
2021-2023 MIGRATION NETWORK REPORT





2023 MIGRATION REPORT

© Bonney Butte 2019 Crew

HawkWatch International's migration network spans much of the western United States. These standardized counts provide large-scale, long-term data on the dynamics of migration and insights into species trends across a broad geography. Long-term monitoring allows detection of large-scale declines such as those seen in American Kestrels and Golden Eagles. Documenting such declines alerts researchers, who can then seek causes and remedies for species in peril. These long-term data can also highlight conservation success stories, such as the Peregrine Falcon, where we see increasing count trends at four sites.

This report includes three years of new data from the HWI migration network. The past few years have seen big numbers for some species and sites, and we're excited to dig into them with you. In 2023, Corpus Christi and Commissary Ridge had record counts! In 2022, seven sites counted record-high numbers of Swainson's Hawks. Opposite these exciting high counts, we also saw continued Golden Eagle and American Kestrel declines at many sites.

Thanks to all that have served on a migration crew—both in recent years and across the decades. Your long days braving the elements to monitor the flight each year make telling the ongoing story of raptors in the west possible. We also thank all of our collaborators, HawkWatch International donors, and anyone who visited a HawkWatch! This work is only possible with the support and enthusiasm of many.

Yours in Raptor Conservation,

The Long-term Monitoring and Community Science Team

Data and content within copyright HawkWatch International 2024

Please cite as:

Sweet, K., Watson, J., and D. Oleyar. HWI 2023 Migration Report. 43 pp.

NETWORK UPDATES

© Amanda Hancock

Long-term monitoring programs by nature see relatively few major changes. However, we bring a few notable changes to our network and reporting this year.

First, we say goodbye to one of our long-term migration sites, Chelan Ridge. Operating from 1998 - 2022 observers counted 41,682 birds. Chelan is a special place for many and provided dozens of early-career conservation biologists with valuable research and field work experience. Ending efforts at Chelan was not an easy decision, but ultimately, we feel that there are ways to utilize limited migration monitoring resources that can be more impactful for raptors. This is the last migration report with new data for Chelan Ridge.

We also say good-bye to our digital data collection platform, Dunkadoo. Dunkadoo has been HawkWatch's data collection platform since 2017 and was created and operated by Russell Conard and Carol Goodman. Russell and Carol donated their time to run Dunkadoo, and we say a huge thanks for their efforts over the years!

Last, we include data from our spring migration site, Gunsight Mountain, AK. HWI initiated full-season efforts here in 2016. Located in a natural funnel between two glacial mountain ranges, Gunsight sees spectacular flights of Golden Eagles and Northern Harriers as well as high-latitude specialties like Rough-legged Hawks and Harlan's subspecies of Red-tailed Hawk. With Golden Eagle and Rough-legged Hawk numbers declining at many count sites, Gunsight provides valuable data about these species on their migratory journeys.



A Harlan's subspecies Red-tailed Hawk (top) soars near a Rough-legged Hawk (bottom)



A hawkwatcher takes in the view at Gunsight Mountain HawkWatch

NETWORK MAP



Orange, south facing hawk symbols are **fall sites** while **yellow**, north facing hawk symbols are **spring sites**. As of 2023, the only spring site in the network is Gunsight Mountain HawkWatch in Alaska. In 2024 we are adding an additional spring site, Tubac HawkWatch located in southern Arizona.

2021 COUNT

	Gunsight Mountain, AK	Chelan Ridge, WA	Bonney Butte, OR	Grand Canyon, AZ	Goshute Mountains, NV	Manzano Mountains, NM	Corpus Christi, TX	Commissary Ridge, WY	Bridger Mountains, MT
Accipiters									
Sharp-shinned Hawk	243	362	1062	795	3410	1042	2189	818	446
Cooper's Hawk		126	320	617	1569	603	1676	853	346
American Goshawk	142	18	15	0	17	22	0	34	17
Unidentified Accipiter	0	30	42	74	102	100	92	120	28
Buteos									
Broad-winged Hawk		8	6	15	50	24	563625	62	25
Red-shouldered Hawk		0	1	0	0	0	20	0	
Zone-tailed Hawk				0		0	22		
Swainson's Hawk	0	12	3	16	87	1242	1848	351	6
Rough-legged Hawk	475	1	4	1	31	1	0	17	60
White-tailed Hawk							63		
Red-tailed Hawk	1419	179	626	625	2769	542	251	1297	262
Ferruginous Hawk		0	1	3	12	1	6	6	10
Unidentified Buteo	6	18	4	21	34	62	15	67	6
Eagles									
Bald Eagle	69	7	140	3	8	2	5	119	96
Golden Eagle	1707	40	69	8	213	78	2	179	1073
Unidentified Eagle	0	2	1	0	0	0	0	1	0
Falcons									
American Kestrel	2	24	14	343	576	242	1140	130	139
Merlin	38	33	98	1	32	27	173	27	27
Prairie Falcon		4	1	1	2	10	7	10	26
Peregrine Falcon	11	11	32	26	26	68	169	24	28
Gyr Falcon	2								0
Unidentified Falcon	0	11	6	7	8	9	13	15	8
Kites									
Mississippi Kite		0			0	0	31020		
White-tailed Kite							4		
Swallow-tailed Kite							197		
Vultures and Others									
Turkey Vulture		25	488	54	364	413	117699	95	38
Black Vulture							1355		
Osprey	40	32	100	13	74	19	186	43	17
Northern Harrier	311	63	16	11	99	26	643	30	44
Unidentified Raptor	0	10	20	12	58	45	85	32	27
Total									
Total	4465	1016	3069	2646	9532	4578	722557	4330	2729

Orange text indicates a count significantly lower than the site average, teal indicates a count significantly higher than the site average, black text indicates a count that does not statistically differ from average.

2022 COUNT

	Gunsight Mountain, AK	Chelan Ridge, WA	Bonney Butte, OR	Grand Canyon, AZ	Goshute Mountains, NV	Manzano Mountains, NM	Corpus Christi, TX	Commissary Ridge, WY	Bridger Mountains, MT
Accipiters									
Sharp-shinned Hawk	275	492	718	760	3347	658	2628	798	232
Cooper's Hawk		191	223	745	2354	441	2068	504	163
American Goshawk	48	23	12	2	12	8	0	28	10
Unidentified Accipiter	0	74	69	253	265	69	85	97	33
Buteos									
Broad-winged Hawk		15	1	19	251	9	523671	91	14
Red-shouldered Hawk		1	4	0	1	0	37	0	
Zone-tailed Hawk				1		3	4		
Swainson's Hawk	0	26	4	184	1617	1815	26704	424	4
Rough-legged Hawk	410	24	4	0	14	0		4	9
White-tailed Hawk							45		
Red-tailed Hawk	1180	379	275	759	2685	253	285	1095	141
Ferruginous Hawk		0	0	1	14	5	3	4	5
Unidentified Buteo	3	13	14	75	73	25	16	71	12
Eagles									
Bald Eagle	106	15	84	9	13	1	15	111	57
Golden Eagle	1847	78	41	2	154	70	5	262	848
Unidentified Eagle	0	2	0	5	0	0	0	20	1
Falcons									
American Kestrel	4	22	16	347	1012	143	1684	145	82
Merlin	50	30	75	13	41	20	179	19	9
Prairie Falcon		2	3	4	16	2	3	9	7
Peregrine Falcon	20	6	12	10	13	15	161	18	19
Gyr Falcon	2								0
Unidentified Falcon	0	4	8	5	4	22	13	14	7
Kites									
Mississippi Kite				0	0	0	29381		
White-tailed Kite							6		
Swallow-tailed Kite							383		
Vultures and Others									
Turkey Vulture		101	400	129	1103	1034	179170	161	28
Black Vulture							1344		
Osprey	48	37	93	54	199	23	208	42	14
Northern Harrier	309	55	16	30	81	18	755	23	99
Unidentified Raptor	0	39	14	18	92	15	94	60	41
Total									
Total	4302	1629	2086	3425	13361	4649	768983	4000	1835

Orange text indicates a count significantly lower than the site average, teal indicates a count significantly higher than the site average, black text indicates a count that does not statistically differ from average.

2023 COUNT

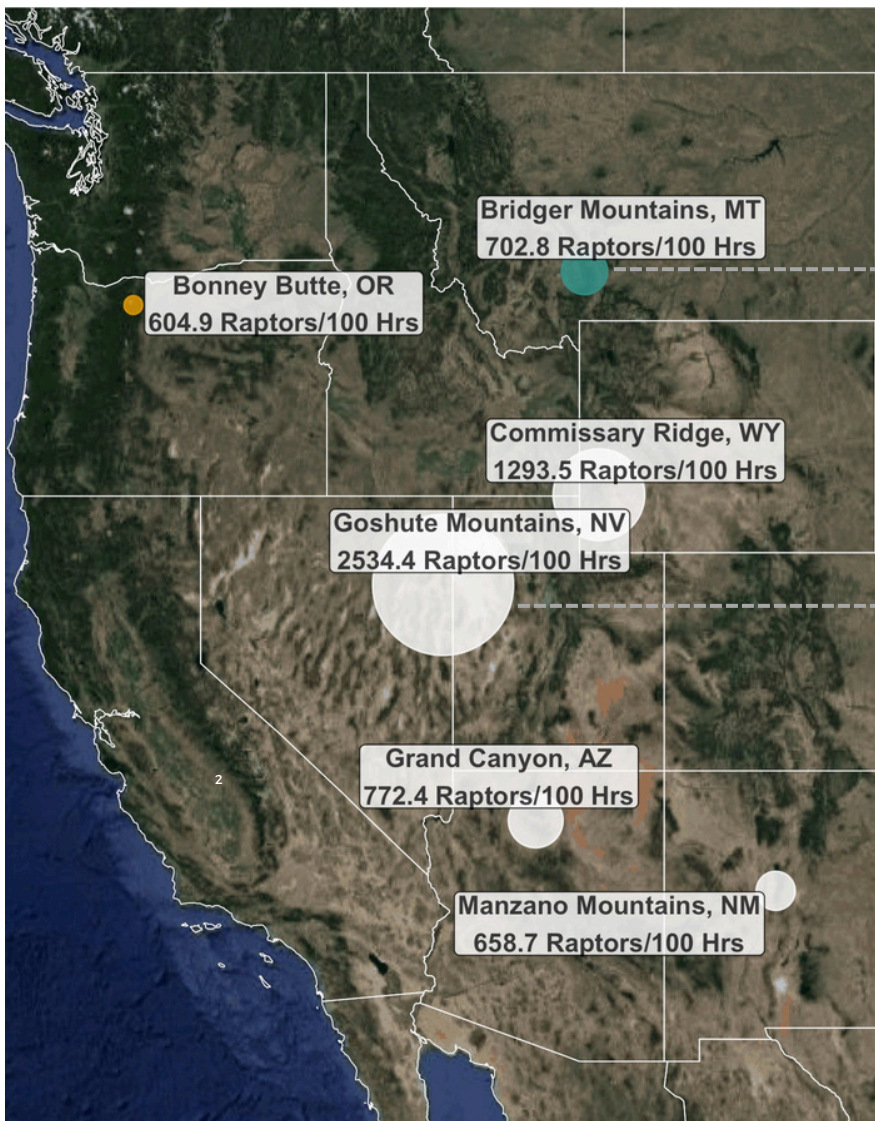
	Gunsight Mountain, AK	Bonney Butte, OR	Grand Canyon, AZ	Goshute Mountains, NV	Manzano Mountains, NM	Corpus Christi, TX	Commissary Ridge, WY	Bridger Mountains, MT
Accipiters								
Sharp-shinned Hawk	<u>280</u>	854	1503	4647	1371	<u>3558</u>	<u>1804</u>	522
Cooper's Hawk		<u>184</u>	864	3205	<u>422</u>	<u>2740</u>	<u>1005</u>	<u>389</u>
American Goshawk	32	9	7	48	4	0	35	17
Unidentified Accipiter	0	23	271	362	<u>290</u>	83	241	70
Buteos								
Broad-winged Hawk		2	33	<u>416</u>	24	816724	<u>142</u>	<u>81</u>
Red-shouldered Hawk		1	0	0	0	24	0	
Zone-tailed Hawk			3		5	4		
Swainson's Hawk	<u>16</u>	2	93	1622	102	2619	356	8
Rough-legged Hawk	278	2	0	22	0	0	<u>2</u>	<u>2</u>
White-tailed Hawk						28		
Red-tailed Hawk	853	273	1222	4519	552	239	<u>1804</u>	162
Ferruginous Hawk		0	1	13	7	2	12	8
Unidentified Buteo	3	8	22	125	69	38	122	12
Eagles								
Bald Eagle	<u>136</u>	98	5	14	1	9	99	40
Golden Eagle	1694	23	3	160	53	0	221	675
Unidentified Eagle	0	1	1	0	3	0	24	3
Falcons								
American Kestrel	4	15	470	1194	326	<u>4115</u>	290	<u>233</u>
Merlin	42	106	10	76	58	100	<u>34</u>	31
Prairie Falcon		2	3	20	10	<u>1</u>	6	14
Peregrine Falcon	17	25	16	35	80	200	<u>34</u>	12
Gyr Falcon	1							0
Unidentified Falcon	0	3	10	10	<u>49</u>	17	24	21
Kites								
Mississippi Kite		0	0	0		<u>69024</u>		
White-tailed Kite						<u>14</u>		
Swallow-tailed Kite						241		
Vultures and Others								
Turkey Vulture		506	72	1170	350	<u>366223</u>	<u>192</u>	<u>57</u>
Black Vulture						<u>2213</u>		
Osprey	<u>53</u>	55	40	115	19	<u>405</u>	50	6
Northern Harrier	<u>605</u>	20	27	181	36	<u>931</u>	47	204
Unidentified Raptor	0	8	17	149	<u>166</u>	<u>25</u>	<u>120</u>	35
Total								
Total	4029	2220	4693	18103	3997	<u>1269616</u>	<u>6664</u>	2602

Orange text indicates a count significantly lower than the site average, teal indicates a count significantly higher than the site average, black text indicates a count that does not statistically differ from average. Underlined text indicates a record high or low from that site (excluding 0 values, which are species that are uncommonly seen at the site, so are not underlined).

DATA INTERPRETATION

We use passage rates to describe species numbers, as effort-adjusted data are more comparable across time and place. For example, one site may have counted more hours than another site because of weather or average season length, making comparisons of raw numbers less meaningful.

We visualize passage rates using both bubble maps and scatter plots. Bubble maps, like the one shown below, site locations with bubbles color-coded to show long-term trends and sized to show relative 2023 passage rates for a given species.



Bubble color indicates whether counts are significantly increasing (teal), decreasing (orange), or show no statistically supported trends (white) at a given site.

Bubble size represents the number of raptors counted per 100 hours, with larger bubbles indicating higher counts. Note that each species' map has a different scale.

*If there were no raptors of a given species seen at a site in 2023, then they are not included on the map. Chelan Ridge data are therefore not included on maps since its last count was in 2022.

*If the vast majority of raptors of a given species were counted at one site (e.g., Corpus Christi which sees huge numbers of some raptor species), we exclude the site from the map and include a piechart for a clearer representation of the data.

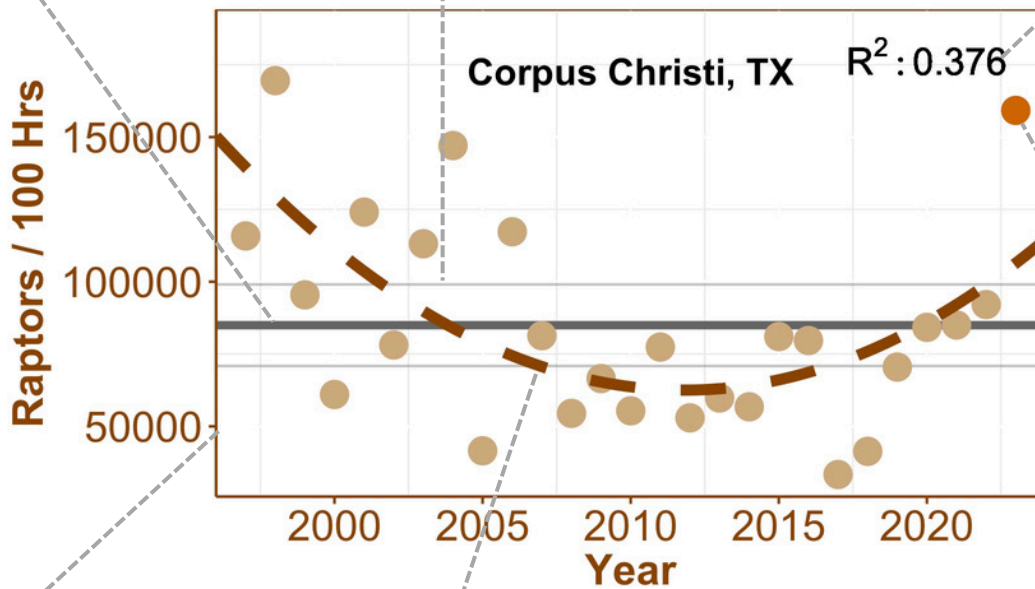
DATA INTERPRETATION

In addition to maps, we also visualize data using scatter plots. Scatter plots show effort-adjusted counts for a given species across each site's lifetime and illuminate long-term trends in species passage rates at each site.

The thick gray line shows the mean passage rate per 100 hours of counting for the lifetime of the site.

The thin gray lines surrounding the average are upper and lower 95 percent confidence intervals. Data points outside of these lines differ statistically from the average passage rate.

R-squared measures how well the plotted line fits the data, with values closer to 1 indicating a better fit.



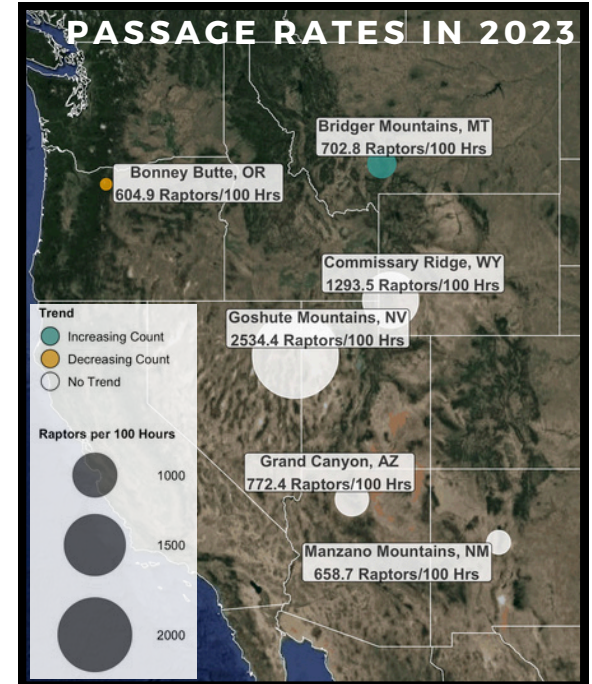
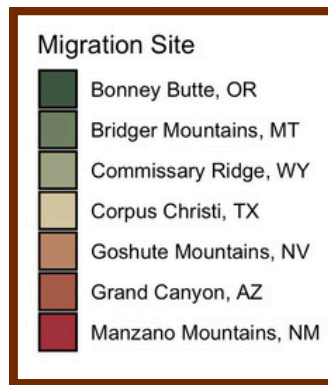
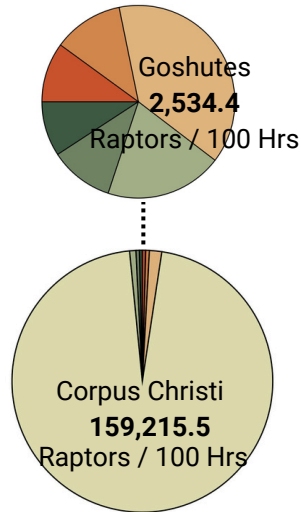
*Note that y axes differ in range based on the average species count at that site.

If the p value was ≤ 0.05 the trend line is displayed in dark brown.

The most recent count, 2023, value is shown in bright orange. Note that Chelan Ridge is included in the scatter plot grids, but data run only through 2022.

ALL RAPTORS

- Overall counts are declining long-term at Bonney Butte and Chelan Ridge.
- In 2023, HWI crews saw record high counts at Commissary Ridge and Corpus Christi. The team at Corpus Christi saw **228,151 raptors in one day!**
- 2022 on the other hand, saw low counts at Bridger Mountains, Bonney Butte, and Grand Canyon.
- 2021 had lower than average counts at Chelan Ridge, Goshute Mountains, Grand Canyon, and Manzano Mountains.



The Corpus Christi HawkWatch has by far the highest raptor passage rates (see pie chart). Given this, we exclude Corpus Christi from the map to more clearly show differences in flight volume across the network.

PASSAGE RATE ACROSS YEARS PER SITE

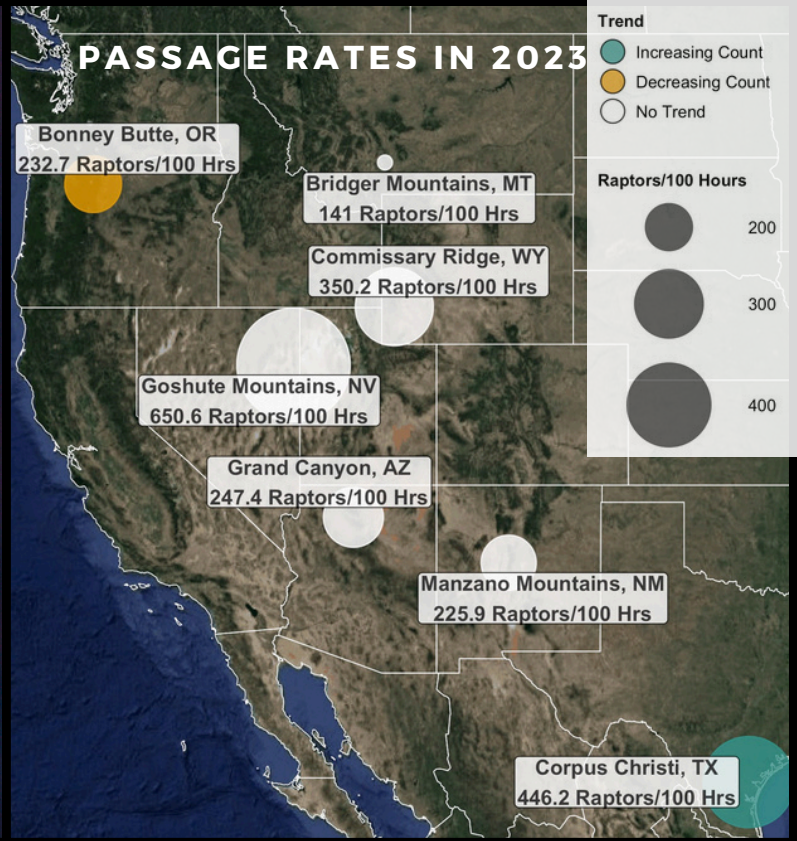


© Georgia Coleman

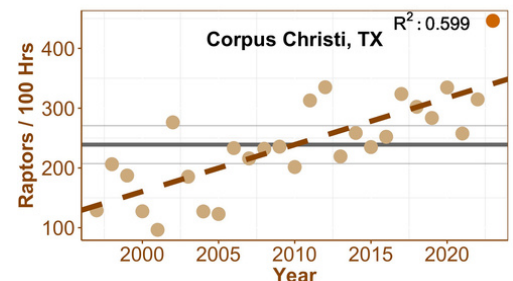
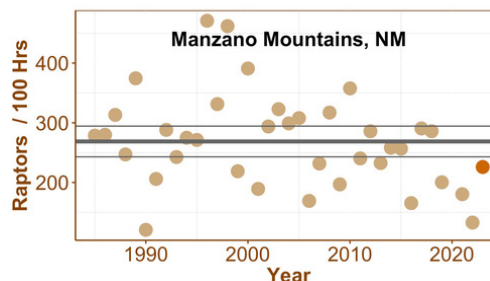
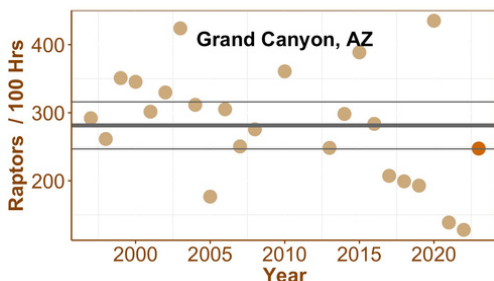
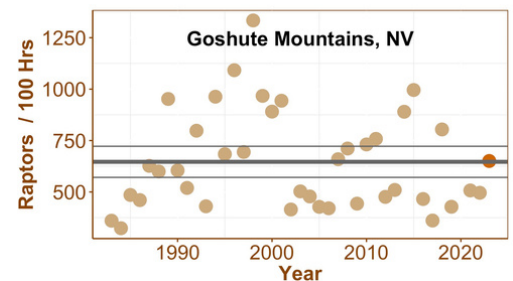
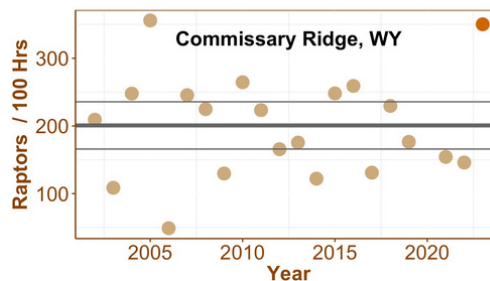
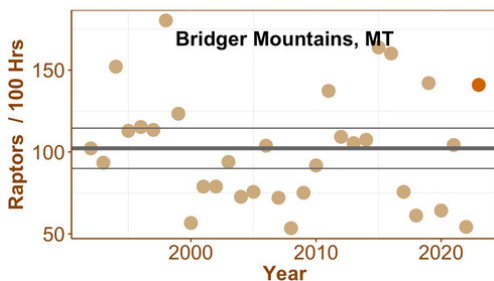
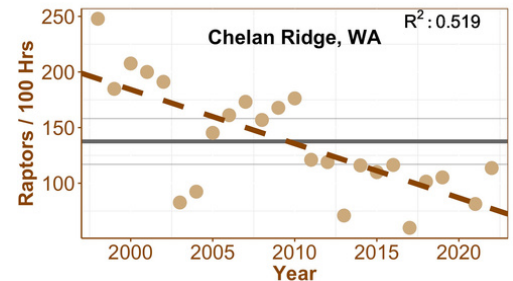
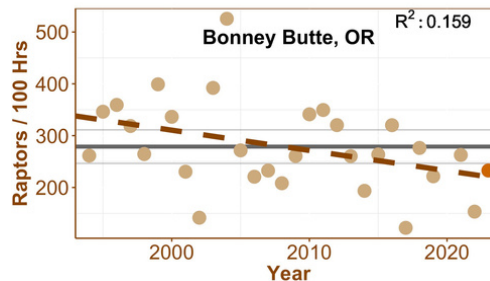


Sharp-shinned Hawks are the most commonly counted raptor at many of our network sites.

Bonney Butte and Chelan Ridge have decreasing Sharp-shinned Hawk counts overall, with most other sites showing no trends. Corpus Christi is the exception, with a record Sharp-shinned Hawk count in 2023 of 3,558 birds and an overall increasing trend.



PASSAGE RATE ACROSS YEARS PER SITE

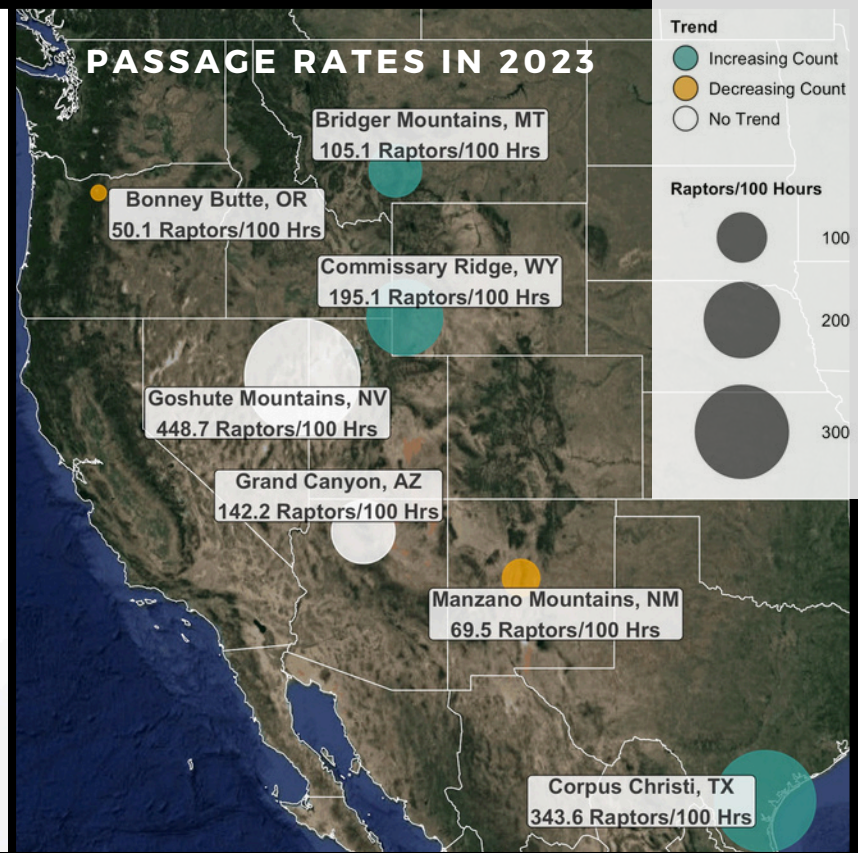


© Georgia Coleman

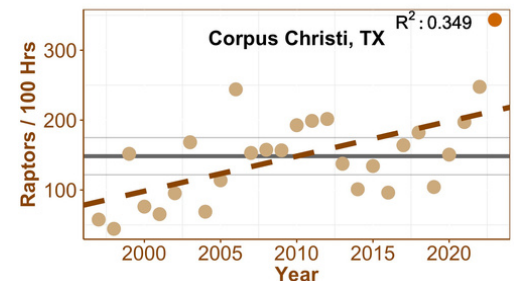
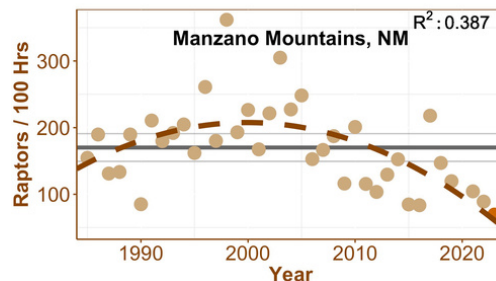
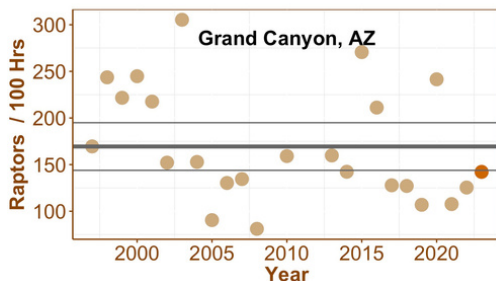
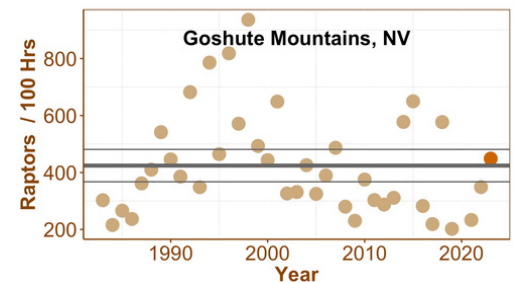
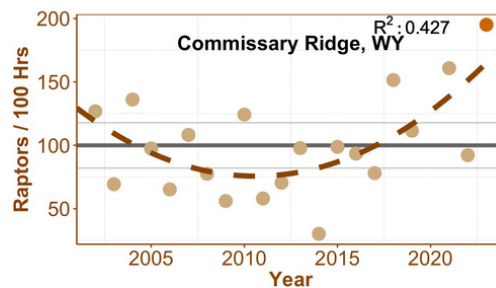
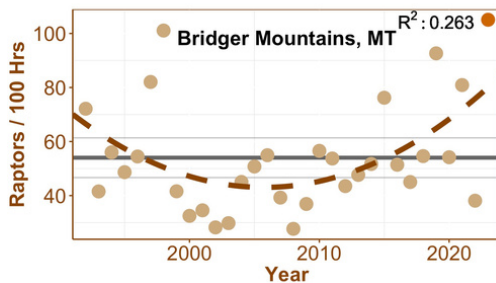
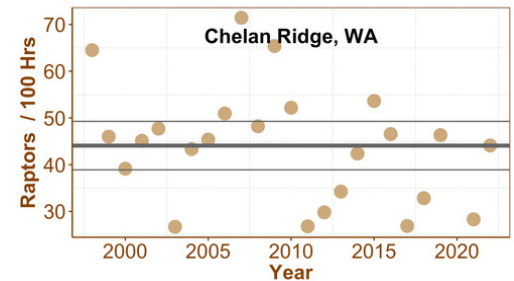
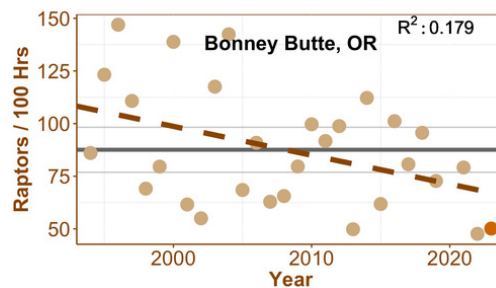


In 2023, crews documented record high Cooper's Hawk counts at Commissary Ridge, Bridger Mountains and Corpus Christi. These sites also show increasing count trends.

However, the trend of declining counts continued at Bonney Butte and the Manzano Mountains where our teams counted some of the lowest Cooper's Hawk numbers in their histories.



PASSAGE RATE ACROSS YEARS PER SITE

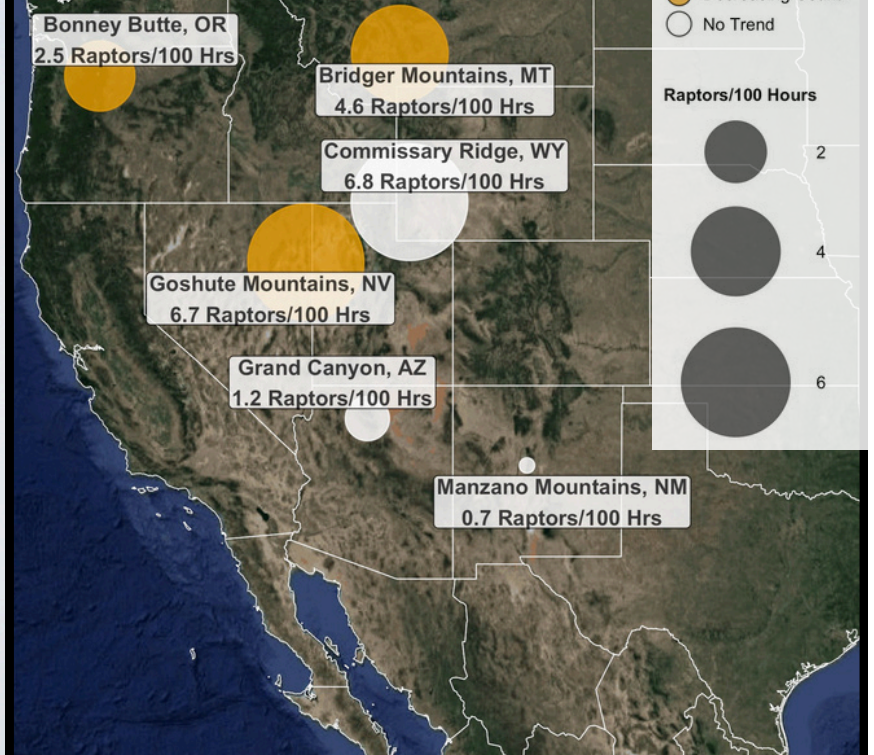


© Jesse Watson

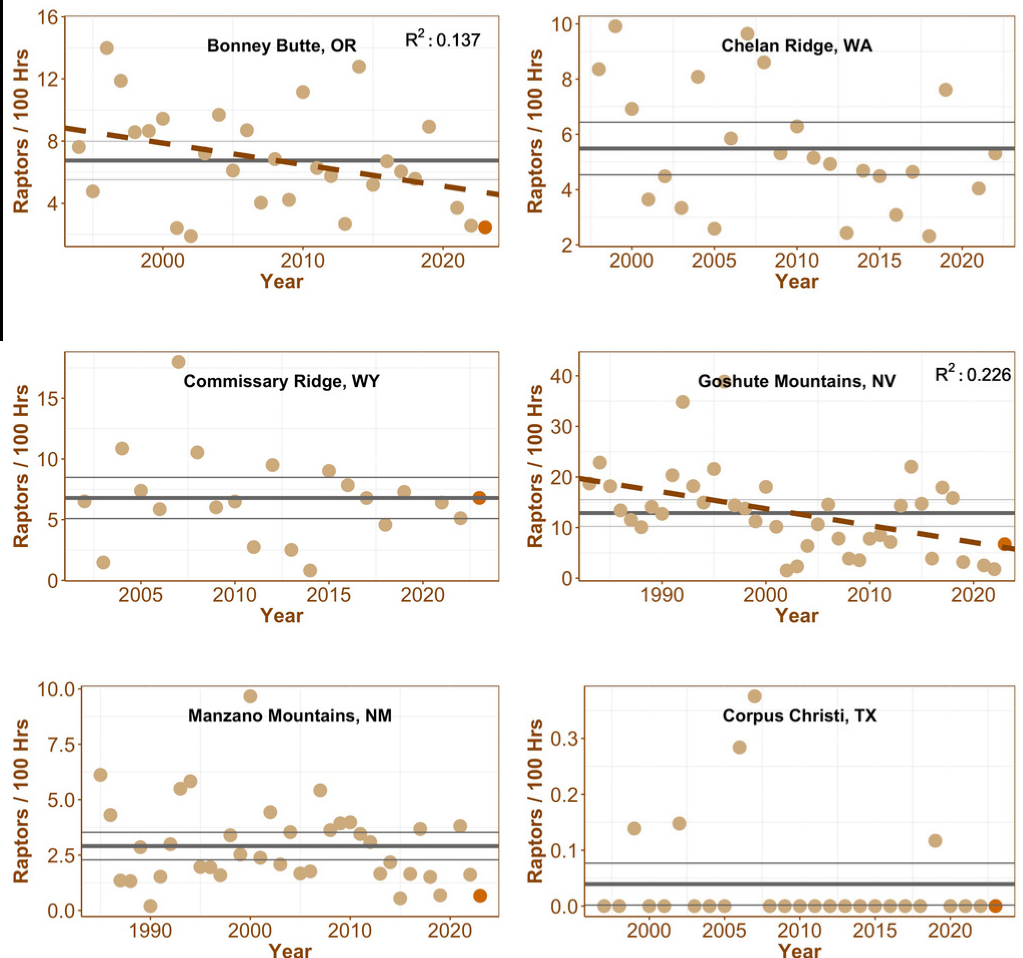


American Goshawks are our least commonly observed accipiter. 2023 was an overall low count year for goshawks, with 4 sites seeing below average passage rates and the rest with numbers in line with site averages. Bonney Butte, Bridger Mountains, and the Goshute Mountains show long-term goshawk declines.

PASSAGE RATES IN 2023



PASSAGE RATE ACROSS YEARS PER SITE



© Jesse Watson

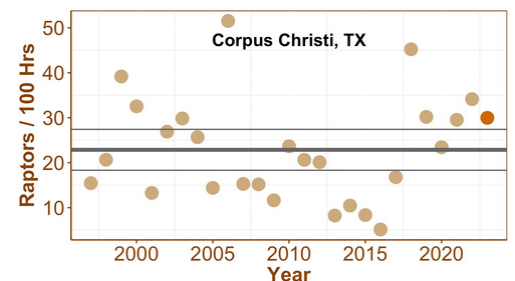
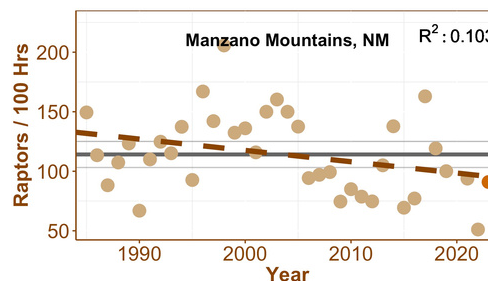
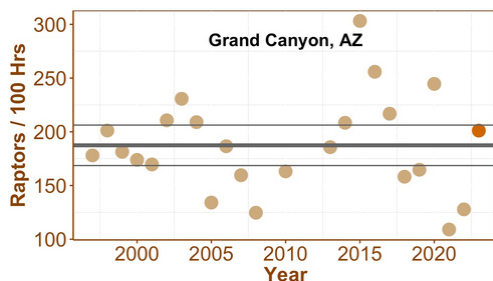
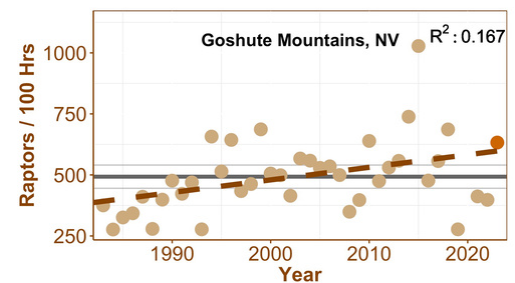
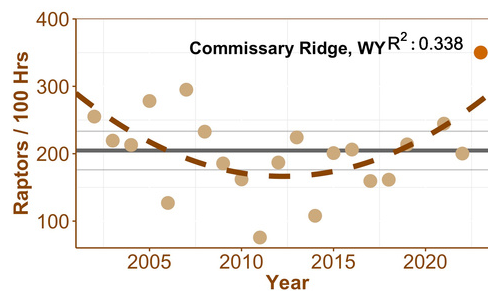
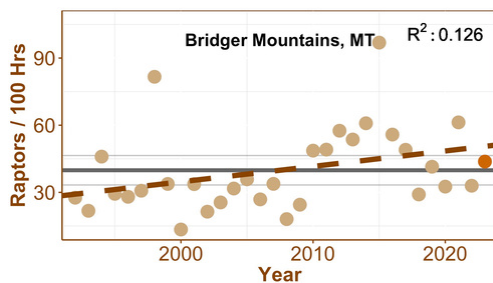
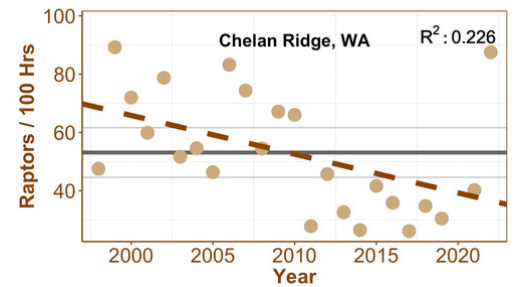
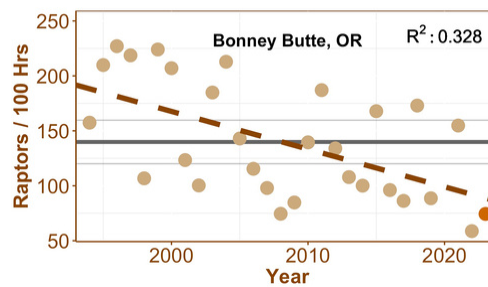


Our teams saw above average numbers of Red-tailed Hawks at four sites in 2023, including a record 1,804 migrants at Commissary Ridge. Bonney Butte and the Manzano Mountains teams counted low Red-tailed numbers in 2023.

Long - term trends are mixed across sites with some decreasing, some increasing and some with no trends.



PASSAGE RATE ACROSS YEARS PER SITE



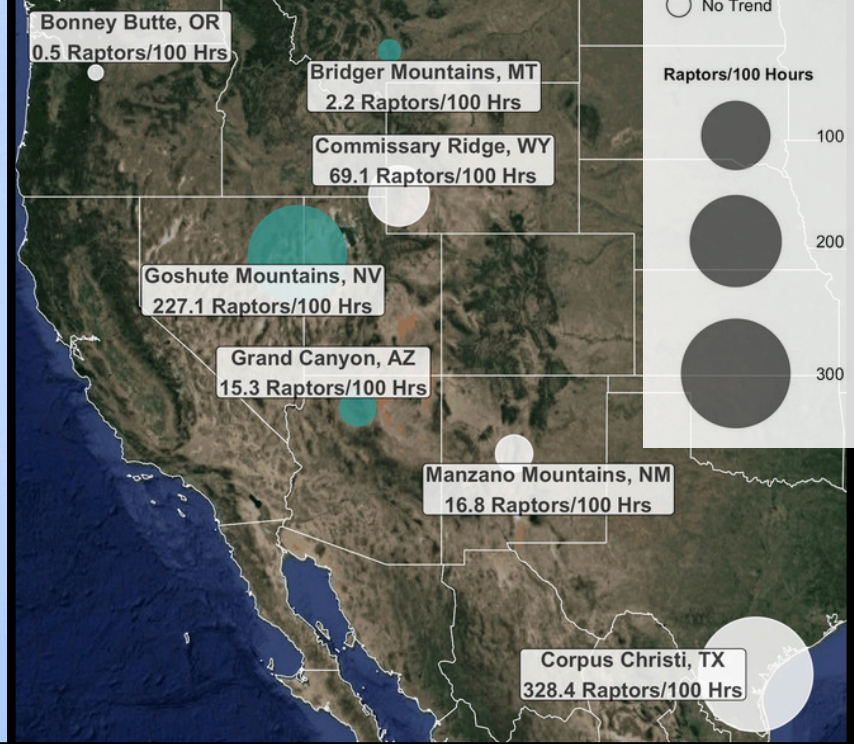
© Jesse Watson



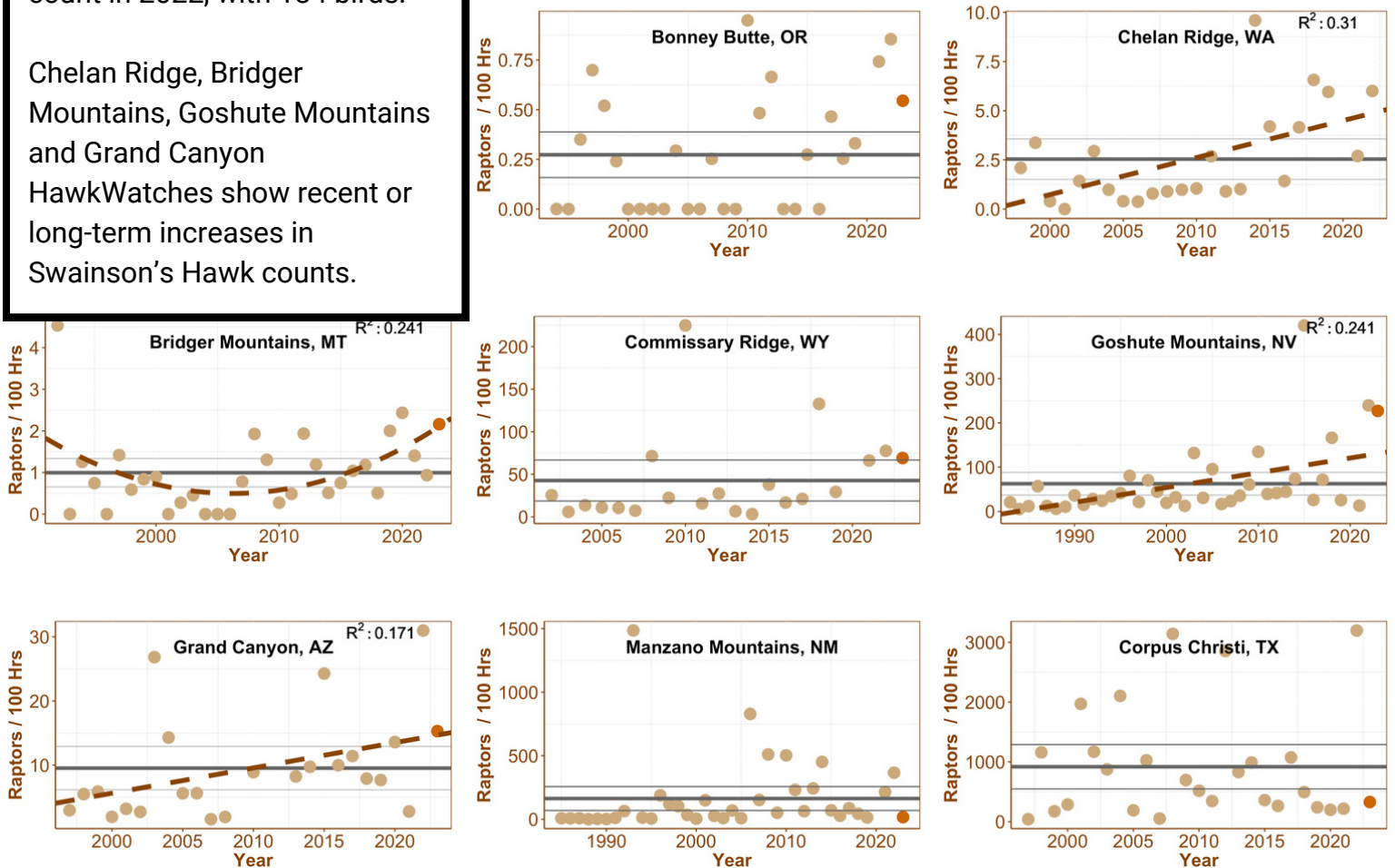
In 2023 our teams counted above average Swainson's Hawk flights at 5 of 7 sites. Corpus Christi saw a record high flight in 2022, with 26,704 birds counted! The Grand Canyon also logged a record count in 2022, with 184 birds.

Chelan Ridge, Bridger Mountains, Goshute Mountains and Grand Canyon HawkWatches show recent or long-term increases in Swainson's Hawk counts.

PASSAGE RATES IN 2023



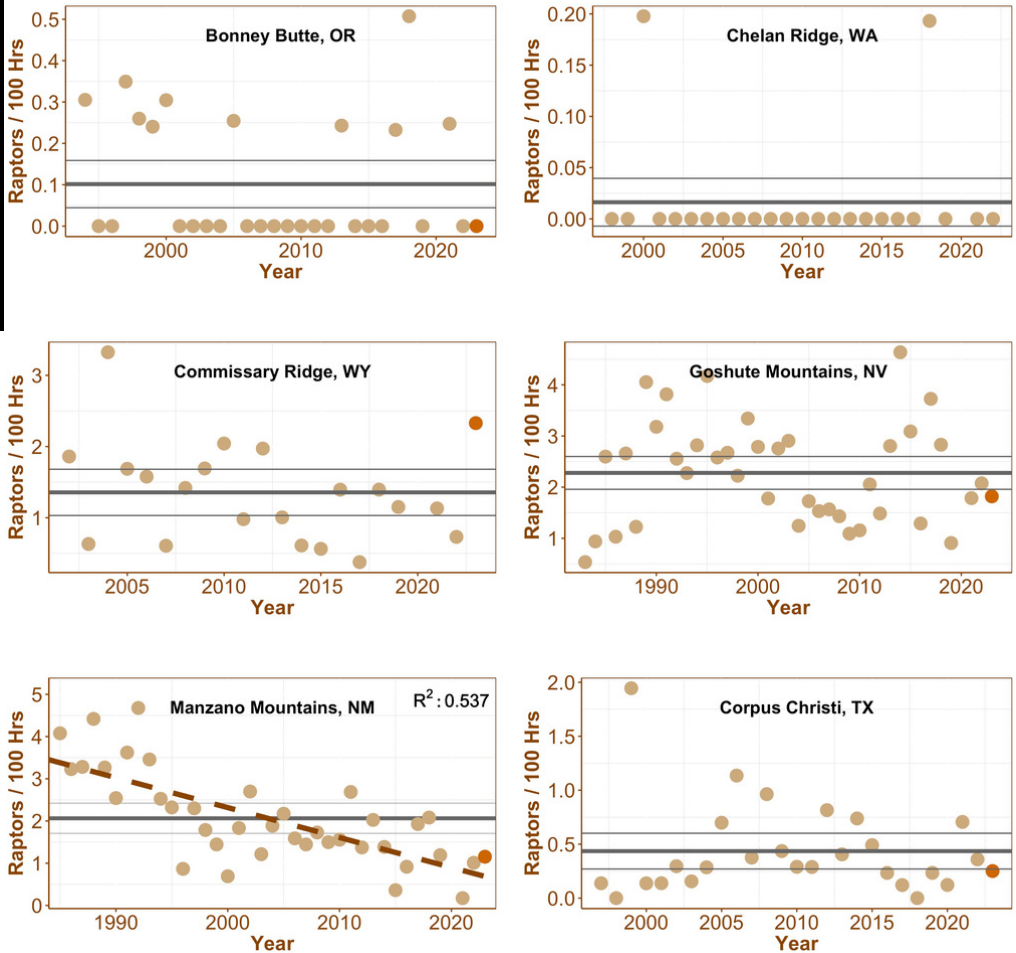
PASSAGE RATE ACROSS YEARS PER SITE





Ferruginous Hawks are a rare sight at most of our count locations because they are most commonly found in grassland habitat, where as most of our count sites are on mountainous ridge lines. Although its not possible to infer much from these counts, there does appear to be an increasing trend at Bridger Mountains and a decreasing trend at the Manzano Mountains.

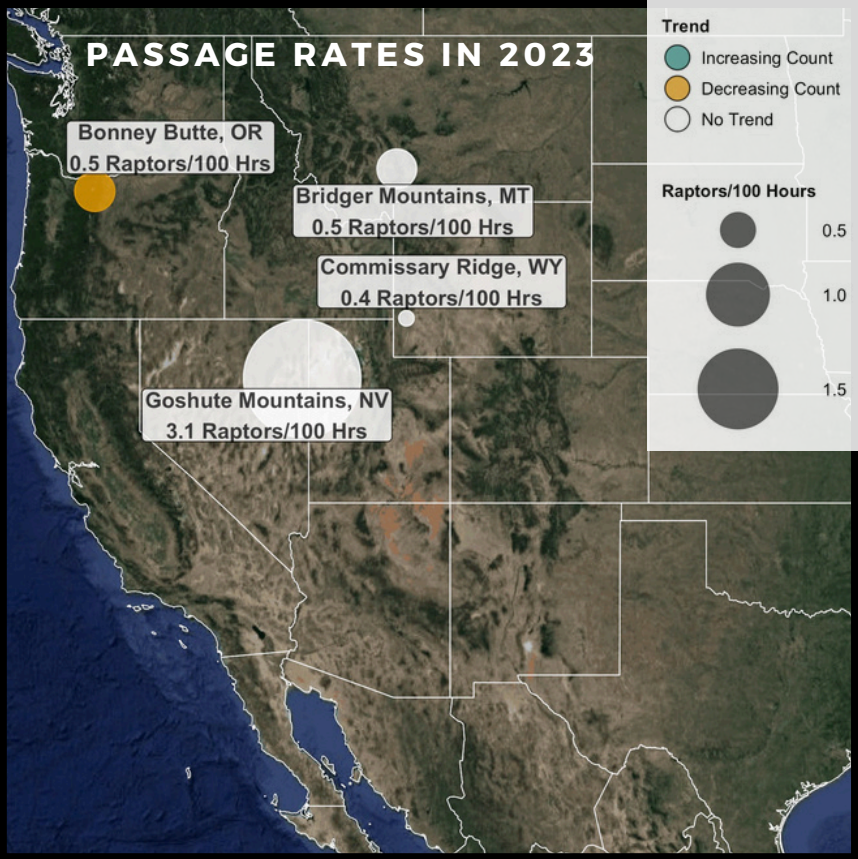
PASSAGE RATE ACROSS YEARS PER SITE



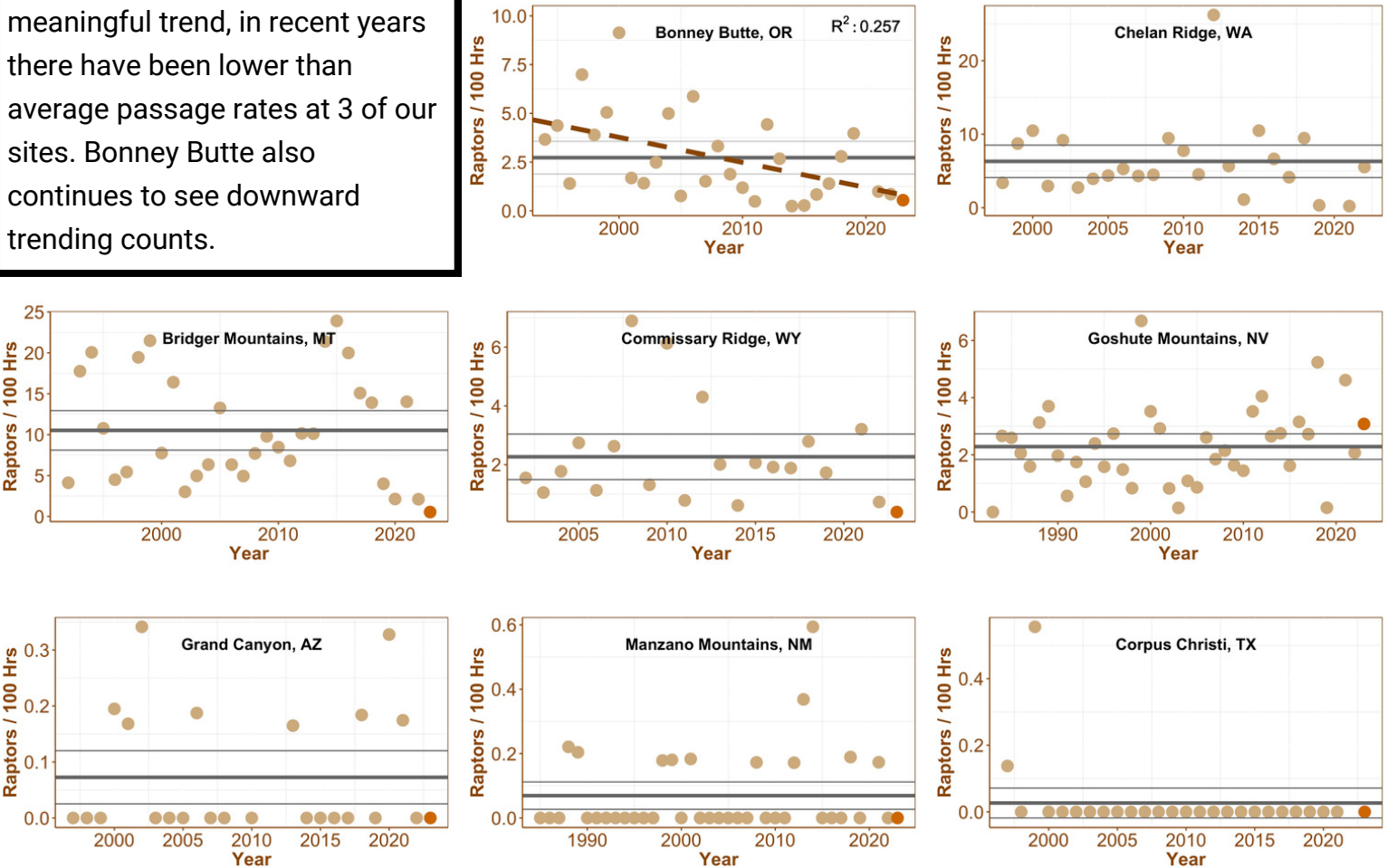
© Jesse Watson



Although we don't often see enough Rough-legged Hawks at most of our sites to discern a meaningful trend, in recent years there have been lower than average passage rates at 3 of our sites. Bonney Butte also continues to see downward trending counts.



PASSAGE RATE ACROSS YEARS PER SITE



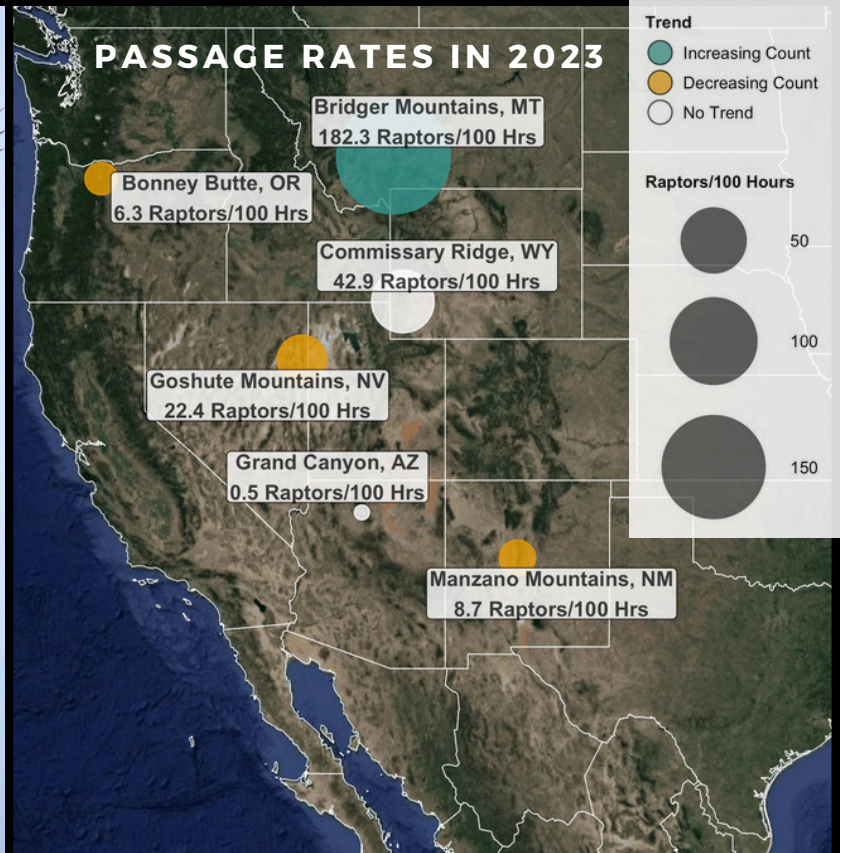
© Jesse Watson



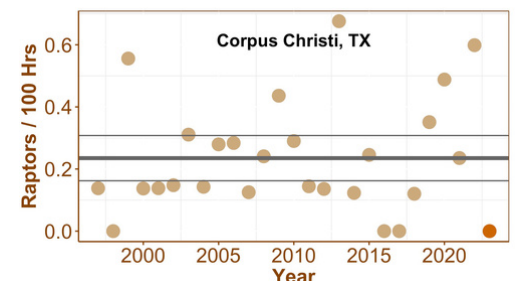
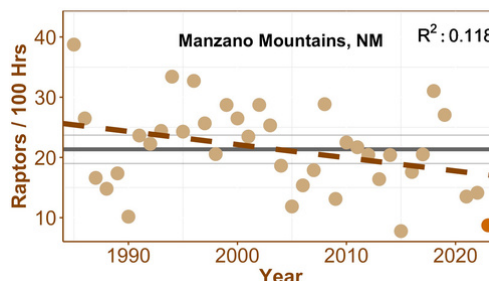
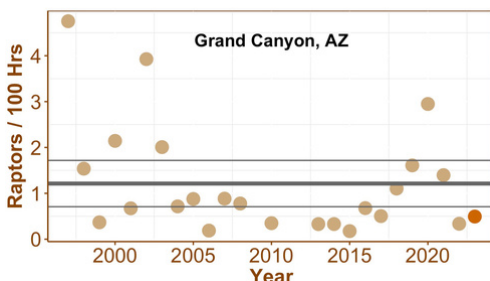
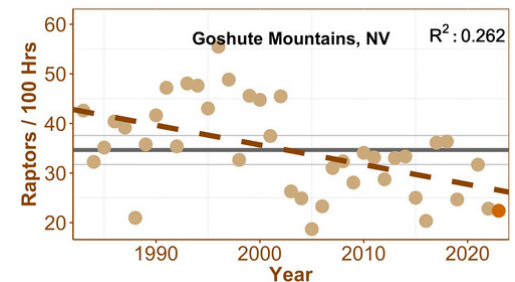
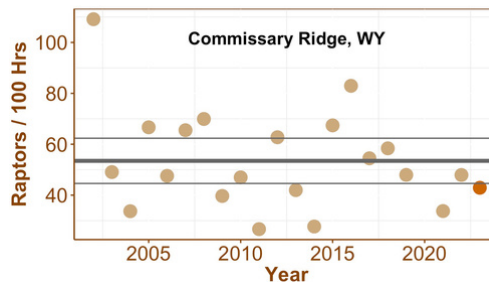
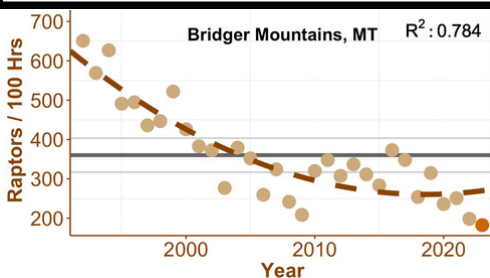
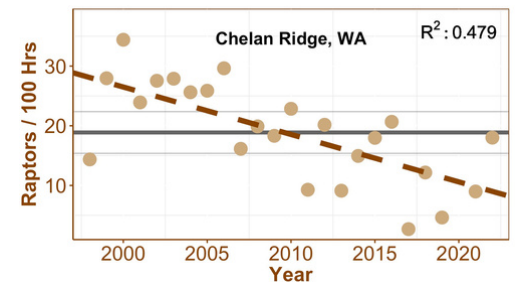
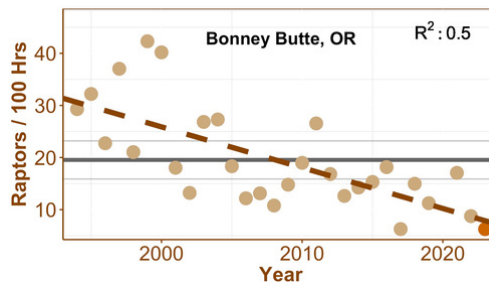
We see declining Golden Eagle counts at 5 sites. In 2023 crews counted below average Golden Eagles at all of our fall sites, with a record low at Bonney Butte.

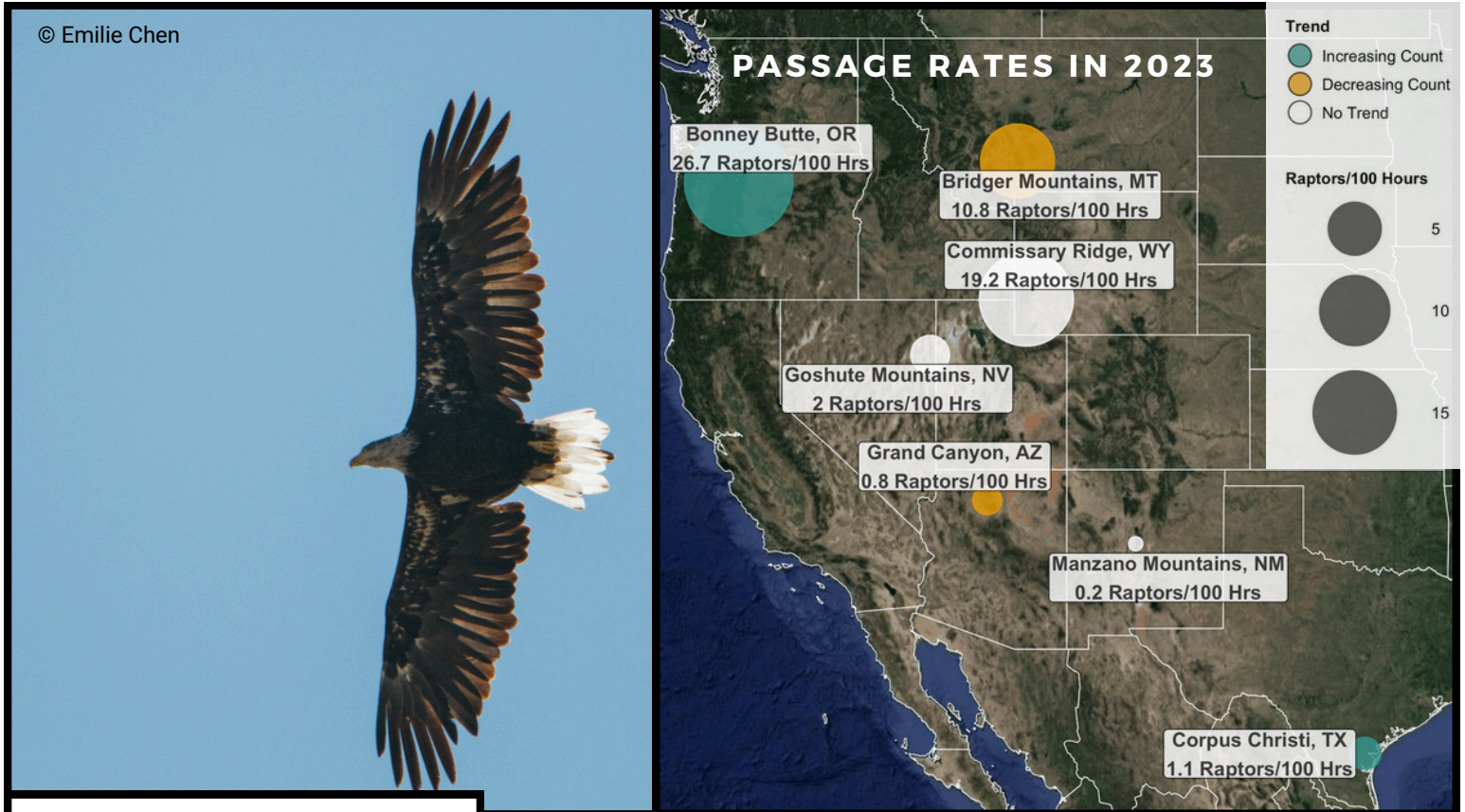
Bridger Mountains had its lowest ever Golden Eagle passage rate in 2023 and the second lowest ever count in 32 years (675 birds in 2023 vs. 638 in 2009). Note that although the quadratic model for Bridger Mountains shows a slight upward trend, the overall long-term trend is overwhelmingly negative.

PASSAGE RATES IN 2023



PASSAGE RATE ACROSS YEARS PER SITE

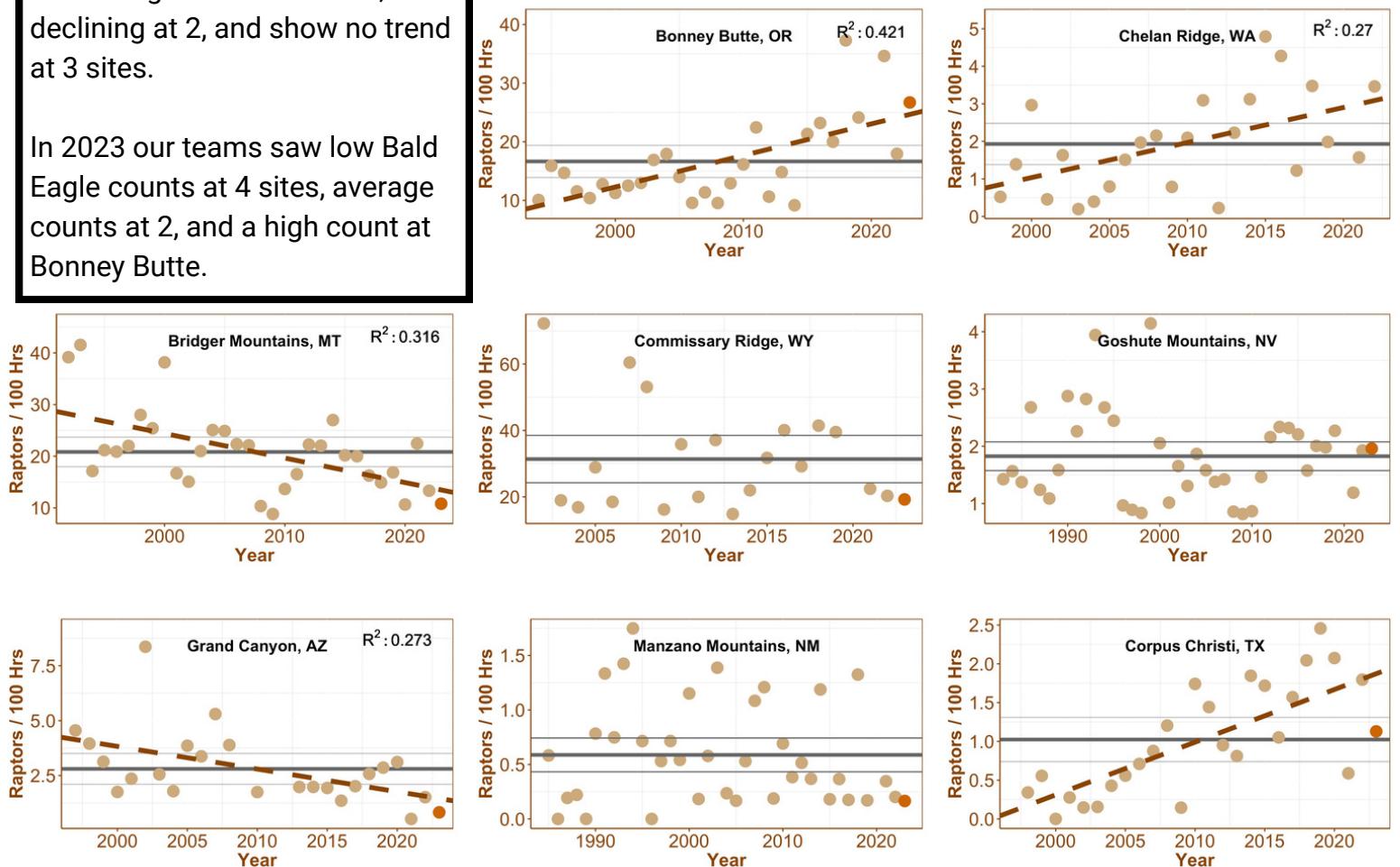




Bald Eagle numbers are increasing overall at 3 sites, declining at 2, and show no trend at 3 sites.

In 2023 our teams saw low Bald Eagle counts at 4 sites, average counts at 2, and a high count at Bonney Butte.

PASSAGE RATE ACROSS YEARS PER SITE

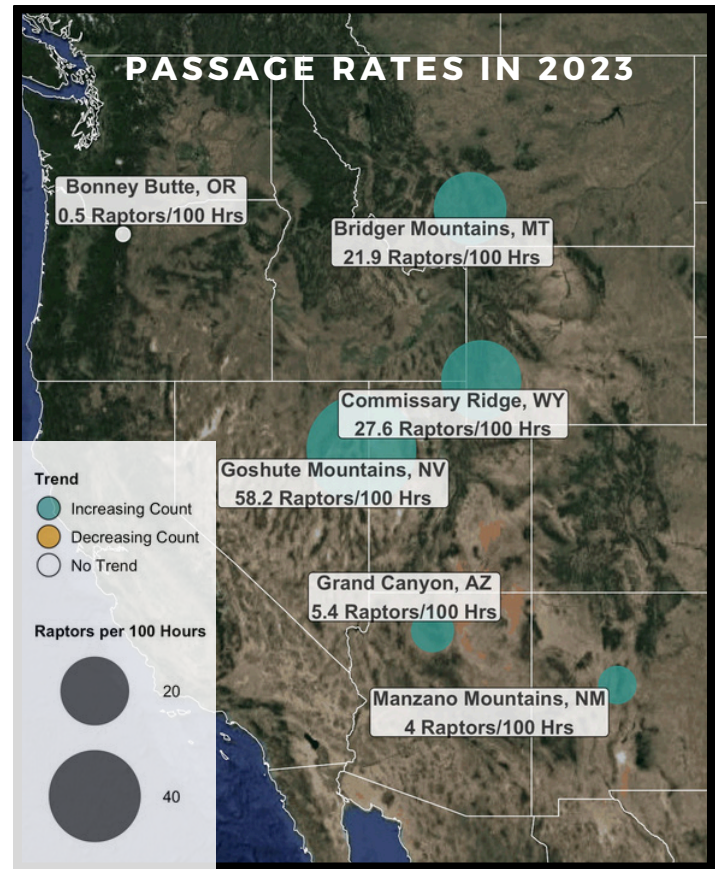
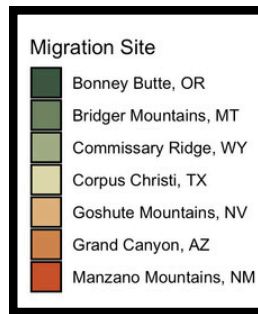
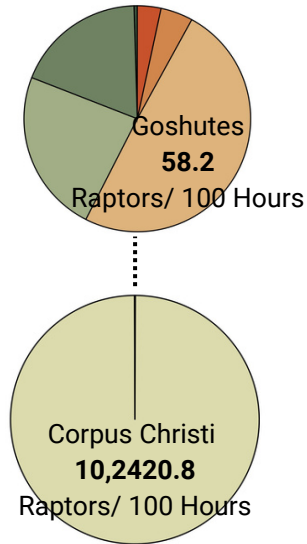


© Jesse Watson

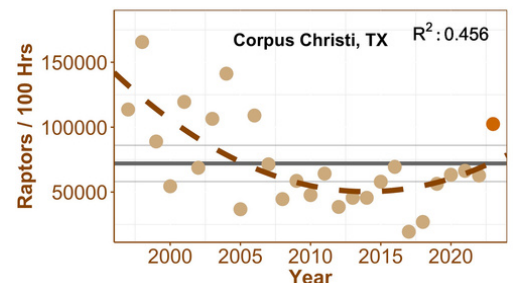
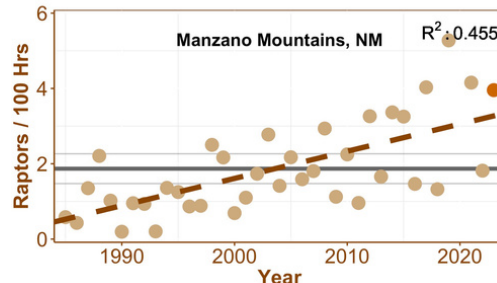
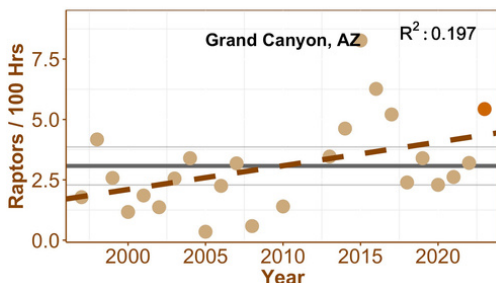
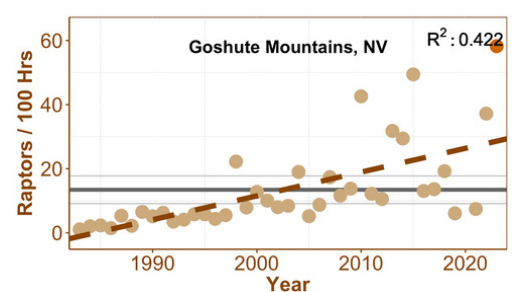
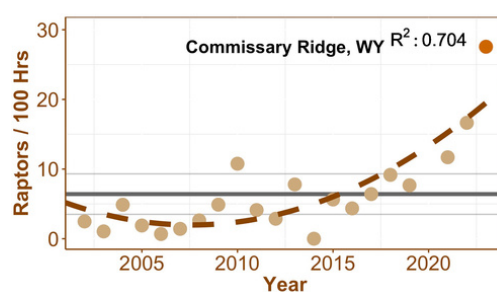
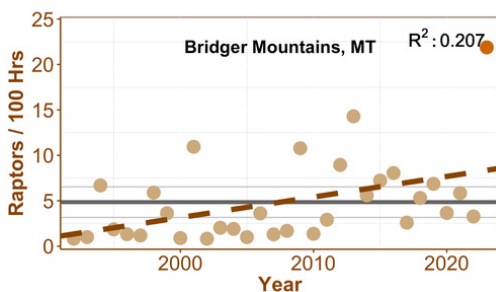
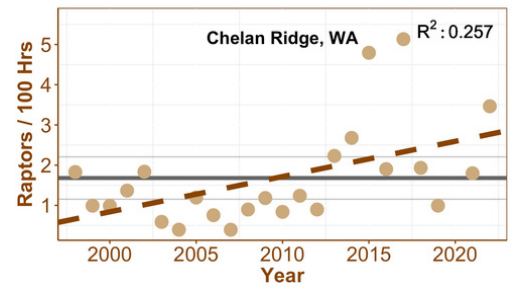
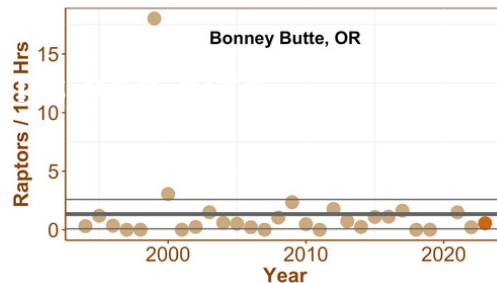


Our team at Corpus Christi counts the vast majority of Broad-winged Hawks in the HWI migration network and in the United States overall. Teams counted above average Broad-winged Hawks at 6 of 7 sites, with record high passage rates and total counts at Bridger Mountains, Commissary Ridge, and Goshute Mountains.

Annual counts are also increasing in either the short or long-term across 7 sites.



PASSAGE RATE ACROSS YEARS PER SITE



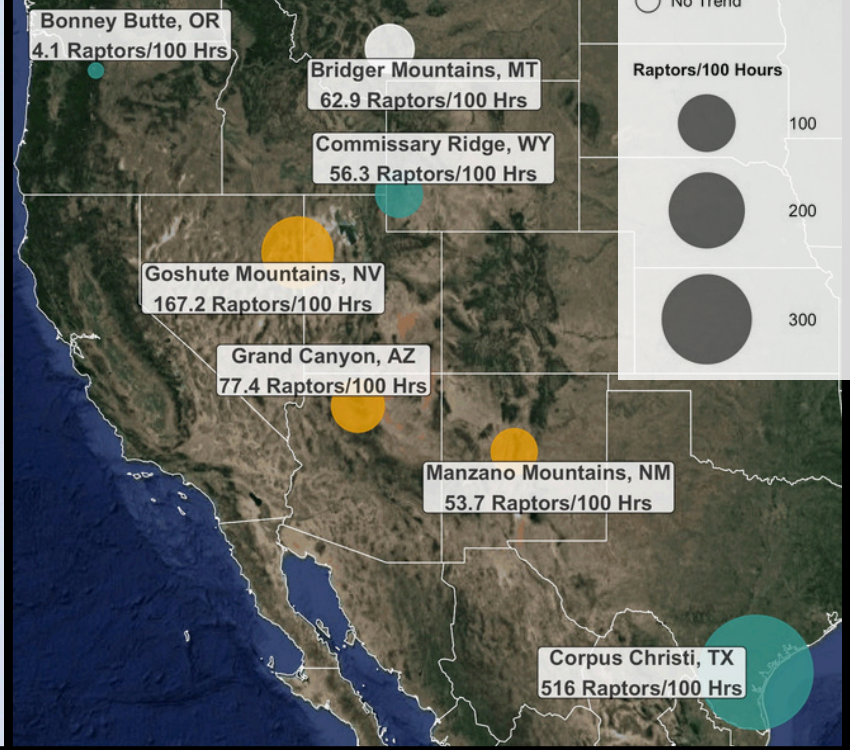
© Jesse Watson



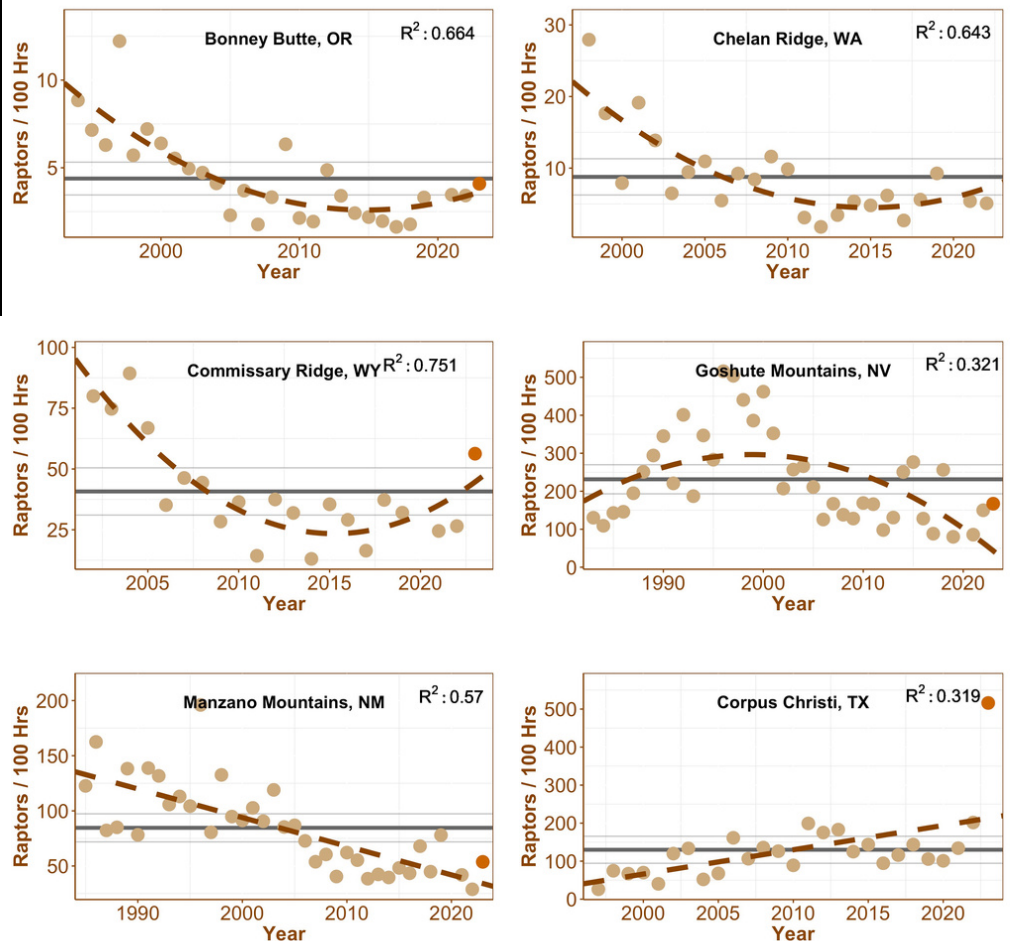
We see declining American Kestrel counts at 6 of 8 sites. This pattern matches population trends seen across much of North America.

A few sites show slight increases in recent years (Commissary, Chelan, Bonney Butte) after long term declines. In 2023, Bridger Mountains saw a record high of 233 kestrels and Corpus Christi had an all-time high of 4,115 kestrels.

PASSAGE RATES IN 2023



PASSAGE RATE ACROSS YEARS PER SITE



© Jesse Watson

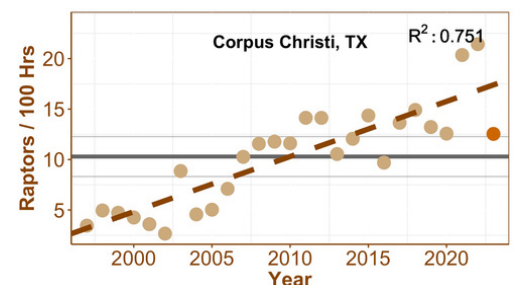
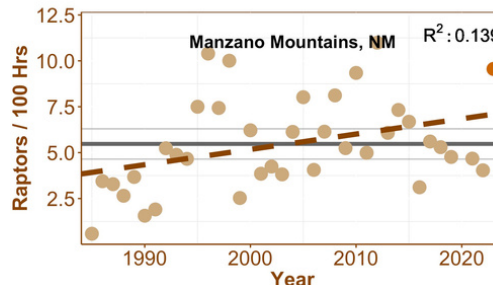
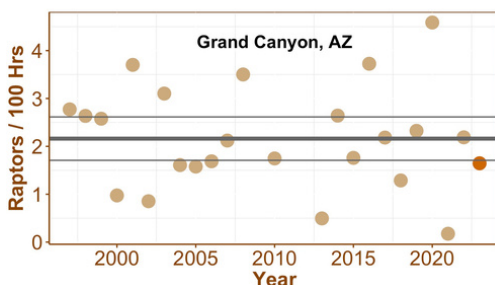
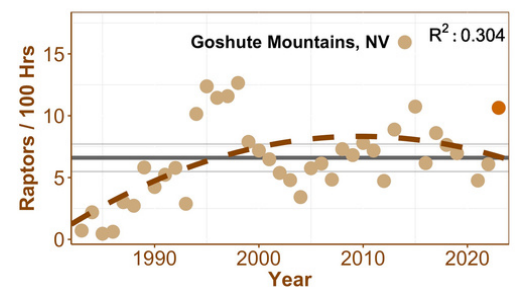
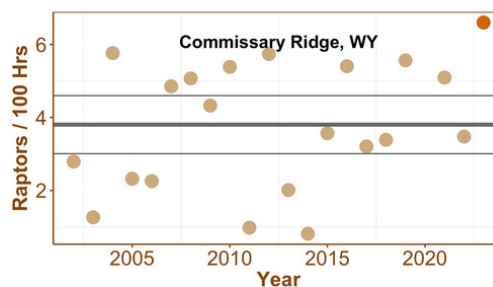
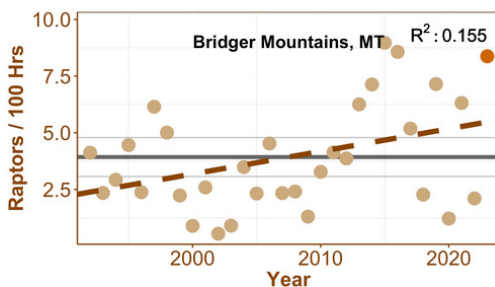
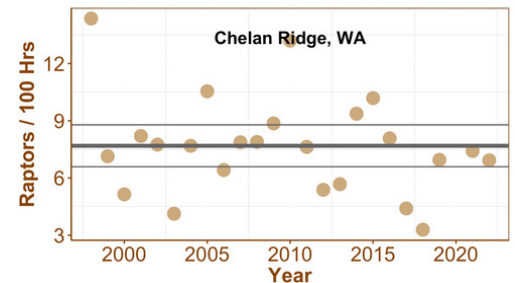
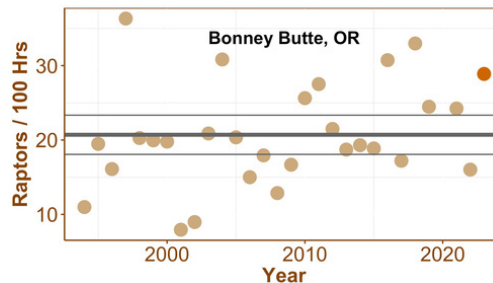


In 2023 our teams counted above average Merlins at all sites except the Grand Canyon, including an all-time high count of 34 at Commissary Ridge.

Bridger Mountains, Manzano Mountains, Corpus Christi and the Goshute Mountains have increasing long-term Merlin counts. We see stable counts at Bonney Butte, Chelan Ridge, Commissary Ridge and the Grand Canyon.



PASSAGE RATE ACROSS YEARS PER SITE



© Georgia Coleman

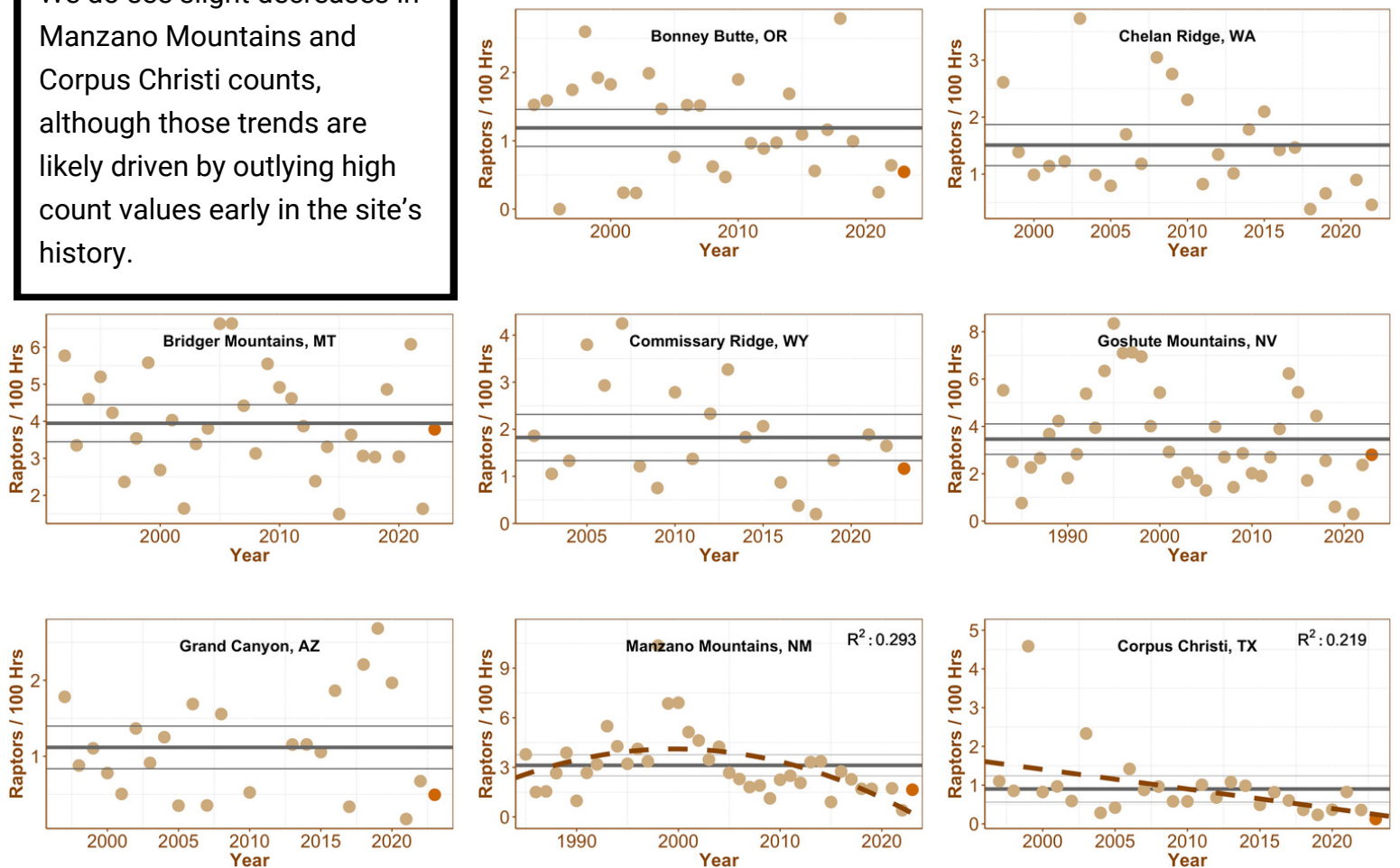


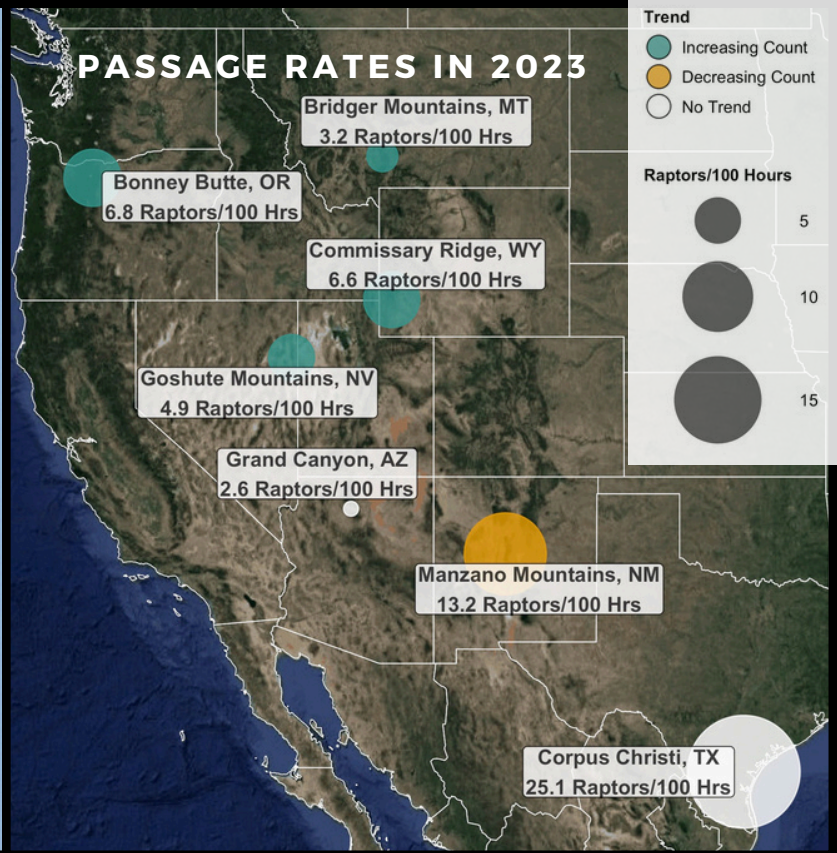
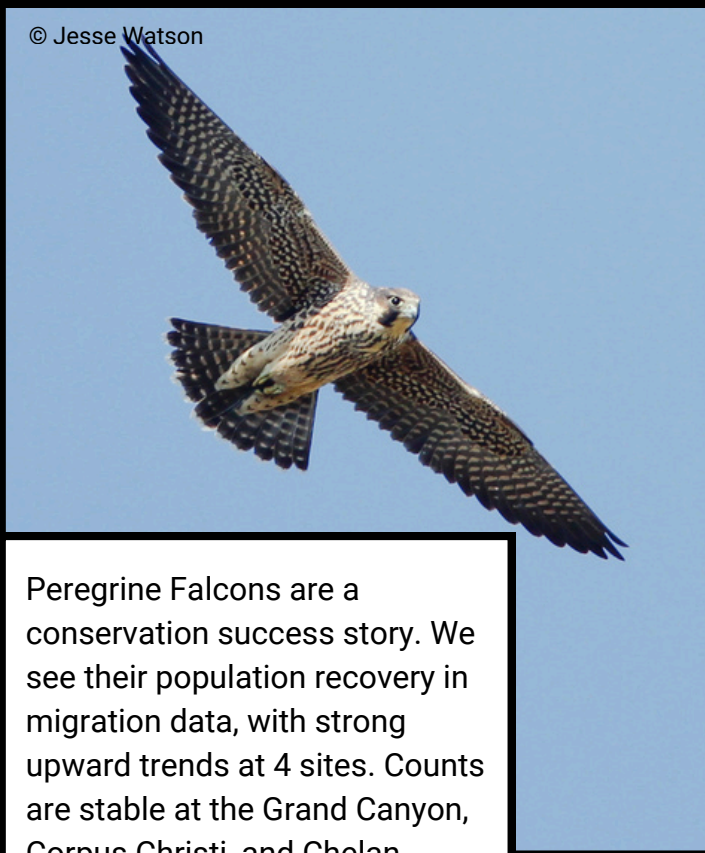
Prairie Falcons are rarely seen at most of our HawkWatch sites.

Although low, these numbers appear stable at most sites. We do see slight decreases in Manzano Mountains and Corpus Christi counts, although those trends are likely driven by outlying high count values early in the site's history.



PASSAGE RATE ACROSS YEARS PER SITE

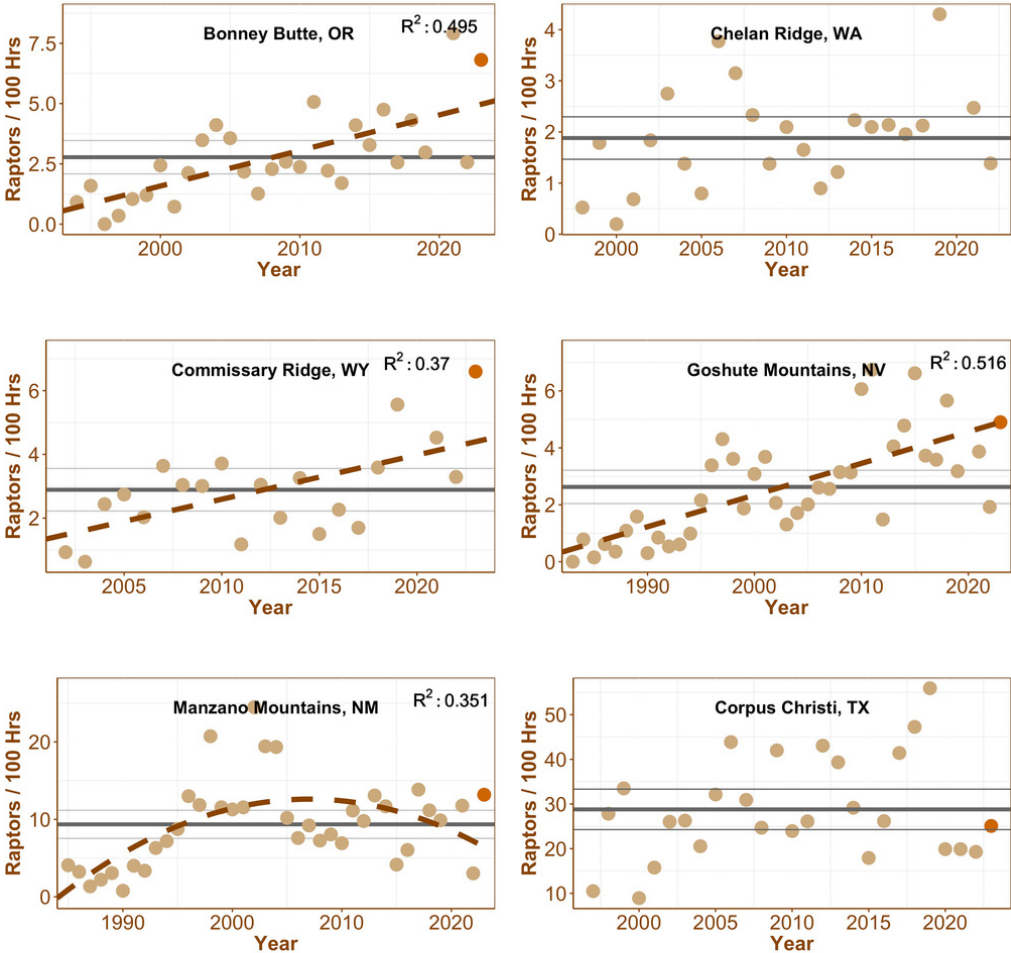




Peregrine Falcons are a conservation success story. We see their population recovery in migration data, with strong upward trends at 4 sites. Counts are stable at the Grand Canyon, Corpus Christi, and Chelan Ridge.

Our teams saw above average numbers of Peregrine Falcons at 4 sites in 2023, including Commissary Ridge, which set a record with 34 peregrines counted.

PASSAGE RATE ACROSS YEARS PER SITE

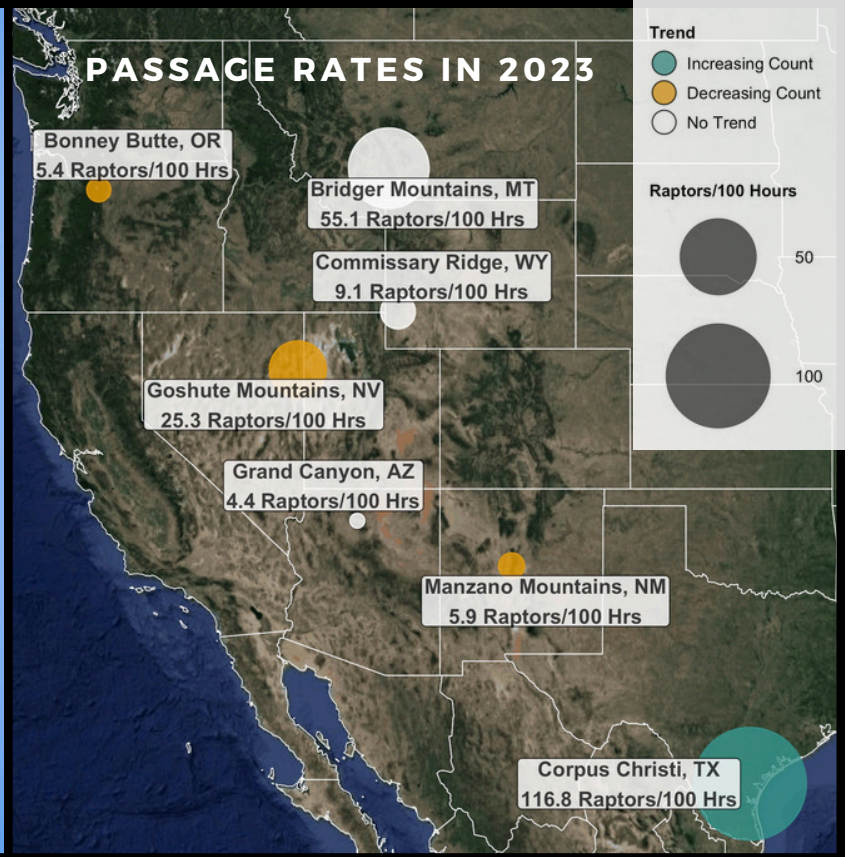


© Jesse Watson

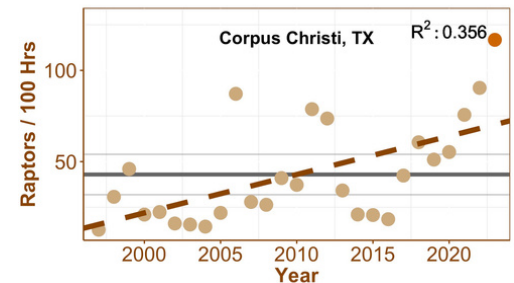
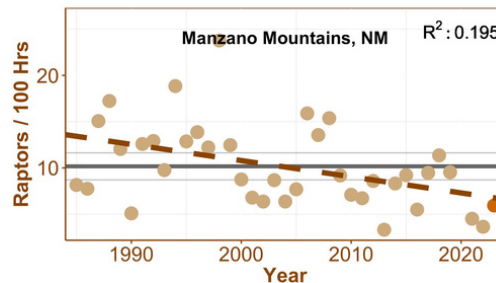
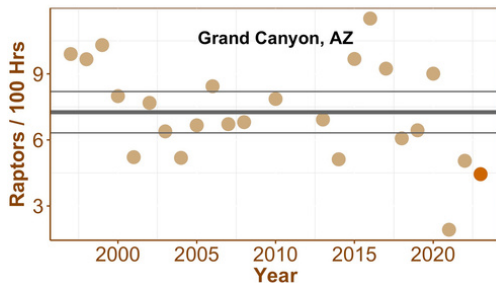
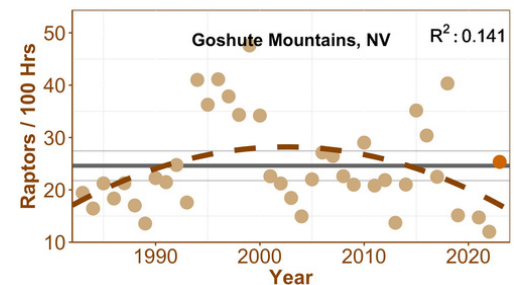
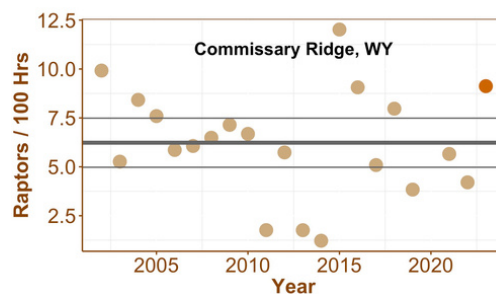
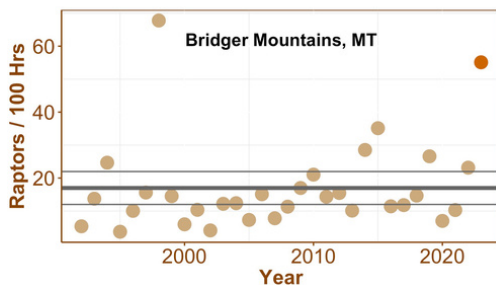
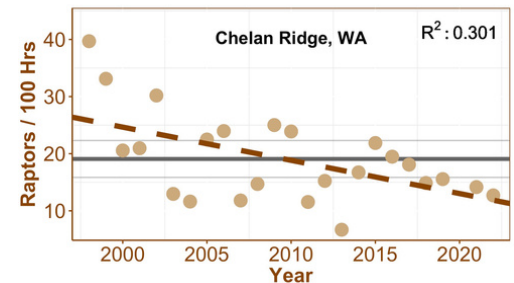
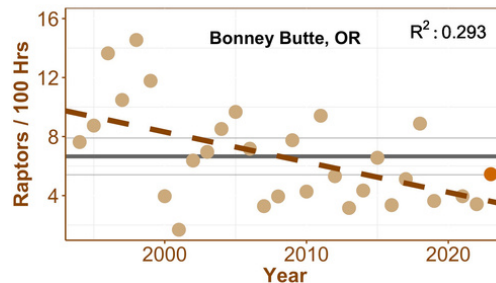


We see declining Northern Harrier counts at Bonney Butte, Chelan Ridge, the Manzano Mountains and the Goshute Mountains.

At Corpus Christi, we see increasing counts of harriers, with a record high count in 2023 of 931 birds. Commissary Ridge and the Bridger Mountains also saw above average counts in 2023.



PASSAGE RATE ACROSS YEARS PER SITE

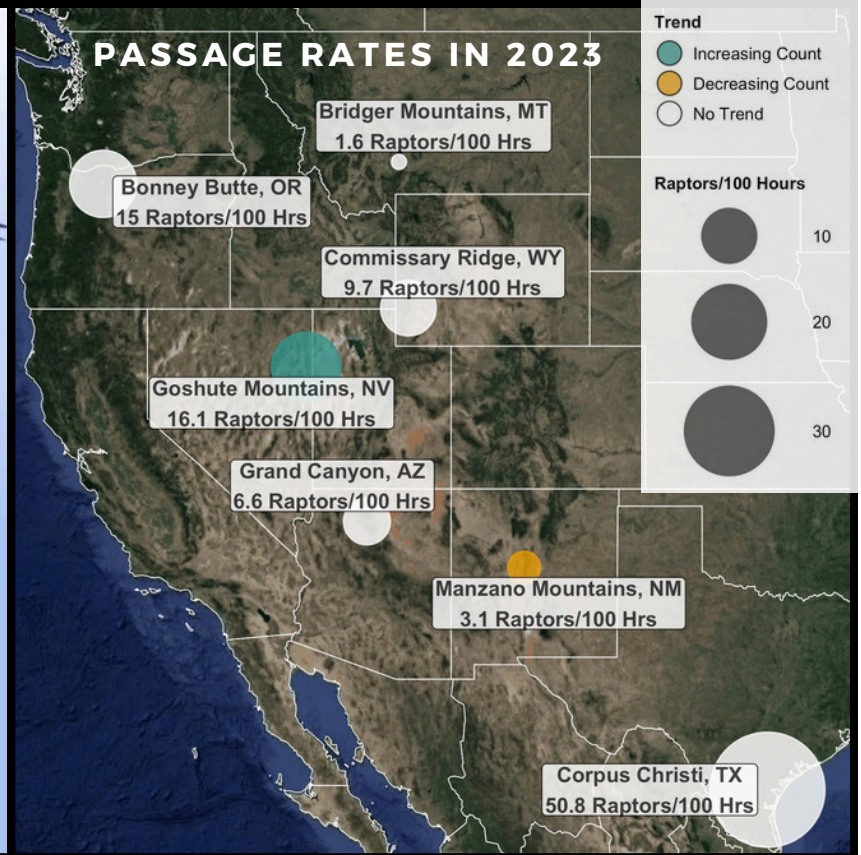


© Georgia Coleman

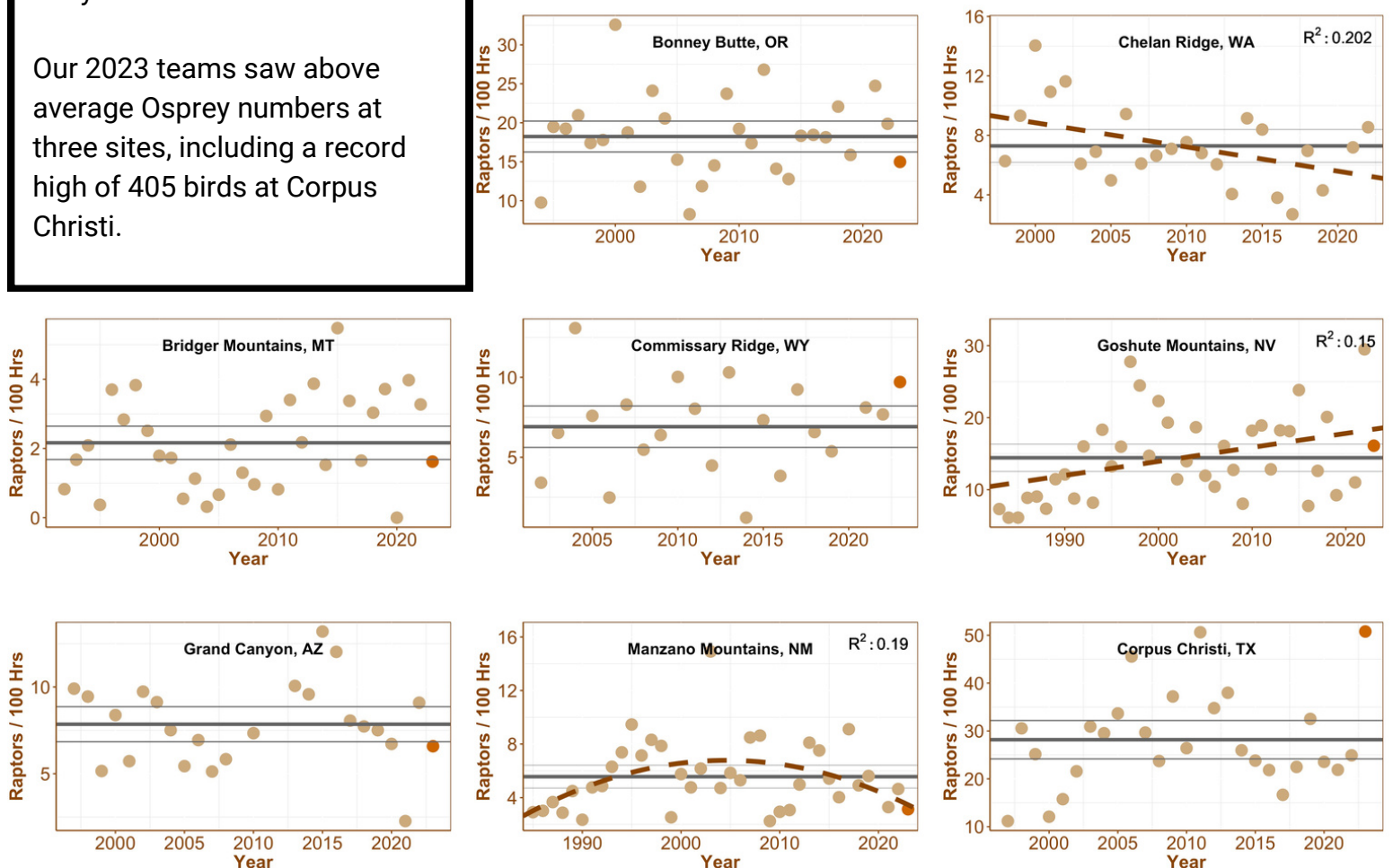


Osprey counts are increasing at Goshute Mountains. They show recent decreases in Manzano Mountains and long-term decreases at Chelan Ridge. They are stable elsewhere.

Our 2023 teams saw above average Osprey numbers at three sites, including a record high of 405 birds at Corpus Christi.



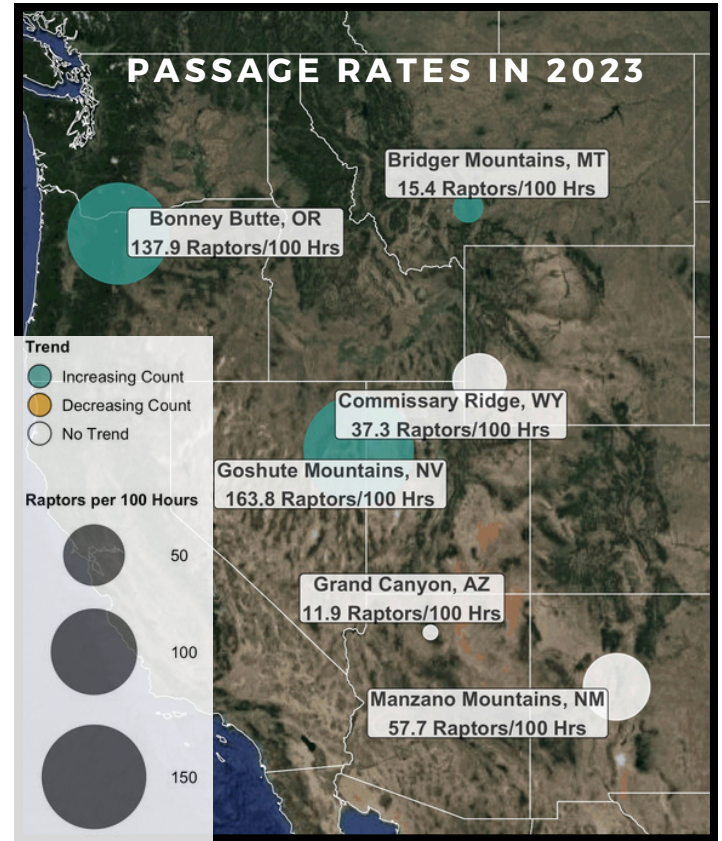
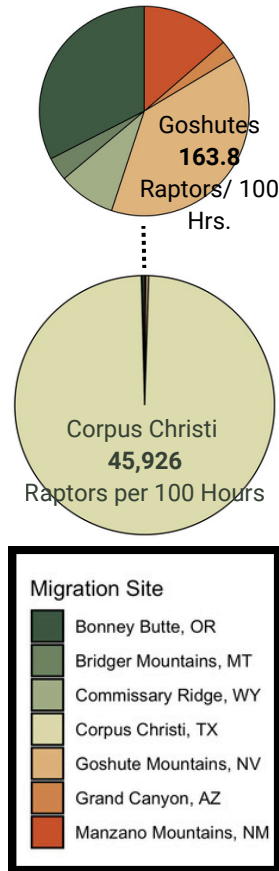
PASSAGE RATE ACROSS YEARS PER SITE



© Jesse Watson

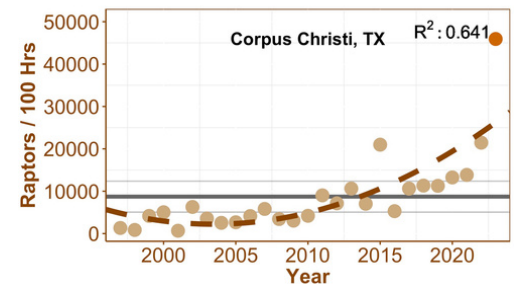
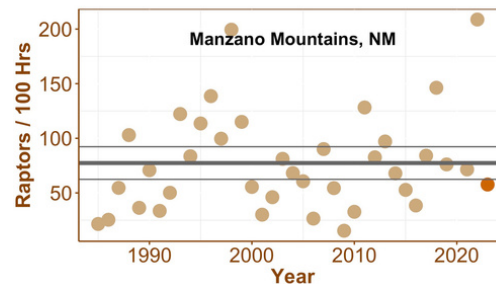
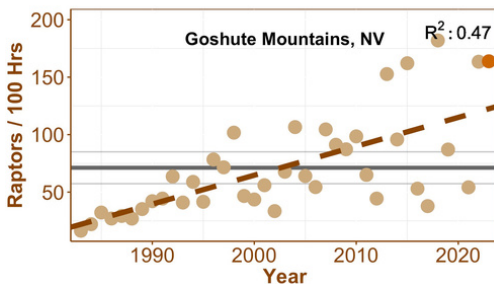
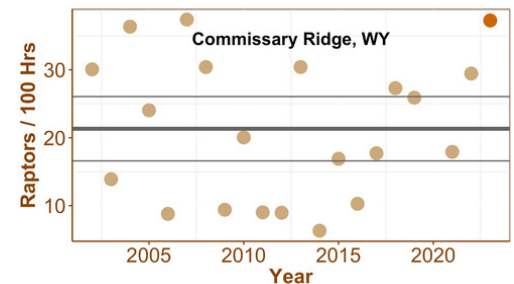
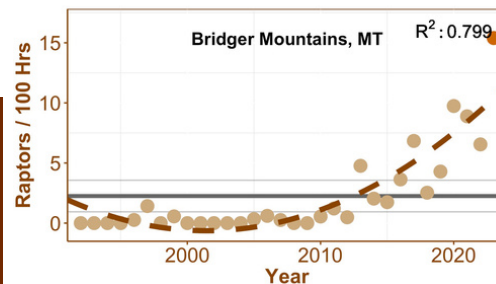
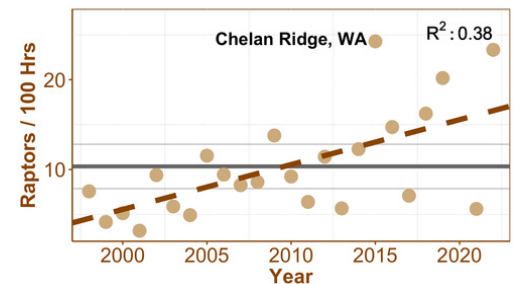
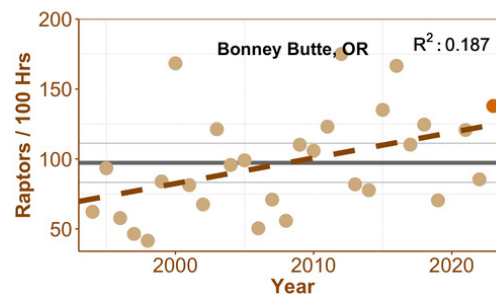


Turkey Vulture counts are increasing at all HWI sites, except Commissary Ridge and the Manzano Mountains, with strong recent upticks beginning around 2010 at Bridger Mountains and Corpus Christi. Corpus Christi more than doubled 2022's record 179,170 count with **366,223** Turkey Vultures in 2023! The Manzano Mountains also saw a record high 1,034 vultures in 2022.



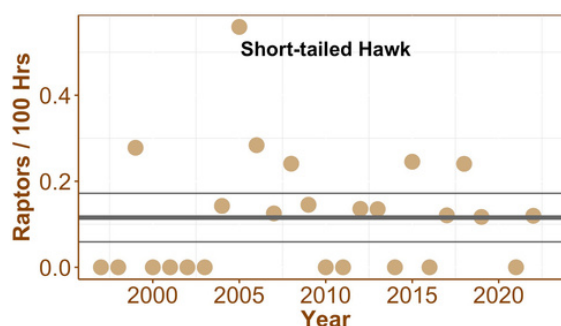
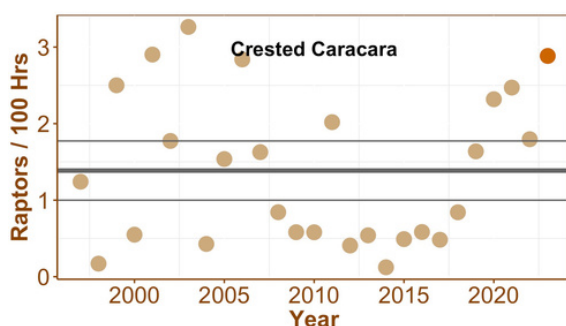
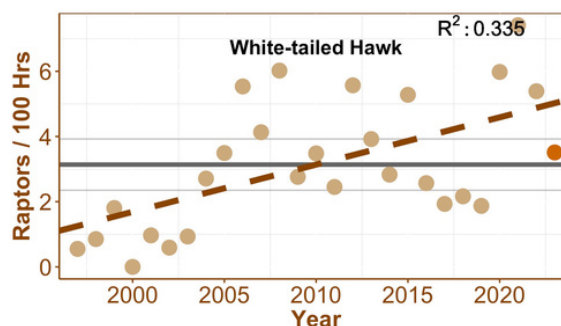
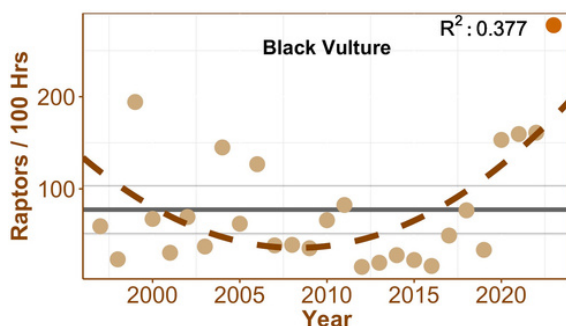
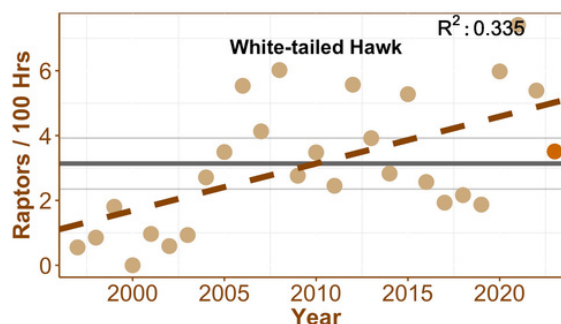
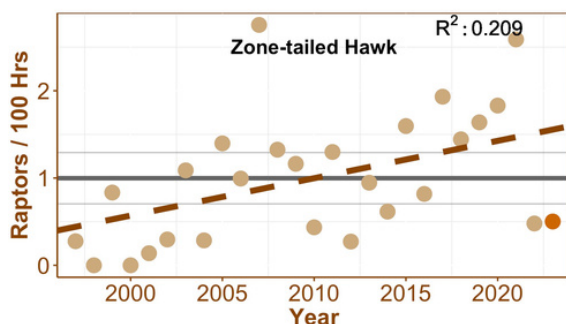
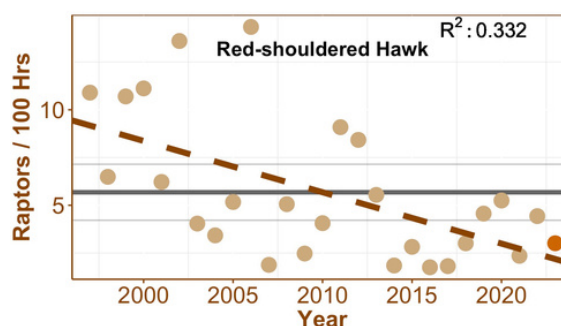
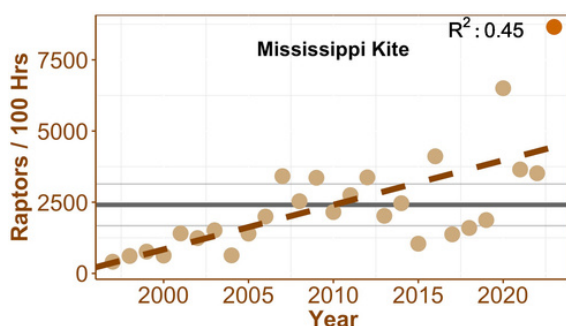
These increases in migration counts support population increases and range expansion of Turkey Vultures in North America, possibly because they benefit from human modified landscapes such as increased road development.

PASSAGE RATE ACROSS YEARS PER SITE



COASTAL BEND SPECIES

Because of its southern location along the gulf coast, the Corpus Christi HawkWatch sees unique species rarely or never observed at our other sites. Here, we showcase counts for those species. In 2023, our Corpus team counted record highs for Mississippi Kites, Black Vultures, and White-tailed Kites.



MIGRATION COUNT

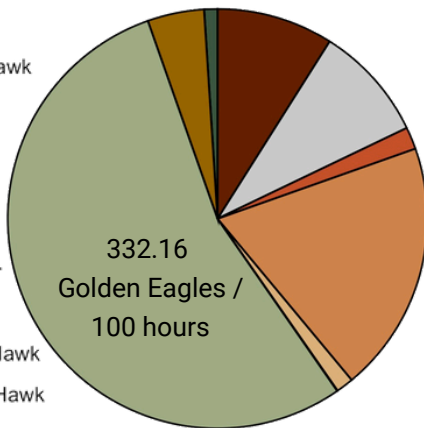
SPRING SITE

GUNSIGHT MOUNTAIN, AK

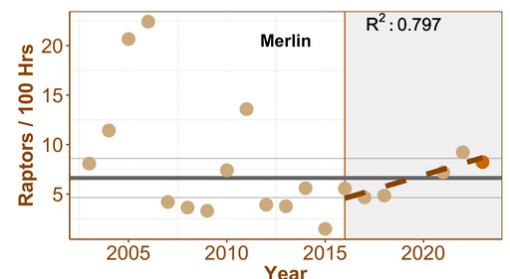
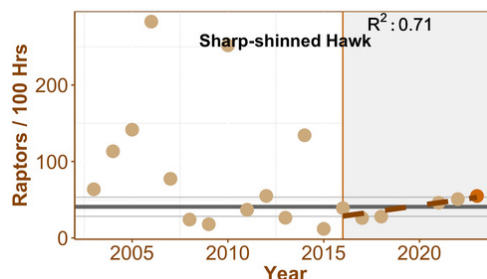
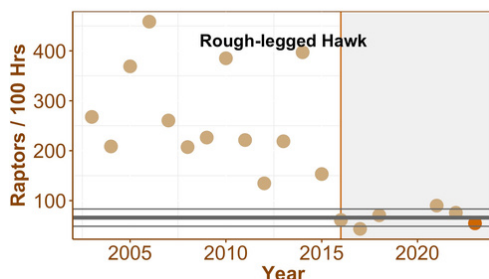
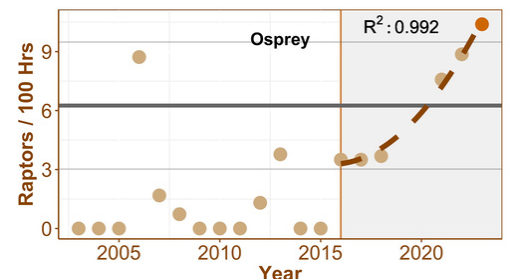
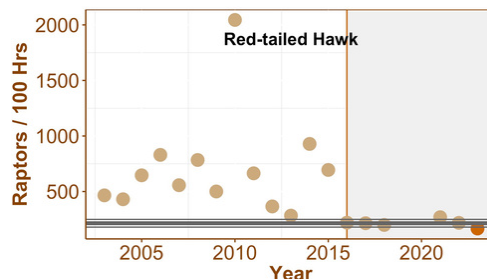
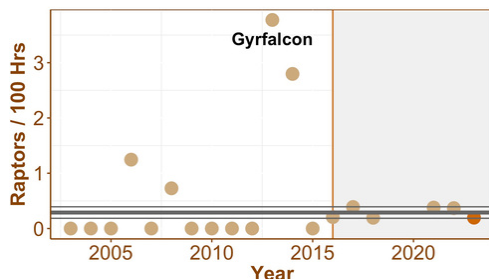
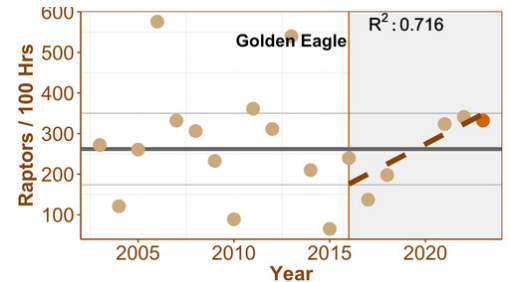
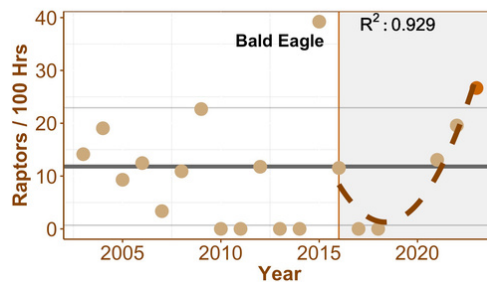
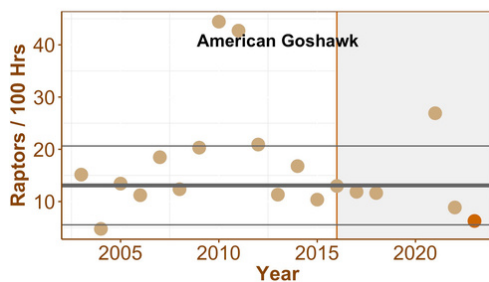
PAGE 28

Species

- American Goshawk
- Bald Eagle
- Golden Eagle
- Gyr Falcon
- Merlin
- Northern Harrier
- Osprey
- Rough-legged Hawk
- Sharp-shinned Hawk



In 2016, HawkWatch conducted the first full-season count at Gunsight Mountain. Counts prior to 2016 were not a full-season effort (mean observer hours: 91.4 hours). 2016 and on had at least 400 total hours (mean 515.7 hours). We include emerging trend lines for data starting in 2016 and on (gray-shaded regions on the scatter plots). Mean and confidence intervals are also from 2016 - 2023. Due to the short time frame for these data, these trends may not yet be informative for population trajectories.



WHAT WE LEARN FROM BANDING



© Cameron Hein

We currently band raptors at Bonney Butte, Manzano Mountains, Goshute Mountains, and Commissary Ridge HawkWatches. We fit captured raptors with a metal USGS leg band that has a unique 9-digit code. We find a small fraction of those bands again later in a fascinating array of circumstances (recaptures at other banding sites, vehicle collisions, found eaten by another hawk and so on). These data aggregate over many years and reveal valuable stories about survival and movement. If you glance at the band recovery maps in this report, migratory flyways begin to become apparent when viewing decades' worth of data together.

Banding operations provide opportunities to answer additional questions. For example, we can learn more about migratory bird movement by equipping birds with satellite tracking units to see where they go. We can also collect a set of standardized images of each bird's plumage to understand molt strategy or collect feather samples to understand the genetic structure of populations, among many other things.

In addition to collecting data that would otherwise be difficult or impossible to obtain, banding offers a unique opportunity for early career conservationists to develop and hone their trapping, handling, and banding skills. Biologists who work on migration crews carry these skill sets on to other conservation projects.

Banding operations also allow visitors a unique way to learn about wildlife. Seeing a raptor up close for the first time can be a life-changing educational experience and fosters connections between these elusive wild animals and the people who may one day speak to conserve them.

Lastly, you can help us learn more about these birds. If you find a bird with a USGS metal band, [report the band to the bird banding laboratory](#).

2021 BANDING TOTALS

Species	Bonney Butte, OR	Chelan Ridge, WA	Commissary Ridge, WY	Goshute Mountains, NV	Manzano Mountains, NM	Total Across Species
Accipiters						
Sharp-shinned Hawk	103	87	111	495	198	994
Cooper's Hawk	29	16	63	226	102	436
American Goshawk	5	2	18	4	2	31
Buteos						
Red-tailed Hawk	33	5	50	43	14	145
Rough-legged Hawk	2	0	0	0	0	2
Broad-winged Hawk	1	0	2	2	0	5
Eagles						
Golden Eagle	0	0	2	0	2	4
Falcons						
Peregrine Falcon	0	0	0	3	1	4
Prairie Falcon	0	0	3	1	0	4
Merlin	3	2	1	3	0	9
American Kestrel	0	0	1	8	5	14
Other						
Northern Harrier	1	2	1	9	0	13
Total						
Total Across Site	177	114	252	794	324	1661



In 2021 the Bonney Butte crew captured two hatch year Rough-legged Hawks.

2022 BANDING TOTALS

Species	Bonney Butte, OR	Chelan Ridge, WA	Commissary Ridge, WY	Goshute Mountains, NV	Manzano Mountains, NM	Total Across Species
Accipiters						
Sharp-shinned Hawk	17	68	71	360	107	623
Cooper's Hawk	2	12	33	244	41	332
American Goshawk	2	0	6	2	0	10
Buteos						
Red-tailed Hawk	0	6	13	35	4	58
Ferruginous Hawk	0	0	0	1	0	1
Broad-winged Hawk	0	0	0	3	0	3
Eagles						
Golden Eagle	0	0	0	1	0	1
Falcons						
Peregrine Falcon	0	0	1	3	0	4
Prairie Falcon	0	2	1	3	0	6
Merlin	3	5	1	2	1	12
American Kestrel	0	1	0	10	0	11
Other						
Northern Harrier	0	2	0	1	0	3
Total						
Total Across Site	24	96	126	665	153	1064



© Goshutes 2022 Crew

In 2022 the Goshute Mountains team banded the first Ferruginous Hawk ever at a HawkWatch migration site! The bird was a dark morph hatch year shown above being released.

2023 BANDING TOTALS

Species	Bonney Butte, OR	Commissary Ridge, WY	Goshute Mountains, NV	Manzano Mountains, NM	Total Across Species
Accipiters					
Sharp-shinned Hawk	129	107	328	129	693
Cooper's Hawk	23	59	147	52	281
American Goshawk	6	5	6	1	18
Buteos					
Red-tailed Hawk	18	13	44	3	78
Swainson's Hawk	0	3	0	0	3
Broad-winged Hawk	1	0	2	0	3
Eagles					
Golden Eagle	0	4	0	0	4
Falcons					
Peregrine Falcon	2	1	1	0	4
Merlin	13	1	5	1	20
American Kestrel	0	2	8	2	12
Other					
Northern Harrier	2	0	0	1	3
Total					
Total Across Site	194	195	541	189	1119



© Frankie Vierela



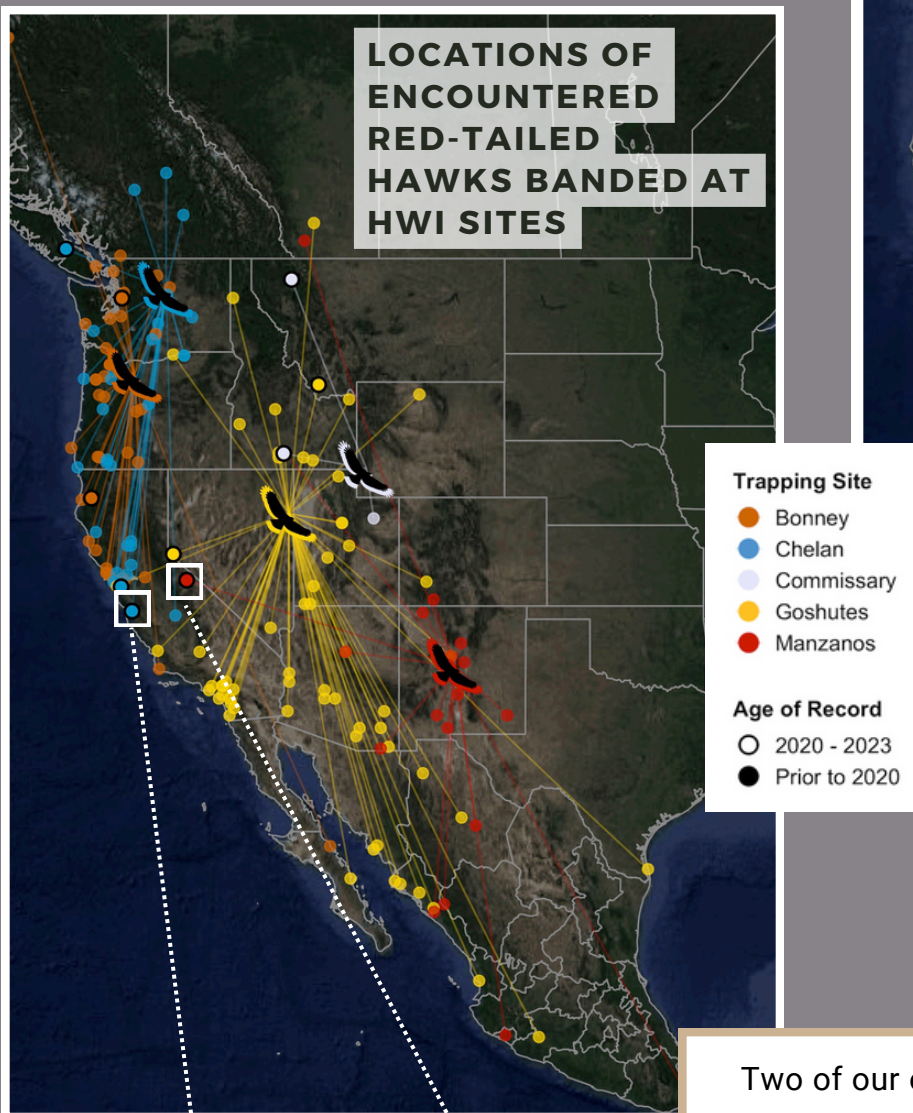
© 2023 Bonney Butte Crew

Banding effort highlights this year include 3 Swainson's Hawks at Commissary Ridge, 13 Merlins at Bonney Butte, and 2 Broad-winged Hawks at the Goshute Mountains. Above left, a Commissary Ridge bander holds a hatch year Swainson's Hawk. Above right, Anna Lemon holds a hatch year Broad-winged Hawk trapped at Bonney Butte.

Note that totals also include foreign recaptures.

RED-TAILED HAWK

Note: Band recovery data downloaded for all maps from the Bird Banding Lab database on November 27, 2023.

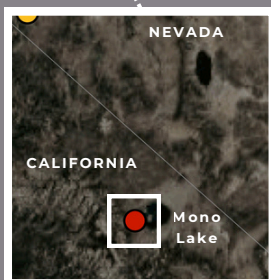
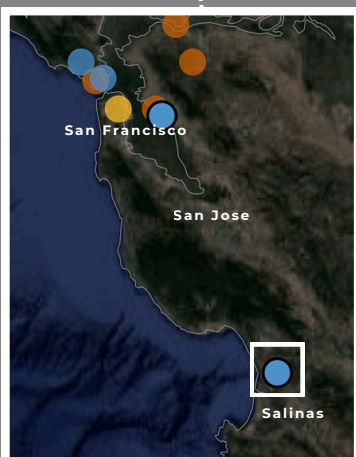


After second year Red-tailed Hawk

Two of our oldest historical Red-tailed Hawk encounters occurred in 2021 and 2023.

In 2021, a Red-tailed Hawk banded in 2000 as a hatch year bird at the Manzano Mountains HawkWatch was recovered near Mono Lake in California (right inset). It was 21 years old when it was recovered.

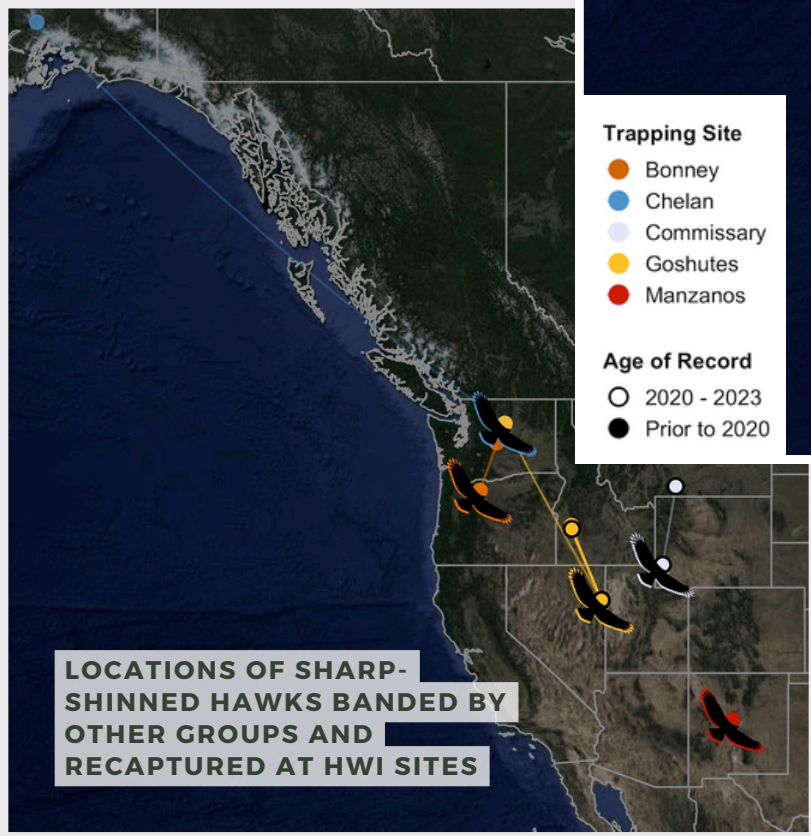
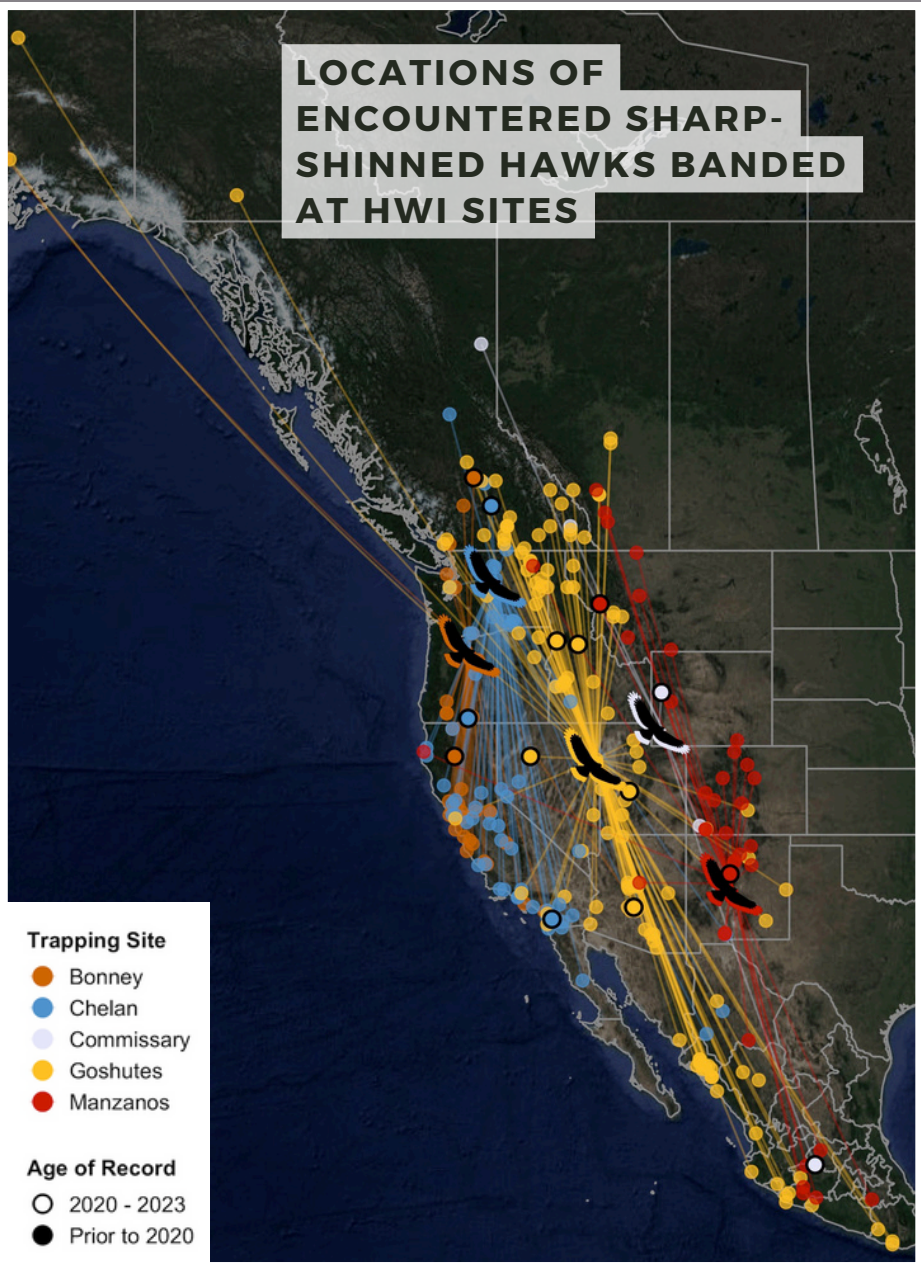
Then, in July 2023, a Red-tailed Hawk banded in 2002 as a hatch year bird at Chelan Ridge was recovered by Elkhorn Slough reserve manager Dave Feliz near Salinas, California (left inset). It was at least 20 years old. Interestingly, the bird was found underneath power lines - indicating that it may have been electrocuted rather than having died from problems associated with its age.



SHARP-SHINNED HAWK

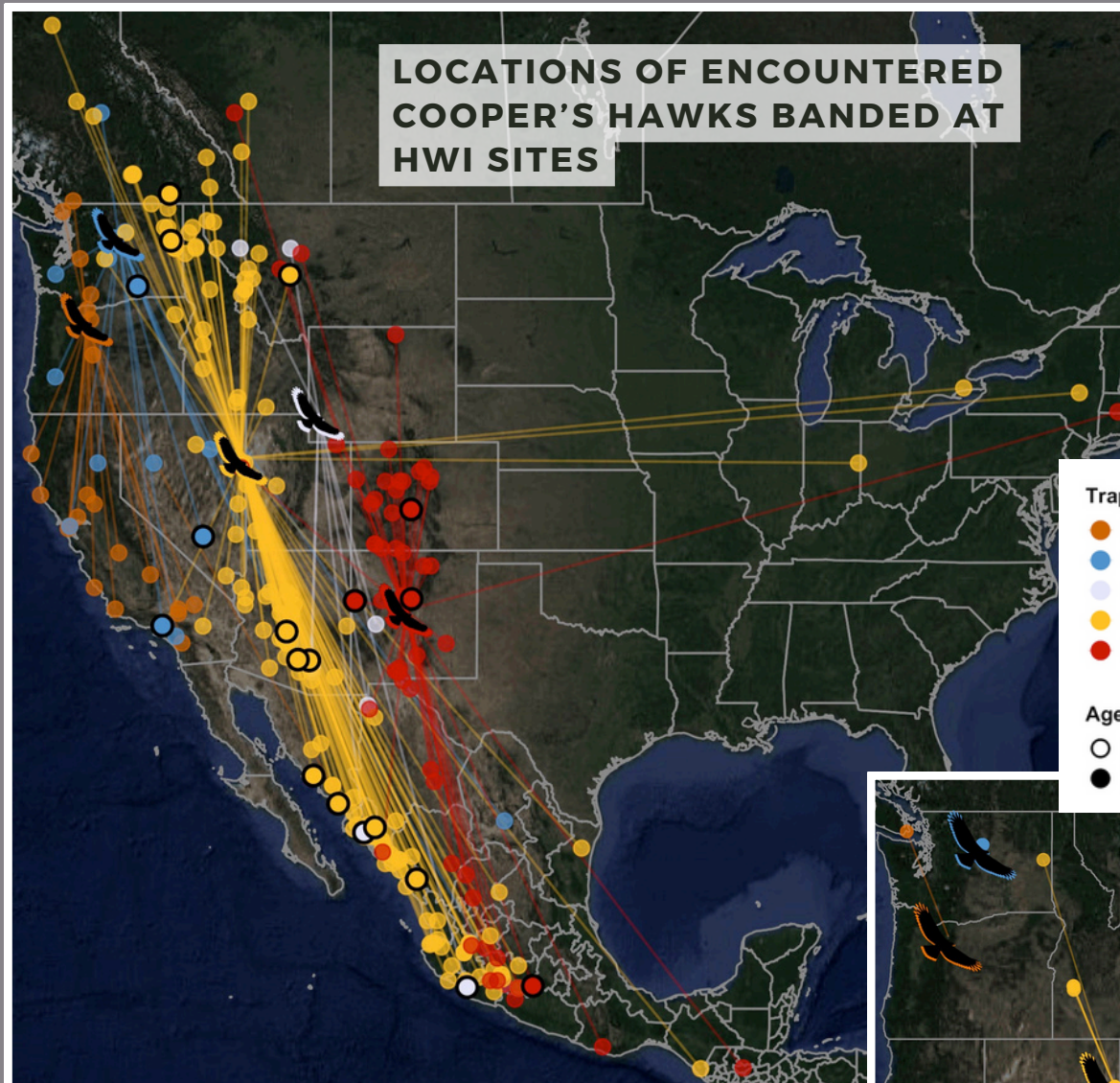


After hatch year Sharp-shinned Hawk



Note: Band recovery data downloaded for all maps from the Bird Banding Lab database on November 27, 2023.

COOPER'S HAWK

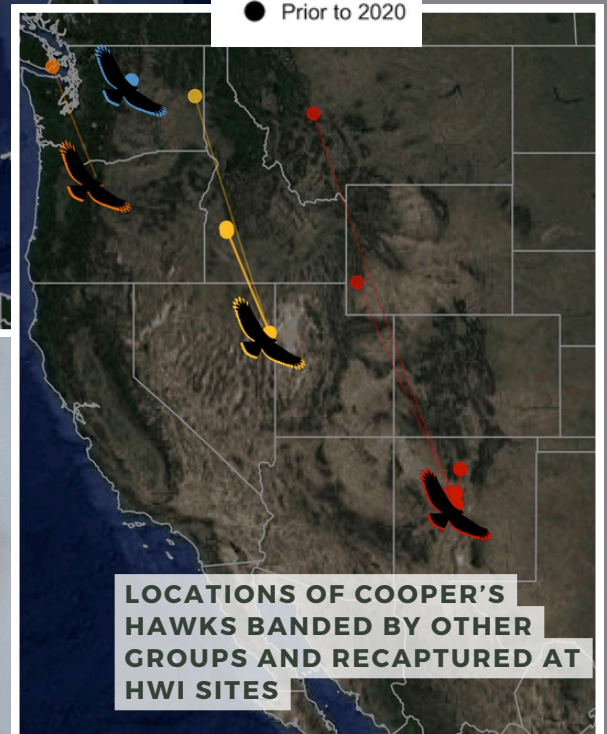


Note: Band recovery data downloaded for all maps from the Bird Banding Lab database on November 27, 2023.

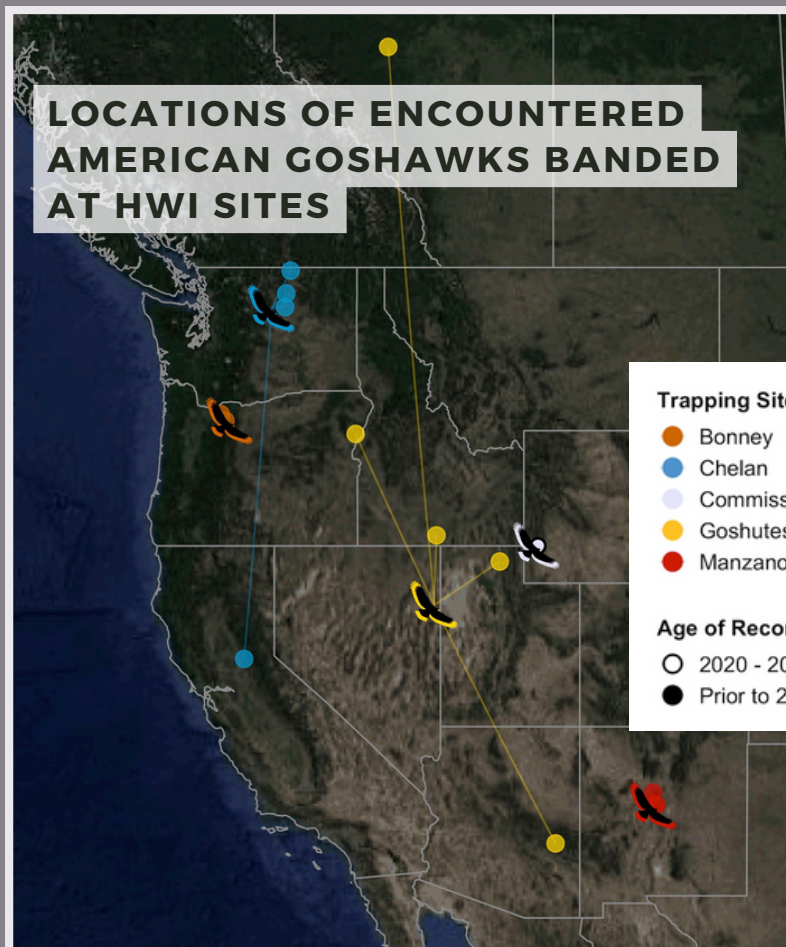


© Elly McManus

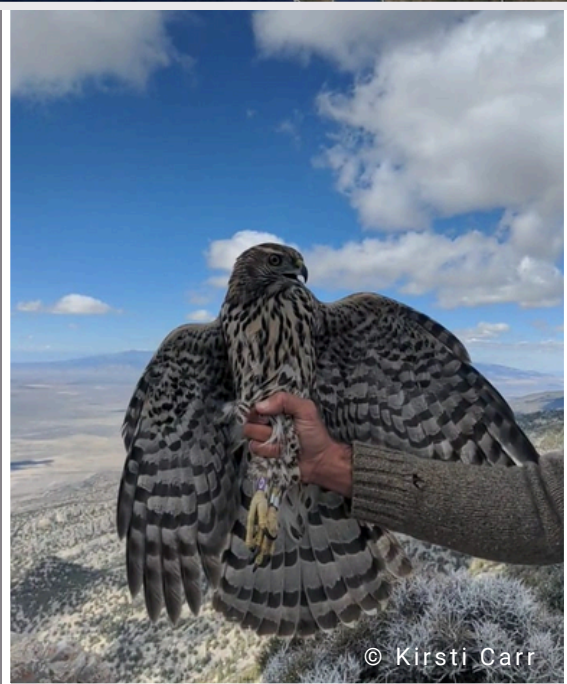
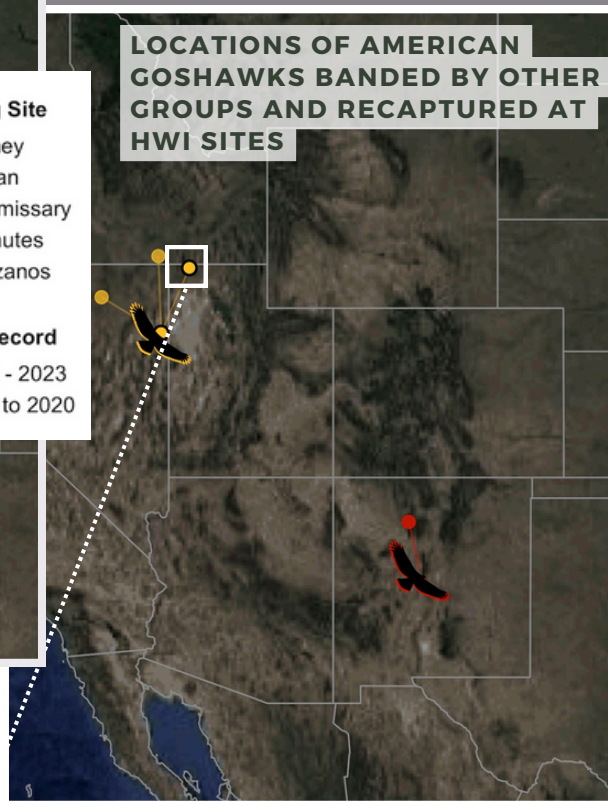
After hatch year Cooper's Hawk



AMERICAN GOSHAWK

LOCATIONS OF ENCOUNTERED
AMERICAN GOSHAWKS BANDED
AT HWI SITES

Note: Band recovery data downloaded for all maps from the Bird Banding Lab database on November 27, 2023.

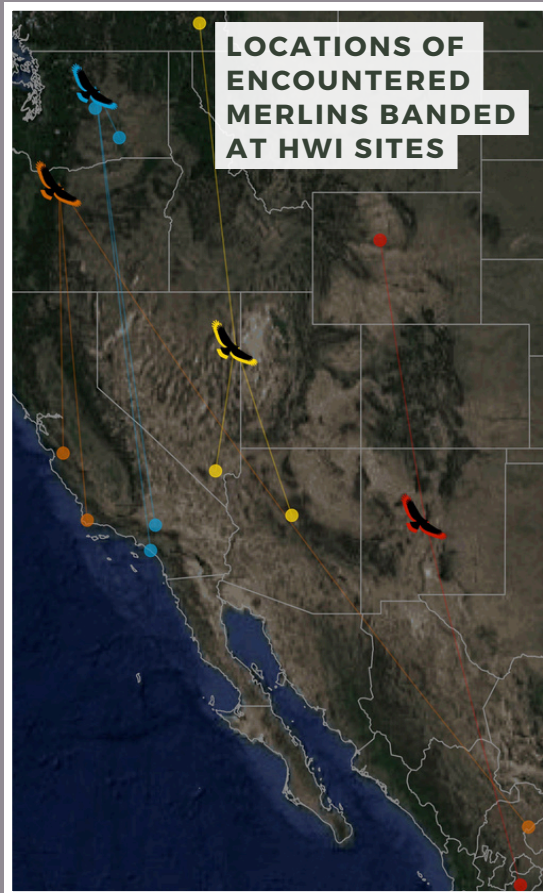
LOCATIONS OF AMERICAN
GOSHAWKS BANDED BY OTHER
GROUPS AND RECAPTURED AT
HWI SITES

© Kirsti Carr

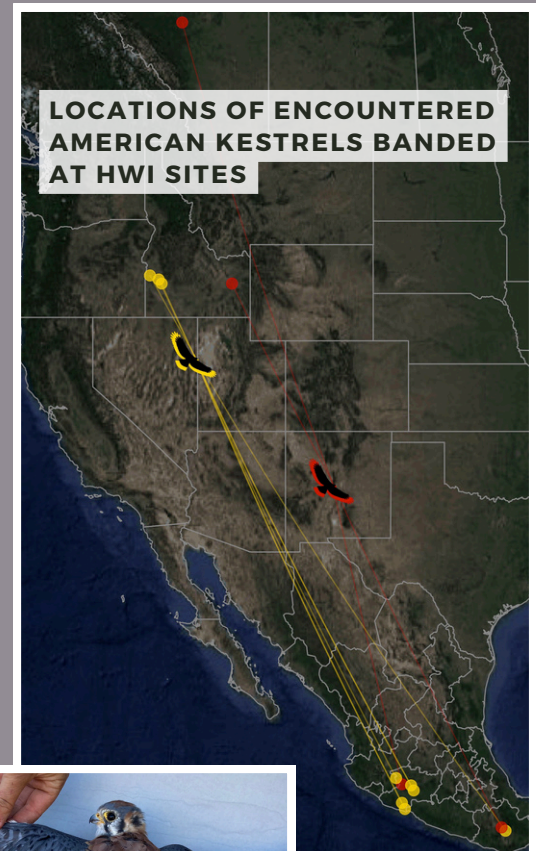
At the Goshutes Mountains HawkWatch, banders captured a hatch year American Goshawk in 2022. Not only was this bird a recapture with a USGS band, but it was also color banded. The bird was banded in northern Utah by scientists from the Intermountain Bird Observatory.

LESS COMMONLY RECOVERED SPECIES

FALCONS



Merlin



© Elly McManus

A male American Kestrel

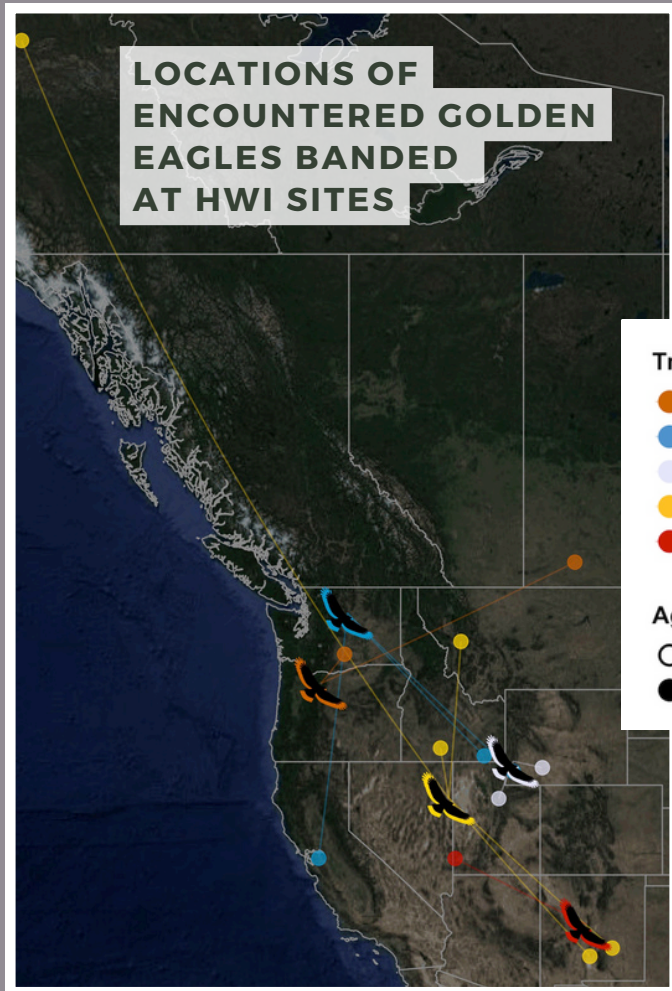


© Nicole Richardson

A hatch year Prairie Falcon

LESS COMMONLY RECOVERED SPECIES

GOLDEN EAGLES AND ASSORTED SPECIES



An adult male Northern Harrier banded in 2021 at Chelan Ridge



Bander Katelyn West holds a Golden Eagle at Commissary Ridge in 2023.

HAWKWATCH VISITORS



Sharing knowledge and helping visitors experience the magic of raptor migration first-hand is a priority at HawkWatch International sites. Our sites host several classroom groups, including both high school and college courses, and are open to the public. Details about how to get to each site and other information for your visit can be found [on our website](#).

Although we were able to welcome 3,542 visitors to our sites in 2023, Bonney Butte was sadly closed to visitors for the majority of the season due to a local fire.

VISITOR TOTALS

Site	2021	2022	2023
Bonney Butte	403	396	8
Chelan Ridge	202	178	NA
Commissary Ridge	29	53	45
Corpus Christi	1044	1674	1664
Goshute Mountains	136	153	112
Grand Canyon	151	869	1199
Gunsight Mountain	536	247	290
Manzano Mountains	188	120	224
Totals	2689	3690	3542



Commissary Ridge HawkWatch 2021: Coburn Blunt, James Petersen, Cody Allen, Georgia Coleman, Frankie Vierela



Manzano Mountains HawkWatch 2021: Parker Jensen, Sage Dale, Taylor Barnes, Jennifer Bridgeman, TC Walker



Corpus Christi HawkWatch 2021: Caroline Wolfe-Merritt, Daniel Horton, Dane Ferrell



Chelan Ridge HawkWatch 2021: Nicole Richardson, Elly McManus, Paula Eberle, Zoe Bonerbo, Erin Barry



Goshute Mountains HawkWatch 2021: Matt Dickey, Jojo Morelli, Will Britton, Melissa Marshall, Kirsti Carr



Bonney Butte HawkWatch 2021: Cassidy Ruge, Karl Garrett, Isaac Grosner, Nora Holmes, Veronica Pedraza



Grand Canyon HawkWatch 2021: Paige Dunnum, Patrick Teetsel, Kaitlyn Stroik

Gunsight Mountain HawkWatch 2021: Cory French and Arthur Green

Bridger Mountains HawkWatch 2021: Mia Cignoni and Evan Farese

Corpus Christi HawkWatch 2020: Dane Ferrell, Daniel Horton, Tucker Davidson

Grand Canyon HawkWatch 2020: Andrew Meiborg, James Petersen, Angelica Varela



Commissary Ridge HawkWatch 2022: James Petersen, Frankie Vierela, Katelyn West, Elly McManus, Coburn Blunt



Manzanos HawkWatch 2022: Nora Holmes, Emma Riley, Madeline Stoker, Harrison Dubois, Taylor Barnes



Corpus Christi HawkWatch 2022: Jamie Russell, Libby Even, Daniel Horton, Dane Ferrell



Chelan Ridge HawkWatch 2022: Amanda Hancock, Gary Palmer, Jessica Matyas, Skyler Bol, Moed Gerveni



Goshute Mountains HawkWatch 2022: Zach Higgins, Jojo Morelli, Kirsti Carr, Will Britton, Matt Dickey



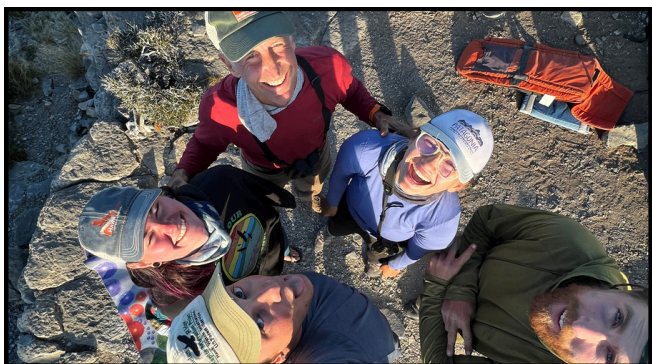
Bonney Butte HawkWatch 2022: Karl Garrett, Tim Baerwald, Sarah Montalvo, Gillian Martin, Rebecca Chandler



Grand Canyon HawkWatch 2022: Will Baxter-Bray, Caroline Wolfe-Merritt, Georgia Coleman

Gunsight Mountain HawkWatch 2022: Matt Dickey and Arthur Green

Bridger Mountains HawkWatch 2022: Jessica Lewis, Luisa Frankenburg, Joshua Jaeger



Goshute Mountains HawkWatch 2023: Zach Higgins, Amanda Young, Bob Fink, Caroline Fegley, Skyler Bol



Bonney Butte HawkWatch 2023: Jamie Russell, Karl Garrett, Tim Baerwald, Anna Lemon, Gillian Martin, Irwin the dog



Corpus Christi HawkWatch 2023: Kendall Watkins, Dane Ferrell, Libby Even, Daniel Horton



Grand Canyon HawkWatch 2023: Andrew Bechdel, Tamara Russo, Josh O'Connor



Commissary Ridge HawkWatch 2023: Yutong Sun, Frankie Vierela, James Petersen, Katelyn West, Sarah Lindsay



Manzano Mountains HawkWatch 2023: Dalton Sonnenberg, Mia Cinello-Smith, Carrie Coonan, Elly McManus

Gunsight Mountain HawkWatch 2023: Arthur Green and Cory French

Bridger Mountains HawkWatch 2023: May Buckingham, Alex McTavish, Anna Wolke

IN MEMORY OF DANE FERRELL

1959-2023

This fall we said goodbye to a great hawkwatcher, Dane Ferrell. A fixture at the Corpus Christi HawkWatch for 20 unforgettable seasons, it's likely that Dane counted more migrant raptors than anyone else in the United States—including first and last season's where he helped count over a million birds. Extremely dedicated, witty and skilled, Dane loved sharing his passion for raptors with all. One of Dane's favorite things to say when predicting the next day's count was "And Hazel will rock..." While this will continue to be the case, the platform at Hazel Bazemore park and elsewhere will rock a little less loudly without our friend Dane.



THE MIGRATION NETWORK IS POSSIBLE DUE TO THE SUPPORT OF MANY PARTNERS. THANK YOU!

Bonney Butte HawkWatch:

USFS: Tiffany Cummins, Ron Kikel, Katie Santini
Oregon Birding Association
Oregon Wildlife Foundation
Friends of Bonney Butte: Rick Gerhardt, Barb
Bresson, Tom Jordan, Kinsman Foundation, Mt
Hood Cultural Center & Museum, Mt Hood Area
Chamber of Commerce
Pacific Power Foundation
The Kinsman Foundation

Join us on FB:

<https://www.facebook.com/groups/bonneybuttehawkwatch/>

Grand Canyon HawkWatch:

NPS: Brian Gatlin
Grand Canyon Conservancy

Join us on FB:

<https://www.facebook.com/groups/grandcanyonhawkwatch/>

Chelan Ridge HawkWatch:

USFS: Janet Millard, Ana Cerro-Timpone, John
Rohrer
Kent Woodruff, Richard Hendricks, Brad Martin,
Icicle Fund, WDFW ALEA
NCWA Audubon: Richard Scranton

Corpus Christi HawkWatch:

Audubon Outdoor Club of Corpus Christi
Nueces County Inland Parks Dept.
Peter Collins, Joel & Vicki Simon
Bob & Jo Creglow, Don Gillespie, Clay Taylor,
Stacy Zarpentine

Join us on FB:

<https://www.facebook.com/groups/corpuschristihawkwatch/>

Commissary Ridge HawkWatch:

BLM: Blaine Potts
Wyoming community foundation
Robert Stevens

Join us on FB:

<https://www.facebook.com/groups/commissaryridgehawkwatch/>

Manzano Mountains HawkWatch:

USFS: Andrea Chavez, Amanda Rael, Ernest
Taylor
Walt and Jennifer Lehman
Roger Grimshaw, Wes Anderson, Steve & Nancy
Cox

Join us on FB:

<https://www.facebook.com/groups/manzanomountainhawkwatch/>

THE MIGRATION NETWORK IS POSSIBLE DUE TO THE SUPPORT OF MANY PARTNERS. THANK YOU!

Goshute Mountains HawkWatch:

BLM: Cam Cameron
Barrick Gold
Nevada Energy Foundation
Robert Stevens

Join us on FB:

<https://www.facebook.com/groups/goshutemountainshawkwatch/>

Gunsight Mountain HawkWatch:

Generous support from the Alaska Department of fish and Game
Alaska Department of fish and Game: Travis booms
Anchorage Audubon society

Join us on FB:

<https://www.facebook.com/share/g/191BunWA71/>

Bridger Mountains HawkWatch:

USFS: Randall Scarlett
Sacajawea Audubon Society, Steve Hoffman,
Bridger Bowl Ski



NETWORK WIDE: HWI DONORS





HAWKWATCH INTERNATIONAL

HAWKWATCH INTERNATIONAL

2240 SOUTH 900 EAST

SALT LAKE CITY, UT 84106

801 484 6808

MIGRATION@HAWKWATCH.ORG

WWW.HAWKWATCH.ORG

#COMEHAWKWATCHWITHUS