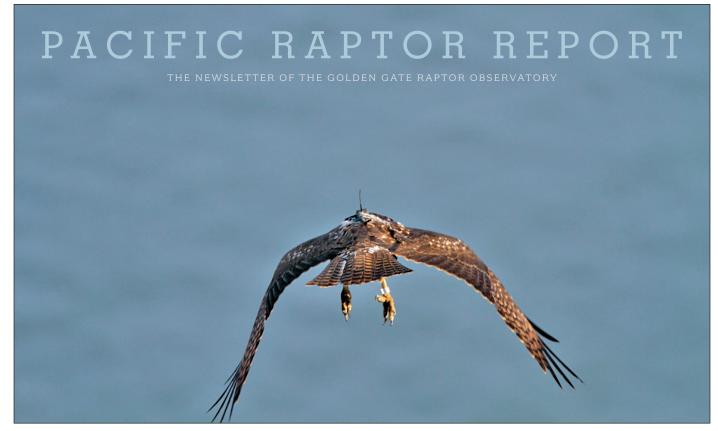
PACIFIC RAPTOR REPORT





Delilah the juvenile Red-tailed Hawk, equipped with a leg band and a GSM transmitter, resumes her flight. [Photo by Step Wilson]

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(Cover) Adult male American Kestrel [Illustration by Lynn Schofield]

THE GOLDEN GATE RAPTOR OBSERVATORY IS A PROGRAM OF THE GOLDEN GATE NATIONAL PARKS CONSERVANCY IN COOPERATION WITH THE NATIONAL PARK SERVICE

DIRECTOR'S NOTE Allen Fish

Buzz Hull and the GGRO

FTER SERVING AS GGRO'S Research Director for 22 years, and as a volunteer nature to publicly revisit past successes, but I can get away with it. Buzz did something extraordinary here at the GGRO. Way before anyone uttered the term "citizen science," Buzz cultivated a community of people deeply committed to learning about raptors through banding and other scientific techniques.

Prior to being on staff, Buzz was part of the first class of GGRO volunteers. This was a highly-driven, self-motivated group who started banding for the Golden Gate National Recreation Area in 1983 and 1984. GGRO founder and National Park Service Ecologist Judd Howell told this group that this program's success would rest on their shoulders. It did, and it does.

Even before he was our Research Director, Buzz took over much of the computer recordkeeping and data analysis for the GGRO banding program. He pushed banding volunteers toward greater use of vertical nets (better for catching small hawks and falcons), and he rehandling hawks.

All of these techniques were written up for the GGRO Bander's Manual, which Buzz initially helped write and then updated at least twice. Buzz later rewrote that manual with Pete Bloom for the North American Banding Council, so that techniques across the continent.

Sometime around the late 1990s, I recall thinking that Buzz Hull may have taught more people to trap and band raptors than anybody in the country. That is a great achievement when hundreds of others in its detail and art. Having managed a laboratory at Letterman Army Hospital for a quarter century, Buzz brought an es-

sential, logical sensibility to the GGRO, but his scientific ethos also included a deep concern for Leader and bander for 30 years, Buzz our study animals. I am certain that a great part Hull retired in February 2013. It isn't in Buzz's of the GGRO's success as a citizen science program comes from Buzz's role-modeling not just the techniques of trapping and banding raptors, but also the responsibility inherent in doing good science on behalf of the hawks you are privileged to handle.

> Buzz was always on the lookout for an opportunity to learn more about the hawks that we had in hand—and to pay the birds back since we disturb their normal lives. Under Buzz's leadership, the last 20 years have brought opportunities for the GGRO to do specialized collaborations with scientists and graduate and undergraduate students at local universities, among them: UC Berkeley, UC Davis, UC Santa Cruz, Sonoma State University, Dominican College, Stanford University, and San Francisco State University.

Remarkably, the most effective GGRO partnership has been between Buzz and his son, Joshua Hull. They have published 11 scientific articles during Buzz's tenure, including studies fined our scientific skills, like measuring and of raptor genetics, West Nile virus and other diseases, differential migration, sexual dimorphism, mechanical lure effectiveness, and human error in identifying birds of prey. It would be easy to blame such superb scientific cooperation on some sort of mutation in the Hull family genetics, but Buzz always watched for the new raptor banders could be trained in these chance to make banding raptors more scientifically far-reaching, and he worked hard with the North American Banding Council to help other banders do the same.

It may surprise you that some of Buzz Hull's strongest contributions to the GGRO have had you think about it: to have brought this ancient nothing to do directly with banding research. technique forward and to carefully instruct For example, it was Buzz who insisted in 1991 that we should have a GGRO docent program with weekend programs to show the techniques of hawk counting and banding. Now, 22

years later, an estimated 100,000 people have attended GGRO's weekend programs. Tens of thousands of kids (and adults!) have held a raptor band or wing, or seen their first accipiter, eye to eye.

Back in the mid-1990s, Buzz took the lead on hiring and managing GGRO's Research Interns, recent graduates who could bring their unflagging effort, sweat, and muscular backs to the taxing five-month migration season. Over a 20year span, Buzz brought nearly 70 young people into our exciting and sometimes chaotic world of raptor research, and at least 80% have since moved on into graduate work in conservation or biology. Some have become research partners and co-authors in their own right, and it may be the strongest statement of their quality to note that eight former interns served as volunteer banders in the 2012 migration season.

A good friend of mine asked me recently, "What is a legacy?" And I immediately thought of Buzz Hull and his impact on the GGRO—of so many hawks that we have talked about, so many people that have been part of the GGRO, and so many stories.

In early 2013, as acknowledgement for his legacy in launching the GGRO, we have set up the Buzz Hull Raptor Research Award. The Hull Award will be an as-needed monetary grant for student researchers working with the GGRO on some unique aspect of raptor research, a longterm and apt tribute to Buzz Hull's love of raptors and their biology.

I am delighted to announce that the first Buzz Hull Raptor Research Award has been given to Kat Tomalty, doctoral candidate in Veterinary Medicine and in Genetics at the University of California at Davis. Kat's research is an examination of West Nile virus impacts on California's raptors a decade after the disease arrived in the western United States.

Allen Fish has been GGRO director since 1985.

Tax-deductible donations to the Buzz Hull Raptor Research Award can be made out to the "Golden Gate National Parks Conservancy" but please write "Hull Award" on the notation line. Mail checks to Jill Harley, GGRO, 1064 Fort Cronkhite, Sausalito, CA 94965. Call the GGRO at 415-331-0730 with questions.



Adult male Harrier and Buzz. [Photo by Siobhan Ruck]

AFTERWORD Buzz Hull -taken from the 1993 "Season Summary"

THE 1993 SEASON FOLLOWED ITS USUAL CYCLE, which seemed to me to be something like a river. In August we waded into the shallow water and gentle currents of early season raptor movement. We had barely enough time to get our feet wet before the stream became a torrent in full flood, sweeping volunteer teams through the narrow gorge of Peak Week. Human energy and excitement joined with the natural force of the raptor movement as volunteers and staff were snatched up by the main current and carried along in a mad ride. Hordes of visitors made pilgrimages to Hawk Hill, to hear Docents speak and demonstrate the banding process, or simply to stand among other birdlovers to view the incredible display of raptors. Riding the river out of this gorge into the calmer waters of late October through December, we all caught our breath. Our view expanded as a greater variety of raptors flew through the Marin Headlands; Banders, Hawkwatchers, and visitors alike had time to appreciate the beauty and diverse character of the birds above.

One of the things I appreciate most about my time at the GGRO is that it puts me in touch with the awe-inspiring cycle of natural processes. During the year I daily scan a sky that seems empty of raptors. Suddenly they're overhead again, at first just a few and then hundreds a day. Most of us have jobs and lives that cut us off from awareness of that built-in flux and change. Out here, we can feel that power still.

RESEARCH NOTE Suzz Hull

A Look Back at 29 Seasons

N 1984 I RESPONDED TO A NOTICE in the San Francisco Chronicle, asking for interested in-L dividuals to volunteer for a raptor banding project being initiated by the still-young Golden study, including knowledge of the all-volunteer enthusiast, Gate National Recreation Area (GGNRA), part Hawk Migration Association of North America of the National Park Service. One day a week of training for six weeks was required, followed by a commitment of one day every two weeks for the fall and early winter. As a long-time raptor enthusiast, I was ripe for just such an activity, hardly realizing the long-term result of my attending that initial meeting.

here in 1984 had a clue about the future of the project, nor did we realize the unique opportunity that was unfolding as we sat in the blinds that first year. Our waiting time between raptors was largely spent getting to know each other and trying to teach ourselves as much as we could about raptor trapping and raptor biology. The learning was uneven and sometimes so far off-base that we spent more time unlearning our mistakes than we did progressing. We all agreed that we were passionate about the birds, learning as much as we could about them, and somehow contributing to their conservation.

I don't think any of us really understood the privilege that had been granted to us. Not only were we able to get this close-up experience with a variety of wild raptors, but we were able to guide and shape this brand-new project with the permission and support of both the National Park Service and the Golden Gate National Parks Association (now the Golden Gate standing of the raptor populations moving National Parks Conservancy).

We watched and participated as the "GGN-RA banding project" grew into a more complete

study of raptor migration through the Marin Headlands. Allen Fish was hired in 1985, bringing a background with a wider view of raptor

Allen quickly connected with Carter Faust, for just such who had been counting hawks from Hawk Hill during the fall and submitting data to HMANA for several years. With the inspiration of Carter hardly realand Allen's own interest in learning as much as he could about the raptor migration, Allen initi-None of us who started banding raptors ated the "Hawk Watch" as an extension of the GGNRA study in 1986.

> The banding project continued to grow into the Golden Gate Raptor Observatory (GGRO). A volunteer-inspired radio-tracking effort was added to GGRO study techniques in 1990. We meeting. volunteers continued to believe that this GGRO was ours to design and expand. Our astonishing, energetic, and inspired group of volunteers kept pushing with improved trapping methods, better training for all three elements of the study, and lots of reading. This energy eventually led to collaborations with local universities, combining understanding gained from the field data collection with genetic analyses, studies of haemoparasites, West Nile Virus antibody studies, and stable isotope analysis.

Now, in 2013, our new Banding Program Manager, Dr. Chris Briggs, is well-prepared to build on our early efforts and initiate research that will yield new and more complete underthrough the Marin Headlands. I eagerly anticipate the insights that will be gained through these efforts.

As a longtime raptor I was ripe an activity, izing the longterm result of my attending that initial

In 1991, Buzz Hull added the job of being GGRO's Research Director to his many hours of volunteering. In February 2013, he officially retired from the GGRO, although he is still the GGRO's Research Director Emeritus.

GSM TRACKING Chris Briggs

At the Nexus of Biology and Technology

make this a fascinating time to be a biologist, particularly one who deals with the movements and migrations of birds. The miniaturization of electronics, batteries, and solar cells means smaller, lighter, more sophisticated, and cheaper tools. Simply put, we can track birds today in ways not dreamed of even just a couple of decades ago.

In 2012, the Golden Gate Raptor Observatory began a new phase of research that will help us

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Intern Regan Dohm prepares to release Delilah the juvenile Red-tailed Hawk after helping fit the hawk with a GSM transmitter. [Photo by Step Wilson]

better understand raptor migration through the Marin Headlands. Specifically, we used a new type of transmitters that utilize Global Systems for Mobile (GSM) technology — the same network many smart phones use to communicate. We attached these transmitters to five raptors: four Red-tailed Hawks, and one Peregrine Falcon. The GSM units obtain very precise location data from satellites, just like your car GPS (Global Positioning Satellite) unit, and then transmit those coordinates via cell phone networks back to us. In effect, the bird "calls" home to tell us where it is. A solar cell integrated into the tracking unit allows it to recharge and potentially last for a year or two. This gives us the opportunity to monitor seasonal movements and migrations well beyond the bird's time in the Marin Headlands.

Each GSM unit weighs approximately 25 grams (about the weight of 10 new pennies) and is about the size of a Matchbox car. The unit is affixed to the bird like a backpack, with the loops of the backpack harness stitched together at the breast. The stitch is made with a thread that will dissolve over time, ensuring that the unit will fall off after a few years. For birds, weight is everything and putting too much weight on an individual hawk could impair its chances of survival. At the GGRO, that means that we can only put 25-g units on heavier-than-

average Red-tailed Hawks and very large Peregrine Falcons.

HE DATA

What have we learned from our five 2012 trackings? There was no consistent north-to-south movement of the birds we tagged, and their movements were generally concentrated around San Francisco Bay. Each bird's tracking, summarized below, can be seen in greater detail at www. parksconservancy.org/gsm-tracking.

Augusta [Juvenile Red-tailed Hawk banded 8/25/2012] Augusta went south, ending up outside Palo Alto, and hanging out near the Stanford Linear Accelerator. She moved slightly within that area over the course of a few weeks, after which she traveled northeast to Hercules. After only a day there, she flew back to the Palo Alto area where she preened feathers over her solar cell (i.e., the unit couldn't charge) and stopped reporting on 11/22/2012. Her reporting picked up again in mid-February and she has been reporting from that same area of Palo Alto through late June.

Big Bird [Juvenile Red-tailed Hawk banded 10/25/2012] Big Bird flew north after banding and we lost her signal on 10/28/2012 near East Lake Reservoir southwest of Willows, CA.

Claire [Juvenile Red-tailed Hawk banded 11/16/2012] Claire flew north to Santa Rosa, then back down to Benicia and south of Oakland when her transmitter failed on 11/27/2012.

Delilah [Juvenile Red-tailed Hawk banded 11/21/2012] Delilah has spanned the East Bay from Richmond to Milpitas, then seemed to settle south of Fremont, CA. But in June, she headed north and then east, all the way to Walla Walla, WA in just ten days! She then retraced her path back southwest and last reported from Bend, OR on 7/6/2013.

Evelyn [Juvenile female Peregrine Falcon banded 11/24/2012] Evelyn flew north to Rohnert Park and we lost her signal on 11/27/2012

COMPARISONS WITH EXTANT TECHNOLOGY

So, how does this compare with other bird-tracking technologies? VHF (Very High Frequency) radiotelemetry that GGRO has used for many years is time-intensive, as the unit emits a signal that must be picked up by a person with a receiver. That means that someone needs to be out there tracking the bird and using an antenna to get bearings. For that increased effort, we are repaid with potentially continuous locations for an individual—if we are able to stay within range of the transmitter.

Although GSM technology requires less human effort and offers more precise location data, it provides fewer data locations per day. Right now we can get 1–5 points per day, depending on how well the unit is being charged. Also, our GSM units have the potential to last for several years, whereas the VHF transmitters generally last only 6–8 weeks.

Other than VHF telemetry, a number of other tracking technologies exist, including satellite transmitters that transmit GPS data via satellite. This provides greater coverage on the ground compared to cell coverage. However, these units are much more expensive (2—4 times as expensive over the course of the life of the unit). In addition, GSMs are unique in that communication is two-way—we can remotely reprogram the number and timing of reports per day that we choose to receive.

Another option is using GPS data loggers. These are light in weight (a few grams) and relatively cheap, but they don't transmit data. That means we would have to recover or recapture an individual hawk after some period to get information about where it has been. For those who follow our band recovery statistics, you know that's an unlikely proposition.

BUMPS IN THE ROAD

Unfortunately, with new technology comes new problems. One unit, Claire's, experienced mechanical failure. We also had difficulty keeping the Red-tailed Hawks from preen-

ing the units under their feathers and covering the solar cells (Augusta and Delilah). That was evident by the steadily declining battery voltage of their units when they stayed within one area. When the hawks would move around, voltage would jump back up. In addition, two units seemed to go out of cell range (Big Bird and Evelyn). What happened to those individuals after the birds went out of range we may never know. An inherent limitation of gathering data via cell networks is being constrained by network coverage—an issue most of us can sympathize with.

LOOKING AHEAD

Next year we hope to be able to put out 10 more units. Our initial data has provided insight that the manufacturer can use to improve the design of the next generation of these units. Our plan will be to place units on five Red-tailed Hawks in our first Red-tailed Hawk peak (August—September 31) and five in the second Red-tailed Hawk peak (October 1—December 31) to examine differential movement of early and late-season migrants. Previous GGRO research has shown that distinct Red-tail populations make up the majority of each peak.

The future opportunities for migration research are exciting. As the technology improves we should see an increase in the number of locations the units can transmit, and the units themselves should get smaller and lighter, allowing us to learn about more species. Also, we can start collecting new and different types of data never available before (e.g., temperature, altitude, flapping frequency). Taking a long-term perspective on these birds will help highlight where some individuals are going, and maybe even indicate where they have come from.

However, as with all things, technology is no panacea and cannot replace the on-the-ground tracking and monitoring we do here each fall. We have an exciting new tool in our toolbox, but we need to make sure we continue to ask the right questions, rather than merely highlight how interesting the newest technology is. I think GGRO has done well to take advantage of this tool, and I look forward to being able to ask new questions we're only just now recognizing are even possible to answer.

Chris Briggs started as GGRO's Banding Program Manager in 2012, having completed graduate studies at the University of Nevada, Reno. Chris was also a GGRO Intern in 2000.

To see our 2012-2013 GSM trackings, go to www.ggro.org and click on the link for GSM Tracking in the list at the bottom. Alternately, if you click on the Video button, you may choose the "Augusta" video which features Chris Briggs placing the GSM device on Augusta the Red-tailed Hawk in August 2012.

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RADIOTRACKING 2012 Lynn Jesus

Lakota Juvenile Broad-winged Hawk

ber of Broad-winged Hawk sightings and bandings on Thursday, September 27, the GGRO Telemetry team re-sorted equipment and re-grouped crews, hoping we might track a second Broadwing to Mexico during 2012 (the first one was Marathon, banded on September 17).

On Saturday morning, Mike Armer's banding crew supplied the year's second telemetry Broadwing, which we named Lakota. In front of the Saturday crowds of hawk-lovers hoping to see kettles of Broadwings, Lakota was released from atop Hawk Hill. This was a rare chance for them to see a Broad-winged Hawk up close. With cameras clicking, Lakota took flight and then sought rest in the trees of Kirby Cove.

The following morning, stationed next to Kirby Cove, I scanned the eucalyptus for roosting birds and caught movement coming from

deep within the trees. The glint off the antenna confirmed it was Lakota! Indeed, Lakota rose up and headed east over Slacker Ridge. Cheryl Kraywinkel and I repositioned ourselves to Battery Spencer, allowing us to follow Lakota's movements in the direction of Angel Island.

Anticipating the beginning of a long day of tracking, Cheryl and I headed to Twin Peaks in San Francisco, as Phil Capitolo and Richard Neidhart were posted along Grizzly Peak above Berkeley, and James Raives was solo on Mount Hamilton. From Twin Peaks, we recorded constant movement as Lakota moved back and forth between Angel Island and the Marin Headlands.

At about noon, Lorri Gong was on Hawk Hill, photographing the kettles of Broadwings overhead. Later, in reviewing her photos, she spotted an antenna on one Broadwing—confirming that Lakota had flown over Hawk Hill.



Intern Sarah Sawtelle holds telemetry bird Lakota for the cameras before releasing this juvenile Broad-winged Hawk from Hawk Hill. [Photo by Bob Power]

In addition to record-breaking numbers of Broadwings that day, record-breaking heat was about to settle in. Along with our copious amount of telemetry equipment (receiver, antenna, radios, etc.), Cheryl and I made quite a fashion statement as we sheltered from the sun on Twin Peaks beneath our umbrellas. That evening Lakota settled down on the north side of Angel Island, in Ayala Cove.

On Monday, October 1, the teams prepared for another hot day in the Bay Area. Lakota popped up from Ayala Cove as the team in Tiburon noted that the signal changed from vertical (for a perched bird) to horizontal (mid-flight) at 10:19 AM. With four teams of trackers posted around the Bay, we again expected Lakota to head south. However, by 12:15 PM, the teams on Tiburon, Twin Peaks, and Berkeley Hills had all lost the signal. The signal was regained later, but all of the bearings were once again vertical. Only Phil and Richard, on

Mount Hamilton, had managed to hear continuous signals throughout the day, but even their signal changed from horizontal to vertical at 12:15 PM. Lakota ended the day on the south side of Angel Island.

On Tuesday, October 2, the heat persisted, forcing hawk-watchers off Hawk Hill early. Three tracking teams took positions around the Bay, but Lakota's signal remained stationary and vertical throughout the day. During dinner, we were all concerned. We discussed sending a team to Angel Island to investigate. However, if the weather changed and Lakota finally decided to fly south, we would be unable to get the tracking team off of the island quickly, due to the ferry schedule

Wednesday finally brought a change in weather. It began sunny, but then fog settled in. Cool temperatures and breezes returned. Unfortunately, Lakota remained on the south side of Angel Island. We made plans to send a team to Angel Island the next day.

On Thursday morning, October 4, James, Phil, and Kate took the 10 am ferry to Angel Island. As the team walked around the east side of the island, the receiver picked up a soft signal upslope. The team split up and headed uphill. They found Lakota's body in the grass with her wings outspread, lying on her back. What a sad ending to this Broadwing's migration. Lakota was brought off the island and her carcass sent to UC Davis to try to determine the cause of death.

We received the final necropsy report on October 12: "The significant finding was the presence of a discrete circular hole with surrounding hemorrhage, extending through muscles on the back between ribs on the dorsal surface of the left thoracic wall, near the vertebral column. The hole is approximately 4—6 mm in width. The wound appears to end in the lung. A search for any foreign objects, such as a bullet, was attempted but none was found, and there was no exit wound found on the opposite side of the body."

So, while we were all ready to track Lakota to Mexico, his or her flight ended here—a shortened life for a very beautiful Broad-winged Hawk. It is hard for any of us to acknowledge the reality of the high mortality rates for first-year hawks (generally 50 to 80%), and likely the 90+ degree temperatures added to the raptors' stress on those days. Still, we know from the lab report that Lakota suffered a severe puncture wound from the back, a wound consistent with an aerial strike from a Redtail or even a Peregrine. But, sadly, that is a story we will never learn more about.

Lynn Jesus has managed the GGRO radiotelemetry program for more years than anybody can recall.



[Photo by Ron Parker]

RADIOTRACKING 2012

Lynn Jesus

Echo Juvenile Red-tailed Hawk

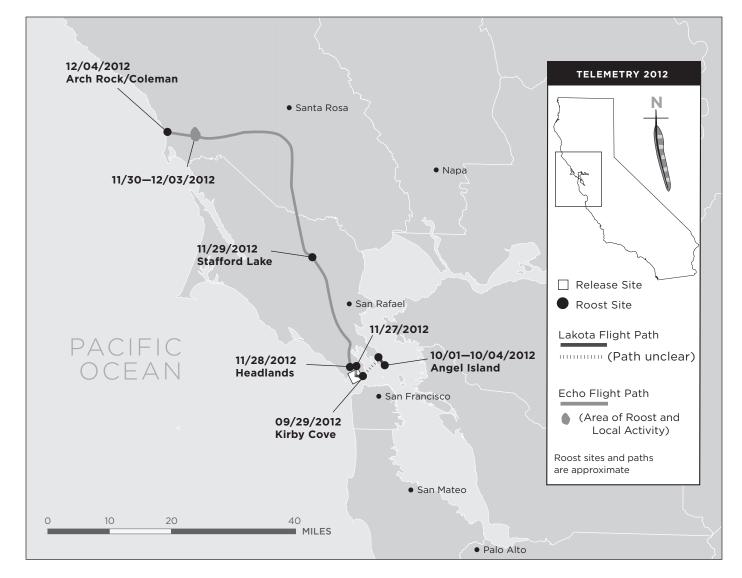
telemetrists tracked one more juvenile Red-tailed Hawk, the 31st since 1990. On November 27, the GGRO banders provided a juvenile, male Redtail, soon-to-be-named "Echo." Jill Harley applied the transmitter to a tail feather, and Echo was released from Hawk Hill.

Libby Rouan wrote the first day's notes: "Echo made a bee-line for the FM towers above Sausalito, and that's where we last heard his signal." The first site was barely one mile from the release point. That evening, an anticipated storm arrived.

The following morning, Barb Westree and Laura Fujii found that Echo had moved. In their end-of-day notes, the team wrote, "Heavy, heavy rain, strong, strong gusts of wind that rattled the car. No signal yet (Smart bird! Hunkered down somewhere)." By 12:30 PM the rain subsided, and Echo popped up from a protective valley in the Marin Headlands. Once he was up and moving, he flew northward. By the end of the day, the teams had located him just south of Stafford Lake near Novato.

On November 29, Echo began his day at Stafford Lake, left the roost area by 8:30 AM, and headed westward. From Mount Burdell, Bill James and Mike Hall were able to pick up occasional signals to the west until Echo finally broke out into the open to the northwest. Cheryl Kraywinkel and Laura took up a position on Sonoma Mountain and were able to get crossbearings with the Burdell team.

After Echo left Stafford Lake, Barb and Kate



Howard spent the rest of the day trying to catch up to him, but did not succeed. The last bearings from Mount Burdell pointed toward the town of Bodega, and indeed Echo was located there the following day.

The severe weather continued, and the teams had to contend with more rain and road closures due to flooding. Everyone was concerned about the tracking teams and Echo, but all had survived another day. The teams located Echo in an area north of the town of Bodega along Tanner Creek Road, known locally as the "Pastures" community.

Echo remained in this area from November 30 through midday on December 4, 2012. Teams even had visual sightings of Echo as he perched in trees, and was harassed by other local birds, including a particularly tenacious male kestrel. On the afternoon of December 4, Echo began to roam and the teams followed the bearings out towards the ocean. That afternoon, the teams wrapped up the active tracking season and the last bearings were taken from Schoolhouse Beach just north of Bodega Bay, and pointed back toward Coleman Road to the southeast.

Later in December, several people took tracking equipment to the Bodega area with hopes of relocating Echo. Lorri Gong headed back out to the area three times during post-season tracking, and picked up Echo's signal on December 9 and December 16 near Coleman Road and various nearby locations. On December 24, she was unable to locate Echo. Ron Parker also tried several times with no luck. Echo had travelled out of the receiver's range.

Lynn Jesus has managed the GGRO radiotelemetry program for more years than anybody can recall.

RADIOTRACKING 2012 Bill James

Marathon Juvenile Broad-winged Hawk

Two Broadwings Fly Identical Routes from Marin to Mexico, 18 Years Apart!



David Jesus lifts Marathon, a juvenile Broad-winged Hawk, back to the migration. [Photo by Allen Fish]

hawks when I joined the Golden Gate Raptor Observatory as a hawkwatcher in 1993. I knew that it was something I would enjoy. It involved raptors, the outdoors, four-wheeling, and exploring out of the way places. The challenge was to try and stay one step ahead of the hawk: Could I think like a raptor?

Our tools were quite different in 1994 when we tracked Zoe, our first Broad-winged Hawk. Back then, pagers and voicemail were our primary communication tools. We carried coins for payphones to communicate with the other teams. We had elaborate numeric codes for use with pagers, to tell

the other teams where they should go next and where we would meet for dinner.

We never knew if they had received the information because it was one-way communication. We left messages on a voice-mail system. We calculated our locations as the distance from known locations using our car odometers because GPS was not available to the public. We had only three vehicles, five people, and a bunch of tracking equipment.

On September 27, 1994, the radio-tracking teams were on-call, waiting for a healthy Broad-winged Hawk to be trapped by the GGRO banders. We had our bags packed and the tracking equipment ready,

and knew where to go as soon as our pagers alerted us. When I received the page it was exciting, like when my wife called to tell me she was on the way to the hospital for the birth of our first child. Zoe the Broadwinged Hawk spent the first night at Fort Baker near the Waldo Tunnel.

The second day I met up with my teammate, David Wimpfheimer. Just before 10 AM, Zoe started flying south. It was hard to keep up, and communications were difficult. We had a bearing that led us to Highway 152 on Pacheco Pass. We had not heard from the other teams all day. As night approached we headed to Casa De Fruta, near Hollister, to find a pay phone to alert the other teams of our location. There, I saw that another telemetrist, Alan Harper, was in the same line. Both of our signals from Zoe had led us to Highway 152. That night we planned for Day 2.

My team was to start south of the bird on Cuesta Ridge near San Luis Obispo, while the other teams would attempt to track Zoe southward from the roost. When we got to the top of Cuesta Ridge there was no signal to the north. I turned the antenna around and found that Zoe was already past us, in the direction of Santa Maria. We had to find a pay phone fast to alert the other teams. That night we met in Santa Maria to strategize for Day 3.

We positioned teams on La Cumbre Peak and Mount Pinos. Zoe flew past our two high-points. We feared that tracking through the Los Angeles basin would be very

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difficult. However, with so many roads and freeways through the basin and highpoints in the hills, we actually found it easy.

Early on the morning of Day 4, Alan Harper and Amy Fesnock had a visual sighting of Zoe roosting in a tree on a golf course near Pomona. David and I were headed to Elsinore Peak, and the third team was on San Jacinto Ridge. We had bearings for most of the day as Zoe flew between Elsinore Peak and San Jacinto Ridge.

On the morning of Day 5, our first signals from Tecate Peak crossed with the signals from Laguna Mountain, indicating that Zoe began the day south of the U.S.-Mexico border and was flying south through Baja California. We stopped tracking at the border, having never imagined that obtaining Mexican permits would be in the cards for this adventure.

We hoped to track another Broad-winged Hawk in subsequent years, but the timing never worked out. Then, in 2012, Broadwings were bountiful, the banders were successful at trapping them, and we had our opportunity.

N SEPTEMBER 17, 2012, eighteen years after tracking Zoe, we put a transmitter on a second Broad-winged Hawk, and named it Marathon with the hope that it would take us on another long and exciting journey. It did!

In many ways, it was easier to track Marathon than Zoe in 1994. We now could communicate using cell phones and text messages, and we recorded our locations using GPS. We had documented knowledge of how far Zoe had flown each day and the high-points that we had used. And this time, we had planned

team rotations using more than 10 people, and we drove an assortment of vehicles from four-wheel drives to Priuses.

Marathon followed a similar path to Zoe's. However, Marathon went down the San Francisco Peninsula while Zoe had traveled south through the East Bay. In 2012, we had the luxury of having an extra "team" consisting of Cheryl Kraywinkel on Mount Hamilton. Cheryl was able to alert the other teams that Marathon had headed southeast towards Panoche Road.

This was about 18 miles further than Zoe had flown on the first day of flight. Although we realized that we could not count on Marathon following the same path as Zoe, we still used most of the same highpoints. I was on Cuesta Ridge on Day 2 for both Marathon and Zoe. Both hawks flew right by Cuesta Ridge and were lost for the day somewhere near Santa Maria.

On Day 3, we were lucky to get just one bearing late in the day that indicated Marathon was still headed south in the direction of Santa Clarita. We strategized that night as to what high-points to use in the Los Angeles Basin. Coincidentally, on that same day, the Space Shuttle was making a final fly-over of Los Angeles, so we knew that the road travel to many high-points would be congested.

On Day 4, we left one team on Mount Wilson while the other two teams set up far to the south on Elsinore Peak and San Jacinto Ridge, as had been done for Zoe. We got to these high-points just in time to receive the signals indicating that Marathon was flying in our direction. She flew very close to the San Jacinto Ridge team of Phil Capitolo and Linda Vallee.

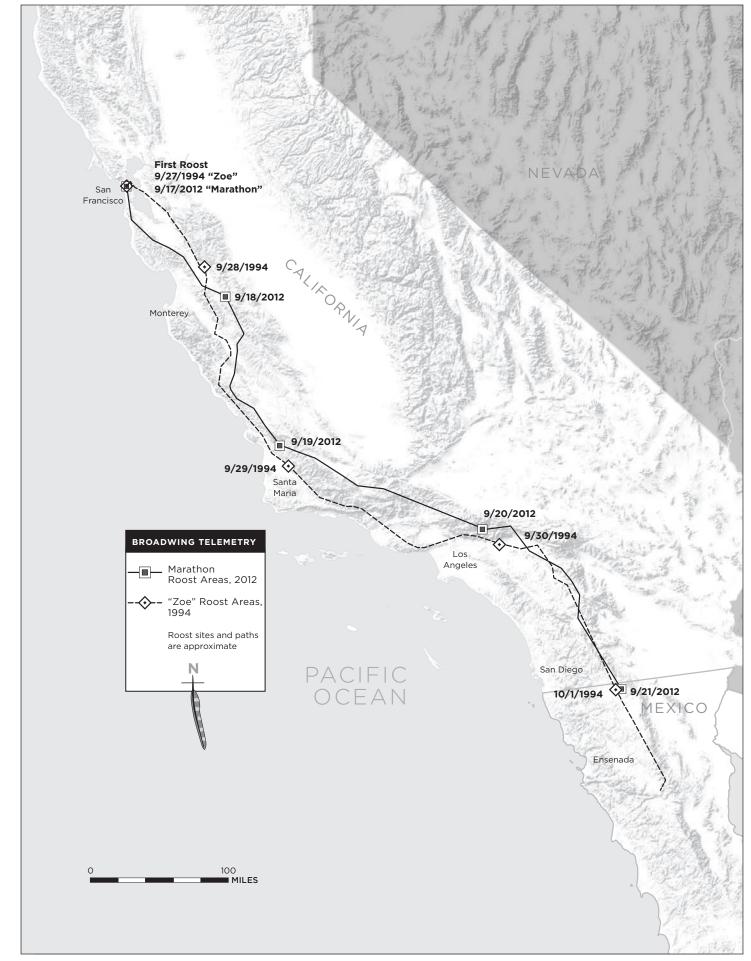
Once Marathon passed, the team on San Jacinto Ridge relocated to Laguna Mountain. They received signals that showed Marathon had made it to Mexico by 5 pm. Both Marathon and Zoe had made it from the Marin Headlands to the Mexican border in four days of actual flying, and both roosted just south of the border on the end of that fourth day.

I am amazed by what a group of individuals from diverse backgrounds, ages, and personalities can accomplish when they all have the clear goal to track a hawk—and when we are each motivated to not let our teams down.

GGRO tracking teams are willing to tolerate long days of hard travel to remote locations on dirt roads throughout the state. We strategize using maps while in moving vehicles on winding roads. We endure long hours of boredom when we are located at a high-point with no signal to report. We record and document the day's events, and we plan for the next day when we are tired and hungry. We sacrifice adequate sleep and continue the pursuit early the next day—all without complaint. If only these traits could be duplicated in the everyday world, there would be no end to the good things that could be accomplished!

While tracking Marathon, I found out that I am now a little older than I was 18 years ago, and my endurance is not as great. However, it was a great experience with great people and I would not have missed it for anything. Each Broad-winged Hawk tracking was a once-in-alifetime experience that I was fortunate enough to experience twice.

Bill James has juggled hawkwatching and radiotracking responsibilities for near 20 years.





[Photo by George Eade]

N September 27, 2012, during a late Thursday morning, the fog that had blanketed the Marin Headlands for two days slowly began to melt. A dozen hawkwatchers arrayed through the four quadrants of our hilltop site watched, counted, and tallied as hawks moved through. As the numbers picked up, I heard this exchange:

From West Quadrant: "South, there's an adult Redtail coming into your quadrant. It's been counted."

South Quadrant: "I can't look now. I'M ON A KETTLE." From another Quadrant: "WE'RE ALL ON KETTLES!"

My first reaction was: That can't be. Then, looking around, I realized that there was a kettle of Broad-winged Hawks in each of the four quadrants! (This is unheard-of at the Golden Gate; in November we sometimes see 20 Redtailed Hawks in one part of the sky, but never this.) These Broadwing kettles each averaged 25 hawks in size, and included an occasional Red-tailed Hawk, Northern Harrier, and accipiter. Through the rest of the day, the swirling kettles continued to give up hawks moving away and gain new ones, maintaining roughly the same numbers.

This was the first big day of the 2012 season for our team. Counters who had little experience working as a team struggled to keep up with the 200 sightings per hour rate of action. They had to save up their counts for the recorder who worked hard to keep up with everything being called in.

Then something in the quadrant system organism turned, clicked into place, and it was working smoothly. The count team worked seamlessly together, tracking hawks, passing hawks, and even basking in the beauty of what was happening all around us. Hundreds of Broadwing sightings were

tracked with other raptors as they moved into the study area, passed through quadrants, and then out of the study area.

As the dayleader, I floated among quadrants, giving advice, coaching new hawkwatchers, and making suggestions to counters about how to divide the kettles into manageable groups. A visiting photographer kept bouncing around the hilltop saying "I can't believe what I'm seeing!"

Banders in Slacker Blind saw a spinning mass of birds against the backdrop of the Pacific Ocean. Visiting dayleaders, hawkwatchers and GGRO Director Allen Fish were a great help and all blessed their luck for choosing that day to visit.

As we debriefed back at GGRO headquarters at the end of the day—after tallying 822 raptor sightings, 295 of them Broad-winged Hawks—I praised the team for evolving from a group of 12 individuals of varying experience into a well-oiled raptor counting machine. I assured them that it was a tough day—an unprecedented, record-setting one for GGRO—and that they had risen to the challenge!

The lasting impression was that anything confusing, anything difficult would be easy to handle compared to what we managed that day. On top of it all, the memory of hundreds of hawks per hour, and unprecedented numbers of Broadwinged Hawk sightings, were gifts that would remind these hawkwatchers why they worked so hard.

One of the first GGRO hawkwatchers in 1986, Fran McDermott retired from hawkwatching in 2013. Fran pioneered and managed our Fieldtrips program; she wrote the Hawkwatchers' Manual; and she managed a 20-year liaison between GGRO and the Hawk Migration Association of North America. Great thanks to Fran from all of us at HAWKWATCH 2012 Melissa Hero

Why I Count Hawks

A Volunteer's View of Hawkwatching

MAGINE WORKING A FULL, LONG WEEK, then driving over an hour to spend your precious day • off outside in the cold, wet fog, and wind. You wait for blue skies to emerge. Sometimes they never do. After four hours of waiting, it might not knew that I had to volunteer for the GGRO. clear, then you drive all the way back home. Why do 164 people do this every other week, for four months? Because we are volunteer hawkwatchers for the Golden Gate Raptor Observatory.

We brave the cold days, the wind, the fog, and sometimes the glaring sun, because we want to catch a glimpse of a Rough-legged or a

Broad-winged Hawk or a Golden Eagle—and experience the excitement of identifying a Turkey Vulture from a Common Raven for the first time. Hawkwatchers are citizen scientists who enjoy watching raptors and want to help contribute to science. And hawkwatchers love raptors.

My love of birds was sparked in high school,

when I ended up choosing a lovebird as a pet. "Jaws" helped me do my homework each night, and most of the time he didn't eat it. After high school, I studied Avian Sciences at UC Davis, where he still helped me with my homework. I took a raptor class during my freshman year and I got to handle large raptors. Allen Fish and Buzz Hull were even guest speakers in one of my classes. I spent a few years doing internships researching cockatiel and Orange-crowned Amazon colonies on campus.

After graduating, I became a high school biology teacher. I wasn't working with birds anymore, but I never lost interest in them. As part of my professional development, I became part of the Exploratorium Teacher Institute, and four years ago I went on their annual field trip to Hawk

Hill. We observed the hawkwatchers and a banding demo. I was hooked. I had missed working with birds and conducting research, and I wanted to help. I wanted to work with birds again. I

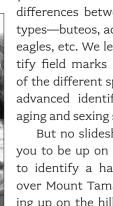
Each year, the fall migration season begins with lots of training classes for new volunteers and those who want a little refresher. One of the things I love about being a GGRO volunteer is that I am always learning. After four seasons, I am nowhere near an expert in raptor identification. In the preseason trainings, we learn the

differences between basic raptor types—buteos, accipiters, falcons, eagles, etc. We learn how to idenis a rewarding tify field marks and flight styles of the different species, and some advanced identification such as aging and sexing species.

But no slideshow can prepare you to be up on Hawk Hill trying to identify a hawk speck flying over Mount Tamalpais. I love being up on the hill trying to figure out those birds, and asking more experienced watchers to explain

how they determined that the tiny dot in the distance was an adult Cooper's Hawk, as opposed to a juvenile or a Sharp-shinned Hawk.

Even though there were foggy days when our team never made it up to Hawk Hill, the days when we did more than made up for it. On one of our last days in 2012, I was in the East Quadrant at the end of the day. There weren't any birds in our area other than a few Red-tailed Hawks that had been circling for the past few hours. Looking towards Angel Island, I spotted a bird coming over Slacker Ridge. It was a buteo with lots of white. I tried to make sense of what I was seeing. I knew it was something good, and I wanted my team to get on the bird. Instead of identifying it, I kind of spit out the words: "Bird, big, lots of white, coming over the ridge, straight towards us."



Volunteering on Hawk Hill experience. Where else can you enjoy amazing views of the Bay Area, while helping to monitor raptor populations?

12 1.3



Cooper's Hawks often show a shorter outermost tail feather, resulting in a notched corner, compared to the cleaner, sharp tail corners on a Sharp-shinned Hawk [Photo by George Eade].

It was a beautiful Rough-legged Hawk. Our entire team got amazing views of the bird. Our dayleader, Bob Power, said it was his first Roughleg on our Saturday in 10 years of volunteering. On days like this, who cares if we get some fog once in a while?

Looking back, 2012 was an amazing season for Broad-winged Hawks. Even though our team missed the big Broadwing day on September 27, we did get some great views. On September 23, we had over 662 raptor sightings, including 27 Broadwings and a Ferruginous Hawk! We got to see stealth bombers and the Blue Angels right above our heads during Fleet Week festivities, we saw a Humpback Whale spouting in the Golden Gate, and our whole team did a pre-Hawkwatch yoga session up on the hill.

Volunteering on Hawk Hill is a rewarding experience. Where else can you enjoy amazing views of the Bay Area, while helping to monitor raptor populations? In sum, 2012 was an incredible year for GGRO with new records, great birds, dedicated volunteers, and lots of fun. I can't wait for next season to begin.

Melissa Hero is a high school biology teacher in Belmont, CA. In addition to volunteering at GGRO, she is a board member for Seguoia Audubon Society and an educator for Mickaboo Companion Bird Rescue.

HAWKWATCH 2012 Sarah Sawtelle

Nuts and Bolts of an Unforgettable Season

THE TOTAL 2012 HAWKWATCH COUNT of 25,138 exceeded the past four seasons, but still fell short of the 10year average total of 28,587. Nonetheless, the season was outstanding for GGRO's 164 dedicated volunteer hawkwatchers and 14 dayleaders due to an unprecedented flight of Broad-winged Hawks in late September, and aboveaverage total counts for Rough-legged Hawks, Ferruginous Hawks, White-tailed Kites, and Red-shouldered Hawks.

This season the peak count day was September 27, when 822 raptor sightings were tallied, or just over 200 raptors per hour (rph). The broader peak occurred between September 19 and 29, during which all six of the season's 100+ rph days were observed, along with two less active days and three days fogged out during that period. Peak species diversity was observed on October 9, when 15 raptor species were

RAPTOR-SIGHTINGS IN THE MARIN HEADLANDS DURING AUTUMN

	2012 Se	ason	Past 10-Year Average*	
	Sightings	RpH**	Sightings	RpH
Turkey Vulture	6,622	14.98	8,865	18.06
Osprey	62	0.14	97	0.20
White-tailed Kite	129	0.29	94	0.19
Bald Eagle	8	0.02	5	0.01
Northern Harrier	523	1.18	728	1.48
Sharp-shinned Hawk	3,149	7.12	4,197	8.55
Cooper's Hawk	2,695	6.10	2,407	4.90
Northern Goshawk	0	0.00	1	0.00
Red-shouldered Hawk	604	1.37	461	0.94
Broad-winged Hawk	755	1.71	135	0.27
Swainson's Hawk	11	0.02	6	0.01
Red-tailed Hawk	8,603	19.46	9,386	19.12
Ferruginous Hawk	31	0.07	21	0.04
Rough-legged Hawk	19	0.04	6	0.01
Golden Eagle	13	0.03	19	0.04
American Kestrel	396	0.90	529	1.08
Merlin	180	0.41	148	0.36
Peregrine Falcon	246	0.56	208	0.42
Prairie Falcon	8	0.02	6	0.01
Unidentified	1,084	2.45	1,236	2.52
Total	25,138	56.87	28,587	57.72

2001-2012: 2010 excluded due to Conzelman Road closure



[Photo by George Eade].

spotted, including five species of buteo and four species of falcon.

The 2012 "species of the year" was unquestionably the Broadwinged Hawk. The season total of 755 sightings was more than triple the previous record. The 295 sightings recorded on September 27 alone made for the largest oneday Broadwing flight ever recorded west of the Rocky Mountains. (See accompanying article by Fran Mc-Dermott.) That single day's total exceeded the previous season record total of 235 sightings in 1999.

Several other buteo species that are usually infrequent visitors to Hawk Hill also showed up in surprisingly high numbers in 2012. After two years without any sightings, 19 Rough-legged Hawks were counted this season—more than triple the annual average and the most since 2006. The 31 Ferruginous Hawk sightings were above the annual average of 21, and the 11 Swainson's Hawks counted were nearly double the average. Other season highlights included two sightings of Short-eared Owls flying past the Hill, and a Common Poorwill on October 18.

BANDING 2012 Tara McIntire

Hawk-Fishing

A Volunteer's View of Banding

before I learned how to walk. with fish during a mayfly hatch, the speed limit; spill, drop, and misplace nearly everything, typically resulting in something wet; and fumble every task, suddenly inca-

to the point of feeling as if I may burst. I am also frustrated to the in my truck, ready at all times to point of exhaustion, with no more race down the road to my favorite

pable of using my hands.

THINK I LEARNED HOW TO FISH LONG flowery words left in my sailor vocabulary. It's the hope, the antici-A glassy pond, bubbling pation, and the excitement when that cast settles onto the water. My causes my heart to race and palms breathing ceases, body crouches, to sweat. In my mad dash to get eyes focus, all for that moment on the water I forget how to drive when the surface breaks and the fly disappears. Then there's the final reward when I hold that sleek, glistening beauty in my hands.

I fished as much as I could until I moved to the Bay Area nearly On the water, I am exhilarated seven years ago. I was spoiled back East, living on a pond with a canoe

> trout pond for an evening outing. Here, surrounded by city, it felt as if fishing was forever and a day away. My fly rod and gear sat idle in the corner. I cycled, hiked, ran, and explored; but none of these activities possessed the allure, art, excitement, or passion of fishing.

Two years ago, through a series of lucky meetings and opportunities, the universe (i.e., Anne Ardillo, Buzz Hull, and Allen Fish) pointed me in an unsuspecting new direction. I had been helping Anne with her work at the Hungry Owl Project, monitoring and banding Barn Owls, when she sug-



Tara McIntire, as a pre-teen, unwittingly trains for her later career as a GGRO raptor bander [Photo courtesy Tara McIntire 1.

gested I consider banding with the GGRO. After she explained more about the program, I sputtered, "You mean you catch hawks?" I think it was in that moment, at the sound of the word "catch," that my raptor fishing journey with GGRO truly began.

That first day of banding, my heart was racing. I'm not sure if it was because of my excitement or if it was from nerves since Buzz, GGRO's Research Director, was in the blind. Most likely a little of both, but I'll let you guess which was the true cause. Even though that first day—spent hiding in an 8' x 10' box—was thick with August fog, sitting with trap lines clutched in my hands and poised for action, felt very familiar.

My second outing was on a beautiful day at Hill 88 with Anne. I could see the hawks in the sky like trout in a clear stream. Though the day was a complete blur (I think the adrenaline erased my mind), I do remember our first capture, a juvenile Red-tailed Hawk. Watching that hawk come close, and waiting for that exact moment to pull the net trigger, was exhilarating. To hold something so untouchable and so exquisite made for a moment that I'll never forget.

learning basic skills, some of which were very familiar to me. I quickly learned that knots are what hold our efforts together. Just as in fishing, they were essential. Knots create and mend our nets, secure and connect our lines and traps. Patience was another very important skill. Taking a moment to hawks!" I of course hadn't made pause and breathe deeply, whether catching a fish or a hawk, was crucial for success — but even more so with hawks, for their safety.



Tara with a juvenile Red-Shouldered Hawk [Photo by Tyson Reed]

Then there was the blood. Banding is just like the fishing days of old, when you'd be hauling gnashing Pickerel (think Northern Pike, but smaller) with sharp teeth grating your fingers like cheese, or slipping up while you're tightening down a knot—only to have the hook and barb sink into your finger, necessitating a trip to the emergency room. Now I found myself dodging fast talons and beaks, which would effortlessly plunge into my hand (my right thumb seemed to be a magnet) in the blink That first season we spent of an eye. Thankfully, another plus side to "raptor-fishing" was having several people around to help pull out the talons!

> Recently, I posted a photo from when I was a kid, proudly holding up two large-mouth bass. A friend and fellow bander said to me, "I get it; you just replaced fish with that connection, but it is so obvious! From water to sky, from Rainbow Trout to Red-tailed Hawks, the fishing parallel was clear and

my conversion nearly complete.

It wasn't until the 2012 season, my second year, that the art and strategy of raptor trapping started to sink in. During my first year I was surprised at every bird, continually lost among landmarks and net numbers as I scrambled for the right trap lines while trying to follow site-leader orders.

With a year under my belt, the basic skills were starting to feel second nature. Just as I would read the water, select the right fly, and carefully place it before a feeding trout, now I could begin to recognize a flap or shape with enough time to both identify and attract a passing hawk and alert the blind into action. I started to focus beyond the walls of the blind, beyond the layers of nets, and imagine what the raptor might see.

For me, this journey into the banding world of GGRO hasn't only been about fishing parallels or about the mission to collect scientific data. It has also been about teamwork, teaching, learning moments (the blood-letting ones seem to be permanently etched in my mind), about long days spent in the blind with good conversation, tall tales, delicious food, and fan-

Though my fishing knowledge has certainly helped me thus far, I know there is still much to learn and experience and I welcome it. I do fear that there is no recovering from these addictive feelings of fulfillment and passion, for those magnificent hawks have cast their alluring spell upon me. Truly, it is I who have been caught.

A newly fledged apprentice bander, Tara is an outdoor/nature enthusiast masquerading as a landscape architect. She is currently plotting her escape from model space.

BANDING 2012 Chris Briggs

Playing to our Strengths

THE 2012 BANDING SEASON WAS THE THIRD BEST ON record with a total of 2,036 birds banded. We broke a few records with that number, including: the number of Redshouldered Hawks banded in a year (42); the number of adult Northern Harriers banded (5); and the number of Broadwinged Hawks banded (9). Records are fun to break, but the solid collection of data from our "bread-and-butter" species of Red-tailed, Cooper's, and Sharp-shinned hawks is also really impressive. In 2012, for example, we captured over 20% of all Cooper's Hawks banded in the United States.

These numbers were made possible by a lot of hard work by our volunteers, including building blinds, maintaining equipment, and training new volunteers. One other record was broken in 2012: long-time bander Russ DeLong reached his 30th year of volunteering with the banding program. During his tenure at the program Russ has banded 676 raptors (not counting birds that he banded under his own permit), 34 of which have been later recovered. Russ's continued commitment to the program is impressive and appreciated.

One of the more interesting 2012 captures to me was a foreign recapture of a Swainson's Hawk. In the parlance of banding, "foreign" does not mean that a bird crossed international borders; it means that when it was captured at the GGRO, it had already been banded outside of our study area. This Swainson's Hawk had been banded as a nestling on July 6, 2012, just outside Tulelake, CA, and was caught at GGRO's Hawk Blind on October 6, 2012 and again at Poison Oak Blind the next day. That journey of over 450 km (288 miles) over four months must have been fascinating, with a route and details we can only guess at.

Relatively little is known about how often individual Swainson's Hawks from the Great Basin interact with the Central Valley population. This encounter highlights that the Cascades and the Sierra Nevada don't form an impenetrable barrier for such a mobile species. If those ranges are not such an obstacle to raptor movements then perhaps we can dare to hope to see more Swainson's Hawks in 2013.

GGRO's new Raptor Banding Manager Chris Briggs conducted research on Swainson's Hawks of California's Butte Valley for the past decade. This 30+ year study was initiated by USFS biologist Brian Woodbridge, and remains one of the longest-run, continuous raptor research projects in the world.



A juvenile Red-tailed Hawk resumes its flight after a short stop in the blind with volunteer bander Candace Davenport [Photo by Calvin Hom]

RAPTORS BANDED IN THE MARIN HEADLANDS DURING AUTUMN

	2012*	Annual Average 1983-2012	Totals 1983-2012			
Northern Harrier	16	10	275			
Sharp-shinned Hawk	731	478	10,809			
Cooper's Hawk	762	559	13,212			
Northern Goshawk	0	0	5			
Red-shouldered Hawk	42	14	362			
Broad-winged Hawk	9	1	31			
Swainson's Hawk	1	0	10			
Red-tailed Hawk	349	315	8,647			
Ferruginous Hawk	0	0	2			
Rough-legged Hawk	0	0	5			
Golden Eagle	0	0	2			
American Kestrel	81	55	1,295			
Merlin	36	29	618			
Peregrine Falcon	7	4	87			
Prairie Falcon	2	2	40			
Eurasian Kestrel	0	0	1			
Total :	2,036	1,468	35,401			
* August 15, 2012—January 5, 2013						

BAND RECOVERIES 2012 Nancy Brink

Across Northern Borders

AR-FLYING HAWKS IGNITE OUR IMAGINATIONS WITH their travels: a Broad-winged Hawk crossing the Mexican border four days after leaving the Marin Headlands; a wayward Eurasian Kestrel banded next to the Golden Gate Bridge; and this season, a band recovery for a Red-tailed Hawk that flew well over 1,000 miles from the Marin Headlands to Fintry, British Columbia, Canada.

cy that issues bird bands for North America, maintains a

database of all birds banded, and notifies banders when their bands are recovered. The "finder" reports the band number of the hawk they have encountered to the BBL, which sends to the GGRO reports of hawks we've banded in the Marin Headlands.

Of the more than 1,200 encounters the

BBL has reported to the GGRO, only nine have been in Canada. The first, reported in 2000, was a male American Kestrel (Band Recovery #398). Banded as a juvenile in October 1998, he was found a year and a half later in Prince Rupert, in the far north of the British Columbia coast (about 250 miles north of the map edge on page 19). "I remember feeling total disbelief," said Marion Weeks, longtime GGRO Band Recovery coordinator. "We'd had only a few Kestrel recoveries—in the Headlands, as far as Davis. But Prince Rupert! It shoots your imagination that much further. We put a band on this released and was flying free again. little hawk and it went way up there!"

Using the basic data from BBL reports, Marion has investigated the eight other Canadian recoveries, all in British Columbia. She has tracked down the finders—rehabbers, birders, conservation officers, and others who care deeply about raptors. Connections are forged that help people on both ends of a hawk's flight to better understand the birds—and learn more about each other's work.

"We still get the newsletter from OWL, the Orphaned

folks at OWL took in a Cooper's Hawk (#400) killed by a window strike, more than a year after it was banded by the GGRO. They also received a four-year old Red-tailed Hawk (#406) with "a loose wing and lesions on its feet." Despite their best efforts, the hawk didn't improve and had to be euthanized.

Finders of these long-distance hawks are as excited as we are to learn how far they've traveled. Edward Pellizzon, The Bird Banding Laboratory (BBL) is the federal agenan avid birder from Victoria, BC, found a dead Redtail (#459) in dense forest at Viaduct Flats on the Saanich Peninsula, an

> autumn hawkwatch site. It was "bone and feathers," he said, and described a nearby nest and fledglings he'd watched - perhaps this bird had been a member of that family. He sent us a meticulous map of where the hawk was found, and an article on problems with eagle predation in BC.

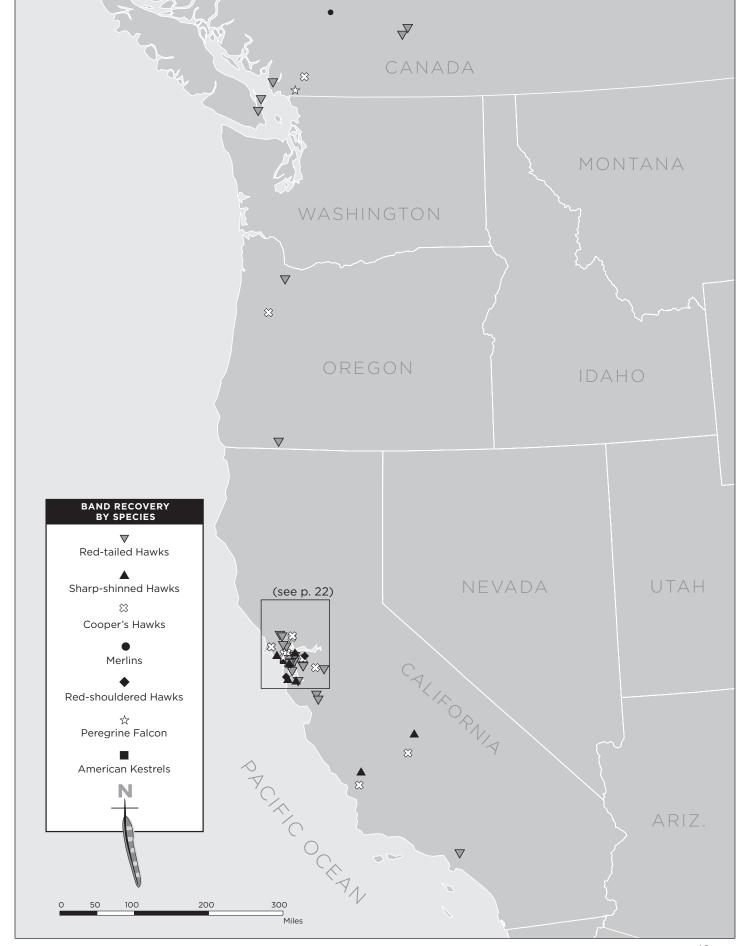


After being banded and released, GGRO hawks have about a 4% chance of being refound. This band recovery rate is a bit higher (5%) for larger raptors like Red-tailed Hawks, and a bit smaller (2%) for small raptors like this adult Sharp-shinned Hawk. [Photo by Mike Armer]

Most band recoveries, sadly, are reporting hawks that have died. But sometimes we (and the hawk) are lucky. Redtail #642 was brought to the Wild Animal Rehab Center (WildARC) in Victoria, BC, after it was hit by a truck on Bowen Island. The first question the rehabber asked Marion was, "Did that Redtail have a tail when you banded it?" Marion assured her that it did—and despite their concerns, the hawk grew a full new set of adult tail feathers. A few weeks later, a WildARC volunteer called to let us know that #462 had been

This year's Canadian band recovery was a Red-tailed Hawk (#1157) banded as a juvenile on October 18, 1996 by Katie Fehring at GGRO. The hawk was found dead on March 30, 2011, two miles north of Fintry, by Conservation Officer Josh Lockwood of Vernon, BC. "Vernon—that location rings a bell," Marion said, flipping through one of those heavy band recovery binders. "I think we had another bird reported by that same office a few years ago."

She quickly found what she was looking for: Band Recov-Wildlife Rehabilitation Society in Delta, BC," Marion said. The ery #820, a Red-tailed Hawk banded as a juvenile in Decem-



ber 2002 and reported in May 2006 by Conservation Officer Brent Smith of the district office in Vernon. The Redtail was found less than 25 miles (as the hawk flies) from the new recovery, just across Okanagan Lake, in arid, semi-desert near Vernon. Officer Smith had led Marion to rehabber Karen Beggs, who took in Redtail #820, its legs black and atrophied by electrocution. The hawk couldn't perch or hunt; with no improvement, the rehabber had to euthanize it.

After futilely trying a number of other ways to contact the reporting officer, we decided to go back to Officer Smith and found him in his Vernon office. He was as excited as we were about this second report of a Redtail banded by the GGRO found in his district, and gave us details about the 15-year-old Redtail.

The Conservation Officer Service was contacted by a person who had found a hawk dead under a power line, near a road, and wanted to stuff it for taxidermy. There were no signs of electrocution; Officer Smith speculated it might have been hit by a car or truck. That spring, he told Marion, the lemming population had crashed up north, and there was a local irruption of Snowy Owls. They were everywhere along the road, eating mice and gophers—and getting hit by 18-wheelers. He had seen seven such victims on one evening.

After chatting about raptors and other wildlife in two very different environments, Officer Smith asked if Marion could send him materials about the GGRO for his wife, an elementary school teacher, to use in her classroom. A fat packet of Pacific Raptor Reports, GGRO brochures, cards with hawk silhouettes, and stickers flew off to Canada.

The nine band recoveries in Canada underscore two of the most rewarding aspects of band recovery "detective" work: getting unexpected news of a long-lived, far-flying hawk; and connecting to people throughout western North America who work with, care for, and study raptors and their habitats. "These hawks are awe-inspiring," said Marion. "The distant recoveries give us a chance to imagine what these birds face: weather, food, finding resting areas, all sorts of dangers. The birds have the drive and instincts to go that far. We are people of nations—but the raptors fly across nations and boundaries, finding a way to arrive safely."

Along with her raptor banding career, videographer Nancy Brink has conducted and filmed oral histories of the early days of the GGRO.

GGRO'S CANADIAN RECOVERIES

398 Juvenile male American Kestrel banded on 10/18/98 by Jesse Conklin; reported by Bryon Carr on 4/27/00 at Prince Rupert, BC. No further information available.

400 Juvenile female Cooper's Hawk banded on 10/30/98 by John

Moody; reported by OWL Wildlife, found after hitting a window on 12/12/99 near Stave Lake, in agricultural area near Abbotsford and Mission, BC.

406 Juvenile Red-tailed Hawk banded on 11/05/97 by Buzz Hull; reported by OWL Wildlife on 02/04/00. Found "injured and emaciated" at Bowen Island, BC, with a "loose wing and lesions on feet." The wing did not heal, and the bird was euthanized.

452 Juvenile Merlin, banded on 9/22/97 by Jimi Scheffel; found by Kelly De Strake at Lillooet, BC, on 10/11/1999. Lillooet—meaning "wild onion" in local native tongue—is a four mile wide valley of sagebrush and cactus between 6,000- to 9,000-foot mountains covered in evergreens, with hot summers and harsh winters. The Merlin was hunting birds on backyard feeders, swooped to get a bird, and hit a window.

459 Second-year Red-tailed Hawk banded on 11/04/93 by Bill Prochnow; found in dense forest at the edge of the wetlands on 7/23/99 by Edward Pellizzon on the Saanich Peninsula at Viaduct Flats, BC. Mr. Pellizzon reported the hawk was "just bones and feathers."

642 Juvenile Red-tailed Hawk banded on 12/18/02 by Julie Goldzman; found on 6/22/04 at Cobble Hill, BC. Reported by Wild ARC in Victoria, BC, after being hit by a truck. After growing new tail feathers, released alive on 10/02/04 on Vancouver Island.

820 Juvenile Red-tailed Hawk banded by John Ungar on 12/11/02; reported by Officer Brent Smith at Vernon, BC on 5/16/06. Taken to rehab with black, atrophied legs; could barely stand and was euthanized after it did not improve.

1029 Juvenile female Peregrine Falcon banded on 9/26/2000 by Alec Hoffman; found dead on side of road on 11/30/09 at Langley, BC by Ken Moore, a self-described "bird guy." The bird was "Big, big female falcon! 48 inch wingspan, just about 4 lbs.!"

1157 Juvenile Red-tailed Hawk banded on 10/18/96 by Katie Fehring; found dead of unknown causes almost 15 years later on 3/30/11, two miles north of Fintry in remote area of British Columbia, Canada; reported by Conservation Officer Josh Lockwood.

BAND RECOVERIES 2011-2013

Marion Weeks

1112 Juvenile Red-tailed Hawk banded on 11/28/02 by Barbara Samuelson; found alive by David Slegers after it was hit by a car at Sherwood, Washington Co., OR on 6/18/11; reported to Bird Banding Laboratory (BBL) by Debbie Daniels, Audubon Portland Wildlife Care Center. The hawk arrived extremely dehydrated, with a swollen shoulder, hyphema in both eyes, and blood in its mouth; it was euthanized due to blindness in both eyes.

1113 Juvenile male Red-tailed Hawk banded on 9/16/07 by Anne Ardillo; caught due to striking radio or other wires or towers on 7/13/11 at El Cerrito, Contra Costa Co., CA; reported by Winnie Kelley. The BBL listed the bird's status as dead.

1114 Juvenile female Red-tailed Hawk banded on 11/4/06 by Tania Pollak; wings, backbone, feathers, and band found by David Clayton, a wildlife biologist, on 6/12/11, 10 miles SW of Ruch, Jackson Co., OR. He had no idea how or when the bird died.

1115 Juvenile female Cooper's Hawk banded on 8/29/07 by David Jesus; band number only obtained on unknown day of January 2011 at Inverness, Marin Co., CA; reported by John Jackson.

1116 Juvenile female Red-tailed Hawk banded on 8/25/10 by Anne Ardillo; partial remains, largely intact, found on 10/11/10 at San Jose, Santa Clara Co., CA, at Cinnabar Hills Golf Club, which is surrounded by rangeland, a reservoir, and riparian areas. Reported by Davinna Ohlson.

1117 Juvenile female Cooper's Hawk banded on 10/8/10 by Buzz Hull; found dead 10/30/11 by Connie Shellooe at her small farm by Karl Twiford.

1121 Juvenile female Sharpshinned Hawk banded on 9/21/07 by Craig Nikitas; found dead 12/2/11 at San Francisco, San Francisco Co., CA; reported by Darren Macker.

1122 Juvenile female Red-tailed Hawk banded on 9/11/10 by Mike Armer; observed flying into a building on Battery and Union Streets, at San Francisco, San Francisco Co., CA on 12/23/11 by its death on 11/14/11 by Barbara Herrera at El Sobrante, Contra Costa Co., CA. Barbara keeps cages of birds outside; this Coop had been hanging around for two weeks. She tried shooing it away and covered her cages. That worked for a few days, so she uncovered the cages and the hawk returned, went under the eaves, and got stuck between a glass door and the cage wall, and died. Barbara noted that adult hawks figure out quickly they can't get

ers, hazing sirens, etc." are used to discourage birds near runways.

1130 Juvenile male Red-tailed Hawk banded on 8/15/11 by Sam Abercrombie; found dead on 12/28/11 at Los Angeles, Los Angeles Co., CA; reported by T J Machado.

1131 Juvenile female Sharpshinned Hawk banded on 9/22/11 by Terry Mead; found dead on "a small sloping hill below our garage" five days later on 9/27/11 at Woodside, San Mateo Co., CA; reported by Linda McLaughlin. "We believe it was a window strike; there was evidence of a strike on the garage window. We have since strung CDs in front of the window as a deterrent. We buried her in our yard."

1132 Juvenile female Red-shouldered Hawk banded on 10/27/11 by Katie Dunbar; found dead of unknown cause on 1/31/12 by Linda Patterson under Cypress trees in a shrubby field next to her home at Half Moon Bay, San Mateo Co., CA.

1133 Juvenile female Peregrine
Falcon banded on 10/25/11 by
Brittney Wendell; found on 2/1/12
by Nona Dennis on old easement
road near water tanks above
Blithedale Road at Mill Valley,
Marin Co., CA. Nona stated the
breast bone was "very conspicuous." This bird is now a study skin
in the GGRO collection. During
preparation "a well-healed puncture mark on the left wing with
old clotted blood" was found by
Mamiko Kawaguchi.

1134 Juvenile female Cooper's
Hawk banded on 8/24/10 by
Patrick Theimer; found dead on
12/17/11, lying on ground at Walnut
Creek, Contra Costa Co., CA. Lindsay Wildlife Museum (LWM) personnel noted that along with being
emaciated it also had a fractured
left leg and injured right shoulder;
reported by Jean Yim of LWM.

1135 Juvenile female Sharpshinned Hawk banded on 9/26/11 by Dick Horn; found dead on 1/26/12 after striking window seven miles north of Visalia and three miles west of Ivanhoe,



Of seven Sharp-shinned Hawk reported in this issue, three (42.8%) were killed by flying into plate glass windows. [Photo by George Eade]

at Atascadero, San Luis Obispo Co., CA. She described the farm as having a small vineyard and winery, along with chickens.

1118 Second-year female Cooper's Hawk banded on 11/7/09 by Siobhan Ruck; found dead on sidewalk by Karen Ames just outside Davies Symphony Hall, at San Francisco, San Francisco Co., CA on 2/6/10. "The hawk was still warm, but definitely dead...no signs of trauma. We suspect that it must have hit the large glass windows of Davies Symphony Hall."

1119 Juvenile male Red-tailed Hawk banded on 9/17/08 by Steve O'Neill; caught due to fracture of right wing at wrist on 11/8/11 at Atherton, San Mateo Co., CA; euthanized on arrival at the Peninsula Humane Society (PHS); reported by Marisa Burman and Patrick Hogan of PHS.

1120 Juvenile male Red-tailed Hawk banded on 9/17/09 by Marc Blumberg; found dead on 11/17/11 at the Presidio of San Francisco, San Francisco Co., CA; reported Silvia Dominguez; dead on arrival at PHS; reported by Marisa Burman and Patrick Hogan of PHS.

1123 Juvenile male Cooper's Hawk banded on 10/16/05 by Julia Camp; found dead along roadway on 12/26/11 by falconer Richard Hoyer, after helping to flush rabbits for another falconer's goshawk at Adair Village, Benton Co., OR; he reported the hawk was in "great condition."

1124 Juvenile female Cooper's Hawk banded on 10/22/11 by Siobhan Ruck; found dead on 10/28/11, face down at bottom of chicken cage wall at Sausalito, Marin Co., CA; reported by Barbara Finnegan.

1125 Juvenile male Cooper's Hawk banded on 10/20/11 by Candace Davenport; found dead on 12/10/11 after flying into 14-foot window of a backyard cabana at Napa, Napa Co., CA; reported by Nancy and Richard Zaslove.

1126 Juvenile female Cooper's Hawk banded on 9/6/11 by Anna Barr; found within 30 minutes of to her birds; young ones take a while longer.

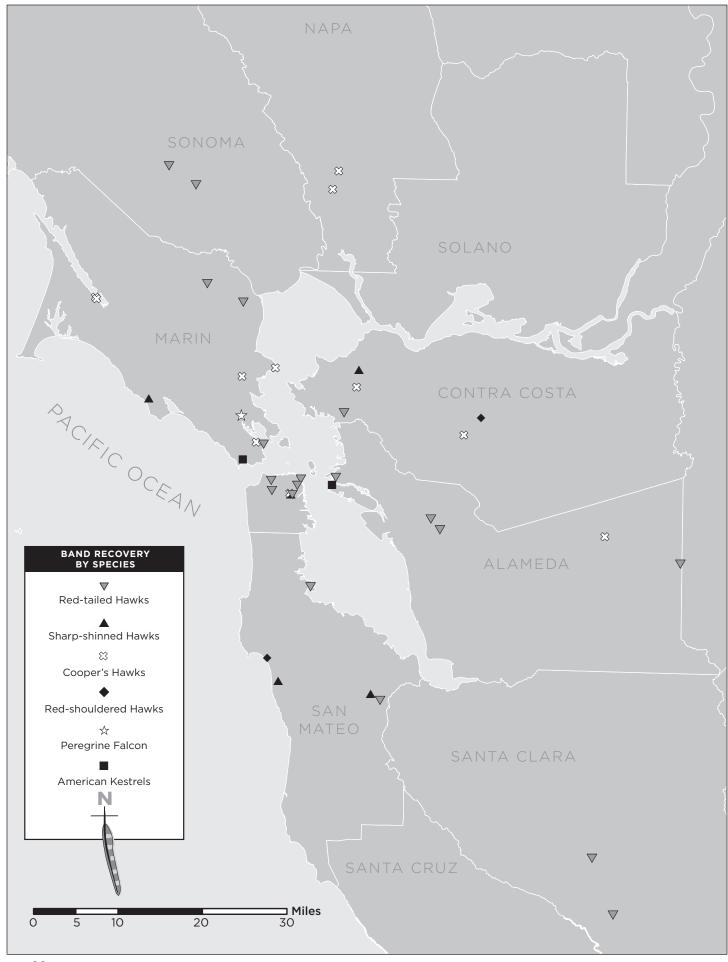
1127 Juvenile female Cooper's Hawk banded on 11/2/11 by Anne Ardillo; found dead near road under power lines on 12/29/11, on a very busy road near quarry at San Rafael, Marin Co., CA. Reported by John Shindelus .

shinned Hawk banded on 10/8/11 by Nancy Mori; found dead, mostly skin, feathers and bones, on 11/30/11, seven miles east of Paso Robles, San Luis Obispo Co., CA; reported by Fred and Vanessa Kulgren. Fred speculated "I suspect...it had not had much to eat and was weakened from traveling. The nights at that time

were below 22 degrees."

1128 Juvenile female Sharp-

1129 Juvenile male Red-tailed Hawk banded on 10/19/11 by Buzz Hull; "hit by airplane...[on] SFO runway, killed" at San Francisco International Airport, San Bruno, San Mateo Co., CA on 12/19/11; reported by James Duenas who added, "pyrotechnics, bird wail-



Tulare Co., CA; reported by David Raymond.

1136 Juvenile female Cooper's Hawk banded on 9/15/10 by Steve O'Neill; found dead (headless) under a tree and in a strawberry patch on 2/24/12 at Inverness, Marin Co., CA; reported by Walter Connolly.

1137 Juvenile female Sharpshinned Hawk banded on 9/26/11 by Brian Smucker; found dead under a tree on 2/23/12 at Half Moon Bay, San Mateo Co., CA; reported by Julie Mutschler of PHS; finder was Hilary Stamper. Julie wrote that "the hawk appeared to be in good shape with no apparent injuries."

1138 Juvenile female Sharpshinned Hawk banded on 9/27/11 by Beth Wommack; trapped and released on 10/2/11 at the Point Reyes Bird Observatory (PRBO) Palomarin Field Station four miles northwest of Bolinas, Marin Co., CA; reported by Renee Cormier of the PRBO. (Four GGRO-banded Sharp-shinned Hawks have been re-trapped at PRBO's songbird mistnets at Palomarin. For more information, see: Culliney and Gardali. 2007. Patterns in movement, captures, and phenology of Sharp-shinned Hawks in central coastal California. Journal of Raptor Research 45: 160-167.)

1139 Juvenile female Red-tailed Hawk banded on 8/29/11 by Buzz Hull; sighted on 10/25/11 by Shirley Doell at Middle Harbor, Shoreline Park, Oakland, Alameda Co., CA. The Redtail was quite tame and perched within 20 feet, allowing her to read the hawk's band number with a 50x spotting scope.

1140 Juvenile female Red-tailed Hawk banded on 8/18/10 by John Ungar; found dead on 3/14/12 by anonymous finder, 11 miles east of Livermore, Alameda Co., CA.

1141 Juvenile male Sharp-shinned Hawk banded on 10/8/11 by Mike Armer; found dead on 2/9/12 at Pinole, Contra Costa Co., CA, after hitting a window while chasing a prey bird. Finders Teresa and James Gozzano stated the prey bird died on impact, while the hawk lived briefly, then died.

1142 Juvenile female Cooper's Hawk banded on 10/14/11 by Erika Walther; found dead on 2/9/12 at Livermore, Alameda Co., CA; reported by Theresa Waschau. Theresa stated, "we have lots of raptors here and we have lots of mice in the fields...it was a beautiful bird with a branch between its talons, no sign of injury, dead on path behind the house."

1143 Juvenile male Red-tailed Hawk banded on 12/3/11 by Katie Dunbar; found dead on 2/13/12 at Bass Cove Trail, a fire/hiking trail around Lake Chabot Regional Park, Alameda Co., CA, "fully intact, recently deceased. No obvious sign of injury or trauma. The body was wet from a recent rain storm." Reported by Park Ranger Terry Kohn.

1144 Juvenile female Cooper's Hawk banded on 9/13/08 by Siobhan Ruck; found on 4/1/12 dead under a lime tree at Napa, Napa Co., CA; reported by David Sullivan. David saw no evidence of injury or gun shot, eyes were sunken.

1145 Juvenile female Red-tailed Hawk banded on 11/15/11 by Nick Villa; caught by hand on 11/29/11 at Fort Baker, Sausalito, Marin Co., CA; it had a disfigured foot, an old fracture, and a dislocated humerus; reported by Kate Lynch of Wildcare, where it was euthanized 24 hours after arrival.

1146 Juvenile Red-tailed Hawk banded on 8/18/10 by Steve O'Neill; was "caught due to control operations" on 4/16/12 at San Francisco, San Francisco Co., CA; reported by Rachel Blatt of PHS. "Bird [was] alive and in captivity" when reported.

1147 Juvenile Red-tailed Hawk banded on 10/3/11 by Eddie Bartley; found dead on 4/28/12 at San Francisco, San Francisco Co., CA by Barbara Vogler.

1148 Juvenile Red-tailed Hawk banded on 12/1/97 by Laurie King; bleached leg bone with band found on 2/18/12 at Deer Island Open Space Park, Novato, Marin Co., CA by Declan Grant and his family while geocaching.

1149 Juvenile male Cooper's Hawk banded on 9/11/11 by Brian Spirou; found at Tipton, Tulare Co., CA by Clarita Rios. Clarita explained that she saw the bird's body on her roof in early 2012 before they retrieved it and reported it to the BBL on 5/17/12.

1150 Juvenile Red-tailed Hawk banded 9/29/05 by Claire O'Neil; found 5/6/12 after being hit by a car at a major intersection at San Francisco, San Francisco Co., CA; reported by Terry Castilyn who "drove by, saw the band, stopped and removed it."

1151 Juvenile Red-tailed Hawk banded on 9/4/09 by Dick Horn; found dead on 3/23/12 at Castro Valley, Alameda Co., CA; reported by Troy Schwenk.

1152 Juvenile Red-tailed Hawk banded on 10/25/97 by Siobhan Ruck; found 14.5 years later northwest of Morgan Hill, Santa Clara Co., CA, on 5/20/12 by Wes King at "6:30 pm during the lunar eclipse...in the dried-up creek feeding the west side of Uvas Lake...completely intact."

1153 Juvenile female American Kestrel banded on 10/30/02 by David Jesus; found in the rain on 6/28/11 by Sarah Koenen, a National Park Service Ranger, in front of the Marin Headlands Visitor Center at Ft. Barry, near Sausalito, Marin Co., CA. The falcon was emaciated and had an injury to one foot. She was taken to Wildcare in San Rafael, where she was treated for dehydration and infection before being released at the Marin Headlands on 7/17/11. Of note: this Kestrel was one of the heaviest females we've ever banded at 135 grams.

1154 Juvenile female Red-shouldered Hawk banded on 9/19/08 by Buzz Hull; found dead with "ants on face/head" and "smell of decomposition" on 6/1/12 at Walnut Creek, Contra Costa Co., CA; reported by Patricia Orlowski of Lindsay Wildlife Museum. LWM report states: "Ran into window,

flew off and was found dead later."

Hawk banded on 10/14/10 by Marion Weeks; found on 6/7/12 by Bart Bundesen while moving his heifers down a hillside, one mile west of Novato, Marin Co., CA. "It was lying there and looked like dried-up jerky. There was no way of telling what happened."

1156 Juvenile female Cooper's Hawk banded on 9/18/10 by Jason Laffer; caught due to injury on 7/9/12 at San Rafael, Marin Co., CA; taken to Wildcare at San Rafael. The hawk expired within 24 hours of arrival; reported by Kate Lynch of Wildcare.

1157 Juvenile Red-tailed Hawk banded on 10/18/96 by Katie Fehring; found almost 15 years later on 3/30/11, two miles north of Fintry in remote area of British Columbia, Canada; reported by Conservation Officer Josh Lockwood; It was found under a power line in a ditch near a road.

1158 Juvenile male Red-tailed Hawk banded on 8/27/10 by Lindsay Addison; caught 7/6/12 at Cotati, Sonoma Co., CA due central nervous system symptoms and taken to Santa Rosa Bird Rescue. By 7/21/12 the hawk, though not completely "healed," was eating and gaining weight, and so was released.

1159 Juvenile Red-tailed Hawk banded on 8/22/01 by Marc Blumberg; trapped and released on 6/19/11 one mile east of Penngrove, Sonoma Co., CA; reported by Stan Moore.

1160 Juvenile male American Kestrel banded 9/17/11 by Mike Armer; was trapped with a female Kestrel 6/26/12 next to nesting California Least Tern colony (a Federally-listed endangered subspecies) at Alameda Naval Air Station, Alameda, Alameda Co., CA. These Kestrels predated many of the young terns. The pair were relocated at least 200 miles from the trapping site; they were released on the Carrizo Plain Grasslands Preserve. Reported by Valerie Burton.

PEREGRINATIONS * Kate Howard and Heather von Bodungen

Humboldt County: Birding the Redwood Giants



A rare Harlan's subspecies of the Red-tailed Hawk soars and hunts at the edge of a coniferous forest near Arcata. [Photo by Kerry Ross]

FAR CRY (AND DRIVE) FROM THE MARIN HEADLANDS, Humboldt County harbors some of the greatest avian treasures of Northern California. A five-hour road trip north on Highway 101 brought two of the 2012 GGRO interns to the northern part of the county, where abundant low-lying grasslands and wetlands are the wintering home to many raptor species. We had four days to find as many bird species as we could, with special emphasis on raptors.

Our first stop was the Humboldt National Wildlife Refuge in Loleta. We went out to the South Jetty in search of Ruddy Turnstones and found one right away. We were then surprised by a Burrowing Owl who obligingly hung around on a rock, posing for us. On our way out, we stopped to look at some "peeps" (small sandpipers) and came out onto the mudflats to find a Peregrine eating one! It was a gorgeous adult that we tried not to disturb. Then, as we picked out Sanderlings, Dunlin, and Western Sandpipers, the peregrine decided to take a meal-on-the-wing. It was a fitting start to our "Peregrinations" trip.

Wildlife Sanctuary, so we got up bright and early on the second day and went for a walk around the marsh. We saw a number of Black-crowned Night-Herons settling into their day-roost, and no shortage of waterfowl. A few raptors were hanging around on the power towers, waiting for the weather to warm up a bit before heading out in search of breakfast.

Our next stop was Eureka for our own breakfast (of a different variety), and then a tour around the bay. On the way south, along the safety corridor that separates Arcata and Eureka, we saw the local dark morph Red-tailed Hawk, a resident for at least seven years, perched in its favorite spot on a billboard. Common and Pacific Loons, Common Mergansers, and Surf Scoters were a few of the waterbirds we saw, along with a flock of Least Sandpipers in the parking lot.

We took Highway 255 out to Samoa to visit the North Jetty and toured around "The Bottoms" of Arcata, where abundant dairy fields are home to many Northern Harriers, American Kestrels, Red-tailed and Red-shouldered Hawks, and Whitetailed Kites. We looked in an old barn for a Barn Owl but no Our lodgings were adjacent to the Arcata Marsh and one was home so we walked out onto some public lands and saw about five or six Short-eared Owls flying around!

We tried to turn every pole-perching raptor we passed into Rough-legged or Ferruginous Hawks but we only found the usual suspects and a juvenile Peregrine. That afternoon we hiked around the Arcata Community forest "salamandering" and stopped at the Mad River Hatchery, where it turns out the steelhead were running—but no Osprey or Bald Eagles were in pursuit.

On day three we headed north. We started with a quick trip around the marsh to wait for our breakfast spot to open and observed several Northern Harriers, American Kestrels, White-tailed Kites and buteos, including a very vocal Redshoulder. We also heard Virginia Rails and found several Canvasbacks and a Redhead—ducks that aren't often spotted in Arcata.

After breakfast we hit the road, heading north on Highway 101 and stopping first in Trinidad for a quick walk around Elkhead Point to look for seabirds and anyone else that was around, like a Brown Creeper and Townsend's Warblers. Next stop was Patrick's Point State Park in search of the elusive Gray Jay. After an \$8 day-use fee and waiting around for an hour, the flock showed up at the campgrounds; it was totally worth it! We also got superb looks at a fairly large flock of Red Crossbills while we waited.

We continued north to see the Roosevelt Elk herd in Orick and drove around Prairie State Redwoods for a while. We started to fade a bit and headed back down to Arcata, where on a whim we parked the car at Kate's old house and checked the pond in the backyard. Lo and behold, there was the American Bittern we were hoping for. We rested for a bit before heading into town for a short while to celebrate New Year's Eve.

Day four was our last day in Arcata and journey home. We headed out Highway 299 to Redding, traveling alongside the Trinity River, which was incredibly clear and blue, a contrast to the muddy, brown rivers some of us are used to in Virginia. We found a beautiful specimen of a Ringtail freshly dead on the highway and stopped rather abruptly to pick it up. After taking precedence over our food in the cooler, it is now a member of a museum collection.

As we got higher in elevation, snow covered the ground and sat in the trees—a beautiful winter landscape. In Redding we stopped off at Turtle Bay to check out the Sundial Bridge and pick up a few new species, including Oak Titmouse, White-breasted Nuthatch, and Nuttall's Woodpecker. We also saw a lovely adult Peregrine with a rosy-washed chest cruising around.

We left Redding and traveled south on Interstate 5 and saw plenty more raptors, including a fast, zippy Merlin. Our next stop was Sacramento National Wildlife Refuge. As we

cruised around the auto-tour, checking out rafts upon rafts of waterfowl, we spotted lots of Redtails and Harriers. Toward the end of the tour we craned our necks to look at an adult Bald Eagle perched high in a tree, who was paying particularly close attention to the large groups of geese and ducks below.... We then skipped over to Colusa National Wildlife Refuge, hoping to catch a glimpse of the rumored Falcated Duck but it wasn't to be found that afternoon. We did see a Great Horned Owl snoozing in a tree and got wonderful close-up looks of White-faced Ibis.

We finally set out for home, exhausted after our marathon trip. It was a long drive but the birds and landscapes were well worth it, and although we only found 118 species, there were many more we could have scrounged up if



RAPTORS SEEN OFTEN

White-tailed Kite, Red-tailed Hawk, Red-shouldered Hawk, Northern Harrier, Turkey Vulture, Peregrine Falcon, American

RAPTORS SEEN OCCASIONALLY

Rough-legged Hawk, Bald Eagle, Osprey, Ferruginous Hawk (above), Merlin, Short-eared Owl

OTHER NOTABLE BIRDS

Ruddy Turnstone, Pacific Loon, Virginia Rail, Canvasback, Redhead, American Bittern, Red Crossbill, Gray Jay

we had explored a bit more. Northern Spotted Owls aren't too hard to find, Rough-legged and Ferruginous Hawks are spotted regularly in the winter, and loads more shorebirds and songbirds can be seen. All in all, it's a fantastic trip that we highly recommend! Just be careful on the roads in winter conditions, and don't be surprised to find a bit of snow and temperatures in the 20s!

One of the 2012 interns, Kate Howard, will be attending graduate school in the fall looking at wildlife ecology in agroecosystems.

Painter and humorist Heather von Bodungen came to GGRO by way of Guilford College and left by way of the cranes at the Audubon Institute in N'Orleans.

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RAPTOR PLUMAGES Chris Briggs/Photos by Russ Delong

Color Aberrations

Author's Note: I have never been a stickler for terminology. Generally I am happy as long as the meaning and intent of the person communicating is clear. I enter this often-heated debate lightly and more with the intent to spark conversation than to stir confusion or ire.

o you've seen a bird that has a white patch of feathers, is overall washed out in color, or perhaps even seems completely white. What term should be used? Is it leucistic? Albino? Partially albino? Certainly some of the confusion in terminology is the result of our inability to get decent views or pictures of particular individuals in the field. Some have proposed we just simply go with the term albino, using modifiers as necessary. But nature isn't simple, and we do it a disservice when we ignore that complexity.

In naming various conditions, birders often focus on the phenotype, or outward appearance. In contrast, ornithologists focus on the underlying causes. While I am swayed by the latter argument, different conditions can yield a similar phenotype and it becomes necessary to convey meaning rather than some knowledge of a condition for which the underlying cause may be unknown.

There are a number of feather pigments. Melanin is the most common type of pigment in feathers. There are two types of melanin: eumelanin (responsible for blacks and browns) and phaeomelanin (responsible for rufous and reddish colors). Other pigments, like carotenoids, probably don't play much of a role in feather coloration of most raptors, but more research needs to be done. There are a lot of names out there, but three names adequately describe most variants: albino, leucistic, and dilute.

Let's start with the term "albino." Often we hear about "partial albinos," but in reality an albino is a bird that has a defect in melanin production such as the inability to produce tyrosinase, an enzyme necessary in melanin production. This leads to no melanin pigmentation in the feathers, skin, or eyes. Thus, there is no such thing as a "partial albino," because indi-

viduals with spots of dark feathers or dark eyes can synthesize melanin. Truly albino birds are quite rare, likely because of low gene frequency in the population. In addition, melanin is important in the retina, and individuals without it suffer from light sensitivity issues that make them vulnerable to predators or competitors.

Leucism is the result of melanin deposition problems within the feather(s), rather than production. Leucism comes in two forms. First are the individuals that appear to be albinos, but have colored eyes and bare parts. This is the classic leucistic individual. Second are individuals that have aberrant white patches (e.g., entire primaries). David Sibley has termed this "partial leucism," which I think is a reasonable term, given we likely won't have the opportunity to diagnose the underlying cause of the observed condition.

Finally, some birds appear "washed out," or have a dilute plumage. The pigment itself is not changed, but it is reduced in concentration. As in a leucistic individual, there is a problem with melanin deposition rather than production.

In reality, there are a number of conditions that produce strange plumages, so this list is incomplete. Plumage patterns could change from a typical individual, genes could be faulty, problems in development could lead to specific areas not producing melanin, and the list goes on. Birders are fascinated with aberrant plumages, and being able to describe them accurately is a good first step.

Further Reading:

Davis, J. N. 2007. Color abnormalities in birds: A proposed nomenclature for birders. Birding 39:36—46.

van Grouw, H. 2006. Not every white bird is an albino: sense and nonsense about colour aberrations in birds. Dutch Birding 28: 79-89.







Above: A classic leucistic bird, this adult Red-tailed Hawk demonstrates problems with melanin deposition in some feathers while others seem unaffected. Leucism can be more or less extensive than this example and can sometimes cause a bird to look almost like an albino.



An example of a dilute bird. Although this juvenile Red-tailed Hawk's plumage is washed-out, all markings are still visible.

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