I

In July 2007, while working on the GGRO’s Cooper’s Hawk nesting study in Berkeley, CA, volunteer Lisa Owens-Viani got a call from a neighbor. Two dead hawks were floating in his child’s kiddie pool. Lisa recognized them as juvenile Cooper’s Hawks that had recently fledged from a neighborhood nest, and took the carcasses to be analyzed. Both hawks were victims of Bromadiolone—a rat poison sold widely as d-Con—but they also carried traces of Bromadiolone, Chlorophacinone, Difenacoum, Warfarin, Difenacoum, and Difethialone. In just a few months of life, these hawks had ingested a cocktail of nearly all the modern anticoagulant rat poisons found in the U.S.

Except for the small problem of causing secondary poisoning of wildlife, pets, and children, anticoagulant rat poisons are a brilliant invention. I say brilliant because I’ve chemically blocked the eater’s vitamin K cycle, which is necessary for blood clotting. A heavy dose may cause outright internal hemorrhaging; a lower dose provokes the poisoned animal to feel thirsty. This is great if you are the homeowner, because the rat is inclined to go outside to find water before it dies. This keeps the rat from dying and stinking up your house.

So, your home is rat-free (for the moment) and now a thirsty, groggy rat—maybe bleeding internally—is looking for water outside your house. What could possibly be interesting in that? Here’s a sample list: dogs, cats, hawks, owls, skunks, weasels, foxes, bobcats, coyotes, and rattlesnakes. In total, California Department of Fish and Wildlife has recorded more than 800 cases in which 24 species of birds and mammals have been poisoned by anticoagulant rat poisons during the last three decades. At least some of these, like Lisa’s hawks, drowned themselves to relieve an unquenchable chemical thirst.

Jump forward four years. Lisa was again monitoring her local Cooper’s Hawks, and a neighbor notified her of a dead hawk lying on the sidewalk in a pool of its own blood. I remember her phone call like it was yesterday. “Allen! I am so done with this! I’m not resting until we get these poisons out of the stores! People don’t realize how dangerous they are! Are you with me?” I paused and thought about the dozens of cases of rodenticide poisonings of hawks and owls that I had heard about. I thought about walking with my 10-year-old daughter into our local hardware store, and how she could walk in there and buy 50 pounds of rat poison and put it anywhere she wants. There are no state or federal regulations to stop her, not even a tracking system to note where she places poisons, or how much she buys. I was done thinking. “Yes, I’m with you,” I told Lisa.

“Yes, I’m with you” soon turned into helping Lisa assemble a coalition of raptor nuts, pet lovers, predator ecologists, IPM (Integrated Pest Management) people, city planners, community organizers, and neighborhood ecologists—collectively called “RATS,” as in “Raptors Are The Solution.” None of us believe that raptors are the only solution, but the name serves to make the point that as long as we believe that raptors are the solution, people, pets, wildlife, and the environment will be better off.

Three recently fledged Peregrine Falcon chicks in the sky near their nest in Berkeley, CA. [PHOTO BY RUTH CANTWELL]

“Elbows at 45-degrees!” Three GGRO hawk counters study a high raptor over the East Quadrant. [Photo by Ruth Cantwell]

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these much more highly skilled rat snatchers when I need their tal- erts? Lisa has guided the RATS coalition, part of Earth Island Institute, through the ups and downs in it for the past three years. Using a resolution passed by San Francisco County to discourage rat poison sales as a model, Lisa’s team has helped pass similar resolutions through 15 Cali-

ifornia cities and two counties. She produced a series of innovative educational posters for public use (“Rat poison kills more than rats”), one of which received more than a half-million hits on Facebook, and others that have graced the walls of East Bay buses and BART sta-
tions. Most importantly, RATS has offered up an all-purpose website, a Facebook page, and a consult-
ing service that has been used by numerous anti-rat-poison activist groups from Malibu to Manhattan.

A NOther local organization prominent in the rodenti-
cide battle has been a Bay Area wildlife rehabilitation group, WildCare, which has run full rodenticide screens on every carnivore brought into their center in recent years. In 2013, 138 samples were tested. The annual peak dates of the fall raptor migra-
tion announced that it would follow through with a ban of sales of most second-gen-
eration anticoagulant rodenticides to un-
licensed buyers (i.e., the general public) starting on July 1. On March 27, British conglomorate Reckitt Benckiser, makers of D-Con (the most-sold brand name of house-
hold rat poisons in the U.S.), filed suit against the state of California to halt the ban. In 2013, the U.S. En-
vironmental Protection Agency an-
nounced a similar ban on household rodenticides; Reckitt Benckiser held that order up in court hearings for more than a year.

SUMMER 2014 UPDATE: As of July 1, 2014, the California Department of Pesticide Regulation has disal-
loved sales of most second-gen-
eration anticoagulant rodenticides to the public. This is a good first step, but the battle is far from over. D-Con is repackaging a first gen-
eration rat poison, Diphacinone, for public sale. Diphacinone has a long track record of causing wild-
life deaths. Also, licensed pesticide handlers will still be able to buy second-generation rodenticides without a hitch. For updates on the state and federal rulings, and other aspects of rat control and rodenti-
cide impacts, check out the RATS Facebook page or website, www.
raptorsarethelosolution.org.

As of July 1, 2014, the California Department of Pesticide Regulation announced that it would fol-

ower a myriad of jobs and trying my hand at a lot of different types of research. When starting my Mas-
ter’s degree, I—like many young biologists—wanted to study con-
servation to “make a difference.” Swainson’s Hawks were rife with research possibilities due to their relatively recent brush with pesti-
cides. Specifically, they were killed by the thousands in Argentina in the mid-1990s as a result of pesti-
cide spraying for grasshoppers and locusts. I fell into the study of hawk populations, as that seemed to be an effective way to influence man-
agement. For example, by discerning which habitat characteristics were correlated with increased re-
production, I could guide land man-

agers trying to boost populations. I pursued a lot of different av-

Myc Perspective Looking Forward

In more recent years, climate change ecologists have also looked to migration monitoring systems like ours as insight-
ful resources for recording shifts in bird ranges or migration. Many ecologists believe that birds, being exceptionally mobile, will have a chance of demonstrating climate-related changes in wildlife behavior. The loss of data due to the government shutdown in 2013 was the biggest injury for GGRO. As the primary site in California for raptor migration monitoring, we strive to be as constant and as consistent as possible. We feel a collective responsibility for managing the best possible database for birds of prey in the state. With that said, we want to thank our NPS and Parks Conservancy colleagues for doing everything in their power to allow us to keep volunteers in the field. It was a very difficult time for all NPS staff across the country—and hopefully one that will not be repeated soon.
Throughout my research I tried in some way to mimic the citizen-science ethos of the GGRO. In Reno, my lab-mate and I started two research projects—an American Kestrel nestbox project and a goldfinch project. The Kestrel project was eye-opening, as we recruited students and volunteers to construct and monitor nest boxes. It was a great idea and had potential, but we quickly discovered that the volunteers’ ability to organize themselves was not something we could count on. Given that we both had remote study sites in the summer, we backed away from that project and moved on.

The second project was studying American and Lesser Goldfinches in and around Reno. This was a winter project that we thought could garner wider community support. We color banded goldfinches at feeders and got the public to help resight them to learn about bird movements and survival. This research suggests that goldfinches are often faithful to wintering areas, and work is being done now on how diet influences plumage coloration. I really enjoy the confluence of research and public engagement. In an era when “Big Data” are revealing fresh insights across a broad spectrum of scientific inquiry, I relish the collection of data that can be greatly accelerated and enhanced through the collective, crowdsourcing power of citizen science.

When the banding manager position opened up at the GGRO, I knew I wanted to be here. First, I love raptors. I know as a scientist I shouldn’t be biased. But you just can’t fight your passions in life. Second, the GGRO already has a great history of engaging enthusiastic volunteers. The base has already been built. Finally, I knew there was a lot of potential to do both interesting and informative science at the GGRO.

There are many questions about both conservation and basic science that can be answered here. From a conservation perspective, there are questions to be explored about population trends in a number of raptor species. There are also more specific threats to raptor populations. For example, we have just started some novel rodenticide research that will explore background levels of rodenticides in Red-tailed Hawks to examine the potential impact on raptor populations. In addition, we have the unique opportunity to see so many individuals raptors each year that we have the ability to help shape our understanding of how an individual’s health is measured and how that may relate to future survival. The GGRO has an opportunity to develop and refine common methods to provide insight not only into the birds migrating through the Marin Headlands, but also for raptor ecology in general.

In addition to looking at conservation-driven questions, there is a lot of potential at the GGRO to examine more basic scientific subjects, e.g., what causes plumage polymorphisms in raptors, or what parasites are found on which raptor species? These questions provide a deeper and fuller understanding of the ecology of each species we study.

One particular fascination of mine is population dynamics—what drives raptor population growth? Being long-lived species, raptor survival time in particular is an important determinant of how well populations can grow and thrive. Unfortunately, survival in raptors is often challenging to measure, even with the relatively high band recovery rates we have at GGRO. Using visually identifiable marks to increase the rate at which individual raptors are observed in the wild may allow us to measure rates of juvenile survival for many species. Color bands are one such marker. Thanks to the large number of bird-watchers in the San Francisco Bay Area, the GGRO is perfectly situated to enlist many people to look for color-banded birds.

But what does this all mean for the future of the GGRO? My goals are to not only strengthen GGRO’s core research, but also to broaden our base of collaborators. Inclusion of more graduate students in our work can be a very effective way to answer more questions, more quickly. Many of these results will contribute to painting a fuller understanding of raptors—as well as of the factors that threaten the birds we love.

In 2013, GGRO started a two-year pilot study examining the efficacy of the use of color bands on two species of hawks moving through the Marin Headlands: Cooper’s Hawks and Red-tailed Hawks. Both species migrate through in large numbers, and we have accumulat ed a wealth of data on their movement based on where recovered hawk bands are reported. “Recovery” often means (with a plethora of notable exceptions) a bird died or was sick or injured enough to get caught by someone who then reported the band number. In general, around 3–8% of the birds we band are recovered.

While this recovery rate is fairly high for a non-game species (while many game bird bands are reported due to hunting, only about 1% of banded songbirds are ever recovered), color-banded birds have the incredible advantage of being a turnover that is individually identifiable. From the outset, we decided color band sighting rates should at least match recovery rates to make it worthwhile the expense, the time needed to properly fit them on the hawks, and the labor of data management. To date we’ve had reports of five out of the 80 Red-tailed Hawks we color-banded in 2013, and one of 65 Cooper’s Hawks. All but one of these reports were accompanied by pictures clear enough to verify the band number, and therefore to identify the individual hawk. Interestingly, four have been seen more than once, with up to two months in between sightings—generally in or near the same area.

We hope that color bands will not only increase our recovery rate, but also spur public interest in our local hawks. For those lucky communities that seem to have been adopted by a Red-tailed Hawk, it will be interesting for neighbors to see how long an individual hawk uses their area, and if the young birds end up settling down to nest in areas they frequent in their first winter. This could tell us something about the little-understood process of how a hawk finds and establishes a breeding site. Alternatively, it could demonstrate that the individual hawks we “always” see sitting in the same spots may not be the same after all, but many birds that happen to use the same perch.

Perhaps unsurprisingly, we are seeing a big difference between the number of re-sightings of Cooper’s Haws and Red-tailed Hawks. I had hoped that enough Cooper’s Hawks would urban and hang around bird feeders so that we would get more reports

COLOR BANDS

Chris Briggs

A New Tool On The Road to Recoveries

The adult Red-tailed Hawk sports a silver Bird Banding Lab band on the right leg, and a blue color band on the left. (Photo by Brian Smuckler)
of them. However, I think that between their small legs and their tendency to hide in the brush, their bands are just a lot harder to see. In contrast, Red-tailed Hawks are conspicuous, perch out in the open, and can be remarkably non-chalant about their proximity to people. Despite this, many people don’t seem to notice the band until the picture is up on the computer screen. So we need to do a better job publicizing our color banding project, and prompt people to pay attention to bird legs as well as the rest of the bird.

After only a few months post-band-posting season we already approached our target for re-sightings of Red-tailed Hawks. This could be due to a low sample sizes, or just a fluke, but it provides hope that this is a great way for us to get more information on the birds that pass through the Marin Headlands each fall. We will continue this as a pilot project in 2014 to build upon the successes of the 2013 season and increase our understanding of the movements and ecology of these birds.

**GSM TRANSMITTERS**  
**Chris Briggs**

In 2013, we continued to experiment with GSM transmitters by putting out six more units on Red-tailed Hawks. In some ways, the units mimicked those deployed in 2012, with some performing quite well and others going offline more quickly than we had hoped. Even with limited data, we did glean interesting information from a number of units.

Technical difficulties again caused failures in some of the units. This year, a system update that modified the communication between cell towers and cell phones seemed to knock out three units between cell towers and cell phones. After staying relatively local in the East Bay for over six months, she decided to “migrate.” Obviously this wasn’t migration in the classic sense, but it was certainly a substantial movement. As the technology improves, I believe we will be able to find out where these birds end up breeding—which could hint at where they came from. While it may take many years to even begin to get a long-term picture of what the birds that move through the Headlands in the fall are doing, I think Delilah has provided a tantalizing first glimpse.

Another notable bird from this past year was Fargo, a juvenile Red-tailed Hawk banded on August 26, 2013. Fargo’s unit performed well, and she reported regularly from parks en route to the Peninsula Humane Society. With funds from the Parks Conservancy, we were able to send her body to UC Davis for a full necropsy (animal autopsy) to determine how she died, and whether the transmitter or harness had impacted her. The lab determined that she had received a lethal dose of Difethialone, an anticoagulant rodenticide, and she died as a result of internal bleeding.

We are providing data to the state to determine whether pesticide application permits can be amended to help prevent future poisonings. Fargo’s necropsy results, coupled with her detailed movement information, may help provide better insight into where she got poisoned, which could help lead to more specific regulatory action. While Fargo’s story is depressing, we have illustrated a serious hazard to raptors by examining daily movements of an individual hawk, and collected data that could be very useful to conservation in an urban setting.

Of the remaining data, there were few surprises for those who have read about band recoveries or radiotelemetry of Red-tailed Hawks from COSTO’s other studies. Most stayed fairly local, but with units not lasting more than a few weeks, it is impossible to know if the hawks made larger movements after some time. All of this data can be seen on a map at www.parksconservancy.org/gsm-tracking. We are currently working with the Adobe Pro Bono Program to create more user-friendly and interactive displays of the GSM data, and we will continue learning lessons about technology and movements of raptors in 2014.

**The 20-gram, GSM transmitter lines up in the middle of the bird’s back and is held in place with Teflon tape which will wear and fall off eventually. (Photo by Mason Cummings)**
GGRO TURNING 30!
THE GOLDEN GATE RAPTOR OBSERVATORY has many roots, but its tap root started growing in 1983 when National Park Service (NPS) ecologist Judd Howell and Will Shor collaborated to trap and band the first migrating hawks in the Marin Headlands. At the same time, retired San Rafael High School teacher Carter Fauz was in his first year of counting all the hawks flying by Hawk Hill.

In 1984, the NPS opened up a new volunteer opportunity—raptor banding in the Marin Headlands—and more than 200 people applied. Judd somehow selected 100 volunteers, and with this cohort, the elements of the GGRO seemed to click in place: hawks, parklands, citizen science, migration, research, conservation, outreach, collaboration.

And that’s why we later picked 1984 as the GGRO’s founding year—the year it all came together. So, happy birthday, Golden Gate Raptor Observatory! You are a robust 30 years old in 2014, old enough to have grown a beard, and still young enough to be spry.

THE GREG HIND ENDOWMENT
WE ARE FORTUNATE to receive many kinds of support from many directions for the GGRO, and I have the honor of announcing the founding of the Greg Hind Endowment Fund, established in the summer of 2013 by Leslie and Troy Daniels, “to further the conservation and research of California’s birds of prey.”

Leslie’s brother Greg Hind died in 2012, leaving an astounding legacy of invention, philanthropy, and cultural and conservation achievement. As a young man on the San Francisco peninsula, Greg personally raised an injured Red-tailed Hawk, and his love of California’s raptors never waned. This year, Leslie and Troy offered the GGRO an endowment both to memorialize Greg, and to support the GGRO’s mission of building connections between people and birds of prey. All of us at the GGRO are deeply grateful to Leslie and Troy Daniels for their commitment and their trust.

HOW GGRO DATA ARE USED SINCE OUR EARLIEST days, staff and volunteers have worked hard to analyze and present GGRO data for scientific audiences. GGRO data are also regularly used by agencies, NGOs, and researchers investigating California raptor trends and ecology. Most recently, the California Department of Fish and Wildlife used GGRO species population trends to support decisions made in the Final Environmental Document Regarding Falconry Regulations (Feb 2013).

As of February 2014, we have presented a total of more than 95 scientific talks and publications. Some of our 2013 presentations included:


Radio telemetry takes lots of planning, logistics, and volunteer time. Whereas GSM Tracking Program uses larger backpack transmitters and cell phone networks to receive locations of the hawks, radio-tracking vHF transmitters that require ground teams in the field to record data via receivers. While the GSM study tracks predomi-
nantly Red-tailed Hawks (a bird large enough to carry the transmitter), the Radio telemetry program can track more dimin-
utive raptors with the smaller tail-mounted units. We always hope that a suitable Broad-winged Hawk might be caught for us to track.

Since capturing Broadwings is inconsistent at the GGRO (the average is one per year), a “stand-by” schedule was planned between September 16 and Oc-
tober 4, the time frame which historically has had the most Broadwing sightings. Day-to-day logistics were also devised, from who would attach the transmitter, to transferring equipment between teams. I told my boss that I might be at work, but if the banders captured a Broadwing, I’d be out tracking.

On Sunday, September 29, 2013, while I was mountain bik-
ing with friends, I received a text message. Did they actually catch a Broadwing? YES! Okay, gotta go, bye! I pedaled back to my car, texted the telemetry team, sped home to load the pre-packed tracking necessities, and drove to the Headlands as quickly as possible.

Kachina, a juvenile Broad-winged Hawk, was released from Hawk Hill at 2:07 pm. She flew a couple of miles northeast and remained there until about 5 pm, when she flew a couple of miles southwest into Rodeo Valley.

That night Kachina roosted just northwest of the intersection of Bunker and McCullough Roads, within the Marin Headlands.

That evening, the trackers dined nearby and dis-
cussed the possibilities of the bird’s flight for the next day. Volunteer Bill James had helped track both pre-
vious Broadwings to Mexico—Zoe in 1994 and Mara-
thon in 2012. (Lakota, also tracked in 2012, was found deceased on Angel Island five days after release.) He shared that the earlier Broadwings each began soaring around 11 am and stopped around 3 pm, going down to roost by 4 pm. Bill stated that the teams were always behind the bird, never capturing end-of-day bearings, and instead finding the bird the next morning when it got up. Finally, he predicted that Kachina would be in the Hollister, CA area, over 100 miles south of the Marin Headlands, by the end of the following day.
The next day, as my team-mate—apprentice Danny Pifre—and I tracked “no signal” data from San Bruno Mountain in cold, misty conditions, I began to train him in “How to Track a Hawk.” I explained that key to tracking is always asking the question: What if the bird goes north? South? East? West? Where do we go as trackers? We must have an answer before the bird makes that move. And that means we must review maps, highpoint lists, and what we know about how a hawk flies, so we can take appropriate action when the bird soars.

When tracking a Red-tailed Hawk (our most-often tracked species), trackers usually have two teams on high points getting bearings and cross-bearings from the transmitter, with a third “chase” team trying to actually keep up with the bird. Teams would rotate roles as the bird moved, leapfrogging along the bird’s path. We could find second- or third-best highpoints when they arrived for evening, cross-bearings, but daytime data would have to be sacrificed.

Yet, the day was drizzling wet with fog in the Headlands, and Kachina’s signal told us that by the end of the day, in the chilly, damp heaviness, she remained near her roost site in the Headlands—not in Hollister. We knew the weather would clear on October 1 and looked forward to Kachina lifting into the sky so to soar! But instead of another nice meal and planning session that evening, the telemetry teams returned to the GGRO office as requested by Director Allen Fish. The news was not good. Allen’s tone was dire and serious. He regrettably informed us that as much as he argued to justify to our National Park Service supervisors that the GGRO programs should continue despite the looming federal government shutdown, their hands were tied, and the ultimate answer was “no.” The GGRO’s hawkswatch, banding, and radiotelemetry programs were to be shut down along with the government. Slated to occur by midnight Eastern Time, it meant that no GPS volunteers would be allowed in the field until the shutdown was officially over.

Volunteers don’t get paychecks, benefits, or bonuses. We give of ourselves and our time to a purpose we passionately believe in, and we do it for free because it is fun and rewarding, and the knowledge gained is critical to raptor conservation. That’s what being a volunteer is about. Yet, our own politicians’ inability to compromise was forcing us to stop. Though Allen had forewarned us of this worrisome possibility earlier that morning, the actual decision was unbelievable and devastating. It was an incomprehensible message. How could they do this?

That drive home was glum. For all of our planning and excitement, we would never find out if Kachina would soar the next day, and cross-bearings from the broken birds would never find out if Kachina took the same path through California as the earlier broadways we had tracked.

Unfortunately, our 2013 radiotelemetry season was immobilized by a political nightmare in Washington, D.C. We can only hope that next season, our elected officials will build bridges rather than undermine citizen-driven wildlife monitoring. Lynne Jesus has organized the GGRO’s Radiotelemetry Program for several decades; Libby Rouan has dedicated herself to leading radiotelemetry teams and preparing data.
The 2013 Hawkwatch season might well be dubbed “the season that wasn’t.” I followed the news rapitly in the days leading up to the government shutdown. While I had many concerns running through my mind, in reality I didn’t want to miss my assigned hawkwatch day. When the shutdown oc- curred, all of the national parks were closed and the GGRO was instructed by the National Park Service not to allow vol- unteers on Hawk Hill, which is on NPS-managed land.

The only downside to the new program was that the government shutdown cut it short.

What did the shutdown impact the GGRO? We lost an entire season of hawk count data. While we can rarely pull significant data out of a single season, the 2013 season will likely yield little usable annual data—no trends, no truly high or low numbers. As a citizen and a GGRO volunteer, this is frustrating to me on many levels. Raptor migration monitor- ing relies on data that are collected in a consistent manner from year to year. With my background as a scientist, I'm well aware of the consequences of collecting compromised data. In the lab, variables are fairly easy to control and one has the luxury of repeating an experiment if necessary. In field biology, there are no such luxuries. Unfortunately, if we lose a year of raptor migration monitoring, we can’t get the birds back for a do-over.

March 28, 2013—October 16. We clearly missed the peak of raptor migration into play. Local weather patterns, habitat and climate chang- ing relies on data that are collected in a consistent manner from year to year. With my background as a scientist, I'm well aware of the consequences of collecting compromised data. In the lab, variables are fairly easy to control and one has the luxury of repeating an experiment if necessary. In field biology, there are no such luxuries. Unfortunately, if we lose a year of raptor migration monitoring, we can’t get the birds back for a do-over.

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What we did count as the season continued and then wound down was the highest number of Bald Eagles we’ve ever recorded in a single season (eleven), each one a juve- nile or subadult. Red-shouldered Hawk, Rough-legged Hawk, and Prairie Falcon numbers were somewhat strong. Osprey, Sharp-shinned Hawk, and Broad-winged Hawk numbers dipped. Of course, Sharp-shinned and Broad-winged Hawks are peak season birds, and without a shutdown we might have made up for initially low numbers.

However, even with all the statistical gyrations I applied to the data, I could not account for disquieting low num- bers of Merlins and Peregrine Falcons this year. As I previ- ously discussed, the numbers we counted this year may be somewhat significant, or they may disappear with further statistical analysis of the trends. Maybe we won’t under- stand the true impact or importance of the data we collect for another 20 or even 50 years.

When I step back and look at the big picture, I must admit it’s not all about the hawks. I love spending my day on Hawk Hill watching all the wildlife and I enjoy time spent with my fellow hawkwatchers. It feels like a day off from my normal life. And there’s always something going on in the Head- lands. This year we saw a bobcat sitting on a dead deer, and then eating that deer. We observed coyotes by the side of the road. A Rusty Blackbird decided to spend the winter at Ro- deo Lagoon near GGRO headquarters. In November, a flock of Tundra Swans flew over the hill.

So while it irritate me beyond reason to have had my small contribution to society negated, truthfully, I’m re- membering all the good I’ve had this past season. The peak season is a time when the accipiters come so fast and furious that identifying them pushes the limits of my skills. It’s a time when I might have a chance to see copious quantities of Broad-winged Hawks circling through the sky as they did last season. Who, I know, I might have missed a rare Mississippi Kite or Eurasian Kestrel. I can al- ways dream of such a season.

Christine Carino, Feduced from the UC Davis Raptor Center, banded for GGRO from 1968 to 1992, then returned in 2010 to GGRO to start a new life as a hawkwatcher.

DR. JOHN W. BOYD, 1938-2012

Dr. John W. Boyd died after a long illness on July 24, 2012. Among many achievements in teaching, birding, and boocie- ball, John was a devoted GGRO hawkwatch dayleader.

Fifteen years ago, John Boyd did my phrasing and intro- duced me on his GGRO Hawkwatch team, Friday II. His sono- rous phone voice belied his somewhat shorter, almost cherubic physical stature. He held a doctorate in microbiology, teaching college after many years of research in the corporate sector, he was a smart guy with a big smile surrounded by a reddish beard. He was a joy to be with on Hawk Hill, funny and easy to talk to as a dayleader he built the foundation of my commitment to the GGRO, and he did that by making a nervous, non-binder apprentice comfortable within a circle of others who knew what they were looking at. When he asked me, “What makes that a...” he did it in a way that invited me to speak.

John Boyd enhanced my ability to see the invisible, which is fundamentally irksome because considering that our Friday II team received more than one award for the most fogged-out days in the Headlands.

I had a particularly salon-like moment at a Santa Rosa inter- section. I was a participant in a significant GGRO moment for me even though I wasn’t on Hawk Hill, amidst trees or in a wildlife area, and John Boyd was nowhere in sight. But he was there. A Red-shouldered Hawk rocketed by me, fifteen or twenty feet above the deck, swooping from my left and out of sight on my right. I smiled, looked around, and realized I was the only one who saw that beautiful bird. No one in the other cars, no one on the sidewalk changed their posture or position, nor swiveled their heads to follow the raptor’s flight.

We just occupied the same moment, and while the moment was different for all of us, my moment was special.

Allen, Buzz, the nature of the Bay Area, and the shared passion for what we all do in the GGRO are certainly all reasons that I’m going into my seventeenth year as a hawkwatcher, but John Boyd’s mentoring eased the anxiety of my early years on Hawk Hill, giving me all the right reasons to come back, season after season. As a dayleader he built the foundation of my commitment to the GGRO, and he did that by making really hard, and still guides me to see what I can.

I was right or wrong, and allowed me to shed my insecurity. John Boyd enhanced my vision, a great gift from a great guy. I miss him, think about him often, am grateful that our paths crossed, and occasionally hear him chuckling from somewhere beyond the fog, where as Lord of the Mist he sees what we can’t, and still guides me to see what I can.
As raptor students, we’re eager to get as much information as we can just by looking at a bird. Identifying species is a great first step, but we may want more. Age is often of interest, but it can sometimes be difficult to assess in the field.

Swainson’s Hawks can be problematic because they have a subadult plumage, which can look very similar to the juvenile plumage. Further complicating matters are the variable color morphs—generally lumped into light, intermediate (or rufous), and dark morphs. While these categories are convenient, they represent a continuous range of light to dark plumages.

A hawk’s morph does not change when they molt (once a light morph always a light morph). The timing of molt completion from subadult to adult seems to vary among individual Swainson’s, but generally happens around three years of age. Here I will try to demystify ageing Swainson’s Hawks based on years of observations of known-aged color-banded individuals.

For simplicity, I will refer to the summers of a bird’s life. For example, a juvenile fresh out of the nest is in its first summer. I will neglect winter plumages, since Swainson’s Hawks are largely absent from the Northern Hemisphere in the winter.

There are a number of guides for general Swainson’s Hawk identification so I won’t belabor basic appearance here. In general, they are pointy-winged buteos that soar with a slight dihedral, with dark primaries and secondaries. Swainson’s Hawks molt throughout the summer, so there are a lot of plumage changes between April and August for immature birds.

**JUVENILE/FIRST SUMMER**

- Incomplete bib
- Flight feathers not as dark as on an adult
- Light cheek patch
- Usually narrow subterminal tail band

**SUBADULT/SECOND SUMMER (NOT ILLUSTRATED)**

- Nearly complete bib
- Cheek patch darkened
- Light superciliary line
- Usually wide subterminal tail band
- Mixed age flight feathers, mostly dark

**LIGHT MORPH**

**INTERMEDIATE MORPH**

**DARK MORPH**

**SUBADULT/THIRD SUMMER**

- Nearly complete bib
- Cheek patch darkened
- Light superciliary line
- Usually wide subterminal tail band
- Mixed age flight feathers, mostly dark

**JUVENILE/FIRST SUMMER**

Like many juvenile buteos, the plumages of juvenile Swainson’s Hawks contain only two colors—an off-white creamy color, and brown. There are no signs of rufous on the bird; those reddish colors don’t seem to appear until later in life, if at all. The bib is incomplete; you may be able to trace a line from the white throat patch to the belly (though that may not be possible with some dark morphs). The characteristic dark primaries and secondaries of an adult Swainson’s Hawk are not as dark and striking in the juveniles. The subterminal dark tail band is approximately the same width as the others. However, there is variability in subterminal band sizes, so this feature is not a good tool for ageing.

The face is noticeably light, with pronounced light superciliary and cheek patches. These light patches create a dark line behind the eye, though some can be fairly thin. The light cheek patch also creates a stripe that can look almost like a bold falcon mustache stripe. These patches, coupled with a light chin, give the head and face an overall light appearance.

**SUBADULT/SECOND SUMMER (NOT ILLUSTRATED)**

At the start of their second summer, very little has changed in a Swainson’s Hawk plumage. The bib has just started to fill out with dark feathers, but can be difficult to distinguish from a juvenile breast. The light areas of the face start to fill in with darker feathers, but there is still a strong
spurciliary line and cheek patch. As new tail feathers grow in, they usually have a subterminal band wider than the other dark tail bands.

To distinguish between the first and second summer individuals, look for molt in the flight feathers. Juvenile flight feathers, and subadults will retain several juvenile outer primaries, whereas a first summer individual, look for molt in the flight feathers. Juvenile flight feathers will be much lighter in color than new adult flight feathers, and in adults, the bib is completely filled in for all morphs—dark morphs, the bib is now indistinguishable from the belly. All indications of lighter plumage have molted out from the head and face, aside from the white chin patch and some lightness around the cere that is present for all but the darkest of individuals.

ADULT/FOURTH SUMMER AND OVER

- Complete bib
- Dark flight feathers
- Wide subterminal tail band

not finish by the time fall migration ends—there is individual variability. The face often still has some residual lighter feathers. In particular, the superciliary line is visible, but subtle. The cheek patch similarly has darkened. The sub-terminal tail band is now broader than the other tail bands, and most or all of the primaries and secondaries are fairly dark.

ADULT (FOURTH SUMMER AND OLDER)

In adults, the bib is completely filled in for all morphs—for dark morphs, the bib is now indistinguishable from the belly. All indications of lighter plumage have molted out from the head and face, aside from the white chin patch and some lightness around the cere that is present for all but the darkest of individuals.

BANDING 2013 Candace Davenport

The Year of Unintended Consequences

In August 2014, I started my ninth year as a bander for the Golden Gate Raptor Observatory. Being a volunteer bander means that for the four months of GGRO’s migration monitoring season, once a week, I get to sit in a tiny little hut, on a stool without a back, and stare out a little slot in the wall that is always a little too low for my height. I get to wear 10 layers of clothing and still feel miserable in what feels like 30-degree weather, with a west wind blowing fog at 50 mph into my face, so that I—and everything around me—get soaking wet. Or I get to sit there when it’s hot, stripped down to very little, with doors cracked open to try and capture a non-existent breeze, and bake in 100-degree heat while anything that has even a tiny brain is tucked away in some nice cool corner taking a siesta.

I get to walk up hills that make my knees hurt and leave me gasping for breath. I get to run down rocky slopes as fast as I can to extract a hawk from a net, while avoiding inch-long talons that seek to puncture my skin. I also get the delight of having constant poison oak somewhere on my body, so that it seems that I am one perpetual four-month itch.

And for the eight months that are not the banding season? I dream and long for those four months that are.

My friends and family think I am nuts. Why would anyone subject themselves to such hardship and extremes? I do so because I am hooked. Captivated. Obsessed. Addicted. I do it so I can, just for a few minutes, hold a wild raptor in my hands. I do it for the chance (not even the guarantee) of being able to look into its eyes and see the wild freedom there.

I do it so that it seems that I am one perpetual four-month itch.

I do it so I can sit in silence and see to the ends of the earth because I am hooked. Captivated. Obsessed. Addicted. I do it so that it seems that I am one perpetual four-month itch.

My eight seasons have been relatively kind to me. To my first two years—in numbers and species! Surprise, surprise—like everything in life, banding seasons change from year to year. The next two years, we were down over 700 and 800 birds, respectively, from the 2007 total bird count, although we broke our Peregrine Falcon record in one year and our Merlin record in the other. Then in 2010, we were down over 1,000 birds from our 2007 season—a very dismal banding year. Luckily, the numbers began to rebound a bit, and in 2012, although no records were broken, we had decent numbers once again.

In 2013, we had even more than the previous record-breaking year. A Northern Goshawk and Rough-legged Hawk were banded, only the fifth capture of each in the entire GGRO history. Amazingly, a Eurasian Kestrel, the first known occurrence of this species in California, was captured and banded at a GGRO banding blind, as well as 81 adult Red-tailed Hawks. I was definitely spoiled, and thought every year was going to be like these first two years—in numbers and species!

All things go through cycles, and raptors are no different, as I certainly learned over my eight banding seasons. We have no control over breeding success, prey availability, weather, or raptor health or whim, which all affect raptor numbers and cause annual differences. But, if you think about it, isn’t that why we band the birds and take the data and Merlins. Even better, the 2007 season broke even more records. We had a massive Cooper’s Hawk season, almost doubling our average numbers, and caught even more total birds than the previous record-breaking year. A Northern Goshawk and Rough-legged Hawk were banded, only the fifth capture of each in the entire GGRO history. Amazingly, a Eurasian Kestrel, the first known occurrence of this species in California, was captured and banded at a GGRO banding blind, as well as 81 adult Red-tailed Hawks. I was definitely spoiled, and thought every year was going to be like these first two years—in numbers and species!

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My eight seasons have been relatively kind to me. To start, I was initially set to come out every other week. My very first banding day was so foggy that we were skunked—didn’t even see a bird, let alone trap a hawk. Yet that experience, sitting in the blind, looking out into the fog, was so filled with mindfulness that I knew I couldn’t wait two weeks to come out again. I had to change my schedule to come out at least once a week.

2006, my first season, broke all sorts of GGRO records for yearly captures (2,182), as well as individual captures of Sharp-shinned Hawks, Cooper’s Hawks, Swainson’s Hawks, American Kestrels, and Merlins. Even better, the 2007 season broke even more records. We had a massive Cooper’s Hawk season, almost doubling our average numbers, and caught even more total birds than the previous record-breaking year. A Northern Goshawk and Rough-legged Hawk were banded, only the fifth capture of each in the entire GGRO history. Amazingly, a Eurasian Kestrel, the first known occurrence of this species in California, was captured and banded at a GGRO banding blind, as well as 81 adult Red-tailed Hawks. I was definitely spoiled, and thought every year was going to be like these first two years—in numbers and species!

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GGRO Intern Emma Cox releases a Red-tailed Hawk. (Photo by Emily Abemethy)
in the first place? Raptors are at the top of the food chain, and if their numbers plummet, then something is likely affecting the lower portions of the food chain. In this sense, raptor-population monitoring serves as an ecological early alert system, so these cycles are to be noted and further explored.

But this year, 2013, had additional man-made variables that literally cut our numbers in half. This was the year of the governmental shutdown (remember that?). The shutdown affected many people directly, from those who were furloughed, to the shop-owners who lost business because people weren’t spending money. However, many people were indirectly affected by the shutdown—the GGRO, and consequently we volunteer banders, were impacted as well. The national parks, and thus the Marin Headlands, were closed and we were told, in no uncertain terms, that we were NOT to go out and band.

So for longer than two weeks, our blinds remained locked and banders stayed home. Unfortunately, it couldn’t have been worse timing. Although our season is four months long, we volunteer banders, were impacted as well. The Marin Headlands, which are closed to the public due to the fall of the hawks, and the governmental shutdown was timed perfectly—exactly during the 2013 peak.

Peak was already a bit late, so when the shutdown hit, we lost two actual weeks of high accipiter numbers, and also some days as the peak waned. Large numbers of accipiters were seen moving through the surrounding areas during the shutdown, so we know they came through. Our average number of banded Sharpies is close to 500. In 2013, we only banded 173, and yes, that is directly related to the government shutdown. The same can be said for Cooper’s Hawks. Our average is around 570, and this year we only banded 390. Although I know that no one sat on Capitol Hill and planned these unintended consequences, 2013 results will always have these unusually small capture numbers.

But maybe more importantly, the shutdown made a whole lot of banders really, really, grumpy, and it definitely lowered my captures for this season (besides making me very grumpy). Because I go banding a lot, I usually have very decent numbers of captures, and with a diversity of species. For example, I’ve had a season with eight Red-shouldered Hawks, sometimes two at a time. I’ve had Northern Harrier double-baggers, seasons filled with Merlins and American Kestrels. I’ve had a Swainson’s Hawk, and I was lucky to be in the blind with a rare Northern Goshawk. But this year, there were just three species for me: Cooper’s, Sharp-shinned, and Red-tailed Hawks—so a very strange year all around.

Yet despite the government shutdown and the lack of numbers and variety, I probably had more adult hawks in 2013 than in most of my prior years added together. So, I am not complaining—each and every bird is special in its own right. But for me, in the end it really isn’t about numbers. I go out on the hill to regain a sense of who I am and why I am here. For me, it’s not about just living. It’s about really being alive. So, here’s to the government staying open, and great numbers of raptors in the banding blinds for everyone in 2014 (and that elusive big falcon for me!).

**1992-2012 are used for this comparison due to similarity of methods and effort between those years and 2015.**

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**Raptors Banded in the Marin Headlands During Autumn**

<table>
<thead>
<tr>
<th>Species</th>
<th>2013 Annual Average</th>
<th>1992-2012 **</th>
<th>1983-2013 **</th>
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**Band Recoveries 2013**

**Nancy Brink**

Thirty Years of Band Encounters

And recovery follow-up is an interplay of storytelling and data collection. We receive limited, coded information from the USGS Bird Banding Lab (BBL) in Patuxent, MD, which oversees distribution of bands, banding data, and band encounters for all species of migratory birds in the United States. Led by long-time volunteer Marion Weeks, the band recovery team tracks down people who report the band numbers to confirm details of hawk condition, mortality, and location.

At the end of the 2013 season, 36,849 hawks of 16 species had been banded by GGRO volunteers since the program’s inception. We have received 1,234 band recovery reports from the BBL. Over 31 seasons, our understanding of the hawks we band has grown: how they travel, how long they live, how they die, and how human activities affect their lives. Sometimes data confirm—and sometimes data challenge—our assumptions.

GGRO citizen scientists have made a journey with the hawks that fly through the Marin Headlands! The late Jim Mills, GGRO bander and volunteer extraordinaire, wrote in the Fall 1992 Pacific Raptor Report: “It will probably take the GGRO 20 years of band recovery data interpretation before we can reach sound conclusions about West Coast raptor activities.” At that time, 4,000 raptors had been banded and we’d received 118 band recovery reports. The overall “encounter rate” was 2.7%. This data told us “that Gold- Gate hawks have been reported from Washington to Mexico.”

Four years later, volunteer bander Karen Scheuermann wrote: “There is a thread that runs between the bander and the recoverer, connecting one chance occurrence in the bird’s life with another…. In one sense, the data set is a rich kaleidoscope of the stories of individual hawks. In another sense, it gives us numbers and patterns which are helping to illuminate the ecology of raptors on the Pacific Coast.” At that time, there were 233 recoveries; the Red-tailed Hawk encounter rate was at 3.4%; the Cooper’s Hawk rate at 2%; and Sharp-shinned Hawks 1.5%.

The kaleidoscope has grown in numbers, intricacy, and depth of information. Our 1,234 recoveries represent an overall encounter rate of 3.0%. While still a small percentage of hawks banded, these encounters provide data that have growing potential to teach us a few things. Indeed, they already have.

For example: in the 2004 Pacific Raptor Report, 30-year GGRO veteran John Keane reminded us that “raptor movements at the GGRO are not a classic north/south flow, but rather are much more complicated and encompass both long-distance migrants passing through the Headlands and individuals exhibiting a diversity of dispersal movements in all directions.” GGRO volunteers now know that the “M-word” means not just “migration,” but also “movements” of raptors.

A rough geographic range can be illuminated by our band recoveries. Hawks banded at GGRO have been recovered as far north (and west) as Prince Rupert Island in Canada, as far east as Lake Havasu City in Arizona, and—a new one this year—as far south as Cara-churo del Nuevo, southwest of Mexico City. But not all recoveries are so exotic; a Redtail banded in 1991 by Cheryl Keene was found in 2013 near the Alexander Avenue overpass at the edge of the Head-
lands. Banded hawks are occasionally recaptured in GGRO blinds, or by other banders as far away as the Goshutes Mountains of eastern Nevada.

A study that analyzed more than 54,000 raptor band recoveries in the U.S. from 1960 to 2008 suggests “that raptor migration follows the topography of the landscape and individuals sometimes concentrate along the coast of a large water body before attempting to cross.” The authors also note “greater clustering ... near populated areas” (Lutmerding et al. 2012) That so many encounters occur near population centers points to an inherent bias in the dataset. A person has to find the hawk and take the initiative to report the band number and relevant information to the BBL for the encounter to be known about. Therefore more hawks are encountered in places where there are more people.

Such biases in data demand caution. Looking at mortality data shows that Sharp-shinned Hawks die frequently from window strikes. Redtails, in particular, are hit by cars. Our reports include many electrocutions and rodenticide poisonings. Finders have apologized for their cats’ predation. The power of our band recovery database is a fun reminder that we’re part of something big here, as we might dig into the data and ask, how we might dig into the data. And revel in the stories. Like that of the Cooper’s Hawk that flew to Caracoles. She was banded in September 2012 by Dian Langlois and flew more than 1,800 miles in less than five months—the longest-distance recovery for the GGRO. We look forward to seeing that record broken in the years to come.

LITERATURE CITED:

723-B Juvenile Red-tailed Hawk banded on 10/20/98 by Carole Hyde; first encounter was on 10/17/03 at Hayward, Alameda Co., CA. Reported by Mark Taylor of Hayward Regional Shoreline Park; Mark stated they were dealing with outbreaks of cholera, followed by avian cholera, but were not able to confirm that the hawk died of either of these, as a bird must be alive or freshly dead to be tested; no injuries noted.

899-B Juvenile female Cooper’s Hawk banded on 8/16/07 by Terry Mead; first encounter was on 6/30/08 at Woodland Hills, Los Angeles Co., CA; suspected of hitting a window and was released by the rehabilitation center that same day after it “went nuts” flying around cage. Caught due to injury on 6/15/13 at Thousand Oaks, Ventura Co., CA, about 14 miles from the first recovery; reported by Marie Taylor. The Bird Banding Laboratory (BBL) lists the bird as “now dead.”

1191 Juvenile Red-tailed Hawk banded on 8/15/94 by Anne Ardillo; found dead sometime in 2004 two miles east of San
Juvenile male Cooper’s Hawk banded on 10/14/12 by Craig Nikitas; found dead on 10/12/12 at Martinez, Contra Costa Co., CA; reported by Rick Carpenter.

Juvenile male Cooper’s Hawk banded on 12/13/12 by Sarah Sawtelle; found on 12/19/12 at Mill Valley, Marin Co., CA; people cutting wood nearby noticed the hawk sitting on a deck railing. They called Marin Humane Society, which notified WildCare. WildCare treated the hawk, but it was lethargic and listless, and died. Testing for rodenticide revealed some exposure, but not enough left to kill her; reported by Nat Smith, a vet tech at WildCare.

Juvenile female Cooper’s Hawk banded on 9/29/12 by Regan Dohm; found dead on 11/6/12 at San Miguel, San Luis Obispo Co., CA; by Daniel Hale, on his patio. He believes the hawk flew into a window; it was not shot, stiff, or cold, and it was clean—no bleeding, no ants or worms. He buried it and a neighbor helped him report it to the BBL.

Juvenile female Cooper’s Hawk banded on 11/13/12 by Ralph Pericoli; found dead on 11/28/12 at Bodega Bay, Sonoma Co., CA, near a tree in an open space near a housing development; reported by Kathy Kent and her husband, John Dolman.

Juvenile female Cooper’s Hawk banded on 10/5/12 by Craig Tewell; reported on 10/23/12 at Santa Ana, Orange Co., CA, with BBL codes “caught by hand” and “bird dead”; reported by Andrea Sidoti of Serrano Animal and Bird Hospital; no further information.

Juvenile male Red-tailed Hawk banded on 10/11/08 by John Perry; trapped and released during banding operations on 1/1/13, five miles northwest of American Canyon, Napa Co., CA; reported by Stan Moore.

Juvenile Red-tailed Hawk banded on 8/26/03 by Sam Stuart; band found on 1/2/13 at Arroyo Seco Road, Greenfield, Monterey Co., CA, about one to two miles northeast of Millers Lodge, close to Los Padres National Forest; reported by Anita Carpenter.
Juvenile male Cooper's Hawk was banded on 10/12/11 by Nancy Mori; found dead on 1/29/13 at San Jose, Santa Clara Co., CA; reported by Joyce Robinson.

Juvenile male Red-tailed Hawk was banded on 8/27/11 by Liz Morata; found dead on 1/14/11 at Mountain View, Santa Clara Co., CA; reported by Gregory Taylor.

After-second-year Red-tailed Hawk banded on 12/10/12 by Rachel Tom; found dead on 12/20/12 at Walnut Creek, Contra Costa Co., CA; reported by Hamilton's backyard. He could not ascertain what caused the hawk's death; it was fresh, "pretty darn clean...he/she was beautiful...love to watch them soar over Mt. Diablo.""
26

found dead on 4/14/13 at Pacifica, San Mateo Co., CA; reported by Michael Johnson.

1218 Juvenile male Cooper's Hawk banded on 9/14/12 by Dan Langos; caught a second time the same day by Craig Melich; found dead on 9/14/13 at Caracuatuio, Guerne, Mexico; reported by Alexis Arzats. This hawk holds the record at Pinnacles of a condor. We had only spotted one deceivingly large Turkey Vulture before the condors left their roosts and took flight for the day. We started up the Condor Gulch Trail, and were soon surrounded by beautiful manzanita trees and dozens of Acom Woodpeckers. About a quarter-mile after the Condor Gulch Trail connected with the High Peaks Trail, my companion spotted a small black dot on a rock to our right about 200 meters away. I squinted into my binoculars and immediately recognized a California Condor. We jumped for joy, high-fived, and then proceeded to take approximately 200 pictures…each. We continued trekking uphill. A fellow intern and I travelled to the East Entrance of Pinnacles on a Saturday, and immediately had our eyes peeled for the black silhouette of a condor. We had only spotted one during our daily Laguna Turkey Vulture before starting our hike. With one goal—spotting the illustrious California Condor—we knew that we had to head up to the high peaks before the condors left their roosts and took flight for the day. We started up the Condor Gulch Trail, and were soon surrounded by beautiful manzanita trees and dozens of Acom Woodpeckers. Since 2003, 19 California Condors have been released in Pinnacles National Park. (Photo by Emily Abernathy.)

PEREGRINATIONS

Emily Abernathy

Pinnacles National Park

T he California Condor has been a poster child for animal conservation since its extinction in the wild in 1987—and during its subsequent captive breeding and reintroduction, we have always held condors high on our list of birds to see because of its federally endangered status. And there is no better place to see a California Condor than at Pinnacles National Park. Located 2½ hours by car from the Marin Headlands, Pinnacles is named after its spectacular rock formations, which are remnants of an ancient volcanic field. It is our newest national park, just signed into law in 2013. After stopping for lunch and then hiked for another hour, we almost gave up hope of seeing another condor. Suddenly, I spotted three large black birds flying off in the distance. Not only were there two more California Condors, but there was a Turkey Vulture flying with them, and seeing the size difference was incredible. Once the condors flew out of sight, we continued following the trail downwards. Towards the end of the High Peaks Trail we started to see signs of wildlife again, including several Western Bluebirds and a Canyon Wren! We were so excited by our luck that we decided to extend our hike and took a right onto the Rim Trail, which goes past Bear Gulch Reservoir. After a lot of ducking and a little bit of crawling, we emerged out of the Bear Gulch Caves and into a small wooded picnic area at the end of the Moss Spring Trail. All of the birds that had eluded us throughout the higher elevations were suddenly all around us down by the stream. We spotted Oak Titmice, Steller’s Jays, a Spotted Towhee, Dark-eyed Junco, and dozens of Acom Woodpeckers on a gnarly tree. Unfortunately, this was the end of our hike, but our good luck didn’t stop there—on the way home we saw an adult Golden Eagle!

California Condors are not the only thing that Pinnacles is famous for. Since 1908, 160 species of birds have been documented in the park, also home to two cave systems that house 14 species of bats. If bats are not your cup of tea, Pinnacles also has the greatest number of bee species per unit area of any place ever studied (www.nps.gov). If you would like to see a California Condor or enjoy a great day hike, from the beautiful riparian lowland habitat to the high peaks of the rocky summits, Pinnacles National Park is the place to be.