

MPG Raptor Banding and Fall Migration Summary Report 2012

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MPG Fall Raptor Migration Summary Report 2012

Abstract: This report summarizes fall 2012 raptor counting and banding at the MPG Ranch. During 65 days of counting from 5 September to 12 November, we counted 2,375 raptors of 17 species. Additionally, we banded 63 raptors of ten species from 7 September - 30 October in our first full fall trapping effort.

Observation Effort and Methods

We counted migrating raptors from 5 September through 12 November for a total of 417 hours. Inclement weather prevented observations on four of the 69 days. West Baldy Ridge (GPS location: 46°42'19.49"N, 113°58'46.37"), the primary lookout, is located 0.25 miles southwest of Baldy Mountain at ~ 5,700 ft. in elevation. We used Indian Ridge (GPS location: 46°41'34.60"N, 114° 1'47.16"W) as an additional count site when West Baldy Ridge was engulfed in stratus clouds. Counts were conducted from West Baldy Ridge 38 days, from Indian Ridge 22 days, and from both sites five days. This year's count was conducted by three primary observers (Eric 'Kerr' Rasmussen *MPG Ranch*, Daniel Harrington *RVRI*, and Cherin Chapman *RVRI*) with assistance from volunteers and MPG Ranch and RVRI staff when possible. Observers were trained in standard raptor counting protocol and used either 8X or 10X high-quality binoculars. Additionally, two 20X – 60X spotting scopes were available for long-distance identifications.

We recorded species, age, sex, altitude, lateral direction, and approach and departure bearing for each bird that passed over the observation site. Observers communicated with hand-held radios when using both count sites to ensure raptors were not double counted. We also kept records of passing birds' three-dimensional positions. Expanding this dataset will allow us to analyze spatial patterns determine if our survey locations are providing us with the best count of migratory raptors, and if raptors consistently use the same pathways as they fly south over the MPG Ranch.

Weather

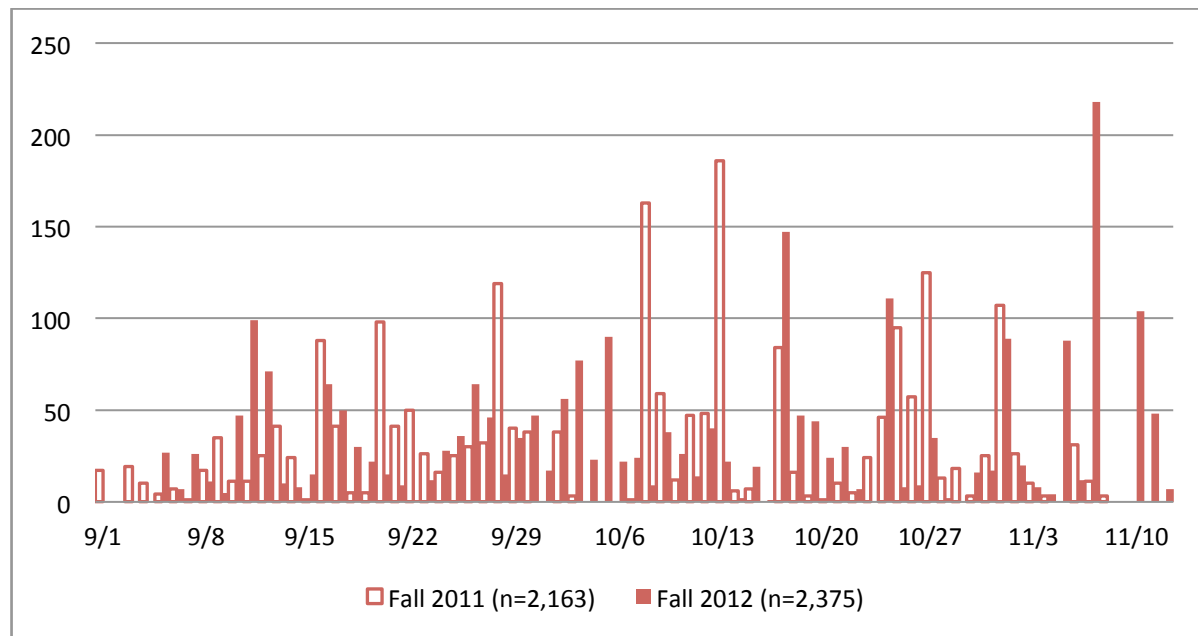
We recorded weather conditions each hour (see separate dataset of Daily Weather Conditions during Fall 2012 Count at the MPG Ranch). Of the 65 days we conducted a count, 31 were overcast and cloudy. There was precipitation on 13 days. We were unable to count on four days, due to low visibility from heavy precipitation. The high temperature for the season was 28 °C (8 September), and the season low temperature was -3°C (11 November). Wind speeds were relatively mild (0-10 kph) most days, though on 10 days speeds >20kph were recorded. Winds were highly variable in direction, but rarely came out of the east.

We had poor visibility 30 days this season, compared to only 11 days with poor visibility in 2011. Smoke from wildfires in the region accumulated in the Bitterroot Valley and persisted for weeks. We believe the presence of smoke limited our ability to detect passing migrants, and may have even caused migrants to circumvent the region.

General Raptor Migration Summary

We recorded 2,375 migrating raptors (Figure 1). This total compares to 2,163 in the fall of 2011. Our peak daily accounts occurred late in the season, compared to a mid-season peak in 2011. Our highest count day was 7 November, when 218 raptors passed overhead. Notable observations include the high counts of Red-tailed Hawks (766), Rough-legged Hawks (253), and Northern Harriers (203). Our count of 25 Broad-winged Hawks is surprising because this species does not breed or overwinter in Montana.

Figure 1: Total observations per day during 2011-2012 fall counts on the MPG Ranch.



Species Composition

We detected 17 species during fall 2012 counts. The five most abundant species counted included: Red-tailed Hawk (766), Sharp-shinned Hawk (377), Rough-legged Hawk (253), Northern Harrier (203), and American Kestrel (190) (Table 1).

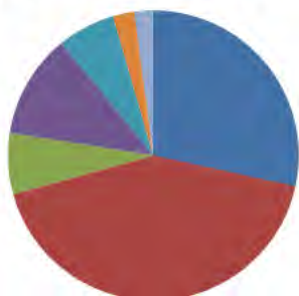
Table 1: Summary of raptors counted during fall 2012 on the MPG Ranch.

Group	Species	Fall 2012 Count
Eagles	Golden Eagle	91
	Bald Eagle	114
	Unknown Eagle	1
Accipiters	Sharp-shinned Hawk	377
	Cooper's Hawk	134
	Northern Goshawk	20
	Unknown Accipiter	27
Buteos	Red-tailed Hawk	766
	Rough-legged Hawk	253
	Swainson's Hawk	8
	Broad-winged Hawk	25
	Ferruginous Hawk	5
	Unknown Buteo	59
Falcons	American Kestrel	190
	Merlin	9
	Peregrine Falcon	8
	Prairie Falcon	11
	Unknown Falcon	1
Other	Northern Harrier	203
	Osprey	28
	Turkey Vulture	23
	Unknown Hawk	22

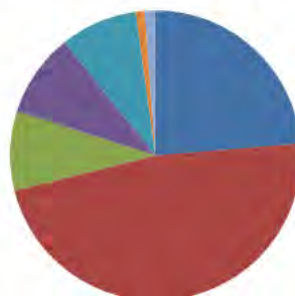
In 2012 we counted more buteos than any other group of raptor, similar to our observations in 2011 (Figure 2).

Figure 2: Percentage of raptors separated by group counted fall 2012 on the MPG Ranch.

Percent of Fall 2011 Total



Percent of Fall 2012 Total

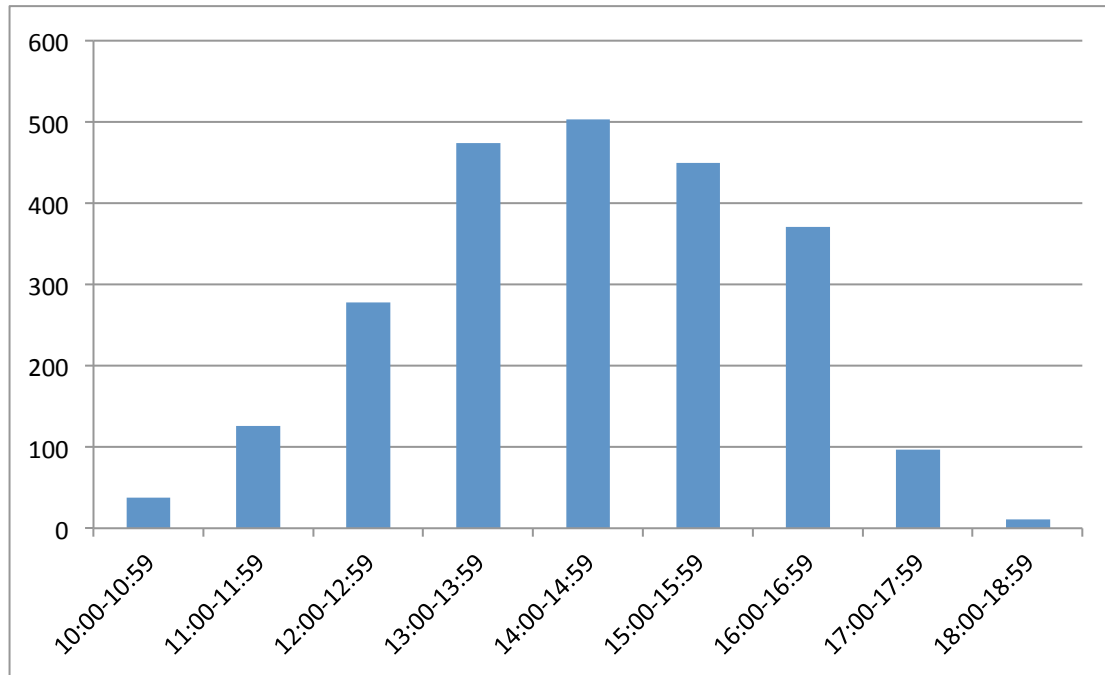


■ Accipiter
■ Buteo
■ Eagle
■ Falcon
■ Northern Harrier
■ Turkey Vulture
■ Osprey

Temporal Patterns of Raptor Migration

We counted proportionally few migrants before noon and after 5 P.M. each day. Over 60% of migrants passed between 1-4 P.M. (Figure 3).

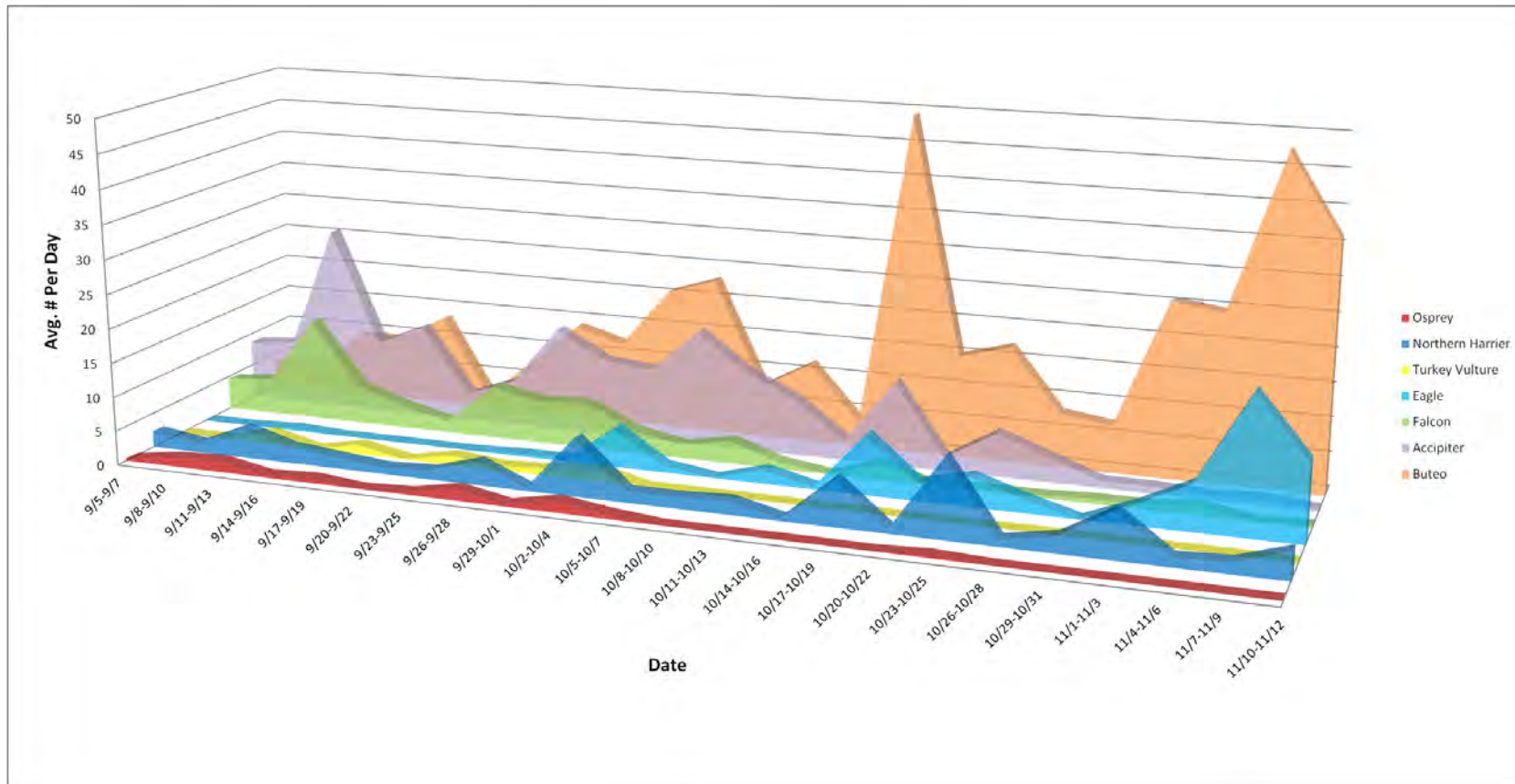
Figure 3: The number of raptors counted in one-hour intervals during 2012 fall migration at the MPG Ranch.



Seasonal Patterns of Raptor Migration

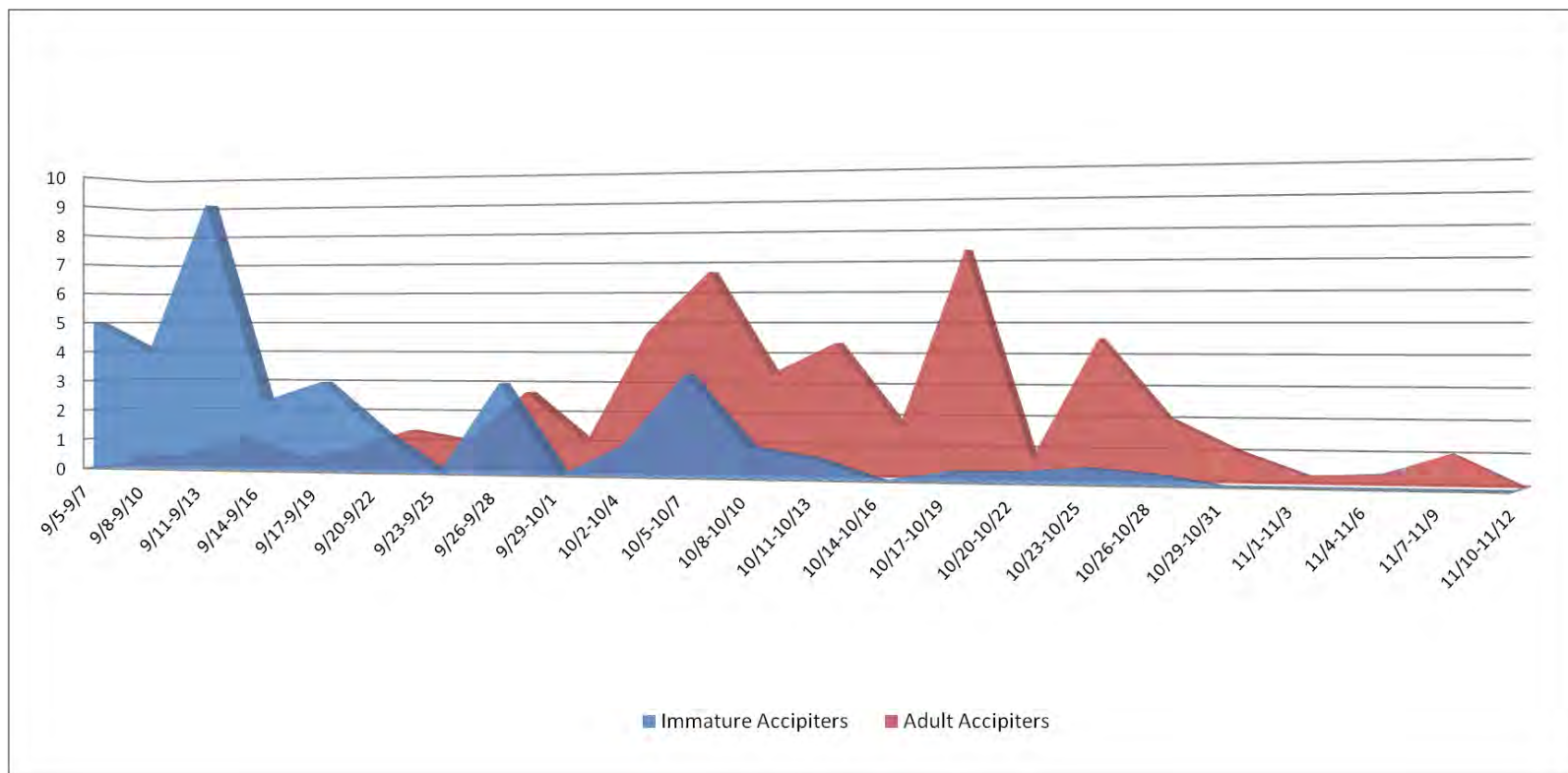
We observed temporal trends in migration patterns for all raptor groups. During the early part of the season we saw most of our Turkey Vultures and Osprey as well as high numbers of accipiters and falcons. We noticed our first eagles and an increase in the number of Northern Harriers and buteos during the middle of the season. The number of passing accipiters stayed fairly high until the end of October, while the number of falcons had sharply dropped by the middle of the month. This was due to a drop in the number of migrating American Kestrels, which made up over 85% of the total number of falcons. During the last few weeks of the count, the flight of accipiters had all but disappeared, and we started to see an increase in the number of passing eagles. Northern Harriers continued to trickle by and the number of buteos, the most counted group since mid-October, continued to rise. At the end of the season our count was comprised almost entirely of buteos and eagles (Figure 4).

Figure 4: Seasonal patterns of raptor migration during fall 2012 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.



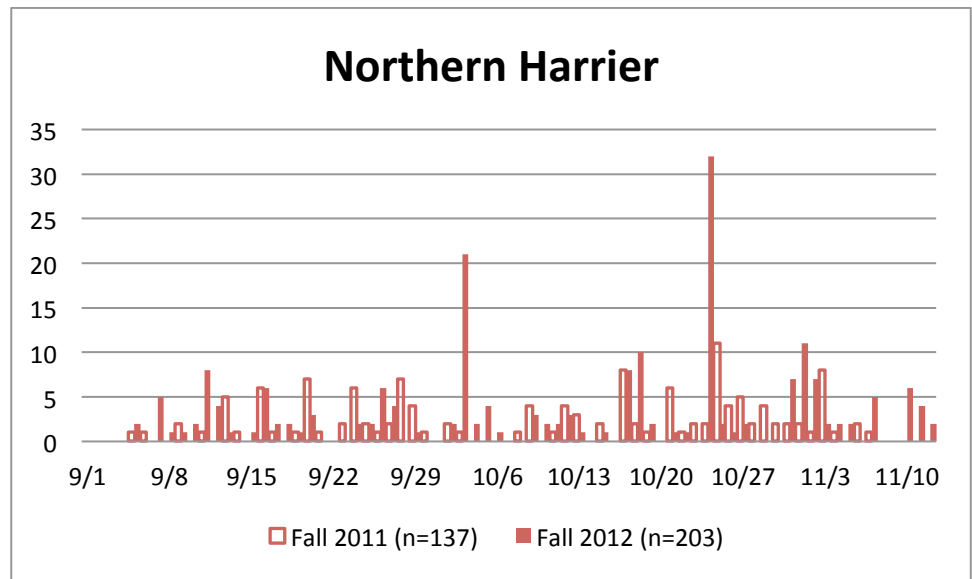
The results of other migration studies suggest that younger birds tend to migrate earlier than older birds. As a group, accipiters are relatively easy to age and migrate in large enough numbers to detect temporal and demographic patterns. We observed more immature accipiters migrating early in the season and more adult accipiters migrating later in the season (Figure 5).

Figure 5: Seasonal Patterns of accipiter migration during fall 2012 at the MPG Ranch separated by age.
For illustrative purposes, numbers of detections were averaged over three day periods to minimize the effect of day-to-day variability.

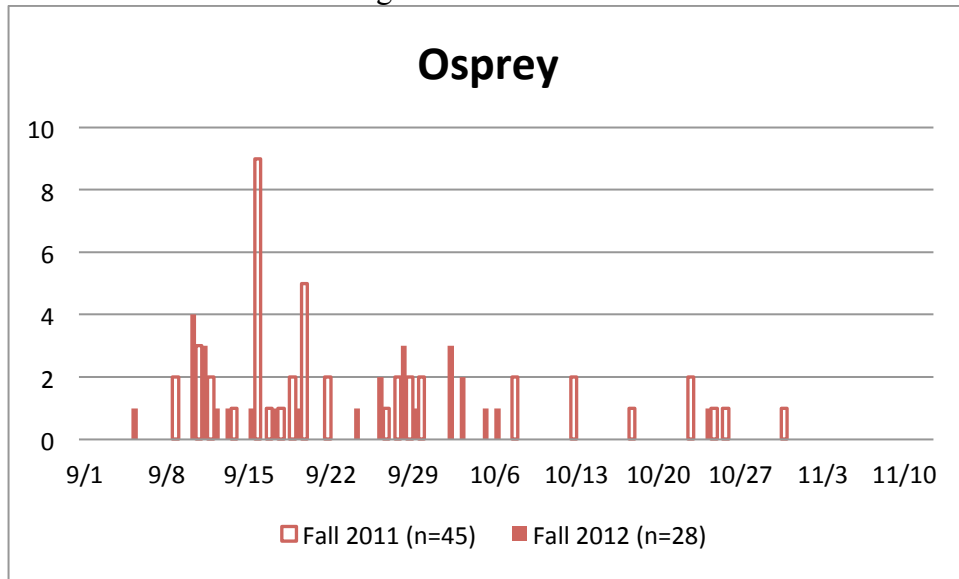


Species Accounts

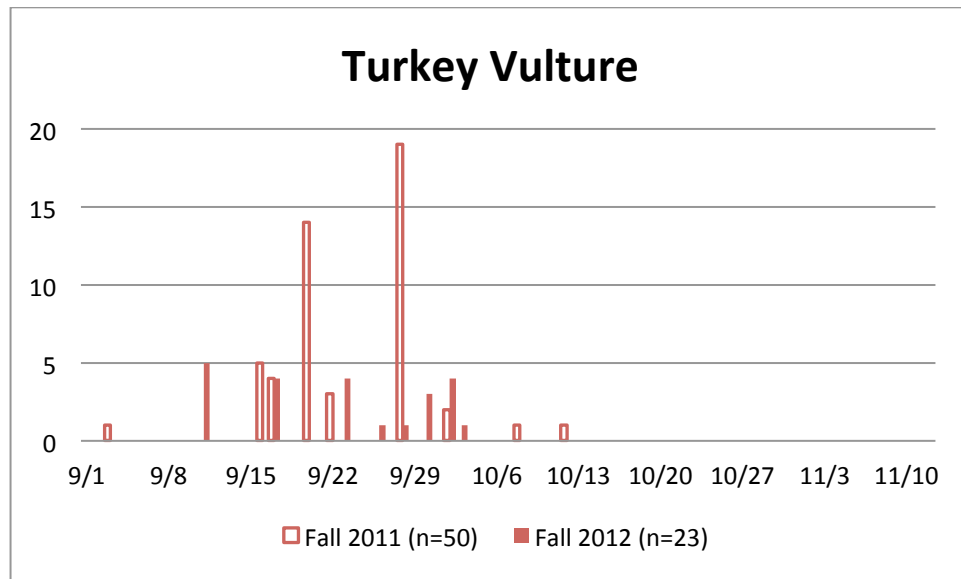
Northern Harrier (NH): Northern Harriers migrated throughout the season, with a few days of extremely high numbers (e.g., 24 October with 32). We observed more Northern Harriers in 2012 compared to 2011 (203 vs. 137), which may partially result from our extended season and the increased use of the lower elevation Indian Ridge site (112 Northern Harriers were counted at the Indian Ridge site compared to 91 at the high site).



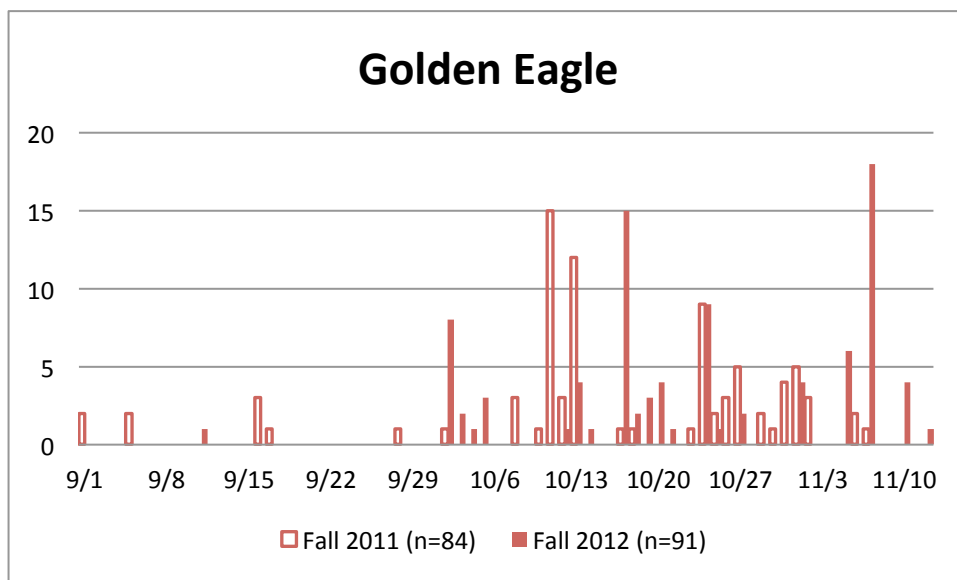
Osprey (OS): Osprey head south relatively early compared to other species, with most migrating in mid- and late September. We counted 28 Osprey from 5 September to 24 October, compared to 45 in 2011. We observed only one Osprey after the first week of October, suggesting that most migrated out of our region during September. All eight Osprey from the ranch outfitted with GPS transmitters migrated south during September. The first to leave was an adult female on 1 September while the last was an adult male on 30 September. We observed far fewer Ospreys during fall migration compared to spring migration (114 counted spring 2012). It is unclear why this difference between seasons is so large.



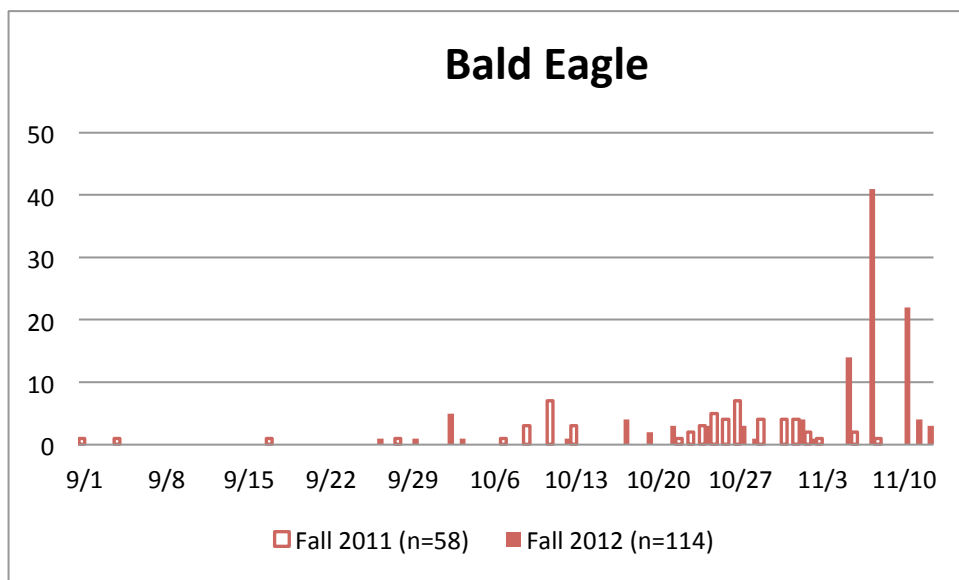
Turkey Vulture (TV): Like Osprey, Turkey Vultures migrated relatively early, with most observations occurring in mid- to late September. We counted 23 Turkey Vultures from 11 September to 3 October, about half of the total we observed in 2011 (50). We believe smoke inhibited our ability to detect migrating Turkey Vultures, many of which migrate out over the central Bitterroot Valley.



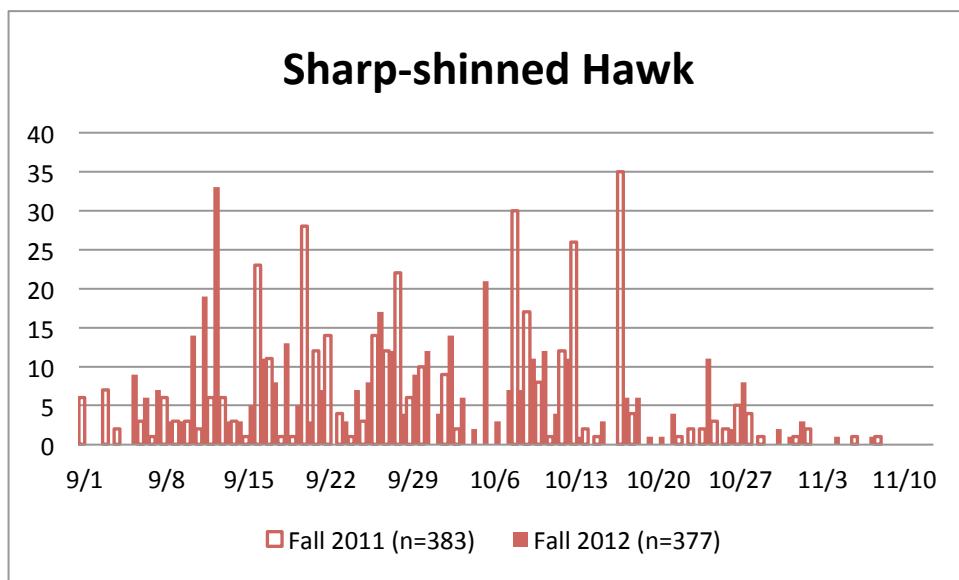
Golden Eagle (GE): We counted 91 Golden Eagles from 11 September to 12 November, compared to 84 in 2011. Day-high counts were 18 and 15, occurring on 7 November and 17 October respectively. Golden Eagles are late-season migrants, as the 7 November peak day indicates. Our transmitter data show the two MPG Ranch Golden Eagles returning to the Bitterroot Valley around 10 November, suggesting that Golden Eagle migration likely extends later than we currently count.



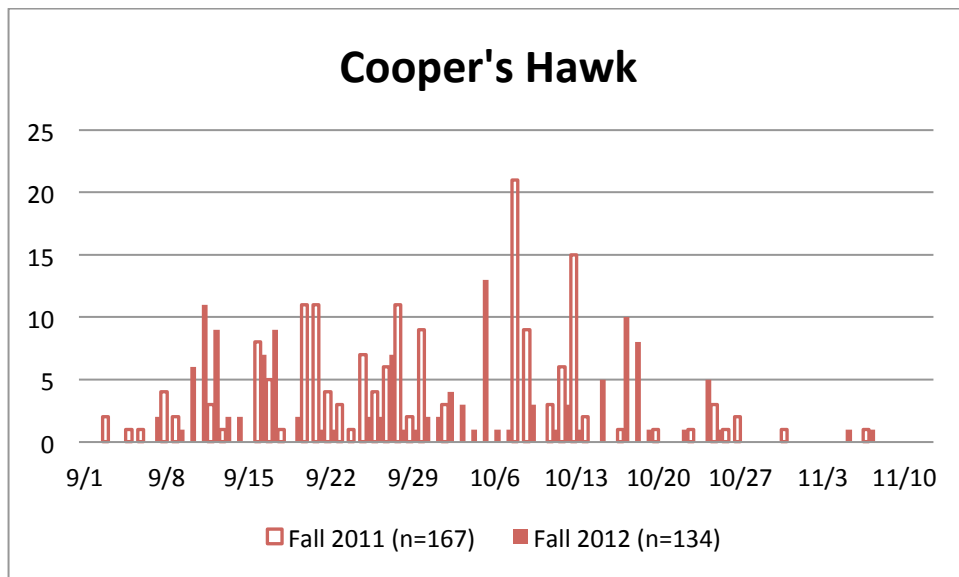
Bald Eagle (BE): Like Golden Eagles, Bald Eagles migrate relatively late. We counted 114 Bald Eagles from 26 September to 12 November. We counted 89 in November, with a day-high count of 41 on 7 November. We extended the count later into November this year; this extension explains the much greater number observed in 2012 compared to 2011 (114 vs. 58). Our data suggest that the Bald Eagle migration was likely just beginning when our observations ended. We may try to count even later next year to capture the entire Bald Eagle migration.



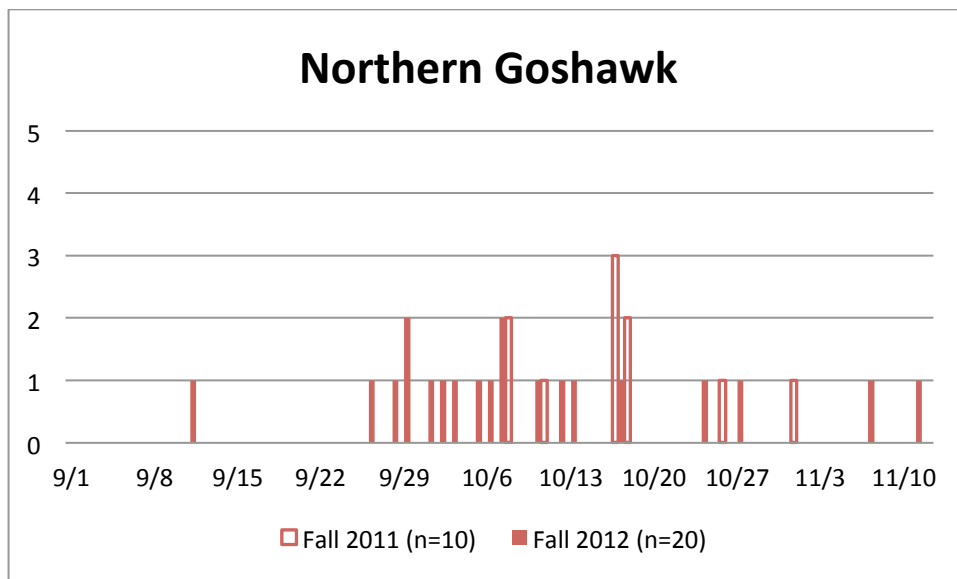
Sharp-shinned Hawk (SS): Sharp-shinned Hawks were second to the Red-tailed Hawk for the most observed species this fall. We counted 377 Sharp-shinned Hawks from 5 September to 7 November, compared to 383 in 2011. We observed most Sharp-shinned Hawks early in the season, counting 244 in September. The daily high occurred on 12 September when we recorded 33 individuals. Though we counted relatively similar numbers in 2011 and 2012 (383 and 377), Sharp-shinned Hawks appeared to migrate approximately one week earlier this year.



Cooper's Hawk (CH): We counted 134 Cooper's Hawks between 7 September and 7 November, compared to 167 in 2011. The day-high count occurred on 5 October with 13, compared to 2011's day-high of 21 on 8 October. We saw relatively similar numbers of Cooper's Hawks this year compared to 2011 (167).

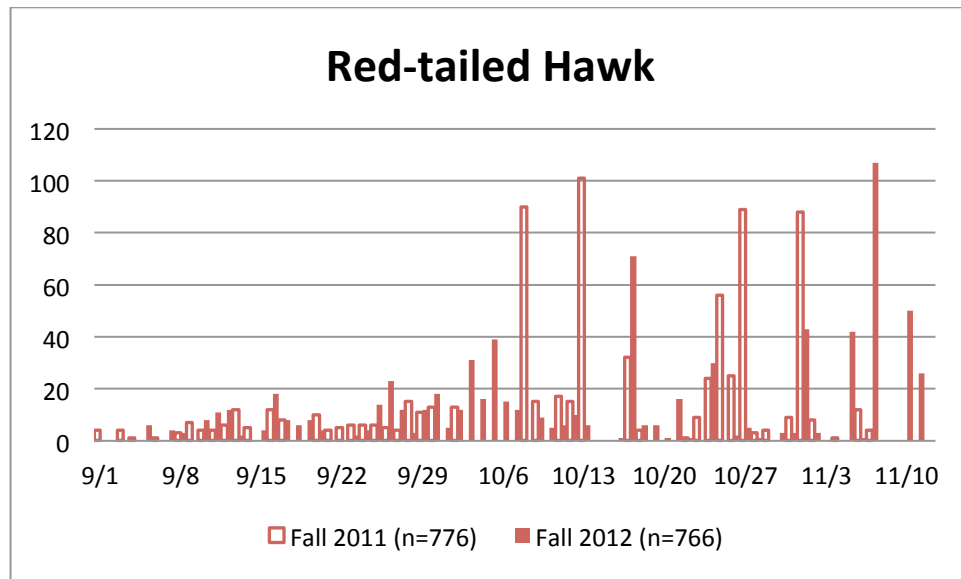


Northern Goshawk (NG): We counted 20 Northern Goshawks this season; five in September, 13 in October, and two in November. This total is double the count from 2011. The nearby trapping station and its associated pigeon lures may partially explain the increase in Northern Goshawk observations. Northern Goshawks generally do not disperse more than 300 km from their natal/nesting grounds and are infrequently detected at raptor migration sites.

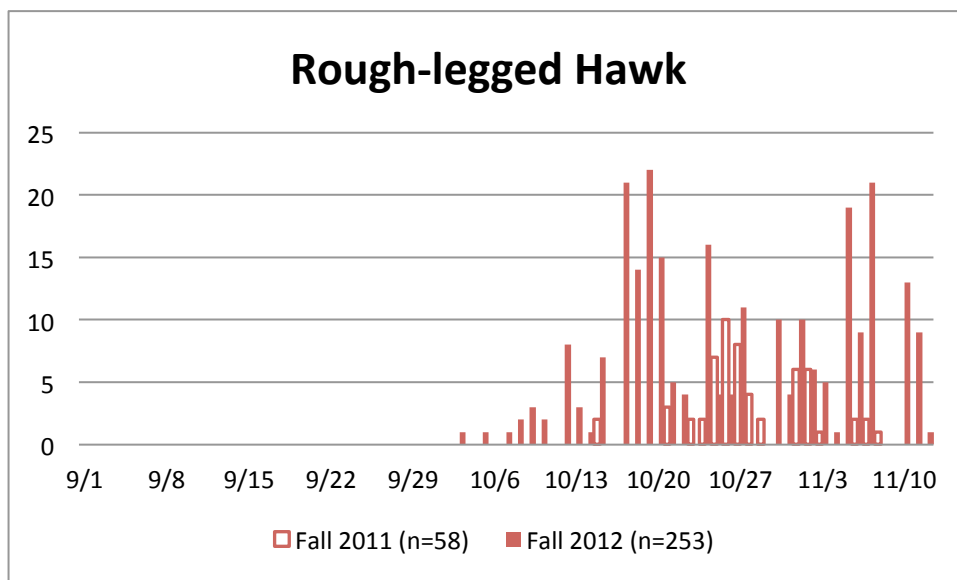


Red-tailed Hawk (RT): We observed migrating Red-tailed Hawks throughout the season, although numbers really increased in early October. We counted 766 Red-tailed Hawks, remarkably similar to the 776 we counted in 2011. We had 182 in September, 312 in October and 272 in November. The peak day occurred on 7 November, when we counted 107, compared with our single day high of 101 on 13 October in 2011.

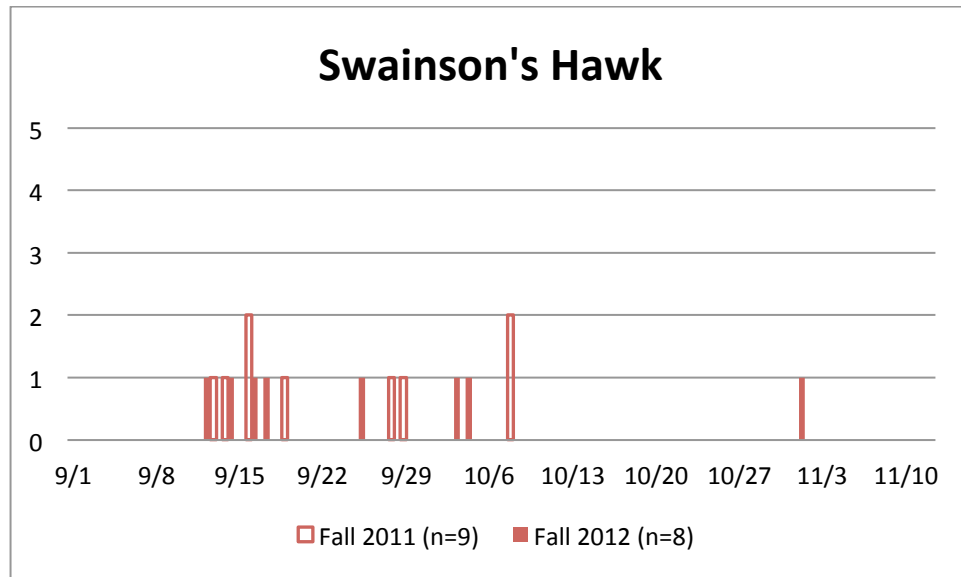
We often observed groups of Red-Tailed Hawks rising on scattered thermals in the Bitterroot Valley during days with north winds and stormy conditions. Our high Red-tailed Hawk counts at the end of the season suggest that their migration may continue later than we thought.



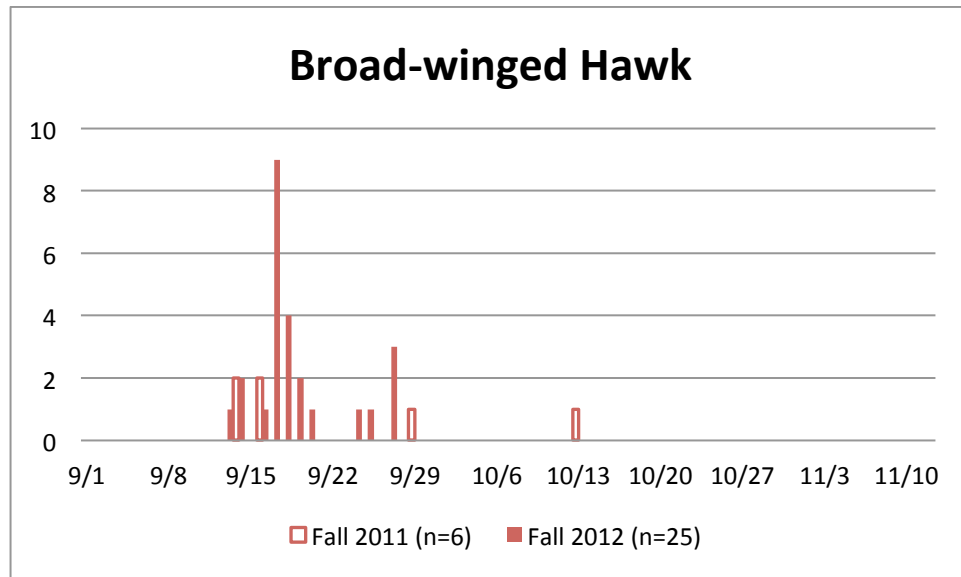
Rough-legged Hawk (RL): We counted 253 Rough-legged Hawks from 3 October through 12 November. This is more than four times that of our 2011 total of 58. The peak day this season was 19 October with 22 counted; our peak day in 2011 was 22 October with 10 counted. Nora Ridge had 231 from 27 September through 30 October. Jewel Basin counted 14 for the season. Bridger 42. With only two seasons of observations, it difficult to speculate why we saw such a difference in count totals between years and count sites.



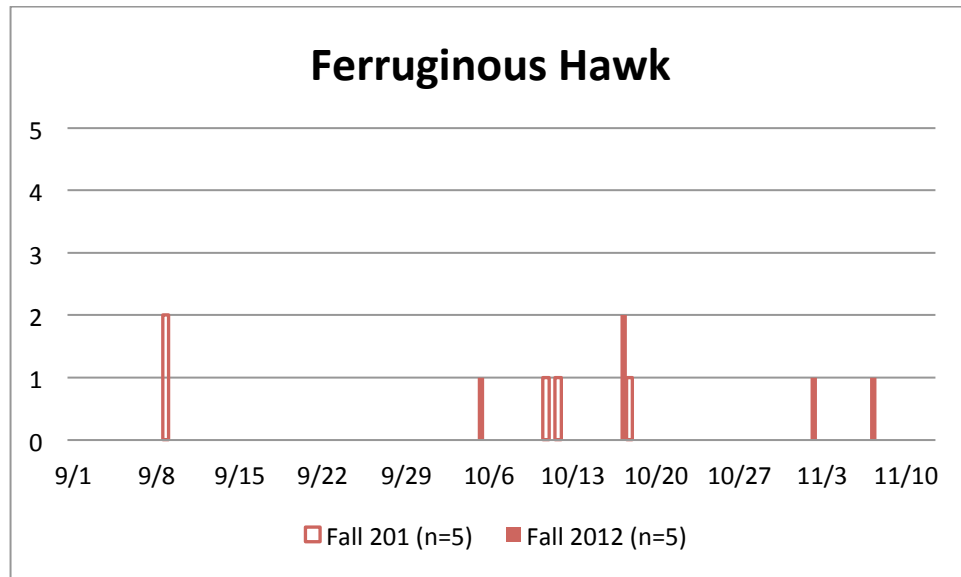
Swainson's Hawk (SW): We counted eight Swainson's Hawks between 12 September and 1 November. A total of nine were counted in 2011. Swainson's Hawks prefer open grassland habitats for breeding and are generally uncommon in the inter-mountain areas of western Montana.



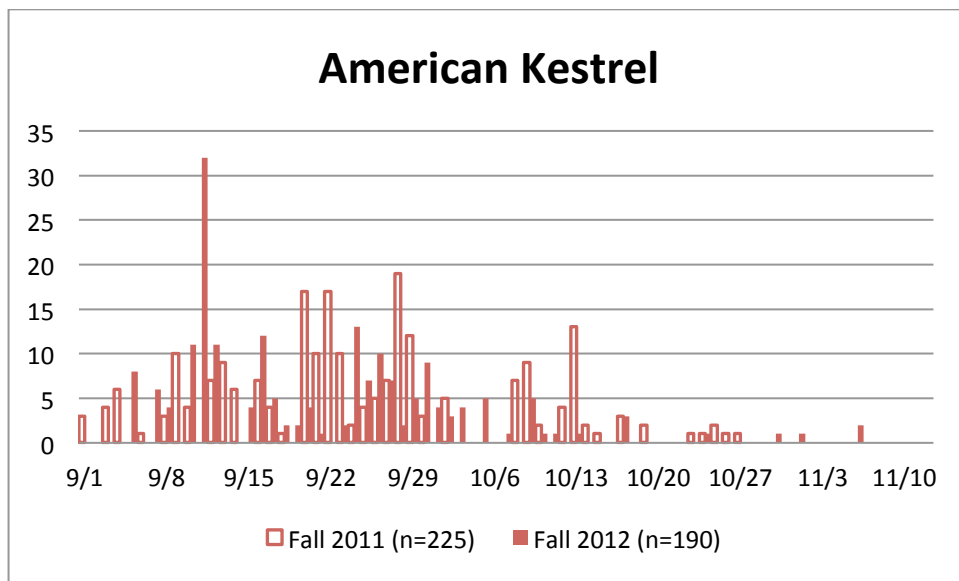
Broad-winged Hawk (BW): We counted 25 Broad-winged Hawks from 15-27 September, compared to only 6 in 2011. A day high of nine was recorded on 17 September.



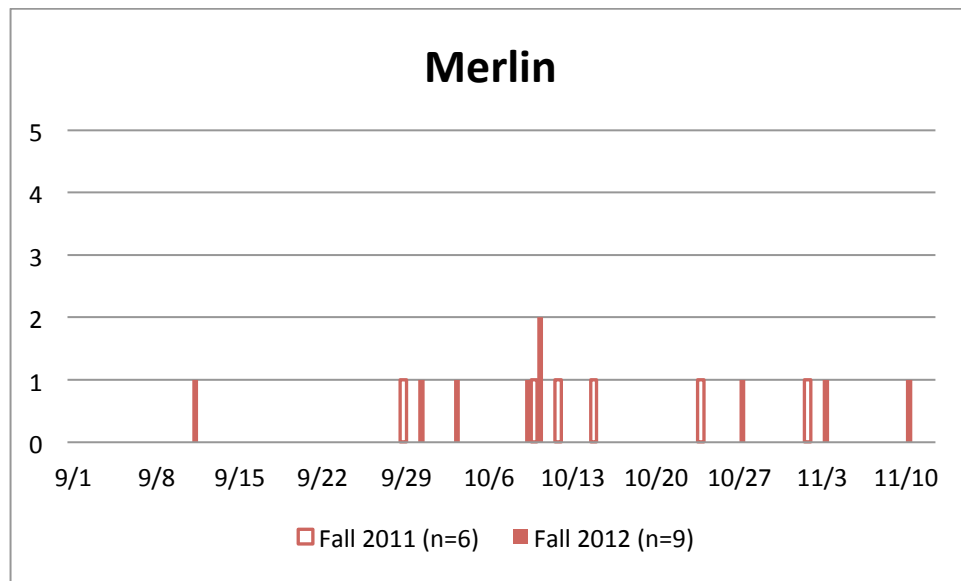
Ferruginous Hawk (FH): We saw five Ferruginous Hawks from 5 October to 7 November. Five were also counted in 2011. Ferruginous Hawks breed in open habitats east of the Continental Divide in Montana. Ferruginous Hawks are uncommon at most count sites, and little is known of their migration ecology.



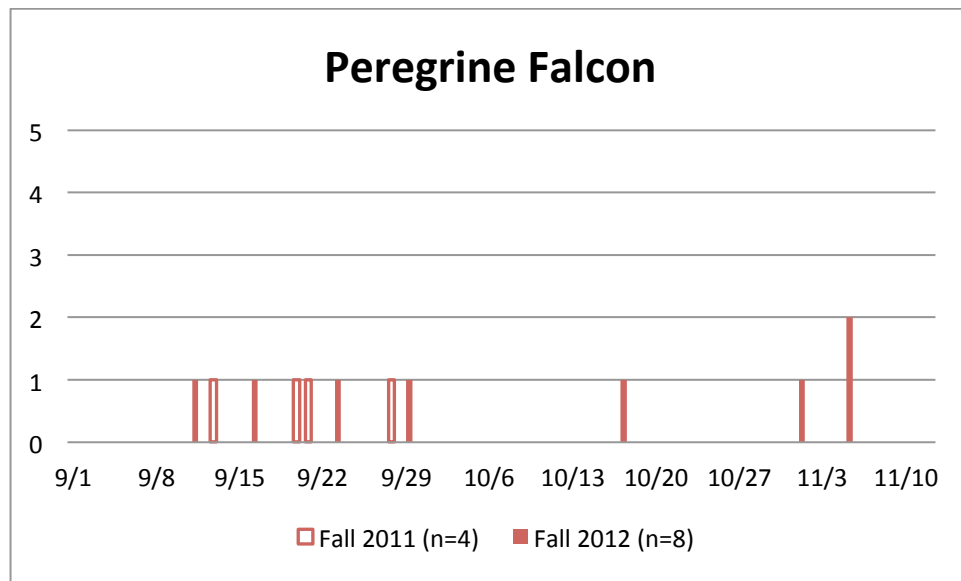
American Kestrel (AK): We counted 190 American Kestrels from 5 September through 6 November and they represent our fifth most-counted species. We counted slightly fewer American Kestrels in 2012 compared to 2011 (190 vs. 225), though our daily high count in 2012 was much higher (32 on 11 September). American Kestrel migration ended relatively early in the season, with just a few individuals migrating past mid-October.



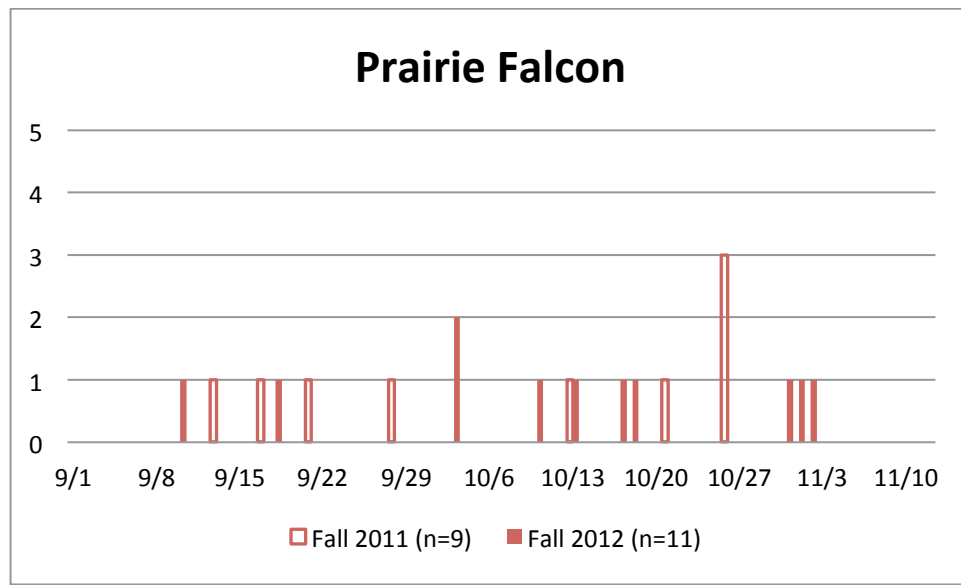
Merlin (ML): We counted 9 Merlins from 11 September through 10 November. We counted 6 Merlins in 2011. Merlins are uncommon at most count sites, with the exception the coastal sites where hundreds can be observed in a season.



Peregrine Falcon (PF): We counted 8 Peregrine Falcons from 11 September through 5 November. We observed 4 in 2011. Like Merlins, these large falcons are relatively rare to all but the coastal count sites.



Prairie Falcon (PR): We recorded 11 Prairie Falcons this year, similar to our count of 9 in 2011. We counted 2 in September, 7 in October, and 2 in November. This interior western U.S. species is uncommon to all count sites.



Comparison Between Raptor Count Sites

Raptor counts took place at four sites in Montana during fall of 2012, though sites differed in start and end dates and overall effort (Table 2). We should note that the Nora Ridge count started unusually late, with counting biased towards the expected peak migration for Golden Eagles. Therefore, we hesitate to use data from this site in a comparative analysis, but present it here for general interest.

Though the number of birds counted per observation hour is lowest at the MPG Ranch, we believe part of this pattern is due to the fact that we counted longer into November, when the overall number of birds migrating decreased but numbers for some species (e.g. eagles, Rough-legged Hawks, and Red-tailed Hawks), remained high.

As in 2011, we observed major differences in species composition between the four raptor count sites in Montana (Table 2, Figure 3). We counted relatively high numbers of Red-tailed Hawks, Turkey Vultures, Osprey, and Northern Harriers at the MPG Ranch. We counted relatively low numbers of Golden Eagles. Though our season extended longer than the others in Montana, we counted relatively high numbers of eagles and buteos in even the final days. It is unclear how much larger our seasonal count total would have been if we had counted later; we recommend a margin of flexibility in the end date of future seasons.

Grouping observations by raptor type highlights the differences between the raptor count sites, with the MPG Ranch counting proportionally the most buteos, the Bridgers counting the most eagles, and Jewel Basin counting the most accipiters (Figure 6).

Figure 6: Comparison of raptor observations between the MPG Ranch, Bridger Mountains, and Jewel Basin during the 2012 fall migration.

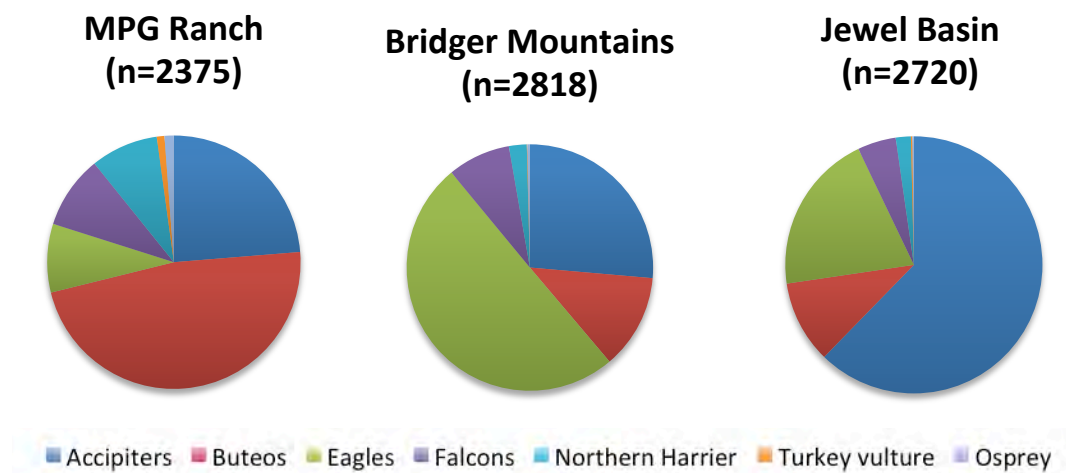


Table 2: Summary of fall 2012 count data and survey effort from four raptor count sites in Montana.

	MPG Ranch	Bridgers	Jewel Basin	Nora
Start date	5-Sep	1-Sep	25-Aug	25-Sep
End date	12-Nov	5-Nov	3-Nov	30-Oct
Observation days	69	58	48	33
Observation hours	417	414.38	327.2	197
Birds/observation hour	5.7	6.8	8.3	9.4
Turkey Vulture	23	2	5	3
Osprey	28	9	5	5
Northern Harrier	203	64	51	38
Sharp-shinned Hawk	377	452	1142	281
Cooper's Hawk	134	180	427	54
Northern Goshawk	20	33	27	21
Unknown accipiter	27	58	79	13
Broad-winged Hawk	25	37	17	13
Swainson's Hawk	8	8	1	0
Red-tailed Hawk	766	238	225	144
Ferruginous Hawk	5	4	1	6
Rough-legged Hawk	253	42	14	231
Unidentified buteo	59	12	21	6
Golden Eagle	91	1272	502	974
Bald Eagle	114	92	39	11
Unidentified eagle	1	12	3	0
American Kestrel	190	147	74	17
Merlin	9	16	20	13
Prairie Falcon	11	16	6	1
Peregrine Falcon	8	34	22	5
Gyr Falcon	0	0	0	0
Unknown falcon	1	13	8	0
Unidentified raptor	22	77	31	23
Grand Total	2375	2818	2720	1859

Fall 2012 Trapping and Banding Results

In 2012, we conducted our first full season, fall banding effort on the MPG Ranch. We constructed a blind on West Baldy Ridge from which we operated three bownets of various sizes. Each bownet had a non-native lure bird (Rock Dove, European Starling, or House Sparrow) which we used to attract passing raptors. As raptors attempted to capture the lure birds, they became entangled in surrounding mist nets or were manually captured in a bownet. Trapping was conducted by Adam Shreading, William Blake, and Tyler Veto.

We banded from 7 September to 30 October and captured a total of 63 individuals of ten different species including a Northern Pygmy-Owl and five Northern Goshawks (Table 3). Our most numerous species captured was the Sharp-shinned Hawk.

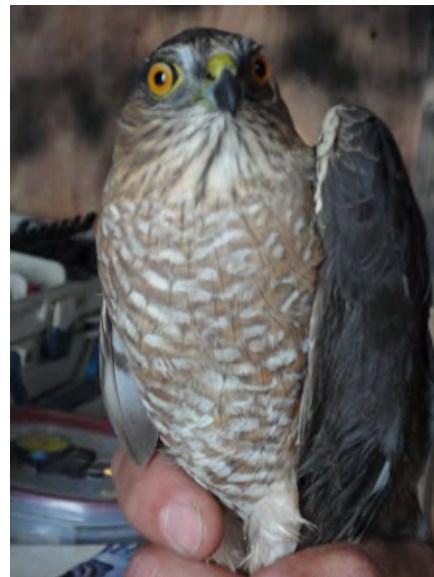


Table 3: Number of raptors captured during fall migration 2011-2012.

Species	Fall 2011	Fall 2012
Golden Eagle	1	0
Sharp-shinned Hawk	10	34
Cooper's Hawk	7	5
Northern Goshawk	0	5
Red-tailed Hawk	4	6
Rough-legged Hawk	0	3
American Kestrel	0	4
Peregrine Falcon	0	2
Prairie Falcon	1	1
Northern Harrier	1	2
Northern Pygmy Owl	0	1
Total:	24	63

We consider these trapping efforts as a tremendous improvement from our pilot efforts in the fall of 2011 where we banded 24 migrants. The location of our new banding station was planned using anecdotal observations of common flightpaths from the previous season. Additionally, we altered the spacing and placement of our nets, which we believe improved the rate of responses from passing raptors.

Summary

This fall's count was similar in total number of migrants to fall 2011, though our peak came a few weeks later. Totals for individual species were similar between years for many species, though we noticed large increases in the numbers of Northern Harriers, Bald Eagles, and Rough-legged Hawks, and large decreases in the numbers of Turkey Vultures and Ospreys. Because our count has only been conducted for two years, it is difficult to determine why these differences between years exist.

Our total flight volume was comparable to other migration counts in Montana, though we observed a much higher species diversity. Based on high late-season counts for several species (e.g. Bald Eagle, Golden Eagle, Red-tailed Hawk, and Rough-legged Hawk), we believe we should extend the count season later into November in future years.

Our trapping site was most effective on days with favorable thermals when migrants passed near the peaks of the Baldy Mountain Complex. We believe adding an additional, lower trapping blind in future seasons would allow us to catch birds passing over the ranch at lower elevations.