

GOLDEN GATE
NATIONAL
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CONSERVANCY



GOLDEN GATE RAPTOR OBSERVATORY

Season Summary 2022

HAWKWATCH • BANDING • COMMUNITY SCIENCE • RESEARCH

Golden Gate Raptor Observatory

ABOUT GGRO

The Golden Gate Raptor Observatory is a program of the Golden Gate National Parks Conservancy in cooperation with the National Park Service, and is made up of 150 community volunteers and a small staff. GGRO's mission is the preservation of California raptors through scientific research, outreach, and community involvement. Each year, we monitor and study the bird of prey migration on the central California coast, particularly at the Marin Headlands, part of the Golden Gate National Recreation Area. We are dedicated to the conservation of raptors both through careful data collection and through involving the public in every aspect of our research.

Our deep gratitude to the Gregory Hind Endowment Fund for critical support of the GGRO, also to the more than 600 people who donated to the GGRO in 2022.

GGRO Season Summary 2022

Compiled and edited by Mellice Hackett. Text by Allen Fish, Teresa Ely, and Laura Echávez.

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If you would like to use GGRO data, please contact us: ggro@parksconservancy.org

Cover Illustration: Red-shouldered Hawk Illustration by Siobhan Ruck

Back Illustration: Sharp-shinned Hawk Illustration by Lora Roame

Below Illustration: Prairie Falcon Illustration by Emma Regnier

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Rodeo Beach Illustration by: Emma Regnier

Introduction

THE 2022 SHARP-SHINNED HAWK DELAY

An average Marin Headlands fall migration starts in mid-August. At the beginning of the season, our Hawkwatch counters are mostly seeing young Red-tailed Hawks, some Cooper's Hawks, some Osprey, an occasional Harrier and Redshoulder, and a Peregrine cruising past Hawk Hill. By the first week in September, the Sharp-shinned Hawks start to appear in singles, then more, then around September 10th the floodgates open, and Sharpshins seem to be everywhere. Sharpshins drive the migration numbers up and up to a spike in late September and early October – a spike that often peaks around 25-30 raptors per hour (RpH).

But 2022 was different. We started counting on August 15th. On September 3rd, the first 2022 Sharpshin was counted on Hawk Hill. On September 10th, aka, Floodgate Day: no Sharpshins. Finally, on September 13th, we had two more sightings on the count. Then 25 sightings by the end of week four. Still under quota but some relief.

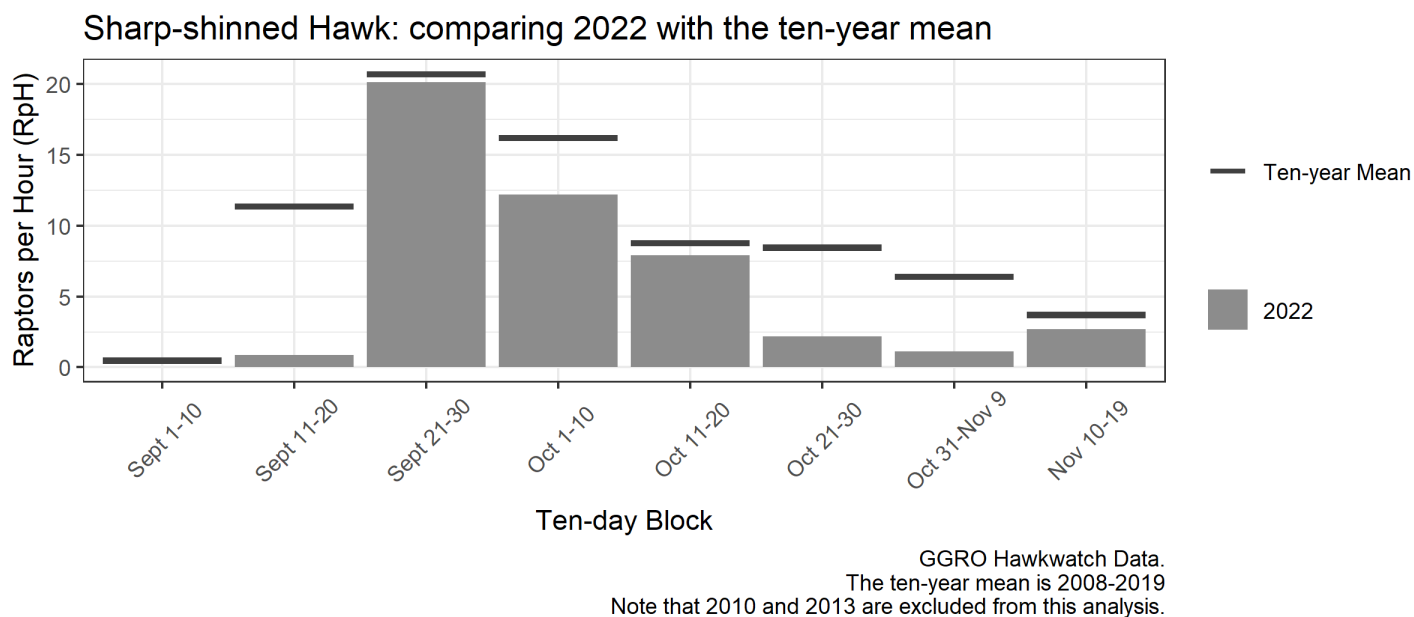
By the fifth week of the migration, September 26th to October 2nd, Sharpshins peaked, totaling 504 sightings for the week, or 19 RpH – about two-thirds of a normal spike, which isn't a great concern. It was the lateness of it all. Someone forgot to turn the Sharp-shinned Hawk migration spigot on until mid-September. Cooper's were also slow to arrive but the numbers were less dramatic.

Our Banding teams also experienced this Sharpshin delay. The first Sharp-shinned Hawk of the season wasn't banded until September 16th and just two more on September 20th. Then the Sharpshin numbers did rise, peaking at 24 hawks banded on September 26th. The rest of the banding season was light for Sharp-shinned and Cooper's Hawks, but never have we seen a lapse in Sharpshins like the first half of September 2022. What caused this weird and striking delay?

Talk ran rampant through the GGRO community – we blamed all the regular culprits: big spring rains squashed the nesting season; the last half-decade of mega-fires in the Pacific states ravaged nesting habitats; migration was delayed by climate change; migratory short-stopping kept songbirds and thus Sharpshins farther north. All are worthy hypotheses, and all will take years to dissect, but the bottom line was this: This event, this in-your-face, clearly-not-normal Sharpshin delay said something else to us. It said, *this is exactly why we do this work*: to detect change.

This is why we have been banding and counting Pacific Flyway hawks in the Golden Gate National Recreation Area for forty years. This is why we keep a community of more than 150 volunteer biologists focused on this annual flight, and why we will continue to do so.

Just as people keep seismographic sensors attached to the ground all over California, just as people measure river flow, air temperature, or ambient noise, we are doing the work necessary so that we can detect it when something extraordinary happens – like a delay in the Sharp-shinned Hawk migration at the Golden Gate. Capturing extraordinary events is especially critical in this time of massive anthropogenic impacts. We have so much to learn about how other species respond to human-caused changes. We have many extraordinary events yet to capture.



The 2022 GGRO was made possible by 150 volunteer banders and counters, by our hard-working field staff Laura Echávez, Krista Fanucchi, and Carmen DeLeon, by our awesome park support staff and colleagues from both the Parks Conservancy and the National Park Service, by our scientific partners for their critical and inspiring research, and by the hundreds of people who donate selflessly and annually to the Golden Gate National Parks Conservancy to keep the GGRO alive and thriving. Thanks to all of you for your dedication to the conservation of the Pacific Raptor Flyway. We raise our binoculars to you.

Allen Fish, GGRO Director

Teresa Ely, GGRO Senior Biologist and Banding Manager

Conservation and Community Science Department
Golden Gate National Parks Conservancy

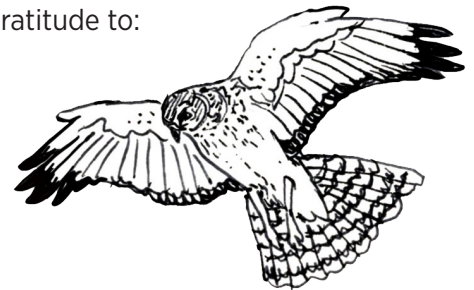
Volunteers

After a couple of years of pent-up pandemic demand, we were finally able to grow our volunteer family again and bring on a couple dozen new Hawkwatch and Banding volunteers. New volunteer training for our programs is a big undertaking, but we are thankful to our 2022 apprentice volunteers for the fresh enthusiasm they brought to our Hawkwatch and Banding teams this season. As for our many returning volunteers – their increasing knowledge and skills are truly fundamental to our success year after year. Our sincerest gratitude to:

Ryan Abusaa
Jon Altemus
Jan Ambrosini
Anne Ardillo
Jennifer Armer
Michael Armer
Stefanie Arthur
Patricia Bacchetti
Mary Badger
Lynn Bantley
Eddie Bartley
Don Bartling
Margot Bezruczyk
Marc Blumberg
Robert Blumberg
Jeff Boissier
Robyn Boothby
Ryan Bourbour
Andy Bradshaw
Nancy Brink
Jennifer Brown
Arden Bucklin-Sporer
Courtney Buechert
Ryan Byrnes
Christine Cariño
Linda Chambers
Oliver Chesley
Conner Cimmeyotti
Laura Coatney
Patricia Contaxis
Patrick Coughlin
Alexandra Cox
Deborah Crooks
Candace Davenport
John Davis
Dennis Davison
Crystal Dolis
Ben Dudek
Joan Duffield

George Eade
Wade Eakle
Rich Eliason
Catherine Elliott
Anastasia Ennis
Michaela Figari
Erin Fisher-Colton
Dan Foldes
Lief Gallagher
Alison Gee
Zeka Glucs
Maureen Grabowski
Susan Greef
Mitchell Green
Keith Gress
Jessica Grubaugh
Erica Harris
JJ Harris
Melissa Hero
Tori Herzog
Kimberly Hettler-Coleman
Rasia Holzman Smith
Calvin Hom
Sam Hontalas
Diane Horn
Josh Hull
Buzz Hull
Eric Jepsen
Chelsea Johnson
John Keane
Brian Kemler
Mary Kenney
Melissa Kohner
Maryrose Kulick
Rachel Lawrence
Cheryl Lentini
Patricia Lessard
William Ludan
Tom Luster

Eric Lynch
Yvette MacDonald
Mary Malec
Robert Martin
Breanna Martinico
Cindy McCauley
Mark McCaustland
James McDermott
Tomas McKay
Paul Meadow
Horacio Mena
Rachel Miller
Jennifer Miller
Margarita Montenegro
Sue Morgan
Nancy Mori
Kimberlie Moutoux
Jody Newman
Titine Newsham
Craig Nikitas
Brian O'Laughlin
Ana Olivar
Rebecca Olsen
Kristin Olson
Claire O'Neil
Ryan Overhiser
Sarah Parnell
Sean Parnell
Denise Peck
Jean Perata
Roy Pisetsky
Bill Prochnow
James Raives
Cricket Raspet
Sonja Raub
Kinley Renger
Lora Roame
Jeff Robinson
Steve Rock



Paul Romanak
Anne Ross
Elizabeth Rouan
Siobhan Ruck
Jane Rudebusch
Rod Santos
Peter Sapienza
Sarah Sawtelle
Linda Schneider
Kaela Schnitzler
Jack Schofield
Lynn Schofield
Paulette Sherry
Tim Stroshane
Linda Sudduth
Natalie Tan-Torres
Christina Tarr
Craig Tewell
Holly Thomas
Laura Thomas
Traci Tsukida
Michael Voeltz
Kristin Vorhies
Noreen Weeden
Marion Weeks
Emily Weil
Carol Weinstein
Jeff Wilcox
Ken Wilson
Woody Woodbury
Jim Yampolsky
Pauline Yeckley
Gretchen Zantzinger

Northern Harrier Illustration by: Emma Regnier



Hawkwatch

The 2022 fall migration was a season of almost-recovery from Covid-19, but someone forgot to tip off the hawks, as we had one of our lowest overall counts in many years. Though we brought our Hawkwatch season back up from 12 to 16 weeks, we kept some safety procedures from the Covid years: social distancing, fencing to keep volunteer counters separated from the public, and no volunteer office visits. We increased the count team size from 5 to 8 people, which included: two Co-Dayleaders, four journey-level counters, one apprentice, and one staff person. On weekends, we added a second staff person to stay near the fence and greet the many visitors.

The 2022 Hawkwatch program was staffed by 75 volunteers and 4 staff members. We brought on apprentices for the first time since 2019 and conducted field classes each morning using foam-core boards invented in 2021 by the late, great George Eade. These “George-Boards” covered a range of raptor identification lessons, for example, Eagle Ages, Accipiter Tails, Brown-backed Harriers, and Buteo Salad.

The season ran from August 15th to December 4th. Except for inclement weather, we counted daily from 10 am to 3 pm. Amidst rain and fog, high heat, and crazy wind, we counted for 410 of the possible 560 hours for the whole season, a bit lower than the average 470 hours/year for the ten years pre-Covid.

Our Parks Conservancy Data Manager Lizzy Edson set up the Hawkwatch 2022 comparison charts to show the raw count data for 2022 and the ten-year average count data. We use the term “sightings” since there is no way to be certain that a bird has been counted previously or not. The rates show sightings per hour; this is better for year-to-year comparisons since the number of count-hours fluctuates annually depending on how many fog days, rainouts, hot days, etc., have happened that year. Of the 18 raptor species counted in 2022, 13 showed declines in migration rates this year, and nine of those were near or over a 50% decline from the ten-year average.

Our four most prolific species – Turkey Vulture, Sharp-shinned, Cooper’s, and Red-tailed Hawk – declined in 2022, most extremely, Cooper’s, with 2022 rates just 44% of the past average. Two species increased in 2022, Bald Eagle and Broad-winged Hawk. Balds have been growing steadily and slowly in number in the fall migration as well as around the SF Bay Area since the 1990s. The Broad-winged Hawk increase mostly took place during four days in late September when 157 Broadwing sightings were recorded.

DAY LEADERS

Jon Altemus, Don Bartling, Andy Bradshaw, Christine Cariño, Deborah Crooks, Dennis Davison, Catherine Elliott, Erica Harris, Sam Hontalas, Mary Kenney, Mary Malec, James McDermott, Horacio Mena, Brian O’Laughlin, Becky Olsen, Libby Rouan, Jane Rudebusch, Linda Schneider, Holly Thomas, Ken Wilson, and Gretchen Zantzinger.

Hawkwatch

Raptor sightings in the Marin Headlands, California, during autumn.

	Count 2022 (sightings)	Average Count 2008-2019* (sightings)	Rate 2022 (sightings/hour)	Average Rate 2008-2019* (sightings/hour)	% Change in Rate**
Turkey Vulture	5974	6571	14.54	16.41	-11%
Osprey	41	63	0.10	0.16	-37%
White-tailed Kite	14	58	0.03	0.15	-80%
Bald Eagle	20	10	0.05	0.02	150%
Northern Harrier	191	478	0.47	1.19	-60%
Sharp-shinned Hawk	1905	3049	4.64	7.61	-39%
Cooper's Hawk	891	2001	2.17	5.00	-57%
Northern Goshawk	0	1	0	0	0
Red-shouldered Hawk	189	399	0.46	1.00	-54%
Broad-winged Hawk	558	270	1.36	0.68	100%
Swainson's Hawk	8	6	0.02	0.02	0
Red-tailed Hawk	6195	7250	15.08	18.11	-17%
Ferruginous Hawk	11	26	0.03	0.07	-57%
Rough-legged Hawk	1	4	0	0.01	-100%
Golden Eagle	8	14	0.02	0.04	-50%
American Kestrel	115	287	0.28	0.72	-61%
Merlin	87	166	0.21	0.41	-49%
Peregrine Falcon	209	201	0.51	0.50	2%
Prairie Falcon	4	4	0.01	0.01	0
Unidentified	424	869	1.03	2.17	-52%
Total Sightings	16,845	21,727	41.01	54.28	-24%
Hours Counted	411	400*			

Data compiled by Lizzy Edson and Allen Fish. If you would like to use these data, please contact us: ggro@parksconservancy.org

* The ten-year average used survey hours 10am to 3pm only for the years 2008-2019, removing 2010 and 2013.

** Change in migration rate from 2008-2019 average to 2022

Banding



Illustration by: Emma Regnier

In 2022, the GGRO Banding Program had huge accomplishments before the field season even started. This was the first season since 2018 that we were able to invite new volunteer apprentices (12) into the Banding Program. During the spring, we lost access to the NPS warehouse (due to heavy metal contamination) where our blinds were stored, but volunteer banders Craig Nikitas, Paul Romanak, and Lynn Bantley stepped in and took on the monumental task of rebuilding three banding blinds, ensuring that we would have a fall field season.

This migration season we banded 601 raptors of nine different species. Cooper's Hawk (197) and Sharp-shinned Hawk (238) numbers were considerably lower than average and only one Northern Harrier was banded. The second wave of Red-tailed Hawks did not happen, but we banded 127 by the end of the season. We also banded low numbers of American Kestrels (10) and Merlins (8).

Despite the lower numbers, we continued to collect invaluable data. We placed color bands on 101 Redtails, 7 Redshoulders, 5 Peregrine Falcons, and we collected over 600 feather samples. We recaptured one Cooper's Hawk that was banded in 2021. No Turkey Vultures were wing-tagged this season, but we had over 160 sightings of tagged vultures. We also had band encounters or resightings 27 Red-tailed and 4 Cooper's Hawks.

There have been changes to the GGRO Banding Program in the past few years that impact our banding totals. Field hours during the general season and daily schedule were adjusted to ensure that staff can always be on-hand to provide support for the volunteers. In 2021 and 2022, we operated three blinds instead of four. During the years 2013, 2018, and 2019, we had low banding season totals, and in 2020 banding operations were completely shut down due to Covid-19. While these physical changes have reduced the number of banding hours for recent seasons, they do not impact the program's goals and purpose.

The GGRO Banding Program is here to collect accurate data, samples, etc. on each individual raptor that we band, and we accomplished this goal in 2022, despite the below-average season.

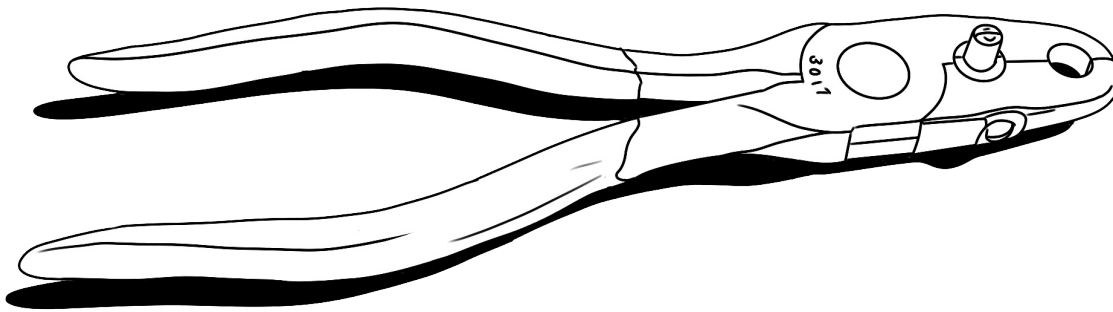
DAY LEADERS

Anne Ardillo, Mike Armer, Eddie Bartley, Marc Blumberg, Robyn Boothby, Nancy Brink, Candace Davenport, Laura Echávez, Teresa Ely, Anastasia Ennis, Krista Fanucchi, Lief Gallagher, Josh Hull, Eric Jepsen, John Keane, Eric Lynch, Craig Nikitas, and Jeff Robinson.

Banding

Raptors banded in the Marin Headlands, California, during autumn.

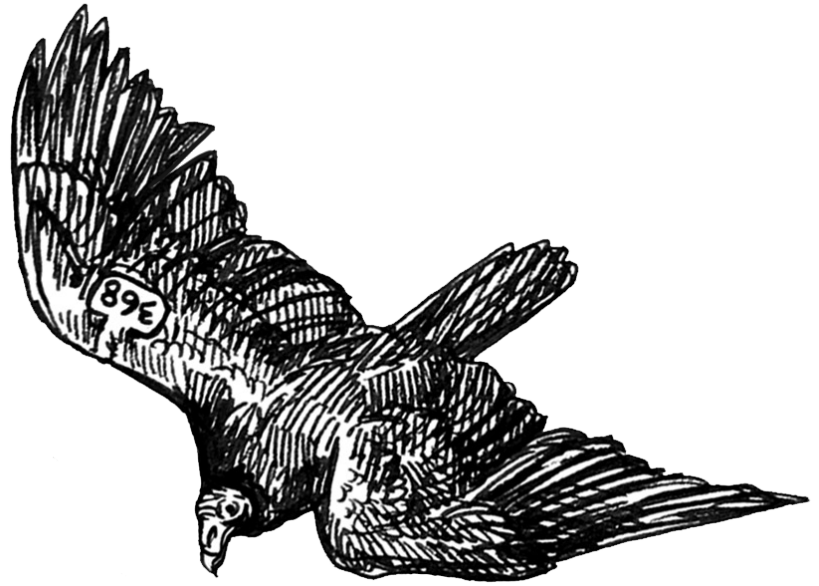
Species	Average 2010-2019*	2021	2022
Northern Harrier	5.2	6	1
Sharp-shinned Hawk	314.2	184	238
Cooper's Hawk	423.9	283	197
Northern Goshawk	0.2	0	0
Red-shouldered Hawk	15.2	22	12
Broad-winged Hawk	2.1	1	1
Swainson's Hawk	0.3	0	0
Red-tailed Hawk	219.6	195	127
Ferruginous Hawk	0.1	1	0
Rough-legged Hawk	0.1	1	0
American Kestrel	28.1	7	10
Merlin	27.7	16	8
Peregrine Falcon	3.5	5	7
Prairie Falcon	1.0	1	0
Total Banded	1041.2	722	601



Banding Pliers Illustration by: Lora Roame

Data compiled by Teresa Ely. If you would like to use these data, please contact us: ggro@parksconservancy.org

* From the early 1990s through 2019, on most days, we used four banding blinds in the GGRO Banding Program. In 2021 and 2022, we only used three blinds, therefore this chart shows the ten-year banding average for only the three blinds, making comparisons more valid. Numbers have not been adjusted for changes in banding season start and end dates in recent years, nor for changes in daily start and end times.



Vulture Ecology Study

Beyond being widely misunderstood by the general public, Turkey Vultures are often misunderstood from an ecological perspective as well. Where do they nest? How widely do they migrate, if at all? And how are they impacted by toxics, especially rodenticides, heavy metals, and even microplastics?

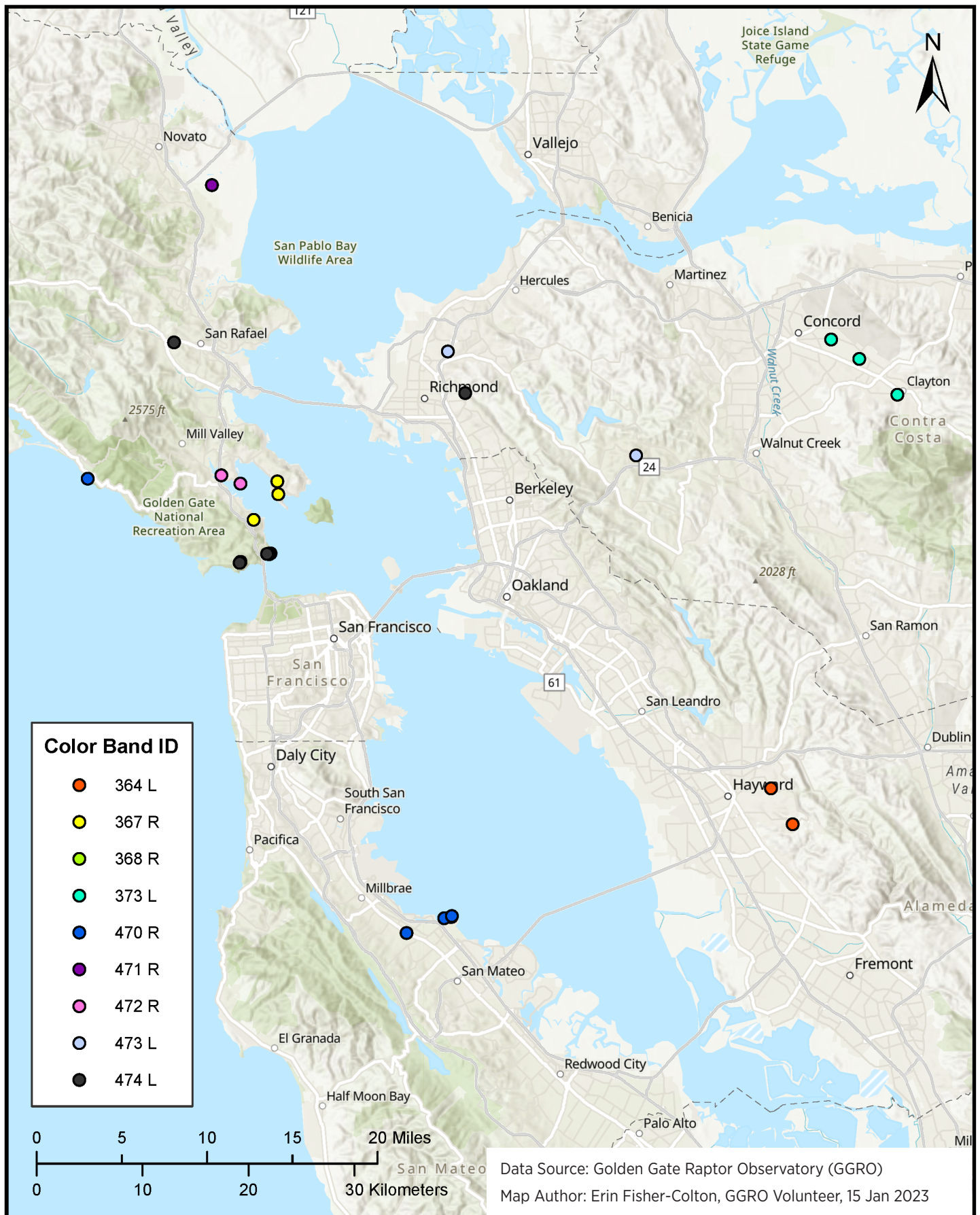
From 2017 to 2020, GGRO wing-tagged 17 Turkey Vultures to study these and other aspects of vulture behavior and conservation, particularly in this urban region. Nine of the tagged vultures were resighted (multiple times) throughout the Bay Area in 2022. The sightings were in Marin, Contra Costa, San Francisco, San Mateo, and Alameda counties.

From day one (August 15th) of the 2022 migration season, GGRO hawkwatch volunteers observed one of our most frequently seen tagged individuals, Turkey Vulture #368 over Hawk Hill. Over the course of the fall season, the volunteers recorded 168 sightings of tagged vultures from the hill, which means during the 411 hours on hawkwatch, we counted a tagged vulture, on average, every 2.5 hours. Following the same trend of the last few years, Turkey Vulture #368 was the most frequently sighted vulture by a considerable margin, with 27 confirmed records from Hawk Hill in 2022. Sightings of other tagged vultures ranged from 1 to 4 sightings throughout the entire season.

Thanks to our steady-handed hawkwatcher-photographers for capturing numbers on the fast-gliding, tagged TVs: John Davis, Don Bartling, Ken Wilson, Mary Malec, and others.

The map on the next page shows tagged Turkey Vulture sightings, outside of the GGRO Hawkwatch, for the greater Bay Area.

Turkey Vulture Band Recoveries in 2022





Research

It is no surprise that, as a forty-year-old Community Science program, the GGRO's scientific publications and presentations should be steeped in collaboration and partnership. It's not readily apparent from the list below, but the research on this page alone includes collaborators from Colgate University, State University of New York, Syracuse, Hamilton College, Cornell University, University of Florida, University of Georgia, University of California – Davis, National Audubon Society, and the National Park Service. Thanks to all our research partners, and particularly to Dr. Joshua Hull of UC Davis, and Dr. Chris Briggs of SUNY Syracuse, for their leadership.

PUBLICATIONS

Bourbour, RP. 2022. The foraging ecology of raptors migrating along the coast of California revealed with eDNA metabarcoding. PhD dissertation. UC Davis.

Briggs, CW, KA Dudus, TE Ely, LA Kwasnoski, and CJ Downs. 2022. Hemolytic parasites affect survival in migrating Red-tailed Hawks. *Conservation Physiology* 10 (1). DOI: 10.1093/conphys/coac075

Claunch, MN, CJ Downs, LA Schoenle, SJ Oakey, TE Ely, C Romagosa, and CW Briggs. 2022. Snap-freezing in the field: effect of sample holding time on performance of bactericidal assays. *Integrative and Comparative Biology*. DOI: 10.1093/icb/icac007

PRESENTATIONS

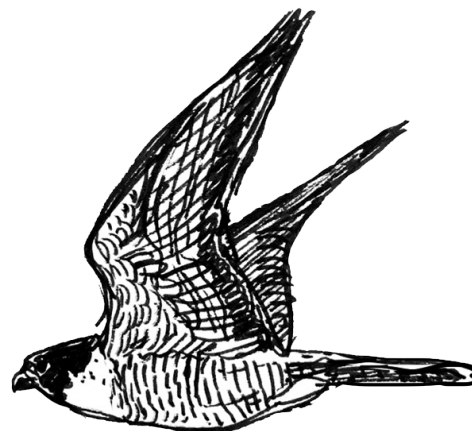
Bourbour, RP. Sept 2022. Beak and talon swabs reveal dietary trends of Sharp-shinned Hawks banded during fall migration. *Western Bird-Banding Association Conference*. UC Davis, CA.

Bourbour, RP. Oct 2022. Combined citizen science datasets reveal interactions between raptors and prey within a migration corridor. Citizen Science and Birds: People Powering Ornithology. *British Ornithologists Union* Zoom conference.

Ely, TE, DE Varland, and JA Smallwood. Oct 2022. Banding and Auxiliary Marking Workshop. *Raptor Research Foundation* conference. Ft. Lauderdale, FL.

Fish, AM. March 2022. The need for conservation biologists: a lens from four decades of raptor research and community science. Empowering Indigenous Communities Symposium. *Bear River Tribe of the Rohnerville Rancheria/Yurok Tribe*. Loleta, CA.

Fish, AM. Nov 2022. Revealing the Pacific Raptor Flyway – a forty-year retrospective of the GGRO. Keynote. 26th Annual *Central Valley Bird Club* Symposium. Stockton, CA.



Outreach

From 1990 to 2019, GGRO staff and interns held weekend “HawkTalks” at high noon on Hawk Hill. These included: a raptor identification mini-class; an overview of GGRO findings; and – if the birds complied – the release of a live, recently-banded hawk. With staff reductions following the outbreak of Covid-19, we had to let go of some GGRO activities, and, sadly, the HawkTalk was among them.

Although full interpretive talks weren’t possible in 2022, we did arrange our weekend schedules so that one GGRO staff person would also be a greeter to informally talk to people about the migration on Hawk Hill, and the results were wonderful. Hawk Hill visitors were enthusiastic and full of questions; they were one of the true highlights of the 2022 season. The Golden Gate Bridge vista is one of the most-visited places in the National Park system, yet many of these travelers have no idea that they are visiting the biggest raptor migration in the Pacific States. Then a Peregrine tears across the sky and someone is hooked for life.

August 15th to December 4th, we tallied 8348 people on the hill, with an average rate of 21.6 visitors per hour (VpH). Interestingly, weekday rates were 16.5 VpH, while weekends and holidays were double that, at 33.4 VpH.

In 2022, school groups continued to use Hawk Hill as a landscape to teach about migration, community science, and raptor ecology: Independence High School, Downtown High School, and USF among them. We are thrilled that our Parks Conservancy colleagues at the Crissy Field Center kept the innovative *Migratory Story* program moving forward in 2022. Bilingual science instructors met with more than 200 kids from nine San Francisco Unified School District classes to explore the raptor migration and the universality of migratory movements among all living things. In February 2022, Parks Conservancy Associate Director of Youth Education, Francis Taroc, was featured in *Audubon* magazine back in February 2022 in an article about *Migratory Story*, and the intersectionality of bird conservation work. [The Paths We Take | Audubon Magazine](#)

GGRO had an increasing digital presence in 2022. During the migration season, Teresa Ely, Laura Echávez, and Krista Fanucchi created more than [100 Instagram posts and stories](#) to fan the flames of interest in Hawk Hill and the raptor flight. GGRO director Allen Fish was interviewed by Michael Hawk (no relation) on the top of Hawk Hill for an episode of Nature’s Archive. [Raptor Migration from Hawk Hill | Nature’s Archive Podcast](#)

Like so many organizations, our outreach work largely shifted from wild landscapes to online during the pandemic, however, 2022 was a great reminder of the lasting impact that happens when people see wildlife outside in a natural place. We look forward to accelerating our Hawk Hill offerings in 2023 and ahead, to make the best use of this magnificent migration, and location, to impact people.

NUMBER OF RAPTOR SIGHTINGS 2011–2022*

Marin Headlands, California

	2011	2012	2014	2015	2016	2017	2018	2019	2021	2022
Turkey Vulture	6447	6622	8433	9692	5998	7063	6694	7340	3414	5974
Osprey	57	62	79	83	67	63	67	58	58	41
White-tailed Kite	74	129	73	36	20	61	42	31	16	14
Bald Eagle	9	8	9	8	8	17	14	19	9	20
Northern Harrier	335	523	394	442	354	905	600	807	426	191
Sharp-shinned Hawk	2622	3149	3539	4652	4138	3107	3389	2021	2740	1905
Cooper's Hawk	1805	2695	2169	3106	1998	2198	1914	2629	1407	891
Northern Goshawk	0	0	0	2	0	0	3	0	1	0
Red-shouldered Hawk	248	604	578	574	265	220	362	280	330	189
Broad-winged Hawk	180	756	310	344	289	286	295	110	194	558
Swainson's Hawk	13	11	10	6	5	13	5	4	9	8
Red-tailed Hawk	7530	8601	7559	10,017	5676	9132	9230	8248	6830	6195
Ferruginous Hawk	18	32	19	73	48	20	29	17	18	11
Rough-legged Hawk	0	19	1	1	4	1	8	8	9	1
Golden Eagle	9	13	32	18	13	16	14	13	6	8
American Kestrel	358	396	380	297	229	268	349	286	126	115
Merlin	166	180	183	257	178	252	182	156	91	87
Peregrine Falcon	264	246	279	225	199	252	205	196	156	209
Prairie Falcon	2	8	7	6	2	5	2	0	5	4
Unidentified	1011	1084	1159	1381	862	906	909	784	728	424
Total Sightings	21,171	25,138	25,213	31,220	20,353	24,785	24,323	23,007	16,573	16,845
Hours	439	442	488	540	443	474	408	443	301	411
Raptors Per Hour	48.2	56.9	51.7	57.8	41.2	52.3	59.7	51.9	55.3	41.0

Data compiled by Lizzy Edson and Allen Fish. If you would like to use these data, please contact us: ggro@parksconservancy.org

* Due to the impacts of regional and world events, GGRO annual data trends should not be assessed without specific knowledge and consultation with GGRO staff.

NUMBER OF RAPTORS Banded 1983–2022*

Marin Headlands, California

	1983-2013	2014	2015	2016	2017	2018	2019	2021	2022	Total
Turkey Vulture	n/a	n/a	n/a	n/a	5	5	2	0	0	17
Northern Harrier	285	18	8	3	3	6	10	6	1	340
Sharp-shinned Hawk	10,972	414	481	463	330	413	181	184	238	13,676
Cooper's Hawk	13,589	485	649	503	496	468	596	283	197	17,266
Northern Goshawk	5	0	1	0	0	1	0	0	0	7
Red-shouldered Hawk	380	25	33	12	3	12	15	22	12	514
Broad-winged Hawk	34	1	3	2	1	5	0	1	1	48
Swainson's Hawk	10	0	0	0	1	0	0	0	0	11
Red-tailed Hawk	9068	222	251	229	212	342	227	195	127	10,873
Ferruginous Hawk	2	0	0	0	1	0	0	1	0	4
Rough-legged Hawk	6	0	0	0	0	0	0	1	0	7
American Kestrel	1321	49	41	24	21	26	10	7	10	1509
Merlin	642	33	50	34	37	21	23	16	8	864
Peregrine Falcon	88	2	2	9	11	5	7	5	7	136
Prairie Falcon	41	2	3	2	1	1	0	1	0	51
Total Banded		1251	1522	1281	1122	1305	1071	772**	601**	45,323

Data compiled by Teresa Ely. If you would like to use these data, please contact us: ggro@parksconservancy.org

*Due to the impacts of regional and world events, GGRO annual data trends should not be assessed without specific knowledge and consultation with GGRO staff. 2020 banding season was suspended due to the COVID-19 pandemic. However, 5 Turkey Vultures were tagged.

** The 2021 and 2022 banding seasons operated with three blinds. All previous seasons operated with four. This is a contributing factor to lower numbers.



Golden Gate Raptor Observatory

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