

Pennsylvania Autumn 2022 Raptor Migration Summary

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Hawkwatchers know September is Broad-winged Hawk season; sure you can see them from early August to early October, but the big numbers are usually seen the third week in September. Dates of peak flights often vary among the Commonwealth's watch sites, which isn't surprising given the longitudinal spread of watch sites, daily weather conditions, and the various flight lines broad-wings take during migration. However, this autumn's broad-wing flight was notable for the thousands of birds moving in a broad front across Pennsylvania in a narrow window of time with peak broad-wing flights on the 16th or 17th at most watch sites. Other notable flights this past autumn included new watch site records for Bald and Golden Eagles, while flights of Osprey and Northern Goshawk were notably low. Read on to see what other notable flights occurred during the 2022 autumn raptor migration season.

Migration Summary

In autumn 2022, 15 Pennsylvania watch sites counted 134,606 raptors in 7289 hours over 1087 days, for an average of 18.5 hawks per hour (Table 1). Bald Eagle Mountain had a limited late season count and the Chester County Hawk Watch and Migration Count at Chambers Lake returned with their first fall count since 2016. Total effort was 5% below average and the total raptor count was 16.7% above the 10-year average of 115,363 (Table 1). Above average numbers were observed for Turkey Vulture, 9633, up 12% from the 10-year average of 8573; Bald Eagle, 3717, up 22%; Sharp-shinned Hawk, 22,596, up 6%; Red-shouldered Hawk, 1190, up 5%; Broad-winged Hawk, 78,657, up 31%; Golden Eagle, 1336, up 13%; and Merlin, 668, up 4% (Table 1).

Nine of 16 species had counts below their 10-year averages. The largest dips were seen in Rough-legged Hawk, 3, down 61% and Northern Goshawk, 39, down 46%. Osprey were below average at all sites and the state total of 1201, was down 33%. Other species with below average counts include Black Vulture, 1006, down 12%; Northern Harrier, 559, down 26%; Cooper's Hawk, 2244, down 5%; Red-tailed Hawk, 9313, down 7%; American Kestrel, 1566, down 10%; and Peregrine Falcon, 293, down 19% (Table 1).

Site Highlights

Allegheny Front (*Somerset/Bedford*) – Allegheny Front counters recorded 8009 raptors in 721.3 hours on 112 days for an

average of 11.1 hawks per hour from August 15 to December 30. Effort was 5% below average and the total raptors were 19% below the 10-year average of 9865. Seven of 16 species had above average counts. Counts of both Bald Eagle, 261, and Golden Eagle, 345, were new season long count records and the count of 1479 Red-tailed Hawks was the highest in 10 years. Other species with above average counts include Turkey Vulture, up 18%, Cooper's Hawk, up 10%, Red-shouldered Hawk, up 33%, and Merlin, up 19%. Four of the 16 species had below average counts, most notably the Osprey count of 46 was down 44% and the second lowest season total in Allegheny Front history. Other species with below average counts were Black Vulture, Broad-winged Hawk, and Peregrine Falcon.

Strong east-southeast winds on September 9 fueled a record Bald Eagle flight with 49 counted, smashing the old record of 38. The first Northern Goshawk of the season was spotted October 23 along with a season high 18 Cooper's Hawks and 133 Red-tailed Hawks. The following day 156 Turkey Vultures were tallied, the fourth highest single day count. Late October and the first half of November saw several days with over 20 Golden Eagles, including 28 on November 9 and 26 on November 10. Golden Eagles peaked in December with 35 counted on the 9th. Two Rough-legged Hawks, both dark morphs, were counted this season, one November 7 and one November 21.

Bake Oven Knob (*Lehigh/Carbon*) – Counters observed 10,711 raptors in 602.5 hours on 97 days for an average of 17.8 raptors per hour from August 15 to November 24. Effort was 22% below the average of 767.8 hours, and the total count

was 11% below the 10-year average of 12,091. Not surprisingly, given the decreased effort, most species had below average counts with the largest drops seen in Osprey, 140, down 48%; Northern Harrier, 34, down 52%; Red-tailed Hawk, 601, down 50%; and Peregrine Falcon, 27, down 42%. Counts of all four species were the lowest in the last 30 years. The only species with above average counts this year were Cooper's Hawk, 235, and Broad-winged Hawk, 6425, which were up 6% and 14%, respectively.

Warm temperatures and light winds produced strong thermals on September 17 which carried a season high 2262 Broad-winged Hawks past the lookout (Table 2). On September 23, 39 Bald Eagles were recorded, the second highest single-day count at Bake Oven. Accipiters peaked October 18 with season highs of 236 Sharp-shinned Hawks (Table 2) and 22 Cooper's Hawks. A season high 10 Merlins also was recorded on the 18th. Golden Eagle peaked on November 13 with 13.

Bald Eagle Mountain – Eagle Field (*Centre*) – Bald Eagle hawk watchers counted 682 raptors in 163.5 hour over 23 days from October 27 to December 19 for an average of 4.2 raptors per hour. This is the third year for this site; however, this year they conducted a late season count focused on Golden Eagles. Golden Eagles numbers were lower than the past two seasons, however, this is likely due to the later start and only conducting counts during favorable winds. The first day of the count on October 27 didn't produce any Golden Eagles but did have a season high 81 Turkey Vultures and the only Peregrine Falcon of the count. The largest Golden Eagle flights were on days with strong west

Table 2. Peak One-day counts at watchsites in Autumn 2021

Site Name	Sharp-shinned Hawk Peak Count	Sharp-shinned Hawk Date	Broad-winged Hawk Peak Count	Broad-winged Hawk Date
Allegheny Front	154	10/22	1162	9/17
Bake Oven Knob	236	10/18	2262	9/17
Chamber's Lake	36	10/8	3096	9/16
Council Cup	10	9/20	471	9/15
Hawk Mountain	283	10/8	2883	9/17
Jack's Mountain	174	10/21	2035	9/17
Little Gap	172	10/15	1450	9/17
Militia Hill	55	9/24	5795	9/16
Rocky Ridge	86	10/7	1100	9/19
Rose Tree Park	30	9/29	1045	9/16
Second Mountain	156	10/20	1007	9/16
Stone Mountain	71	10/10	764	9/16
Summit Mountain	-	-	533	9/17
Waggoner's Gap	560	10/7	2037	9/18

or northwest winds with counts peaking on December 1 with 41 goldens. Gusty west-northwest winds on November 25 produced the highest Bald Eagle flight of the season with 16 and the second highest Golden Eagle flight with 38.

Chester County Hawk Watch at Chamber's Lake (*Chester*) – Chambers Lake counters observed 10,384 raptors in 597 hours over 79 days from September 8 to November 30 for an average of 17.4 raptors per hour. This is only the second time a full season count has been conducted at Chamber's Lake, the other being in 2010. The largest count of the season was on September 16 with 3118 raptors including 3096 Broad-winged Hawks most of which flew low over the lookout. Another 1999 broad-wings were counted on September 26. Flights of Turkey Vulture started to build in mid-October with an October high 171 on the 28th. A season high 185 Turkey Vultures were counted on November 10. The high counts for both Red-shouldered Hawk and Red-tailed Hawk were October 29 with 28 and 31 counted, respectively.

Council Cup (*Luzerne*) – Council Cup watchers recorded 932 raptors in 75 hours over 25 days from September 13 to November 8 for an average of 12.4 raptors per hour. Both effort and the total count were 25% above average, however effort and count totals have varied considerably over the last 10 years.

Sixteen American Kestrels were tallied on September 14, the third highest single-day count at Council Cup. The following day counters recorded a season high 484 raptors: one Osprey, 2 Bald Eagles, 7 Sharp-shinned Hawks, 471 Broad-winged Hawks, and 3 American Kestrels. Five Bald Eagles were observed on September 23 along with the only Merlin of the season.

Hawk Mountain (*Berks/Schuylkill*) – Hawk Mountain counters tallied 20,347 raptors in 1067 hours over 116 days from August 15 to December 30 for an average of 19.1 raptors per hour. Effort was 3% below the average of 1104 hours and the overall count was 25% above the 10-year average of 16,317. Counts of Bald Eagle, 591, and Broad-winged Hawk, 12,503 were up 21% and 60%, respectively and were the second and ninth highest counts recorded at Hawk Mountain (Table 1). Counts of 10 species were below average, most notable were Northern Goshawk, down 71%; Osprey, down 33%; and Red-tailed Hawk, down 20% (Table 1). Other species with below average counts include Black Vulture, Turkey Vulture, Northern Harrier, Cooper's Hawk, Red-shouldered Hawk, Golden Eagle, and Peregrine Falcon.

A four-day total of nearly 10,000 Broad-winged Hawks was recorded from the September 16th through the 19th, with a peak of 2883 broad-wings on the 17th

(Table 2). Gusty northwest winds produced a Bald Eagle parade on September 23: a season high 38 Bald Eagles were counted with 22 eagles after 4:00 pm, the fourth highest single-day Bald Eagle count at Hawk Mountain. The best count day of October was on the 8th; 12 species were recorded with season highs of 283 Sharp-shinned Hawks, 32 Cooper's Hawks, 55 American Kestrels, 10 Merlins, and 6 Peregrine Falcons. Two of four Northern Goshawks counted this season were seen on November 13 along with 24 Bald Eagles and a season high 10 Golden Eagles.

Jack's Mountain (*Mifflin*) – Jack's Mountain counters tallied 10,796 raptors in 545.8 hours across 87 days from August 14 to December 18 for an average of 19.8 hawks per hour. Effort was 3% above the 10-year average of 530.5 hours and the total count was 50% above the average of 7195. It was a season of record highs; the season total was a new record driven by record counts of Black Vulture, 94, up 147%; Bald Eagle, 287, up 60%; Sharp-shinned Hawk, 1565, up 83%; Cooper's Hawk, 160, up 50%; and Broad-winged Hawk, 7089, up 49%. Other species with above average counts include Turkey Vulture, Northern Harrier, Red-shouldered Hawk, Red-tailed Hawk, American Kestrel, and Merlin. Jacks Mountain was the only Pennsylvania watch site to record above average counts of Northern Harrier, Osprey and Golden Eagle were the only species with below average counts. Counts of Osprey, 35, were down 43% and counts of Golden Eagle, 87, were down 30% and the lowest since 2013.

Broad-winged Hawk flights peaked mid-September with 1525 broad-wings on the 16th and 2035 counted on the 17th. A record 19 Bald Eagles were observed on September 20 along with one Osprey, 33 Sharp-shinned Hawks, 6 Cooper's Hawks, 579 Broad-winged Hawks, 8 Red-tailed Hawks, 9 American Kestrels, 2 Merlins and 2 Peregrine Falcons. A record 20 Cooper's Hawks and first Northern Goshawk of the season were recorded on October 12. Golden Eagle counts peaked November 13 with 21, the third highest count recorded at Jack's Mountain.

Little Gap (*Northampton*) – Little Gap observers counted 9920 hawks in 243.5 hours over 40 days from September 1 to November 28 for an average of 40.7 birds per hour. Effort was 48% below average and the count total was 14% below the average of 11,579. However, the number of birds counted per hour was 53% above the 10-year average of 26.6. All species had below average counts, except for Bald Eagle and Broad-winged Hawk which had average counts. The largest drops in count numbers were Northern Harrier, down 70%; Golden Eagle, down 65%; Black Vulture, down 62%; Osprey, down 51%; and Red-tailed Hawk, down 50%.

Flights of Broad-winged Hawk started to build September 14 when 381 broad-wings were recorded along with 12 Ospreys, 15 Bald Eagles, 95 Sharp-shinned Hawks, a season high 24 American Kestrels, 2 Merlins, and a Peregrine Falcon. Broad-wing flights peaked on September 17 with a high of 1450 (Table 2). Light southwest winds October 15 produced several season-high counts: 127 Sharp-shinned Hawks, 21 Cooper's Hawks, and 15 Merlins. A late adult Broad-winged Hawk was observed October 18. The first Northern Goshawk was recorded October 27 along with 10 Bald Eagles, 32 Sharp-shinned Hawks, 16 Cooper's Hawks, and a season high 104 Red-tailed Hawks.

Militia Hill (*Montgomery*) – Militia Hill counters recorded 18,589 raptors in 430.3 hours across 68 days from September 1 to November 15 for an average of 43.2 raptors per hour. Effort was 3% below the 10-year average of 443 hours, but total count was 87% above the average of 9925. Counts of Broad-winged Hawk, 15,726, were 118% above the average of 7199. The 184 Red-shouldered Hawks counted were well above average and was the second highest count at Militia Hill. Other species with above average counts include Turkey Vulture, up 28%; Bald Eagle, up 25%; and Cooper's Hawk, up 13%. Six of 13 species had below average counts. The largest drops were seen in Black Vulture and Osprey, which were 51% and 50% below average, respectively. Other species with below average counts include Sharp-shinned Hawk, down 11%; Red-tailed Hawk; down 25%; American Kestrel, down 29%; and Merlin, down 30%.

Broad-winged Hawk flights were light for the first half of September, before a large push on September 15 and 16; a combined 7879 broad-wings were tallied including a season high 5795 on the 16th. Another big flight of broad-wings was on September 24 with 4115. Also counted on the 24th were 6 Ospreys, 3 Northern Harriers, 55 Sharp-shinned Hawks, 4 Cooper's Hawks, 4 American Kestrels, 20 Bald Eagles, a new single day count record for Militia Hill, and a Swainson's Hawk, the only one recorded at Pennsylvania watch sites this Autumn. Late October saw a nice push of Red-shouldered Hawk with a high of 73 shoulders counted on the 29th, a new count record for Militia Hill. Two Golden Eagles were recorded in November, one on the 2nd and one on the 10th.

Rocky Ridge Park (*York*) – Rocky Ridge observers tallied 3812 raptors in 216.5 hours on 46 days from August 13 to November 29 for an average of 17.6 birds per hour. Effort at Rocky Ridge increased significantly starting in 2018, so comparisons are made to their 5-year averages. Effort was 19% below the 5-year average of 268.4 hours and the total count was 28% below the average of 5272. This

season's count of 59 Black Vultures was 37% above the average of 43. Counts of Bald Eagle, 75, and Red-tailed Hawk, 124, were up 7% and 21%, respectively. All other species had average or below average counts with the largest declines in numbers of Turkey Vulture, down 60%; and Osprey and Northern Harrier both down 50%.

A season high 14 Bald Eagles were counted September 9, the second highest day at Rocky Ridge. The best accipiter day occurred October 7 with 86 Sharp-shinned Hawks and 5 Cooper's Hawks. Light northeast winds on October 28 produced season high counts of 20 Black Vultures, 17 Turkey Vultures, 6 Red-shouldered Hawks, 41 Red-tailed Hawks, and 2 Merlins.

Rose Tree Park (Delaware) – Rose Tree Park counters recorded 4219 raptors in 378.5 hours over 73 days from August 31 to November 18 for an average of 11.2 hawks per hour. Effort was 18% below the 10-year average of 460 hours, and the overall count was 13% above the average of 3736. The above average total was driven by the Broad-winged Hawk count of 3194 which was 91% above average, and the only species at Rose Tree Park above average this year. Two Golden Eagles were tallied this year, hitting the 10-year average. All other species had below average counts, including record low counts of Osprey, 81, Northern Harrier, 14, Sharp-shinned Hawk, 275, Cooper's Hawk, 48, and American Kestrel, 79, and the second lowest counts of Red-shouldered Hawk, 68, Red-tailed Hawk, 91, and Peregrine Falcon, 8.

The high day for the season was September 19 when 1090 raptors were tallied, including 8 Ospreys, 2 Northern Harriers, 12 Bald Eagles, 4 Sharp-shinned Hawks, 10 Cooper's Hawks, 1045 Broad-winged Hawks, and 6 American Kestrels. Another push of broad-wings passed by September 24 and 26 with 618 and 571 counted, respectively. October's high count came on the 21st with 100 raptors counted, including a season high 63 Turkey Vultures. The last Osprey of the season was observed November 3.

Second Mountain (Lebanon) – Second Mountain hawk watchers counted 6975 raptors in 781.3 hours across 112 days from August 15 to December 15 for an average of 8.9 hawks per hour. Effort was similar to the 10-year average of 777.8 hours and the overall count was 8% below the 10-year average of 7564. Counts of Bald Eagle, Sharp-shinned Hawk, Red-tailed Hawk, and Merlin were above average (Table 1). The 285 Bald Eagles counted were a record high and 31% above the average of 218. Eleven of 15 species had below average counts. The Black Vulture total of 70 was down 71% and was the second lowest season count since 2000. Only two Northern Goshawks were counted, 70% below the average of 7. Other species with below

average counts include Turkey Vulture, Osprey, Northern Harrier, Cooper's Hawk, Red-shouldered Hawk, Broad-winged Hawk, Golden Eagle, American Kestrel and Peregrine Falcon.

A Merlin was first official migrant of the season when it flew south the morning of August 15. The bulk of the Broad-winged Hawk migration occurred September 16-18 when 2261 broad-wings streamed past the hawk watch with a high of 1007 on the 16th (Table 2). Gusty north winds produced the first Golden Eagle of the season on September 29. Flights of Sharp-shinned Hawk started to build at the end of the first week in October and peaked on October 20 with 156. A season high 101 Turkey Vultures were tallied on October 27. A juvenile Northern Goshawk was observed on the December 2, only the second goshawk of the season.

Stone Mountain (Huntingdon/Mifflin) – Stone Mountain counters recorded 5494 raptors in 433 hours over 76 days from August 31 to December 8 for an average of 12.7 raptors per hour. Effort was 9% below the 10-year average, whereas the total count was 18% above the average of 4667. The count of 1106 Turkey Vultures was up 147% and a new seasonal record. Bald Eagle also had a good count with 223, up 35% and the second highest season long count. Other species with above average counts include Sharp-shinned Hawk, Broad-winged Hawk, American Kestrel, Merlin, and Peregrine Falcon. Seven of the 16 species recorded this Autumn had counts below their 10-year averages. Most notable were Red-shouldered Hawk, 28, down 43% and the lowest count since 1993. Golden Eagle, 114, were the lowest in 10 years and were down 17%. No Northern Goshawks were counted for the first time in Stone Mountain's 32-year history.

A season high 13 Bald Eagles were counted on September 10 and 20. West-northwest winds on October 8 produced one of the best flights of the season: 164 raptors were counted including season highs of 9 Cooper's Hawks, 5 Red-shouldered Hawks, 58 Red-tailed Hawks, and 28 American Kestrels, as well as the last Broad-winged Hawk of the season. A record high 573 Turkey Vultures were counted October 22, shattering the old record of 220. High count days for Golden Eagle included 20 on November 9, and 19 on November 28. A light morph Rough-legged Hawk was seen November 20, one of only 3 counted in Pennsylvania this season.

Summit Mountain (Fayette) – Summit Mountain watchers tallied 599 raptors in 11 hours between September 16 and 17 for an average of 54.5 hawks per hour. Effort was much less than the 5-year average of 66.6 hours and the total was 54% below average.

Counters enjoyed a nice flight of Broad-winged Hawks on the 17th with 52

tallied. Although the flight was spread out, the last kettle moved through just above treetops giving spectacular views. Also recorded on the 17th were 10 Turkey Vultures, one Sharp-shinned Hawk, 5 Red-tailed Hawks, and 3 American Kestrels.

Waggoner's Gap (Cumberland) – Waggoner's Gap counters recorded 23,137 raptors in 1025 hours over 131 days from August 1 to December 31 for an average of 22.6 birds per hour. Effort was similar to the 10-year average of 1029 hours and the overall count was 17% above the average of 19,798. Bald Eagle had a record flight for the fifth straight year with 855. Merlin also set a new seasonal record with 152. Other species that had above average counts include, Sharp-shinned Hawk, up 38%; Cooper's Hawk, up 20%; Red-shouldered Hawk, up 28%; Broad-winged Hawk, up 11%; Red-tailed Hawk, up 5%; and American Kestrel, up 9%. Five of 15 species had below average counts. Black Vultures were scarce and their total of 3 was a new low. The 145 Ospreys counted were the lowest in 40 years and down 45%. Other species with below average counts were Turkey Vulture, down 11%; Northern Harrier, down 13%; and Peregrine Falcon, down 11%.

Broad-winged Hawks were sparse for most of August with a high of 32 on the 13th and an August total of 110, barely outpacing the Red-tailed Hawk total of 99. August's total count was the lowest since 2005. Counts of Broad-winged Hawk started to build September 14 with 440 broad-wings and culminated in a season high 2037 on September 18. Following rain on three of the first four days of October, counters enjoyed a run of 17 straight days of triple-digit Sharp-shinned Hawks flights with peaks of 560 on 7th and 547 on the 20th. Moderate north winds produced a new daily record of 39 Bald Eagles October 27. A season high four Northern Goshawks were recorded November 8 along with 16 Bald Eagles, 91 Red-tailed Hawks, and a season high 33 Golden Eagles.

Conclusions

As with any migration count, every year there are winners and losers, counts of some species will be up while others will be down. This held true at Pennsylvania watch sites in autumn 2022. The big winners were Bald Eagle and Broad-winged Hawk. The Bald Eagle count total was the second highest ever recorded in Pennsylvania and the Broad-winged Hawk total was the third highest and counts of both species were above average at most Pennsylvania watch sites. Counts for most species varied among sites, and as if often the case, high counts at a few sites can produce an above average count statewide. Such is the case with Golden Eagle this year; the above average Golden Eagle total was driven by the

record-breaking count at Allegheny Front and the addition of Bald Eagle Mountain, as counts at virtually all other watch sites were below average. While a below average count can be a cause of concern, it is only one year of data, and it is the long-term trends calculated over many years that should be the focus. For example, while counts of Peregrine Falcons were below average this year, the 20-year trend is stable.

Unfortunately, there are some species that appear to be perennial “losers”. Northern Goshawk, now listed as Endangered in Pennsylvania, has been showing long-term declines at watch sites throughout the Northeast, and this year’s total was the second lowest in the last 20 years. Rough-legged Hawks, while never abundant at Pennsylvania watch sites, have become an increasingly rare sighting. The rough-leg total of three matched the record low set in 2019. Counts of some of our more common migrants also have been declining; gone are the September Osprey and late-season Red-tailed Hawk parades, at least at Hawk Mountain. Over the last 20 years counts measured in the number of birds per hour to adjust effort, have declined for both

species, as well as Northern Harriers (Figure 1). The potential cause(s) of the declines vary, ranging from competition with Bald Eagles for Osprey, to habitat loss for Northern Goshawks and Northern Harriers, to global climate change for Red-tailed and Rough-legged hawks.

Population studies on raptors are difficult due to their large size and extensive home ranges, so migration counts are the most effective way to determine populations trends. Pennsylvania watch sites are leading the way, providing data that is critical for long-term trend analysis. Documenting the trends is the first step, however determining the cause(s) and mitigating negative trends through conservation action is the goal.

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Pennsylvania Autumn Hawk Watch Sites

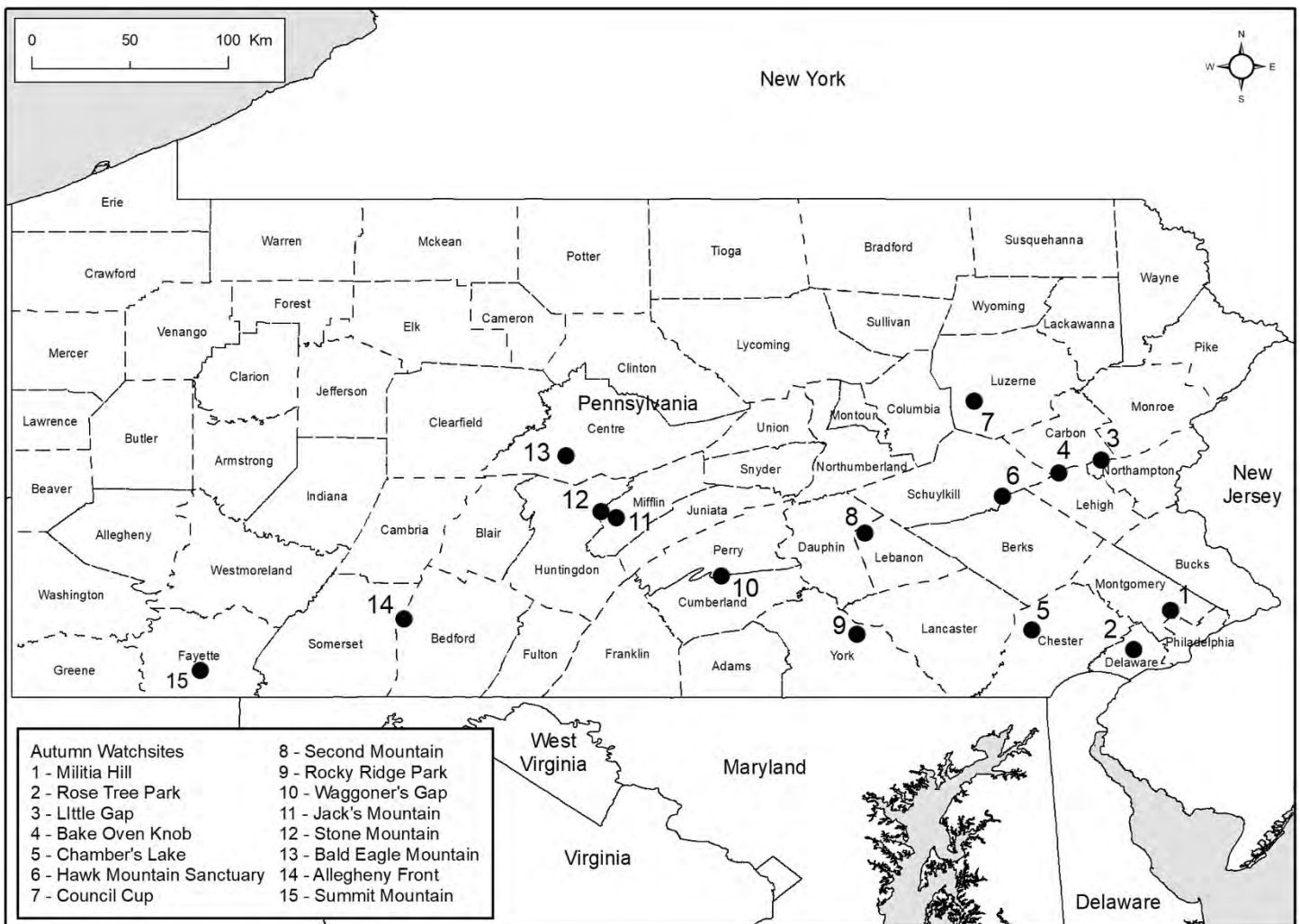


Table 1. Autumn 2022 count results for Pennsylvania watchsites.

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	16	101.8	3	7	6	21	0	9	6	0	1	51	31	0	0	6	0	0	0	10	151
September	29	195.8	0	20	37	156	3	134	39	0	4	3767	189	0	2	19	4	6	0	40	4420
October	27	189.3	4	393	3	52	17	933	85	1	34	0	902	0	48	31	25	7	0	42	2577
November	25	153.0	2	72	0	26	12	25	15	1	13	0	333	2	206	0	3	3	0	13	726
December	15	81.5	0	1	0	6	1	9	2	0	3	0	24	0	89	0	0	0	0	0	135
Total	112	721.3	9	493	46	261	33	1110	147	2	55	3818	1479	2	345	56	32	16	0	105	8009
Total per hr			0.01	0.68	0.06	0.36	0.05	1.54	0.20	0.00	0.08	5.29	2.05	0.00	0.48	0.08	0.04	0.02	0.00	0.15	11.10
% of flight			0.1	6.2	0.6	3.3	0.4	13.9	1.8	0.0	0.7	47.7	18.5	0.0	4.3	0.7	0.4	0.2	0.0	1.3	100.0
Average last 10 yrs	115.8	757.6	31.0	417.7	82.4	176.4	35.3	1133.8	133.1	3.8	41.4	6256.1	1141.0	1.0	209.5	57.8	26.8	27.4	0.0	90.0	9864.5

BAKE OVEN KNOB (Lehigh) - Bob Hoopes, 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	110.8	42	147	17	9	0	22	8	0	0	67	26	0	0	4	3	2	0	6	353
September	29	208.5	75	239	107	182	11	610	97	0	14	6341	179	0	1	51	20	7	0	37	7971
October	28	162.8	63	290	15	35	17	914	118	4	26	17	230	0	10	28	39	17	0	36	1859
November	23	120.5	56	94	1	71	6	11	12	5	38	0	166	0	47	1	1	1	0	18	528
Total	97	602.5	236	770	140	297	34	1557	235	9	78	6425	601	0	58	84	63	27	0	97	10711
Total per hr			0.39	1.28	0.23	0.49	0.06	2.58	0.39	0.01	0.13	10.66	1.00	0.00	0.10	0.14	0.10	0.04	0.00	0.16	17.78
% of flight			2.2	7.2	1.3	2.8	0.3	14.5	2.2	0.1	0.7	60.0	5.6	0.0	0.5	0.8	0.6	0.3	0.0	0.9	100.0
Average last 10 yrs	103.0	767.8	297.2	947.5	267.6	362.0	71.5	2393.0	221.0	12.8	112.1	5630.4	1191.6	0.0	94.0	125.7	78.9	46.4	0.0	238.8	12090.6

BALD EAGLE MOUNTAIN - EAGLE FIELD (Centre) - Nick Bolgiano and Jon Kauffman, co-compilers

Month	Days	Hours	BLVU	TUVU	OSPR	BAEA	NOHA	SSHA	COHA	NOGO	RSHA	BWHA	RTHA	RLHA	GOEA	AMKE	MERL	PEFA	SWHA	Unid	Total
October	1	8.3	0	81	0	5	1	4	0	0	0	0	9	0	0	1	0	1	0	0	102
November	14	102.8	0	50	0	57	1	20	6	0	5	0	73	0	213	0	0	0	0	1	426
December	8	52.5	0	1	0	25	0	2	1	0	1	0	15	0	107	0	0	0	0	2	154
Total	23	163.5	0	132	0	87	2	26	7	0	6	0	97	0	320	1	0	1	0	3	682
Total per hr			0.00	0.81	0.00	0.53	0.01	0.16	0.04	0.00	0.04	0.00	0.59	0.00	1.96	0.01	0.00	0.01	0.00	0.02	4.17
% of flight			0.0	19.4	0.0	12.8	0.3	3.8	1.0	0.0	0.9	0.0	14.2	0.0	46.9	0.1	0.0	0.1	0.0	0.4	100.0

CHESTER COUNTY HAWK WATCH AT CHAMBER'S LAKE (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	22	170.3	0	0	121	55	6	116	41	0	4	6000	10	0	0	32	11	5	0	0	6401
October	30	238.0	160	1159	84	93	5	232	53	0	79	0	173	0	3	13	13	4	0	0	2071
November	27	188.5	209	1206	1	83	2	22	9	0	82	0	292	0	1	2	3	0	0	0	1912
Total	79	596.8	369	2365	206	231	13	370	103	0	165	6000	475	0	4	47	27	9	0	0	10384
Total per hr			0.62	3.96	0.35	0.39	0.02	0.62	0.17	0.00	0.28	10.05	0.80	0.00	0.01	0.08	0.05	0.02	0.00	0.00	17.40
% of flight			3.6	22.8	2.0	2.2	0.1	3.6	1.0	0.0	1.6	57.8	4.6	0.0	0.0	0.5	0.3	0.1	0.0	0.0	100.0

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	9.0	0	0	2	7	0	10	0	0	0	0	0	0	0	6	3	0	0	2	30
October	2	9.0	0	131	1	8	2	20	5	0	15	0	104	0	1	0	0	0	0	0	287
November	8	32.5	0	122	1	22	1	15	4	0	1	1	71	0	0	4	0	0	0	2	244
Total	13	50.5	0	253	4	37	3	45	9	0	16	1	175	0	1	10	3	0	0	4	561
Total per hr			0.00	5.01	0.08	0.73	0.06	0.89	0.18	0.00	0.32	0.02	3.47	0.00	0.02	0.20	0.06	0.00	0.00	0.08	11.11
% of flight			0.0	45.1	0.7	6.6	0.5	8.0	1.6	0.0	2.9	0.2	31.2	0.0	0.2	1.8	0.5	0.0	0.0	0.7	100.0
Average for 10 yrs	15.2	62.3	1.0	113.6	5.9	26.7	6.3	66.4	7.8	0.0	2.7	310.2	186.1	0.0	1.4	18.4	0.9	0.8	0.0	7.7	769.2

HAWK MOUNTAIN (Berks and Schuylkill) - David Barber, 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	179.7	0	0	31	20	5	13	5	0	3	120	37	0	0	16	3	2	0	2	257
September	28	289.1	1	14	167	196	22	1193	129	0	12	12366	206	0	1	175	60	26	0	40	14608
October	29	262.2	19	421	20	149	44	2314	262	2	70	17	503	0	11	120	96	31	0	37	4116
November	28	241.3	74	181	1	174	29	53	28	2	57	0	507	0	74	1	6	2	0	5	1194
December	14	95.1	27	22	0	52	1	1	2	0	2	0	43	0	21	0	1	0	0	0	172
Total	116	1067.4	121	638	219	591	101	3574	426	4	144	12503	1296	0	107	312	166	61	0	84	20347
Total per hr			0.11	0.60	0.21	0.55	0.09	3.35	0.40	0.00	0.13	11.71	1.21	0.00	0.10	0.29	0.16	0.06	0.00	0.08	19.06
% of flight			0.6	3.1	1.1	2.9	0.5	17.6	2.1	0.0	0.7	61.4	6.4	0.0	0.5	1.5	0.8	0.3	0.0	0.4	100.0
Average last 10 yrs	122.4	1103.9	154.5	678.8	329.0	486.5	120.1	3623.6	448.2	13.9	163.7	7793.1	1612.9	1.0	128.6	317.1	169.1	64.1	0.1	165.6	16317.0

JACK'S MOUNTAIN (Mifflin) - Darrell Smith, 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	15.0	0	0	3	8	0	5	3	0	0	27	8	0	0	1	1	1	0	0	57
September	25	168.8	14	0	30	135	12	291	48	0	6	7056	140	0	2	64	17	10	0	4	7829
October	29	185.8	12	216	2	82	36	1256	103	1	24	6	533	0	12	59	6	9	0	9	2366
November	24	150.0	66	100	0	60	11	13	5	1	17	0	177	0	63	1	0	0	0	6	520
December	6	26.3	2	0	0	2	1	0	1	0	0	0	8	0	10	0	0	0	0	0	24
Total	87	545.8	94	316	35	287	60	1565	160	2	47	7089	866	0	87	125	24	20	0	19	10796
Total per hr			0.17	0.58	0.06	0.53	0.11	2.87	0.29	0.00	0.09	12.99	1.59	0.00	0.16	0.23	0.04	0.04	0.00	0.03	19.78
% of flight			0.9	2.9	0.3	2.7	0.6	14.5	1.5	0.0	0.4	65.7	8.0	0.0	0.8	1.2	0.2	0.2	0.0	0.2	100.0
Average last 10 yrs	87.1	530.5	38.0	233.0	60.9	179.9	48.6	853.4	106.9	3.6	29.3	4763.9	629.1	0.4	124.8	66.3	17.2	22.1	0.0	17.4	7195.4

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
September	18	121.3	0	21	90	137	7	595	34	0	1	6868	46	0	0	81	27	8	0	7	7922
October	13	81.0	8	204	2	71	10	802	91	3	38	2	347	0	5	21	45	14	0	10	1673
November	9	41.3	19	73	0	54	2	9	6	1	19	0	113	0	19	1	3	2	0	4	325
Total	40	243.5	27	298	92	262	19	1406	131	4	58	6870	506	0	24	103	75	24	0	21	9920
Total per hr			0.11	1.22	0.38	1.08	0.08	5.77	0.54	0.02	0.24	28.21	2.08	0.00	0.10	0.42	0.31	0.10	0.00	0.09	40.74
% of flight			0.3	3.0	0.9	2.6	0.2	14.2	1.3	0.0	0.6	69.3	5.1	0.0	0.2	1.0	0.8	0.2	0.0	0.2	100.0
Average last 10 yrs	69.9	464.7	70.5	367.7	186.1	261.2	63.7	2066.8	230.7	8.0	83.7	6846.8	1006.0	0.4	69.2	134.1	81.2	38.1	0.0	65.2	11579.4

MILITIA HILL (Montgomery) - Rich Conroy and Jamie Stewart, 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	28	193.0	0	0	73	95	16	301	44	0	3	15716	1	0	0	86	6	4	1	9	16355
October	27	185.3	3	1088	16	57	23	318	80	0	143	10	37	0	0	64	17	16	0	18	1890
November	13	52.0	4	217	0	4	3	20	15	0	38	0	27	0	2	0	2	3	0	9	344
Total	68	430.3	7	1305	89	156	42	639	139	0	184	15726	65	0	2	150	25	23	1	36	18589
Total per hr			0.02	3.03	0.21	0.36	0.10	1.49	0.32	0.00	0.43	36.55	0.15	0.00	0.00	0.35	0.06	0.05	0.00	0.08	43.21
% of flight			0.0	7.0	0.5	0.8	0.2	3.4	0.7	0.0	1.0	84.6	0.3	0.0	0.0	0.8	0.1	0.1	0.0	0.2	100.0
Average last 10 yrs	63.1	443.2	14.3	1015.8	177.4	124.9	42.0	719.9	123.8	215.0	89.0	7198.6	86.3	0.2	2.8	210.5	35.9	21.9	0.3	60.3	9925.3

ROCKY RIDGE (York) - Carter Johnson, compiler

Month	Days	Hours	BLVJ	TUVJ	OSPR	BAEA	NOHA	SSHA	COHA	NOGO	RSHA	BWHA	RTHA	RLHA	GOEA	AMKE	MERL	PEFA	SWHA	Unid	Total
August	3	11.3	0	2	2	2	0	0	1	0	2	1	5	0	0	1	0	0	0	2	18
September	23	125.5	5	3	24	49	13	257	9	0	3	2793	25	0	0	49	1	3	0	7	3241
October	15	63.3	49	41	1	20	1	226	11	0	13	3	72	0	0	36	3	3	0	9	488
November	5	16.5	5	18	0	4	3	8	1	0	3	0	22	0	0	0	1	0	0	0	65
Total	46	216.5	59	64	27	75	17	491	22	0	21	2797	124	0	0	86	5	6	0	18	3812
Total per hr			0.27	0.30	0.12	0.35	0.08	2.27	0.10	0.00	0.10	12.92	0.57	0.00	0.00	0.40	0.02	0.03	0.00	0.08	17.61
% of flight			1.5	1.7	0.7	2.0	0.4	12.9	0.6	0.0	0.6	73.4	3.3	0.0	0.0	2.3	0.1	0.2	0.0	0.5	100.0
Average last 5 yrs	55.4	268.4	43.0	161.2	54.0	69.8	34.2	574.4	35.8	0.0	27.0	3973.8	102.2	0.0	0.8	136.8	11.2	8.2	0.0	39.4	5272.0

ROSE TREE PARK (Delaware) - Chris Pugliese, co-compilers

Month	Days	Hours	BLVJ	TUVJ	OSPR	BAEA	NOHA	SSHA	COHA	NOGO	RSHA	BWHA	RTHA	RLHA	GOEA	AMKE	MERL	PEFA	SWHA	Unid	Total
August	1	2.3	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2
September	30	182.5	0	0	75	53	8	126	21	0	5	3176	10	0	0	48	6	5	0	11	3544
October	25	109.5	0	181	5	13	6	135	24	0	31	16	41	0	0	29	10	3	0	9	503
November	17	84.3	0	57	1	14	0	14	3	0	32	0	40	0	2	2	1	0	0	4	170
Total	73	378.5	0	238	81	80	14	275	48	0	68	3194	91	0	2	79	17	8	0	24	4219
Total per hr			0.00	0.63	0.21	0.21	0.04	0.73	0.13	0.00	0.18	8.44	0.24	0.00	0.01	0.21	0.04	0.02	0.00	0.06	11.15
% of flight			0.0	5.6	1.9	1.9	0.3	6.5	1.1	0.0	1.6	75.7	2.2	0.0	0.0	1.9	0.4	0.2	0.0	0.6	100.0
Average last 10 yrs	78.7	459.9	20.2	470.1	130.2	125.6	35.6	631.8	113.3	0.6	135.0	1671.0	171.3	0.1	1.9	147.4	23.8	16.7	0.0	40.9	3735.7

SECOND MOUNTAIN (Lebanon) - David Schwenk, compiler

Month	Days	Hours	BLVJ	TUVJ	OSPR	BAEA	NOHA	SSHA	COHA	NOGO	RSHA	BWHA	RTHA	RLHA	GOEA	AMKE	MERL	PEFA	SWHA	Unid	Total
August	16	97.8	0	0	8	13	4	5	2	0	0	45	12	0	0	3	1	0	0	0	93
September	28	204.8	0	0	49	65	17	418	39	0	5	2907	98	0	1	38	8	3	0	13	3661
October	28	199.0	40	297	5	108	22	1507	93	1	36	33	361	0	10	43	25	13	0	33	2627
November	28	202.8	30	92	3	83	0	20	4	0	35	0	218	0	40	1	1	1	0	8	536
December	12	75.0	0	8	0	16	0	1	0	1	2	0	18	0	9	0	1	1	0	1	58
Total	112	781.3	70	397	65	285	43	1951	138	2	78	2985	707	0	60	85	36	18	0	55	6975
Total per hr			0.09	0.51	0.08	0.36	0.06	2.50	0.18	0.00	0.10	3.82	0.90	0.00	0.08	0.11	0.05	0.02	0.00	0.07	8.93
% of flight			1.0	5.7	0.9	4.1	0.6	28.0	2.0	0.0	1.1	42.8	10.1	0.0	0.9	1.2	0.5	0.3	0.0	0.8	100.0
Average last 10 yrs	119.8	777.8	239.2	508.7	82.3	218.0	61.6	1577.8	186.1	6.7	85.5	3702.6	617.9	1.5	77.9	100.5	32.2	22	0.1	43.1	7563.7

STONE MOUNTAIN (Huntingdon) - Greg Grove, compiler

Month	Days	Hours	BLVJ	TUVJ	OSPR	BAEA	NOHA	SSHA	COHA	NOGO	RSHA	BWHA	RTHA	RLHA	GOEA	AMKE	MERL	PEFA	SWHA	Unid	Total
August	1	6.5	0	0	6	6	0	2	0	0	0	8	3	0	0	4	0	0	0	0	29
September	26	149.5	0	0	34	107	18	252	40	0	6	2222	66	0	0	56	15	19	0	5	2840
October	25	146.5	5	982	7	70	15	607	52	0	12	4	295	0	7	60	26	6	0	2	2150
November	21	114.5	6	124	1	36	5	18	2	0	9	0	149	1	99	1	3	0	0	3	457
December	3	15.5	0	0	0	4	0	0	1	0	1	0	4	0	8	0	0	0	0	0	18
Total	76	433	11	1106	48	223	38	879	95	0	28	2234	517	1	114	121	44	25	0	10	5494
Total per hr			0.03	2.56	0.11	0.52	0.09	2.03	0.22	0.00	0.06	5.17	1.20	0.00	0.26	0.28	0.10	0.06	0.00	0.02	12.70
% of flight			0.2	20.1	0.9	4.1	0.7	16.0	1.7	0.0	0.5	40.7	9.4	0.0	2.1	2.2	0.8	0.5	0.0	0.2	100.0
Average last 10 yrs	82.4	475.5	22.1	448.2	59.8	165.6	42.7	800.5	95.9	3.4	49.2	2125.8	553.3	1.2	136.8	80.5	24.1	22.7	0.0	22.7	4541.3

SUMMIT MOUNTAIN (Fayette) - Peter Livengood, compiler

Month	Days	Hours	BLVU	TUVU	OSPR	BAEA	NOHA	SSHA	COHA	NOGO	RSHA	BWHA	RTHA	RLHA	GOEA	AMKE	MERL	PEFA	SWHA	Unid	Total	
September	2	11.0	0	10	0	1	0	4	0	0	0	572	8	0	0	3	1	0	0	0	0	599
Total	2	11.0	0	10	0	1	0	4	0	0	0	572	8	0	0	3	1	0	0	0	0	599
Total per hr			0.00	0.91	0.00	0.09	0.00	0.36	0.00	0.00	0.00	52.00	0.73	0.00	0.00	0.27	0.09	0.00	0.00	0.00	0.00	54.45
% of flight			0.0	1.7	0.0	0.2	0.0	0.7	0.0	0.0	0.0	95.5	1.3	0.0	0.0	0.5	0.2	0.0	0.0	0.0	0.0	100.0

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	165.0	0	0	10	57	3	11	9	0	4	110	99	0	0	12	1	5	0	4	325
September	27	243.0	0	0	124	259	39	2747	157	0	20	7556	364	0	1	168	47	15	0	28	11525
October	26	243.0	1	1109	10	264	62	5885	383	1	130	66	1179	0	41	93	99	29	0	50	9402
November	27	231.0	2	312	1	215	30	58	32	11	102	0	758	0	156	3	5	2	0	18	1705
December	21	143.0	0	33	0	60	3	2	0	4	2	0	54	0	15	0	0	3	0	4	180
Total	131	1025.0	3	1454	145	855	137	8703	581	16	258	7732	2454	0	213	276	152	54	0	104	23137
Total per hr			0.00	1.42	0.14	0.83	0.13	8.49	0.57	0.02	0.25	7.54	2.39	0.00	0.21	0.27	0.15	0.05	0.00	0.10	22.57
% of flight			0.0	6.3	0.6	3.7	0.6	37.6	2.5	0.1	1.1	33.4	10.6	0.0	0.9	1.2	0.7	0.2	0.0	0.4	100.0
Average last 10 yrs	136.6	1029.2	37.3	1628.2	262.6	652.2	156.5	6306.7	486.0	17.5	201.4	6977.3	2326.1	1.5	219.1	254.0	106.4	60.5	0.1	131.4	19797.8

2021 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	104	690	45	156	83	136	12	67	34	0	10	431	221	0	0	47	9	10	0	24	1285
September	325	2302	95	307	939	1506	174	7073	705	0	83	78052	1342	0	8	902	224	111	1	205	91727
October	312	2094	364	6492	170	1021	262	15148	1359	13	636	174	4696	0	147	604	404	154	0	259	31903
November	267	1713	473	2613	9	889	105	293	139	21	450	0	2888	3	922	13	29	14	0	89	8950
December	79	489	29	65	0	165	6	15	7	5	11	0	166	0	259	0	2	4	0	7	741
Total	1087	7288.7	1006	9633	1201	3717	559	22596	2244	39	1190	78657	9313	3	1336	1566	668	293	1	584	134606
Total per hr			0.14	1.32	0.16	0.51	0.08	3.10	0.31	0.01	0.16	10.79	1.28	0.00	0.18	0.21	0.09	0.04	0.00	0.08	18.47
% of flight			0.7	7.2	0.9	2.8	0.4	16.8	1.7	0.0	0.9	58.4	6.9	0.0	1.0	1.2	0.5	0.2	0.0	0.4	100.0
Average of last 10 yrs	1166	7659	1136	8573	1792	3049	756	21299	2368	72	1137	60251	10062	8	1182	1730	641	362	1	945	115363
% compared to average	-6.8	-4.8	-11.5	12.4	-33.0	21.9	-26.1	6.1	-5.2	-45.9	4.7	30.5	-7.4	-61.0	13.0	-9.5	4.3	-19.0	66.7	-38.2	16.7

KEY TO TABLE HEADERS

BLVU	Black Vulture	RSHA	Broad-winged Hawk
TUVU	Turkey Vulture	BWHA	Red-tailed Hawk
OSPR	Osprey	RTHA	Rough-legged hawk
BAEA	Bald Eagle	RLHA	Golden Eagle
NOHA	Northern Harrier	GOEA	American Kestrel
SSHA	Sharp-shinned Hawk	AMKE	Merlin
COHA	Cooper's Hawk	PEFA	Peregrine Falcon
NOGO	Northern Goshawk	SWHA	Swainson's Hawk
RSHA	Red-shouldered Hawk	Unid	Unidentified