

**Golden Gate Raptor Observatory**

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*GGRO Season Summary 2014*

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HAWKWATCH  
BANDING  
VOLUNTEERS  
RADIOTELEMETRY  
GSM TRACKING  
OUTREACH  
RESEARCH NOTES  
DONORS  
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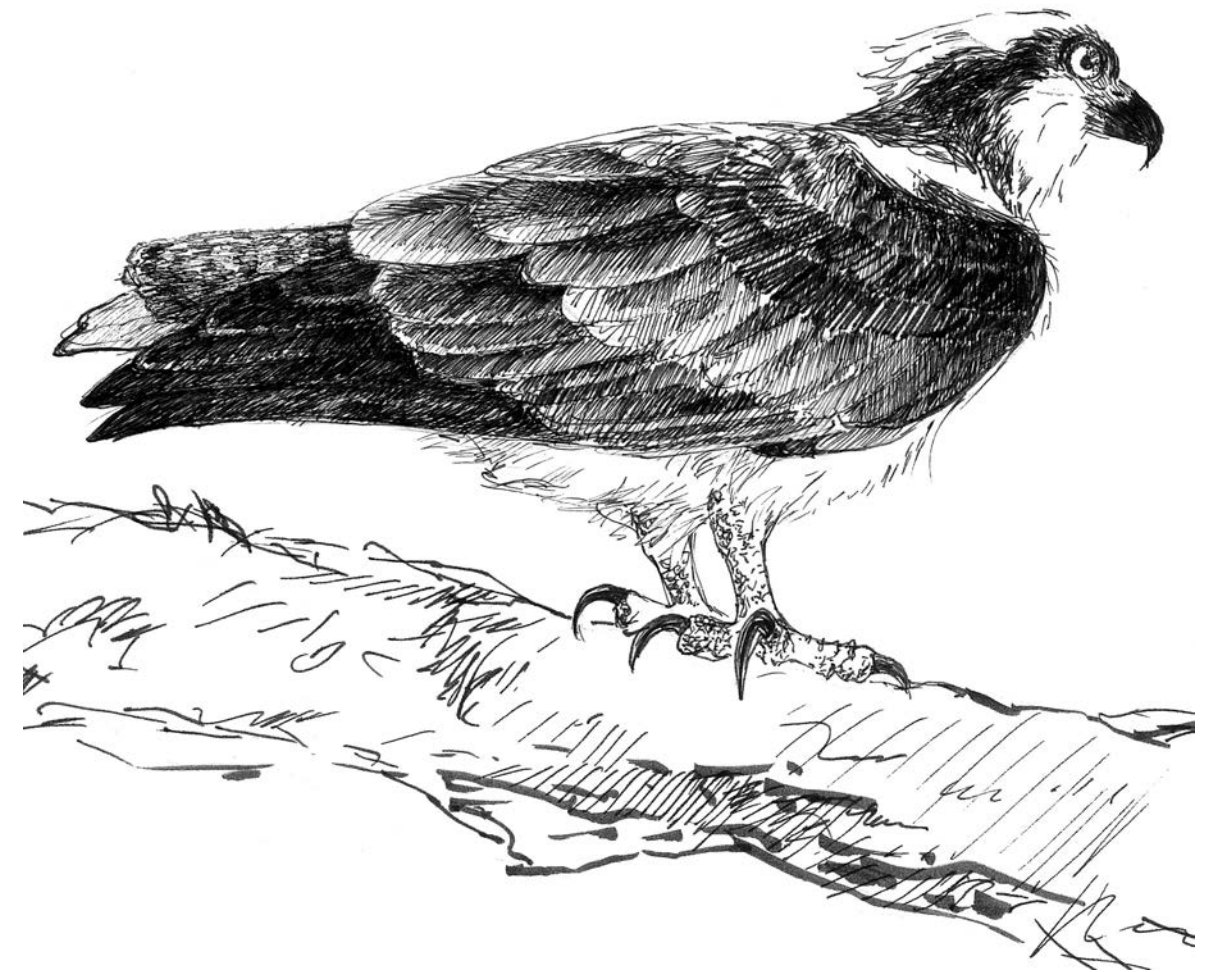


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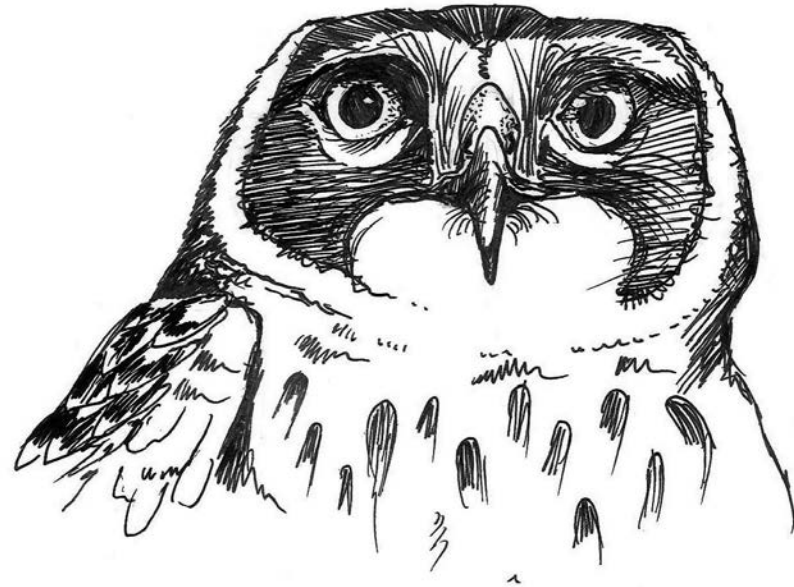


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*Season Summary 2014*

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HAWKWATCH • BANDING • VOLUNTEERS • RADIOTELEMETRY  
GSM TRACKING • OUTREACH • RESEARCH NOTES • DONORS



Despite a relatively low annual count on Hawk Hill (just under 400 sightings), banders trapped an above-average 18 Northern Harriers in 2014. (Illustration by Bridget Bradshaw)

## GOLDEN GATE RAPTOR OBSERVATORY

The Golden Gate Raptor Observatory's mission is to inspire the preservation of birds of prey. Our business is to monitor and study the bird of prey migration along 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. The GGRO is a program of the Golden Gate National Parks Conservancy and the National Park Service, and is made up of 297 community volunteers and a small staff.

GGRO Season Summary 2014 written by Allen Fish, Chris Briggs, Lynn Jesus, Laura Young, and Bridget Bradshaw.

Compiled and edited by Laura Young and published by

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Requests for or questions about GGRO data should be addressed to ggro@parksconservancy.org.

Cover Illustration: In 2014, GGRO volunteers Tony Brake and Harve Wilson published an article in *Western Birds* on the growing population of nesting Osprey on San Francisco Bay. (Pen and ink by Siobhan Ruck)

## G G R O S T A F F

ALLEN FISH, GGRO DIRECTOR • CHRIS BRIGGS, RESEARCH DIRECTOR  
LAURA YOUNG, OPERATIONS MANAGER • BUZZ HULL, RESEARCH DIRECTOR EMERITUS  
2014 INTERNS: BRIDGET BRADSHAW, MATT DELGADO,  
KATE OWENS, PHOEBE PARKER-SHAMES, AND KRIS VANESKY

## NUMBER OF RAPTOR-SIGHTINGS 2003-2014, MARIN HEADLANDS\*

	2003	2004	2005	2006	2007	2008	2009	2011	2012	2014
Hours	500	530	456	492	524	508	497	439	442	487
Turkey Vulture	10,804	10,133	7,877	9,211	9,228	7,529	8,060	6,447	6,622	8,433
Osprey	134	124	110	108	90	88	81	57	62	79
White-tailed Kite	63	201	66	130	71	74	93	74	129	73
Bald Eagle	4	3	6	2	2	6	10	9	8	9
Northern Harrier	352	957	460	1,090	1,002	454	614	335	523	394
Sharp-shinned Hawk	5,171	3,257	4,407	5,244	4,636	4,091	3,332	2,622	3,149	3,539
Cooper's Hawk	2,022	2,454	2,427	3,367	3,717	1,956	1,738	1,805	2,695	2,169
Northern Goshawk	1	0	1	0	4	2	1	0	0	0
Red-shouldered Hawk	289	548	149	612	512	559	529	248	604	578
Broad-winged Hawk	123	42	146	183	70	131	180	202	755	310
Swainson's Hawk	8	5	4	7	12	1	1	13	11	10
Red-tailed Hawk	6,994	13,094	7,277	11,410	11,869	6,860	8,297	7,529	8,603	7,559
Ferruginous Hawk	14	31	33	25	13	15	11	18	31	19
Rough-legged Hawk	1	0	4	21	10	4	2	0	19	1
Golden Eagle	14	21	13	24	38	18	11	9	13	32
American Kestrel	690	547	627	611	378	377	458	358	396	380
Merlin	175	173	198	230	140	184	149	166	180	183
Peregrine Falcon	229	229	219	235	181	224	259	264	246	279
Prairie Falcon	3	9	5	8	4	7	9	2	8	7
Unidentified	1,232	1,474	1,440	1,438	1,381	905	991	1,011	1,084	1,159
<b>Total</b>	<b>28,324**</b>	<b>33,302</b>	<b>25,469</b>	<b>33,956</b>	<b>33,368</b>	<b>23,485**</b>	<b>24,826</b>	<b>21,169</b>	<b>25,138</b>	<b>25,213</b>
<b>Raptor Activity</b> (raptors per hour)	<b>56.6</b>	<b>62.8</b>	<b>56.0</b>	<b>68.9</b>	<b>63.7</b>	<b>46.2</b>	<b>49.9</b>	<b>48.2</b>	<b>56.9</b>	<b>51.8</b>

\* 2010 data are not included here because two count sites were used and data are not directly comparable; 2013 data not included due to incomplete season caused by government shutdown

\*\* Total includes 1 Mississippi Kite.

**NUMBER OF RAPTORS BANDED 1983-2014, MARIN HEADLANDS\***

	1983-2007	2008	2009	2010	2011	2012	2013**	2014	Total
Northern Harrier	243	5	8	1	2	16	10	18	303
Sharp-shinned Hawk	8,018	646	558	362	494	731	173	414	11,396
Cooper's Hawk	10,527	504	451	524	444	762	390	485	14,087
Northern Goshawk	5	0	0	0	0	0	0	0	5
Red-shouldered Hawk	273	17	13	2	15	42	21	25	408
Broad-winged Hawk	20	0	2	0	0	9	3	1	34
Swainson's Hawk	8	0	0	1	0	1	0	0	10
Red-tailed Hawk	7,490	280	226	115	187	349	434	222	9,303
Ferruginous Hawk	2	0	0	0	0	0	0	0	2
Rough-legged Hawk	5	0	0	0	0	0	1	0	6
Golden Eagle	2	0	0	0	0	0	0	0	2
American Kestrel	965	38	73	82	56	81	37	50	1,382
Merlin	381	27	62	52	60	36	24	33	675
Peregrine Falcon	62	10	3	2	3	7	2	2	91
Prairie Falcon	29	3	3	1	2	2	2	2	44
Eurasian Kestrel	1	0	0	0	0	0	0	0	1
<b>Total</b>	<b>28,031</b>	<b>1,530</b>	<b>1,399</b>	<b>1,142</b>	<b>1,263</b>	<b>2,036</b>	<b>1,087</b>	<b>1,252</b>	<b>37,749</b>

\*Data compiled by Chris Briggs. 2014 data are through January 1, 2015.  
 \*\*Not a complete season; missed October 1-16 due to government shutdown

# I N T R O D U C T I O N

I've been thinking a lot lately about where naturalists come from.

Twenty years ago, I got a call from Ann Kositsky of Berkeley. Ann's two sons, 10 and 12, wanted to be hawk-counters with the Golden Gate Raptor Observatory as part of their home-schooling biology regimen. Could they volunteer? A swirl of responses ran around my head: (1) Kids? Um, great! (2) But what will the adult volunteers think about having kids around? (3) And, this isn't environmental education; it's field biology. Can pre-teens handle the focus and study?\*

Ann heard my pause and quickly added, "I will be with them constantly to make sure their needs are taken care of. And I'll be a volunteer so we will all study together. At any moment you feel that we aren't making a positive contribution, just let me know and we will leave." I took Ann at her word and invited them to go through the interview process.

That was 1994. The Kositsky-Haiman family has been and continues to be a success story for the GGRO. In 1999, Aaron Haiman became the youngest dayleader of a hawkwatch team at the age of fifteen. Joshua Haiman took the team over in 2005, and has managed it now for a decade. Aaron recently completed his master's degree in Avian Sciences at UC Davis, and is part way through a PhD. His blog "abirdingnaturalist" is jammed with insights into the life of a graduate student in Ecology. Joshua is a metalsmith and jewelry-maker (Arabesque Designs) and professional dancer. Ann – their mom and teacher – is still part of the team now after 21 years.

Since Ann's phone call, 28 student hawkwatchers have joined GGRO with a parent in tow, and some have become our most astute raptor-spotters. When they've left for college or other pursuits, some parents stayed on with us, such as Ross Forman, now in his 14th year. Ross's daughter, Alex, now a geologist with an environmental engineering firm, recently wrote me a note about her half-decade as a GGRO teen volunteer:

The GGRO taught me how to interact with adults from a young age, and gave me the communication and social skills to be confident in my ideas by the time I entered college. I grew up spending my falls in one of the most beautiful places in the Bay Area while building my knowledge of birds and migration.

So, I am still not sure where young naturalists come from, but I have learned that when they do show up, they are critical players in the big scheme of things. We old naturalists must fan the flames of their interest, or at least show them the hawks and get out of the way. Many volunteers have made the GGRO what it is, and 2014 was a milestone year for some. Our only twenty-year anniversary volunteer this year is banding dayleader Marc Blumberg, who himself started as a teenager! Three volunteers hit their quarter-century mark this year: Stefanie Arthur, Mamiko Kawaguchi, and David Wimpfheimer. Another three celebrated their 30th year as GGRO volunteers!: Nancy Mori, Nick Villa, and David Wood.

The GGRO is annually brought to you by about 300 raptor-fervent volunteers, some working hundreds of hours per year. We are also sustained by a large safety-net of Park colleagues, both with the National Park Service and the Parks Conservancy. I want to single some people out for their watchful and generous support these past few years: Daphne Hatch, Bill Merkle, and Terry Kriedler of the GGNRA; and Sharon Farrell and Cathie Barner of the Conservancy. These five work hard behind the scenes to make sure that many moving parts of the GGRO are buoyed and championed. Thank you.

2014 also brought a big staff change for us. After a decade of managing the GGRO infrastructure, our Operations Manager, Jill Harley, moved to Colorado last summer where she was quickly grabbed up by the smart folks at the Rocky Mountain Institute. Jill was a magnificent force at the GGRO, both productive and amiable. She took us from "just getting by" to being a well-oiled raptor conservation biology machine. Thank you from all of us, Jill. And a very warm welcome to our new Ops Manager, Laura Young, herself a biologist with five years' experience as a GGRO bander.

To our volunteers, dayleaders, interns, donors, colleagues, and Park staff, thank you for making 2014, our 30th year, an effective and memorable year for the GGRO.

- Allen Fish

\*Answers: (2) Passionate and focused adult hawk-counters love to have passionate and focused kid hawk-counters around. Some of these kids quickly became mascots of their team, focusing a passion for studentship across the entire group; and (3) Yes, pre-teens and teens can be focused (or not) on data-collection. Pretty much the same as for adults.



# H A W K W A T C H

## RAPTOR-SIGHTINGS IN THE MARIN HEADLANDS DURING AUTUMN

	2014 Season (487 hours)		Past 10-Year Average (2002-2012)** (497 hours)	
	Sightings	Raptors/hour	Sightings	Raptors/hour
Turkey Vulture	8,433	17.32	8,703	17.51
Osprey	79	0.16	96	0.19
White-tailed Kite	73	0.15	98	0.20
Bald Eagle	9	0.02	5	0.01
Northern Harrier	394	0.81	711	1.43
Sharp-shinned Hawk	3,539	7.27	4,180	8.41
Cooper's Hawk	2,169	4.45	2,495	5.02
Northern Goshawk	0	0.00	1	<0.01
Red-shouldered Hawk	578	1.19	473	0.95
Broad-winged Hawk	310	0.64	201	0.40
Swainson's Hawk	10	0.02	7	0.01
Red-tailed Hawk	7,559	15.52	9,430	18.97
Ferruginous Hawk	19	0.04	23	0.05
Rough-legged Hawk	1	<0.01	7	0.01
Golden Eagle	32	0.07	18	0.04
American Kestrel	380	0.78	512	1.03
Merlin	183	0.38	180	0.36
Peregrine Falcon	279	0.57	220	0.44
Prairie Falcon	7	0.01	7	0.01
Unidentified	1,159	2.38	1,231	2.48
<b>Total</b>	<b>25,213</b>	<b>51.77</b>	<b>28,596</b>	<b>57.54</b>

\*\*2010 and 2013 data not included due to partial seasons

The 2014 Hawkwatch season started on August 18 and ran for 16 weeks through December 7. Of the potential 672 hours (we count for six-hour days), we totaled 487 hours of counting, just under the average hours counted for the last ten years. Raptor counts were made by 180 volunteers, including 14 dayleaders who were each responsible for the quality of the data taken on their day.

The season was average in many ways. For the entire autumn we totaled 25,213 sightings, or nearly 52 raptors per hour (RpH). We focus on a "migration rate" unit of measurement, RpH, since nobody can really ever know if the

## D A Y L E A D E R S

TIM BEHR • CHRISTINE CARIÑO • LEWIS COOPER • DENNIS DAVISON • ALLEN FISH  
 JOSHUA HAIMAN • ERIC JEPSEN • MARY KENNEY • HORACIO MENA • KIM MEYER  
 BRIAN O'LAUGHLIN • BOB POWER • JAMES RAIVES • LAURY ROSENTHAL

# D O N O R S

Noreen Weeden & Eddie Bartley	Ardith Betts	David Presotto & Caryl Carr	<b>IN MEMORY OF JOSEPH F. MAGGIORA:</b>
Marion Weeks & Stephen Blossom	Marc Blumberg	Jeff Robinson	Jean Perata & Dennis Davison
Emily Weil	Robert & Marion Blumberg	Ann Ruffer	
Jill Weinstein	Johnny Brown	Peter Sapienza	<b>IN MEMORY OF DON SCHMOLDT:</b>
S. Paul Welles	Michael Butler	Linda Schneider	Sandy Slichter
David Wells	Caryl Carr	David Sexton	
Richard & Virginia Welsh	Terry & Zeo Coddington	James Shea	<b>IN MEMORY OF RUTH DUDEN &amp; ERNIE SCOFFONE:</b>
Gretchen Whisenand	Kay & Tom Conneely	Jay Sheets	Jean Perata & Dennis Davison
Peter White	Gerald & Kathleen Connell	David Snipper	
M.K. Whyte	Jason Cooper	Craig & Elise Tewell	
David Wiechers	Lewis Cooper	John Ungar	
Vicki Wilhite	Tom Delebo	Linda Vallee	<b>IN MEMORY OF MAT STANLEY:</b>
Jeff Wilkinson	Nancy Elliot	Marion Weeks & Stephen Blossom	Margaret Stanley
Edwin Williams & Joan Halverson	Richard Ferris	Jill Weinstein	
Kathleen Winslow	George & Patsy Fish	David Wells	
Kathy & George Wolf	Quentin Goodrich	Kathy & George Wolf	
Pat Wong	Alane Gray	Yellow-billed Tours	
Carolyn & A. Frederick Wood	Keith Gress	March Conservation Fund	
Nick & Kathleen Yatsko	Mary Ellen Hannibal		
Bob Zeiss	Melissa Hero	<b>GSM TRACKING FUND:</b>	
	Lynn Hoerle & Jeff Wilson	Penny Lewis	
	Calvin Hom		
<b>ORGANIZATIONS:</b>	Sam Hontalas	<b>THE GREGORY HIND ENDOWMENT:</b>	
Adobe Systems, Inc.	J. Pearce Hurley	Leslie & Troy Daniels	
Marin Horizon School	Jennifer Hyypio	Steve & Joan Manlin	
Mitchell Family Trust	Marcine Johnson		
Nature Trip	Joan Lamphier	<b>IN MEMORY OF WILLY FIVIS:</b>	
Prospect Sierra School	Dian Langlois	Helene Jaillet & Victor Swan	
	JoAnn McAllister	Robert & Donna Fivis	
<b>DAP FUND:</b>	Nancy Mori		
Caryn & Joe Ansel	Thomas Moutoux		
Anne Ardillo	Patricia Overshiner		
Kendra Armer	Dana Owens		
William Barnaby	Ronald Parker		
Mai-Liis & Don Bartling	Jean Perata & Dennis Davison		



A record fifty Acorn Woodpeckers were tallied on Hawk Hill in 2014. (Illustration by Bridget Bradshaw)

# D O N O R S

Marcine Johnson	Ronald Maykel	Dana Owens	Linda Schneider
Craig Jones	JoAnn McAllister	Diane Parish & Paul Gelburd	Samuel Schuchat & Ilana DeBare
Peter & Lindsay Joost	Maureen McCormick	Ronald Parker	Emily Schultz
Cyril Juanitas	Susan McGreevy	Ruth Ann Pennell	Anita Scuri
Jeff Kahn	Peter McGuire	Allan Peoples	David Sexton
Benjamin Kaplan	Tara McIntire	Allan Plumb	James Shea
Mamiko Kawaguchi	Carol McIntyre	Carol Poole	Debra Love Shearwater
Nancy Kittle	John & Leslie McQuown	Bob Power	Jay Sheets
Joanna Klima	Terry Mead	David & Cay Pratt	Martin Sidor
John Knox	Mona & Horacio Mena	David Presotto	Surinderjit & Sukhjiwan Singh
Ann Kositsky	Amy Meyer	Carol Prince	Kate Skelly & Tim Stoddard
Allison Kozak	Ivan & Maris Meyerson	John & Cynthia Rathkey	Sandra Slichter
Cheryl Kraywinkel	Steven Miller	Gail Richardson	Ronald Smith
Julia Kringel	Edith Mitchell	Eileen Richey	David Snipper
Jason Laffer	Sue Morgan	H. Allan & Helen Ridley	Sharon Solomon
Nelson Laffer	Nancy Mori	Marci Riseman & Evan Sagerman	Hai-Thom Sota
Joan Lamphier	Alida Morzenti	Duane & Barbara Robinson	Sheila Sousa
Barbara Lancaster	Thomas Moutoux	Jeff Robinson	Patricia Spencer
Dian Langlois	Kathleen Mugele	Elizabeth Rouan	Philip Steiner
Owen Leibman	Heidi Munzinger	Ruth Royter	Joan Stewart
Robert Lennihan	Suzanne Murphy	Sibhoan & Bill Ruck	Ann Stone
Winifred Lennihan	Mark Mushkat	Ann Ruffer	Meryl Sundove
Patricia Lessard	Mikiye Nakanishi	Maggie Rufo	Mark Sutherland
Peter Leveque	Soo-Hi & Alan Nayer	Leonard & Elizabeth Rush	Craig & Elise Tewell
Allison Levin	Gregg & Sharon Niceley	Dede Sabbag	Bruce & Phyllis Thompson
Ann Linder	Maureen Noon	Walter Sakai	John Ungar
Marie & Barry Lipman	Jill North	Serena Salomon	John & Janet Upton
Taiyo Lipscomb	Ed & Marcia Nute	Ivan Samuels	Linda Vallee
Kirsten Liske	John Odell & Gloria Kemp	Peter Sapienza	Richard Vanderlugt
David Loeb	Steven O'Donnell	Charles & Susan Savage	Jullie Vasquez
Carolyn & John Longstreth	Brian O'Laughlin	Michael Savino	Nick & Denise Villa
Jean Loo	Rebecca Olsen & Ken Wilson	Birgit Schilling	Jerry Vitenson
Chris Macintosh	Kenn Osborne	Norma Schmid	Wendy Warrington
David & Lynne Madison	Douglas & Veronica Overman	Marilyn Schmitz	Penelope Watson
Ron Mallory	Patricia Overshiner	Donald Schmoltd	
Nancy Martin			
Alice May			

# H A W K W A T C H

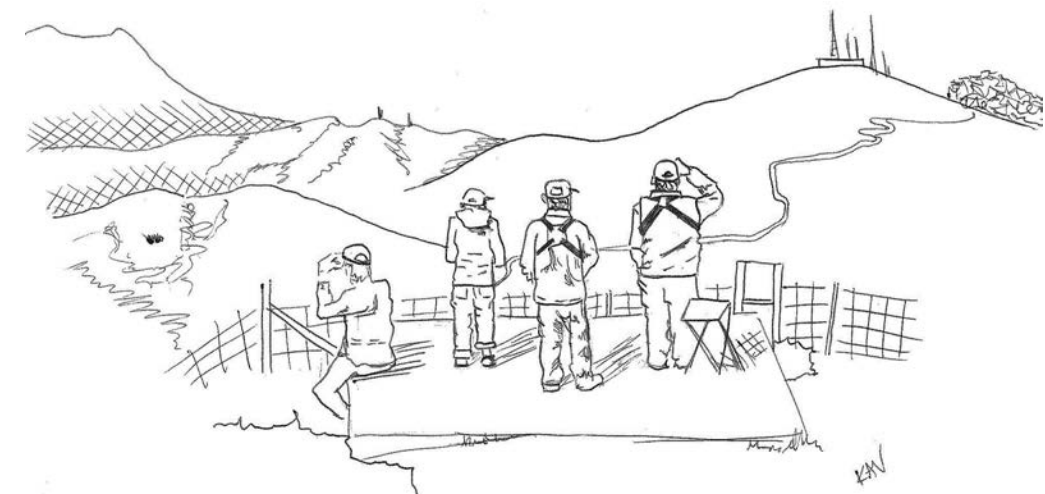
Red-tailed Hawk that came by at 2 pm was already counted at 10 am. Looking back at the past ten years, we have had season's RpH as low as 46.1 and as high as 69.9, so our 2014 rate is in the lower end of the curve (52 RpH).

While most of our regular 19 species were within 20% of their previous ten-year averages, a few species defied normal. Northern Harriers were at the low end with 394 sightings. This is nearly half the harrier numbers we were seeing ten years ago. At about 75% of their previous ten-year averages were both American Kestrels (expected) and White-tailed Kites (not expected).

On the positive end, we had a strong Golden Eagle count this fall (32 sightings), and the highest count for Peregrines (279 sightings) in GGRO history. In contrast, our three bread-and-butter species – Sharp-shinned, Cooper's, and Red-tailed Hawks – were well below average, which meant that the whole count was a little low.

The season's high day occurred on October 1, a bit later than usual, with 911 raptors sighted, a rate of nearly 142 RpH! November 4 got a 15-species count, which included Prairie Falcon, Ferruginous Hawk, both eagles, and a couple of late-season Broad-winged Hawks. Amazingly, we counted three more Broadwings on November 23, one of the latest Broadwing dates in our 30-year history.

Weather-wise, the 2014 season was pretty up-beat. During the fog season (August through September) we suffered only five fog-out (shut-down) days, compared to ten each for 2012 and 2013. We made up for it with some solid rainouts during the last weeks of the count, a much-needed series of storms for the crispy state of California.



*Hawkwatchers scan the north quadrant at Hawk Hill. (Illustration by Kris Vanesky)*

This was our first year to keep a butterfly and dragonfly migration count on Hawk Hill! Much like the hawk count, we have no way of knowing when we are making double-counts, so we simply define each insect as a "sighting". We tallied 111 dragonfly-sightings spread across 19 days, consisting primarily of Variegated Meadowhawks and Green Darners. There were also smatterings of Blue-eyed Darners, Flame Skimmers, Cardinal Meadowhawks, and Black Saddlebags – in all, averaging about six dragonflies per day.

Butterflies were more abundant than dragonflies across the season. We totaled 255 butterfly sightings, around half of which were Monarchs. Pipevine Swallowtails seemed constant. Anise Swallowtails dwindled as the season wore on, whereas the *Vanessa* species (i.e., Red Admirals, Painted Ladies, and West Coast Ladies) became more abundant. We reached 14 species of dragonflies and butterflies, excluding some mystery species that are comfortably situated in our unidentified categories. Thank you to all who helped count and point out passing insects - Herb Brandt, Tim Behr, George Eade, Sam Hontalas, Mike Hall, and Christine Lamphear were especially helpful. We hope that this is the beginning of a long tradition of entomological monitoring on Hawk Hill.

- Allen Fish and Bridget Bradshaw

# B A N D I N G

## RAPTORS BANDED IN THE MARIN HEADLANDS DURING AUTUMN

	2014 (Aug 17, 2014 - Jan 3, 2015)	Annual Average* 1992-2013**	Totals 1983-2014
Northern Harrier	18	11	303
Sharp-shinned Hawk	414	475	11,396
Cooper's Hawk	485	561	14,087
Northern Goshawk	0	0	5
Red-shouldered Hawk	25	16	408
Broad-winged Hawk	1	1	34
Swainson's Hawk	0	0	10
Red-tailed Hawk	222	322	9,303
Ferruginous Hawk	0	0	2
Rough-legged Hawk	0	0	6
Golden Eagle	0	0	2
American Kestrel	50	56	1,382
Merlin	33	29	675
Peregrine Falcon	2	4	91
Prairie Falcon	2	2	44
Eurasian Kestrel	0	0	1
<b>Total</b>	<b>1,252</b>	<b>1,477</b>	<b>37,749</b>

\*2013 data are not a complete season; missed October 1-16 due to government shutdown.

\*\*1992-2013 are used for this comparison due to similarity of methods and effort between those years and 2014.

The 2014 banding season started similarly to the last several, with decent flows of Red-tailed Hawks, American Kestrels, and a smattering of accipiters. There were relatively few fog-outs in August and September aiding our ability to see, if not actually trap, the hawks around us.

As September rolled along the hawk flow did not build the way we have come to expect. A middling peak was put on hold for a 106-bird, 7-species day at the end of September that included three *Buteo* species (Red-tailed Hawk, Red-shouldered Hawk, and Broad-winged Hawk). The third-largest trapping day in GGRO history provided hope that numbers would improve. This hope dimmed as the raptor numbers petered out quickly concomitant with heat from the typical October east winds.

November's second Redtail peak proved similarly below average, but at least present. With some much-needed rains coming in December, banders were often put on hold while the roads and the hawks dried out. Our season total (1,252) was the third lowest in the past ten years, beating out 2013 (thanks, government shutdown!) and 2010. The only species above average for the last ten years were Northern Harriers (18) and Red-shouldered Hawks (25).

## D A Y L E A D E R S

ANNE ARDILLO • JENNIFER ARMER • EDDIE BARTLEY • MARC BLUMBERG  
 RANDY BREAUX • NANCY BRINK • RUSS DELONG • CLAIRE GALLAGHER • JOHN HOLSON  
 BUZZ HULL • JOSH HULL • DAVID JESUS • MAMIKO KAWAGUCHI • JOHN KEANE • CRAIG NIKITAS

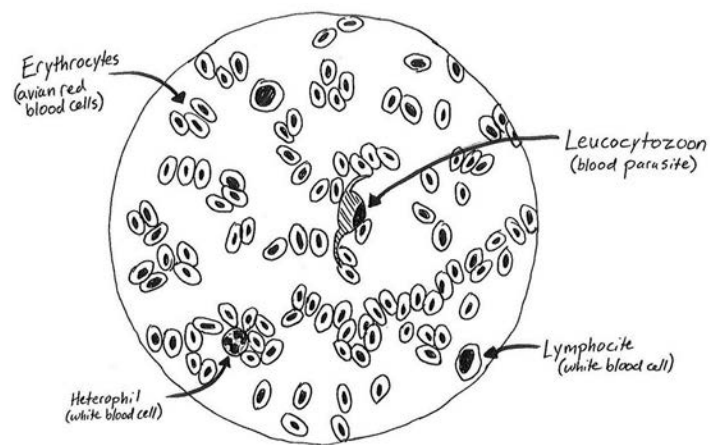
# D O N O R S

Cheryl Abel	Phyllis Browning	David Driggs	Keith Gress
Leslie Andrews	Shannon Burke	Barbara Duncan	Mary Haack
Anonymous	Michael Butler	Steve Dykes	Mike Hall
Caryn & Joe Ansel	Richard & Sandra Camp	Wade Eakle	Ty Hall
Anne Ardillo	Hugh & Pearl Champion	Peter Ehrlich	Lora Haller
Marilyn Armbruster	Sally Cedarblade	Nancy Elliot	Mary Ellen Hannibal
Kendra Armer	Corry Chen	Richard Engle & Paula Horowitz	John Harris
Loretta Armstrong	Marshall Clark	Anastasia Ennis	Diane Hart
Ray Arpon	Collin Cochrane	Marian Erdelyi	George Hartzell
Stefanie Arthur	Terry & Zeo Coddington	Natalee Ernstrom	Kathleen Hazelton-Leech
Marylou Avanzino	George Coles	Norval Fairman	Bennett Heasman
Paul Babwin & Karen Bell	Ron Colwell	Charles Feledy	Pete Heller
Chloe Banks	Huguette Combs	Tom Felts & Robin Mitchell	Melissa Hero
William Barnaby	Katherine Compagno	Ron Felzer	David Herrema & Victoria van Meter
Reginald & Katherine Barrett	Roger & Martha Conant	Richard Ferris	Diane Hichwa
Mai-Liis & Don Bartling	Kay & Tom Conneely	Jeanne Fidler	Edna Hickok
Anne Baxter	Gerald Connell	Virginia Fifield	Jan Hintermeister
Linda Becker	Duncan & Joan Cook	Robbie Fischer	Jennifer Ho
Sandra Berggren	Jason Cooper	George & Patsy Fish	Lynn Hoerle & Jeff Wilson
Ardith Betts	Lewis Cooper	Katherine Francone	Sam Hontalas
Thomas & Rebecca Birdsall	Marilyn Cooper	Gayle Fuetsch	Dick & Diane Horn
Carl & Jean Blom	Chris Cottrell	Theresa Gabel & Timothy Zumwalt	Richard & Theresa Horrigan
Marc Blumberg	Thomas Crane & Deidre Harrison	Kathleen Gadway	Michael House
Robert & Marion Blumberg	J.R. Crumpler	Inman Gallogly	Karen Hoyt
Robyn Boothby	Reese & Kathleen Cutler	Leo & Jane Gaspardone	Penn Hughes & Viola Gonzales
Roxanne Borcich	Charles Cutting	Kris Geiger	Karen Humphrey
John & Olive Borgsteadt	Ludek Dadok	Valinda Gillis	Jennifer Hyypio
Dix & Marilyn Boring	Jon & Catherine d'Alessio	Morey Goldstein	Angela Ippolito
Heather Borman	Belle, Jim & Drusie Davis	Lorri Gong	John Irwin
Gleneda Borton	Pamela Dayton	Quentin Goodrich	Heather Ishak
Julius & Edith Bradley	Tom Delebo	Cindy Goral & Jerry Scharf	Victoria Jackson
Toby Bradshaw	Frank DeMarco	Alane Gray	Helene Jaillet & Victor Swan
Anthony Brake	Karen DeMello	Dorothy Gregor	Kathy Jarrett
Geraldine Brown	Licia DeMeo	Earl Gress	Lynn & David Jesus
Johnny Brown	Clarence Donahoe		
	David Dotur		

# R E S E A R C H

**RODENTICIDES.** Early this year we continued our examination of anticoagulant rodenticides (ARs) in Red-tailed Hawks. In total, we examined 47 birds for ARs from blood samples collected in 2013. Of these 47 individuals, five tested positive. These poisons are quickly filtered from the blood to the liver – meaning we will only detect ARs in the blood for a few days after exposure. Despite this small window between exposure and detection in the blood, around 10% of randomly sampled raptors tested positive, more evidence that there could be conflicts between pest management and wildlife.

However, the condition of birds tested (how heavy they are relative to their size) was not different between those exposed to ARs and those testing negative. So it is unclear how low levels or recent exposure of ARs may influence raptors. If we can increase sample sizes, we may start to learn if recovery rates (i.e., mortality rates) of exposed individuals are the same as unexposed individuals. However, this will likely require large sample sizes collected over multiple seasons. Interns Kris Vanesky and Phoebe Parker-Shames are currently counting cells in the blood smears from the birds tested to determine if there are subtler effects from ARs than changes in weight or fat reserves.



Red-tailed Hawk blood sample being examined under a microscope. (Illustration by Phoebe Parker-Shames)

At the Wildlife Society Western region conference in Reno in February, Allen Fish co-organized a plenary session on *Citizen Science and Wildlife Biology*, and gave a short talk on Citizen Science at the GGRO. The next day, Allen spoke on 20-year trends in raptor species at the Golden Gate, a joint analysis with US Forest Service staff Sylvia Mori and John Keane, as well as Buzz Hull and Josh Hull. Long-time GGRO volunteers Tony Brake and Harve Wilson published their summary of Osprey nesting on San Francisco Bay in *Western Birds* in the late summer, and contributed their data to Jules Evens' presentation on Bay region Ospreys at the Western Field Ornithologists' meeting in San Diego.

Also in 2014, San Francisco State grad student Mark Jasper published his analysis on diversity in Red-tailed Hawk blood parasites in the *Journal of Ornithology*, with co-authors Buzz Hull and Josh Hull. In September, at the annual Raptor Research Foundation conference held in Texas, we showed the first results of our research on rodenticides in Red-tailed Hawks, and presented volunteer Phil Capitolo's poster on Broad-winged Hawk migration in California.

- Chris Briggs

**COLOR BANDING.** We continued to put out color bands this year to try to increase the number of encounters of banded birds. After 2013, we only heard about one Cooper's Hawk, and additional color bands put out through September did not produce more encounters. We decided to halt application of color bands on Cooper's Hawks unless we get a better response from the 37 additional bands put out in 2014. However, Red-tailed Hawks had similarly lack-luster results in 2014 relative to 2013, with only a single individual to-date being re-sighted. We hope more individuals will be sighted as we wrap up this pilot study for color banding. Our goal is to have resights of color bands match our recovery rate.

**PUBLICATIONS AND PRESENTATIONS.** We published two scientific articles and participated in four scientific

# B A N D I N G

Of note was the recapture of an adult female Cooper's Hawk, already banded when trapped on October 27. While we do occasionally recapture the same bird within the same day or week, it is very rare for us to recapture a bird first trapped elsewhere. GGRO long-time friend Bud Anderson originally captured the hawk on August 17, 2011, outside of Seattle-Tacoma Airport. The individual was relocated to prevent collisions with aircraft and three years later found its way through the Marin Headlands. It is certainly interesting that this bird happened to migrate through the Headlands, but we have yet to see one of the patagial-tagged Red-tailed Hawks caught near Seattle or Portland.

We picked up a large apprentice class with 29 new banders starting in 2014. This kept our 15 dayleaders and 44 site-leaders busy with training. The diminished raptor activity gave us time to focus on training without the distraction of too much else going on outside the blind. Many thanks to all the banders for helping train these apprentices, getting them experience, and helping to start them off on the right foot. While not all apprentices finished the season with us, most made great strides in their banding skills and we look forward to continuing that progress in 2015.

A huge effort was made again this year to keep us banding and included more than 12,000 volunteer hours from over 100 banding volunteers. This included the construction of a new blind, repairing and replacing much of the platform for another blind, replacing a floor at Townsley, two weekends to set the blinds up, and two more to take them off the hill in January. While on the hill, the blinds were run for a total of 2,678 hours, meaning it took approximately 2 hours of field effort for each bird trapped, an efficiency lower than most years.

We will likely never know why our numbers in 2014 were low, but it seems reasonable to speculate that the drought and weather conditions during migration both limited opportunities. With decent rainfall already to start the 2015 winter, we will see if more moisture translates to more raptors next season.

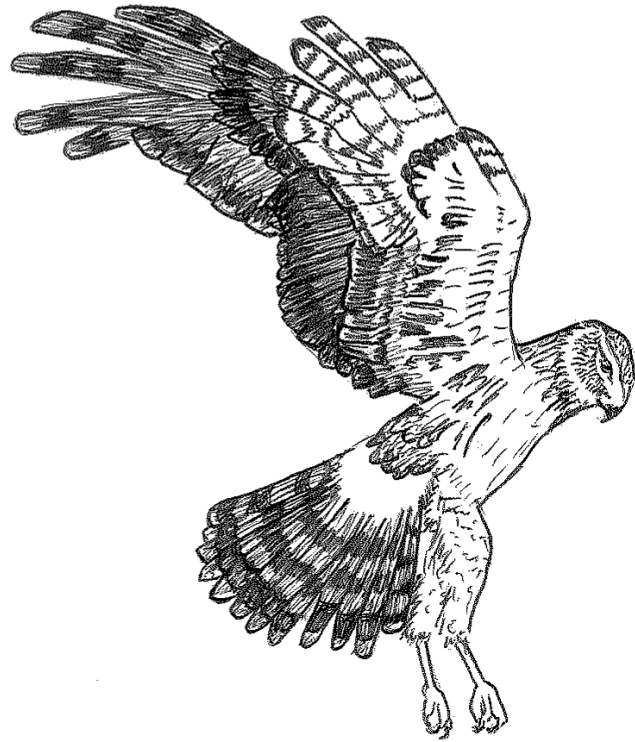
- Chris Briggs



Intern Phoebe Parker-Shames admires a newly-banded Red-shouldered Hawk. (Illustration by Kris Vanesky)

# V O L U N T E E R S

Sam Abercrombie	Johnny Brown	Tom Conneely	J.D. Durst
Caryn Ansel	Ellen Burroughs	Jason Cooper	George Eade
Anne Ardillo	Garrett Burrow	Lewis Cooper	Wade Eakle
Jennifer Armer	Michael Butler	David Coughlin	Melanie Echanique
Kendra Armer	Diane Caliva	Emma Cox	Rich Eliason
Michael Armer			Nancy Elliot
Ray Arpon			Tessa Emmer
Stefanie Arthur			Grace Enlow
Lacey Babnik			Anastasia Ennis
Lynn Bantley			Janeann Erickson
Ryan Bantley			Laura Erickson
Shahram Baradaran			James Fahlbusch
Kathleen Barker			John Farnsworth
Bill Barnaby			Richard Ferris
Eddie Bartley			Robbie Fischer
Don Bartling			Allen Fish
Julie Baughman			Ken Focht
Larry Beard			Dan Foldes
Tim Behr			Lee Fogue
Maxine Berg			Ross Forman
Ronald Berg			Stephen Friesen
Ardith Betts			Laura Fujii
Marc Blumberg			Kathleen Gadway
Robert Blumberg			Jennifer Gale
Jeff Boissier	Phil Capitolo	Deborah Crooks	Claire Gallagher
Robyn Boothby	Chris Cariño	Chris Cruz	Jim Garlock
Carroll Botvinick	Caryl Carr	Candace Davenport	Jack Gedney
Andy Bradshaw	Sally Cedarblade	Belle Davis	Angelo Gilbert
Bridget Bradshaw	Linda Chambers	Jim Davis	Louise Gilbert
Sawyer Brand	Rich Cimino	Dennis Davison	Lorri Gong
Herb Brandt	Michael Clark	Deanna de Castro	Tyler Gough
Randy Breaux	Jim Clausen	Tom Delebo	Alane Gray
Chris Briggs	Laura Coatney	Matthew Delgado	Ann Greiner
Nancy Brink	Terry Coddington	Carmen DeLeon	David Gregoire
Jim Broadstreet	Kay Conneely	Russ DeLong	Keith Gress



*A Northern Harrier spots its next meal.  
(Illustration by Kris Vanesky)*

# O U T R E A C H

When you're out in nature everyday it's easy to lose appreciation for the magic of the spectacle. On Hawk Hill, we stand casually and point at a Red-tailed Hawk moving in languid circles above the middle platform and maybe cast a passing glance at a Turkey Vulture that comes so close you can hear the air pushing against its feathers. But to someone who lives among buildings and cars and hordes of other humans, the chance to be close to a wild thing is so precious and unlikely that it is inspiring in and of itself.

The point of outreach is to hand people the code to a world that maybe they didn't know existed. We give them information, facts, identification strategies, and natural histories of raptors. But the bigger and perhaps more important goal of outreach is to inspire curiosity. To me, science is interesting because of all of the crazy things that we've found in the world. However, science is stimulating because of the vast ocean of things that we *haven't* found and *don't* know.

The kids that came to Hawk Hill this year were wells of curiosity. They overflowed with questions. I was at an elementary school one day with a bunch of first graders. One of them raised her hand. "Which raptor is the biggest?" So I asked, "Do you mean the heaviest one, or the one with the longest wingspan?" The kid thought for a moment. "The one with the biggest head." To which I had no answer, but hazarded a guess at Bald Eagle. How do you even begin to tell them that there are many more raptors in the rest of the world? "What is the fastest raptor?" "Is a Peregrine faster than a cheetah?" "Is a cheetah faster than a lion?" Of course they'll remember that Peregrines are fast, but I encourage them to ask why. Why does a Peregrine need to be fast?

Out of the 500 or so people that listened to a GGRO Hawk Talk or a Banding Demonstration this year, I wonder how many will someday see a Cooper's Hawk snatch a White-crowned Sparrow off their bird feeder and think, "Long tail, eats birds, came out of the forest. I bet that's an accipiter." Will they think about where that bird came from? Where it's going? Will they remember to look at its long, thin legs amidst a flurry of plucked sparrow feathers? And will this inspire them to look more closely at all bird-ish things?

Thank you to all the groups that either came up to the Hill (fog or sun) or dedicated some classroom time to raptors: Aim High, the Marin Horizon School Hawks, NatureBridge, the Reset Foundation, Children's Day School Hawks and Owls, Galileo High School's Wilderness Art and Literary Collective, the Bay Area Science Festival, Girl Scouts of America, Sonoma State University, Pepperwood Reserve, California Academy of Sciences, Exploratorium, Marin County Parks, Cuyahoga Valley Parks Association, Head-Royce School, Prospect Sierra School, Mill Valley Outdoor Arts Club, Migratory Bird Day, and Marin Wildlife Day.

- Bridget Bradshaw



*Boy with accipiter silhouette on Hawk Hill. (Illustration by Bridget Bradshaw)*

## D O C E N T S

RYAN BANTLEY • EDDIE BARTLEY • BRIDGET BRADSHAW • RANDY BREAUX  
CHRIS BRIGGS • TOM DELEBO • ALLEN FISH • CRAIG NIKITAS  
BILL PROCHNOW • SIOBHAN RUCK • SARAH SAWTELLE • NICK VILLA



# G S M T R A C K I N G

## RAPTORS FITTED WITH GSM TRANSMITTERS IN 2014

Bird Name	Species/Age/Sex	Deployed	Last Received	General Movements
Lupine	Red-tailed Hawk juvenile female	9/7/2014	11/26/2014	South to Indio, CA, then east into Nevada; northwest to Klamath Falls region of Oregon, and then south again, last reporting just north of Colusa, CA
Mills	Red-tailed Hawk juvenile female	9/15/2014	No data	Unknown
Northern	Red-tailed Hawk juvenile male	10/8/2014	10/12/2014	North-northwest, last reporting from an area midway between Bodega and Sebastopol, CA

**WHILE 2014** was not the most active tracking season, it may win the award for most interesting. In our third year using GSM (Global System for Mobile communications) transmitters, we deployed just three units, all on juvenile Red-tailed Hawks. Of these, one (Mills) has not returned data and a second unit (Northern) collected just six data points before going offline.

The first, and most prodigious, transmitter of 2014 was put out September 9 on Lupine (named for the unassuming host plant of the endangered Mission Blue butterfly), a female Red-tailed Hawk. In just one week, she flew an unprecedented 540 miles south to Indio, CA. On September 15, she reported from the Mojave Desert where her transmitter then went dark. When the unit finally reported again, three days later, Lupine had traversed the southern Sierra crest into Nevada and flown roughly 500 miles *north* to an area just outside of Pyramid Lake.

Although just that feat of migration impressed us, Lupine's story did not end there. On September 18, Lupine crossed back into California, flew northwest through Susanville and then headed due north to settle in an agricultural area outside Bonanza, OR, for the next two months. This spot was most notable because it is less than 25 miles from another GSM bird, Kenya, which was tagged in the fall of 2013.

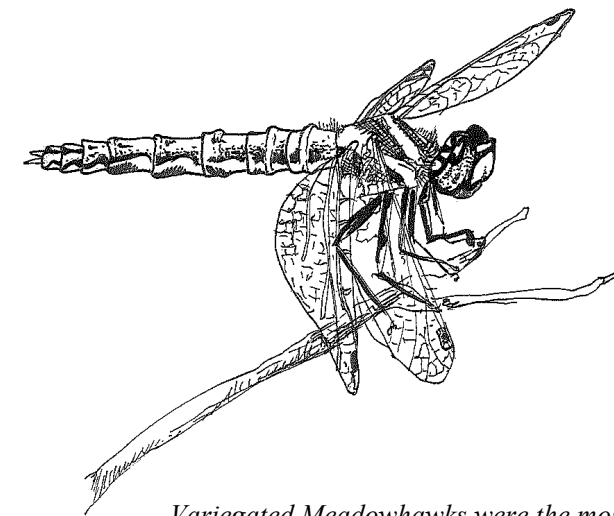
As of this writing, Loopin' Lupine (as she has affectionately come to be known) moved once more – south again into California's Central Valley, barely 10 miles north of Colusa. Although her unit has not reported since late November, we remain hopeful that there might be more to Lupine's story. Transmitters can sometimes stay off-line for weeks, or even months, until battery power and cell reception align to allow for data transfer.

**TWO TRANSMITTERS FROM 2013** also reported data into summer 2014. Kenya, an adult Redtail, passed the winter around Point Reyes before heading north in April to settle on the east bank of Upper Klamath Lake in Oregon. However, at the time of her last transmission on September 15, Kenya had moved southwest away from the lake that had been her summer home. The second 2013 Redtail, Juanita, after spending most of the winter in Menlo Park, and perhaps feeling the pressure of resident breeders, began bouncing around the South Bay in May of 2014 before heading northward. Her unit last reported on July 20, just north of Highway 37 near the Sonoma Baylands.

- Laura Young

# V O L U N T E E R S

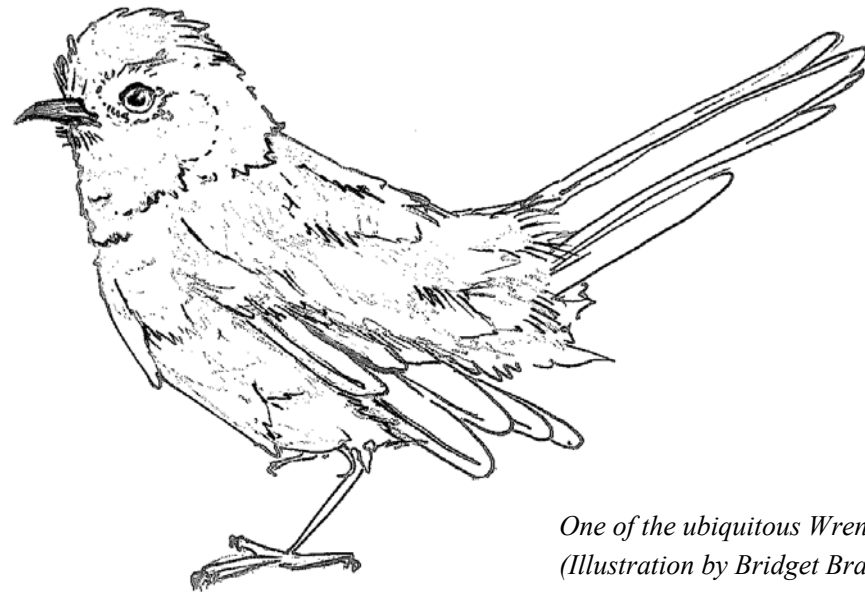
Eli Gross	Lynn Jesus	Ann Linder	Paul Mirocha
Brianna Hackler	Debbie Kahn	Lianna Lopez	Sue Morgan
Aaron Haiman	Judy Kaufman	William Ludan	Nancy Mori
Joshua Haiman	Kanani Kauka	Karen Lundin	Tom Moutoux
Mike Hall	Mamiko Kawaguchi	Eric Lynch	Daniel Murnane
Jim Hallisey	Beth Kean	Karen Madsen	Poornima Murthi
Mary Ellen Hannibal	John Keane	Mary Malec	Angela Newsham
Michael Harkins	Mary Kenney	Audrey Martin	Jeanette Nichols
Katie Harrington	John Kenny	Alexandra Matthews	Chris Nikitas
Judy Harris	Walter Kitundu	Ron Maykel	Craig Nikitas
Susan Harris	Rina Kor	Megan Mayo	Maureen Noon
Michele Harrison	Ann Kositsky	JoAnn McAllister	John Odell
Melissa Hero	Doris Kretschmer	Zoe McCormick	Brian O'Laughlin
David Herrema	Shelby LaMotte	Tara McIntire	Cindi Oldenkamp
Cheri Hinkley	Christine Lamphear	Ewen McKechnie	Ana Olivar
Jennifer Ho	Joan Lamphier	Raleigh McLemore	Rebecca Olsen
Lynn Hoerle	Dian Langlois	Paul Meadow	Claire O'Neil
Krista Hoff			Steve O'Neill
Ruth Holbrook			Marissa Ortega-Welch
Nora Holmes			Kenn Osborne
Ryan Holmes			Pat Overshiner
Tom Holmes			Dana Owens
John Holson			Kate Owens
Calvin Hom			Elizabeth Palmer
Sam Hontalas			Ron Parker
Ashley Hoover			Phoebe Parker-Shames
Diane Horn			Molly Peppel
Dick Horn			Jean Perata
Heather Hoyles			Ralph Pericoli
Buzz Hull			John Perry
Josh Hull			Rondi Phillips
Sara Hurley	James Lawson	Horacio Mena	Ryan Phillips
Bill James	Cheryl Lentini	Kim Meyer	Roy Pisetsky
Eric Jepsen	Patricia Lessard	Rachel Miller	Ruth Poliakov
David Jesus	Allison Levin	Steve Miller	Bob Power



*Variegated Meadowhawks were the most numerous dragonfly seen on Hawk Hill.  
(Illustration by Bridget Bradshaw)*

# VOLUNTEERS

Bill Prochnow	Linda Schneider	Jeremy Thweatt	Jill Weinstein
James Raives	Emily Schultz	Kat Tomalty	David Wells
Katherine Raspet	Terrie Schweitzer	Jasper Toscani	Barbara Westree
Chris Read	David Sexton	Leslie Tribe	Nick Whelan
Gus Recinos	Amanda Shafer	Kyla Tripp	Eira Whitty
Gregory Reidenbach	Paulette Sherry	Traci Tsukida	Jeffry Wilkinson
Don Reinberg	Janice Sinclair	Mikhail Twarogowski	Ken Wilson
Theresa Rettinghouse	Kate Skelly	John Ungar	Step Wilson
Eileen Richey	Lauren Smith	Linda Vallee	David Wimpfheimer
Jeff Robinson	Brian Smucker	Karen Vandergrift	Bright Winn
Steven Rock	David Snipper	Kris Vanesky	Beth Wommack
Toby Rohmer	Curtis Snyder	Kim Varney	Pat Wong
Diane Rooney	Tate Snyder	Douglas Vaughan	David Wood
Will Rose	KC Sorgen	Nick Villa	Claire Wolf
Laury Rosenthal	Claire Starks	Kristin Vorhies	Jim Yampolsky
Elizabeth Rouan	Tim Stoddard	Elizabeth Wakeman	Laura Young
Siobhan Ruck	Linda Sudduth	Jacqueline Wall	Amanda Zamara
Dede Sabbag	Jennifer Sullivan	Erika Walther	
Shankar Sankararaman	Michelle Tattersall	Noreen Weeden	
Peter Sapienza	Craig Tewell	Marion Weeks	
Juta Savage	Holly Thomas	Kenneth Weidner	
Sarah Sawtelle	Laura Thomas	Emily Weil	



One of the ubiquitous Wrentits found on Hawk Hill.  
(Illustration by Bridget Bradshaw)

# RADIOTELEMETRY

## RAPTORS RADIOTRACKED IN 2014

Bird Name	Species/Age/Sex	Tracking Season	Net Direction	Last Known Location	Net Distance from Headlands
Frosty	Red-tailed Hawk juvenile male	11/8-11/16	North-Northwest	Canfield Rd, 4 mi W. of Rohnert Park, CA	38 miles

In 2014, the Telemetry season was divided into two sessions, the Broadwing “Wait” and the Scheduled Tracking period.

From September 20 through October 5, a dedicated group of telemetrists put themselves on stand-by, waiting for the banders to provide a suitable, healthy Broad-winged Hawk for the teams to track. Unfortunately, none were trapped so it ended up being a very long sixteen day “Wait” period.

The official Scheduled Tracking period began on November 7. Although there had been good numbers of Redtails banded the prior week, a weather change meant that banders were unable to provide a subject for tracking on the seventh. On a sunny November 8, three tracking teams were waiting in the Headlands when banders announced that they had a healthy, juvenile Red-tailed Hawk for us. Barb Westree applied the small transmitter while Brian Smucker held the bird. Barb named him “Frosty”, and the male Redtail was released near the FM towers. Eleven days of radio-telemetry tracking began. Frosty spent the first evening in a eucalyptus grove in the Headlands, to the west of Hwy 101, above Sausalito. On Day Two, he flew north towards Petaluma. The following day Frosty settled in an area just west of the intersection of Stony Point Road and Todd Avenue. The teams tracked him from nearby dairy farms and businesses as Frosty became somewhat stationary in an area bound by Todd, Stony Point, and Llano.



Telemetrist David Jesus prepares to release Frosty. (Illustration by Bridget Bradshaw)

As a stationary bird, we stayed with Frosty longer than we normally would because we had a great group of eager apprentice trackers who needed field experience. For many of the experienced trackers, it was an area with which they were already familiar, since Echo (male, juvenile Redtail) had taken them there in 2012. Over the years, several of our juvenile Red-tailed and Cooper’s Hawks have settled down in the area between Santa Rosa and Point Reyes.

Post-season, in between rain storms and showers, several telemetrists returned to the area to check on Frosty. On December 4, Frosty had re-located along Canfield Road near Blank Road, which is about four miles south of the Todd/Stony Point area, and west of Rohnert Park, CA.

- Lynn Jesus

## CHASE LEADERS

PHIL CAPITOLO • MIKE HALL • BILL JAMES • LYNN JESUS • LIBBY ROUAN • BARB WESTREE