor lead poisoning and lead ammunition inadvertently ingested by condors when they feed on carcasses (Finkelstein et al., 2010). In 2015, USGS analyzed samples for other types of contaminants in samples collected by PNP in 2013-2014. Results from both studies will be used to confirm and/or detect multiple environmental contaminants condors ingest and how they affect their health and survival. Several new research projects proposed in 2015 to be implemented in 2016 are described later in this report.

Outreach

The PNP Condor Program defines outreach as any activity that provides an opportunity for greater understanding of a particular resource or issue. Activities include but are not limited to: promoting awareness, presenting information, partnership building, education, volunteer efforts, and citizen science programs. Outreach is not stationary or static. Over time and with changing needs, PNP has adapted outreach strategies. Outreach to surrounding communities and those affected by conservation actions on public lands provide an opportunity for greater trust and cooperation between PNP and local residents. Building a foundation of trust and cooperation can lead to partnerships, with the ultimate goal to share resource stewardship commitments together. Outreach is not unidirectional. It builds a foundation that fosters communication and understanding to flow in multiple directions. It increases understanding of needs and concerns beyond the park boundary and opportunities to realize aspects of natural resources that had not been previously considered. This benefits both, immediate and long-term efforts, whether they are directly related to condor recovery, the use of non-lead ammunition, or any community conservation efforts that benefit from greater collaboration. In this report, we use the word outreach as defined here and not limited to one particular activity or topic.

As lead exposure in wild condors continues to be the primary challenge to recovery, PNP Condor Program staff have continued outreach about the impacts of spent ammunition to scavenging wildlife with other park staff, local landowners, ranchers, hunters, and the general public. The Pinnacles Condor Program has dedicated the time of one biologist to conduct outreach and work closely with the Institute for Wildlife Studies (IWS), VWS, and other partners to collaborate on outreach efforts. Additionally, during the course of routine fieldwork, the field staff speaks with park visitors and local residents. Outreach is conducted in the local community, statewide, and at larger scales to address the complexity of this issue, from local perceptions to nationwide non-lead ammunition availability.

Hunting and ranching operations are essential to condor recovery. These operations depend on clean water and healthy habitats to sustain livestock and game species. Condors benefit from the operations for water as well as the availability of nesting and foraging habitat. Carcasses left on the land from hunting and ranching operations are important food for condors, as long as they have not been shot with lead ammunition. Hunters and ranchers already have a long tradition of wildlife stewardship. Increased partnerships and open communication are needed to address the impacts of lead ammunition. The success of condor recovery efforts relies on eliminating condor exposure to lead.

PNP's outreach strategy continues to promote education and voluntary efforts to reduce the impacts of spent lead ammunition on wildlife health. The focus is to keep outreach messages consistent across a variety of audiences. The core concept is focused on the fact that condors benefit from hunting and ranching operations when non-lead ammunition is used. With hunting and ranching audiences, we focus on available alternatives to lead ammunition and how to achieve the best performance from non-lead ammunition. With park visitors and the general public, we stress the need for continued hunting and ranching, as well as how those traditions play a crucial role in wildlife conservation.

Personnel

Implementing a long-term endangered species recovery program requires consistent staff capacity, which results in well-trained, experienced staff. Our program consists of a manager, wildlife health outreach coordinator, two field crew leaders, a biological science technician, and two interns, all working full-time and primarily year-round. An additional wildlife biologist works with the program full-time for six months per year.

Volunteers provide vital program support and receive extensive training prior to assisting in the field. We ask volunteers to make a year-long commitment to the program for a minimum of two days per month. Volunteers assisted in tracking, field observations, and a wide variety of logistical tasks that support management of the species. In 2015, 20 volunteers contributed over 3,500 hours.

RESULTS

Population Monitoring

In January 2015, PNP managed 32 condors, 18 males and 14 females, which comprised approximately half of the flock in central California. The seven captive-reared juveniles that were transferred to PNP in 2014 were released at the beginning of the year and an additional six captive-reared birds arrived at PNP in the fall. Five were females transferred from the Oregon Zoo. The sixth juvenile was a male transferred from the World Center for Birds of Prey. One bird from this cohort was released in December, and the others are scheduled for release in early 2016. In addition, PNP housed an adult mentor bird until mid-April, when that bird was transferred back to southern California.

There were seven nesting attempts that included at least one PNP condor. Of those, three successfully fledged chicks although just one is now a PNP-managed bird (the other two are managed by VWS). Including the captive-reared juveniles awaiting release, and one fledgling, the total population of PNP-managed condors grew to 39 birds, 19 of each gender and the fledgling of unknown gender, by the end of 2015. Combined with birds managed by VWS, there were nearly 80 birds occupying the central CA area, Figure 1.

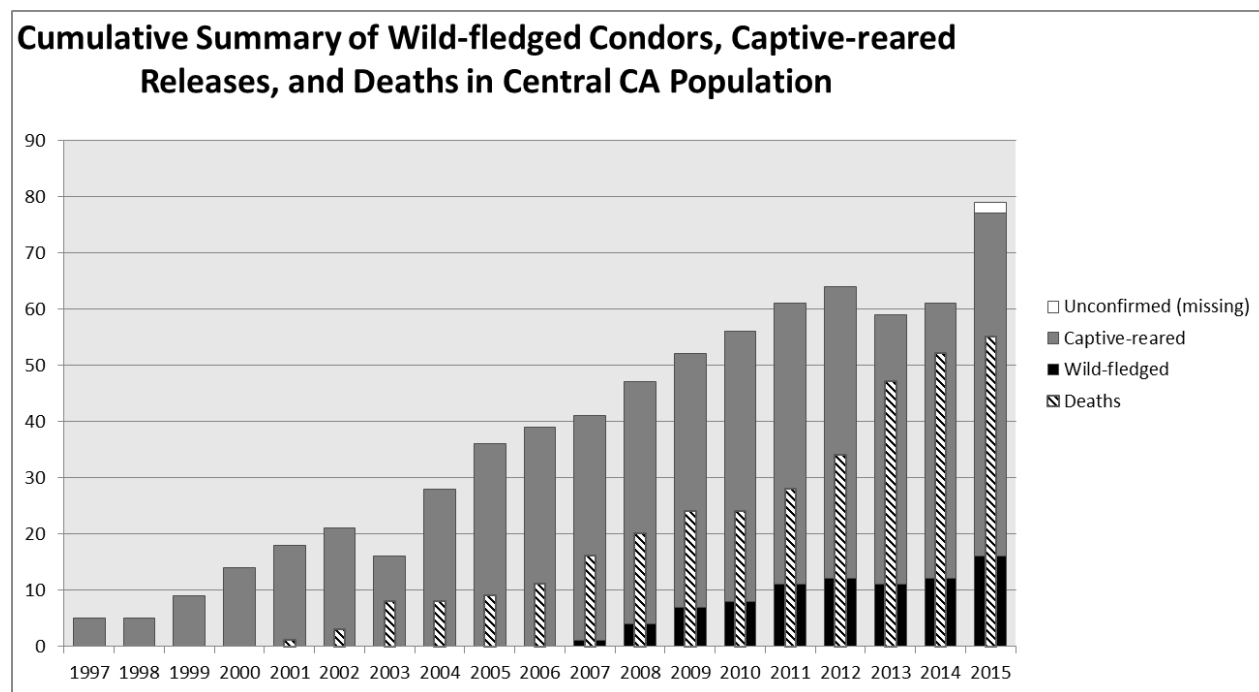
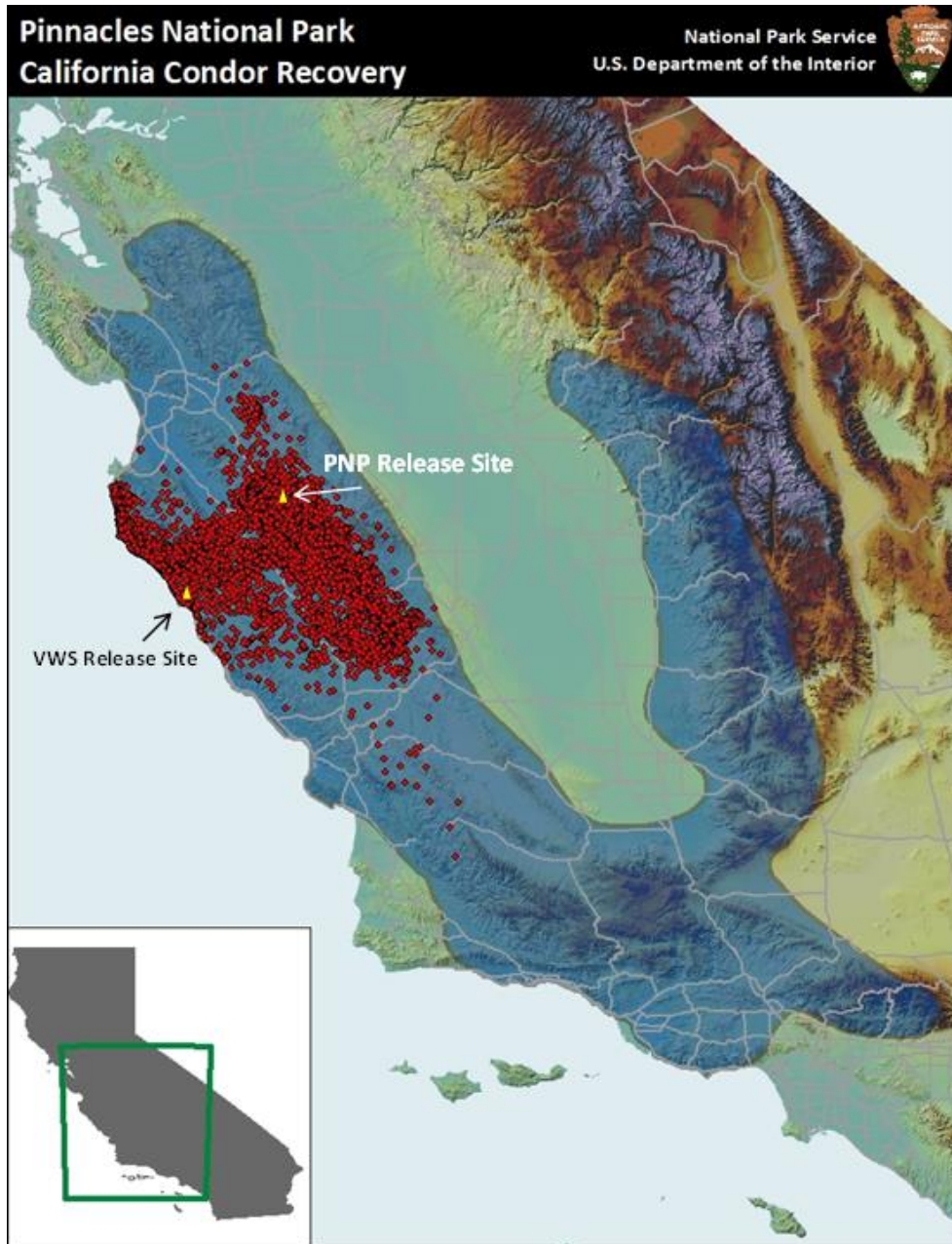


Figure 1. Chart presents total *cumulative* deaths and condors (both wild-fledged chicks and captive-reared) currently managed by PNP and VWS in the central California area. Condors missing <12 months are categorized as 'Unconfirmed 'missing'. *VWS data provided by J. Burnett, Big Sur Condor Program Coordinator and Senior Biologist.*

Survival Monitoring

Throughout the year, PNP monitored radio and GPS-tagged condors almost daily. Condors without functioning tags were observed opportunistically, often when they were near other radio tagged birds that were being tracked. This year, there were 2,807 visual observations of wild condors by PNP biologists. Including birds monitored in captivity, there were 3,755 visuals of condors by PNP biologists. On 312 days of the year, staff recorded at least one visual observation. Whenever possible, biologists closely monitored any condor behaving abnormally and any bird with a GPS tag that did not move in over 24 hours to determine if the individual was injured or sick.



Staff used GPS data to efficiently locate approximately half of PNP-managed birds daily and these data often directed where staff focused efforts for a given day. Over 200,000 GPS locations were downloaded from transmitters on 21 PNP-managed condors throughout the year. Condors released by both VWS and PNP (all condors ranging across central California) used the landscape in all directions surrounding the park. Figure 2 maps a selection of satellite GPS location data from several PNP-managed condors

Figure 2. Location data from selected PNP-managed condors with GPS transmitters in 2015.

and represents the core range used by central California condors in 2015. Because condors are social, monitoring them via GPS transmitters adds great efficiency to locating all released condors, including those with no functioning radio or GPS transmitters.

Long Range Movements

In 2015, the central CA flock had at least six condors fly into the southern CA condor range and beyond. These long-range movements were captured via radio-telemetry, photo, video, but primarily through GPS tag data. Three PNP-managed condors with GPS tags flew well beyond

the typical central CA range: 463, 550, and 564. Figure 3 captures long distance movements by one condor.

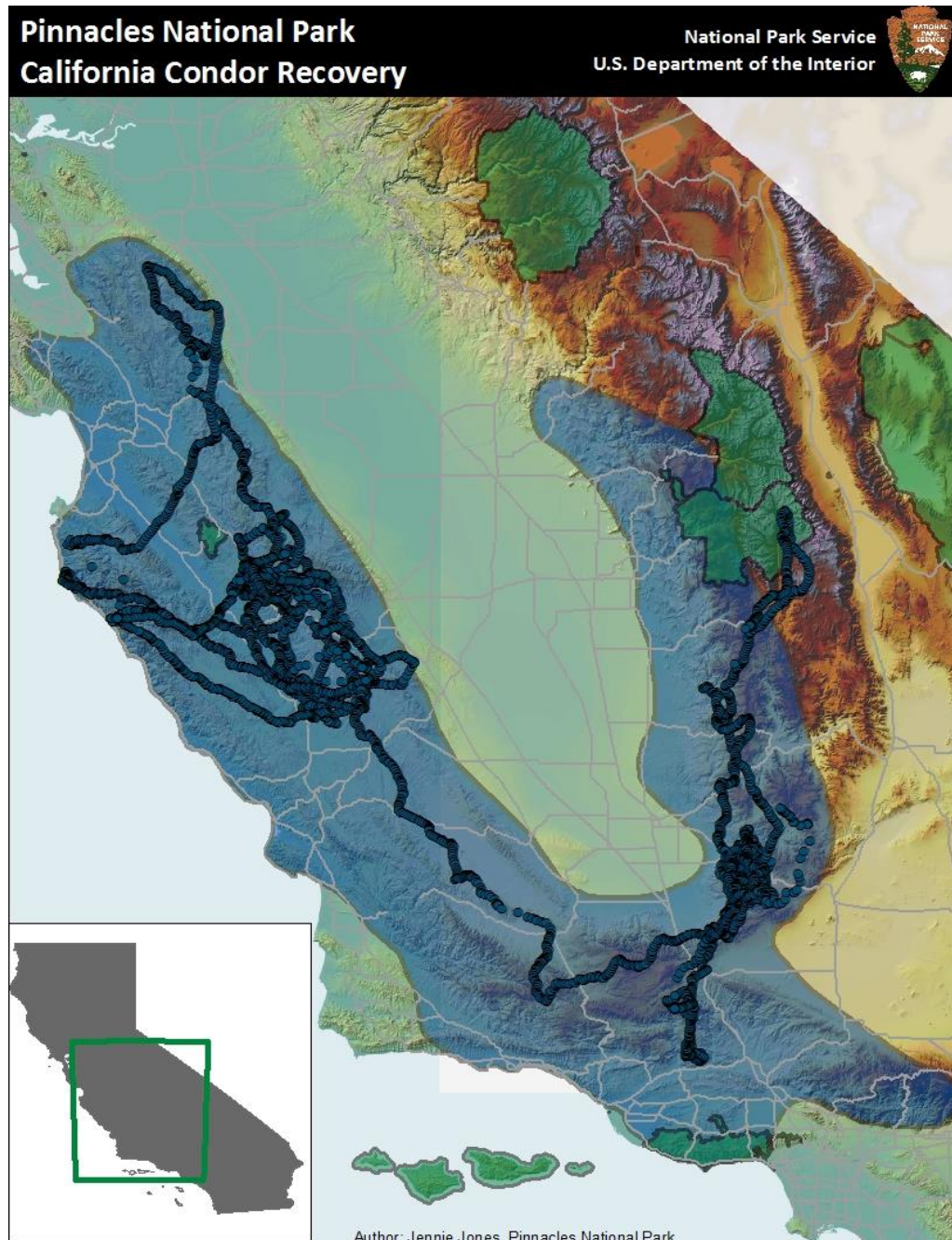


Figure 3. Long-range movement of condor 564 over a period of three weeks.

564: From late August to late September 2015, 564 flew the entire California condor range and beyond. On August 28, 564 flew from Big Sur in Monterey County through San Benito, Merced, Stanislaus, San Joaquin, and Alameda Counties. The next day, he returned to southern San Benito County. Within the next three days, 564 flew south to Santa Barbara County and then northeast to Bear Valley Springs in the Tehachapi Mountains. Based on GPS, that bird was near other condors from the southern CA flock. 564 explored between Bear Valley Springs and Hopper Mountain until September 8, when he flew outside of the California condor historical range to Sequoia National Park, northwest of Mt. Whitney. 564 roosted in southeastern Sequoia NP for several nights, then went between the Tehachapis and southern Sequoia NP one more time before heading back to central CA. Based on GPS data, there was one USFWS-managed condor that went with 564 to the southeastern edge of Sequoia NP, but did not go as far north as 564 did. 564 began his journey back to central CA on September 17 and was seen again in Big Sur on September 20, 2015.

463: On August 12, 2015, 463 flew into Ventura County. Based on data from GPS, he traveled with VWS-managed condors 231, 477, and 567; which also have GPS tags. 463 and the VWS-managed condors began in southern San Benito County. They flew together and roosted within 20 miles of Hopper Mountain National Wildlife Refuge. The next day, GPS showed the birds had returned to central CA.

550: From October 3 to October 7, 2015, 550's GPS data showed her at Hopper Mountain. 550 was wearing a GPS tag that was malfunctioning and data was only received intermittently. Because of this, it is unknown what date 550 flew down to southern CA, when she left, or what path she took. 550 was in Big Sur on the morning of September 27, had GPS data in Hopper Mountain on the evenings of October 3, 4, 5, and 7, and finally GPS showed her back in Big Sur on October 17, 2015.

Mortality

There was one confirmed mortality in 2015 of a PNP-managed condor. This was a chick approximately six weeks old. There were no remains in the nest to collect. Lead poisoning continues to be the primary cause of death for adult condors, Table 1.

Missing Birds

During 2015, Condor Recovery Program partners decided to wait until a condor is missing for one year before reporting it as dead. One Pinnacles condor, 713, has been missing since May 5, 2015. Numerous efforts were made, including two aerial telemetry flights, to locate this bird, however, all were unsuccessful. PNP staff will continue to monitor for this bird until May of 2016 before listing it as a mortality.

Table 1. Condor mortality of PNP and VWS-managed condors since 2001. *VWS data provided by J. Burnett, Big Sur Condor Program Coordinator and Senior Biologist.*

ID	Estimated Date of Death	Managed By	Cause Of Death
230	5/9/2001	VWS	Powerline Electrocution: Bird electrocuted on line (mid-span)
233	5/17/2002	VWS	Missing
212	10/30/2002	VWS	Powerline Electrocution: Bird electrocuted on line (mid-span)
254	2/19/2003	VWS	Powerline Electrocution: Bird electrocuted on line (mid-span)
260	5/20/2003	VWS	Malnutrition
170	6/15/2003	VWS	Lead Toxicosis
256	10/17/2003	VWS	Unknown: Bird recovered in desiccated state
179	12/20/2003	VWS	Missing: Bird disappeared after wild fire at Hopper NWR
164	9/30/2005	VWS	Unknown: Bird recovered in desiccated state
376	6/30/2006	VWS	Powerline Electrocution: Bird electrocuted on line (mid-span)
363	7/14/2006	VWS	Malnutrition: Bird died from poor body condition
417	5/12/2007	PINN	Trauma to neck, possible predator
301	5/15/2007	VWS	Powerline Electrocution: Bird electrocuted on line (mid-span)
307	5/16/2007	PINN	Unknown - possible snake envenomation
356	10/2/2007	VWS	Unknown: Found dead near release site in desiccated state
429	12/4/2007	VWS	Missing
278	6/25/2008	VWS	Missing
377	6/25/2008	VWS	Missing
336	9/7/2008	PINN	Lead Toxicosis
475	12/21/2008	VWS	Trauma
286	5/11/2009	VWS	Lead Toxicosis
503	7/6/2009	VWS	Trash Ingestion
422	7/12/2009	PINN	Unknown
303	10/23/2009	VWS	Lead Toxicosis
621	4/28/2011	VWS	Trauma
624	5/25/2011	VWS	Trauma
294	6/7/2011	VWS	Unknown: Bird recovered in desiccated state
499	11/9/2011	VWS	Aspiration
478	4/21/2012	PINN	Lead Toxicosis
588	7/21/2012	PINN	Unknown
298	10/22/2012	VWS	Lead Toxicosis
644	11/10/2012	VWS	Exposure: hypothermia.
318	11/30/2012	VWS	Lead Toxicosis
598	12/8/2012	PINN	Unknown
312	4/4/2013	PINN	Lead Toxicosis
681	4/13/2013	PINN	Unknown, chick - nothing in nest to recover, no necropsy report
693	9/8/2013	PINN	Unknown, chick - no collection based on remote nest location
715	5/20/2013	VWS	Unknown, chick disappeared
345	5/28/2013	PINN	Lead Toxicosis
686	6/1/2013	VWS	Unknown, chick recovered in desiccated state
335	6/1/2013	PINN	Lead Toxicosis
306	6/9/2013	PINN	Electrocution, possible indirect lead exposure
332	7/2/2013	PINN	Lead Toxicosis
194	7/11/2013	VWS	Missing
708	7/12/2013	VWS	Trauma, chick died in nest
313	8/6/2013	PINN	Lead Toxicosis
714	9/4/2013	VWS	Trauma, chick died in nest
501	9/25/2013	VWS	Missing
451	12/7/2013	PINN	Lead Toxicosis
400	4/29/2014	PINN	Lead Toxicosis
401	6/15/2014	PINN	Lead Toxicosis (proximate) perforation of the ventriculus (immediate)
444	8/26/2014	VWS	Lead Toxicosis
411	12/6/2014	PINN	Unknown: Bird recovered in desiccated state
664	12/31/2014	VWS	Lead Toxicosis
242	7/30/2015	VWS	Lead Toxicosis
769	8/29/2015	VWS	Unknown, suspected trauma
782	5/23/2015	PINN	Unknown, chick - nothing in nest to recover, no necropsy report
788	4/30/2015	VWS	Unknown, chick - nothing in nest to recover, no necropsy report
798	6/10/2015	VWS	Unknown, chick - nothing in nest to recover, no necropsy report
615	11/17/2015	VWS	Necropsy results pending

* For chicks with no carcass recovery, estimated nest fail date used

Trapping

PNP conducted two trapping cycles in 2015: May to early July and October through November. In addition to scheduled seasonal trapping, some opportunistic trapping occurred throughout the year when specific birds were captured for transmitter replacement or behavioral and health issues. Capture success in the spring was limited at PNP and moderate in the fall. Trapping in conjunction with the VWS release site allowed for a greater number of condor captures, particularly in the spring, than trapping at PNP alone. Twenty-eight PNP-managed condors were trapped in 2015 between the PNP and VWS facilities. Thirteen of those 28 were trapped in both the spring and autumn seasons. An additional six condors were trapped opportunistically outside of the regular trapping seasons, Table 2.

Beginning in 2014, staff recorded the total number of days per season when staff were present at the facility with the specific intent to trap birds. In 2015, PNP staff spent 116 person-days trapping and captured 34 individuals, which included opportunistic trapping efforts dictated by the presence of a target bird in the park. Capture data are summarized in Table 2, which only includes condors that were captured at the PNP facility.

Table 2. 2015 PNP trapping effort and captures of PNP and VWS-managed condors at PNP.

Trapping Season	Date Range	Total handling days*	Total captures**	Total individuals captures***	Person Days
Spring	May - early July	8	19	18	57
Autumn	October - November	8	25	24	53
Opportunistic	Year Round	4	6	6	6
	Totals	20	50	34	116

**Days biologists initially handled any condors trapped at Pinnacles. These include condors caught for health checks, transmitter replacements, or as non-targets. Nestling handlings that took place at nests are not included.*

***Number of condors trapped including multiple captures of the same individual during the given time frame.*

****Number of individual condors trapped during the given time frame at Pinnacles.*

Reproduction

In 2015, there were ten nests in central California. Seven of those nests included at least one PNP-managed condor, Table 3. Overall, nine PNP-managed condors attempted to nest this year; four paired with VWS-managed birds, two PNP-managed pairs, and one PNP-managed female in a trio with two VWS-managed males. Included in these numbers is a female-female pair, one from each organization. There were five fledglings from the central California flock this year, three from pairs that involved PNP-managed condors. Two nests were remote and never visually confirmed, but GPS and parental behavior suggested the chicks fledged and they were

later visually confirmed. Figure 4 includes seven 2015 nests of PNP-managed birds that had eggs, including the double female pair that had two eggs. The status of four of these nests was inferred via GPS data from one or both of the parents.

Table 3. 2015 central California nesting summary. *VWS data provided by J. Burnett, Big Sur Condor Program Coordinator and Senior Biologist.*

Nest ID	Nesting male	Nesting female	Wild egg ID	Estimated lay date	Wild Egg Fate	Foster Egg Used?	Foster egg ID	Nestling studbook	# of Nest Entries	Nest Outcome
SF	199	438	CC215	2/16/2015	Wild egg hatched in nest	No	NA	789	0	Fledge
TC	204/470	534	CC815	2/27/2015	Wild egg hatched in nest	No	NA	798	0	Failed
SMC	Unk	317/171*	CC515/CC915	2/17/2015	Both failed, infertile	Yes	15HOS11	787	2	Fledge
PC	251	222	CC115	2/1/2015	Failed, egg crushed	no	na	na	1	Failed
PC	251	222	CC615	2/26/2015	Failed, egg crushed	Yes	LA115	773	2	Fledge
SB2	330	375	CC715	2/27/2015	Wild egg hatched in nest	No	NA	800	0	Fledge
LP11	340	236	CC415	2/17/2015	Wild egg hatched in nest	No	NA	782	3	Failed
NM2	351	418	CC315	2/16/2015	Wild egg hatched in nest	No	NA	788	1	Failed
SB	405	525	CC1015	3/20/2015	Failed, unknown	No	NA	NA	0	Failed
AC	167	190	CC1115	3/10/2015	Wild egg hatched in nest	No	NA	799	3	Fledge

Note* * Female/female nest; unknown which egg laid by which female, both failed and infertile

PNP Condor Nesting Details

PNP and VWS manage nests based on geographic location and ease of monitoring as opposed to who manages the parent condors. In 2015, PNP managed three nests: one in the park and two in southern San Benito County on private property. Condors 340 and 236, the new resident pair within the park, attempted nesting for the first time this year. 340, an 11-year old PNP-managed male, paired with 236, a 14-year old, VWS-managed female. His previous mate, 444, died of lead poisoning in 2014. PNP dedicated 34 hours observing the nest that had formerly been used by 340 and 444 in 2013. Together with project partners, PNP performed three nest entries: egg fertility check, hatch check, and 30-day nestling check. Shortly after the 30-day check, both 340 and 236 were observed out of the nest for long periods of time, indicating likely nest failure. PNP did a nest check on May 30, 2015 and confirmed an empty nest with no indication of what happened to the nestling.

The other two PNP-managed nests were in southern San Benito County. One pair included an eleven-year old PNP male, 330, and a 10-year old VWS female, 375. 330 has no working radio or GPS transmitters. All nest monitoring was based on 375's GPS transmitter. Due to the remote location of this nest, it was never visually confirmed. As 375 regularly returned to the nest site through the rest of the year, it was assumed that the chick fledged. The unmarked fledgling was later seen feeding on a non-proffered carcass with 330 in San Benito County. The other pair to nest in San Benito County involved both PNP-managed birds: 405, a nine-year old male, and 525, a six-year old female. This nest was also monitored solely through GPS data and failed prior to the estimated hatch date.

PNP Nesting Summary 2009-2015

Both VWS and PNP intensively managed condor nests to maximize the likelihood of success. This includes replacing infertile eggs with viable ones, monitoring the health of nestlings, providing care or treatment if needed, and the removal of micro-trash if found within nest

cavities. Therefore, interpreting nesting results requires consideration of our active management strategies, which increase the chance of nest success. In addition, a greater number of condors in the central CA area reach breeding age each year, therefore increasing the number of nesting attempts. The first nest ever to include a PNP-managed condor was in 2009. Nesting attempts by PNP-managed condors have increased over time, Figure 4. A decline in the number of eggs in 2014 was most likely due to mortality of seven breeding-age condors the previous year.

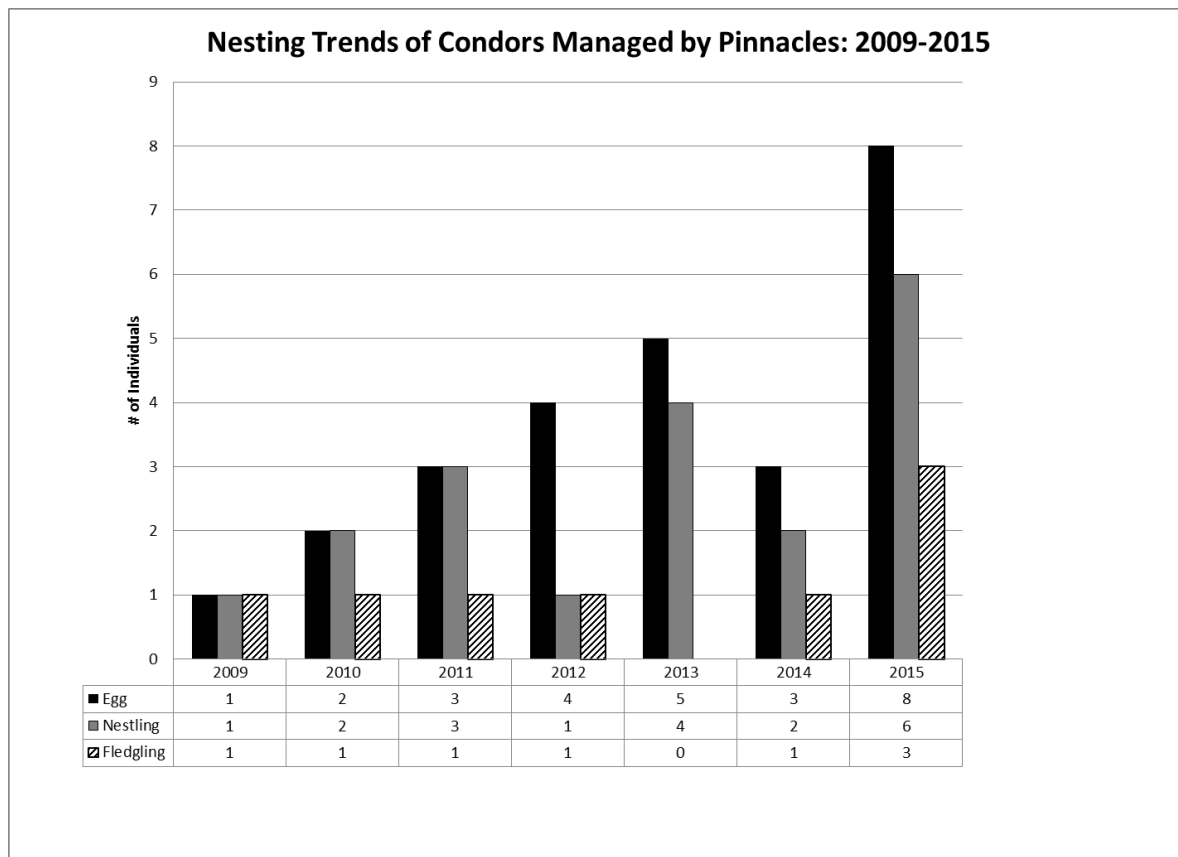


Figure 4. Egg, nestling, and fledgling counts for PNP-managed condors since 2009. *Note: These data include nests that had a PNP-managed breeder but the nestlings were not necessarily a PNP-managed bird because VWS and PNP manage nestlings based on nest location, not parents.*

Microtrash at nest sites

During nest entries, staff search for microtrash within the nest. Since 2009, 43 nest entries were conducted which resulted in locating and removing microtrash from 4 nests of 11 total monitored. Trash included items made of plastic, rubber, PVC pipe pieces, and a bottle cap. Trash items weighed between .1 to 26.9 grams.

Baiting

In 2015, proffered carcasses were placed at two locations in PNP: the captive pen and Hilltop. Most of the carcasses were calves procured from organic dairies in Modesto, CA. In 2015, we

placed 175 calves, one coyote, one pig and one horse for condors. Of those 175 calves, 127 were used to bait the facility to feed captive condors. During trapping seasons carcasses were placed exclusively at the captive pen to increase trapping success.

Remote Monitoring

To supplement radio and GPS monitoring, thousands of still photos and video hours were collected and reviewed regularly, throughout the year, Photo 5.



Photo 5. Photo taken with remote camera.

Non-proffered Food

Biologists observed eight non-proffered feeding events including over 40 individual observations of condors feeding on non-proffered food sources. Biologists identified condors feeding on one calf, one cow, one coyote, one pig, one bird, one deer, and two unidentified carcasses.

Management

Captive-bred Releases

In 2015, PNP released eight captive bred condors into the wild. Seven were juveniles that PNP had received from the USFWS in October 2014. These seven were released between the months of January and April 2015. In September, PNP received five female juveniles from the Oregon Zoo. A pre-release male was received from the World Center for Birds of Prey in Idaho via USFWS in November. One of the female juveniles was successfully released in December. The rest of the pre-release juveniles are scheduled to be released in early 2016.

Lead Sampling

Blood lead level sampling continued to be a priority management action for any bird captured at PNP, whether captured during a scheduled trapping season or opportunistically. Figure 5 summarizes the lab blood lead values for all PNP condors. In 2015, a total of 29 PNP-condors were tested. Birds below 35 µg/dL on our field lead test kit do not receive chelation treatment, based on current recovery program protocols, however, the lab value may be greater. In addition, some condors captured at PNP with field test kit blood lead levels between 25 and 35 µg/dL were radiographed and held for a lead depuration study.

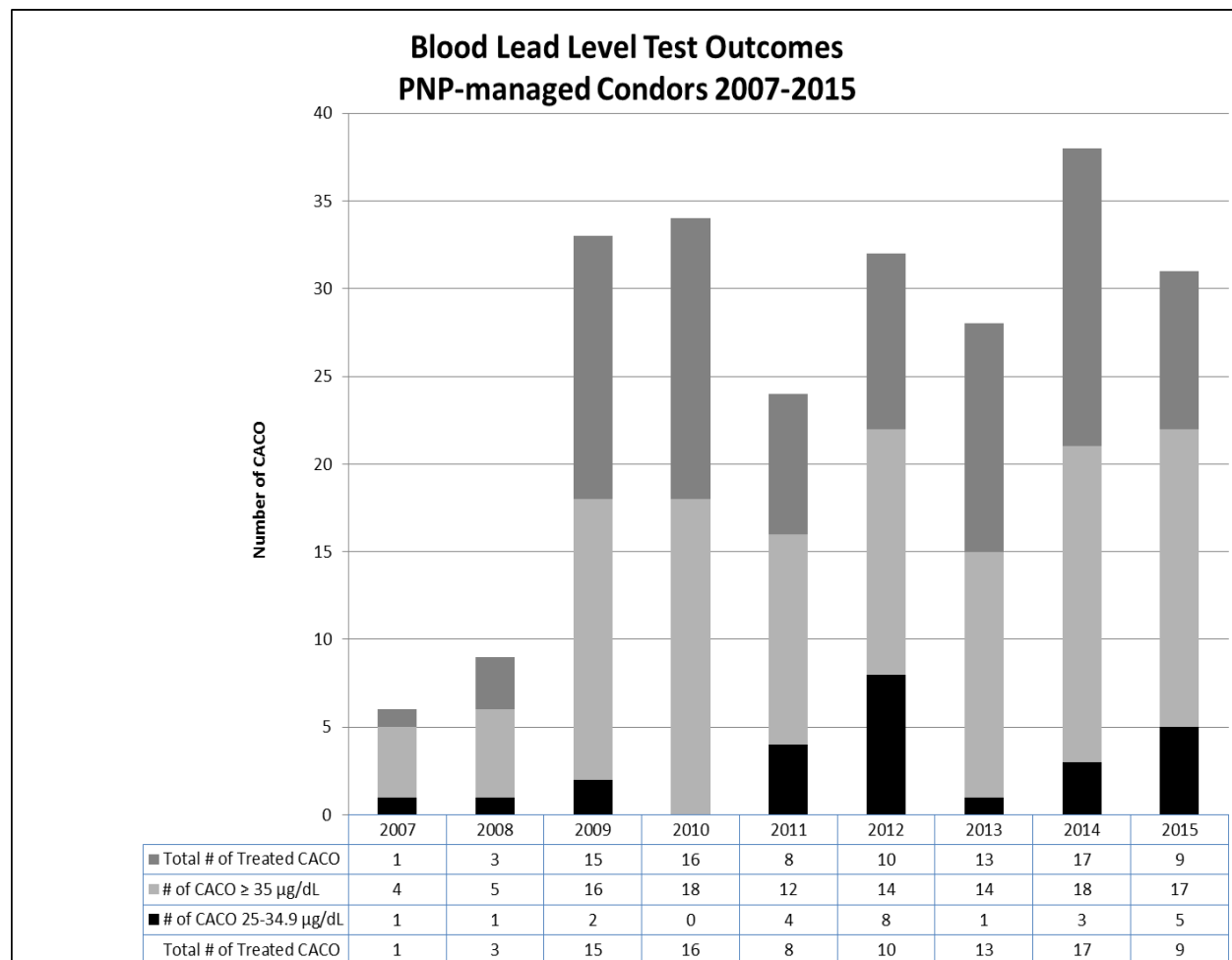


Figure 5. Treatment and blood lead values for PNP-managed condors 2007–2015.

Treatment

Chelation

In 2015, nine Pinnacles condors were treated for elevated blood lead levels. Two birds were treated at two different times in the year. Chelation treatment for birds with field lead values between 35 µg/dL and 65 µg/dL were administered in PNP's CCU and those greater than 65 µg/dL or showing clinical signs of lead poisoning were treated at the Oakland Zoo. PNP staff

treated six condors in the CCU, including two VWS-managed condors. The Oakland Zoo began treating condors for lead poisoning in 2014 and this year five PNP condors were treated there. Results from blood lead sampling vary by year. Figure 5 summarizes PNP-managed condors' blood lead level data received from laboratories since 2007, as well as the number of condors that received chelation treatment.

Radiographs

Condors with blood lead levels greater than 35 µg/dL based on the LeadCare Analyzer were radiographed by PNP, zoo staff, or veterinarians to determine whether metallic densities were present. All condors that were taken to Oakland Zoo for chelation treatment were radiographed by veterinary staff there. PNP radiographed condors with elevated lead levels, Photo 6, to help determine whether birds should be treated at the park or taken to zoos, Table 4.

Table 4. Radiograph information for PNP-managed condors and VWS condors radiographed at PNP in 2015.

Bird	Clinic	Purpose of Radiograph	Density observed in Radiograph	Outcome
231	CCU	Elevated Lead	No	N/A
405	CCU	Elevated Lead	No	N/A
431	Oakland Zoo	Elevated Lead	Yes, one fragment in the lower GI	Fed rat skins, and the bird cast out the fragment the next morning
525	Oakland Zoo	Elevated Lead	No	N/A
534	Oakland Zoo	Elevated Lead	No	N/A
569	CCU	Elevated Lead	No	N/A
589	Oakland Zoo	Elevated Lead	No	N/A
602	CCU	Elevated Lead	No	N/A
602	CCU	Elevated Lead	No	N/A
606	CCU	Elevated Lead	No	N/A
626	Oakland Zoo	Elevated Lead	No	N/A
684	CCU	Elevated Lead	No	N/A
704	CCU	Elevated Lead	No	N/A
704	CCU	Elevated Lead	No	N/A

**This table captures all PNP birds radiographed either at PNP or elsewhere and any VWS birds that were radiographed by PNP. Some birds were radiographed more than once, which is indicated by multiple entries in this table.



Photo 6. PNP staff prepping to radiograph a condor at the PNP CCU. NPS photo by Gavin Emmons.

Surgeries

In 2015, one PNP-managed condor required surgery. A VHF radio transmitter that had been on condor 688's wing broke apart and tore the patagial hole. 688 was trapped on June 2, 2015 and inspected the following day. On June 4, 2015, Dr. Wells performed a patagial repair at the Monterey Avian and Exotic Clinic and the bird fully recovered.

Vaccination

In 2015, West Nile Virus vaccinations were given to 27 PNP condors, following the existing protocol of one vaccination per year. Condors not captured did not receive a vaccination.

Hazing

In 2015, staff hazed eight condors. Five of them were hazed twice during the year.

Collaborative Research

Chelation Efficacy Research

A PNP/UCSC chelation efficacy research study began in 2015 to evaluate the benefits of chelation on condors over time in terms of reduced mortality. Blood and feather sample

collection supported this effort, Photo 7. Evaluating lead concentrations and isotopic compositions in sequential feather segments from individual birds will provide data on the degree, frequency, and severity of lead exposures in California condors. These data will be considered with chelation history of individual birds. PNP measured and marked at least one growing feather when a condor had any growing primaries at the time of capture. If a condor had molted a previously sampled feather, we collected another sample when possible. In addition, during each initial handling of a condor we collected a blood sample.



Photo 7. Blood sample collection during condor handling at PNP. NPS photo by Gavin Emmons.

Contaminants Study

This research is a collaboration between PNP and USGS in Portland, OR. The purpose is to identify contaminant threats to condor health and assess nutritional adequacy of food resources to evaluate current management strategies and better understand ways to minimize risk to environmental contaminant exposure. The research is focused on four contaminant groups to which condors are likely exposed: Polychlorinated biphenyls (PCBs), Organochlorine pesticides (OCs); Polybrominated diphenyl ethers (PBDEs), and Mercury (Hg). Primary objectives include: analysis of condor food resources for contaminants and nutrient composition; analysis of wild condor blood samples for contaminants, and quantification of relative contributions of the variety of food sources to condor diets using stable isotope analyses. Sample collection began in 2013 and continued through fall 2014. USGS worked on data analysis for this research during 2015 and results should be published in 2016.

Chelation Treatment and Lead Depuration Study

To better understand chelation effectiveness in condors, PNP took blood samples from birds that required treatment after they received two and four chelation treatments and then analyzed these samples for their lead values. These data will indicate how fast chelation treatment reduces the lead load in condors. In addition, we assessed natural lead depuration when chelation treatment was not given by collecting blood samples once per week for a two week period from condors with field blood lead values >25 and <35 $\mu\text{g/dL}$. These data may help inform future chelation effectiveness research. This work will continue in 2016.

Blood Parasite Research

In collaboration with USFWS, VWS, and PNP, San Francisco State University (SFSU) researchers will analyze blood samples collected for parasites that can be associated with diseases, such as avian malaria. This two year study will involve a small blood sample, <1 ml from 30 or more individual condors. All sample and data analyses will be conducted by researchers at SFSU. Sample collection for this research is planned for 2016–2017.

Rodenticide Exposure Research

Research and sampling conducted on Prairie falcons within PNP in 2014 detected exposure to highly toxic, second generation rodenticides, thereby raising concerns that condors may also be consuming food contaminated by these toxins. In conjunction with PNP Wildlife staff and NPS NRSS Biological Resources Division, an initial set of samples of blood from live condors and liver tissue from condor carcasses was submitted for laboratory analysis. The preliminary results, particularly of the liver samples, showed that some condors were being exposed and highlighted the need to continue this research to collect more samples over multiple years. The collaboration with the NPS Washington office will continue and a proposal for work with USGS on this research has been developed for FY17 funding.

Outreach

A large component of the Condor Recovery Program is educational outreach and interpretation. As the only condor release site in a national park, park visitation gives staff an opportunity to reach thousands of people from all over the world. Providing the public with information about the natural resources in the park and the surrounding landscape is an essential pathway to inspire environmental consciousness and enthusiasm and is also one of the duties of a national park.

In 2015, the condor program continued to expand interpretive contacts (in-person discussions about condors and the recovery program). While in the field, biologists and trained volunteers were available to answer questions and provide visitors with informal interpretation about condors. Condor staff and volunteers spoke with 5,332 park visitors within the park and 52 individuals while tracking outside of the park boundary. In addition to informal contacts, biologists presented six educational programs to over 255 visitors.

2015 also saw the beginning of the 'Pinnacles Condor Experience', an outreach and fundraising program through the Park's formal non-profit Friends group: Pinnacles Partnership. This new educational outreach program provided free lectures on condors at REI stores around the Bay Area and Central Coast. In addition, there were three guided hikes at PNP with multiple biologists providing information and interpretation on the condor program.

Outreach about lead as an environmental contaminant is recognized as one of the most important actions that can positively impact condor recovery. PNP staff employed various outreach funds and efforts to educate diverse groups on the impacts of lead on condors, other wildlife, and human safety, as well as the benefits of removing lead from the landscape. The primary partner for non-lead outreach was IWS. PNP also had opportunities to offer technical support to VWS for their Free Non-lead Ammo program.

Targeted Non-lead Outreach

This year marked the tenth year of conducting outreach related to the use of non-lead ammunition and lead poisoning in condors from the inadvertent ingestion of spent ammunition from animal remains left in the field. Outreach is not a short-term effort but one that requires a long-term commitment. In looking back over the past ten years, it is important to note the progress that has been made. The general public, NPS staff, hunters, ranchers, and wildlife managers are increasingly aware of this issue and of means to reduce lead exposure in wildlife. With increasing awareness of this issue, the outreach efforts continue to expand partnerships with a wide variety of individuals, organizations, and agencies. Availability and options for non-lead ammunition continue to grow each year. Research continues to be conducted and published to further the understanding of lead poisoning. Through this long-term commitment to non-lead outreach, the park and partners at IWS, are routinely asked for assistance by interested parties working to address this issue.

Legislative and regulatory efforts are tools for reducing the impacts of lead ammunition to non-target wildlife but are not simple solutions to this complicated issue. Additionally, these efforts can create challenges to outreach, as they are generally viewed as unfair and unnecessary by hunting and ranching communities. A prime example of this was the first non-lead shooting demonstration held in 2006, which was sponsored in cooperation with several organizations representing shooting sports. One year later in 2007, with the passage of AB 821 in California, these and other key groups shifted their stance on this issue and focused on overturning legislation rather than continuing to work collaboratively toward a mutual solution. The passage of AB 711 in California and threats of litigation in Arizona continue to challenge collaborative efforts as organizations and agencies involved in these measures expend time and resources on addressing opposing viewpoints rather than focusing on common goals and solutions.

Signed into law in 2013, AB 711 requires the use of non-lead ammunition to be used for the take of all wildlife in California. This bill requires a stepped implementation plan that is scheduled to be completed by July 2019. The first phase of this plan was implemented in July of 2015, requiring the use of non-lead ammunition for the take of any animal on state wildlife

areas and ecological reserves and for the take of Nelson bighorn sheep. The next phase takes effect in 2016, requiring the use of non-lead ammunition for shotguns, excluding hunts for doves, quail, snipe, and those through licensed game clubs. Non-lead ammunition is a new tool for many hunters. One of the challenges in requiring the use of a new and different tool without education on its use has resulted in poor performance and a lack of confidence in the ammunition. In 2015, PNP refined its outreach messaging to address questions specific to this law.

Table 5. 2015 IWS and PNP Non-lead Outreach Events.

Date	Days	Event	Location	Type of Participation	Contacts
1/8/2015	4	ISE Sacramento	Sacramento, CA	Booth	1251
1/20/2015	1	Southern California Friends of the Condor	Ventura, CA	Presentation	20
1/26/2015	1	San Benito County Fish and Game Advisory Board Meeting	Hollister, CA	Update	9
2/1/2015	3	Society of Range Management Annual Meeting	Sacramento, CA	Table, Presentation	190
2/12/2015	1	Pinnacles National Park Seasonal Interp Training	Pinnacles, CA	Presentation	30
2/24/2015	3	Montana Wildlife Chapter Annual Conference	Helena, MT	Toolkit	n/a
2/27/2015	3	Central Valley Sportsmen's Show	Bakersfield, CA	Booth	229
3/28/2015	2	Windwolves Preserve Open House	Maricopa, CA	Booth	141
3/29/2015	4	George Wright Society Conference	Oakland, CA	Table, Presentation	60
4/11/2015	1	Advanced Hunter Ed Clinic Deer	Victorville, CA	Table, Shooting Demo	40
4/16/2015	1	Central Coast Rangeland Coalition Fall Meeting	Carmel Valley, CA	Table	35
4/18/2015	1	Advanced Hunter Ed Clinic Pig	Lockwood, CA	Table, Presentation	65
5/1/2015	2	CADFW Hunter Ed Instructor Conference	Olympic Valley, CA	Table, Ammo Raffle	155
5/11/2015	4	11th Biennial Western States Deer and Elk Workshop	Canmore, Alberta, Canada	Toolkit	n/a
5/16/2015	1	Advanced Hunter Ed Clinic Pig	Gilroy, CA	Table, Shooting Demo	45
5/21/2015	1	SF Bay Area National Park Science Symposium	San Francisco, CA	Table, Presentation	40
5/30/2015	1	California Deer Association SoCal Chapter Dinner	San Bernardino, CA	Table, Ammo Raffle	107
6/6/2015	1	Advanced Hunter Ed Clinic Deer	Gilroy, CA	Table, Shooting Demo	45
7/11/2015	1	Albany Rifle and Pistol Club	Albany, OR	Toolkit	n/a
7/27/2015	1	Winchester Gun Club	Santa Barbera, CA	Demo	15
8/29/2015	1	Ojai Valley Gun Club	Ojai, CA	Shooting Demo	15
9/6/2015	1	Vulture Awareness Day Santa Barbara Zoo	Santa Barbara, CA	Table	53
10/3/2015	1	Youth Quail Hunt Mojave National Preserve	Kelso, CA	Table, Ammo Donation	92
10/7/2015	1	Sespe Hunters BBQ	Fillmore, CA	Table	35
11/6/2015	1	Southern California Fish and Game Advisory Board Meeting	Los Angeles, CA	Presentation	14
11/7/2015	1	Pinnacles Partnership Condor Experience	Pinnacles, CA	Table, Presentation	22
11/20/2015	1	Non-lead Workshop OR Zoo	Portland, CA	Panel Discussion	88
12/1/2015	1	Hollister Ranchers Workshop	Hollister, CA	Table, Ammo Raffle	23
	45				2819

Over the past year, PNP and its partners participated in a total of 25 events over 37 days and had conversations with 2,819 individuals (these numbers do not include informal conversations or discussions that took place throughout the year with local community members and others interested in the issue), Table 5. The data include events that IWS and PNP staff did not attend but supported by sending outreach toolkits and discussing messaging in advance with partners presenting these materials at their own events. These included three events over eight days conducted by partners in Oregon and Montana. Although important, these events are difficult to quantify in terms of number of conversations or contacts made. IWS and PNP staff have worked together over many years to be consistent in how to quantify outreach contacts.

Important events and changes to outreach in 2015 include: the Oregon Zoo hiring an outreach coordinator, increased coordination among condor recovery partners, IWS contracting a Range

Rider, a multi-agency Monterey Condor Workshop, and IWS losing their central California outreach coordinator position. The Oregon Zoo worked with a variety of partners to hire their Wildlife and Lead Outreach Coordinator. The addition of this position expands partnerships and the geographic scope of outreach. Key outcomes of the Monterey workshop were conversations on the continued need for outreach and the need to prioritize work on collaborative outreach strategies and agency policies.

Unfortunately, IWS's Non-lead Outreach Coordinator position for central California became vacant at the end 2015. This position had been maintained in various capacities since 2007 but with limited available funding, IWS decided not to fill this position until funding is secured. Even with increased capacity from staff in southern California, the loss of this position will have a negative impact on outreach in California and beyond. Successful outreach is dependent on individual relationships, which take time to develop and are not easily transferred. In addition reduced outreach staff capacity limits the ability and flexibility to attend multiple, concurrent events.

In 2016, PNP and IWS will continue to look for opportunities to develop new partnerships and expand outreach. Misinformation continues to be one of the significant challenges for non-lead outreach. Staff continue to receive questions and criticism that spent lead ammunition has not been documented as having a negative impact on condor survival or the health of other scavenging wildlife. To address this need for accurate information, PNP and IWS continue to update the huntingwithnonlead.org web site and associated social media outlets. Staff also hopes to continue working with new partners and at outreach venues to broaden the scope of outreach and increase accessibility to accurate information and resources. However, in order to do this, an increase in outreach funding is essential.

General Community Outreach

PNP is surrounded by private lands, which provide condors and many other native wildlife species with important habitat. The Pinnacles outreach program includes: building relationships with land owners and managers to foster communication, helping address any human/wildlife conflicts, and creating trust within the community. PNP requests permission to access private lands as needed to locate dropped transmitters, sick or injured birds, and possible nesting activity. These informal meetings, as well as radio tracking along public roads, create opportunities to answer questions about the condor program and interact one on one with land managers and local residents who can have a direct positive impact on condor survival. Ranching and hunting lifestyles are not only compatible with, but are necessary to condor recovery in central California. Working together with the community, the hope is that these traditions remain viable in the lands surrounding the park.

After securing funding for an IWS Range Rider in 2014, a position that supports activity connecting PNP with the surrounding community and implements projects that mutually benefit ranching operations and habitat conservation, IWS contracted a local resident in San Benito County to fill this role. Building off previous knowledge of the area and efforts by the San Benito Working Landscapes Group, the Range Rider program successfully completed one ranch

cleanup/tire recycling project, assisted in distributing non-lead ammunition to local landowners and residents, assisted with pest species management, and started planning for work on water resource improvements that will benefit both livestock and wildlife.

RECOMMENDATIONS

Monitoring

Maintaining staff capacity and efficient monitoring creates a well-rounded program, including outreach and research components that are coordinated with condor management. The 2015 increase in the number of condors with GPS tags increased monitoring efficiency by reducing the number of 'missing' birds that were difficult to locate and by guiding the field crew's efforts after viewing GPS data each morning. Further increasing the number of birds with GPS tags would simultaneously result in more data of higher precision and better use of personnel time. In addition, although nest monitoring via radio tracking, observations, and GPS tags are sufficient to determine nest location and outcome, these tools cannot necessarily address questions on the fate of an egg or nestling. PNP received funding to install nest cameras into accessible 2016 nests to help address these questions.

Management

Lead in the environment remains the primary threat to condor recovery. Condors will continue to use the public and private lands from PNP to the coast that offer excellent foraging and roosting habitat. Addressing the threat of lead on all these lands is an ongoing need and focus, as is providing the best care possible to condors exposed to lead. A greater understanding of the efficacy of chelation treatment will help all condor recovery programs and release sites determine when it is most useful. PNP recommends chelation treatment for condors be further researched and reviewed to increase the understanding of the options it provides. The NPS/UCSC collaboration on the chelation efficacy research is funded and will continue through 2018.

Research

Each research project conducted to date has informed management decisions that affect the recovery of the species. PNP biologists continue to work closely with researchers and prioritize the collection of samples and data that support scientific research. With funding for research limited, PNP recommends all condor release sites and recovery partners work together with USFWS leadership to discuss highest priority needs, research proposals, joint funding opportunities, data sharing, and collaboration at minimum yearly. Opportunities to meet and

discuss research priorities could be aligned with annual field team meetings or scheduled at other times.

Outreach

Outreach efforts continue to be critical to inform the public's perception of wildlife conservation, condor recovery, non-lead ammunition, and understanding of how lead affects all wildlife species. Outreach gives staff the opportunity to highlight the importance of a hunter's role in condor recovery and how hunting, as well as ranching, provides forage and habitat for condors. Outreach is not a short-term effort but builds over many years.

With the addition of an outreach program in Oregon, continued and more formal collaborative efforts are needed. These efforts should include mutually reinforcing strategies, a shared success-measurement system, secure funding, and staff dedicated specifically to outreach coordination. Conversations have started to raise support for increased outreach coordination among condor recovery partners, and this should remain a priority for 2016.

Continued research, including studies on the extent and effect of lead poisoning in wildlife, the role of ranching and hunting in wildlife management and the societal and cultural factors that influence this controversial topic should continue as a priority in 2016. With increased awareness of non-lead ammunition we have seen an increase in questions relating to its role in management. Without sufficient knowledge and evidence to back decisions to use non-lead ammunition, agencies are hesitant to invest time and resources to reduce the risk of lead poisoning in wildlife through the use of non-lead ammunition and agency staff may find it difficult to obtain support needed to implement new policies.

Developing strong partnerships will continue to be an important step in successful outreach efforts. Fostering inclusion and cooperation while addressing the issue of lead will help us understand and appreciate our audience and partners better. As new partnerships are developed this will increase the capacity for outreach and ability to work toward a positive solution, but only if appropriate levels of funding are directed to non-lead outreach by multiple partners and federal and state agencies.

PNP recommends condor recovery release sites and all recovery partners across the western US work together on an outreach program that diverse audiences can understand. Each organization can learn from the successes of others to date and fine tune messages that are most suitable for their audiences. PNP will continue with outreach at multiple scales, including with the immediate surrounding community.

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