

# MPG Raptor Banding and Fall Migration Summary Report 2014

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## Summary

After recording state record for the most migrant raptors counted during a season (5,077), and most migrant raptors counted in one day (983) in 2013, this year we once again tallied the most migrating raptors of any Montana count site. Turkey Vultures, typically one of the least observed species at Montana's count sites, were our most counted species this year for the second year in a row, followed by Red-tailed Hawks, Sharp-shinned Hawks, and American Kestrels. Compared to Montana's other four migration surveys locations, who's counts are typically comprised of Golden Eagles and Sharp-shinned Hawks, we saw a higher proportion of Turkey Vultures, Red-tailed Hawks, falcons, and Osprey. Unlike other raptors, these species seem less confined to ridgelines, and many fly south at low altitudes above the Bitterroot Valley. Our lower count site on Indian Ridge has greatly improved our ability to detect these individuals, and should be the primary survey location for future surveys.

We captured 66 raptors from two trapping locations. Our higher elevation site caught primarily accipiters, while our new location on Indian Ridge captured more falcons. Compared to previous years, we banded less Sharp-shinned Hawks, but more American Kestrels, Merlins, Peregrine Falcons, and Prairie Falcons. We believe using blinds at lower elevations on the MPG Ranch is the main reason we have captured more falcons during the 2013-2014 fall seasons compared to previous years.



## Table of Contents

Abstract.....	1
Observation Effort and Methods .....	1
Weather .....	1
General Raptor Migration Summary.....	2
Species Composition. ....	3
Temporal Pattern of Raptor Migration .....	5
Seasonal Pattern of Raptor Migration .....	6
Species accounts .....	7
Northern Harrier.....	7
Osprey .....	7
Turkey Vulture.....	8
Golden Eagle.....	8
Bald Eagle .....	9
Sharp-shinned Hawk.....	9
Cooper’s Hawk .....	10
Northern Goshawk .....	10
Red-tailed Hawk .....	11
Rough-legged Hawk .....	11
Swainson’s Hawk.....	12
Broad-winged Hawk .....	12
Ferruginous Hawk.....	13
American Kestrel .....	13
Merlin.....	14
Peregrine Falcon .....	14
Prairie Falcon .....	15
Comparison Between Raptor Count Sites. ....	15
Fall 2014 Trapping and Banding Results .....	18

## Table of Figures

Figure 1: Total observations per day during 2011-2014 fall counts on the MPG Ranch.....	2
Table 1: Summary of raptors counted during fall surveys on the MPG Ranch.....	3
Figure 2: Percentage of raptors separated by group counted fall 2014 on the MPG Ranch.....	4
Table 2: Birds counted per hour at Indian Ridge and West Baldy Ridge during the 2013-2014 fall counts.....	5
Figure 3: The number of raptors counted in one-hour intervals during 2014 fall migration at the MPG Ranch.....	5
Figure 4: Seasonal patterns of raptor migration during fall 2014 at the MPG Ranch. ....	6
Table 3: Summary of fall 2014 count data and survey effort from four raptor count sites in Montana.....	16
Figure 5: Comparison of raptor observations between the MPG Ranch, Nora Ridge, Bridger Mountains, and Jewel Basin during the fall 2014 counts.....	17
Table 4: Number of raptors captured during fall migration 2011-2014.....	18
Figure 6: Proportion of raptors captured at each trapping site by group.....	19

# MPG Fall Raptor Migration Summary Report 2014

**Abstract:** This report summarizes fall 2014 raptor counting and banding at the MPG Ranch. During 72 days of counting from 1 September to 12 November, we counted 3,548 diurnal raptors of 17 species. This total is higher than the counts of 2011 and 2012, but less than our 2013 total. Additionally, we banded 66 raptors of 10 species from 7 September to 30 October.

## **Observation Effort and Methods**

We counted migrating raptors from 1 September through 12 November for a total of 462 hours. Inclement weather prevented observation one of the 72 days. As in previous years, West Baldy Ridge (GPS location: 46°42'19.49"N, 113°58'46.37") was our primary lookout. We used Indian Ridge (GPS location: 46°41'34.60"N, 114° 1'47.16"W) when West Baldy Ridge was engulfed in stratus clouds, and as an additional count site when the number of observers allowed. Counts were conducted from West Baldy Ridge 9 days, from Indian Ridge 10 days, and from both sites 53 days. Observers communicated with hand-held radios when using both count sites to ensure raptors were not double counted. This year's count was conducted by four primary observers: Eric 'Kerr' Rasmussen *MPG Ranch*, Karen Prisby *RVRI*, Breanne Cooney *RVRI*, and Zeke Smith *RVRI*.

We recorded species, age, sex, altitude, lateral direction and distance, and approach and departure bearing for each bird that passed the observation sites. We hope to identify patterns in the paths of migrating raptors as this dataset grows, and use this information to improve survey locations and methodology.

## **Weather**

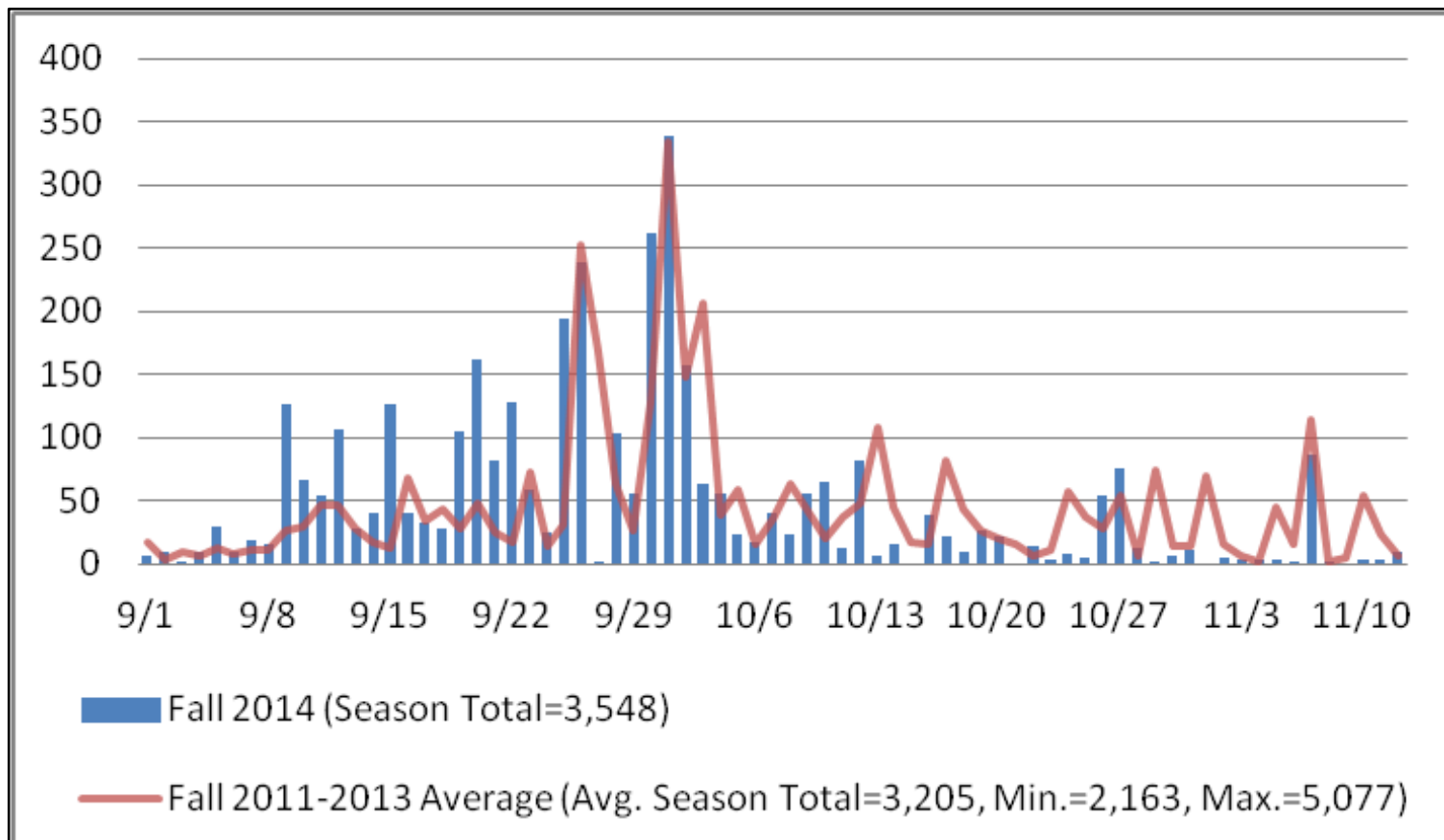
We recorded weather conditions each hour. Of the 72 days we conducted a count, 41 were overcast and cloudy. There was precipitation on 11 days. We were unable to count on one day due to low visibility from heavy precipitation. The season high temperature was 31 °C (4 September), and the season low temperature was -15 °C (12 November). Wind speeds were most often mild (0-10 kph). We sometimes experienced gusty winds, especially later in the day; the average daily-high gust was 24 kph for hours after 1400, compared to 14 kph for hours before 1400. Winds were northern (35%), southern (31%) or western (26%) most often, and, as in the three previous falls, rarely from the east (8%). Visibility was good for the vast majority of count days; wildfire smoke severely hampered visibility on four days.



### **General Raptor Migration Summary**

We recorded 3,548 migrating raptors (Figure 1). This total compares to 5,077 in 2013, 2,375 in 2012 and 2,163 in 2011. Our highest counts occurred in late September to early October including 338 on October 1, 261 on September 30, and 239 on September 26. The timing of this peak period was nearly identical to last season, when we counted 3,322 raptors from 26 September-3 October, including an astonishing 983 migrants on 1 October, 2013. Our daily counts in 2011-2012 peaked toward the end of October.

**Figure 1: Total observations per day during the 2014 fall count compared to the previous seasons' average daily counts.**



### **Species Composition**

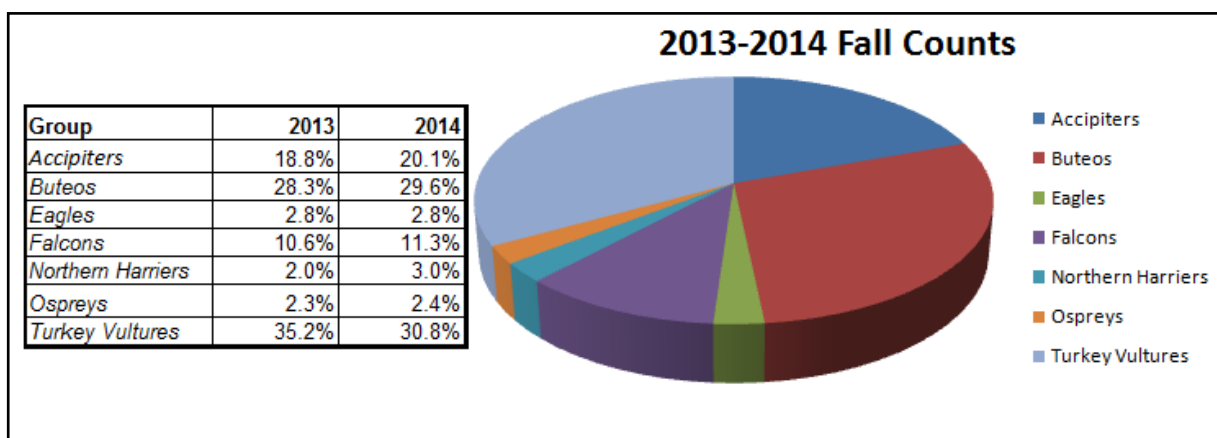
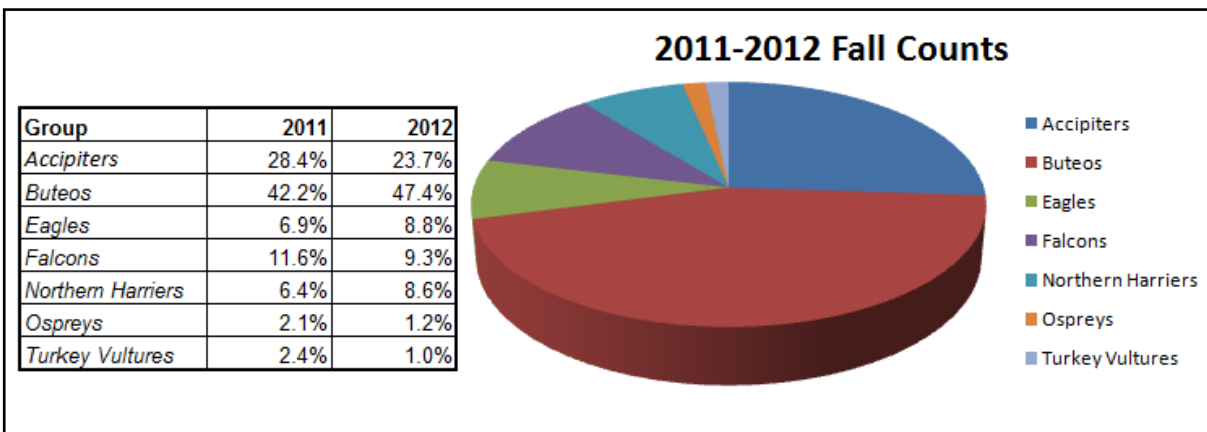
As in previous years, we observed 17 species during our fall 2014 surveys. The five most abundant species included: Turkey Vulture (1,089), Red-tailed Hawk (816), Sharp-shinned Hawk (335), American Kestrel (310), and Cooper's Hawk (264) (Table 1). We saw fewer eagles and Sharp-shinned Hawks than in previous seasons, but more Merlins and Swainson's Hawks.

**Table 1: Summary of raptors counted during four fall surveys on the MPG Ranch.**

<b>Group</b>	<b>Species</b>	<b>Fall 2014</b>	<b>Fall 2013</b>	<b>Fall 2012</b>	<b>Fall 2011</b>
Eagles	Golden Eagle	44	81	91	84
	Bald Eagle	53	66	114	58
	Unknown Eagle	0	0	1	5
Accipiters	Sharp-shinned Hawk	335	591	377	383
	Cooper's Hawk	264	288	134	167
	Northern Goshawk	23	32	20	10
	Unknown Accipiter	86	81	27	44
Buteos	Red-tailed Hawk	816	973	766	776
	Rough-legged Hawk	112	101	253	58
	Swainson's Hawk	28	16	8	9
	Broad-winged Hawk	41	122	25	6
	Ferruginous Hawk	4	6	5	5
	Unknown Buteo	41	133	59	46
Falcons	American Kestrel	310	344	190	225
	Merlin	43	30	9	6
	Peregrine Falcon	23	21	8	4
	Prairie Falcon	24	12	11	9
	Unknown Falcon	8	7	1	2
Other	Northern Harrier	107	109	203	137
	Osprey	84	121	28	58
	Turkey Vulture	1,089	1,861	23	50
	Unknown Hawk	25	82	22	34

While the species composition of the fall 2013-2014 counts were similar to each other, they were very different from the 2011-2012 seasons. Turkey Vultures, which comprised an insignificant portion of the 2011 and 2012 fall counts, were the most counted species during the last two seasons. We also counted more falcons during our 2013-2014 surveys. As a result, we observed a decrease in the proportion in buteos, accipiters, eagles, Northern Harriers, and Ospreys. An increase in falcon numbers over the past two seasons has kept their contribution to each season's total count fairly consistent (Figure 2).

**Figure 2: Percentage of raptors separated by group counted during the fall 2011-2014 surveys on the MPG Ranch.**



We believe the higher totals of Turkey Vultures observed during the 2013-2014 fall counts are due to an increased use of the Indian Ridge count site. Over the past four years we have discovered that many raptors pass by the MPG Ranch at low altitudes, over foothills and the Bitterroot River. This flight pattern is very different from most migratory corridors, where raptors concentrate along north-south ridgelines. This pattern is especially true for Turkey Vultures. Our lower site on Indian Ridge has greatly improved our ability to detect these birds, usually too distant to see from our site on West Baldy Ridge. We did not discover the Indian Ridge count site until late into the 2011 season, and only used it as an alternative site when poor weather prevented us from counting on West Baldy Ridge, until 2013. As a result, we likely missed large numbers of Turkey Vultures during our 2011-2012 surveys. Had we not been counting at Indian Ridge during 2013, we would have missed the vast majority of the record daily highs in late September to early October. In fact, we have averaged more birds per survey hour at Indian Ridge than West Baldy Ridge in both 2013-2014 (Table 2). We believe we should continue to operate both sites in the future, but use Indian Ridge as our primary lookout.



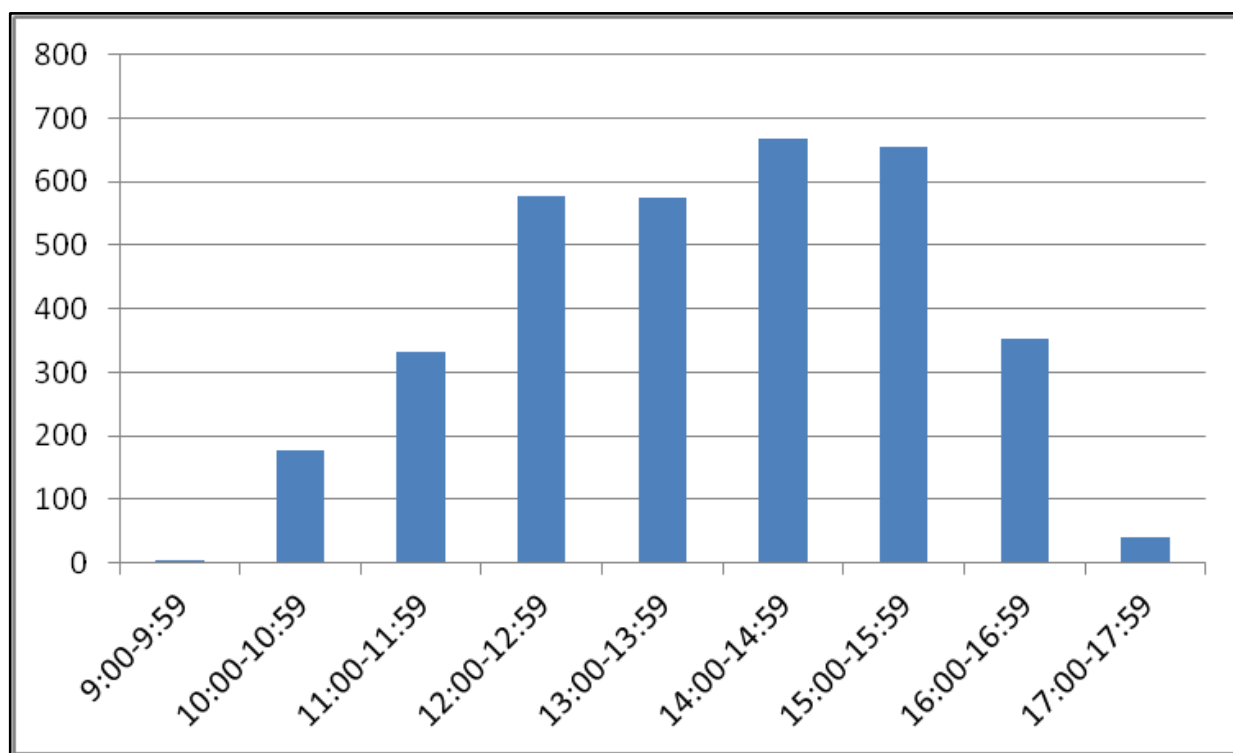
**Table 2: Birds counted per hour at Indian Ridge and West Baldy Ridge during the 2013-2014 fall counts.**

	Site	Observations Per Hour of Survey					Total Raptors
		Accipiters	Buteos	Eagles	Falcons	Turkey Vultures	
2013	Indian Ridge	1.82	3.37	0.36	0.85	5.49	12.41
	West Baldy Ridge	1.34	0.90	0.12	0.47	0.35	3.40
2014	Indian Ridge	0.75	1.34	0.16	0.44	2.52	5.47
	West Baldy Ridge	1.04	1.30	0.08	0.57	0.27	3.49

### **Temporal Patterns of Raptor Migration**

Each fall, we count few migrants before noon and after 5 P.M. each day, though counts were rarely conducted before 10 A.M. or after 5 P.M. This year, approximately 73% of migrants passed between 12-4 P.M. (Figure 3).

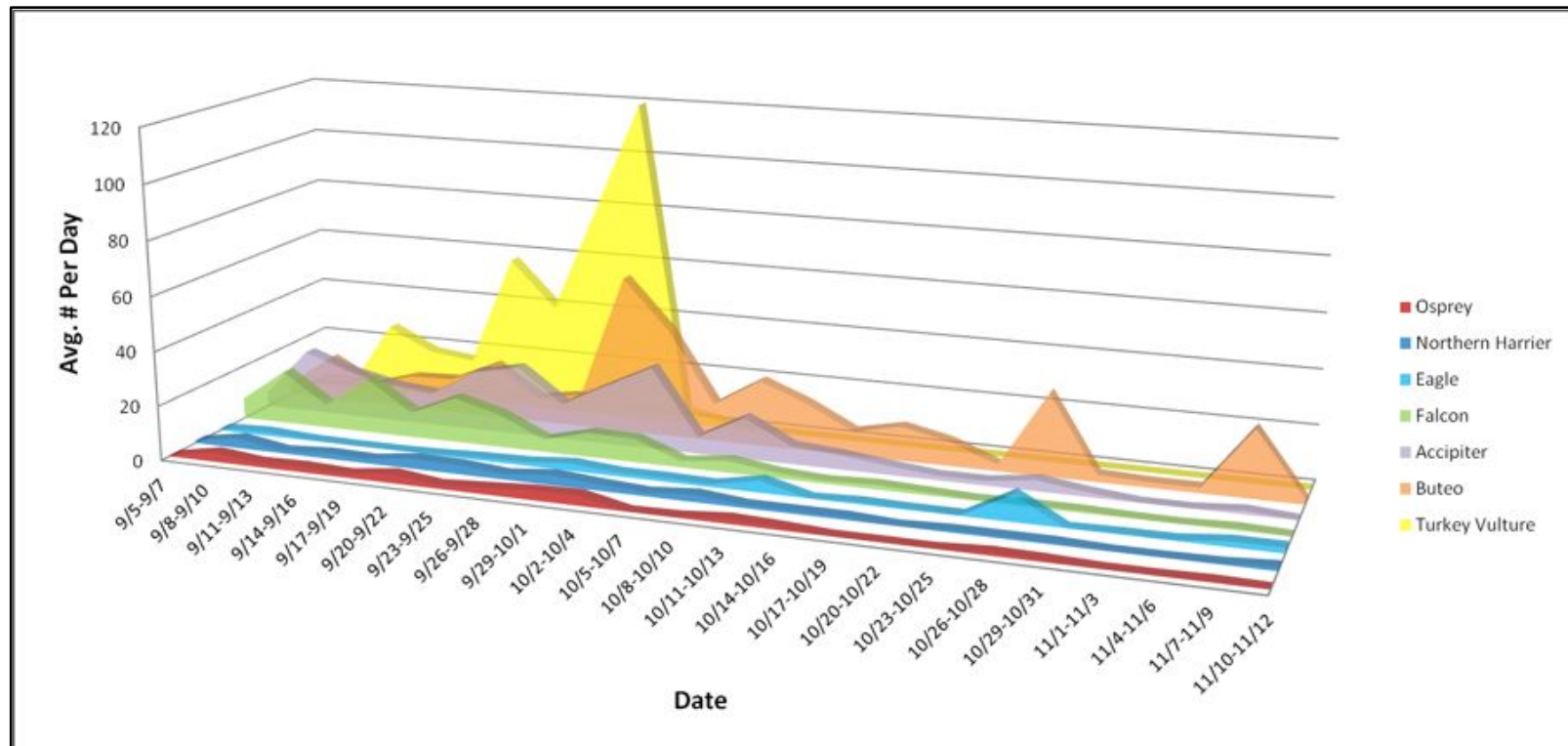
**Figure 3: The number of raptors counted in one-hour intervals during 2014 fall migration at the MPG Ranch.**



### Seasonal Patterns of Raptor Migration

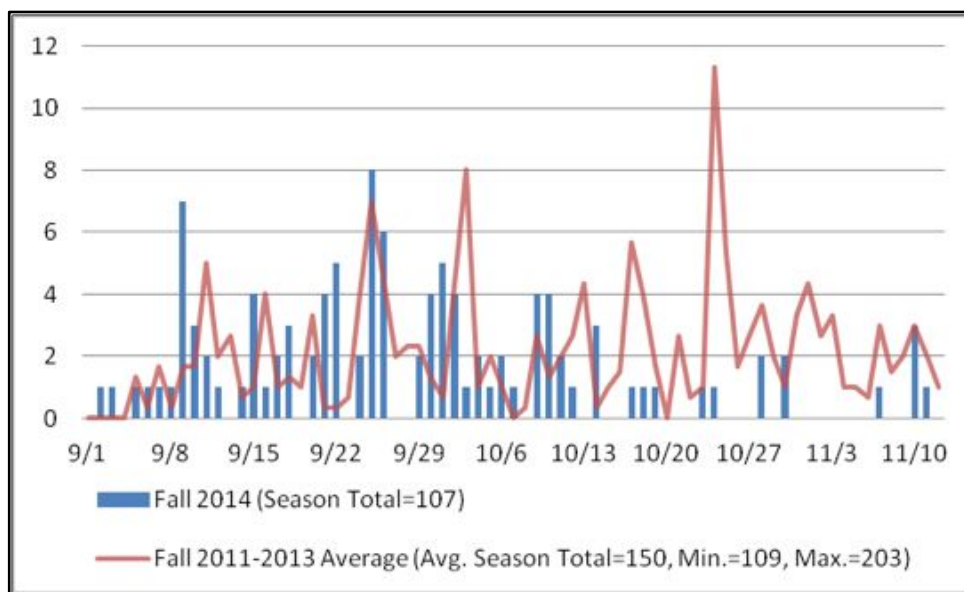
This season's temporal trends between raptor groups were in line with our previous surveys. Ospreys and Northern Harriers were seen in low number throughout September, but rarely observed after the second week of October. Accipiters and falcons were also most prevalent during this period, though the decrease in accipiters after mid October was less dramatic. The number of passing buteos and Turkey Vultures accelerated during the first half of the season, and peaked during the first week of October. Turkey Vultures all but vanished from the count after this peak, while buteos continued to be seen in fair, but declining, numbers. Buteo numbers picked up again in late October to early November, during a push where we also saw our highest number of eagles (Figure 4).

**Figure 4: Seasonal patterns of raptor migration during fall 2014 at the MPG Ranch. For illustrative purposes, numbers of detections were averaged over three day periods to minimize the effect of day-to-day variability.**

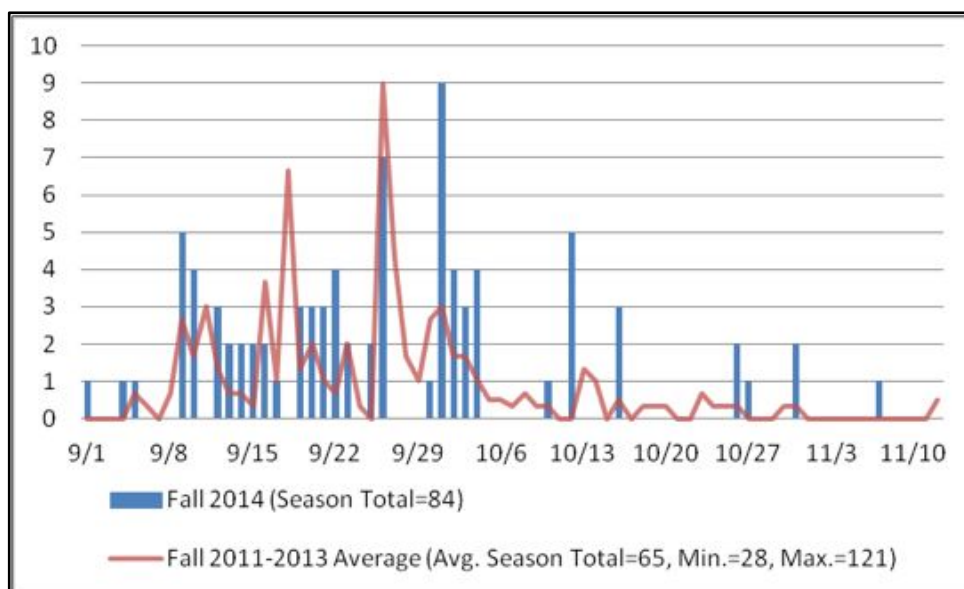


## Species Accounts

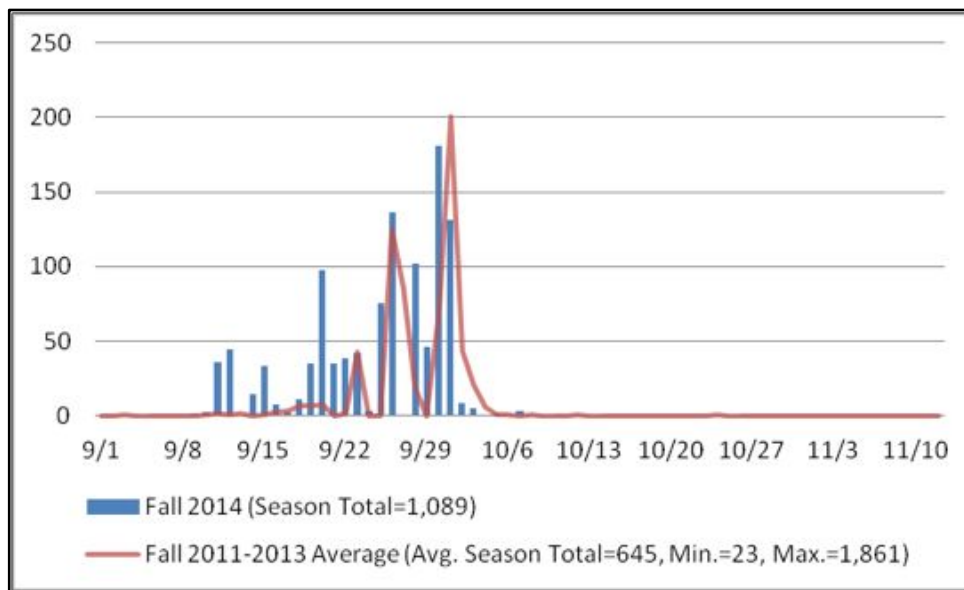
**Northern Harrier:** We counted 107 Northern Harriers from 2 September to 11 November this season, compared to 203 in 2012 and 137 in 2011. We count Northern Harriers in low numbers throughout the fall. This year, we saw a much higher proportion of our count in the first half of this season, compared to previous years.



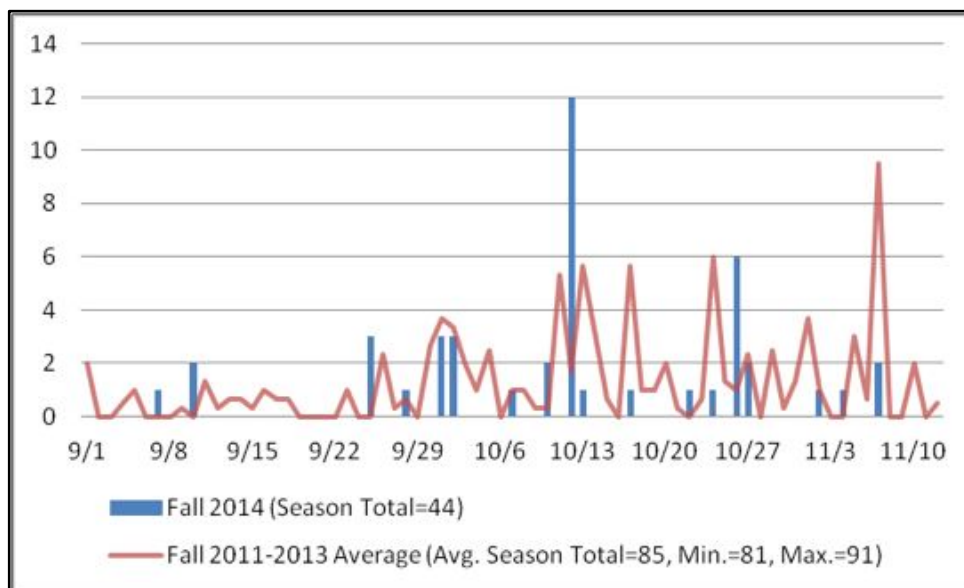
**Osprey:** We recorded 84 Osprey this fall. The peak of Osprey migration occurred during the last week of September, and as in previous years, we infrequently saw Ospreys throughout the second half of the season.



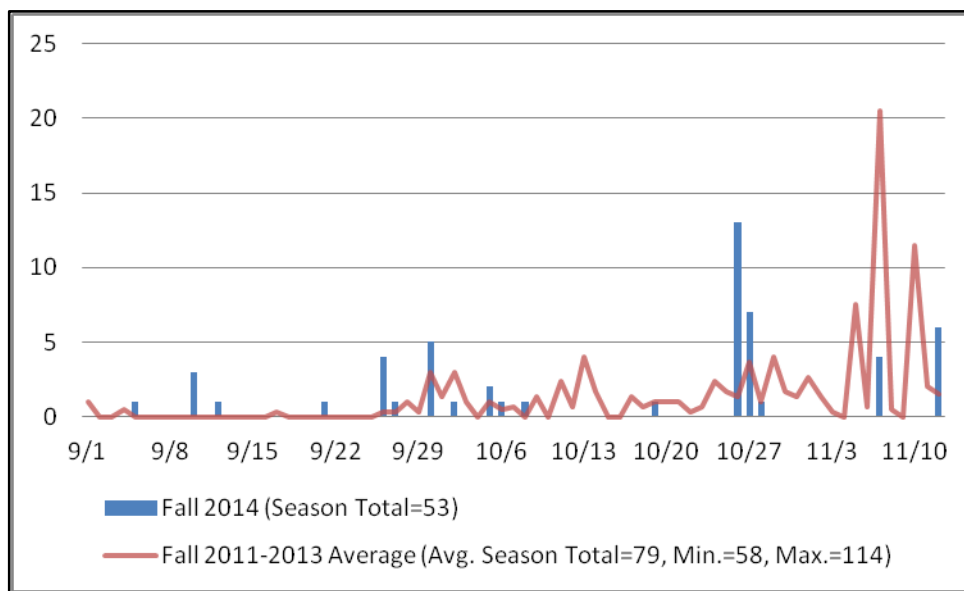
**Turkey Vulture:** Turkey Vultures were the most counted species this fall, for the second consecutive season. We counted 1,089 Turkey Vultures from 9 September to 7 October, including a daily high of 136 individuals on 26 September. This total compares to a sum of just 73 counted in 2011 to 2012. We attribute this increase to our Indian Ridge count site, which we started to use extensively in the 2013 season.



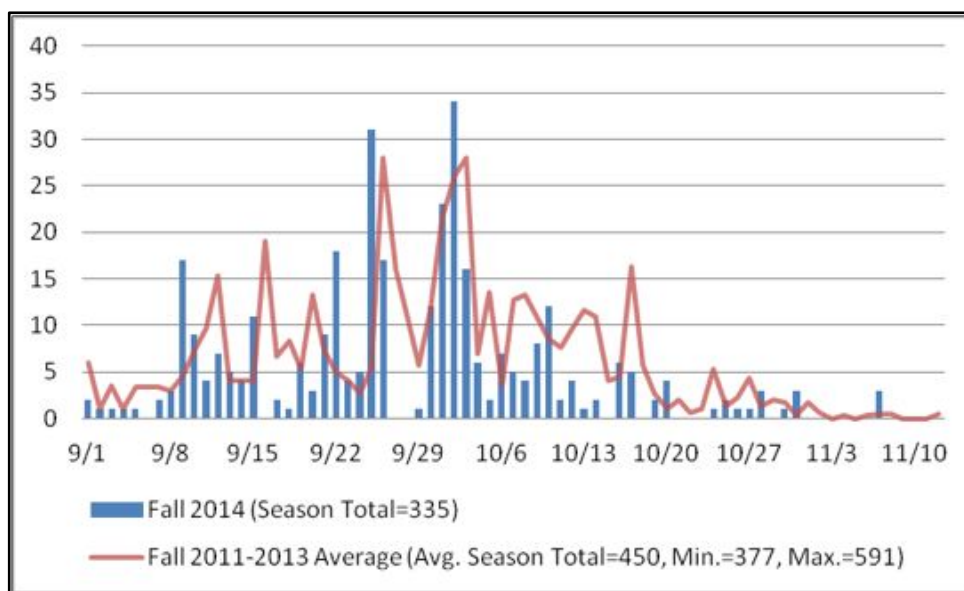
**Golden Eagle:** We recorded 44 Golden Eagles this year, our lowest total of any fall count. Montana's other migration sites did not see a significant decline in the number of Golden Eagles counted; Nora Ridge even recorded their highest season total of Golden Eagles since 2007. The Bitterroot Valley and Sapphire Mountains are likely only used by Golden Eagles wintering nearby. Our satellite tracking data from migratory Golden Eagles indicate they most often trace the Continental Divide when making long-distance movements.



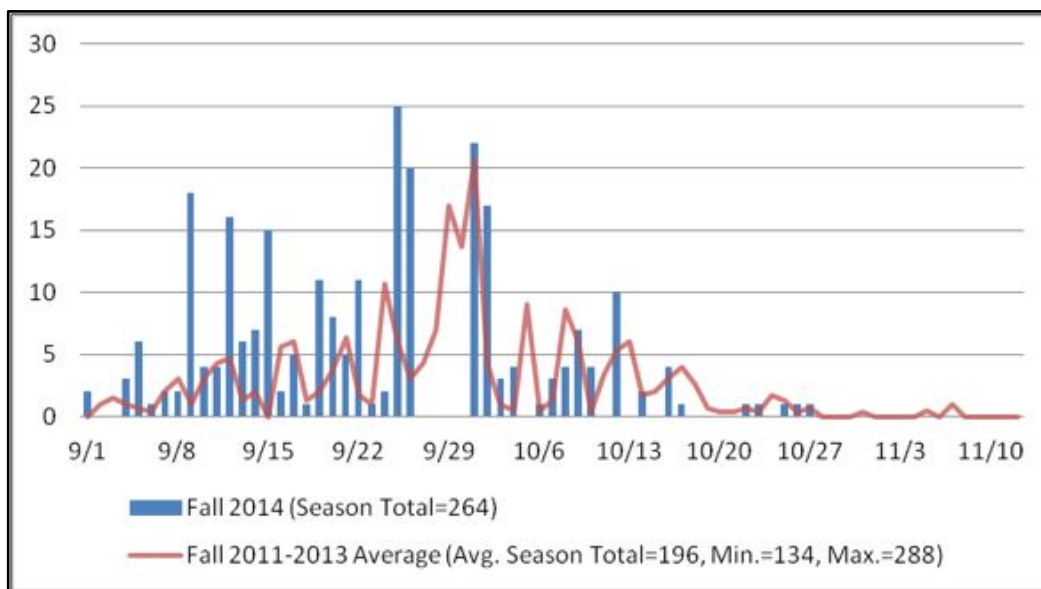
**Bald Eagle:** We counted 53, Bald Eagles this year. As in previous seasons, we saw a small push of Bald Eagles near the beginning of October, but most individuals were counted later in the season.



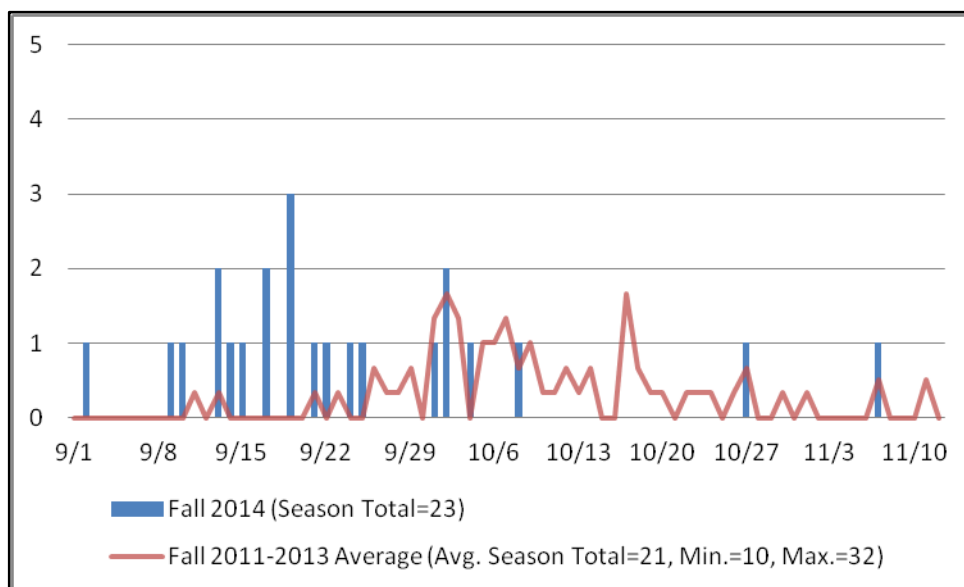
**Sharp-shinned Hawk:** We counted 335 Sharp-shinned Hawks from 1 September to 7 November, making it the third most observed species for the second consecutive season. Their numbers peaked slightly in early October, though stayed fairly steady from early September until the third week in October. The daily high occurred on 2 October when we recorded 34 individuals.



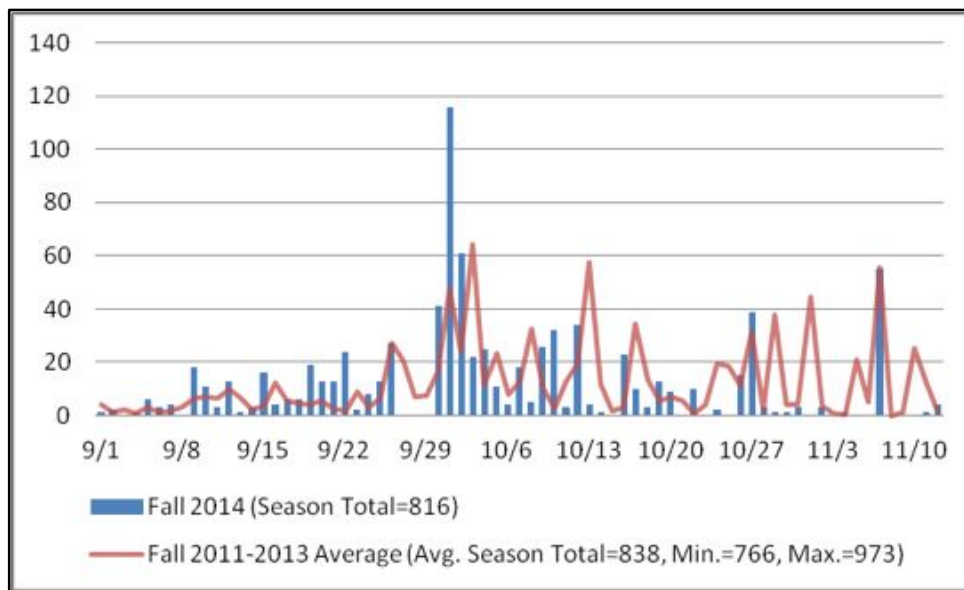
**Cooper's Hawk:** We counted 264 Cooper's Hawks from 1 September to 27 October. Like Sharp-shinned Hawks, their numbers peaked around the beginning of October, and largely subsided by the third week of October.



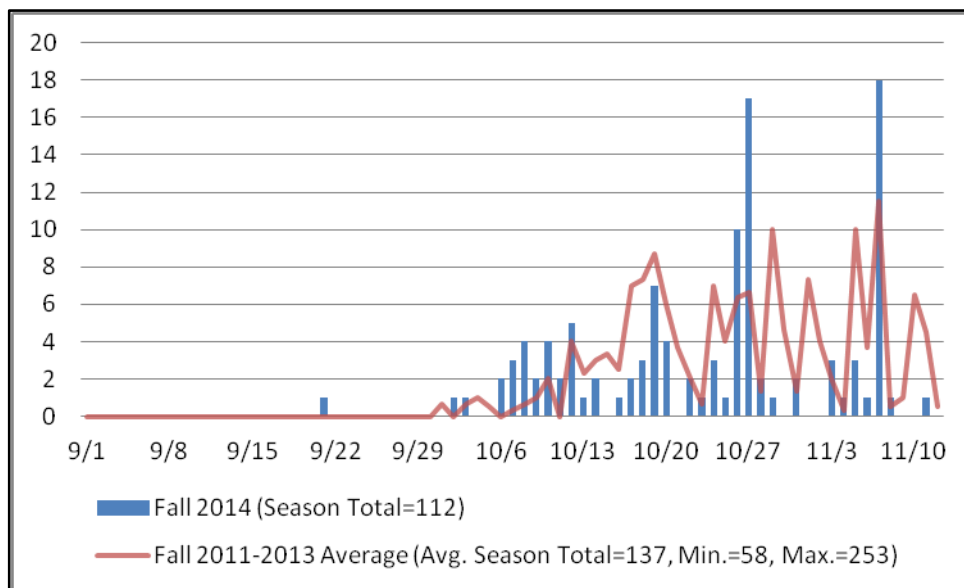
**Northern Goshawk:** We counted 23 Northern Goshawks this fall. Like the other two accipiters, the majority of Northern Goshawks were counted during the first half of the season.



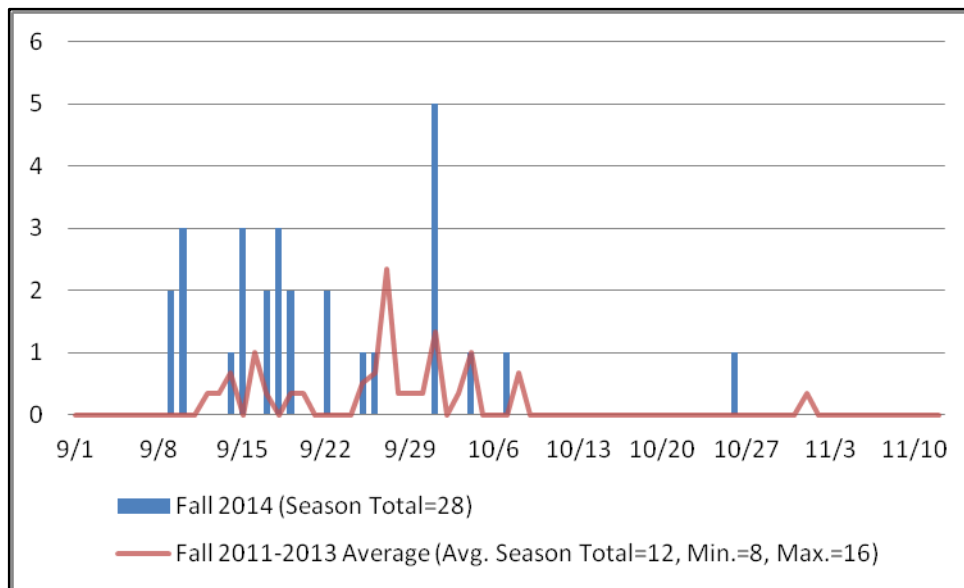
**Red-tailed Hawk:** Red-tailed Hawks were the second most observed species this season for the second consecutive season. We counted 816, with peak daily counts during the first few days of October, including a count of 116 on 1 October. Numbers stayed fairly high until the third week of October, after which we had few days with high counts. As each previous season, our Red-tailed Hawk total was much higher than that of Montana's three other count sites.



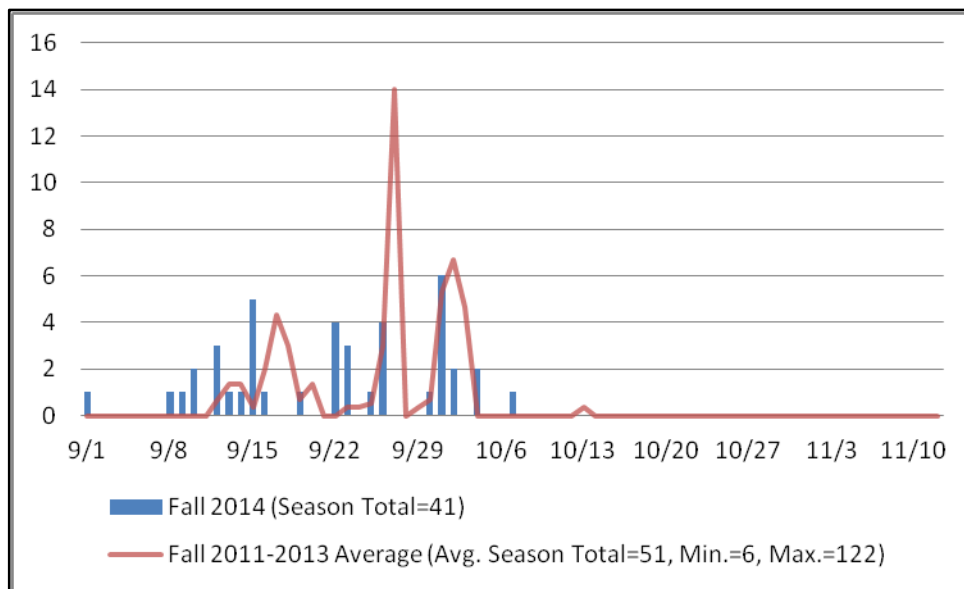
**Rough-legged Hawk:** We observed 112 Rough-legged Hawks this season, including one on 21 September, our earliest encounter of the species by ten days. As in the three previous seasons, Rough-legged Hawks were regularly counted throughout October and into the end of the survey in November.



**Swainson's Hawk:** We counted 28 Swainson's Hawks from 9 September to 26 October. Of all the buteos that breed in Montana, Swainson's Hawks move south the earliest. This trend is most likely due to the fact that they must travel thousands of miles to their wintering grounds in Argentina.

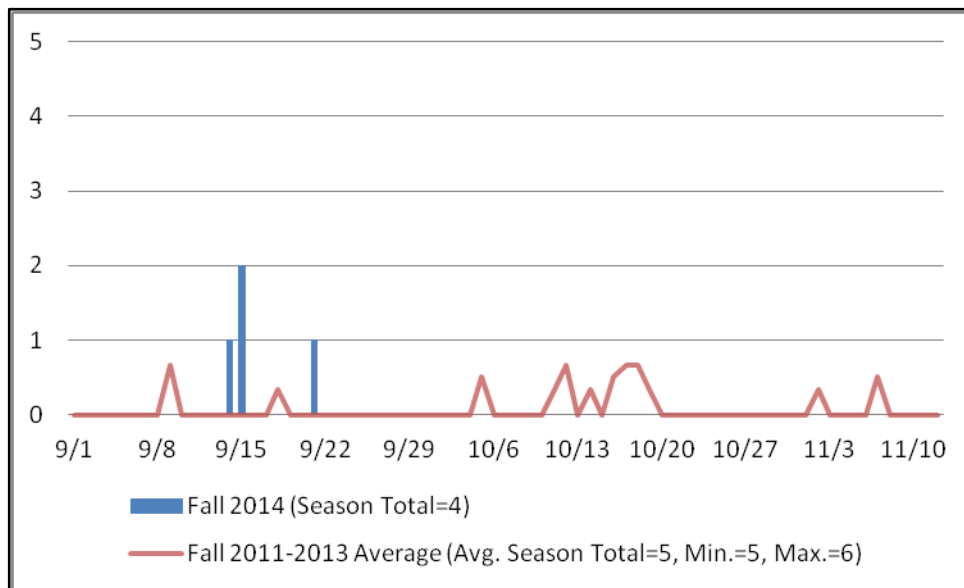


**Broad-winged Hawk:** We counted 41 Broad-winged hawks from 1 September to 7 October. This sighting on 7 October is our latest record of a Broad-winged Hawk to date; the majority of individuals pass by in mid September.

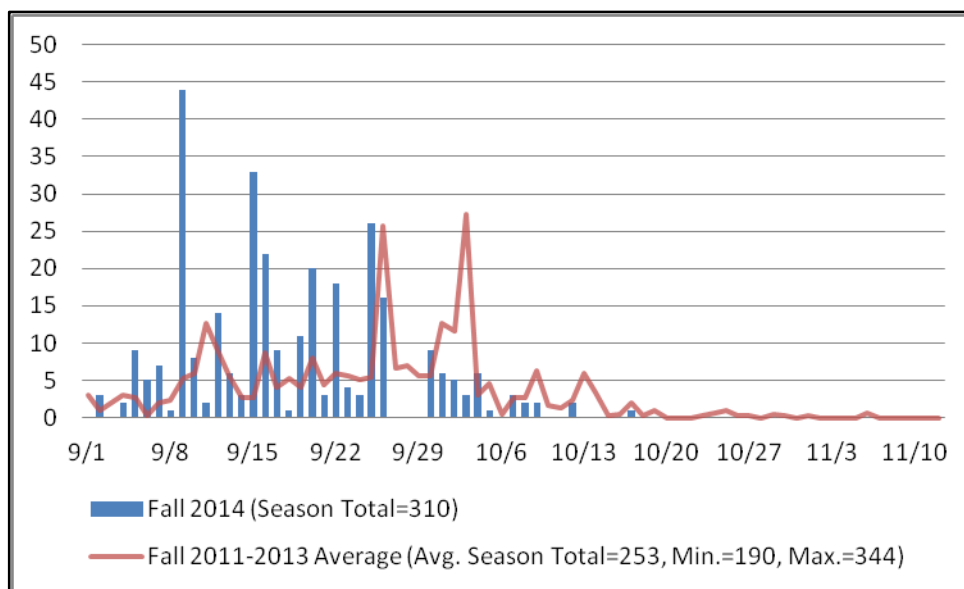




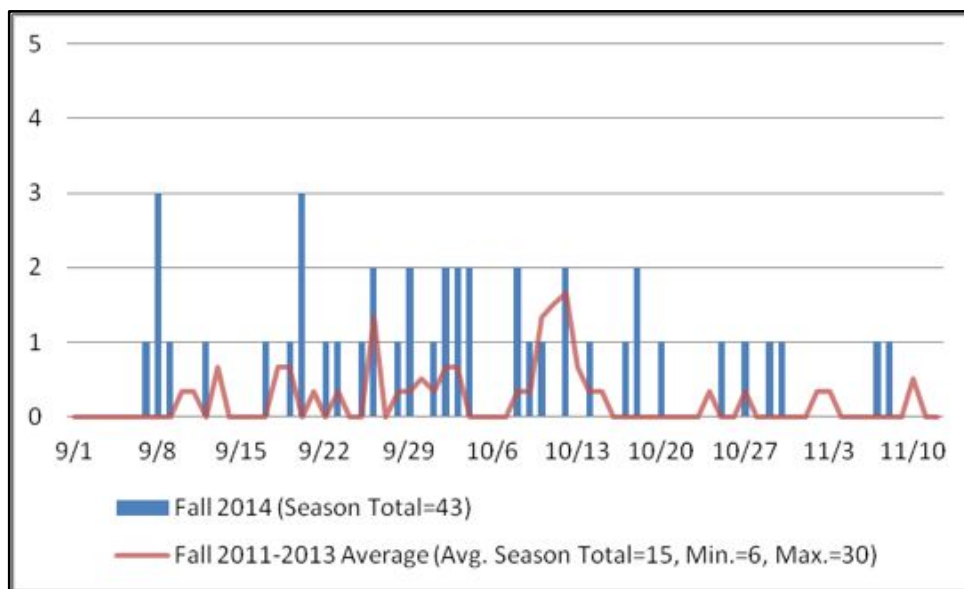
**Ferruginous Hawk:** Ferruginous Hawks are the least frequently counted of all seventeen species recorded during our fall surveys. We saw four during the third week of September. Ferruginous Hawks are rarely observed at raptor count sites across the U.S., and we know little about their migration ecology.



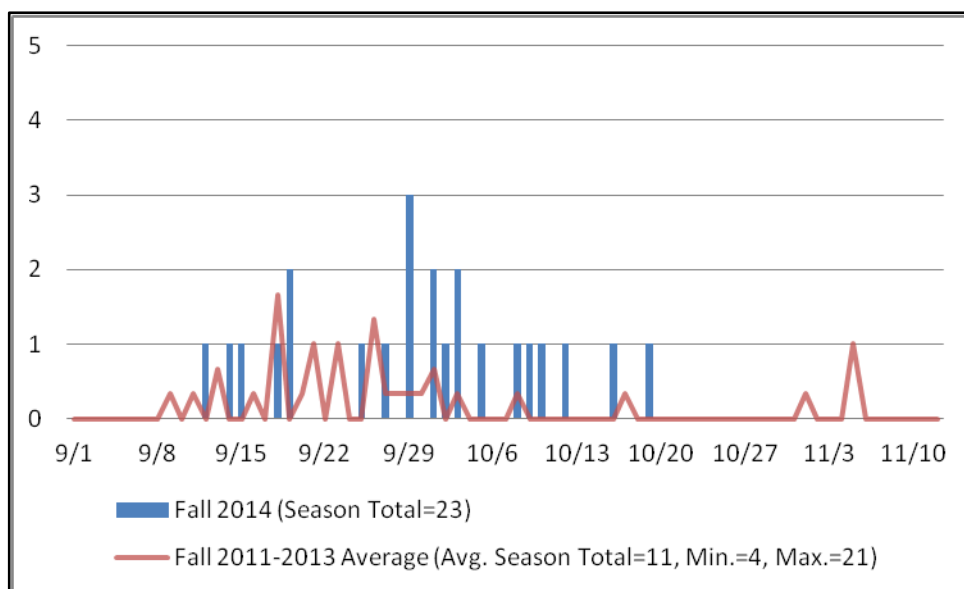
**American Kestrel:** We counted 310 American Kestrels from 2 September to 17 October, including a daily high count of 44 on 9 September. American Kestrels migrate early; we see the majority of them pass by during the month of September.



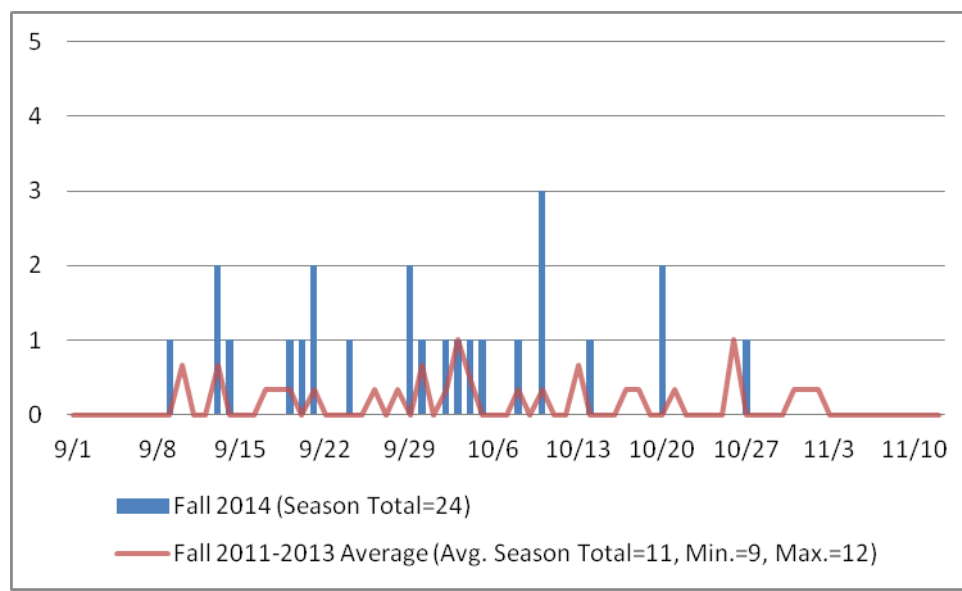
**Merlin:** This year we recorded our highest season total of Merlins. We counted 43 from 7 September through 8 November, compared to just 9 in 2012 and 6 in 2011. Like Turkey Vultures, the majority of Merlins are counted at our lower count site on Indian Ridge.



**Peregrine Falcon:** We counted 23 Peregrine Falcons from 12 September through 19 October.



**Prairie Falcon:** We recorded 24 Prairie Falcons this season from 9 September-27 October. Prairie Falcons are relatively uncommon across the U.S., and are one of the most infrequently counted birds at most raptor count sites.



### **Comparison Between Raptor Count Sites**

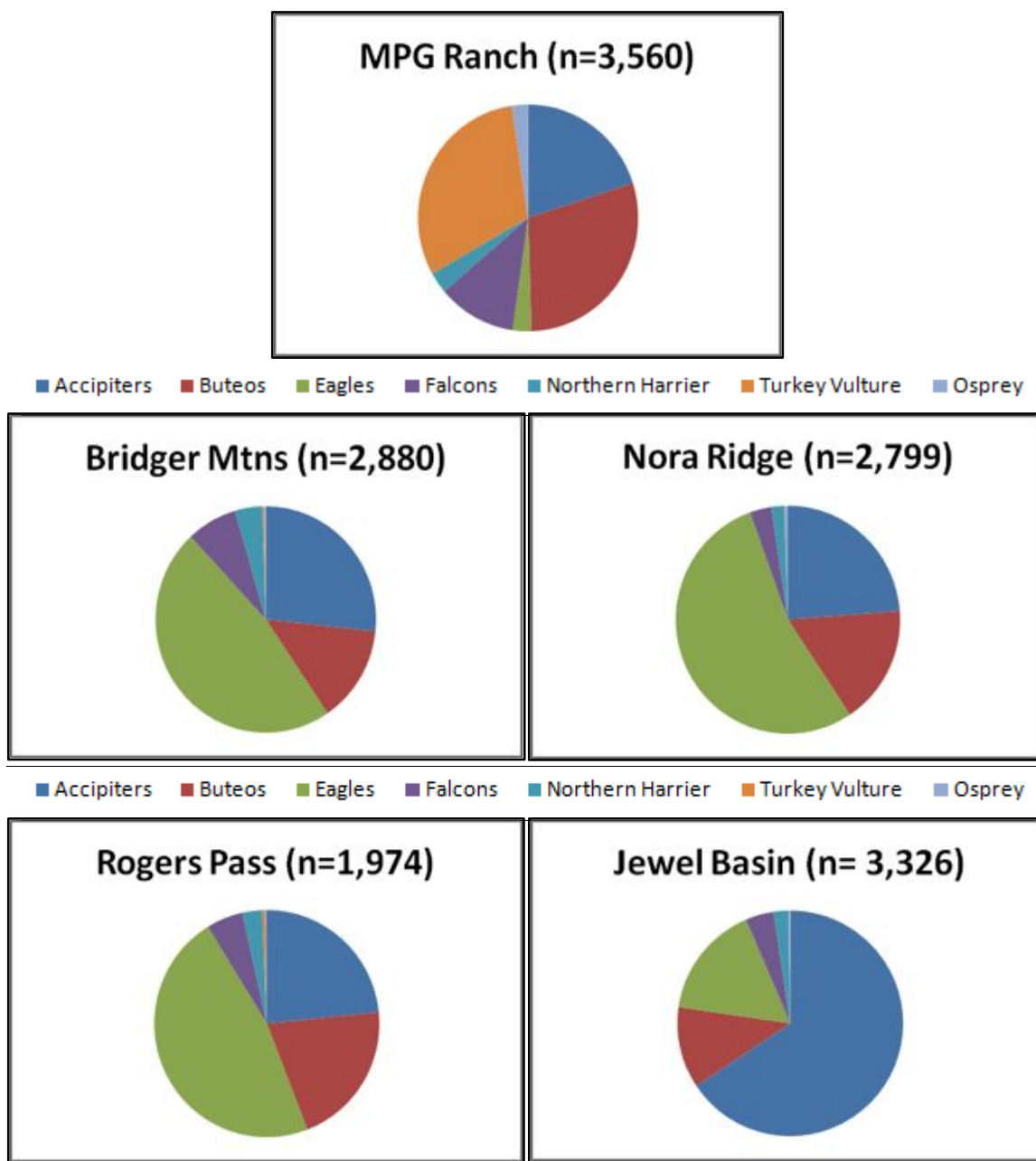
Raptor counts took place at five sites in Montana during fall of 2014, though sites differed in start and end dates and overall effort (Table 2). We had the highest total count of Montana's five surveys, though all sites recorded relatively high season totals. The Bridger Mountains saw their highest season total since 1999, Nora Ridge recorded its highest total since 2007, and Jewel Basin recorded their highest count ever. This season's count was the first conducted from Rogers Pass, located on the Continental Divide, four miles from Nora. As in previous years, the species compositions of Montana's count sites were very different (Table 3). Our totals of Turkey Vultures, Red-tailed Hawks, Broad-winged Hawks, Osprey, were much higher than the other three sites, while our total of Golden Eagles was much lower. The relative ease of accessing our survey sites allowed us to count on days where weather would have prevented observers from reaching the Bridger Mountains, Nora Ridge, Rogers Pass, and Jewel Basin count locations. Though the higher accessibility of our sites allowed for more observation days and observation hours, it likely reduced our birds/observation hour, as many of these hours occurred during poor weather where few migrants passed by.

**Table 3: Summary of fall 2014 count data and survey effort from four other raptor count sites in Montana.**

	<b>MPG Ranch</b>	<b>Bridger Mountains</b>	<b>Nora Ridge</b>	<b>Rogers Pass</b>	<b>Jewel Basin</b>
Start Date	1 Sep	1 Sep	15 Sep	8 Sep	26 Aug
End Date	12 Nov	8 Nov	30 Oct	24 Oct	31 Oct
Observation Days	71	58	43	49	52
Observation Hours	462	394	277	224	339
Birds/Observation Hour	7.7	7.3	10.1	8.8	9.8
Turkey Vulture	1,089*	8	2	9	2
Osprey	84	6	12	4	6
Northern Harrier	107	112	51	54	70
Sharp-shinned Hawk	335*	422*	421*	287*	1,536*
Cooper's Hawk	264*	205*	155*	86*	504*
Northern Goshawk	23	60	42	33	61
Unknown Accipiter	86	64	38	45	69
Broad-winged Hawk	41	22	64	52	13
Swainson's Hawk	28	2	1	0	0
Red-tailed Hawk	816*	239*	185*	114*	320*
Ferruginous Hawk	4	8	7	6	0
Rough-legged Hawk	112	84	185*	202*	31
Unknown Buteo	41	37	26	26	22
Golden Eagle	44	1,222*	1,448*	894*	481*
Bald Eagle	53	106	36	13	57
Unknown Eagle	0	11	2	1	0
American Kestrel	310*	138*	52	63	73*
Merlin	43	28	19	25	26
Peregrine Falcon	23	23	10	7	11
Prairie Falcon	24	13	4	2	10
Unknown Falcon	8	7	1	5	14
Unknown Raptor	25	63	38	46	20
<b><i>Grand Total</i></b>	<b><i>3,560</i></b>	<b><i>2,880</i></b>	<b><i>2,799</i></b>	<b><i>1,974</i></b>	<b><i>3,326</i></b>

Jewel Basin counted proportionally more accipiters, while eagles dominated the counts of the Bridger Mountains, Rogers Pass and Nora Ridge. The large numbers of Turkey Vultures observed during the last week of September and first week of October dominated our total at the MPG Ranch (Figure 5).

**Figure 5: Comparison of raptor observations between the MPG Ranch, Bridger Mountains, Nora Ridge, Roger Pass, and Jewel Basin during the 2014 fall migration.**



### **Fall 2014 Trapping and Banding Results**

We conducted our third season of fall banding in 2014. As in previous years, we used live Rock Doves, European Starlings, and House Sparrows to attract passing raptors. As raptors attempted to take the lures, they were captured in manually controlled bow nets. Trapping was conducted by Adam Shreading, Tyler Veto, and ErickENZien. We used the same trapping location on West Baldy Ridge as in 2012-2013, and relocated our lower trapping blind from 2013, ~ 1.5 km to the southeast, higher up on Indian Ridge. We hoped this new position would improve the chances of our lures being seen by passing birds. We banded a total of 52 days from 7 September to 30 October. We captured 66 individuals of 10 species (Table 4). Compared to previous seasons, we banded fewer accipiters and more falcons.

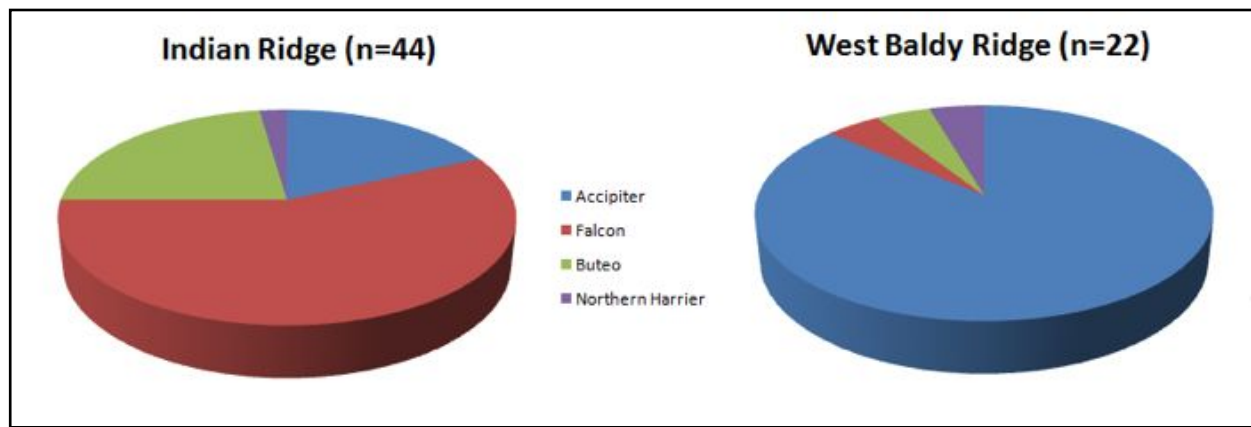
**Table 4: Number of raptors captured during fall migration 2011-2014.**

<b>Species</b>	<b>Fall 2014</b>	<b>Fall 2013</b>	<b>Fall 2012</b>	<b>Fall 2011</b>
Golden Eagle	0	0	0	1
Sharp-shinned Hawk	19	39	34	10
Cooper's Hawk	7	13	5	7
Northern Goshawk	1	4	5	0
Red-tailed Hawk	9	9	6	4
Rough-legged Hawk	2	0	3	0
American Kestrel	10	5	4	0
Merlin	9	6	0	0
Peregrine Falcon	4	1	2	0
Prairie Falcon	3	1	1	1
Northern Harrier	2	2	2	1
Northern Pygmy Owl	0	1	1	0
<b>Total:</b>	<b>66</b>	<b>81</b>	<b>63</b>	<b>24</b>



We trapped 44 raptors at Indian Ridge and 22 at West Baldy Ridge. Accipiters made up the majority of birds captured at our West Baldy Ridge station, while falcons were most frequently captured at our site on Indian Ridge (Figure 6).

**Figure 6: Proportion of Raptors Captured at Each Trapping Site by Group.**



Because we have captured relatively few total raptors for the amount of effort over the past three seasons, we will not be attempting full-time trapping next fall. The high number of falcons banded over the past two seasons on the MPG Ranch, however, was impressive. We plan to develop species-specific research goals in the coming months, and conduct a less time-intensive banding project next year.



On 8 September, we banded a hatch-year female Sharp-shinned Hawk at our West Baldy Ridge Trapping site. Five weeks later, she died from colliding with a window in Arizona. Though band recoveries such as these are rare, they are the best tool we currently have to track individuals of species too small to wear GPS transmitters.

