

# 2016 Autumn Raptor Migration Summary

## Laurie Goodrich

Easterly winds in September 2016 funneled Broad-winged Hawks to the Appalachians, leaving several southeastern Pennsylvania watchsites wanting more. A dearth of strong cold fronts reduced October's usual parade of migrants at most sites and may have contributed to below-average statewide counts for Sharp-shinned and Cooper's Hawks, Osprey, and American Kestrel. Despite the lackluster winds and the warmer-than-normal temperatures through October and November, Red-shouldered and Red-tailed Hawk counts were near average statewide.

Pennsylvania's 13 watchsites recorded 112,222 raptors in 1170 days and 8104 hours of counting between 1 August and January 2017, a rate of 13.9 hawks per hour statewide. Total raptors were 22% higher than in 2015 but 9% below the ten-year average for the state (Table 1). Count effort was 8% above-average and included the return of Bucktoe Creek Preserve of Chester County to the watch-site line-up, but there was no report from the Pipersville Broad-winged Hawk watch and the Tuscarora Summit watch was again not conducted.

Several kites were sighted during September, including 3 Mississippi Kites: an immature at Bake Oven Knob on 16 August, an adult at Militia Hill on 24 September, and a probable adult at Rose Tree Park on 7 September. A Swallow-tailed Kite was seen by several observers at Allegheny Front on 6 September.

Four species showed above-average counts statewide. Bald and Golden Eagles, were up 45% and 6% respectively, with 3028 Bald Eagles and 1101 Golden Eagles counted. The Red-shouldered Hawk count was 1179 and Merlins totaled 713, both up 7% statewide (Table 1). The Bald Eagle total represented a new record and their abundance brings a new challenge for watchsites, separating migrants from residents.

Below-average counts were tallied for 10 of 16 regularly recorded species. Two open-habitat species that have shown widespread declines in the region were recorded in low numbers in 2016 - Northern Harrier, with 709 counted statewide, and American Kestrel, with 1410 counted (Table 1, Figure 1). The statewide counts were 31% and 25% below the 10-year averages respectively, and for harriers the total was the lowest ever recorded in the state (Table 1). The Osprey tally was 1987, down 24% compared to the 10-year average and the second-lowest count ever. All three accipiters were low: Sharp-shinned Hawk (18,149), down 31%; Cooper's Hawk (2154), down 26%; and Northern Goshawk (145), down 13% (Table 1). Decreases in Osprey sightings correspond to patterns shown at most eastern flyway watchsites where

significant declines were documented during the last decade (see [www.rpi-project.org](http://www.rpi-project.org)). This decline in migrants is in contrast to a growing nesting population within the state.

An interesting Osprey observation occurred this autumn, giving a clue to nesting locations of Ospreys counted during the autumn season Pennsylvania's watches. Dr. Rob Bierregaard reported the pathway of a satellite-tagged adult male from a nest in northern New Hampshire in summer 2016. "Wausau" left his nest territory on 4 September and the next day entered eastern Pennsylvania, flying south along the Delaware River to the Kittatinny Ridge near Delaware Water Gap and then turning to follow the Ridge southwest. He went to roost that evening on the Kittatinny Ridge near Route 309 in Lehigh County, just west of Bake Oven Knob and east of Hawk Mountain. (R. Bierregaard, pers. Comm.). Although the transmitter was not on in early morning, Dr. Bierregaard reports Wausau was aloft early on the 6th and may have passed by Hawk Mountain where a lone Osprey was recorded just before 7 am that morning on steady northwest winds. His transmitter indicates he flew southwest off the Ridge possibly just west of Hawk Mountain between 8 am and 9 am as his location was north of Lancaster at 9 am and he soon exited Pennsylvania to fly south past Baltimore. To see his entire journey and other eastern Osprey tracks for 2016 visit *Ospreytrax* website (<http://www.ospreytrax.com>).

**Allegheny Front (Somerset and Bedford Counties)** - Watchers at Allegheny Front tallied an above-average 8764 hawks in 813 hours and 105 days of counting between mid-August and mid-December 2016 (Table 1). Mid-September brought several days of over 1000 Broad-winged Hawks, with the largest one-day count of 1079 on 17 September

(Table 2). Moderate northeast winds on 6 September brought the rarest migrant for the fall when a Swallow-tailed Kite approached the site from the northwest and circled overhead three times before continuing south. What a cooperative bird!

The highest one-day count of Bald Eagles, 13, soared past on 25 September, helping bring the season's total of Bald Eagles to 136, the highest autumn count in recent history. In contrast, the Golden Eagle count of 138 was 30% below-average (Table 1). The largest one-day count of Golden Eagles for the autumn, 20, flew past on 1 November along with 44 Red-tailed Hawks, 18 Sharp-shinned Hawks, a single Bald Eagle, and 8 other raptors.

Above-average counts also were tallied for Broad-winged Hawk (5058), Sharp-shinned Hawk (1251), and Peregrine Falcon (39) (Table 1). A particularly great day for Peregrines occurred 5 October when 9 Peregrines and 3 Merlins zipped past. Below-average counts were observed for seven species, including Cooper's Hawk (118), 43% below the 10-year average and Red-shouldered Hawk (31), and 43% below average (Table 1).

**Bake Oven Knob (Lehigh County)** - Bake Oven Knob started the season with a flourish by recording one of the few Mississippi Kites to be spotted in 2016, an immature bird that hovered above the rocks giving watchers an excellent look on 16 August. A week later the Bake Oven counters tallied a peak Bald Eagle number of 23 on 22 August. The total raptors for autumn, 13,734, was slightly above the ten-year average of 13,371. Coverage hours (814) and days (105) were slightly above-average as well. Observers recorded the first large flight of Broad-wings, 1303, on 16 September and a peak flight of 1801 on 20 September (Table 2). Seven

**Table 2. Peak one-day migration counts for selected species.**

Site	Broad-winged Hawk		Bald Eagle	
	Count	Date	Count	Date
Allegheny Front	1,079	9/17	13	9/25
Bake Oven Knob	1,801	9/20	23	8/22
Bucktail Creek Pres	675	9/25	15	11/26
Council Cup	361	9/16	-	
Hawk Mountain	3,018	9/20	22	12/3
Jack's Mountain	910	9/21	9	9/11
Little Gap	3,389	9/20	22	8/25
Militia Hill	2,694	9/24	15	9/24
Rocky Ridge Park	1,181	9/21	4	10/22
Rose Tree Park	399	9/24	12	9/25
Second Mountain	2,665	9/16	12	Several
Stone Mountain	312	9/16	12	10/22
Waggoner's Gap	1,973	9/21	35	9/24

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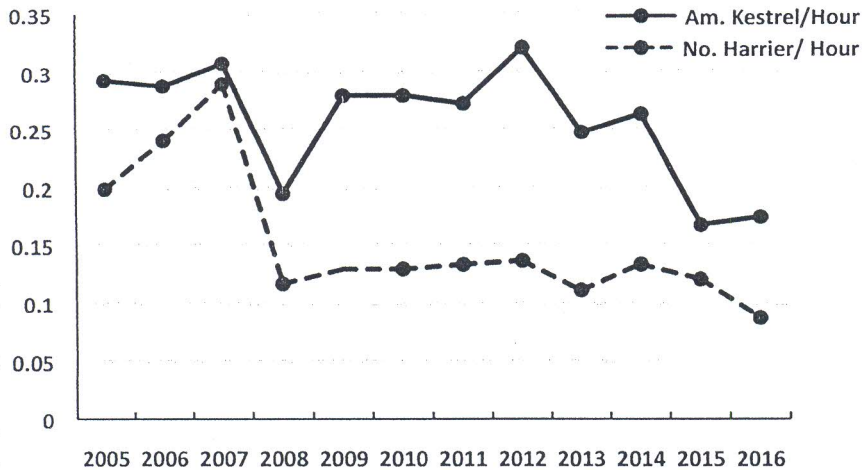
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Figure 1 Number of Autumn Migrants per Hour at Pennsylvania Watchsites



species were above-average, with the count of 352 Bald Eagles 41% above the ten-year average. Broad-winged Hawk (6477) and Red-tailed Hawk (2144) were 20% and 26% above-average, respectively (Table 1). Six species were below-average (Table 1), including Osprey (280), 34% below-average; Sharp-shinned Hawk (2111), 32% below-average; and American Kestrel (75), 50% below-average (Table 1).

**Bucktoe Creek Preserve (Chester County)** – Bucktoe Creek Preserve relaunched their autumn count in 2016, tallying 4266 hawks in 678 hours over 91 days from 1 September through 30 November. Their highest one-day count occurred 25 September with 625 Broad-wings (Table 2), 6 Bald Eagles, and 8 American Kestrels among 724 total raptors. The highest eagle days were 26 November with 15 Bald Eagles and 14 October with 2 Golden Eagles. Average counts for this site are based on three years of data in the last decade. Higher counts of Broad-wings were recorded in 2010 than 2016, but winds were not favorable for Broad-wings at southeastern watch-sites in 2016. Welcome back Bucktoe Creek Preserve! We are excited to have this site active again and look forward to reports in years to come.

**Council Cup (Luzerne County)** – The Council Cup site was covered for three days in September totaling 14 hours, a decline in coverage by more than 50% compared to prior years; not surprisingly, the total count of 369 raptors was also well below average (Table 1). The best day occurred on 16 September when compiler Donald Kapral recorded 361 Broad-winged Hawks, one Osprey, and one American Kestrel along with 8 non-migrating Bald Eagles. This northeast site near the Susquehanna River can have some interesting flights and is not a far drive for northeastern birdwatchers. If you have time to contribute, contact details for compiler can be found at

www.hawkcount.org in the site profile section.

**Hawk Mountain Sanctuary (Berks and Schuylkill counties)** – Hawk Mountain recorded 17,587 raptors between 15 August and 25 January, with 127 days and 1127 hours of counting. The total count was 7% below the ten-year average (Table 1). A new record was set for Bald Eagle with 489 tallied for the official season of 15 August to 15 December and 508 for entire season (Table 1). Above-average counts also were recorded for Turkey Vulture (595), 5% above average; Merlin (193) up 8%; and Broad-winged Hawk (9361), 19% above average (Table 1). Sharp-shinned Hawk (2958) and Cooper's Hawk (370) were 34% and 36% below average, respectively. The Osprey count (343) was down 29% and Northern Harrier (118) down 30%. Hawk Mountain's peak one-day count occurred on 20 September when 3018 Broad-winged Hawks were recorded along with 8 other species including 20 Sharp-shinned Hawks, 4 Bald Eagles, and 4 Ospreys. The highest one-day count for Bald Eagle came late in the year, when 22 Bald Eagles soared past on 3 December, along with 17 Red-tailed Hawks and one Golden Eagle. The highest count of Golden Eagles occurred 28 October, with 15, accompanied by 14 Bald Eagles and 146 Red-tailed Hawks.

**Jack's Mountain (Mifflin County)** – Jack's Mountain counters recorded 5029 raptors during 97 days and 600 hours of counting. The total raptor count was 18% above average, possibly because coverage has increased at the site in recent years; effort in 2016 was the highest since 2001. Most species were above-average, excepting the American Kestrel (35), which was 25% below the ten-year average (Table 1). Bald Eagles were seen regularly through the fall with a peak one-day count of 9 on 11 September and a season-record tally of 148. The Golden Eagle count of 144 was the

second-highest on record for the site, reaffirming the importance of this ridge for eagle migration. Northwest winds on 6 November brought the season's one-day peak for Golden Eagle, 17, including 16 adults and one immature.

**Little Gap (Northampton County)** – Counters at Little Gap recorded an above-average 14,322 hawks with 104 days and 696 hours of counting. The count was 5% above the ten-year average of 13,693 hawks (Table 1). Little Gap set a new season-record for Bald Eagle, 335, with a one-day peak count of 22 on 22 August (Table 1, 2). Seven other species showed above-average counts including Black Vulture, Turkey Vulture, Broad-winged Hawk, Red-tailed Hawk, The American Kestrel upswing counted at this site, 209 compared to the average of 181, was in contrast to below-average counts observed at many sites (Table 1). Below-average counts were recorded for Osprey (211), down 37%; Sharp-shinned Hawk (2271), down 28%; and Cooper's Hawk, (268), down 21% (Table 1). September 20 brought the highest one-day count for the season and the highest one-day total for Broad-winged Hawks statewide, 3389 (Table 2). Counters were kept busy after the morning fog lifted, sighting many close kettles. The next day, 21 September, 1606 Broad-winged Hawks were counted plus 62 Sharp-shinned Hawks, 17 American Kestrels, 3 Merlins, and 3 Peregrine Falcons, for the second-highest one-day count for the site.

**Militia Hill (Montgomery County)** – Watchers at Militia Hill counted 7553 raptors in 61 days and 446 hours of watching (Table 1). The total count was 44% below-average with most species below-average. One exception was Bald Eagle (114), which was 9% above average. The Broad-winged Hawk count of 5649 was 48% below the average of 10,765 (Table 1). The highest one-day count of Broad-winged Hawks was 2694, on 24 September, along with an impressive 42 Ospreys, 64 Sharp-shinned Hawks, 29 American Kestrels, and the season's one-day peak of 15 Bald Eagles (Table 2). One of the rarest migrants of the season also came on the 24th, an adult Mississippi Kite, observed gliding overhead through telescope and binoculars. The next day, 1492 Broad-wings and 10 Bald Eagles were sighted, contributing to the second-highest one-day count of the season, a total of 1543 raptors. The highest one-day count of Sharp-shinned Hawk, 50, was tallied on 9 October along with 7 Cooper's Hawks, 10 American Kestrels, 3 Red-shouldered Hawks, 3 Merlins, 3 Ospreys, 2 Bald Eagles, and one Peregrine Falcon.

**Rocky Ridge (York County)** – Counters at the part-time watch in Rocky Ridge Park tallied 3945 hawks in 98 hours on 21 days from 24 August to 26 October. The total count was 86% above-average - primarily

due to above-average numbers of Broad-winged Hawks (3496), 71% above-average. Rocky Ridge tallied 2 days of Broad-winged Hawk counts above 1000 with 1041 on the 20th and 1181 on the 21st, the highest one-day count for the season (Table 2). Counters also recorded 3 Ospreys, 2 Northern Harriers, 45 Sharp-shinned Hawks, and 10 American Kestrels on the 21st, bringing the one-day count to 1241. Above-average counts were observed for most species, except Bald Eagle (12), which was 75% below the ten-year average (Table 1).

**Rose Tree Park (Delaware County)** – Rose Tree Park recorded a below-average 2990 raptors during 79 days and 496 hours in autumn 2016 (Table 1). Total raptors were 51% below the ten-year average partly due to the low Broad-winged Hawk count (825), 76% below average. Rose Tree Park reported below-average counts for most raptors, except Black Vulture (75), 36% above-average (Table 1). The rarest migrant of the autumn, a Mississippi Kite, was observed for several minutes in late morning on 7 September, before it glided south.

Counters recorded a one-day peak count for Broad-winged Hawks (399) on 24 September along with 17 Ospreys, 5 American Kestrels, 5 Merlins, and 2 Peregrine Falcons. The following day brought the site's one-day peak count for Bald Eagle, 12, and another 287 Broadwings (Table 2). North to northeast winds on 3 October brought an exciting mid-autumn flight to Rose Tree Park including 113 Sharp-shinned Hawks, 75 Broad-winged Hawks, 37 American Kestrels, 19 Ospreys, 19 Cooper's Hawks, 8 Peregrine Falcons, and 7 Merlins, mostly during the afternoon. October 26 brought the highest count of Red-shouldered Hawks, 21; mostly adult birds and some appearing in small kettles with other raptors.

**Second Mountain (Lebanon County)** – Second Mountain recorded 9688 hawks in 137 days and 818 hours between 15 August and 31 December. The site set a new season record for Bald Eagle, 269, compared to the ten-year average of 182 (Table 1). Three other species were above-average including Black Vulture (520), up 46%; Broad-winged Hawk (5966), up 39%; and Golden Eagle (103), up 13% (Table 1). All other species except Turkey Vulture were below-average. The largest dip was seen for Sharp-shinned Hawk (1020), 53% below the ten-year average (Table 1). Second Mountain observers tallied their highest one-day Broad-winged Hawk count, 2665, on 16 September along with 10 Ospreys (Table 2). The peak one-day count of 12 Bald Eagles occurred on several different days in September and October including 20 September when the Bald Eagles were accompanied by an early adult Golden Eagle and 31 American Kestrels (Table 2). On 10 October, another 12 Bald Eagles were recorded, accompanied by 2 immature Golden Eagles and an impressive parade of 257 Turkey Vultures.

**Stone Mountain (Huntingdon County)** – Stone Mountain observers tallied 3608 migrating raptors during 88 days and 518 hours of counting (Table 1). Count effort for the site was the highest on record although the total number of migrating raptors was 11% below-average. The 166 Bald Eagles set a new record, with a one-day peak count of 12 on 22 October (Table 2). Broad-winged Hawk numbers were slightly low at 1519, compared to 1568 on average (Table 1). The highest one-day count for the site and highest count of Broad-winged Hawks occurred on 16 September when Stone Mountain counters tallied 312 Broad-winged Hawks, 6 Ospreys, 4 Bald Eagles, 4 Sharp-shinned Hawks, one Northern Harrier, and one Red-shouldered Hawk (Table 2). In contrast to some sites, watchers counted above-average numbers of Osprey, 84, compared to 74 on average (Table 1). Only 51 American Kestrels were recorded, 39% below the ten-year average. The count of 80 Cooper's Hawks was also low, 38% below average (Table 1). November 5 and 6 brought the best Golden Eagle days, with 15 and 10 recorded, respectively. The last significant flight of Golden Eagles, 11, sailed south on 22 November. The Golden Eagle total of 116 was near the ten-year average of 117.

**Waggoner's Gap (Cumberland County)** - Waggoner's Gap recorded 20,367 raptors in 138 days and 1023 hours from 1 August to 31 December. The total was 12% below the ten-year average of 23,272. Counters set a new season record for Bald Eagle, recording 576 compared to the prior record of 535. Counts of most species were lower than average, including American Kestrel (219), 28% below-average (Table 1). Season totals were buoyed by a great Broad-winged Hawk flight in September. With 9436 counted, Broad-winged Hawks were 18% above the ten-year average of 7971 (Table 1) and counters saw eight September days with greater than 500 birds. The highest one-day total occurred on 21 September, when 1973 Broad-wings moved through. The day before, 1740 sailed past the lookout, helping boost the season tally.

Waggoner's Gap watchers recorded the highest statewide one-day count of Bald Eagles on Sept 24 when 35 were tallied. A lone sub-adult Golden Eagle also was sighted that day. Accipiters were well below average with the lowest counts in more than 14 years (Table 1). Northwest winds on 10 October brought the highest one-day count of Sharp-shinned Hawks, 550, along with 27 Cooper's Hawks and 5 Golden Eagles. A Golden Eagle parade was enjoyed November 4, 5, and 6 when 28, 20, and 27 were tallied, respectively. Two Rough-legged Hawks, dark morphs, were sighted, one on 2 December and one on 10 December; however, the total was slightly below the ten-year average of 3.5 (Table 1).

## Conclusions

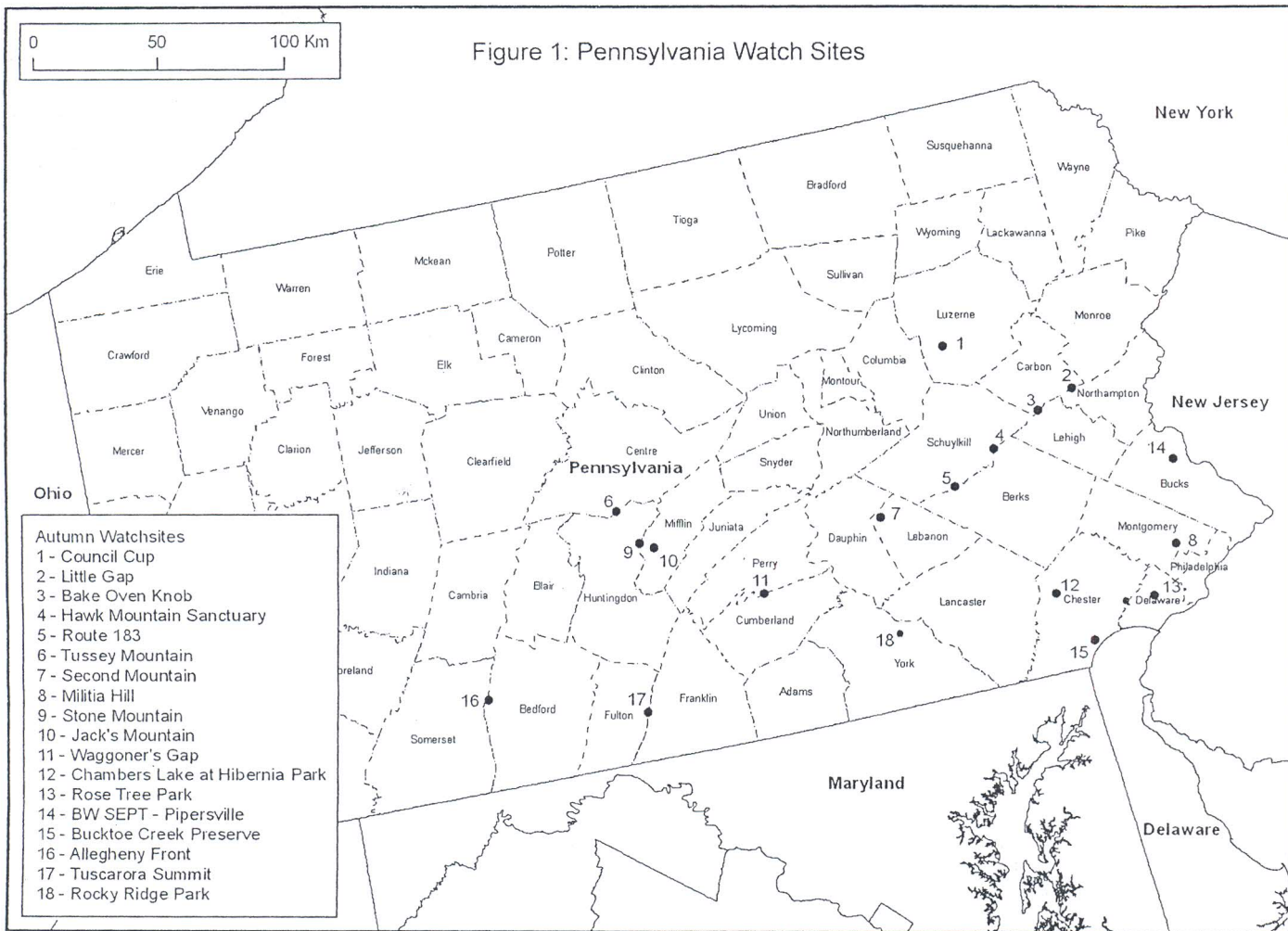
In 2106 we salute the element of change and flux in hawk migration counts. Pennsylvania may host more watch sites than most (all?) states or provinces in North America and therein fills a useful role in regional monitoring. The data collected from Pennsylvania watchsites, both where they coincide and where they differ, provide an index to the breadth of change in raptor populations across the continent. New records or above-average counts of Bald Eagles contrast with continued declines in field-nesting raptors, e.g. American Kestrel and Northern Harrier, and may also directly intersect with dips in Osprey numbers. The lower counts of Sharp-shinned and Cooper's Hawks (except note Waggoner's Gap) could signal changes in migration behavior or timing, as has been documented for Red-tailed Hawk in recent years. Further monitoring and research will clarify the pattern and its' possible source - having the data collected and archived by Pennsylvania hawkwatchers is essential to our understanding.

## Acknowledgements

I thank Pennsylvania's hawk counters for their many hours of counting, as well as the site compilers for organizing the data and sharing their results. Data was provided by [www.hawkcount.org](http://www.hawkcount.org) with permission of site compilers, a website maintained by the Hawk Migration Association of North America and managed by Jason Sodergren, database manager. Locations of sites and daily counts can be viewed at HMANA's [www.hawkcount.org](http://www.hawkcount.org) site. I thank David Barber for the site map and Grace Auld for her assistance with tables. This is Hawk Mountain Sanctuary contribution number 272.

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Figure 1: Pennsylvania Watch Sites



We must sadly report that the hawk watch community has lost two long-time hawk watchers from the Jacks Mt. site in Mifflin County. Ron Singer was the compiler for decades, watching and counting raptors at Jacks since 1975. Ron passed away March 5 of complications following surgery. Gloria Bickel began joining Ron and the other Jacks counters around 1992, becoming one of the leading reporters from the site. Gloria died this past November 19. The work of Ron and Gloria at Jack's added substantially to our knowledge of raptor migration through Appalachians and they will be greatly missed by Pennsylvania birders. Our condolences to his family, friends, and fellow Jack's Mountain watchers.  
 ---- Laurie Goodrich and Greg Grove

TABLE 1. AUTUMN WATCH SITES IN PENNSYLVANIA

Table 1. Autumn 2016 count results for Pennsylvania watchsites.

**ALLEGHENY FRONT (Bedford/Somerset) - Bob Stewart, compiler**

Month	Days	Hours	BLVU	TUVU	OSPR	BAEA	NOHA	SSHA	COHA	NOGO	RSHA	BWHA	RTHA	RLHA	GOEA	AMKE	MERL	PEFA	SWHA	Unid	Total
August	17	106.3	16	26	12	11	1	18	5	0	0	231	47	0	0	8	1	0	0	14	330
September	30	236.5	8	6	76	65	10	182	42	0	7	4823	200	0	6	20	8	7	0	37	5488
October	31	221.0	9	312	18	47	19	1007	52	2	17	4	814	0	41	13	16	31	0	21	2423
November	30	185.8	0	43	0	11	2	44	17	2	7	0	199	1	90	0	1	1	0	24	442
December	11	28.3	0	0	0	2	0	0	2	0	0	0	6	0	1	0	0	0	0	0	11
<b>Total</b>	<b>119</b>	<b>777.8</b>	<b>33</b>	<b>387</b>	<b>106</b>	<b>136</b>	<b>32</b>	<b>1251</b>	<b>118</b>	<b>4</b>	<b>31</b>	<b>5058</b>	<b>1266</b>	<b>1</b>	<b>138</b>	<b>41</b>	<b>26</b>	<b>39</b>	<b>0</b>	<b>96</b>	<b>8764</b>
Total per hr		0.04	0.50	0.14	0.17	0.04	0.15	1.61	0.04	0.04	0.04	6.50	1.63	0.00	0.18	0.05	0.03	0.05	0.00	0.12	11.27
% of flight		0.4	4.4	1.2	1.6	0.4	0.4	14.3	1.3	0.0	0.4	57.7	14.4	0.0	1.6	0.5	0.3	0.4	0.0	1.1	100.0
Average last 10 yrs	111.6	797.2	33.4	418.3	96.2	104.8	50.1	1177.8	209.9	6.8	55.6	3903.0	1513.1	2.5	195.9	64.0	30.0	27.5	0.1	152.1	8041.1

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**BAKE OVEN KNOB (Lehigh) - Bob Hoopes, Dan Kunkle, co-compilers**

Month	Days	Hours	BLVU	TUVU	OSPR	BAEA	NOHA	SSHA	COHA	NOGO	RSHA	BWHA	RTHA	RLHA	GOEA	AMKE	MERL	PEFA	SWHA	Unid	Total
August	17	136.5	45	196	72	59	4	39	10	0	2	168	56	0	2	11	8	0	0	32	705
September	30	239.0	76	289	191	140	26	442	61	0	9	6288	134	0	2	37	55	29	0	106	7885
October	31	238.3	91	327	17	93	42	1518	128	15	79	21	1144	0	58	26	51	22	0	92	3724
November	27	199.8	75	169	0	60	18	112	23	17	62	0	810	0	51	1	4	5	0	13	1420
<b>Total</b>	<b>105</b>	<b>813.5</b>	<b>287</b>	<b>981</b>	<b>280</b>	<b>352</b>	<b>90</b>	<b>2111</b>	<b>222</b>	<b>32</b>	<b>152</b>	<b>6477</b>	<b>2144</b>	<b>0</b>	<b>113</b>	<b>75</b>	<b>118</b>	<b>56</b>	<b>0</b>	<b>243</b>	<b>13734</b>
Total per hr		0.35	1.21	0.34	0.43	0.11	0.27	2.59	0.27	0.04	0.19	7.96	2.64	0.00	0.14	0.09	0.15	0.07	0.00	0.30	16.88
% of flight		2.1	7.1	2.0	2.6	0.7	0.7	15.4	1.6	0.2	1.1	47.2	15.6	0.0	0.8	0.5	0.9	0.4	0.0	1.8	100.0
Average last 10 yrs	102.9	807.1	284.3	957.3	422.2	248.8	111.1	3118.2	277.2	26.7	120.7	5399.5	1697.1	0.5	100.3	151.8	97.2	54.5	0.0	283.0	13371.0

\*Includes Mississippi Kite on 08/16/2016

**Bucktoe Creek Preserve(Chester) - Larry Lewis, compiler**

Month	Days	Hours	BLVU	TUVU	OSPR	BAEA	NOHA	SSHA	COHA	NOGO	RSHA	BWHA	RTHA	RLHA	GOEA	AMKE	MERL	PEFA	SWHA	Unid	Total
September	30	224.5	0	0	103	50	9	147	49	0	8	1127	2	0	0	64	4	1	0	0	1564
October	31	247.5	0	183	24	124	14	582	170	1	74	53	273	0	6	39	17	2	0	6	1568
November	30	206.0	0	221	0	107	16	204	85	0	136	0	355	0	3	1	2	4	0	0	1134
<b>Total</b>	<b>91</b>	<b>678.0</b>	<b>0</b>	<b>404</b>	<b>127</b>	<b>281</b>	<b>39</b>	<b>933</b>	<b>304</b>	<b>1</b>	<b>218</b>	<b>1180</b>	<b>630</b>	<b>0</b>	<b>9</b>	<b>104</b>	<b>23</b>	<b>7</b>	<b>0</b>	<b>6</b>	<b>4266</b>
Total per hr		0.00	0.60	0.19	0.41	0.06	0.11	1.38	0.45	0.00	0.32	1.74	0.93	0.00	0.01	0.15	0.03	0.01	0.00	0.01	6.29
% of flight		0.0	9.5	3.0	6.6	0.9	0.9	21.9	7.1	0.0	5.1	27.7	14.8	0.0	0.2	2.4	0.5	0.2	0.0	0.1	100.0
Average for 10 yrs	50.3	336.1	0.0	166.7	71.3	137.0	25.0	484.3	159.3	0.7	92.3	1146.7	317.3	0.0	3.7	85.0	15.0	4.3	0.0	3.0	1727.7

**COUNCIL CUP (Luzerne) - Donald Kapral, compiler**

Month	Days	Hours	BLVU	TUVU	OSPR	BAEA	NOHA	SSHA	COHA	NOGO	RSHA	BWHA	RTHA	RLHA	GOEA	AMKE	MERL	PEFA	SWHA	Unid	Total
September	3	13.5	0	0	2	0	0	0	0	0	0	366	0	0	0	1	0	0	0	0	369
<b>Total</b>	<b>3</b>	<b>13.5</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>366</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>369</b>
Total per hr		0.00	0.00	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	27.11	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00	27.33
% of flight		0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	99.2	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	100.0
Average for 10 yrs	19.6	91.1	1.2	134.1	16.9	35.2	6.0	93.9	9.6	0.0	0.7	330.2	200.4	0.0	0.7	22.8	0.1	1.0	0.0	23.7	877.7

**HAWK MOUNTAIN (Berks and Schuylkill) - Laurie Goodrich, compiler**

Month	Days	Hours	BLVU	TUVU	OSPR	BAEA	NOHA	SSHA	COHA	NOGO	RSHA	BWHA	RTHA	RLHA	GOEA	AMKE	MERL	PEFA	SWHA	Unid	Total
August	17	168.3	6	8	62	54	6	36	9	0	2	171	50	0	2	31	4	1	0	17	459
September	30	298.0	10	45	242	140	40	559	62	0	11	9136	123	0	3	133	82	15	0	84	10685
October	31	289.0	44	450	36	127	49	2243	262	13	87	54	1004	0	52	53	93	30	0	130	4727
November	30	237.3	31	91	3	83	17	115	36	18	47	0	926	1	57	0	11	2	0	20	1458
December/January	19	134.5	22	1	0	104	6	15	1	4	2	0	78	0	17	0	3	0	0	5	258
<b>Total</b>	<b>127</b>	<b>1127.0</b>	<b>113</b>	<b>595</b>	<b>343</b>	<b>508</b>	<b>118</b>	<b>2968</b>	<b>370</b>	<b>35</b>	<b>149</b>	<b>9361</b>	<b>2181</b>	<b>1</b>	<b>131</b>	<b>217</b>	<b>193</b>	<b>48</b>	<b>0</b>	<b>256</b>	<b>17587</b>
Total per hr		0.10	0.53	0.30	0.45	0.10	2.63	0.33	0.03	0.03	0.13	8.31	1.94	0.00	0.12	0.19	0.17	0.04	0.00	0.23	15.61
% of flight		0.6	3.4	2.0	2.9	0.7	16.9	2.1	0.2	0.2	0.8	53.2	12.4	0.0	0.7	1.2	1.1	0.3	0.0	1.5	100.0
Average last 10 yrs	125.2	1100.5	136.8	562.1	483.5	325.5	169.7	4515.5	585.1	32.9	171.3	7871.7	2313.0	1.2	132.0	391.7	177.8	58.9	0.5	198.3	18969.7

**JACK'S MOUNTAIN (Mifflin) - Ron Singer, compiler**

Month	Days	Hours	BLVU	TUVU	OSPR	BAEA	NOHA	SSHA	COHA	NOGO	RSHA	BWHA	RTHA	RLHA	GOEA	AMKE	MERL	PEFA	SWHA	Unid	Total
September	30	182.8	4	0	57	77	10	103	26	0	2	3090	36	0	0	17	5	3	0	3	3433
October	31	187.0	14	145	13	54	19	468	85	4	25	9	325	0	51	17	9	14	0	11	1263
November	27	173.0	5	2	1	10	4	20	10	1	6	0	143	0	78	1	5	1	0	0	287
December	9	57.3	13	1	0	7	0	1	0	0	1	0	8	0	15	0	0	0	0	0	46
<b>Total</b>	<b>97</b>	<b>600</b>	<b>36</b>	<b>148</b>	<b>71</b>	<b>148</b>	<b>33</b>	<b>592</b>	<b>121</b>	<b>5</b>	<b>34</b>	<b>3099</b>	<b>512</b>	<b>0</b>	<b>144</b>	<b>35</b>	<b>19</b>	<b>18</b>	<b>0</b>	<b>14</b>	<b>5029</b>
Total per hr			0.06	0.25	0.12	0.25	0.06	0.99	0.20	0.01	0.06	5.17	0.85	0.00	0.24	0.06	0.03	0.03	0.00	0.02	6.38
% of flight			0.7	2.9	1.4	2.9	0.7	11.8	2.4	0.1	0.7	61.6	10.2	0.0	2.9	0.7	0.4	0.4	0.0	0.3	100.0
Average last 10 yrs	62.0	352.7	28.2	129.3	57.2	76.6	30.6	572.7	65.3	2.1	14.5	2667.5	450.5	0.0	62.8	47.3	12.4	11.8	0.0	14.6	4242.1

**LITTLE GAP (Northampton) - Michael Schall, compiler**

Month	Days	Hours	BLVU	TUVU	OSPR	BAEA	NOHA	SSHA	COHA	NOGO	RSHA	BWHA	RTHA	RLHA	GOEA	AMKE	MERL	PEFA	SWHA	Unid	Total
August	11	65.3	0	5	28	32	2	17	4	0	2	50	22	0	0	17	4	3	0	2	188
September	30	225.8	13	19	156	111	17	533	49	0	5	7971	116	0	3	137	55	17	0	38	9240
October	29	212.3	43	330	27	115	37	1606	171	7	48	20	856	1	47	55	60	22	0	50	3495
November	29	165.8	87	123	0	53	13	115	44	15	36	0	781	1	39	0	8	3	0	10	1328
December	5	27.0	5	0	0	24	0	0	0	1	1	0	28	0	11	0	0	0	0	1	71
<b>Total</b>	<b>104</b>	<b>696.0</b>	<b>148</b>	<b>477</b>	<b>211</b>	<b>335</b>	<b>69</b>	<b>2271</b>	<b>268</b>	<b>23</b>	<b>92</b>	<b>8041</b>	<b>1803</b>	<b>2</b>	<b>100</b>	<b>209</b>	<b>127</b>	<b>45</b>	<b>0</b>	<b>101</b>	<b>14322</b>
Total per hr			0.21	0.69	0.30	0.48	0.10	3.26	0.39	0.03	0.13	11.55	2.59	0.00	0.14	0.30	0.18	0.06	0.00	0.15	20.58
% of flight			1.0	3.3	1.5	2.3	0.5	15.9	1.9	0.2	0.6	56.1	12.6	0.0	0.7	1.5	0.9	0.3	0.0	0.7	100.0
Average last 10 yrs	90.9	582.5	96.4	462.9	334.8	224.2	102.6	3148.0	338.7	22.4	93.9	6792.6	1578.8	0.7	76.7	181.1	98.5	41.3	0.0	99.5	13693.3

**MILITIA HILL (Montgomery) - Andy Fayer, Lynne Jackson, Rich Conroy, co-compilers**

Month	Days	Hours	BLVU	TUVU	OSPR	BAEA	NOHA	SSHA	COHA	NOGO	RSHA	BWHA	RTHA	RLHA	GOEA	AMKE	MERL	PEFA	SWHA	Unid	*Total
September	30	213.0	0	0	137	80	15	195	17	0	7	5453	2	0	0	117	9	10	0	24	6067
October	31	233.3	4	575	13	34	7	360	69	0	48	196	54	0	3	53	17	23	0	40	1486
<b>Total</b>	<b>61</b>	<b>446.3</b>	<b>4</b>	<b>575</b>	<b>150</b>	<b>114</b>	<b>22</b>	<b>555</b>	<b>86</b>	<b>0</b>	<b>55</b>	<b>5649</b>	<b>56</b>	<b>0</b>	<b>3</b>	<b>170</b>	<b>26</b>	<b>33</b>	<b>0</b>	<b>64</b>	<b>7553</b>
Total per hr			0.01	1.29	0.34	0.26	0.05	1.24	0.19	0.00	0.12	12.66	0.13	0.00	0.01	0.38	0.06	0.05	0.00	0.14	16.93
% of flight			0.1	7.6	2.0	1.5	0.3	7.3	1.1	0.0	0.7	74.8	0.7	0.0	0.0	2.3	0.3	0.3	0.0	0.8	100.0
Average last 10 yrs	59.8	448.5	27.1	664.5	256.0	105.3	74.4	1056.0	137.5	1.4	63.2	10765.0	1132	0.2	3.7	261.8	33.2	29.4	0.4	67.7	13659.8

\*Including Mississippi Kite on 09/24/2016

\*Total includes one Mississippi Kite on September 18

**ROCKY RIDGE (York) - Randy Phillips, compiler**

Month	Days	Hours	BLVU	TUVU	OSPR	BAEA	NOHA	SSHA	COHA	NOGO	RSHA	BWHA	RTHA	RLHA	GOEA	AMKE	MERL	PEFA	SWHA	Unid	Total
August	1	4.5	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
September	11	62.3	0	0	41	6	9	209	3	0	0	3496	1	0	0	35	0	0	0	3	3803
October	9	31.3	0	18	4	5	2	78	4	0	1	0	10	0	1	12	2	1	0	1	139
<b>Total</b>	<b>21</b>	<b>98.0</b>	<b>0</b>	<b>18</b>	<b>46</b>	<b>12</b>	<b>11</b>	<b>287</b>	<b>7</b>	<b>0</b>	<b>1</b>	<b>3496</b>	<b>11</b>	<b>0</b>	<b>1</b>	<b>48</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>4</b>	<b>3945</b>
Total per hr			0.00	0.18	0.47	0.12	0.11	2.93	0.07	0.00	0.01	35.67	0.11	0.00	0.01	0.49	0.02	0.01	0.00	0.04	40.26
% of flight			0.0	0.5	1.2	0.3	0.3	7.3	0.2	0.0	0.0	88.6	0.3	0.0	0.0	1.2	0.1	0.0	0.0	0.1	100.0
Average last 10 yrs	13.7	66.8	0.7	19.7	27.0	59.7	7.7	213.7	6.7	0.0	0.7	2037.7	103	0.0	0.5	42.3	2.0	1.5	0.0	2.0	2112.0

**ROSE TREE PARK (Delaware) - Holly Merker, compiler**

Month	Days	Hours	BLVU	TUVU	OSPR	BAEA	NOHA	SSHA	COHA	NOGO	RSHA	BWHA	RTHA	RLHA	GOEA	AMKE	MERL	PEFA	SWHA	Unid	Total
September	29	188.8	0	0	102	61	15	147	31	0	3	743	3	0	0	65	12	7	0	7	1197
October	31	190.3	8	319	38	43	29	425	71	0	64	82	99	0	0	81	20	23	0	30	1332
November	19	116.5	67	90	1	27	4	57	12	0	60	0	131	0	1	1	2	0	0	8	461
<b>Total</b>	<b>79</b>	<b>495.5</b>	<b>75</b>	<b>409</b>	<b>141</b>	<b>131</b>	<b>48</b>	<b>629</b>	<b>114</b>	<b>0</b>	<b>127</b>	<b>825</b>	<b>233</b>	<b>0</b>	<b>1</b>	<b>147</b>	<b>34</b>	<b>30</b>	<b>0</b>	<b>45</b>	<b>2990</b>
Total per hr			0.15	0.83	0.28	0.26	0.10	1.27	0.23	0.00	0.26	1.66	0.47	0.00	0.00	0.30	0.07	0.06	0.00	0.09	6.03
% of flight			2.5	13.7	4.7	4.4	1.6	21.0	3.8	0.0	4.2	27.6	7.8	0.0	0.0	4.9	1.1	1.0	0.0	1.5	100.0
Average last 10 yrs	86.2	552.3	54.8	431.2	185.7	133.0	64.1	1052.7	156.7	1.2	167.6	3379.7	322.4	0.2	3.2	158.8	32.2	18.1	0.2	49.8	6211.7

% of flight Mississippi Kite on 09/17/2016

**SECOND MOUNTAIN (Lebanon) - David Schwenk, compiler**

Month	Days	Hours	BLVU	TUVU	OSPR	BAEA	NOHA	SSHA	COHA	NOGO	RSHA	BWHA	RTHA	RLHA	GOEA	AMKE	MERL	PEFA	SWHA	Unid	Total
August	17	67.0	0	0	11	11	1	0	2	0	3	25	15	0	0	7	0	1	0	1	77
September	30	226.8	71	9	70	58	15	233	32	2	13	5930	51	0	5	63	12	6	0	10	6580
October	30	225.5	298	516	6	94	29	737	70	0	43	11	245	0	35	21	16	7	0	28	2156
November	30	187.3	94	167	1	66	9	47	19	3	15	0	216	0	46	2	2	1	0	11	698
December	30	111.5	57	11	0	40	2	3	0	0	3	0	39	0	17	0	0	0	0	0	177
<b>Total</b>	<b>137</b>	<b>818.0</b>	<b>520</b>	<b>703</b>	<b>88</b>	<b>269</b>	<b>56</b>	<b>1020</b>	<b>123</b>	<b>8</b>	<b>77</b>	<b>5966</b>	<b>566</b>	<b>0</b>	<b>103</b>	<b>93</b>	<b>31</b>	<b>15</b>	<b>0</b>	<b>50</b>	<b>9688</b>
Total per hr			0.64	0.86	0.11	0.33	0.07	1.25	0.15	0.01	0.09	7.29	0.69	0.00	0.13	0.11	0.04	0.02	0.00	0.06	11.84
% of flight			5.4	7.3	0.9	2.8	0.6	10.5	1.3	0.1	0.8	61.6	5.8	0.0	1.1	1.0	0.3	0.2	0.0	0.5	100.0
Average last 10 yrs	130.0	900.5	357.4	703.7	149.9	182.0	102.6	2180.4	236.9	20.8	113.5	4303.7	945.7	2.4	90.5	103.6	37.8	26.1	0.7	57.8	9617

**STONE MOUNTAIN (Huntingdon) - Greg Grove, compiler**

Month	Days	Hours	BLVU	TUVU	OSPR	BAEA	NOHA	SSHA	COHA	NOGO	RSHA	BWHA	RTHA	RLHA	GOEA	AMKE	MERL	PEFA	SWHA	Unid	*Total
August	3	15.5	0	0	4	5	0	4	1	0	0	30	4	0	0	3	0	0	0	0	51
September	27	160.3	0	0	60	60	11	117	18	0	1	1484	33	0	0	29	2	3	0	9	1827
October	26	156.0	20	130	20	64	27	552	51	2	43	5	332	1	17	17	31	16	0	9	1337
November	25	139.8	3	29	0	32	5	39	10	3	6	0	132	1	76	2	1	1	0	1	341
December	7	46.5	0	1	0	5	1	0	0	0	0	0	21	1	23	0	0	0	0	0	52
<b>Total</b>	<b>88</b>	<b>518.0</b>	<b>23</b>	<b>160</b>	<b>84</b>	<b>166</b>	<b>44</b>	<b>712</b>	<b>80</b>	<b>5</b>	<b>50</b>	<b>1519</b>	<b>522</b>	<b>3</b>	<b>116</b>	<b>51</b>	<b>34</b>	<b>20</b>	<b>0</b>	<b>19</b>	<b>3608</b>
Total per hr			0.04	0.31	0.16	0.32	0.08	1.37	0.15	0.01	0.10	2.93	1.01	0.01	0.22	0.10	0.07	0.04	0.00	0.04	6.97
% of flight			0.6	4.4	2.3	4.6	1.2	19.7	2.2	0.1	1.4	42.1	14.5	0.1	3.2	1.4	0.9	0.6	0.0	0.5	100.0
Average last 10 yrs	68.8	390.4	24.8	231.1	73.7	101.1	48.4	822.3	127.6	7.1	48.4	1568.3	758.9	0.8	117.4	82.5	30.6	19.1	0.1	33.3	4035.8

**WAGGONER'S GAP (Cumberland) - David Grove, compiler**

Month	Days	Hours	BLVU	TUVU	OSPR	BAEA	NOHA	SSHA	COHA	NOGO	RSHA	BWHA	RTHA	RLHA	GOEA	AMKE	MERL	PEFA	SWHA	Unid	Total
August	30	153.5	0	0	34	72	5	23	5	0	6	201	83	0	0	27	2	4	0	8	470
September	28	233.5	0	0	274	192	32	1023	62	0	13	9207	131	0	1	133	16	17	0	40	11141
October	28	267.0	18	1058	28	184	85	3597	222	13	111	27	1175	0	75	56	54	28	0	72	6803
November	27	228.0	21	244	2	56	22	172	45	13	58	0	909	0	145	3	7	4	0	18	1719
December	25	140.8	8	3	0	72	3	5	7	6	5	0	94	2	21	0	1	2	0	5	234
<b>Total</b>	<b>138</b>	<b>1022.8</b>	<b>47</b>	<b>1305</b>	<b>338</b>	<b>576</b>	<b>147</b>	<b>4820</b>	<b>341</b>	<b>32</b>	<b>193</b>	<b>9435</b>	<b>2392</b>	<b>2</b>	<b>242</b>	<b>219</b>	<b>80</b>	<b>55</b>	<b>0</b>	<b>143</b>	<b>20367</b>
Total per hr			0.05	1.28	0.33	0.56	0.14	4.71	0.33	0.03	0.19	9.23	2.34	0.00	0.24	0.21	0.08	0.05	0.00	0.14	19.91
% of flight			0.2	6.4	1.7	2.8	0.7	23.7	1.7	0.2	0.9	46.3	11.7	0.0	1.2	1.1	0.4	0.3	0.0	0.7	100.0
Average last 10 yrs	139.2	1112.6	77.9	1600.3	409.6	466.6	223.3	7748.5	696.4	47.3	231.9	7970.8	4042.5	4.3	335.0	431.5	150.8	81.9	0.1	148.8	23271.7

**2014 TOTALS FOR ALL WATCHSITES**

Month	Days	Hours	BLVU	TUVU	OSPR	BAEA	NOHA	SSHA	COHA	NOGO	RSHA	BWHA	RTHA	RLHA	GOEA	AMKE	MERL	PEFA	SWHA	Unid	Total
August	113	717	67	235	224	245	19	137	36	0	15	876	277	0	4	105	19	9	0	74	2,343
September	338	2,505	182	368	1,511	1,040	209	3,890	452	2	79	59,114	832	0	20	851	260	115	0	361	69,289
October	339	2,498	549	4,363	244	984	359	13,173	1,355	57	640	482	6,331	2	386	443	386	209	0	490	30,453
November	274	1,839	383	1,179	8	505	110	925	301	72	433	0	4,602	4	586	11	42	22	0	105	9,288
December	106	546	105	17	0	254	12	24	10	14	12	0	274	3	105	0	6	2	0	11	849
<b>Total</b>	<b>1,170</b>	<b>8,104</b>	<b>1,296</b>	<b>6,162</b>	<b>1,987</b>	<b>3,028</b>	<b>709</b>	<b>18,149</b>	<b>2,154</b>	<b>145</b>	<b>1,179</b>	<b>60,472</b>	<b>12,316</b>	<b>9</b>	<b>1,101</b>	<b>1,410</b>	<b>713</b>	<b>357</b>	<b>0</b>	<b>1,041</b>	<b>112,222</b>
Total per hr			0.16	0.76	0.25	0.37	0.09	2.24	0.27	0.02	0.15	7.46	1.52	0.00	0.14	0.17	0.09	0.04	0.00	0.13	13.85
% of flight			1.1	5.5	1.8	2.7	0.6	16.2	1.9	0.1	1.1	53.9	11.0	0.0	1.0	1.3	0.6	0.3	0.0	0.9	100.0
Average of last 10 yrs	1125.6	7492.5	1275.4	6513.2	2608.1	2093.6	1021.1	26267.8	2923.3	167.3	1101.1	60922.0	12736.8	11.9	1041.8	1868.3	667.5	367.9	4.0	1133.6	122724.3
% compared to average	3.9	8.2	0.8	-5.4	-23.8	44.6	-30.6	-30.9	-26.3	-13.3	7.1	-0.7	-3.3	-24.4	5.7	-24.5	6.8	-3.0	-100.0	-8.2	-8.6

\*Total includes two Mississippi Kites

\*Total includes one Mississippi Kite on September 22

\*Includes three Mississippi Kites & one Swallow-tailed Kite



# 2016 Autumn Raptor Migration Summary

## Laurie Goodrich

Easterly winds in September 2016 funneled Broad-winged Hawks to the Appalachians, leaving several southeastern Pennsylvania watchsites wanting more. A dearth of strong cold fronts reduced October's usual parade of migrants at most sites and may have contributed to below-average statewide counts for Sharp-shinned and Cooper's Hawks, Osprey, and American Kestrel. Despite the lackluster winds and the warmer-than-normal temperatures through October and November, Red-shouldered and Red-tailed Hawk counts were near average statewide.

Pennsylvania's 13 watchsites recorded 112,222 raptors in 1170 days and 8104 hours of counting between 1 August and January 2017, a rate of 13.9 hawks per hour statewide. Total raptors were 22% higher than in 2015 but 9% below the ten-year average for the state (Table 1). Count effort was 8% above-average and included the return of Bucktoe Creek Preserve of Chester County to the watch-site line-up, but there was no report from the Pipersville Broad-winged Hawk watch and the Tuscarora Summit watch was again not conducted.

Several kites were sighted during September, including 3 Mississippi Kites: an immature at Bake Oven Knob on 16 August, an adult at Militia Hill on 24 September, and a probable adult at Rose Tree Park on 7 September. A Swallow-tailed Kite was seen by several observers at Allegheny Front on 6 September.

Four species showed above-average counts statewide. Bald and Golden Eagles, were up 45% and 6% respectively, with 3028 Bald Eagles and 1101 Golden Eagles counted. The Red-shouldered Hawk count was 1179 and Merlins totaled 713, both up 7% statewide (Table 1). The Bald Eagle total represented a new record and their abundance brings a new challenge for watchsites, separating migrants from residents.

Below-average counts were tallied for 10 of 16 regularly recorded species. Two open-habitat species that have shown widespread declines in the region were recorded in low numbers in 2016 - Northern Harrier, with 709 counted statewide, and American Kestrel, with 1410 counted (Table 1, Figure 1). The statewide counts were 31% and 25% below the 10-year averages respectively, and for harriers the total was the lowest ever recorded in the state (Table 1). The Osprey tally was 1987, down 24% compared to the 10-year average and the second-lowest count ever. All three accipiters were low: Sharp-shinned Hawk (18,149), down 31%; Cooper's Hawk (2154), down 26%; and Northern Goshawk (145), down 13% (Table 1). Decreases in Osprey sightings correspond to patterns shown at most eastern flyway watchsites where

significant declines were documented during the last decade (see [www.rpi-project.org](http://www.rpi-project.org)). This decline in migrants is in contrast to a growing nesting population within the state.

An interesting Osprey observation occurred this autumn, giving a clue to nesting locations of Ospreys counted during the autumn season Pennsylvania's watches. Dr. Rob Bierregaard reported the pathway of a satellite-tagged adult male from a nest in northern New Hampshire in summer 2016. "Wausau" left his nest territory on 4 September and the next day entered eastern Pennsylvania, flying south along the Delaware River to the Kittatinny Ridge near Delaware Water Gap and then turning to follow the Ridge southwest. He went to roost that evening on the Kittatinny Ridge near Route 309 in Lehigh County, just west of Bake Oven Knob and east of Hawk Mountain. (R. Bierregaard, pers. Comm.). Although the transmitter was not on in early morning, Dr. Bierregaard reports Wausau was aloft early on the 6th and may have passed by Hawk Mountain where a lone Osprey was recorded just before 7 am that morning on steady northwest winds. His transmitter indicates he flew southwest off the Ridge possibly just west of Hawk Mountain between 8 am and 9 am as his location was north of Lancaster at 9 am and he soon exited Pennsylvania to fly south past Baltimore. To see his entire journey and other eastern Osprey tracks for 2016 visit *Ospreytrax* website (<http://www.ospreytrax.com>).

**Allegheny Front (Somerset and Bedford Counties)** - Watchers at Allegheny Front tallied an above-average 8764 hawks in 813 hours and 105 days of counting between mid-August and mid-December 2016 (Table 1). Mid-September brought several days of over 1000 Broad-winged Hawks, with the largest one-day count of 1079 on 17 September

(Table 2). Moderate northeast winds on 6 September brought the rarest migrant for the fall when a Swallow-tailed Kite approached the site from the northwest and circled overhead three times before continuing south. What a cooperative bird!

The highest one-day count of Bald Eagles, 13, soared past on 25 September, helping bring the season's total of Bald Eagles to 136, the highest autumn count in recent history. In contrast, the Golden Eagle count of 138 was 30% below-average (Table 1). The largest one-day count of Golden Eagles for the autumn, 20, flew past on 1 November along with 44 Red-tailed Hawks, 18 Sharp-shinned Hawks, a single Bald Eagle, and 8 other raptors.

Above-average counts also were tallied for Broad-winged Hawk (5058), Sharp-shinned Hawk (1251), and Peregrine Falcon (39) (Table 1). A particularly great day for Peregrines occurred 5 October when 9 Peregrines and 3 Merlins zipped past. Below-average counts were observed for seven species, including Cooper's Hawk (118), 43% below the 10-year average and Red-shouldered Hawk (31), and 43% below average (Table 1).

**Bake Oven Knob (Lehigh County)** - Bake Oven Knob started the season with a flourish by recording one of the few Mississippi Kites to be spotted in 2016, an immature bird that hovered above the rocks giving watchers an excellent look on 16 August. A week later the Bake Oven counters tallied a peak Bald Eagle number of 23 on 22 August. The total raptors for autumn, 13,734, was slightly above the ten-year average of 13,371. Coverage hours (814) and days (105) were slightly above-average as well. Observers recorded the first large flight of Broad-wings, 1303, on 16 September and a peak flight of 1801 on 20 September (Table 2). Seven

**Table 2. Peak one-day migration counts for selected species.**

Site	Broad-winged Hawk		Bald Eagle	
	Count	Date	Count	Date
Allegheny Front	1,079	9/17	13	9/25
Bake Oven Knob	1,801	9/20	23	8/22
Bucktail Creek Pres	675	9/25	15	11/26
Council Cup	361	9/16	-	
Hawk Mountain	3,018	9/20	22	12/3
Jack's Mountain	910	9/21	9	9/11
Little Gap	3,389	9/20	22	8/25
Militia Hill	2,694	9/24	15	9/24
Rocky Ridge Park	1,181	9/21	4	10/22
Rose Tree Park	399	9/24	12	9/25
Second Mountain	2,665	9/16	12	Several
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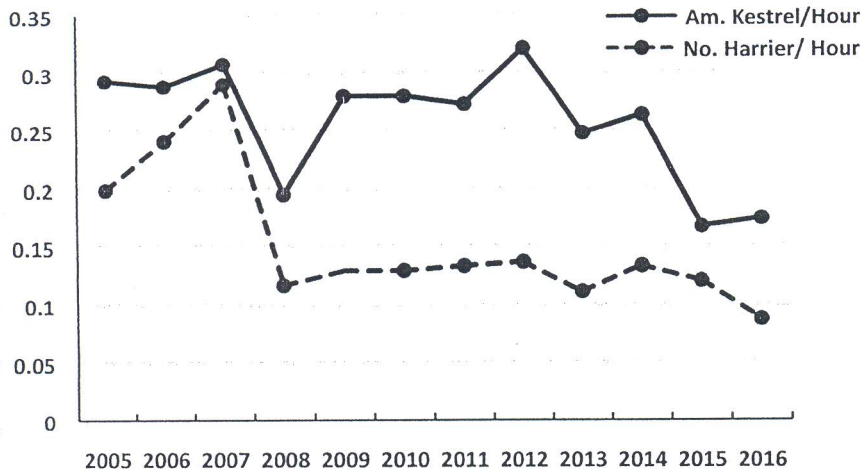
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Figure 1 Number of Autumn Migrants per Hour at Pennsylvania Watchsites



species were above-average, with the count of 352 Bald Eagles 41% above the ten-year average. Broad-winged Hawk (6477) and Red-tailed Hawk (2144) were 20% and 26% above-average, respectively (Table 1). Six species were below-average (Table 1), including Osprey (280), 34% below-average; Sharp-shinned Hawk (2111), 32% below-average; and American Kestrel (75), 50% below-average (Table 1).

**Bucktoe Creek Preserve (Chester County)** - Bucktoe Creek Preserve relaunched their autumn count in 2016, tallying 4266 hawks in 678 hours over 91 days from 1 September through 30 November. Their highest one-day count occurred 25 September with 625 Broad-wings (Table 2), 6 Bald Eagles, and 8 American Kestrels among 724 total raptors. The highest eagle days were 26 November with 15 Bald Eagles and 14 October with 2 Golden Eagles. Average counts for this site are based on three years of data in the last decade. Higher counts of Broad-wings were recorded in 2010 than 2016, but winds were not favorable for Broad-wings at southeastern watch-sites in 2016. Welcome back Bucktoe Creek Preserve! We are excited to have this site active again and look forward to reports in years to come.

**Council Cup (Luzerne County)** - The Council Cup site was covered for three days in September totaling 14 hours, a decline in coverage by more than 50% compared to prior years; not surprisingly, the total count of 369 raptors was also well below average (Table 1). The best day occurred on 16 September when compiler Donald Kapral recorded 361 Broad-winged Hawks, one Osprey, and one American Kestrel along with 8 non-migrating Bald Eagles. This northeast site near the Susquehanna River can have some interesting flights and is not a far drive for northeastern birdwatchers. If you have time to contribute, contact details for compiler can be found at

[www.hawkcount.org](http://www.hawkcount.org) in the site profile section.

**Hawk Mountain Sanctuary (Berks and Schuylkill counties)** - Hawk Mountain recorded 17,587 raptors between 15 August and 25 January, with 127 days and 1127 hours of counting. The total count was 7% below the ten-year average (Table 1). A new record was set for Bald Eagle with 489 tallied for the official season of 15 August to 15 December and 508 for entire season (Table 1). Above-average counts also were recorded for Turkey Vulture (595), 5% above average; Merlin (193) up 8%; and Broad-winged Hawk (9361), 19% above average (Table 1). Sharp-shinned Hawk (2958) and Cooper's Hawk (370) were 34% and 36% below average, respectively. The Osprey count (343) was down 29% and Northern Harrier (118) down 30%. Hawk Mountain's peak one-day count occurred on 20 September when 3018 Broad-winged Hawks were recorded along with 8 other species including 20 Sharp-shinned Hawks, 4 Bald Eagles, and 4 Ospreys. The highest one-day count for Bald Eagle came late in the year, when 22 Bald Eagles soared past on 3 December, along with 17 Red-tailed Hawks and one Golden Eagle. The highest count of Golden Eagles occurred 28 October, with 15, accompanied by 14 Bald Eagles and 146 Red-tailed Hawks.

**Jack's Mountain (Mifflin County)** - Jack's Mountain counters recorded 5029 raptors during 97 days and 600 hours of counting. The total raptor count was 18% above average, possibly because coverage has increased at the site in recent years; effort in 2016 was the highest since 2001. Most species were above-average, excepting the American Kestrel (35), which was 25% below the ten-year average (Table 1). Bald Eagles were seen regularly through the fall with a peak one-day count of 9 on 11 September and a season-record tally of 148. The Golden Eagle count of 144 was the

second-highest on record for the site, reaffirming the importance of this ridge for eagle migration. Northwest winds on 6 November brought the season's one-day peak for Golden Eagle, 17, including 16 adults and one immature.

**Little Gap (Northampton County)** - Counters at Little Gap recorded an above-average 14,322 hawks with 104 days and 696 hours of counting. The count was 5% above the ten-year average of 13,693 hawks (Table 1). Little Gap set a new season-record for Bald Eagle, 335, with a one-day peak count of 22 on 22 August (Table 1, 2). Seven other species showed above-average counts including Black Vulture, Turkey Vulture, Broad-winged Hawk, Red-tailed Hawk, The American Kestrel upswing counted at this site, 209 compared to the average of 181, was in contrast to below-average counts observed at many sites (Table 1). Below-average counts were recorded for Osprey (211), down 37%; Sharp-shinned Hawk (2271), down 28%; and Cooper's Hawk, (268), down 21% (Table 1). September 20 brought the highest one-day count for the season and the highest one-day total for Broad-winged Hawks statewide, 3389 (Table 2). Counters were kept busy after the morning fog lifted, sighting many close kettles. The next day, 21 September, 1606 Broad-winged Hawks were counted plus 62 Sharp-shinned Hawks, 17 American Kestrels, 3 Merlins, and 3 Peregrine Falcons, for the second-highest one-day count for the site.

**Militia Hill (Montgomery County)** - Watchers at Militia Hill counted 7553 raptors in 61 days and 446 hours of watching (Table 1). The total count was 44% below average with most species below-average. One exception was Bald Eagle (114), which was 9% above average. The Broad-winged Hawk count of 5649 was 48% below the average of 10,765 (Table 1). The highest one-day count of Broad-winged Hawks was 2694, on 24 September, along with an impressive 42 Ospreys, 64 Sharp-shinned Hawks, 29 American Kestrels, and the season's one-day peak of 15 Bald Eagles (Table 2). One of the rarest migrants of the season also came on the 24th, an adult Mississippi Kite, observed gliding overhead through telescope and binoculars. The next day, 1492 Broad-wings and 10 Bald Eagles were sighted, contributing to the second-highest one-day count of the season, a total of 1543 raptors. The highest one-day count of Sharp-shinned Hawk, 50, was tallied on 9 October along with 7 Cooper's Hawks, 10 American Kestrels, 3 Red-shouldered Hawks, 3 Merlins, 3 Ospreys, 2 Bald Eagles, and one Peregrine Falcon.

**Rocky Ridge (York County)** - Counters at the part-time watch in Rocky Ridge Park tallied 3945 hawks in 98 hours on 21 days from 24 August to 26 October. The total count was 86% above-average - primarily

due to above-average numbers of Broad-winged Hawks (3496), 71% above-average. Rocky Ridge tallied 2 days of Broad-winged Hawk counts above 1000 with 1041 on the 20th and 1181 on the 21st, the highest one-day count for the season (Table 2). Counters also recorded 3 Ospreys, 2 Northern Harriers, 45 Sharp-shinned Hawks, and 10 American Kestrels on the 21st, bringing the one-day count to 1241. Above-average counts were observed for most species, except Bald Eagle (12), which was 75% below the ten-year average (Table 1).

**Rose Tree Park (Delaware County)** – Rose Tree Park recorded a below-average 2990 raptors during 79 days and 496 hours in autumn 2016 (Table 1). Total raptors were 51% below the ten-year average partly due to the low Broad-winged Hawk count (825), 76% below average. Rose Tree Park reported below-average counts for most raptors, except Black Vulture (75), 36% above-average (Table 1). The rarest migrant of the autumn, a Mississippi Kite, was observed for several minutes in late morning on 7 September, before it glided south.

Counters recorded a one-day peak count for Broad-winged Hawks (399) on 24 September along with 17 Ospreys, 5 American Kestrels, 5 Merlins, and 2 Peregrine Falcons. The following day brought the site's one-day peak count for Bald Eagle, 12, and another 287 Broadwings (Table 2). North to northeast winds on 3 October brought an exciting mid-autumn flight to Rose Tree Park including 113 Sharp-shinned Hawks, 75 Broad-winged Hawks, 37 American Kestrels, 19 Ospreys, 19 Cooper's Hawks, 8 Peregrine Falcons, and 7 Merlins, mostly during the afternoon. October 26 brought the highest count of Red-shouldered Hawks, 21; mostly adult birds and some appearing in small kettles with other raptors.

**Second Mountain (Lebanon County)** – Second Mountain recorded 9688 hawks in 137 days and 818 hours between 15 August and 31 December. The site set a new season record for Bald Eagle, 269, compared to the ten-year average of 182 (Table 1). Three other species were above-average including Black Vulture (520), up 46%; Broad-winged Hawk (5966), up 39%; and Golden Eagle (103), up 13% (Table 1). All other species except Turkey Vulture were below-average. The largest dip was seen for Sharp-shinned Hawk (1020), 53% below the ten-year average (Table 1). Second Mountain observers tallied their highest one-day Broad-winged Hawk count, 2665, on 16 September along with 10 Ospreys (Table 2). The peak one-day count of 12 Bald Eagles occurred on several different days in September and October including 20 September when the Bald Eagles were accompanied by an early adult Golden Eagle and 31 American Kestrels (Table 2). On 10 October, another 12 Bald Eagles were recorded, accompanied by 2 immature Golden Eagles and an impressive parade of 257 Turkey Vultures.

**Stone Mountain (Huntingdon County)** – Stone Mountain observers tallied 3608 migrating raptors during 88 days and 518 hours of counting (Table 1). Count effort for the site was the highest on record although the total number of migrating raptors was 11% below-average. The 166 Bald Eagles set a new record, with a one-day peak count of 12 on 22 October (Table 2). Broad-winged Hawk numbers were slightly low at 1519, compared to 1568 on average (Table 1). The highest one-day count for the site and highest count of Broad-winged Hawks occurred on 16 September when Stone Mountain counters tallied 312 Broad-winged Hawks, 6 Ospreys, 4 Bald Eagles, 4 Sharp-shinned Hawks, one Northern Harrier, and one Red-shouldered Hawk (Table 2). In contrast to some sites, watchers counted above-average numbers of Osprey, 84, compared to 74 on average (Table 1). Only 51 American Kestrels were recorded, 39% below the ten-year average. The count of 80 Cooper's Hawks was also low, 38% below average (Table 1). November 5 and 6 brought the best Golden Eagle days, with 15 and 10 recorded, respectively. The last significant flight of Golden Eagles, 11, sailed south on 22 November. The Golden Eagle total of 116 was near the ten-year average of 117.

**Waggoner's Gap (Cumberland County)** – Waggoner's Gap recorded 20,367 raptors in 138 days and 1023 hours from 1 August to 31 December. The total was 12% below the ten-year average of 23,272. Counters set a new season record for Bald Eagle, recording 576 compared to the prior record of 535. Counts of most species were lower than average, including American Kestrel (219), 28% below-average (Table 1). Season totals were buoyed by a great Broad-winged Hawk flight in September. With 9436 counted, Broad-winged Hawks were 18% above the ten-year average of 7971 (Table 1) and counters saw eight September days with greater than 500 birds. The highest one-day total occurred on 21 September, when 1973 Broad-wings moved through. The day before, 1740 sailed past the lookout, helping boost the season tally.

Waggoner's Gap watchers recorded the highest statewide one-day count of Bald Eagles on Sept 24 when 35 were tallied. A lone sub-adult Golden Eagle also was sighted that day. Accipiters were well below average with the lowest counts in more than 14 years (Table 1). Northwest winds on 10 October brought the highest one-day count of Sharp-shinned Hawks, 550, along with 27 Cooper's Hawks and 5 Golden Eagles. A Golden Eagle parade was enjoyed November 4, 5, and 6 when 28, 20, and 27 were tallied, respectively. Two Rough-legged Hawks, dark morphs, were sighted, one on 2 December and one on 10 December; however, the total was slightly below the ten-year average of 3.5 (Table 1).

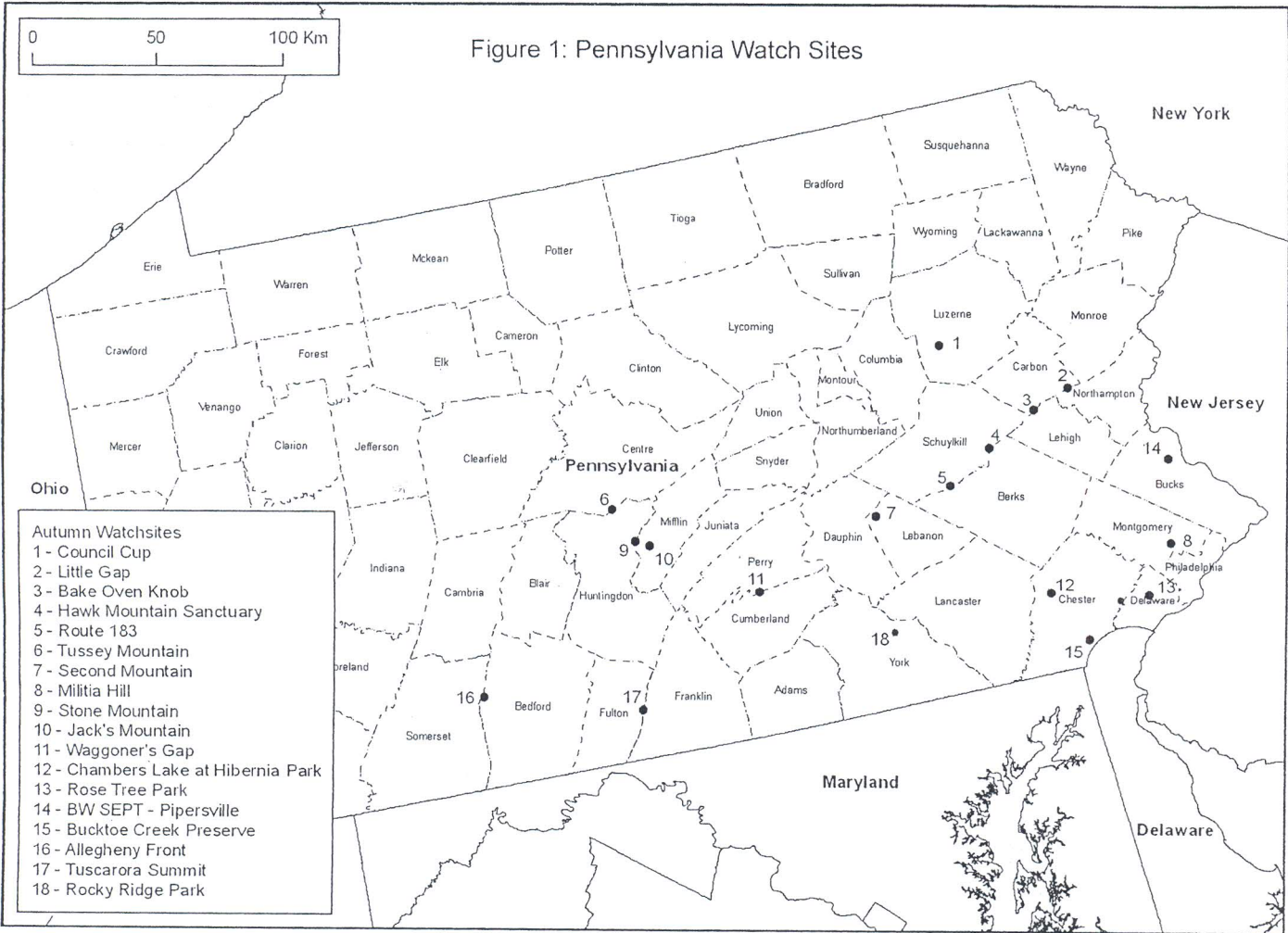
## Conclusions

In 2106 we salute the element of change and flux in hawk migration counts. Pennsylvania may host more watch sites than most (all?) states or provinces in North America and therein fills a useful role in regional monitoring. The data collected from Pennsylvania watchsites, both where they coincide and where they differ, provide an index to the breadth of change in raptor populations across the continent. New records or above-average counts of Bald Eagles contrast with continued declines in field-nesting raptors, e.g. American Kestrel and Northern Harrier, and may also directly intersect with dips in Osprey numbers. The lower counts of Sharp-shinned and Cooper's Hawks (except note Waggoner's Gap) could signal changes in migration behavior or timing, as has been documented for Red-tailed Hawk in recent years. Further monitoring and research will clarify the pattern and its' possible source - having the data collected and archived by Pennsylvania hawkwatchers is essential to our understanding.

## Acknowledgements

I thank Pennsylvania's hawk counters for their many hours of counting, as well as the site compilers for organizing the data and sharing their results. Data was provided by [www.hawkcount.org](http://www.hawkcount.org) with permission of site compilers, a website maintained by the Hawk Migration Association of North America and managed by Jason Sodergren, database manager. Locations of sites and daily counts can be viewed at HMANA's [www.hawkcount.org](http://www.hawkcount.org) site. I thank David Barber for the site map and Grace Auld for her assistance with tables. This is Hawk Mountain Sanctuary contribution number 272.

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We must sadly report that the hawk watch community has lost two long-time hawk watchers from the Jacks Mt. site in Mifflin County. Ron Singer was the compiler for decades, watching and counting raptors at Jacks since 1975. Ron passed away March 5 of complications following surgery. Gloria Bickel began joining Ron and the other Jacks counters around 1992, becoming one of the leading reporters from the site. Gloria died this past November 19. The work of Ron and Gloria at Jack's added substantially to our knowledge of raptor migration through Appalachians and they will be greatly missed by Pennsylvania birders. Our condolences to his family, friends, and fellow Jack's Mountain watchers.

--- Laurie Goodrich and Greg Grove

FIGURE 1. AUTUMN 2010 COUNT RESULTS FOR PENNSYLVANIA

Table 1. Autumn 2016 count results for Pennsylvania watchsites.

ALLEGHENY FRONT (Bedford/Somerset) - Bob Stewart, compiler

Month	Days	Hours	BLVU	TUVU	OSPR	BAEA	NOHA	SSHA	COHA	NOGO	RSHA	BWHA	RTHA	RLHA	GOEA	AMKE	MERL	PEFA	SWHA	Unid	Total	
August	17	106.3	16	26	12	11	1	18	5	0	0	231	47	0	0	8	1	0	0	0	14	390
September	30	236.5	8	6	76	65	10	182	42	0	7	4823	200	0	6	20	8	7	0	0	37	5498
October	31	221.0	9	312	18	47	19	1007	52	2	17	4	814	0	41	13	16	31	0	0	21	2423
November	30	185.8	0	43	0	11	2	44	17	2	7	0	199	1	90	0	1	1	0	0	24	442
December	11	28.3	0	0	0	0	0	0	2	0	0	0	6	0	1	0	0	0	0	0	0	11
<b>Total</b>	<b>119</b>	<b>777.8</b>	<b>33</b>	<b>387</b>	<b>106</b>	<b>136</b>	<b>32</b>	<b>1251</b>	<b>118</b>	<b>4</b>	<b>31</b>	<b>5058</b>	<b>1266</b>	<b>1</b>	<b>138</b>	<b>41</b>	<b>26</b>	<b>39</b>	<b>0</b>	<b>96</b>	<b>8764</b>	
Total per hr			0.04	0.50	0.14	0.17	0.04	1.61	0.15	0.01	0.04	6.50	1.63	0.00	0.18	0.05	0.03	0.05	0.00	0.12	11.27	
% of flight			0.4	4.4	1.2	1.6	0.4	14.3	1.3	0.0	0.4	57.7	14.4	0.0	1.6	0.5	0.3	0.4	0.0	1.1	100.0	
Average last 10 yrs	111.6	797.2	33.4	418.3	96.2	104.8	50.1	1177.8	209.9	6.8	55.6	3903.0	1513.1	2.5	195.9	64.0	30.0	27.5	0.1	152.1	8041.1	

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BAKE OVEN KNOB (Lehigh) - Bob Hoopes, Dan Kunkle, co-compilers

Month	Days	Hours	BLVU	TUVU	OSPR	BAEA	NOHA	SSHA	COHA	NOGO	RSHA	BWHA	RTHA	RLHA	GOEA	AMKE	MERL	PEFA	SWHA	Unid	Total	
August	17	136.5	45	196	72	59	4	39	10	0	2	168	56	0	2	11	8	0	0	0	32	705
September	30	239.0	76	289	191	140	26	442	61	0	9	6288	134	0	2	37	55	29	0	106	7885	
October	31	238.3	91	327	17	93	42	1518	128	15	79	21	1144	0	58	26	51	22	0	92	3724	
November	27	199.8	75	169	0	60	18	112	23	17	62	0	810	0	51	1	4	5	0	13	1420	
<b>Total</b>	<b>105</b>	<b>813.5</b>	<b>287</b>	<b>981</b>	<b>280</b>	<b>352</b>	<b>90</b>	<b>2111</b>	<b>222</b>	<b>32</b>	<b>152</b>	<b>6477</b>	<b>2144</b>	<b>0</b>	<b>113</b>	<b>75</b>	<b>118</b>	<b>56</b>	<b>0</b>	<b>243</b>	<b>13734</b>	
Total per hr			0.35	1.21	0.34	0.43	0.11	2.59	0.27	0.04	0.19	7.96	2.64	0.00	0.14	0.09	0.15	0.07	0.00	0.30	16.88	
% of flight			2.1	7.1	2.0	2.6	0.7	15.4	1.6	0.2	1.1	47.2	15.6	0.0	0.8	0.5	0.9	0.4	0.0	1.8	100.0	
Average last 10 yrs	102.9	807.1	284.3	957.3	422.2	248.8	111.1	3118.2	277.2	26.7	120.7	5399.5	1697.1	0.5	100.3	151.8	97.2	54.5	0.0	283.0	13371.0	

\*Includes Mississippi Kite on 08/16/2016

Bucktoe Creek Preserve(Chester) - Larry Lewis, compiler

Month	Days	Hours	BLVU	TUVU	OSPR	BAEA	NOHA	SSHA	COHA	NOGO	RSHA	BWHA	RTHA	RLHA	GOEA	AMKE	MERL	PEFA	SWHA	Unid	Total
September	30	224.5	0	0	103	50	9	147	49	0	8	1127	2	0	0	64	4	1	0	0	1564
October	31	247.5	0	183	24	124	14	582	170	1	74	53	273	0	6	39	17	2	0	6	1568
November	30	206.0	0	221	0	107	16	204	85	0	136	0	355	0	3	1	2	4	0	0	1134
<b>Total</b>	<b>91</b>	<b>678.0</b>	<b>0</b>	<b>404</b>	<b>127</b>	<b>281</b>	<b>39</b>	<b>933</b>	<b>304</b>	<b>1</b>	<b>218</b>	<b>1180</b>	<b>630</b>	<b>0</b>	<b>9</b>	<b>104</b>	<b>23</b>	<b>7</b>	<b>0</b>	<b>6</b>	<b>4266</b>
Total per hr			0.00	0.60	0.19	0.41	0.06	1.38	0.45	0.00	0.32	1.74	0.93	0.00	0.01	0.15	0.03	0.01	0.00	0.01	6.29
% of flight			0.0	9.5	3.0	6.6	0.9	21.9	7.1	0.0	5.1	27.7	14.8	0.0	0.2	2.4	0.5	0.2	0.0	0.1	100.0
Average for 10 yrs	50.3	336.1	0.0	166.7	71.3	137.0	25.0	484.3	159.3	0.7	92.3	1146.7	317.3	0.0	3.7	85.0	15.0	4.3	0.0	3.0	1727.7

COUNCIL CUP (Luzerne) - Donald Kapral, compiler

Month	Days	Hours	BLVU	TUVU	OSPR	BAEA	NOHA	SSHA	COHA	NOGO	RSHA	BWHA	RTHA	RLHA	GOEA	AMKE	MERL	PEFA	SWHA	Unid	Total
September	3	13.5	0	0	2	0	0	0	0	0	0	366	0	0	0	1	0	0	0	0	369
<b>Total</b>	<b>3</b>	<b>13.5</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>366</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>369</b>
Total per hr			0.00	0.00	0.15	0.00	0.00	0.00	0.00	0.00	0.00	27.11	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00	27.33
% of flight			0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	99.2	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	100.0
Average for 10 yrs	19.6	91.1	1.2	134.1	16.9	35.2	6.0	93.9	9.6	0.0	0.7	330.2	200.4	0.0	0.7	22.8	0.1	1.0	0.0	23.7	877.7

HAWK MOUNTAIN (Berks and Schuylkill) - Laurie Goodrich, compiler

Month	Days	Hours	BLVU	TUVU	OSPR	BAEA	NOHA	SSHA	COHA	NOGO	RSHA	BWHA	RTHA	RLHA	GOEA	AMKE	MERL	PEFA	SWHA	Unid	Total
August	17	168.3	6	8	62	54	6	36	9	0	2	171	50	0	2	31	4	1	0	17	459
September	30	298.0	10	45	242	140	40	559	62	0	11	9136	123	0	3	133	82	15	0	84	10685
October	31	289.0	44	450	36	127	49	2243	262	13	87	54	1004	0	52	53	93	30	0	130	4727
November	30	237.3	31	91	3	83	17	115	36	18	47	0	926	1	57	0	11	2	0	20	1458
December/January	19	134.5	22	1	0	104	6	15	1	4	2	0	78	0	17	0	3	0	0	5	258
<b>Total</b>	<b>127</b>	<b>1127.0</b>	<b>113</b>	<b>595</b>	<b>343</b>	<b>508</b>	<b>118</b>	<b>2968</b>	<b>370</b>	<b>35</b>	<b>149</b>	<b>9361</b>	<b>2181</b>	<b>1</b>	<b>131</b>	<b>217</b>	<b>193</b>	<b>48</b>	<b>0</b>	<b>256</b>	<b>17587</b>
Total per hr			0.10	0.53	0.30	0.45	0.10	2.63	0.33	0.03	0.13	8.31	1.94	0.00	0.12	0.19	0.17	0.04	0.00	0.23	15.61
% of flight			0.6	3.4	2.0	2.9	0.7	16.9	2.1	0.2	0.8	53.2	12.4	0.0	0.7	1.2	1.1	0.3	0.0	1.5	100.0
Average last 10 yrs	125.2	1100.5	136.8	562.1	483.5	325.5	169.7	4515.5	585.1	32.9	171.3	7871.7	2313.0	1.2	132.0	391.7	177.8	58.9	0.5	198.3	18969.7

**JACK'S MOUNTAIN (Mifflin) - Ron Singer, compiler**

Month	Days	Hours	BLVU	TUVU	OSPR	BAEA	NOHA	SSHA	COHA	NOGO	RSHA	BWHA	RTHA	RLHA	GOEA	AMKE	MERL	PEFA	SWHA	Unid	Total
September	30	182.8	4	0	57	77	10	103	26	0	2	3090	36	0	0	17	5	3	0	3	3433
October	31	187.0	14	145	13	54	19	468	85	4	25	9	325	0	51	17	9	14	0	11	1263
November	27	173.0	5	2	1	10	4	20	10	1	6	0	143	0	78	1	5	1	0	0	287
December	9	57.3	13	1	0	7	0	1	0	0	1	0	8	0	15	0	0	0	0	0	46
<b>Total</b>	<b>97</b>	<b>600</b>	<b>36</b>	<b>148</b>	<b>71</b>	<b>148</b>	<b>33</b>	<b>592</b>	<b>121</b>	<b>5</b>	<b>34</b>	<b>3099</b>	<b>512</b>	<b>0</b>	<b>144</b>	<b>35</b>	<b>19</b>	<b>18</b>	<b>0</b>	<b>14</b>	<b>5029</b>
Total per hr			0.06	0.25	0.12	0.25	0.06	0.99	0.20	0.01	0.06	5.17	0.85	0.00	0.24	0.06	0.03	0.03	0.00	0.02	8.38
% of flight			0.7	2.9	1.4	2.9	0.7	11.8	2.4	0.1	0.7	61.6	10.2	0.0	2.9	0.7	0.4	0.4	0.0	0.3	100.0
Average last 10 yrs	62.0	352.7	28.2	129.3	57.2	76.6	30.6	572.7	65.3	2.1	14.5	2667.5	450.5	0.0	62.8	47.3	12.4	11.8	0.0	14.6	4242.1

**LITTLE GAP (Northampton) - Michael Schall, compiler**

Month	Days	Hours	BLVU	TUVU	OSPR	BAEA	NOHA	SSHA	COHA	NOGO	RSHA	BWHA	RTHA	RLHA	GOEA	AMKE	MERL	PEFA	SWHA	Unid	Total
August	11	65.3	0	5	28	32	2	17	4	0	2	50	22	0	0	17	4	3	0	2	188
September	30	225.8	13	19	156	111	17	533	49	0	5	7971	116	0	3	137	55	17	0	38	9240
October	29	212.3	43	330	27	115	37	1606	171	7	48	20	856	1	47	55	60	22	0	50	3495
November	29	165.8	87	123	0	53	13	115	44	15	36	0	781	1	39	0	8	3	0	10	1328
December	5	27.0	5	0	0	24	0	0	0	1	1	0	28	0	11	0	0	0	0	1	71
<b>Total</b>	<b>104</b>	<b>696.0</b>	<b>148</b>	<b>477</b>	<b>211</b>	<b>335</b>	<b>69</b>	<b>2271</b>	<b>268</b>	<b>23</b>	<b>92</b>	<b>8041</b>	<b>1803</b>	<b>2</b>	<b>100</b>	<b>209</b>	<b>127</b>	<b>45</b>	<b>0</b>	<b>101</b>	<b>14322</b>
Total per hr			0.21	0.69	0.30	0.48	0.10	3.26	0.39	0.03	0.13	11.55	2.59	0.00	0.14	0.30	0.18	0.06	0.00	0.15	20.58
% of flight			1.0	3.3	1.5	2.3	0.5	15.9	1.9	0.2	0.6	56.1	12.6	0.0	0.7	1.5	0.9	0.3	0.0	0.7	100.0
Average last 10 yrs	90.9	582.5	96.4	462.9	334.8	224.2	102.6	3148.0	338.7	22.4	93.9	6792.6	1578.8	0.7	76.7	181.1	98.5	41.3	0.0	99.5	13693.3

**MILITIA HILL (Montgomery) - Andy Fayer, Lynne Jackson, Rich Conroy, co-compilers**

Month	Days	Hours	BLVU	TUVU	OSPR	BAEA	NOHA	SSHA	COHA	NOGO	RSHA	BWHA	RTHA	RLHA	GOEA	AMKE	MERL	PEFA	SWHA	Unid	Total
September	30	213.0	0	0	137	80	15	195	17	0	7	5453	2	0	0	117	9	10	0	24	6067
October	31	233.0	4	575	13	34	7	360	69	0	48	196	54	0	3	53	17	23	0	40	1486
<b>Total</b>	<b>61</b>	<b>446.3</b>	<b>4</b>	<b>575</b>	<b>150</b>	<b>114</b>	<b>22</b>	<b>555</b>	<b>86</b>	<b>0</b>	<b>55</b>	<b>5649</b>	<b>56</b>	<b>0</b>	<b>3</b>	<b>170</b>	<b>26</b>	<b>23</b>	<b>0</b>	<b>64</b>	<b>7553</b>
Total per hr			0.01	1.29	0.34	0.26	0.05	1.24	0.19	0.00	0.12	12.66	0.13	0.00	0.01	0.38	0.06	0.05	0.00	0.14	16.93
% of flight			0.1	7.6	2.0	1.5	0.3	7.3	1.1	0.0	0.7	74.8	0.7	0.0	0.0	2.3	0.3	0.3	0.0	0.8	100.0
Average last 10 yrs	59.8	448.5	27.1	664.5	256.0	105.3	74.4	1056.0	137.5	1.4	63.2	10765.0	113.2	0.2	3.7	261.8	33.2	29.4	0.4	67.7	13659.8

\*Including Mississippi Kite on 09/24/2016

\*Total includes one Mississippi Kite on September 18

**ROCKY RIDGE (York) - Randy Phillips, compiler**

Month	Days	Hours	BLVU	TUVU	OSPR	BAEA	NOHA	SSHA	COHA	NOGO	RSHA	BWHA	RTHA	RLHA	GOEA	AMKE	MERL	PEFA	SWHA	Unid	Total
August	1	4.5	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
September	11	62.3	0	0	41	6	9	209	3	0	0	3496	1	0	0	35	0	0	0	3	3803
October	9	31.3	0	18	4	5	2	78	4	0	1	0	10	0	1	12	2	1	0	1	139
<b>Total</b>	<b>21</b>	<b>98.0</b>	<b>0</b>	<b>18</b>	<b>46</b>	<b>12</b>	<b>11</b>	<b>287</b>	<b>7</b>	<b>0</b>	<b>1</b>	<b>3496</b>	<b>11</b>	<b>0</b>	<b>1</b>	<b>48</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>4</b>	<b>3945</b>
Total per hr			0.00	0.18	0.47	0.12	0.11	2.93	0.07	0.00	0.01	35.67	0.11	0.00	0.01	0.49	0.02	0.01	0.00	0.04	40.26
% of flight			0.0	0.5	1.2	0.3	0.3	7.3	0.2	0.0	0.0	88.6	0.3	0.0	0.0	1.2	0.1	0.0	0.0	0.1	100.0
Average last 10 yrs	13.7	66.8	0.7	19.7	27.0	59.7	7.7	213.7	6.7	0.0	0.7	2037.7	10.3	0.0	0.5	42.3	2.0	1.5	0.0	2.0	2112.0

**ROSE TREE PARK (Delaware) - Holly Merker, compiler**

Month	Days	Hours	BLVU	TUVU	OSPR	BAEA	NOHA	SSHA	COHA	NOGO	RSHA	BWHA	RTHA	RLHA	GOEA	AMKE	MERL	PEFA	SWHA	Unid	Total
September	29	188.8	0	0	102	61	15	147	31	0	3	743	3	0	0	65	12	7	0	7	1197
October	31	190.3	8	319	38	43	29	425	71	0	64	82	99	0	0	81	20	23	0	30	1332
November	19	116.5	67	90	1	27	4	57	12	0	60	0	131	0	1	1	2	0	0	8	461
<b>Total</b>	<b>79</b>	<b>495.5</b>	<b>75</b>	<b>409</b>	<b>141</b>	<b>131</b>	<b>48</b>	<b>629</b>	<b>114</b>	<b>0</b>	<b>127</b>	<b>825</b>	<b>233</b>	<b>0</b>	<b>1</b>	<b>147</b>	<b>34</b>	<b>30</b>	<b>0</b>	<b>45</b>	<b>2990</b>
Total per hr			0.15	0.83	0.28	0.26	0.10	1.27	0.23	0.00	0.26	1.66	0.47	0.00	0.00	0.30	0.07	0.06	0.00	0.09	6.03
% of flight			2.5	13.7	4.7	4.4	1.6	21.0	3.8	0.0	4.2	27.6	7.8	0.0	0.0	4.9	1.1	1.0	0.0	1.5	100.0
Average last 10 yrs	86.2	552.3	54.8	431.2	185.7	133.0	64.1	1052.7	156.7	1.2	167.6	3379.7	322.4	0.2	3.2	158.8	32.2	18.1	0.2	49.8	6211.7

MISSISSIPPI KITE ON 09/18/2016

SECOND MOUNTAIN (Lebanon) - David Schwenk, compiler

Month	Days	Hours	BLVU	TUVU	OSPR	BAEA	NOHA	SSHA	COHA	NOGO	RSHA	BWHA	RTHA	RLHA	GOEA	AMKE	MERL	PEFA	SWHA	Unid	Total
August	17	67.0	0	0	11	11	1	0	2	0	3	25	15	0	0	7	0	1	0	1	77
September	30	226.8	71	9	70	58	15	233	32	2	13	5930	51	0	5	63	12	6	0	10	6580
October	30	225.5	298	516	6	94	28	737	70	0	43	11	245	0	35	21	16	7	0	28	2166
November	30	187.3	94	167	1	66	9	47	19	3	15	0	216	0	46	2	1	1	0	11	698
December	30	111.5	57	11	0	40	2	3	0	3	3	0	39	0	17	0	0	0	0	0	177
<b>Total</b>	<b>137</b>	<b>818.0</b>	<b>520</b>	<b>703</b>	<b>88</b>	<b>269</b>	<b>56</b>	<b>1020</b>	<b>123</b>	<b>8</b>	<b>77</b>	<b>5966</b>	<b>566</b>	<b>0</b>	<b>103</b>	<b>93</b>	<b>31</b>	<b>15</b>	<b>0</b>	<b>50</b>	<b>9688</b>
Total per hr			0.64	0.86	0.11	0.33	0.07	1.25	0.15	0.01	0.09	7.29	0.69	0.00	0.13	0.11	0.04	0.02	0.00	0.06	11.84
% of flight			5.4	7.3	0.9	2.8	0.6	10.5	1.3	0.1	0.8	61.6	5.8	0.0	1.1	1.0	0.3	0.2	0.0	0.5	100.0
Average last 10 yrs	130.0	900.5	357.4	703.7	149.9	182.0	102.6	2180.4	236.9	20.8	113.5	4303.7	945.7	2.4	90.5	103.6	37.8	26.1	0.7	57.8	9617

\*Total includes one Mississippi Kite on September 22

STONE MOUNTAIN (Huntingdon) - Greg Grove, compiler

Month	Days	Hours	BLVU	TUVU	OSPR	BAEA	NOHA	SSHA	COHA	NOGO	RSHA	BWHA	RTHA	RLHA	GOEA	AMKE	MERL	PEFA	SWHA	Unid	*Total
August	3	15.5	0	0	4	5	0	4	1	0	0	30	4	0	0	3	0	0	0	0	51
September	27	160.3	0	0	60	60	11	117	18	0	1	1484	33	0	0	29	2	3	0	9	1827
October	26	156.0	20	130	20	64	27	552	51	2	43	5	332	1	17	17	31	16	0	9	1337
November	25	139.8	3	29	0	32	5	39	10	3	6	0	132	1	76	2	1	1	0	1	341
December	7	46.5	0	1	0	5	1	0	0	0	0	0	21	1	23	0	0	0	0	0	52
<b>Total</b>	<b>88</b>	<b>518.0</b>	<b>23</b>	<b>160</b>	<b>84</b>	<b>166</b>	<b>44</b>	<b>712</b>	<b>80</b>	<b>5</b>	<b>50</b>	<b>1519</b>	<b>522</b>	<b>3</b>	<b>116</b>	<b>51</b>	<b>34</b>	<b>20</b>	<b>0</b>	<b>19</b>	<b>3608</b>
Total per hr			0.04	0.31	0.16	0.32	0.08	1.37	0.15	0.01	0.10	2.93	1.01	0.01	0.22	0.10	0.07	0.04	0.00	0.04	6.97
% of flight			0.6	4.4	2.3	4.6	1.2	19.7	2.2	0.1	1.4	42.1	14.5	0.1	3.2	1.4	0.9	0.6	0.0	0.5	100.0
Average last 10 yrs	68.8	390.4	24.8	231.1	73.7	101.1	48.4	822.3	127.6	7.1	48.4	1568.3	758.9	0.8	117.4	82.5	30.6	19.1	0.1	33.3	4035.8

WAGGONER'S GAP (Cumberland) - David Grove, compiler

Month	Days	Hours	BLVU	TUVU	OSPR	BAEA	NOHA	SSHA	COHA	NOGO	RSHA	BWHA	RTHA	RLHA	GOEA	AMKE	MERL	PEFA	SWHA	Unid	Total
August	30	153.5	0	0	34	72	5	23	5	0	6	201	83	0	0	27	2	4	0	8	470
September	28	233.5	0	0	274	192	32	1023	62	0	13	9207	131	0	1	133	16	17	0	40	11141
October	28	267.0	18	1058	28	184	85	3597	222	13	111	27	1175	0	75	56	54	28	0	72	6803
November	27	228.0	21	244	2	56	22	172	45	13	58	0	909	0	145	3	7	4	0	18	1719
December	25	140.8	8	3	0	72	3	5	7	6	5	0	94	2	21	0	1	2	0	5	234
<b>Total</b>	<b>138</b>	<b>1022.8</b>	<b>47</b>	<b>1305</b>	<b>338</b>	<b>576</b>	<b>147</b>	<b>4820</b>	<b>341</b>	<b>32</b>	<b>193</b>	<b>9435</b>	<b>2392</b>	<b>2</b>	<b>242</b>	<b>219</b>	<b>80</b>	<b>55</b>	<b>0</b>	<b>143</b>	<b>20367</b>
Total per hr			0.05	1.28	0.33	0.56	0.14	4.71	0.33	0.03	0.19	9.23	2.34	0.00	0.24	0.21	0.08	0.05	0.00	0.14	19.91
% of flight			0.2	6.4	1.7	2.8	0.7	23.7	1.7	0.2	0.9	46.3	11.7	0.0	1.2	1.1	0.4	0.3	0.0	0.7	100.0
Average last 10 yrs	139.2	1112.6	77.9	1600.3	409.6	466.6	223.3	7748.5	696.4	47.3	231.9	7970.8	4042.5	4.3	335.0	431.5	150.8	81.9	0.1	148.8	23271.7

2014 TOTALS FOR ALL WATCHSITES

Month	Days	Hours	BLVU	TUVU	OSPR	BAEA	NOHA	SSHA	COHA	NOGO	RSHA	BWHA	RTHA	RLHA	GOEA	AMKE	MERL	PEFA	SWHA	Unid	Total
August	113	717	67	235	224	245	19	137	36	0	15	876	277	0	4	105	19	9	0	74	2,343
September	338	2,505	182	368	1,511	1,040	209	3,890	452	2	79	59,114	832	0	20	851	260	115	0	361	69,289
October	339	2,498	549	4,363	244	984	359	13,173	1,355	57	640	482	6,331	2	386	443	386	209	0	490	30,453
November	274	1,839	383	1,179	8	505	110	925	301	72	433	0	4,602	4	586	11	42	22	0	105	9,288
December	106	546	105	17	0	254	12	24	10	14	12	0	274	3	105	0	6	2	0	11	849
<b>Total</b>	<b>1,170</b>	<b>8,104</b>	<b>1,286</b>	<b>6,162</b>	<b>1,987</b>	<b>3,028</b>	<b>709</b>	<b>18,149</b>	<b>2,154</b>	<b>145</b>	<b>1,179</b>	<b>60,472</b>	<b>12,316</b>	<b>9</b>	<b>1,101</b>	<b>1,410</b>	<b>713</b>	<b>357</b>	<b>0</b>	<b>1,041</b>	<b>112,222</b>
Total per hr			0.16	0.76	0.25	0.37	0.09	2.24	0.27	0.02	0.15	7.46	1.52	0.00	0.14	0.17	0.09	0.04	0.00	0.13	13.85
% of flight			1.1	5.5	1.8	2.7	0.6	16.2	1.9	0.1	1.1	53.9	11.0	0.0	1.0	1.3	0.6	0.3	0.0	0.9	100.0
Average of last 10 yrs	1125.6	7492.5	1275.4	6513.2	2608.1	2093.6	1021.1	26267.8	2923.3	167.3	1101.1	60922.0	12736.8	11.9	1041.8	1868.3	667.5	367.9	4.0	1133.6	122724.3
% compared to average	3.9	8.2	0.8	-5.4	-23.8	44.6	-30.6	-30.9	-26.3	-13.3	7.1	-0.7	-3.3	-24.4	5.7	-24.5	6.8	-3.0	-100.0	-8.2	-8.6

\*Total includes two Mississippi Kites

†Includes three Mississippi Kites & one Swallow-tailed Kite