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NorthEast Hawk Watch 2021 Hawk Migration Report

Northern Harrier by Brian Rusnica

2021 NorthEast Hawk Watch Sites



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NorthEast Hawk Watch

The *NorthEast HawkWatch* promotes the systematic study of migrating hawks in New England, southeastern New York and northeast New Jersey. Membership is open to anyone. Annual dues are \$10 payable to "NEHW" c/o treasurer: Joe Wojtanowski, PO Box 142, Poquonock, CT 06064.

Visit the website of *NorthEast HawkWatch* at www.battaly.com/nehw/ to download a membership application, view seasonal site totals at all sites and daily counts at selected sites, download PDFs of previous reports, and find directions to hawkwatch sites in the northeast.

All counts can be easily reported online through a free service offered by the Hawk Migration Association of North America (HMANA). To sign up, visit www.hawkcount.org and click on "Account Request" link. To receive daily reports from all sites using the hawkcount program, subscribe to BIRDAWK, which is also free and can be done by visiting the HMANA homepage at www.hmana.org and following the simple instructions there.

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From the President:

In the pages that follow you will once again find Trudy's indepth analysis of your data. She always does a fantastic job of giving the numbers some context. Understanding long-term trends is what NEHW is all about. For the last 50 years we have been counting hawks just so that we might make sense of the annual fluctuations. If you want to

dig deeper into the numbers, see presentations of our latest findings and share your thoughts and observations with your fellow hawkwatchers, we have the event for you!

Next year, we will once again host a Hawkwatch Conference. After these past two crazy years, we look forward to gathering in person to share our love of raptors.

Mark your calendars:

NorthEast Hawk Watch Conference

April 1, 2023

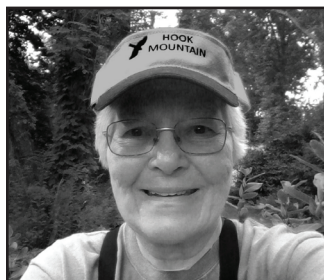
Holyoke Community College

Holyoke, MA

We will share details of the program and speakers closer to the event, so stay tuned. I wish you all a productive and healthy fall hawkwatch season. May your skies be filled with raptors . . . and I look forward to seeing you all in Holyoke in April.

Iain MacLeod

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From the Editor:

2021 was a year of surprises and wonder as we watched, counted, and reported our awesome raptors. Your data is compiled here and used to help us understand raptor dynamics, including trends, distribution, and pathways.

In this report, we follow up on some earlier topics and expand to new ones. We revisit spring Harriers to see how the 2021 count compared to

the sudden drop in 2020. Did the Harriers bounce back? Check out the spring section.

For the first time in our history, fall Sharpies were out-ranked in numbers by Turkey Vultures. To help us understand the decline, your historic Sharpie counts from the 1980s are compared to the 2010s to determine if the loss in Sharpies is related to the distance from the coast. See the 'Flying Low' section beginning on page 18.

In the 2020 Report we recognized the dilemma that breeding Broadwings are increasing (BBS) while migrating Broadwings are decreasing (NEHW). In this issue we find a potential explanation, and then support it with exciting new telemetry results from Hawk Mountain's Broadwing project. Check out the tracks of the five Broadwings that provide new insights into Broadwing movements in the NorthEast!

Drew's column discusses a topic we have all wondered about, how wing shape impacts flight style of raptors. His wealth of experience in studying raptor behavior, combined with his physics background, provides us with new ways to watch and appreciate our hawks as we count them.

Be sure to check out the Peak Day Table on page 27 and updates to the centerfold and the NEHW Watch List. Did you see any Broadwings in September 2021? Check out the Broadwing Distribution, 2021 section to find out where they were and when!

All this information is only possible because of you. Thanks to each of you for keeping the count at your watch sites, and for helping to scan the skies. This Report depends on you being there!

Trudy Battaly

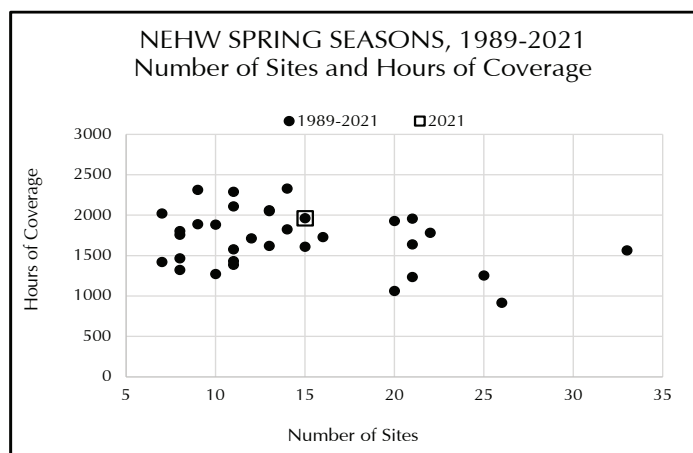
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Spring 2021—A Good Season

The Spring 2021 NEHW season brought us good news. When compared to Spring 2020, eight species had counts above those in 2020, and seven species had counts that were about the same as 2020. Only one species, Northern Goshawk, had a lower count. 2021 was a good season, a rewarding season for our spring counters.

Thank You NEHW Counters!

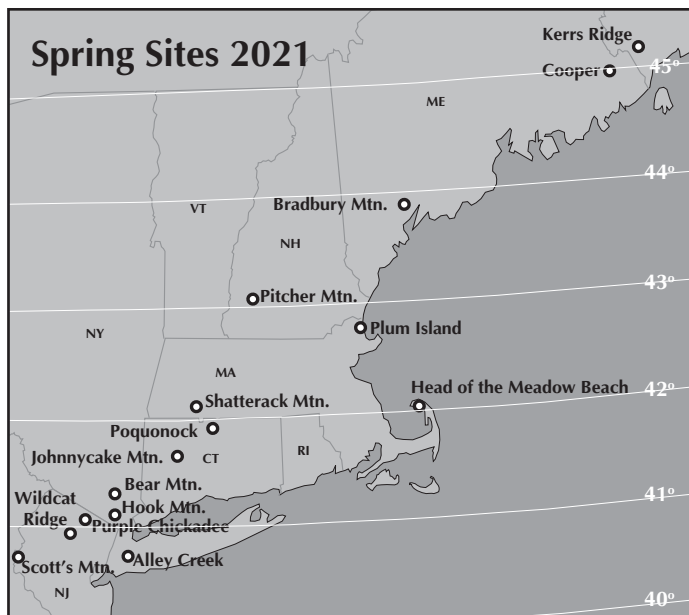
Counters at 15 sites across the NorthEast counted 17231 hawks. This is surpassed by only 6 years since 1990. To achieve this, our counters put in 1966 hours which is 16% above our 30-year average of 1689. Since 1989 the NorthEast had 10 Spring seasons with more than 15 sites. However, nine of those years occurred before 1999, and none had more hours of coverage. This reveals our history quite well—more sites with less coverage during the 1990's. On the graph comparing the number of sites to the hours of coverage we see the 1990's to the right, beyond a gap between 16 and 20 sites, and including from 20 to 33 sites. The square for 2021 shows a season that fits well into the cluster of years since 2000, with more sites and more hours of coverage than most of those years. Thank you, counters! You have been putting in the hours, and you rewarded us with a good 2021 Spring season!



The Sites

The 15 sites with coverage in Spring 2021 include, from north to south, two in Region 45, none in Region 44, two in Region 43, three in Region 42, five in Region 41, and three in Region 40. This is a net gain of one site more than the 14 sites in Spring 2020. The three sites reporting in 2021 that did not report in 2020 include Kerrs Ridge, Shatterack Mountain, and Bear Mountain. These account for the welcome addition of 11 days and 68 hrs. The two sites not reporting in 2021 include Barre Falls and Montclair. Both of these sites have provided significant data for decades—Barre Falls averaged 102 hrs./yr. over 18 years and Montclair averaged 354 hrs./yr. over 16 years, so their absence is meaningful. Hopefully, these sites will contribute again in the future.

This shifting of site coverage among these five sites resulted in a net loss of 39 days and 297 hrs. from Spring 2020 to Spring 2021. However, changes in coverage at the other 10 sites made up much of this loss. Hawk counters at Cooper, Bradbury Mountain, and Pitcher Mountain in Region 43, Plum Island and Head of the Meadow in Region 42, Poquonock, Johnnycake, Hook Mountain, and Purple Chickadee in Region 41, and Wildcat Ridge, Alley Creek, and Scott's Mountain in Region 40 put in more hours collectively than in 2020, reducing the five-site loss of 297 hours to a net loss of 90 hours from 2020 to 2021. Thank you to all our amazing hawk watchers!



Region 45 has two watch sites, Kerrs Ridge and Cooper. **Kerr's Ridge** is our furthest north site, in New Brunswick, CA. This is the 4th spring with coverage, and the first since 2017. There were fewer hours and hawks in 2021, but there were 47 hawks/hour, including 31 Broadwings/hour. Those 5+ hours were well selected! **Cooper** continued its increased effort and was rewarded with one of the four Golden Eagles in the NorthEast region and record high counts for Turkey Vultures (57), Osprey (4), Northern Harrier (14), Redtail (4), Merlin (2), and Total Hawks (122).

Region 43 has two hawk watch sites: Bradbury Mountain, and Pitcher Mountain. **Bradbury Mountain** put in more days (56) and hours (427) than other sites this year, and this effort resulted in the NorthEast high counts for Total Hawks (4817) and for six species—Osprey (390), Bald Eagle (127), Sharp-shinned Hawk (736), Cooper's Hawk (100), Northern Goshawk (4), and Red-tailed Hawk (180). The Bald Eagle and Cooper's Hawk counts are also site records, as were the counts for Turkey Vultures (603) and Peregrine Falcon (13). Even with fewer days and hours than last year, **Pitcher Mountain** counted its first Black Vulture, one of the four Golden Eagles, and the other two Northern Goshawks of the season—remarkable for its 28 hours of coverage. It also had site records for Bald Eagle (16) and Red-shouldered Hawks (15).

Region 42 has three hawk watch sites: Plum Island, Shatterack Mountain, and Head of the Meadow. **Plum Island** counted our first **Eurasian Kestrel** since the last one they counted in 2008. They also had NorthEast high counts for Northern Harrier (125), America Kestrel (651), Merlin (137), and Peregrine Falcon (14). The Merlin count was also a site record, along with Sharp-shinned Hawk (644) and Cooper's Hawk (56). Their extraordinary Sharpie count was more than twice their next highest count and 4.5 times their average. Moreover, their single day Sharpie count of 461 on May 2 is the highest day count in the NorthEast since Apr 29 2010, when 1072 were counted at Sandy Hook, NJ. **Shatterack Mountain** covered more days and hours than in other years, resulting in record counts for six species: Osprey (43), Bald Eagle (7), Northern Harrier (4), Cooper's Hawk (8), Red-shouldered Hawk (5), and their first migrating Red-tailed Hawks (2). They also tied their previous high Kestrel count (14). **Head of the Meadow** had the NorthEast high for Turkey Vulture (872), and the only **Mississippi Kites** (2) counted in the NorthEast. This was only their second year at this new site. With more days and hours there were higher counts for Northern Harrier (35), Red-

tailed Hawk (75), and American Kestrel (104). Also, counts for several species were at least double the 2020 counts, including Cooper's Hawk (92), Red-shouldered Hawk (13), Broad-winged Hawk (261), Merlin (67), and Peregrine Falcon (12).

Region 41 has five sites including Poquonock, Johnnycake, Bear Mountain, Hook Mountain, and Purple Chickadee. **Poquonock** once again counted 13 hawk species. Excluding 2009 when coverage was more than twice any other year, 2021 had increased effort with above average counts for Black Vulture (8), Turkey Vulture (60), Red-tailed Hawk (25), and Peregrine Falcon (2). **Johnnycake Mountain** put in only half the average effort, and still achieved a site record for Bald Eagle (33) and an above average count for Broad-winged Hawk (377). **Bear Mountain** counted on only one day for their third Spring season, but tallied four site records—Bald Eagle (13), Sharp-shinned Hawk (9), American Kestrel (4), and Peregrine Falcon (5). **Hook Mountain** had another year with substantial coverage, resulting in NorthEast high counts for three species—Black Vulture (131), Red-shouldered Hawk (222), and Broad-winged Hawk (2482)—as well as the single day NorthEast high for Total Hawks (1223). These were also site records, along with record Total Hawks (3805) and six other record species: Turkey Vulture (360), Bald Eagle (33), Northern Harrier (21), Sharp-shinned Hawk (204), American Kestrel (79), and Merlin (27). The Shoulder count is particularly notable when compared to the previous high of 60 in 2017. **Purple Chickadee** doubled their effort in this third year of Spring counting, resulting in record high counts for 12 of the 14 species documented. They enjoyed one of the four Golden Eagles counted in the NorthEast, and set site records for Turkey Vulture (161), Osprey (68), Bald Eagle (30), Northern Harrier (7), Sharp-shinned Hawk

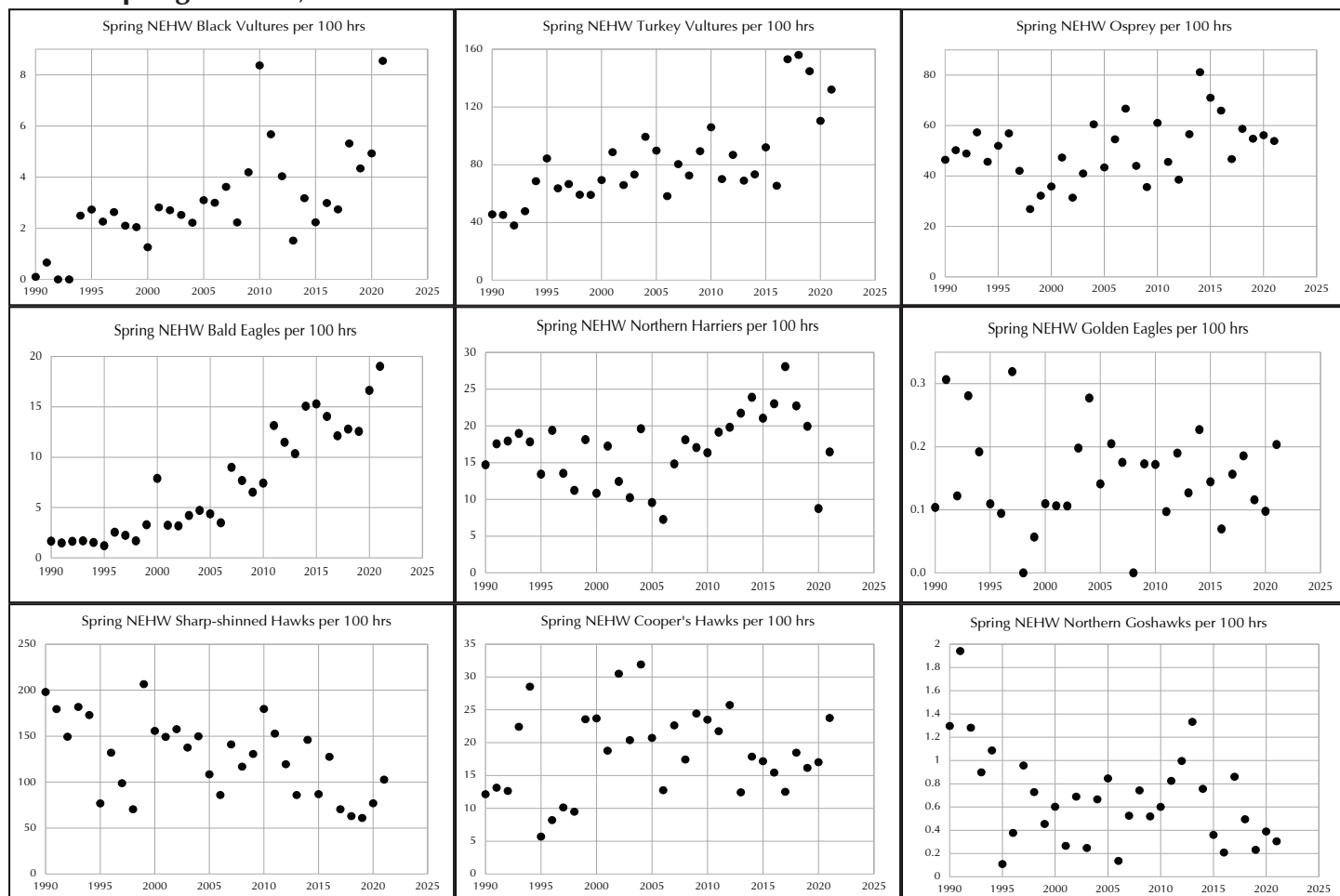
(149), Cooper's Hawk (45), Red-shouldered Hawk (60), Broad-winged Hawk (1657), Red-tailed Hawk (64), American Kestrel (51), and Peregrine Falcon (4). They also set a new Total Hawk record (2336).

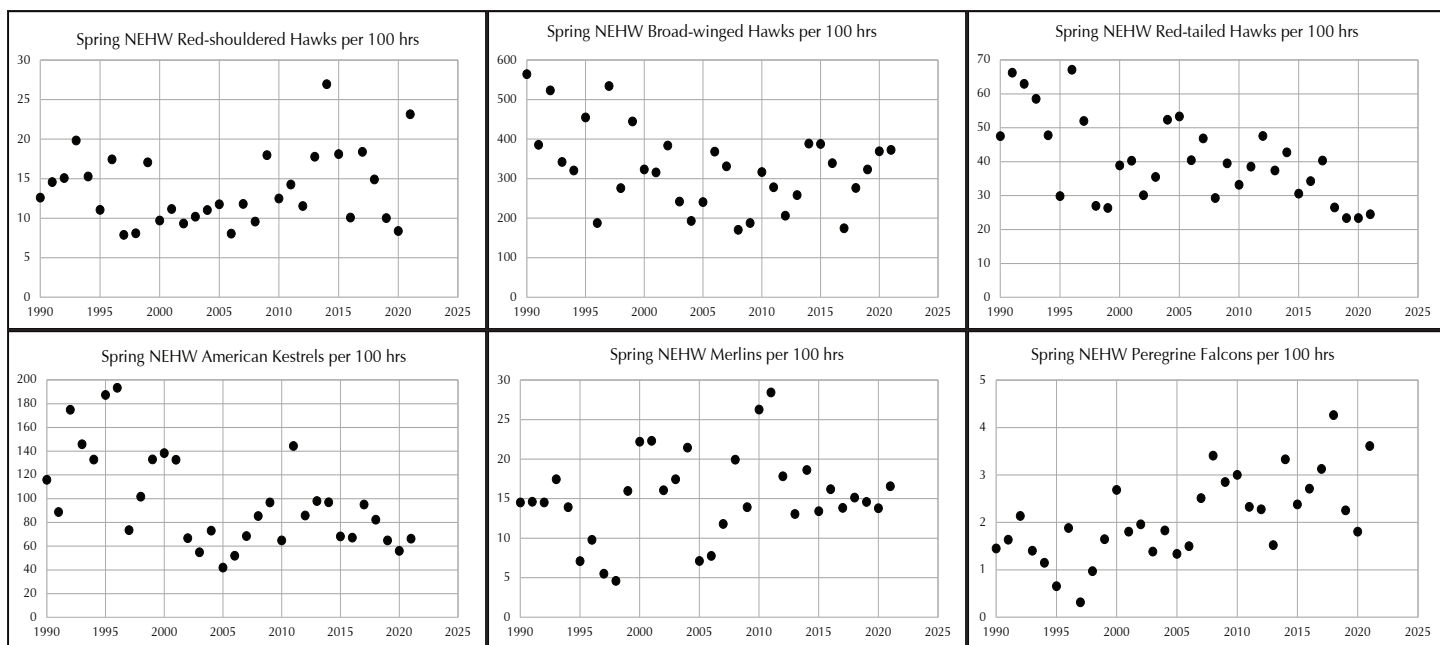
Region 40 has three sites: Wildcat Ridge, Alley Creek, and Scott's Mountain. **Wildcat Ridge** continued its 20 years of coverage with fewer hours than the early 2000s, but about the same effort as 2020. With most site records occurring from 2002 to 2007 and different amounts of coverage, focus was placed on the last five years. This shows that 2021 has above average counts for Cooper's Hawk (24), Broad-winged Hawk (199), and Red-tailed Hawk (40). **Alley Creek** completed its fourth season with a new species, a Golden Eagle, which was one of the four seen in the NorthEast in Spring 2021. Even with fewer hours than in 2020, there were site records for Total Hawks (818) and for five species: Black Vulture (14), Turkey Vulture (355), Osprey (223), Broad-winged Hawk (5), and American Kestrel (42). **Scott's Mountain** did their sixth annual one day Spring watch with their best day so far. They had site records for Total Hawks (307) and for three species: Osprey (14), Northern Harrier (7), and Broad-winged Hawk (252).

The Hawks Trends—30 Year History at a Glance

The year-to-year dedication of our counters provides us with graphs that tell us many things. Is a species increasing, decreasing, or staying about the same since 1990? The right-most dot on each graph is 2021. Its position tells us how this season compares to other seasons. So, check out your favorite species. Is it increasing, decreasing, or remaining about the same as other seasons?

NEHW Spring Seasons, Trends-at-a-Glance: 1990–2021





The 2021 Count – Best Count since 2011!

NorthEast Spring 2021 Seasonal Totals

	Site	Days	Hrs	BV	TV	OS	BE	NH	SS	CH	NG	RS	BW	RT	RL	GE	AK	ML	PG	UR	Othr	TOTAL	HK/DY	MAX	DATES
45	Kerrs Ridge	2	5.25			11	5	6	24	0	0	0	164	11	0	0	14	0	4	3	0	245	123	236	3/21-4/20
	Cooper	23	98	0	57	4	19	7	14	1	0	2	6	4	0	1	3	2	0	2	0	122	5	30	3/2-4/28
43	Bradbury Mountain	58	427	2	603	390	127	91	736	100	4	129	1962	180	0	0	334	71	13	75	0	4817	83	858	3/15-5/15
	Pitcher Mountain	11	28	1	52	2	16	2	19	5	2	15	8	21	0	1	2	0	0	2	0	148	13	72	2/24-4/18
42	Plum Island	47	236	0	70	20	9	125	644	56	0	0	1	0	0	0	651	137	14	43	1EK	1771	38	699	3/15-5/15
	Shatterack Mountain	8	37		0	43	7	4	32	8	0	5	233	2	0	0	14	1	0	10	0	359	45	167	4/13-4/24
41	Head of the Meadow	48	267	0	872	148	25	35	127	92	0	13	261	75	0	0	104	67	12	33	2MK	1866	39	188	4/9-6/28
	Poquonock	51	148	8	60	9	6	1	5	7	0	3	44	25	0	0	4	2	2	6	0	182	4	33	2/24-5/7
40	Johannycake Mt	2	9	0	0	0	3	0	0	1	0	0	34	0	0	0	1	0	0	1	0	40	20	21	4/20-4/24
	Bear Mountain	1	6	0	0	3	13	1	9	1	0	1	22	3	0	0	4	3	5	0	0	65	65	65	4/27
40	Hook Mountain	37	177	131	360	110	33	21	204	91	0	222	2482	29	0	0	79	27	12	4	0	3805	103	1223	3/3-5/11
	Purple Chickadee	49	222	1	161	68	30	7	149	45	0	60	1657	64	0	1	51	4	4	34	0	2336	48	536	2/24-5/21
40	Wildcat Ridge	27	112	11	4	14	9	0	12	24	0	3	199	49	0	0	0	0	1	24	0	350	13	165	3/6-5/14
	Alley Creek	50	188	14	355	223	64	17	35	32	0	1	5	12	0	1	42	11	3	3	0	818	16	118	2/24-5/12
40	Scott's Mountain	1	8	0	0	14	8	7	9	4	0	1	252	7	0	0	2	1	1	1	0	307	307	307	4/17
	Total	415	1966	168	2597	1059	374	324	2019	467	6	455	7330	482	0	4	1305	326	71	241	2	17231	42		2/24-6/28
Average, 1991-2020		287	1689	52	1382	840	122	286	2182	327	12	223	5276	682	4	3	1628	270	36	171	4	13497	47		

BV: Black Vulture, TV: Turkey Vulture, OS: Osprey, BE: Bald Eagle, NH: Northern Harrier, SS: Sharp-shinned Hawk, CH: Cooper's Hawks, NG: Northern Goshawk, RS: Red-shouldered Hawk, BW: Broad-winged Hawk, RT: Red-tailed Hawk, RL: Rough-legged Hawk, GE: Golden Eagle, AK: American Kestrel, ML: Merlin, PG: Peregrine Falcon, UR: Unidentified Raptor, MK: Mississippi Kite, HK/DY: Hawks/Day, MAX: Maximum Day Total

Actual counts. Hawk watchers at our 15 sites counted 17231 Spring migrants, our best count since 2011! This is 28% above the 30-year average, with record high counts for three species—Turkey Vulture (2597), Bald Eagle (374), and Red-shouldered Hawk (455). In addition to our record Turkey Vultures, there were four species with counts of more than 1000: Broad-winged Hawk (7330), Sharp-shinned Hawk (2019), American Kestrel (1305), and Osprey (1059). Of these, Sharpies had the most remarkable increase, with the best count since 2012, 444 more than the previous 2020 Spring season, and only 160 shy of the 30-year average. In addition to our record Red-shouldered and Bald Eagle counts, there were five species with counts of more than 100: Red-tailed Hawk (482), Cooper's Hawk (467), Merlin (326), Northern Harrier (324), and Black Vulture (168). Of these, the most notable is Cooper's Hawk, the other accipiter with its best count since 2012. Unlike Sharpies, however, the Coops count was 43% above the 30-year average—nice! Species with fewer than 100 include: Peregrine Falcon (71), Northern Goshawk (6), Golden Eagle (4), and Mississippi Kite (2). Of these, the Peregrine stands out as our 4th highest Spring count since 1987! For comparison, there were only 37 Peregrines in 2020.

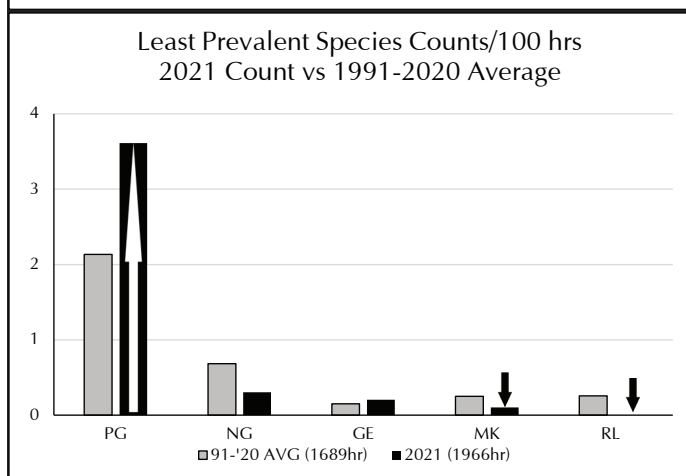
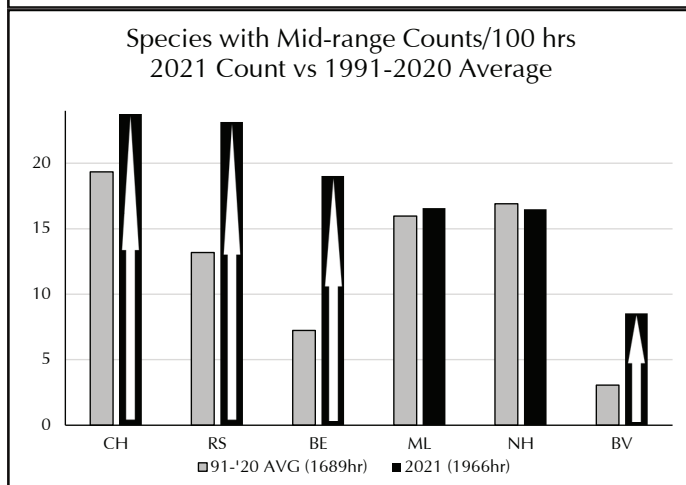
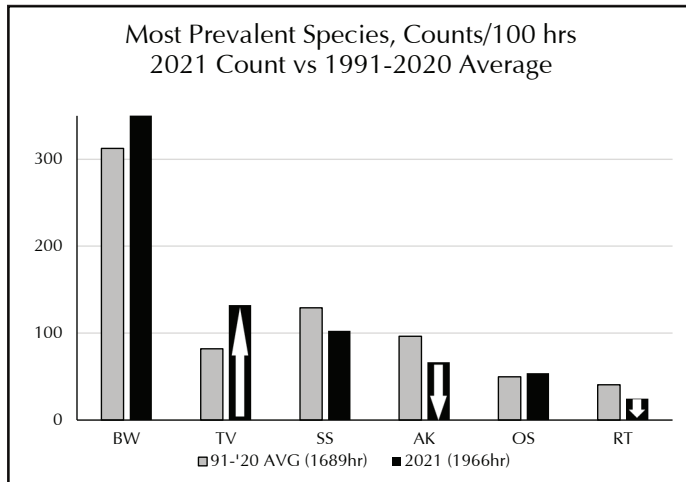
Standardized counts. When standardized to hawks per 100 hours, this changes a little. Total Hawks (877/100 hrs.) are at the 30-year average, with record high counts for two species—Black Vulture (8.5/100 hrs.) and Bald Eagle (19/100 hrs.). Counts for Red-shouldered Hawk (23/100 hrs.) and Peregrine Falcon (3.6/100 hrs.) were our 2nd highest. Above average, at average, and below average species are noted on the Species Prevalence charts with up arrows, no arrows, and down arrows, respectively. A species is assumed to be at average when it is within 20% of the 30-year average.

Species Prevalence—a punctuated random shuffle

2021 brought a shuffle of the ranks once again, with changes from 2020 for seven of 16 species. Five species dropped in rank, and two species gained. While this may seem unbalanced for our good season, six of these changes reflect a change in only one rank and are likely random. The biggest change this season was Red-shouldered Hawk, which had a remarkable jump up from 11th to 8th. This is a repeat of 2017, but this time it is more a consequence of increased Red-shoulder numbers than the drop in Coops and rise in Harriers that occurred in 2017.

The only other species with a higher rank in 2021 compared to 2020 was American Kestrel. Kestrel moved from 5th to 4th, exchanging places with Osprey. Four other species dropped one rank, including Mississippi Kite and the three species with very similar counts—Bald Eagle (19/100 hrs.), Merlin (16.6/100 hrs.), and Northern Harrier (16.5/100 hrs.).

Using the standardized hawk counts, we compare our 2021 Spring data to our 30-year history. The charts tell the story, with hatched bars representing the 30-year average and solid bars representing the 2021 season. Among our Most Prevalent species, we see that Broadwing stands out as our 1st ranked species by a wide margin, both historically and at present. Following the hatched bars, we also see that, historically, Sharpies ranked 2nd and Kestrels ranked 3rd. That, of course, has changed with the advance of Turkey Vultures. In 2017 the TVs took 2nd and have remained in that rank since then.



For the Mid-range Species, Harriers and Merlins have dropped several ranks from their historical positions, even with average counts in 2021. This is a consequence of the extraordinary counts for Red-shoulders and Bald Eagles this season. The excellent Black Vulture count brought that species to mid-range, but did not change its rank. For the Least Prevalent Species, Mississippi Kites and Roughlegs are down from their historical ranks, enabling Golden Eagle to move up, even at average counts.

Species with Above Average Counts

From our Seasonal Totals Table, with actual counts, we see that a remarkable 11 species had above average counts in Spring 2021! That's a great testament to our Spring watchers—more sites, more hours, more hawks, and more fun for our watchers! When we standardize the data, six species were more than 20% above average—**Black Vulture** (+192%), **Turkey Vulture** (+62%), **Bald Eagle** (+169%), **Cooper's Hawk** (+28%), **Red-shouldered Hawk** (+74%), and **Peregrine Falcon** (74%). Additionally, the **Golden Eagle** (4) count was our highest since 2012, and near the record (6).

Record High Bald Eagles and Black Vultures. This is the 2nd year that the **Bald Eagle** counts were record highs for both the actual and the standardized counts! We have become accustomed to expecting this, as Bald Eagles re-populate the NorthEast, expanding into both fresh and salt water habitats. The **Black Vultures** (168, 8.5/100 hrs.), however, reached a record for standardized data only. In 2010 there were more than this season (195, 8.4/100 hrs.), but there were also more hours.

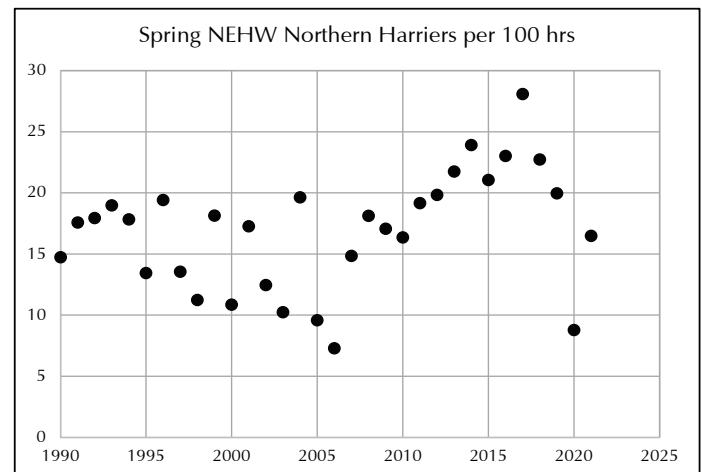
Species with Average Counts

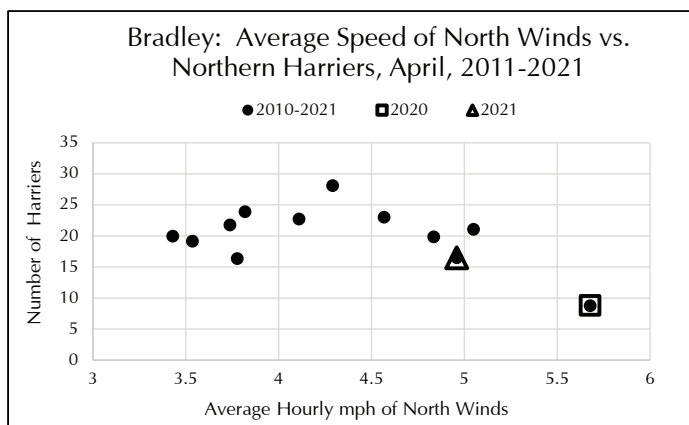
The standardized **Osprey** (+7%), **Broadwing** (+17%), and **Merlin** (+9.4%) counts brought those species within 20% of average. Other species in this range include **Northern Harrier** (-3%) and **Sharp-shinned Hawk** (-18%).

Northern Harriers—Return to 30-Year Average

Recall that the Spring 2020 Harrier count was an unprecedented, precipitous drop compared to other recent years (NEHW 2020 *Hawk Migration Report*, p. 5-7). So, this season is a reprieve for Harrier, with a return to the 30-year average. However, a careful view of the Harrier graph clearly shows that 2021 is at the low end of counts since 2011, excluding 2020. Did last year's wind analysis predict this?

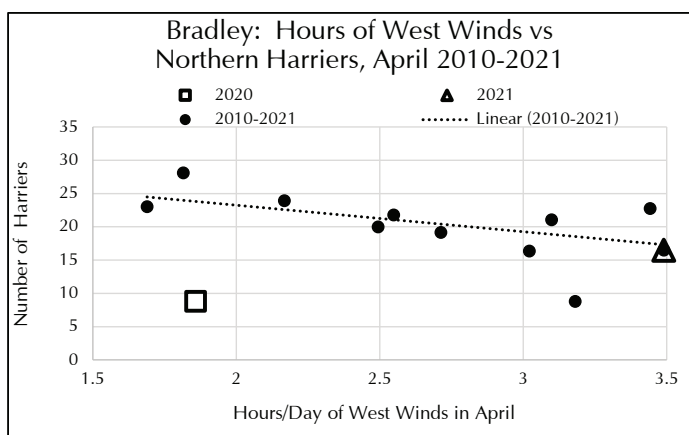
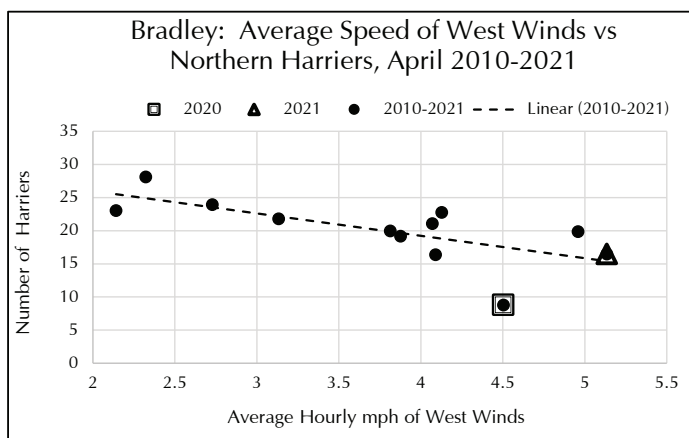
To answer this question, we update the winds at Bradley International Airport, using the hourly data from 7am to 5pm for all days in April 2021, and resolve this data to the four cardinal directions—North, East, South, and West. Since the very strong North winds in April 2020 likely contributed to the drop in Harriers, we first look at North winds. The daily April 2021 average of 4.9 mph North winds, when paired with our





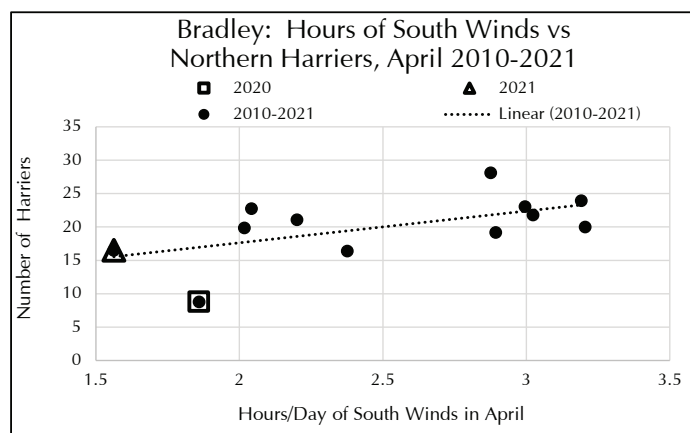
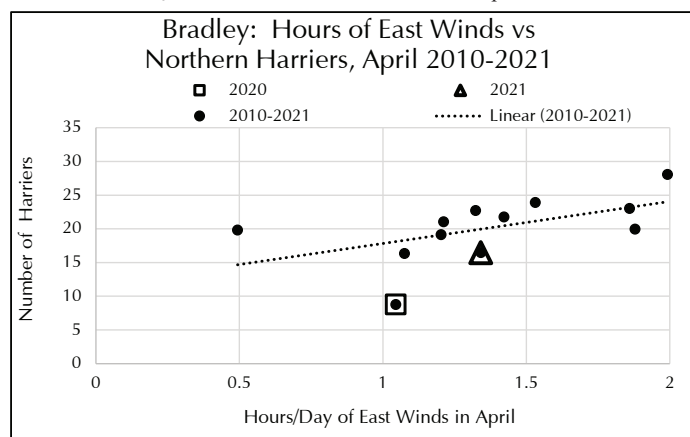
16.5 Harriers/100 hrs., results in a 2021 data point (triangle) that lies within the range of the randomly dispersed data from 2011 to 2019. In contrast, the 5.7 mph in 2020 (square) is still very obviously an outlier, far from the other points.

We next look at the 2021 data for the other winds, and find that all of the significant relationships noted in 2020 were strengthened in 2021. Harriers are inversely correlated with West Winds, both the strength of West Winds ($r = -0.682$, $p = 0.007$) and the Hours of West Winds ($r = -0.556$, $p = 0.030$). Also, Harriers are positively correlated with Hours of East Winds ($r = 0.543$, $p = 0.034$) and Hours of South Winds ($r = 0.568$, $p = 0.027$).



The triangle on the graphs represents the 2021 data. We see that 2021 had both the strongest West winds and the most Hours of West winds since 2010. 2021 also had the least Hours of South winds, while the Hours of East winds were at average. These factors likely contributed to the Harrier count at the low end of this last decade.

When the 2021 wind data is used in the equations generated last year, three of the predictions are within 1.4 Harriers/100 hrs. and the average of the four predictions is 17.1/100 hrs., remarkably close to our actual 16.5/100 hrs. Harriers. The close proximity of the 2021 data points to the regression lines further suggests that these winds are a good predictor of the Harrier numbers. Thankfully, it appears that the unprecedented drop of 2020 has not jarred our Harrier counts from expected.



Sharp-shinned Hawk—A Sigh of Relief!

For three years in a row, from 2017 to 2019, we had record low Spring counts for **Sharpies**. Last year they broke that pattern with a slight improvement, and this year our Sharpies rebounded from 61/100 hrs. in 2019 to 103/100 hrs. That's a higher count than six of the last eight years! So, breathe a sigh of relief—Sharpies are holding on, at least for now.

Species with Below Average Counts

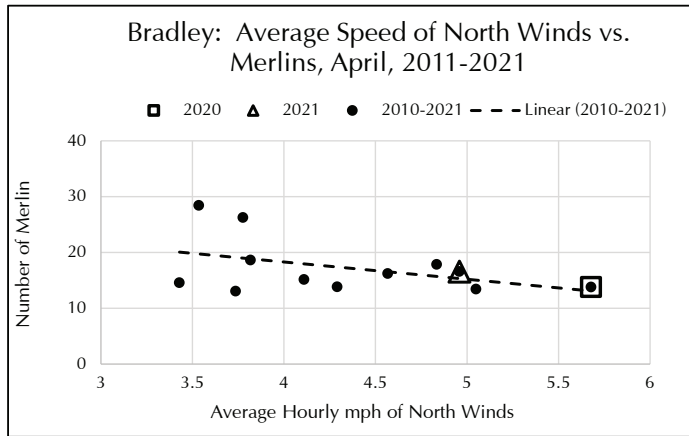
Spring 2021 had below average counts for **Northern Goshawk** (-55%), **Red-tailed Hawk** (-40%), **American Kestrel** (-33%), and **Mississippi Kite** (-56%). We have had five years with fewer **Goshawks**, but those were spread across the years since the late 1990s, not showing a specific pattern of decline. The **Redtails**, however, dropped below 30/100 hrs. in 2018, and have remained low since then, holding level at 24/100 hrs.

Kestrels have hovered between 50/100 hrs. and 100/100 hrs. since the early 2000's, when their numbers dropped from double those counts. We have had six years with fewer Kestrels than the 66/100 hrs. that we counted this season. Thus, our spring Kestrels are still low, but not critically low. **Mississippi Kite** is relatively new to the NorthEast, first appearing in 2000. Since then, we have counted from 0 to 14 individuals each year, with an average of 4 Kites. However, most of these Kites were counted at Pilgrim Heights, a site which closed in 2019 as visibility declined. So, counting 2 Kites at Head of the Meadow this season is likely a random count for a new and welcome site.

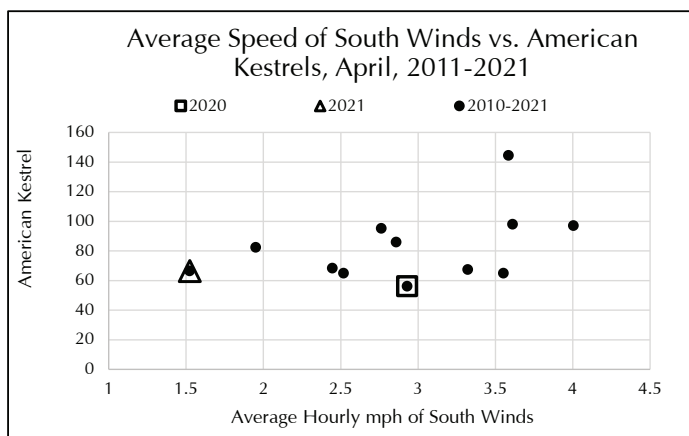
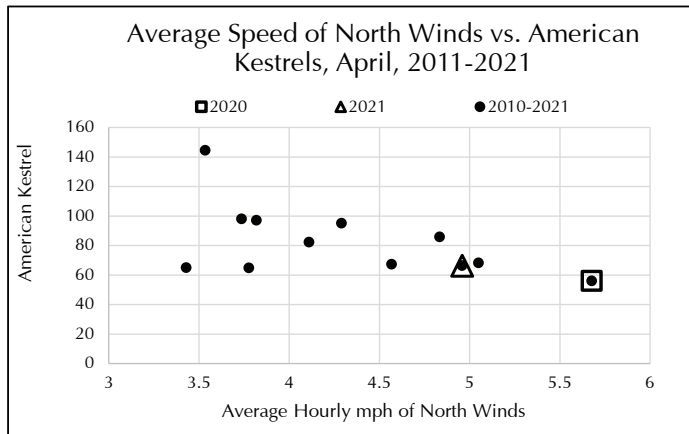
This was the 2nd year in a row with no **Roughlegs** at all. There have been seven other years with no Roughlegs, including three years in the 1990s and two years in the 2000s. So, we can hope that there will be more Roughlegs in the years to come.

More on Winds

With the wind updated, this was the perfect time to find out if the winds impacted any species other than Harriers. Comparisons showed no correlations of winds to Total Hawks, or to Broadwings, or to Sharpies. However, there is a moderate inverse correlation between **Merlins** and the speed of North winds ($r=-0.434$, $p=0.079$), and two associations between Kestrels and winds.



The **Kestrel** counts are not normally distributed, so our best approach is simply to view the graphs. They show generally decreasing counts for Kestrels with stronger North winds and slightly increasing counts with stronger South winds.



Even though these associations are weaker than those for Harriers, it is interesting to see that the three species for which winds seem to be important—Harriers, Merlins, and Kestrels—are most prevalent along the coast. Could it be that winds have a bigger impact on the species that migrate along the coast?

So, we have more questions to answer about our Spring migrants! Your counts have helped us to recognize patterns and ask targeted questions. Thank you, and keep counting! We need your good data!

Daily Counts for NEHW Sites, Spring 2021

KERRS RIDGE, Bocabec, NB, CA

2021	HRS	BV	TV	OS	BE	NH	SS	CHNG	RS	BW	RT	RL	GE	AK	ML	PG	UR	TOTAL
3/21	1.5	0	0	0	0	0	0	0	0	0	9	0	0	0	0	0	0	9
4/20	3.75	0	3	11	5	6	24	0	0	164	2	0	0	14	0	4	3	236
TOTAL	5.25	0	3	11	5	6	24	0	0	164	11	0	0	14	0	4	0	245
4YrAv	21	0	20	57	6	25	56	0	1	342	15	0	0.3	35	4	1	8	572

COOPER, ME

Karen E. Holmes

2021	HRS	BV	TV	OS	BE	NH	SS	CHNG	RS	BW	RT	RL	GE	AK	ML	PG	UR	TOTAL
3/2	2.5	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
3/20	2.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/22	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/30	5	0	1	0	2	0	0	1	0	0	2	0	1	0	0	0	2	9
3/31	3	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2
4/1	0.5	0	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	30
4/2	4.5	0	1	0	1	1	0	0	0	0	2	0	0	0	0	0	0	5
4/3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4/8	4	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	2
4/9	6.5	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	4
4/10	6	0	5	0	2	1	1	0	0	0	0	0	0	0	1	0	0	10
4/11	4.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4/12	4.5	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	4
4/13	3.25	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
4/14	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4/15	7.5	0	4	0	3	0	0	0	0	0	0	0	0	1	0	0	0	8
4/19	6.75	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0	4
4/20	4.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4/21	3	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2
4/24	7.25	0	5	0	1	2	0	0	0	0	0	0	0	0	1	0	0	9
4/25	5.25	0	1	0	1	1	13	0	1	0	0	0	0	0	0	0	0	17
4/27	3.5	0	2	0	2	1	0	0	0	1	0	0	0	0	0	0	0	6
4/28	6	0	0	0	2	0	0	0	0	5	0	0	0	0	0	0	0	7
TOTAL	97.5	0	57	4	19	7	14	1	2	6	4	0	1	3	2	0	2	122
11YrAv	56.8	0.4	15	3	10	2.2	4	1.4	0	0.2	7	1	0	0	3	1	0	52

BRADBURY MOUNTAIN, Pownal, ME

Andrew Sharp, Derek Lovitch, Jeannette Lovitch, Jim Pinfold, Zane Baker, others

2021	HRS	BV	TV	OS	BE	NH	SS	CHNG	RS	BW	RT	RL	GE	AK	ML	PG	UR	TOTAL
3/15	8	0	2	0	3	0	0	0	0	0	0	0	0	0	0	0	0	5
3/16	8	0	10	0	9	0	0	3	0	5	0	3	0	0	0	0	0	30
3/17	8	0	10	0	3	0	0	1	0	7	0	14	0	0	0	0	1	36
3/18	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/19	8	0	0	0	5	0	0	1	0	1	0	1	0	0	0	0	1	9
3/20	8	1	6	0	3	0	2	6	0	4	0	23	0	0	2	1	5	53
3/21	8	1	7	0	4	2	1	3	0	4	0	8	0	0	1	0	1	32
3/22	8	0	10	0	3	1	5	2	0	6	0	9	0	0	1	0	0	37
3/23	8	0	16	0	1	2	1	2	0	13	0	7	0	0	1	0	0	43
3/24	7	0	38	0	2	3	2	2	0	6	0	8	0	0	1	0	1	63
3/27	8	0	244	1	8	0	11	7	1	17	0	13	0	7	2	1	3	315
3/28	5	0	11	0	1	0	0	0	0	0	0	0	0	0	0	0	0	12
3/30	8	0	42	0	1	5	5	3	0	0	0	3	0	5	0	0	0	64
3/31	8	0	113	2	3	1	0	4	0	4	0	4	0	8	0	1	2	142
4/1	4	0	3	0	0	0	0	0	0	1	0	0	0	0	0	0	0	4
4/2	8.0	0	12	0	3	0	5	1	0	2	0	1	0	0	3	0	0	32
4/3	8	0	8	0	0	0	0	0	0	0	0	0	0	1	0	0	1	10
4/4	8	0	7	0	3	1	5	0	1	2	0	4	0	4	1	0	0	28
4/5	4	0	1	0	1	0	2	0	0	0	0	0	0	0	0	0	0	4
4/6	8	0	18	1	9	0	1	2	0	1	0	15	0	1	0	0	3	51
4/7	8	0	10	2	2	0	2	0	0	0	0	2	0	1	0	0	0	19
4/8	8	0	1	1	5	2	10	2	0	5	0	2	0	0	6	0	0	34
4/9	8	0	2	12	4	6	7	7	0	8	1	9	0	25	2	0	8	91
4/10	8	0	9	13	4	2	40	6	0	16	10	10	0	28	1	2	2	143
4/11	8	0	6	4	3	0	3	3	0	1	5	2	0	1	0	0	1	29
4/12	8	0	9	0	0	0	2	0	0	1	0	0	0	0	0	0	0	12
4/13	8	0	4	4	0	0	1	1	0	0	1	0	0	0	1	0	0	12
4/14	8	0	0	20	3	6	2	3	0	2	2	2	0	10	3	2	3	58
4/15	8	0	2	9	1	3	2	2	0	2	22	2	0	9	1	0	2	57
4/17	5	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	2
4/18	8	0	0	28	0	5	10	1	0	5	28	2	0	0	1	0	0	80
4/19	8	0	2	55	6	16	43	5	0	1	408	7	0	24	1	0	8	576
4/20	8	0	0	69	7	13	176	7	0	2	472	4	0	88	13	2	5	858
4/21	6	0	0	10	0	1	37	2	0	3	53	0	0	15	4	0	2	127
4/22	8	0	0	5	0	0	8	0	0	0	6	0	0	1	0	0	0	20
4/23	8	0	0	2	0	0	1	0	0	0	28	0	0	1	0	0	0	32
4/24	8.0	0	0	10	4	1	32	0	0	0	154	1	0	14	3	0	1	220
4/25	8	0	0	9	0	2	50	2	0	0	66	0	0	18	4	0	0	151
4/26	8	0	0	5	1	0	6	1	0	0	15	0	0	1	0	0	1	30
4/27	8	0	0	12	1	0	12	2	0	1	47	0	0	0	2	1	1	79
4/28	8	0	0	5	1	0	14	1	0	3	82	1	0	6	4	0	0	117

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BRADBURY MOUNTAIN, Pownal, ME

Andrew Sharp, Derek Lovitch, Jeannette Lovitch, Jim Pinfold, Zane Baker, others

2021	HRS	BV	TV	OS	BE	NH	SS	CHNG	RS	BW	RT	RL	GE	AK	ML	PG	UR	TOTAL
4/29	6	0	0	0	0	1	1	0	0	3	0	0	0	0	0	0	0	5
4/30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5/1	8	0	0	21	2	2	35	1	1	254	2	0	0	7	2	1	5	333
5/2	8	0	0	12	1	3	58	1	1	155	4	0	0	14	1	0	4	254
5/3	8	0	0	3	0	0	37	0	0	21	0	0	0	2	3	0	0	67
5/4	8	0	0	6	0	3	31	4	0	24	0	0	0	0	0	1	0	70
5/5	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5/6	8	0	0	18	1	0	8	0	0	15	0	0	0	3	1	0	0	46
5/7	8	0	0	12	0	2	33	0	0	16	2	0	0	13	7	0	5	90
5/8	8	0	0	9	0	0	5	1	0	2	1	0	0	0	0	0	0	19
5/9	8	0	0	5	5	4	12	3	0	13	5	0	0	9	1	0	0	58
5/10	8	0	0	9	4	3	5	2	0	11	1	0	0	2	1	0	1	39
5/11	8	0	0	9	0	0	4	1	0	2	0	0	0	1	1	0	0	19
5/12	8	0	0	2	0	0	0	2	0	1	1	0	0	0	0	0	0	6
5/13	8	0	0	0	3	1	4	0	0	4	1	0	0	1	1	0	0	15
5/14	8	0	0	1	3	0	2	1	0	5	1	0	0	0	2	0	0	15
5/15	8	0	0	3	3	0	3	2	0	36	5	0	0	4	3	1	0	64
TOTAL	427	2	603	390	127	91	736	100	4	129	1962	180	0	334	71	13	75	4817
17YrAv	369	0.6	279	366	63	87	589	58.2	6	71.2	1524	196	1	315	57	4	38	3657

PITCHER MOUNTAIN, Stoddard, NH

Levi Burford, Katrina Fenton, Nora Hanke

2021	HRS	BV	TV	OS	BE	NH	SS	CHNG	RS	BW	RT	RL	GE	AK	ML	PG	UR	TOTAL
2/24	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/10	3.5	0	5	0	4	0	0	0	0	0	0	0	0	0	0	0	0	9
3/11	2.25	0	2	0	0	0	0	1	0	0	0	2	0	0	0	0	0	5
3/12	2.25	0	2	0	2	0	0	0	0	0	0	3	0	1	0	0	0	8
3/16	2.25	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
3/17	1.25	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
3/25	3	0	9	0	2	0	2	2	0	7	0	9	0	0	0	0	0	31
3/30	4	1	32	1	8	1	9	1	1	8	0	6	0	2	0	0	0	72
4/9	2.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4/10	2.5	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
4/18	2	0	0	1	0	1	7	1	0	0	8	0	0	0	0	0	0	18
TOTAL	27.5	1	52	2	16	2	19	5	2	15	8	21	0	1	2	0	2	148
7YrAv	32	0	38	11	6	2	21	5	1	5	170	14	0	1	10	1	0	295

PLUM ISLAND, Newburyport, MA

Bob Secatore, Mark Schoene, Ted Mara, Paul Roberts, Brian Rusnica, Judd Nathan, others

2021	HRS	BV	TV	OS	BE	NH	SS	CHNG	RS	BW	RT	RL	GE	AK	ML	PG	UR	TOTAL
3/15	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/16	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/18	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/20	4.8	0	0	0	0	2	0	1	0	0	0	0	0	0	0	0	0	4
3/22	3	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
3/23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
3/26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/27	4.5	0	39	0	1	11	0	1	0	0	0	0	0	19	0	0	0	71
3/29	7.0	0	0	0	0	4	0	2	0	0	0	0	0	8	1	0	1	16
3/30	0.5	0	0	1	0	5	0	0	0	0	0	0	0	1	2	0	1	10
3/31	4.5	0	0	0	0	3	0	0	0	0	0	0	0	3	2	1	2	11
4/1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4/2	7.5	0	0	0	0	3	0	1	0	0	0	0	0	5	0	0	0	9
4/3	6.5	0	18	2	0	3	0	1	0	0	0	0	0	5	3	0	0	32
4/4	5.5	0	3	0	0	5	1	2	0	0	0	0	0	1	0	0	1	13
4/5	4	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	3
4/6	5.75	0	0	0	0	5	0	0	0	0	0	0	0	0	3	0	0	8
4/7	2.5	0	0	0	0	3	1	0	0	0	0	0	0	0	0	0	0	4
4/8	1	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	2
4/9	4.5	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	3
4/10	6.25	0	0	1	0	0	0	1	0	0	0	0	0	4	0	0	0	6
4/11	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4/12	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
4/13	7.75	0	0	0	0	3	1	1	0	0	0	0	0	0	2	0	0	8*
4/14	8	0	0	0	0	0	0	0	0	0	0	0	0	16	1	0	0	17
4/15	4.25	0	0	1	0	0	0	0	0	0	0	0	0	1	2	0	0	4
4/17	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4/18	6.5	0	0	6	1	10	0	0	0	0	0	0	0	2	0	1	1	21
4/19	6.25	0	0	0	0	9	2	0	0	0	0	0	0	13	1	0	5	30
4/20	9.5	0	0	0	0	8	7	6	0	0	0	0	0	79	2	0	3	105
4/22	6	0	0	1	0	3	0	0	0	0	0	0	0	2	0	0	0	6
4/23	5.75	0	0	0	0	6	1	2	0	0	0	0	0	16	3	0	1	29
4/24	10.5	0	10	0	0	10	67	7	0	0	0	0	0	35	7	1	6	143
4/25	1.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4/26	6.75	0	0	0	0	1	0	0	0	0	0	0	0	8	4	0	0	13
4/27	9.75	0	0	1	3	6	37	7	0	0	0	0	0	29	6	2	0	91
4/30	7.75	0	0	0	0	2	11	0	0	0	0	0	0	71	18	2	3	107
5/1	10	0	0	0	0	5	23	1	0	0	0	0	0	45	17	1	1	93
5/2	11	0	0	4	3	6	461	19	0	0	1	0	0	169	23	4	9	699
5/6	8.75	0	0	0	0	0	11	0	0	0	0	0	0	17	22	0	1	51
5/8	5	0	0	0	0	0	3	0	0	0	0	0	0	3	1	1	0	8
5/9	7.75	0	0	0	1	1	12	2	0	0	0	0	0	33	2	0	0	51
5/11	9.25	0	0	0	0	2	1	1	0	0	0	0	0	42	5	0	3	54
5/12	6	0	0	0	0	2	1	0	0	0	0	0	0	19	6	0	0	28
5/13	7.75	0	0	1	0	1	4	1	0	0	0	0	0	4	4	1	1	17
5/14	2.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
5/15	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	236	0	70	20	9	125	644	56	0	0	1	0	0	651	137	14	43	1771
16YrAve	145	0	58	33	5	106	173	18	0	1	6	1	0	534	74	8	17	1035

*1 European Kestrel on Apr 13

SHATTERACK MOUNTAIN, Russell, MA

Tom Swoczek

2021	HRS	BV	TV	OS	BE	NH	SS	CHNG	RS	BW	RT	RL	GE	AK	ML	PG	UR	TOTAL	
4/13	5	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	
4/14	6	0	0	30	1	3	11	2	0	106	0	0	0	7	1	0	6	167	
4/18	6.25	0	0	5	1	0	8	3	0	2	53	0	0	2	0	0	2	76	
4/19	6	0	0	2	1	1	7	1	0	1	23	0	0	3	0	0	2	41	
4/21	2	0	0	5	0	0	2	1	0	0	24	1	0	0	0	0	0	33	
4/22	2	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	2	
4/23	4.25	0	0	0	4	0	1	0	0	0	11	1	0	0	0	0	0	17	
4/24	5	0	0	1	0	0	3	1	0	1	14	0	0	0	2	0	0	22	
TOTAL	36.5	0	0	43	7	4	32	8	0	5	233	2	0	0	14	1	0	359	
6YrAv	21	0	0	22	3	2	22	2	0	1	207	0	0	0	7	1	0	5	271

POQUONOCK, Poquonock, CT

Joseph Wojtanowski

2021	HRS	BV	TV	OS	BE	NH	SS	CHNG	RS	BW	RT	RL	GE	AK	ML	PG	UR	TOTAL	
4/2	1.53	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4/3	3.55	0	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	3	
4/4	5.05	0	3	0	0	0	0	0	0	0	2	0	0	0	0	0	0	5	
4/5	3.05	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	
4/6	4.15	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	
4/7	4.15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4/8	1.48	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	
4/13	1.4	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	
4/14	4	0	3	3	0	1	0	0	0	1	0	0	0	1	1	0	1	11	
4/17	3.17	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	4	
4/18	3.92	0	1	1	0	0	2	0	0	28	0	0	0	0	0	0	1	33	
4/19	3.87	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4/20	4.83	0	2	0	1	0	1	1	0	0	0	0	0	0	0	1	0	6	
4/22	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4/23	1.55	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
4/24	3.08	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1	3	
4/25	2.53	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	
4/26	4.05	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	2	4	
4/27	2.48	0	0	2	0	0	0	0	0	4	0	0	0	0	0	0	0	6	
4/28	2	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	
5/1	4.88	2	2	0	0	0	1	0	0	4	1	0	0	1	0	0	0	11	
5/2	1.67	0	0	1	0	0	1	0	0	1	0	0	0	1	0	0	0	4	
5/6	1.53	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2	
5/7	1.35	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	
TOTAL	148	8	60	9	6	1	5	7	0	3	44	25	0	0	4	2	6	182	
7YrAv	108	7	58	20	9	3	20	8	0	8	125	35	0	0	9	2	1	6	315.1

JOHNNYCAKE MOUNTAIN, Burlington, CT

Kenneth Merrifield, Dana Campbell

2021	HRS	BV	TV	OS	BE	NH	SS	CHNG	RS	BW	RT	RL	GE	AK	ML	PG	UR	TOTAL	
4/20	5	0	0	0	2	0	0	0	0	15	0	0	0	1	0	0	1	19	
4/24	4	0	0	0	1	0	0	1	0	19	0	0	0	0	0	0	0	21	
TOTAL	9.02	0	0	0	3	0	0	1	0	34	0	0	0	1	0	0	1	40	
8YrAv	22	5	8	12	11	1	11	10	0	1	221	15	1	0	10	0	1	5	309

BEAR MOUNTAIN, Bear Mountain, NY

Carol Weiss, Gerhard Patsch, Tracy Patsch, Barry Babcock

2021	HRS	BV	TV	OS	BE	NH	SS	CHNG	RS	BW	RT	RL	GE	AK	ML	PG	UR	TOTAL
4/27	6	0	0	3	13	1	9	1	1	22	3	0	0	4	3	5	0	65
TOTAL	9.02	0	0	0	3	3	0	0	1	34	0	0	0	1	0	0	1	40
3YrAv	7	0	0	2	6	1	4	2	0	27	7	0	0	2	1	3	0	54.67

HOOK MOUNTAIN, Rockland Lake, NY

Ajit Antony, Liza Antony, Tom Fiore, Felicia Napier, Pedro Roche, Karen Troche, others

2021	HRS	BV	TV	OS	BE	NH	SS	CHNG	RS	BW	RT	RL	GE	AK	ML	PG	UR	TOTAL	
3/3	6.92	95	45	0	13	0	1	2	0	49	0	6	0	0	0	1	0	212	
3/7	3.25	7	6	0	3	0	0	0	0	2	0	1	0	0	0	0	0	19	
3/10	3	15	18	0	0	1	0	2	0	30	0	0	0	0	0	0	0	66	
3/11	4.75	1	7	0	0	0	1	2	4	42	0	0	0	0	0	0	0	57	
3/12	2.75	0	0	0	0	0	1	1	0	5	0	0	0	0	0	0	0	7	
3/16	3.5	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	
3/20	4.25	0	6	0	0	0	1	2	0	4	0	0	0	0	0	0	0	13	
3/22	3.75	1	6	0	2	0	0	2	0	12	0	0	0	0	0	0	0	23	
3/25	6.25	3	0	0	0	0	0	10	0	7	0	0	0	0	1	0	0	21	
3/26	2.75	1	49	0	0	0	3	2	0	22	0	4	0	0	3	0	0	84	
3/27	4.25	0	8	0	0	0	3	4	0	5	0	0	0	0	0	0	0	20	
3/30	6.75	0	160	7	2	4	4	5	0	4	0	2	0	0	5	1	3	197	
3/31	3	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	
4/4	3	0	32	1	2	0	0	1	0	3	0	0	0	0	0	0	0	39	
4/5	3	0	0	0	0	1	2	2	0	0	0	1	0	0	0	0	0	6	
4/6	3.25	0	0	3	1	0	2	2	0	2	0	0	0	0	1	0	0	11	
4/8	3.25	0	1	1	0	1	6	0	0	11	0	0	0	0	7	0	0	27	
4/9	4.75	0	0	1	0	0	2	1	0	1	0	1	0	0	2	1	0	12	
4/10	2.75	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	
4/13	8	2	14	13	0	1	7	3	0	6	102	1	0	0	28	5	0	183	
4/14	8	0	0	6	3	1	25	1	0	9	74	0	0	0	9	6	3	137	
4/16	6	0	0	6	1	0	5	1	0	2	346	0	0	0	0	1	0	362	
4/17	8	0	0	15	3	2	21	5	0	1	169	2	0	0	3	2	0	1223	
4/18	6.75	6	5	9	1	3	16	5	0	0	331	0	0	0	6	1	0	383	
4/20	9	0	2	5	0	0	21	5	0	0	25	5	0	0	4	4	3	74	
4/22	5.5	0	0	6	0	0	4	3	0	0	34	0	0	0	1	0	2	50	
4/23	5.5	0	0	5	1	1	10	1	0	0	36	0	0	0	1	1	0	56	
4/24	2.5	0	0	1	0	0	0	0	0	0	33	0	0	0	0	0	0	34	
4/26	4.25	0	0	0	0	1	2	1	0	1	22	0	0	0	0	0	0	27	
4/27	3.75	0	0	4	0	0	1	1	0	0	20	2	0	0	0	0	0	28	
4/30	6.25	0	1	5	0	0	6	9	0	0	56	0	0	0	2	0	0	79	
5/1	6.5	0	0	9	0	0	13	1	0	2	90	0	0	0	1	0	0	116	
5/2	6.25	0	0	5	1	4	28	10	0	0	102	1	0	0	4	1	1	157	
5/4	5	0	0	2	0	0	4	2	0	0	9	0	0	0	0	2	0	19	
5/6	5.75	0	0	3	0	0	10	3	0	0	25	2	0	0	0	1	0	44	
5/9	2.75	0	0	1	0	0	4	0	0	0	3	1	0	0	0	0	0	9	
5/11	2.5	0	0	2	0	0	0	0	0	0	5	0	0	0	0	0	0	7	
TOTAL	177	131	360	110	33	21	204	91	0	222	2482	29	0	0	79	27	12	4	3805
16YrAv	42	11	38	34	9	8	70	22	0	31	839	18	0	0	32	6	3	4	1125

PURPLE CHICKADEE, Ringwood, NJ

Stephanie Seymour

2021	HRS	BV	TV	OS	BE	NH	SS	CHNG	RS	BW	RT	RL	GE	AK	ML	PG	UR	TOTAL
2/24	2.25	0	0	0	0	0	0	0	0	2	0	3	0	0	0	0	0	5
3/3	1.75	0	0	0	1	0	0	0	0	3	0	2	0	0	0	0	0	6
3/6	2	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
3/7	2.5	0	1	0	0	1	0	0	0	0	0	2	0	0	0	0	0	4
3/9	2.75	1	3	0	2	0	0	1	0	4	0	7	0	0	0	0	0	18
3/10	6.5	0	5	0	0	0	0	2	0	19	0	1	0	0	0	0	0	27
3/11	7	0	6	0	0	0	0	2	0	18	0	5	0	0	1	0	0	32
3/13	2.25	0	0	0	0	0	1	0	0	2	0	0	0	0	0	0	0	3
3/14	3.5	0	1	0	0	0	0	1	0	0	0	1	0	0	0	0	0	3

PURPLE CHICKADEE, Ringwood, NJ

Stephanie Seymour

2021	HRS	BV	TV	OS	BE	NH	SS	CHNG	RS	BW	RT	RL	GE	AK	ML	PG	UR	TOTAL
3/20	3	0	0	0	2	0	0	2	0	0	0	2	0	0	0	0	0	6
3/21	2.5	0	15	0	0	0	0	0	0	0	0	2	0	0	0	0	0	17
3/23	3.25	0	12	0	3	0	0	0	3	0	1	0	1	0	0	0	0	20
3/27	6.25	0	56	0	0	0	4	3	0	2	0	6	0	4	0	0	2	77
4/3	5	0	2	0	0	0	0	1	0	0	0	2	0	0	0	0	0	5
4/4	4.5	0	9	1	1	0	3	2	0	1	0	2	0	0	0	0	0	19
4/5	4.75	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	2
4/6	4	0	2	0	2	0	1	0	0	0	1	0	0	1	1	0	0	8
4/9	6.5	0	3	0	0	0	1	1	0	0	2	0	0	1	0	0	0	8
4/10	1.75	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
4/13	7.5	0	26	11	0	2	1	1	0	2	27	0	0	12	1	0	1	84
4/14	6.5	0	0	4	1	0	7	1	0	1	21	1	0	4	0	0	3	43
4/16	6.75	0	0	8	0	0	3	1	0	0	74	2	0	1	0	1	0	90
4/17	6.75	0	0	5	3	2	4	0	0	0	508	0	0	2	0	0	1	525
4/18	7	0	0	6	1	0	19	4	0	0	244	0	0	7	1	0	3	285
4/19	6.5	0	0	0	1	0	19	1	0	0	66	0	0	6	0	0	2	95
4/20	6.75	0	3	4	0	0	13	1	0	2	30	4	0	4	0	0	2	63
4/22	3	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
4/23	7.75	0	2	1	3	0	4	2	0	0	34	1	0	1	0	0	3	51
4/24	7.25	0	3	1	0	0	6	1	0	0	36	2	0	0	0	0	0	49
4/25	2.5	0	0	0	0	0	1	1	0	0	8	1	0	0	0	0	0	11
4/26	2	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
4/27	7.5	0	0	3	0	0	6	4	0	1	40	3	0	2	0	1	1	61
4/28	5.25	0	4	14	4	1	25	8	0	0	471	2	0	1	0	1	5	536
4/30	6.75	0	0	3	0	0	1	0	0	0	13	1	0	0	0	0	0	18
5/1	1.5	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
5/2	8	0	4	3	2	0	17	1	0	0	47	1	0	3	0	0	2	80
5/3	3	0	0	0	0	1	3	0	0	0	1	0	0	1	0	0	0	6
5/4	3.25	0	0	1	0	0	3	0	0	0	5	2	0	1	0	0	2	14
5/6	4.75	0	0	0	2	0	1	0	0	0	1	0	0	0	0	0	0	4
5/7	3	0	0	1	0	0	3	0	0	0	4	0	0	0	0	0	1	9
5/9	3.5	0	2	0	0	0	0	0	0	0	5	0	0	0	0	0	0	7
5/10	3.75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5/11	6.5	0	0	1	0	0	2	2	0	0	8	1	0	0	0	1	3	18
5/13	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5/14	4.25	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
5/15	5.5	0	0	0	1	0	0	1	0	0	1	1	0	0	0	0	1	5
5/17	6.5	0	2	0	1	0	0	1	0	0	1	2	0	0	0	0	2	9
5/19	2	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	4
5/21	2.25	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
TOTAL	222	1	161	68	30	7	149	45	40	60	1657	64	0	1	51	4	4	2336
3YrAv	136	6	92	41	21	3	76	31	0	24	978	39	0	0	24	4	2	1367

ALLEY CREEK, Queens, NY

Steve Walter

2021	HRS	BV	TV	OS	BE	NH	SS	CH	NG	RS	BW	RT	RL	GE	AK	ML	PG	UR	TOTAL
3/20	4.5	0	4	0	2	0	0	3	0	0	0	0	0	0	0	0	0	0	9
3/21	2.5	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
3/23	3	0	1	1	0	0	1	2	0	0	0	0	0	0	0	1	0	0	6
3/25	3.5	0	3	4	1	0	0	2	0	0	0	0	0	0	0	0	0	0	10
3/26	4.5	1	3	30	3	1	2	2	0	0	0	0	0	0	3	0	0	1	46
3/27	6	0	50	5	5	0	1	3	0	0	0	2	0	0	0	0	0	0	66
3/29	5.5	1	13	22	2	0	0	1	0	0	0	0	0	0	3	0	0	0	42
3/30	5	0	4	10	2	0	0	3	0	0	0	0	0	0	2	0	0	0	21
3/31	2.5	0	2	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
4/2	3.5	1	4	1	2	0	0	1	0	0	0	0	0	0	0	0	0	0	9
4/4	4	0	14	2	0	0	0	0	0	0	0	1	0	0	0	1	0	0	18
4/5	3.5	2	0	3	0	0	1	0	0	0	0	0	0	0	0	0	0	0	6
4/6	6.5	0	5	22	0	0	1	0	0	0	0	0	0	0	0	0	0	0	28
4/7	4	0	1	8	1	1	0	0	0	0	0	0	0	0	1	0	0	0	12
4/10	3.5	2	6	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	11
4/13	3	0	8	8	1	0	0	0	0	0	0	0	0	0	0	1	0	0	18
4/14	6	0	6	17	3	4	4	3	0	0	1	0	0	0	4	1	0	0	43
4/16	4	0	6	8	0	0	2	0	0	0	0	0	0	0	2	0	0	0	18
4/18	6.5	4	61	19	5	5	6	2	0	0	3	0	0	0	9	3	1	0	118
4/19	4	2	3	10	1	0	1	1	0	0	0	0	0	0	0	0	0	0	18
4/20	5.5	0	27	2	2	1	0	0	0	0	0	0	0	0	2	1	0	0	35
4/21	3.5	0	1	0	0	0	0	0	0	0	0	0	0	0	3	1	1	0	6

ALLEY CREEK, Queens, NY

Steve Walter

2021	HRS	BV	TV	OS	BE	NH	SS	CH	NG	RS	BW	RT	RL	GE	AK	ML	PG	UR	TOTAL
4/22	2.5	1	4	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	6
4/23	4.5	0	1	0	5	0	1	1	0	0	0	0	0	0	0	0	0	0	8
4/24	4	0	23	4	2	0	0	0	0	0	0	0	0	0	1	0	0	0	30
4/26	2	0	1	2	0	0	0	0	0	0	0	0	0	0	1	0	0	0	4
4/27	4.5	0	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
4/28	6.5	0	6	18	1	1	3	0	0	0	0	2	0	1	7	1	0	0	40
5/2	6.5	0	1	8	3	1	4	0	0	0	0	0	0	0	2	0	0	0	19
5/4	2.5	0	1	1	0	0	0	0	0	0	0	0	0	0	2	0	0	0	4
5/9	4.5	0	14	4	0	2	0	0	0	0	0	0	0	0	0	0	0	2	22
5/11	4	0	17	3	1	0	0	0	0	0	1	0	0	0	0	0	1	0	23
5/12	3	0	3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	4
TOTAL	188	14	355	223	64	17	35	32	0	1	5	12	0	1	42	11	3	0	818
4YrAv	151	8	257	149	44	13	32	23	0	2	3	7	0	0	26	14	5	1	584

SCOTT'S MOUNTAIN, MCR Harmony TWP. NJ

Paul Murray, Christina Hagan, Mark Burton, Paul Shanahan

2021	HRS	BV	TV	OS	BE	NH	SS	CH	NG	RS	BW	RT	RL	GE	AK	ML	PG	UR	TOTAL
4/17	7.5	0	0	14	8	7	9	4	0	1	252	7	0	0	2	1	1	1	307
TOTAL	7.5	0	0	14	8	7	9	4	0	1	252	7	0	0	2	1	1	1	307
6YrAv	7	0	0	7	8	3	7	4	0	0	78	9	0	0	3	0	0	2	121

NEHW Spring Historical Summary Per 100 Hours: 1992-2021

YEAR	SITES	HRS	BV	TV	OS	BE	NH	SS	CH	NG	RS	BW	RT	RL	GE	AK	M	PF	UR	MK	SK	TOT
1992	21	1638	0.0	38	49	1.6	18	149	13	1.3	15	523	63	0.7	0.1	175	15	2.1	16	0.0	0.0	1080
1993	22	1780	0.0	48	57	1.7	19	182	22	0.9	20	342	59	0.1	0.3	146	17	1.4	8	0.0	0.0	980
1994	33	1564	2.5	69	46	1.5	18	173	29	1.1	15	321	48	0.4	0.2	133	14	1.2	14	0.0	0.0	904
1995	26	914	2.7	84	52	1.2	13	77	6	0.1	11	455	30	0.0	0.1	187	7	0.7	9	0.0	0.0	936
1996	20	1061	2.3	64	57	2.5	19	132	8	0.4	17	188	67	0.4	0.1	193	10	1.9	10	0.0	0.0	773
1997	25	1253	2.6	67	42	2.2	14	99	10	1.0	8	534	52	0.1	0.3	74	6	0.3	23	0.0	0.0	934
1998	21	1235	2.1	59	27	1.7	11	70	9	0.7	8	276	27	0.0	0.0	102	5	1.0	11	0.0	0.0	611
1999	8	1758	2.0	59	32	3.3	18	206	24	0.5	17	445	26	0.0	0.1	133	16	1.6	13	0.0	0.0	998
2000	14	1824	1.3	69	36	7.9	11	156	24	0.6	10	323	39	0.1	0.1	138	22	2.7	11	0.1	0.0	851
2001	10	1881	2.8	89	47	3.2	17	149	19	0.3	11	316	40	0.0	0.1	133	22	1.8	13	0.0	0.0	866
2002	9	1886	2.7	66	31	3.2	12	158	30	0.7	9	384	30	0.0	0.1	67	16	2.0	4	0.6	0.0	820
2003	7	2021	2.5	73	41	4.2	10	138	20	0.2	10	242	36	0.2	0.2	55	17	1.4	8	0.0	0.0	658
2004	8	1803	2.2	99	61	4.7	20	150	32	0.7	11	193	52	0.4	0.3	73	21	1.8	8	0.3	0.0	731
2005	7	1419	3.1	90	43	4.4	10	108	21	0.8	12	241	53	0.2	0.1	42	7	1.3	11	0.1	0.0	647
2006	8	1466	3.0	58	55	3.5	7	86	13	0.1	8	368	40	0.1	0.2	52	8	1.5	10	0.1	0.0	714
2007	12	1711	3.6	81	67	9.0	15	141	23	0.5	12	331	47	0.6	0.2	68	12	2.5	9	0.6	0.0	821
2008	11	2288	2.2	73	44	7.7	18	117	17	0.7	10	170	29	0.7	0.0	85	20	3.4	7	0.2	0.0	612
2009	9	2313	4.2	89	36	6.5	17	131	24	0.5	18	188	40	0.3	0.2	97	14	2.9	7	0.0	0.0	675
2010	14	2329	8.4	106	61	7.4	16	180	23	0.6	12	317	33	0.0	0.2	65	26	3.0	9	0.4	0.0	869
2011	13	2061	5.7	70	46	13.1	19	153	22	0.8	14	279	39	0.2	0.1	144	28	2.3	10	0.5	0.0	846
2012	11	2107	4.0	87	39	11.5	20	119	26	1.0	12	206	48	0.0	0.2	86	18	2.3	11	0.0	0.0	690
2013	11	1576	1.5	69	57	10.3	22	86	12	1.3	18	259	37	0.4	0.1	98	13	1.5	9	0.3	0.0	695
2014	8	1321	3.2	73	81	15.1	24	146	18	0.8	27	389	43	0.3	0.2	97	19	3.3	10	0.5	0.2	950
2015	11	1386	2.2	92	71	15.3	21	87	17	0.4	18	388	31	0.6	0.1	68	13	2.4	11	0.7	0.1	839
2016	11	1430	3.0	66	66	14.1	23	128	15	0.2	10	339	34	0.1	0.1	67	16	2.7	7	0.3	0.0	792
2017	10	1272	2.7	153	47	12.1	28	70	13	0.9	18	175	40	0.7	0.2	95	14	3.1	7	0.2	0.1	680
2018	13	1618	5.3	156	59	12.9	23	62	18	0.5	20	271	27	0.1	0.2	82	15	4.2	7	0.1	0.0	764
2019	16	1728	4.3	145	55	12.6	20	61	16	0.2	10	323	23	0.2	0.1	65	15	2.3	4	0.7	0.0	757
2020	13	2050	4.9	110	56	16.6	9	77	17	0.4	8	369	23	0.0	0.1	56	14	1.8	8	0.1	0.0	772
2021	15	1950	8.6	132	53	18.8	16	102	24	0.3	23	366	24	0.0	0.2	66	17	3.4	12	0.1	0.0	866
AVE	13.9	1688	3.2	85	50	7.7	17	123	19	0.6	14	317	39	0.2	0.2	98	15	2.1	10	0.2	0.0	804

2021 Fall Season

In Fall of 2021, hawk watchers at 45 sites across the NorthEast counted 190,154 hawks. This is more than the 180,873 counted in 2020, and only 1500 fewer than in 2018 when we celebrated a return of 30,000 to 36,000 hawks absent in the previous two years, 2017 and 2016. So, our count this season was a good one! You did well! You accomplished this by counting for 10,167 hours, slightly less than last year's 10,405 hours. So, you counted more hawks in fewer hours than last year—a good year, indeed! You counted 18.7 hawks/hour in 2021, more than in any year since 2014, except for 2018 when you counted 20.1 hawks/hour.

The 45 sites this season are two more than last season, and the most since 2012. With a net gain of two sites, this actually represents a jumble of eight different sites—four new sites, one returned site, and three sites with coverage in 2020 that were missing-in-action this season. The new sites in 2021 include Sandwich Central School in New Hampshire, Killington Mountain in Vermont, Southwick Wildlife Management Area in Massachusetts, and Maltby Lakes in Connecticut. The returned site is Booth Hill in Connecticut. It is good to have these sites on board. We welcome them and appreciate their additions of 29 hours and 345 hawks to our count. The three sites with coverage in 2020 but not this season include Carter Hill in New Hampshire, and two Connecticut sites, Apple Hill and Boothe Memorial. They provided significant contributions last season, and are missed this season.

With four of the five new and returning sites north of the 42nd Parallel, the table structure now begins with Region 45, our furthest north region, north of the 45th Parallel. Other regions remain the same—Regions 44 through 40, each north of its corresponding latitude, and Region CO, our Coastal Region. For comparison of the old Region 44 to the new Regions 44 and 45, the % of hawks, % of hours, and % of Hawks without Broadwings and Vultures (XBV) for the new Regions 44 and 45 can be summed. However, per hour or per day values cannot.

For these discussions, site records refer to new high counts compared to all the data we have for the site, but averages refer to the last 10 years at each site. Above average counts refer to those that were at least 20% higher than average, while below average refers to those that were at least 20% lower than average. Counts within the range of +/- 20% are considered average.

Region 45

5% of hawks, 2% of XBV*, 25 hawks/hour, 148 hawks/day, 22 XBV/day, 4% of hours.

[*Note: XBV=Hawks without Broadwings and both vultures]

Region 45 includes Greenlaw Mountain in New Brunswick and Cooper in Maine. This region counted 5% of the hawks in the NorthEast in 4% of the hours, averaging 148 hawks/day, 25 hawks/hour, and 22 XBV/day.

Greenlaw Mountain had a record high year, with records for Total Hawks (9080), and a doubling of the previous records for Broad-winged Hawk (7089), Turkey Vulture (630), and Bald Eagle (225). Also above average was Red-shouldered Hawk (6). Below average species include Cooper's Hawk (8), Northern Goshawk (12), Red-tailed Hawk (148), and Peregrine Falcon (12). In its 11th year, **Cooper** put in greater effort, and was rewarded with a record two Golden Eagles. Most of the other seven species counted were about average, with Bald Eagle (3) the only species below average.

Region 44

13% of hawks, 7% of XBV*, 43 hawks/hour, 251 hawks/day, 40 XBV/day, 6% of hours.

Region 44 includes Cadillac Mountain and Clarry Hill in Maine; and Mount Philo in Vermont. This region counted 13% of the hawks in the NorthEast in 6% of the hours, averaging 251 hawks/day and 43 hawks/hour, the highest of all the regions. The 40 XBV/day has remained about the same since 2019.

Cadillac Mountain set site records for Turkey Vulture (274) and Bald Eagle (204), by substantial increases. However, there were below average counts for five species—Northern Harrier (66), Sharp-shinned Hawk (593), Cooper's Hawk (13), Broad-winged Hawk (395), and Red-tailed Hawk (18). The species at average this season include Osprey (142), Northern Goshawk (6), American Kestrel (449), Merlin (49), and Peregrine Falcon (21). **Mount Philo** counted 11 species in its 4th year, with new site records for three species—Turkey Vulture (347), Broad-winged Hawk (3319), and American Kestrel (59). These contributed to a new high count for Total Hawks (3939). With more effort (60 hrs.) than two of the other three years, most species were above average. **Clarry Hill** had two high counts for the NorthEast—Bald Eagle (405) and Total Hawks (18846). This Total is a remarkable 10% of all the hawks counted in the NorthEast this season. Counts for Turkey Vulture (2219) and Red-shouldered Hawk (56) were site records, and above average species include the Bald Eagle and two other species, Northern Harrier (142) and Broad-winged Hawk (14584). This amazing Broadwing count was surprisingly not the highest in the NorthEast this season! Rough-legged Hawk (1) was below average, along with all three falcons—American Kestrel (130), Merlin (20), and Peregrine Falcon (19).

Region 43

14% of hawks, 6% of XBV*, 41 hawks/hour, 313 hawks/day, 38 XBV/day, 6% of hours.

Region 43 includes Sandwich Central School, Interlakes School, and Concord School in New Hampshire, and Killington Mountain, Mt. Ascutney State Park and Putney Mountain in Vermont. This region counted 14% of the hawks of the NorthEast in 6% of the hours, averaging 313 hawks/day, which was triple that in 2020. The region also counted 6% of XBV, averaging 38 XBV/day which was higher than 2020, and 41 hawks/hour, also triple that in the 2020.

Sandwich Central School began counting hawks this season on two days, and added 86 hawks of six species to our count, including Broad-winged Hawk (72) and Bald Eagle (4). This is our northern most site in New Hampshire, and offers a sampling opportunity in a region not previously covered. **Killington** is another hopeful new site. It is located in our previously unsampled central Vermont. As many of our hawks seem to be migrating further north in recent years, we can expect these new sites to add important data in the years to come. **Interlakes School** counted for their usual two days this season with outstanding results—site records for six species and Total Hawks (7354), and their first ever Swainson's Hawk. The six site records include Osprey (12), Bald Eagle (29), Sharp-shinned Hawk (53), Red-shouldered Hawk (2), Broad-winged Hawk (7212), and American Kestrel (14). With so many hawks in just two days, Interlakes has the highest hawks/day (3677) and hawks/hour (490) of the season! **Mt. Ascutney State Park** put in fewer hours this, their 2nd year, than last year and ended up with fewer hawks. The averages for both years were the same, at 2 hawks/hour. This is another site that improves our sampling, and we hope for continued coverage. **Concord School** had record high counts for Osprey (3) and Red-tailed Hawk (10). In their 11th season, they counted for more hours (24) than average, and had an above average total count (177). This was a consequence of an above average Broad-winged Hawk (120) count. **Putney Mountain** had high counts for the NorthEast for both Broad-winged Hawk (14668) and

Red-tailed Hawk (573). The Broadwing count is 14% of the total for all 45 sites in the NorthEast—quite amazing! In its 39th year, Putney set site records for three species—Turkey Vulture (935), Bald Eagle (206), and the Broadwings—and for Total Hawks (18,649). Two additional species, Red-shouldered Hawk (53) and Golden Eagle (11), were above average, and a Rough-legged Hawk (1) graced their skies this season. Below average species include Cooper's Hawk (95) and Northern Goshawk (7). All other species were at average.

Region 42

**16% of hawks, 12% of XBV*, 17 hawks/hour,
104 hawks/day, 23 XBV/day, 17% of hours.**

Region 42 includes Pack Monadnock in New Hampshire, Helderberg in New York, Booth Hill in Connecticut, and eight sites in Massachusetts—Mount Watatic, Wachusett Mountain, Pinnacle Rock, Barre Falls, Mount Holyoke, Shatterack Mountain, Blueberry Hill, and Southwick WMA. This region counted 16% of the hawks of the NorthEast in 17% of the hours, averaging 104 hawks/day and 17 hawks/hour. These averages are well below those in 2020. Region 42 also counted 12% of XBV, similar to last year, and averaged 23 XBV/day.

Pack Monadnock had the high for the NorthEast for Northern Goshawk (13), which is actually a below average count for the site. There were four new site records, including the first ever Black Vultures (2), Turkey Vulture (641), Bald Eagle (227), and a tie with last season for Red-shouldered Hawk (223). Both Golden Eagle (11) and Peregrine Falcon (57) were above average, and a Rough-legged Hawk (1) at average. Besides Goshawk, the only other below average species was Broad-winged Hawk (6055), resulting in a below average Total Hawks (9605). All other species were at average. **Mount Watatic** had its 2nd year with Black Vulture (2), and a site record for Bald Eagle (137). Almost all species were above average, including Turkey Vulture (48), Northern Harrier (20), Cooper's Hawk (69), Red-shouldered Hawk (12), Broad-winged Hawk (4790), Red-tailed Hawk (17), American Kestrel (35), Merlin (33), and Peregrine Falcon (6). Also counted was the first Golden Eagle since 2010. **Helderberg** had site records for three species and above average counts for four others. The records were for Black Vulture (104), Turkey Vulture (264) and Cooper's Hawk (45). The above average counts were Bald Eagle (49), Broad-winged Hawk (2946), Red-tailed Hawk (140), and American Kestrel (18). With hours slightly below average, there were also four species that were below average—Osprey (8), Sharp-shinned Hawk (17), Merlin (2) and Peregrine Falcon (4).

Wachusett had above average hours, site records for five species, above average counts for four species, and a Rough-legged Hawk (1)! The species with record counts were Turkey Vulture (948), Bald Eagle (232), Cooper's Hawk (166), Golden Eagle (5), and Merlin (63). Above average species included Northern Harrier (28), Red-shouldered Hawk (57), Red-tailed Hawk (174), and American Kestrel (193). There were two species at average, Osprey (170) and Sharp-shinned Hawk (406), and only one species that was below average, Broad-winged Hawk (4458). **Pinnacle Rock** had record highs for days and hours, resulting to above average counts for nine species and a Northern Goshawk (1), the first counted since 2010. The above average species include Turkey Vulture (18), Osprey (50), Bald Eagle (14), Northern Harrier (11), Red-shouldered Hawk (4), Broad-winged Hawk (6), American Kestrel (10), Merlin (8), and Peregrine Falcon (5). The three remaining species include Cooper's Hawk (28) that was at average, and Sharp-shinned Hawk (46) and Red-tailed Hawk (6) that were both below average. Contrary to Pinnacle Rock, **Barre Falls** had record low counts for days and hours, resulting in below average counts for all species, and record low counts for nine species. For this 22nd year the count included 11 species.

Mount Holyoke counted for only a couple of hours this season. It's good to see a second effort at this site and we hope for increased sampling in the future. **Shatterack Mountain** had below average hours, resulting in below average counts across all 12 of the species counted. Nonetheless, two species had substantial numbers, including Osprey (30) and Cooper's Hawk (30). With about the same coverage as last season, **Blueberry Hill** counted 15 species again this season, including Northern Goshawk (2) and Golden Eagle (1), and added Rough-legged Hawk (1)! Turkey Vulture (618) was above average, and both Merlin (14) and Peregrine Falcon (6) were at average. All other species were below average. **Southwick WMA** started with several days of coverage this year, counting six species. The most interesting among the species was Northern Harrier. With four Harriers in 10 hours, that's above the average across the NorthEast of 1.5 in 10 hours. **Booth Hill** resumed coverage this season after a three-year hiatus. Nine species were counted, mostly Broad-winged Hawk (212), followed by Turkey Vulture (11).

Region 41

**26% of hawks, 33% of XBV*, 15 hawks/hour,
87 hawks/day, 33 XBV/day, 33% of hours.**

Region 41 has 14 sites, seven in Connecticut, six in New York, and one in New Jersey. The Connecticut sites include Poquonock, Middle School, Johnnycake, Chestnut Hill, Botsford Hill, Maltby Lakes, and Quaker Ridge. The New York sites include Mohonk, I-84, Bear Mountain, Mount Peter, Chestnut Ridge, and Hook Mountain. The single New Jersey site is Purple Chickadee. This region counted 26% of the hawks in 33% of the hours. While this is a lower percentage than last year, it remains the highest of the regions. Also, the per day and per hour averages are about the same as last year.

Poquonock started in 2008 with two years of higher coverage than in other years. Compared to the six years of coverage since then, this season had above average coverage (55 days, 168 hrs.), resulting in 14 species, with above average counts for Black Vulture (9) and Merlin (6). Also, there were average counts for Turkey Vulture (38), Osprey (13), American Kestrel (5), and Peregrine Falcon (2), and a Golden Eagle (1). All other species were below average. **Middle School** had below average coverage resulting in below average counts for most of the six species counted. An exception was Northern Harrier (2), counted for the first time in three years. **Johnnycake** also had below average coverage resulting in below average counts for most of the nine species counted. The exceptions here were Red-tailed Hawk (5), which was above average, and Red-shouldered Hawk (2), which was at average. **Mohonk** also had below average coverage, yet still had above average counts for four species—Turkey Vulture (181), Bald Eagle (93), Sharp-shinned Hawk (393), and American Kestrel (67). They had average counts for two species, Northern Harrier (22) and Cooper's Hawk (50), and they counted a Golden Eagle (1). There was an interesting flip from 2020. Black Vulture maxed at 33 in 2020, but were missing this season, for the first time since 2015. All other species were below average.

Chestnut Hill had average coverage, counting nine species this season. Several species had above average counts, including Bald Eagle (32), Northern Harrier (4), and Cooper's Hawk (11). Species at average were Sharp-shinned Hawk (35), American Kestrel (12), Merlin (1), and Peregrine Falcon (2). Broad-winged Hawk (2343) is about average for the last six years, but is below average for the last ten years. **Botsford Hill** counted eight species this season. With coverage at average, two species were also at average, Bald Eagle (17) and Cooper's Hawk (7). Having missed Peregrine for 20 of the last 27 years, it is good to see Peregrine for a second year in succession. The Broad-winged (645) count was the

3rd lowest since 1990. **I-84** had even more coverage this season than in 2020, accompanied by a full raft of new records. It had the NorthEast high count for Golden Eagles (27), and a Zone-tailed Hawk! Remarkable! With 59 hours more this season than in 2020, 12 of the 15 species counted had new site records. The three species with higher counts in 2020 than in 2021 were Bald Eagle (209,168), Northern Harrier (18,17), and Red-tailed Hawk (484, 268). Also, there were 16.3 Hawks/hr. this season, almost double the 9.7 Hawks/hr. in 2020. It was definitely a busy season at I-84! **Bear Mountain** had below average coverage this season, yet had above average counts for Turkey Vulture (145), American Kestrel (68) and Merlin (12), plus six species with at-average counts. The species at average include Osprey (42), Bald Eagle (77), Northern Harrier (6), Sharp-shinned Hawk (218), Cooper's Hawk (36), and Red-shouldered Hawk (13). Also counted were two Golden Eagles. At **Maltby Lakes**, this was the first year of counting. They tallied 95 hawks of 11 species, with Broad-winged Hawk (58) accounting for more than half their count. We will be watching for more to come in the years ahead.

Mount Peter balanced site records this year with both a record high and a record low. The record high was Turkey Vulture (1584), which was almost double the previous high in 2020. There were also two species with above average counts, Bald Eagle (140) and Northern Harrier (46), and more Golden Eagles (4) than in 2020. The record low was Red-tailed Hawk (113), at one fourth the 2020 count. While there were four species below average, a balance continued numerically with average Osprey (122), Cooper's Hawk (114), Red-shouldered Hawk (119), Broad-winged Hawk (6769), and American Kestrel (125), resulting in an average for Total Hawks (10,120). **Chestnut Ridge** did well this season. They had two season high counts for the NorthEast, Turkey Vulture (3798) and Sharp-shinned Hawk (2759), and one of the four Swainson's Hawks. They also had a site record for Bald Eagle (265), and above average counts for seven other species: Osprey (364), Northern Harrier (201), Cooper's Hawk (616), Red-shouldered Hawk (555), Golden Eagle (15), American Kestrel (468), and Merlin (96). These balanced the below average Broad-winged Hawks (2501) resulting in average Total Hawks (11,917). Likewise, **Hook Mountain** did well this season. They had the high for the NorthEast for Black Vulture (180), and two site records: Turkey Vulture (1330) and Cooper's Hawk (350). There were six species with above average counts, including Osprey (383), Bald Eagle (209), Northern Harrier (137), Red-shouldered Hawk (337), American Kestrel (299), and Golden Eagle (14). The Golden count was almost triple the average. With Sharpies (1800) at average, the only below average species was Broad-winged Hawk (1069), and that brought the Total Hawks (6343) to just below average. **Quaker Ridge** had the most hours (689) in the NorthEast, and also had the highest Red-shouldered Hawk (635) in the NorthEast. Interestingly, this Shoulder count is merely average compared to their record of 1046 in 2014. They had a site record for Black Vulture (78) this season and above average counts for two other species, Turkey Vulture (1868) and Golden Eagle (13). There were average counts for six other species: Bald Eagle (231), Northern Harrier (104), Cooper's Hawk (422), American Kestrel (483), Merlin (89), and Peregrine Falcon (33). Both Broad-winged Hawk (1562) and Sharp-shinned Hawk (1721) were below average, bringing Total Hawks (7732) below average. This was **Purple Chickadee's** 5th year counting. With even greater effort this season, there were nine new site records! These include Turkey Vulture (313), Osprey (48), Bald Eagle (66), Northern Harrier (37), Sharp-shinned Hawk (491), Cooper's Hawk (186), Red-shouldered Hawk (114), Golden Eagle (6), and American Kestrel (115). Well done!

Region 40

17% of hawks, 21% of XBV*, 15 hawks/hour, 89 hawks/day, 34 XBV/day, 22% of hours.

Region 40 has one site in New York, Lenoir Wildlife Sanctuary, and five sites in New Jersey—State Line, Wildcat Ridge, Montclair, Scott's Mountain, and Washington Valley. This region counted 17% of the hawks and 21% of XBV in 22% of the hours, almost identical to last season. The average of 89 hawks/day is higher than in 2020, but the 34 XBV/day and 14 hawks/hour is unchanged.

State Line increased effort this season to a site high of 497 hours of coverage. This resulted in a site record for Turkey Vulture (3469) and above average counts for five other species: Bald Eagle (333), Cooper's Hawk (368), Red-shouldered Hawk (337), Golden Eagle (3), and American Kestrel (378). There were also six species at average: Black Vulture (66), Osprey (477), Northern Harrier (85), Sharp-shinned Hawk (1426), Merlin (71), and Peregrine Falcon (72). Only the two buteos, Broad-winged Hawk (917) and Red-tailed Hawk (281), were below average. Even so, Total Hawks (8404) remained at average. **Lenoir** had below average days (22), resulting in below average counts for most of the 13 species counted. Nevertheless, there were above average counts for three species and average counts for two species. Above average counts included Osprey (126), American Kestrel (78), and Merlin (10), and average counts included Turkey Vulture (477) and Bald Eagle (75). **Wildcat Ridge** had average coverage, and tied a site record for Merlin (20). Interestingly, this record was set back in 1998! However, there were almost three times more hours that year. Accounting for coverage, this year has 8 Merlin/100 hrs. compared with 3 Merlin/100 hrs. in 1998. That makes it a new site record! Nice! They also had above average Red-shouldered Hawks (25), two Golden Eagles, and average counts for Black Vulture (30), Bald Eagle (56), Cooper's Hawk (98), Red-tailed Hawk (48), and Peregrine Falcon (6). Other species were below average, including Broad-winged Hawk (1911) and Total Hawks (2648).

Montclair counted one of the two Mississippi Kites recorded this season, plus a Northern Goshawk. With average coverage, they tallied above average counts for five species and average counts for three species. The above average species include Turkey Vulture (1975), Bald Eagle (190), Northern Harrier (61), Cooper's Hawk (423), and Peregrine Falcon (64). Average species include Black Vulture (85), Red-shouldered Hawk (337), and American Kestrel (270). The remaining four species were below average but at higher counts than the previous two years, resulting in the best season since 2018. **Scott's Mountain** had a season that was somewhat similar to Mount Peter, which is along the same ridge about 55 miles NNE. It had two site records, one a record high and one a record low. The record high was for Bald Eagle (313), and the record low was for Red-tailed Hawk (415), and the Redtail count was only about half of the 2020 count. They also counted four Northern Goshawk and 17 Golden Eagles. Seven species had average counts, including Northern Harrier (79), Sharp-shinned Hawk (1544), Cooper's Hawk (185), Red-shouldered Hawk (210), American Kestrel (209), Merlin (62), and Peregrine Falcon (37). Two below average species, Osprey (137) and Broad-winged Hawk (7747) brought Total Hawks (11,041) to just below average. **Washington Valley** counted for their 5th season at their current site (previously nearby Chimney Rock), so numbers are still showing substantial variation. With coverage below the average of the previous four years, there were two new record highs and three record lows. The record high counts were for Turkey Vulture (541) and Rough-legged Hawk (1). The Roughleg was their 2nd, having counted one in 2017, their first season. The record low counts were for Osprey (38), Red-shouldered Hawk (117), and Red-tailed Hawk (30). They counted 15 species, averaging 25 hawks/hour.

Coastal Region (CO)

**9% of hawks, 20% of XBV*, 14 hawks/hour,
86 hawks/day, 57 XBV/day, 12% of hours.**

Region CO includes three coastal sites, Lighthouse Point in Connecticut, and Fire Island and Fort Tilden in New York. These three sites counted 9% of the hawks of the NorthEast and 20% of XBV in 12% of the hours. The Region averaged 14 hawks/hour, and 86 hawks/day, more than in 2020, and 57 XBV/day, the highest of the regions.

It was a truly unusual and remarkable season for **Lighthouse Point**, beginning with the beyond-normal species counted. They counted 1 Mississippi Kite, two Swainson's Hawks, and one Short-eared Owl! And,

they had high counts for the NorthEast for five species—Osprey (1148), Northern Harrier (263), Cooper's Hawk (1007), American Kestrel (1180), and Peregrine Falcon (129). Notable for these species, the Osprey and Harrier counts were merely average for them, and the Coops and Peregrine were actually below average. They had above average counts for three more species: Bald Eagle (48), Broad-winged Hawk (5378), and Golden Eagle (6). Of these, the Broadwings are the biggest story—the count was the best since 1994, when they counted 5738. That's a retrofit to 27 years ago! What a surprise for all of us. **Fire Island** had a big surprise with the appearance of a Golden Eagle this season. It is the 3rd Golden to pass the FIRE watch since 1982! The 1st Golden was in 1992, after 10 years of counting. The 2nd took another 22 years to finally arrive, in 2014. FIRE

NorthEast Fall 2021 Seasonal Totals

Reg	Site		Days	HRS	BV	TV	OS	BE	NH	SS	CH	NG	RS	BW	RT	RL	GE	AK	ML	PG	UR	Other	Total	XBV
45	Greenlaw Mt.	NB	40	274	0	630	125	225	65	469	8	12	6	7089	148	0	1	183	34	12	73	0	9080	1361
	Cooper	ME	22	86	0	32	0	3	0	2	2	0	0	17	0	0	2	7	1	0	0	0	66	17
44	Cadillac Mt.	ME	48	225	0	274	142	204	66	593	13	6	0	395	18	0	0	449	49	21	119	0	2349	1680
	Mt. Philo SP	VT	15	60	0	347	30	77	13	37	4	0	7	3319	24	0	0	59	2	0	20	0	3939	273
	Clarry Hill	ME	37	294	0	2219	253	405	142	644	48	6	56	14584	287	1	5	130	20	19	27	0	18846	2043
43	Sandwich Central	NH	2	5	0	6	0	4	0	1	2	0	0	72	1	0	0	0	0	0	0	0	86	8
	Killington Mt.	VT	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
	Interlakes School	NH	2	15	0	25	12	29	1	53	2	0	2	7212	0	0	0	14	1	0	2	1SW	7354	117
	Mt. Ascutney SP	VT	2	4	0	0	0	0	0	0	3	0	0	6	0	0	0	0	0	0	0	0	9	3
	Concord School	NH	5	24	0	32	3	0	0	4	0	0	0	120	10	0	0	0	0	0	8	0	177	25
	Putney Mt.	VT	72	590	2	935	161	206	71	1573	95	7	53	14668	573	1	11	211	48	34	0	0	18649	3044
42	Pack Monadnock	NH	76	548	2	641	182	227	85	1291	157	13	223	6055	329	1	11	165	100	57	66	0	9605	2907
	Mount Watatic	MA	18	121	2	48	44	137	20	181	69	0	12	4790	17	0	1	76	33	6	40	0	5476	636
	Helderberg	NY	11	70	104	264	8	49	6	17	45	0	0	2946	140	0	0	18	2	4	34	0	3637	323
	Wachusett Mt.	MA	73	435	0	948	170	232	28	406	166	0	57	4458	174	1	5	193	63	25	213	0	7139	1733
	Pinnacle Rock	MA	34	214	0	18	50	14	11	46	28	1	4	6	6	0	0	10	8	5	17	0	224	200
	Barre Falls	MA	19	85	0	50	17	34	1	68	15	0	1	261	27	0	0	16	9	0	11	0	510	199
	Mount Holyoke	MA	1	2	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	2	1
	Shatterack Mt.	MA	22	109	0	146	30	13	7	97	30	0	11	1173	5	0	0	21	4	2	17	0	1556	237
	Blueberry Hill	MA	35	160	0	618	23	9	14	180	30	2	22	966	27	1	1	82	14	6	18	0	2013	429
	Southwick WMA	MA	3	10	0	0	1	2	4	0	0	0	0	2	0	0	0	7	4	0	1	0	21	19
	Booth Hill	CT	2	11	0	11	2	3	1	1	1	0	2	212	4	0	0	0	0	0	0	0	237	14
41	Poquonock	CT	55	168	9	38	13	7	2	6	3	0	2	108	8	0	1	5	6	2	14	0	224	69
	Middle School	CT	7	16	0	1	1	2	2	0	2	0	0	50	0	0	0	0	0	0	6	0	64	13
	Johnnycake	CT	3	8	3	16	7	10	1	0	1	0	2	39	5	0	0	0	0	0	14	0	98	40
	Mohonk	NY	19	110	0	181	18	93	22	393	50	0	8	1552	30	0	1	67	6	2	9	0	2432	699
	Chestnut Hill	CT	16	57	0	0	15	32	4	35	11	0	0	2343	0	0	0	12	1	2	11	0	2466	123
	Botsford Hill	CT	15	54	0	0	16	17	2	30	7	0	0	645	0	0	0	6	2	1	18	0	744	99
	I-84	NY	33	186	56	339	45	168	17	211	69	0	80	1670	268	0	27	47	25	5	1	1ZT	3029	964
	Bear Mt.	NY	42	174	0	145	42	77	6	218	36	0	13	702	14	0	2	68	12	5	11	0	1351	504
	Maltby Lakes	CT	4	11	0	0	6	3	1	8	4	0	3	58	2	0	0	2	1	2	5	0	95	37
	Mount Peter	NY	70	473	77	1584	122	140	46	871	114	0	119	6769	113	0	4	125	8	11	17	0	10120	1690
	Chestnut Ridge	NY	89	665	59	3798	364	265	201	2759	616	0	555	2501	78	0	15	468	96	27	114	1SW	11917	5559
	Hook Mt.	NY	77	482	180	1330	383	209	137	1800	350	0	337	1069	104	0	14	299	78	37	16	0	6343	3764
40	Quaker Ridge	CT	90	689.3	78	1868	358	231	104	1721	422	0	635	1562	124	0	13	483	89	33	11	0	7732	4224
	Purple Chickadee	NJ	55	302.8	17	313	48	66	37	491	186	0	114	1759	58	0	6	115	21	14	70	0	3315	1226
	State Line	NJ	82	497	66	3469	477	333	85	1426	368	0	337	917	281	0	3	489	71	72	10	0	8404	3952
	Lenoir Wildlife	NY	22	98	33	477	126	75	2	91	20	0	13	271	10	0	0	78	10	3	0	0	1209	428
	Wildcat Ridge	NJ	52	253	30	20	42	56	5	314	98	0	25	1911	48	0	2	35	20	6	36	0	2648	687
	Montclair	NJ	84	597	85	1975	217	190	61	831	423	1	337	915	194	0	0	270	73	64	20	1MK	5657	2682
	Scott's Mt.	NJ	90	620	0	0	137	313	79	1544	185	4	210	7747	415	0	17	209	62	37	82	0	11041	3294
	Washington Valley	NJ	31	124	80	541	38	120	41	582	104	0	117	1080	30	1	2	209	81	11	3	0	3040	1339
	Lighthouse Pt.	CT	92	586	16	360	1148	323	263	1250	1007	0	130	5378	239	0	6	1180	253	129	230	1M2W1E	11916	6162
	Fire Island	NY	76	456	0	0	501	8	232	106	32	0	0	0	0	0	1	880	886	116	4	1SO	2767	2767
	Fort Tilden	NY	32	198	1	7	879	13	160	257	63	0	5	4	11	0	0	836	295	32	3	0	2566	2554
Totals			1676	10167	900	23706	6256	4624	2045	20607	4889	52	3498	107402	3822	6	151	7524	2488	802	1373	9*	190154	58146

*2 Mississippi Kites, 1 Zone-tailed Hawk, 4 Swainson's Hawks, 1 Snowy Owl, 1 Short-eared Owl; BV Black Vulture, TV Turkey Vulture, OS Osprey, BE Bald Eagle, NH Northern Harrier, SS Sharp-shinned Hawk, CH Cooper's Hawk, NG Northern Goshawk, RS Red-shouldered Hawk, BW Broad-winged Hawk, RT Red-tailed Hawk, RL Rough-legged Hawk, GE Golden Eagle, AK American Kestrel, ML Merlin, PG Peregrine Falcon, UR Unidentified Raptor, XBV Total without Broad-winged Hawks or Vultures

NorthEast Fall 2021 Hawks/100 Hours by Region

Reg	Sites	Days	HRS	BV	TV	OS	BE	NH	SS	CH	NG	RS	BW	RT	RL	GE	AK	ML	PG	Total	XBV
45	2	62	360	0	184	35	63	18	131	3	3.3	2	1974	41	0.0	0.8	53	10	3	2541	383
44	3	100	579	0	490	73	118	38	220	11	2.1	11	3159	57	0.2	0.9	110	12	7	4339	690
43	6	84	641	0	156	27	37	11	254	16	1.1	9	3443	91	0.2	1.7	35	8	5	4098	499
42	11	294	1764	6	156	30	41	10	130	31	0.9	19	1183	41	0.2	1.0	33	13	6	1725	380
41	14	575	3396	14	283	42	39	17	252	55	0.0	55	613	24	0.0	2.4	50	10	4	1470	560
40	6	361	2188	13	296	47	50	12	219	55	0.2	47	587	45	0.0	1.1	59	14	9	1463	566
CO	3	200	1240	1	30	204	28	53	130	89	0.0	11	434	20	0.0	0.6	234	116	22	1392	926
TOT	45	1676	10167	9	233.2	62	45	20	202.7	48	0.5	34	1056	38	0.1	1.5	74	24	8	1870	572
2020	43	1821	10405	10	172.1	52	43	19	201.5	45	0.8	40	963	64	0.2	1.1	75	27	8	1738	594
10yrAve	42		10473	6	119.3	60	31	18	253.4	46	1.3	29	1332	57	0.1	1.1	63	26	9	2079	622

also had the only Snowy Owl counted in the NorthEast this season, and the high for the NorthEast for Merlin (886). While the Merlin high has been the norm for the site, this season's count was actually below average. The barrier beach did bring two species with above average counts, Northern Harrier (232) and American Kestrel (880). Sharp-shinned Hawk (106), Cooper's Hawk (32), and Peregrine Falcon (116) were all below average. This was **Fort Tilden's** 4th season, with days and hours increasing in each year. Consequently, there were four site records, including Black Vulture (1), Osprey (879), Northern Harrier (160), and Peregrine Falcon (32). The Black Vulture was the first counted at the site. Altogether there were 13 species documented this season. This site has the advantage of being at the west end of a barrier beach for the coastal flight, and also near the mainland for the inland flight.

The Hawks—an average year?

The 190,154 hawks counted in our Fall 2021 season represents an average year at all levels, including the 10-year, 20-year, and 40-year averages. This is a success, as we have worked toward this for the last three years. Of course, with the nature of hawk counts, there is much variation among the species. We have four species that are above all three averages, one species that is above the 20-year and 40-year averages, and four species below all three averages. A balancing act among all our species results in our average Total Hawks.

Distribution of Hawks Across the Northeast

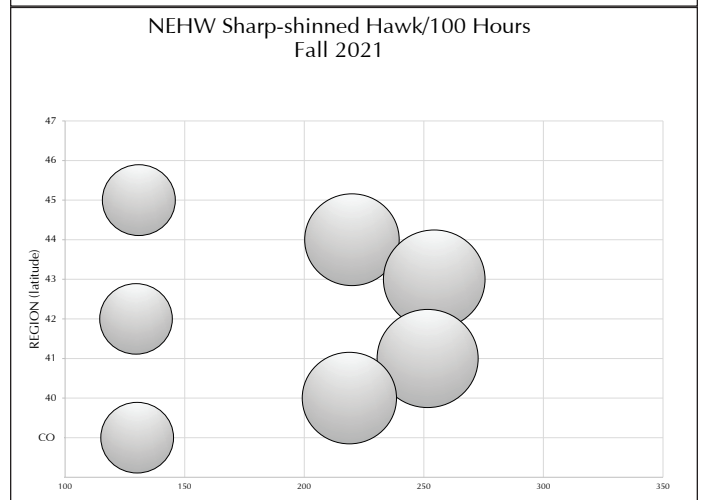
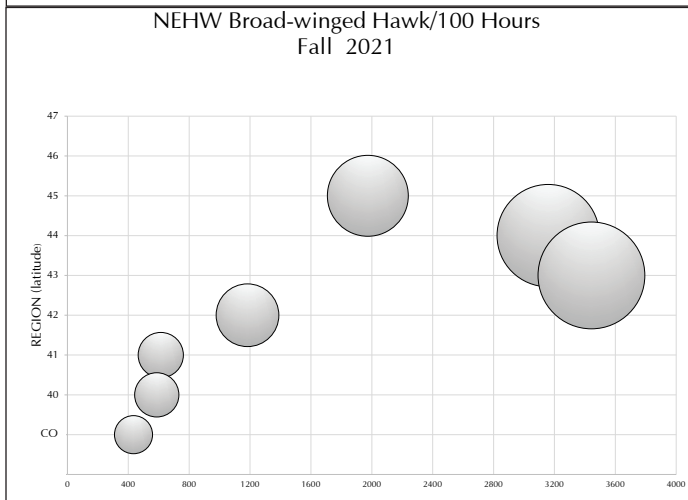
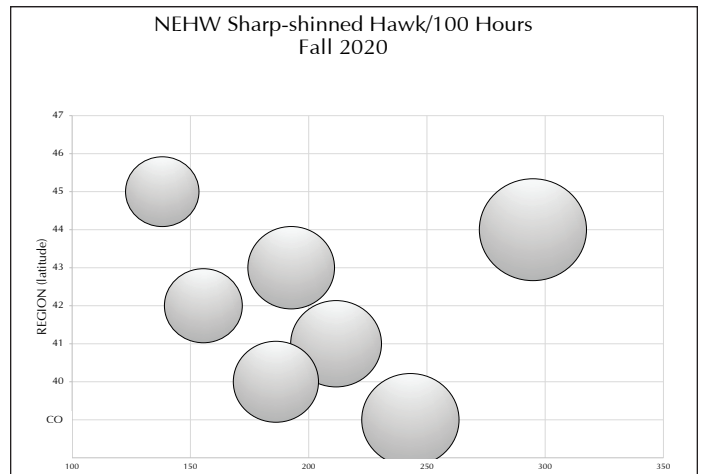
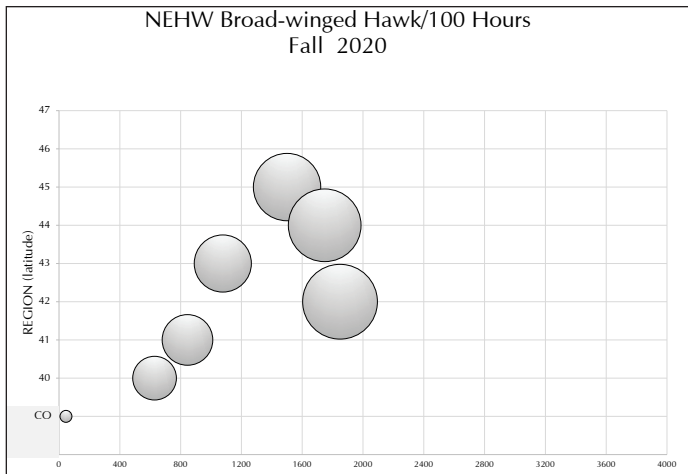
How does "average Total Hawks" represent the Fall 2021 season for you? Did it seem like an average year? Not for me! At Hook, it was the year of the Golden Eagle. Drew and I do Thursdays, and we counted nine of the 14 Golden Eagles, with three Golden Eagles and one Bald in one binocular view on Nov 2! What a powerful experience, absolutely unique in my 40+ years of counting at Hook! At FIRE, we do Tuesdays, and we had the continuing pleasure of counting 100 of the 886 Merlin, a favorite of mine, and near average for the site. BUT, at Hook there were virtually no Broadwings on Thursdays (18!) or otherwise (1069), and at FIRE, there were virtually no Sharpies on Tuesdays (6!) or otherwise (106). Did Broadwings and Sharpies abandon these sites? these regions?

While the NorthEast Fall 2021 Seasonal Totals table gives the total counts for your site, along with all other sites, it is easier to get a sense of what the season was like from the Hawks/100 hrs. by Region table. This table shows each region along with total number of sites, days, and hours in that region. The hawks here represent hawks/hour using total hawks for the region divided by total hours for that region. Since these average hawks/hour would be such small numbers for most species, we then multiply by 100 hours.

This table tells us much about the distribution of our hawks. Black Vulture is mostly found in our southern regions, while Turkey Vulture is spread across the regions with substantial numbers up north. Osprey, Harrier, and all three falcons are most prevalent along the coast. Bald Eagle is most prevalent up north. See pages 23 to 26 in our 2020 NEHW Report for more detailed explanations last year. For most species, this year's distribution is similar to last year's. However, there are two species that are different, the same two species that Drew and I found absent from our counts—Broadwings and Sharpies!

Broadwing Differences. The NEHW average in 2020 was 963 Broadwings/100 hrs., similar to this year's average of 1056/100 hrs. But in 2020 the largest regional average was 1849/100 hrs., in Region 42. This year the largest regional average was 3443/100 hrs., almost twice last year's, and further north in Region 43. Furthermore, the average for Region CO this year is 10 times that of 2020. Bubble charts (page 16) help us to visualize these differences. The vertical axis shows the regions, from the Coastal Region in the south to Region 45 in the north. and the horizontal axis shows the average Broadwings/100 hrs. Bubbles that are further to the right represent more Broadwings. For example, on the 2021 chart, the furthest right bubble corresponds to the 3443 Broadwings/100 hrs. on the Regional Table for Region 43. Within each chart, the size of the bubbles also shows the relative averages for the different regions on that chart. This visual emphasizes the differences in amounts, with smaller bubbles on the left and larger bubbles on the right. We see that in 2020 the average Broadwings were closer together numerically (similar sizes) and distributed more evenly across the regions. The exception was the Coastal Region, which had 64 Broadwings/100 hrs. In 2021, the Coastal Region had more, but the Broadwings were distributed mostly in Regions 43 and 44, with some in Region 45, and few in the southern regions. Hook is in Region 41. No wonder Drew and I only counted 18 Broadwings! Broadwings just didn't show up in the south.

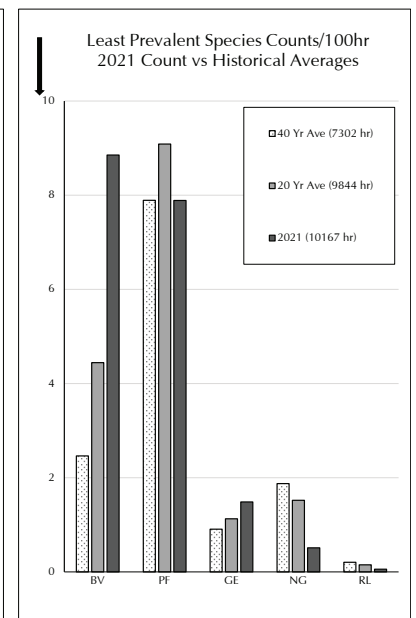
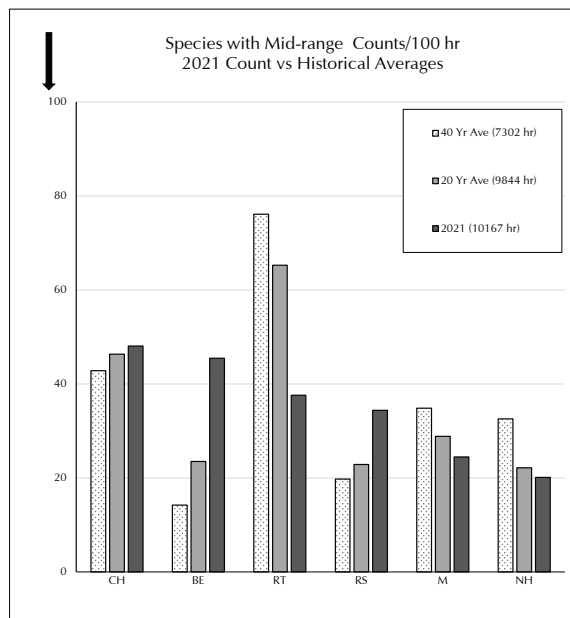
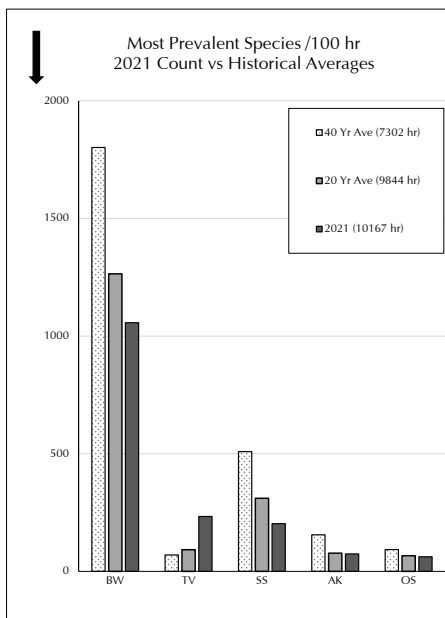
Sharpie Differences. Since the 2015 NEHW Report, when I started analyzing your data, the site with the maximum number of Sharpies in the NorthEast has been Lighthouse Point, on the shore of Long Island Sound, . . . until it isn't! This season was the first season when Lighthouse is not 1st. It's not even 2nd . . . or 3rd . . . or 4th! What? What happened to Sharpies? There were 201 Sharpies/100 hrs. in 2020, and 203/100 hours in 2021, basically identical. So, why the sudden change? Looking at the bubble charts for these two Sharpie seasons, we see that in 2020 there were three regions with more than 200/100 hours, and the Coastal Region was the 2nd highest. In 2021 there were four regions with more than 200/hr., a large gap between those four and the remaining regions, and the Coastal Region is far to the left among the lowest counts.



So, the Sharpies abandoned the coast! Of course, at FIRE we have been seeing a decline in Sharpies on the barrier beach for a while. Now, it is apparently also occurring at other coastal sites. This will be very interesting to watch. We know that Sharpie counts have declined everywhere across the NorthEast. Could the decline have impacted a population that migrates along the coast to a greater extent than those that migrate inland? Or is this a result of changes in weather patterns, with more favorable winds inland? There is always more to learn! Keep counting so we can.

Species Prevalence—historic shifts in rank

For an overview of our species and their relative abundance, our Species Prevalence charts are arranged from most prevalent to least prevalent species. To accommodate the vastly different magnitude of the counts, three different charts are used, each with different vertical scales. Prevalence refers to our current 2021 data, shown on the charts as the darkest bars. These are the bars that decrease in sequence from left to right.



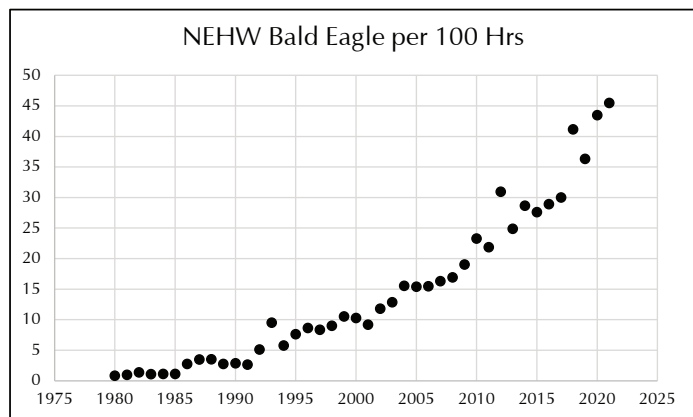
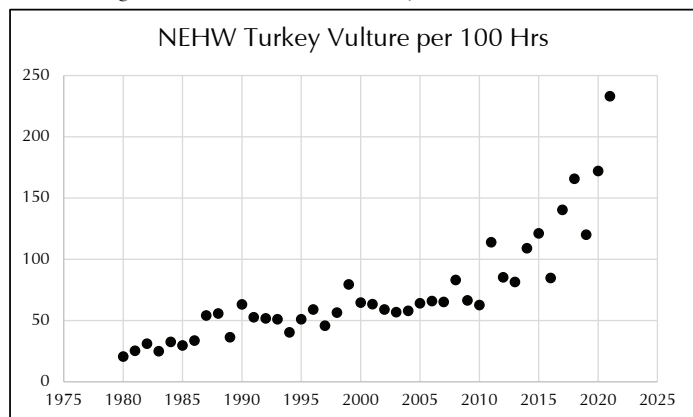
The 40-year average (lightest bar) and the 20-year average (gray bar) are included and provide an historical trend for each species.

Broadwings remain our most prevalent species, with counts that are more than four times any other species. However, Sharp-shinned Hawks no longer hold 2nd place! As Sharpies remain at low numbers and Turkey Vultures continue to increase, 2nd place now goes to Turkey Vulture, and Sharpie slips to 3rd for the first time in our history. Red-tailed Hawks gave us a second historic ranking. Redtails dropped three ranks, from 5th to 8th, and reside in 8th place for the first time in our history! Other species remained in the same relative positions around these changes, shifting up to fill in the Redtail gap, or remaining in place below it. Needless to say, our raptor migrants are in a dynamic state of flux, and you are documenting this with your data.

Using the three bars for each species, the Prevalence Chart reveals long-term trends. Declining species show higher 40-year bars dropping in succession to lower 20-year bars, then to the lowest 2021 bar. Declining species include Broad-winged Hawk, Sharp-shinned Hawk, Red-tailed Hawk, Merlin, Northern Harrier, Northern Goshawk, and Rough-legged Hawk. Increasing species show the reverse, low 40-year bars increasing in succession to higher 20-year bars, and then to the highest 2021 bar. Increasing species include Turkey Vulture, Cooper's Hawk, Bald Eagle, Red-shouldered Hawk, Black Vulture, and Golden Eagle. For other species the trend is not as well defined. For example, Kestrel and Osprey may still be in decline, or might be entering stasis or a recovery stage. Peregrine Falcon increased historically, but has not maintained that increase. For more detailed information, see the Centerfold for year-to-year information.

Species—Flying High: 2 record highs, 3 highs and 5 specialties

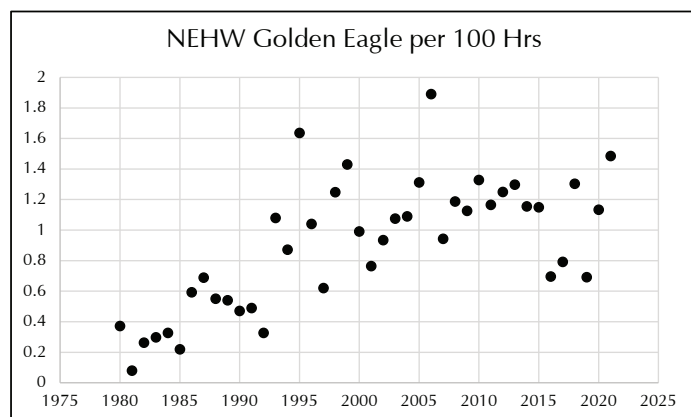
You are continuing to tally records for the NorthEast. This year there were two record high counts, for Turkey Vulture (23706, 233/100 hrs.) and Bald Eagle (4624, 45/100 hrs.). Turkey Vulture records have become



the norm, with five records in the last seven years, and this year was a substantial jump above the previous high. For the same seven years, Bald Eagle had records in three years. The counts for both species have approximately doubled in the last 10 years. We have all enjoyed seeing more of these species throughout the NorthEast.

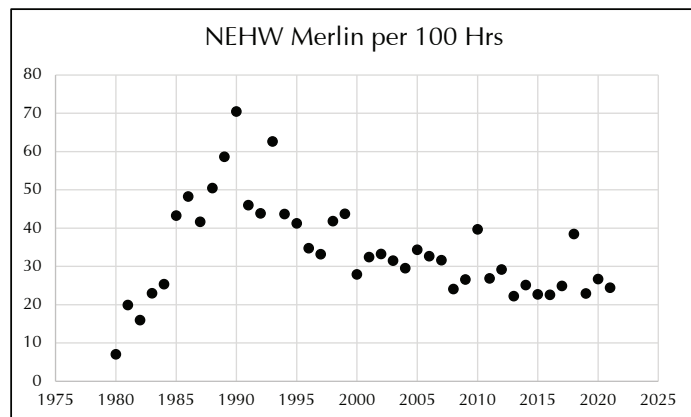
In addition to these record high counts, we have three species that are well above average. These include Black Vulture (900, 8.9/100 hrs.) and Red-shouldered Hawk (3498, 34/100 hrs.), both of which had record high counts in 2020, and Golden Eagle (151, 1.5/100 hrs.), which has had varied counts in the last five years.

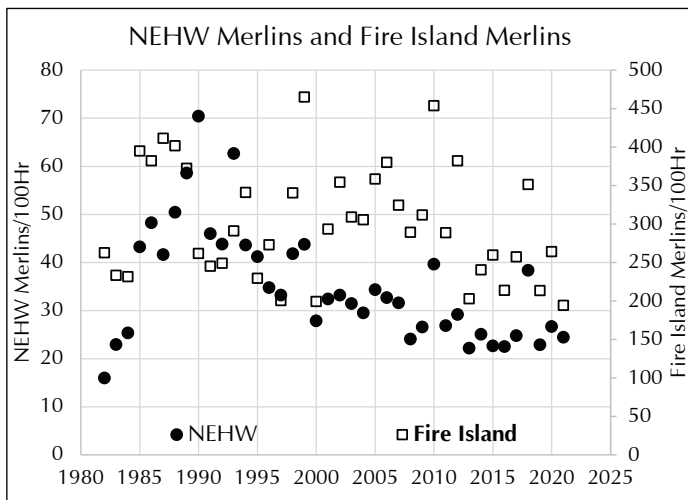
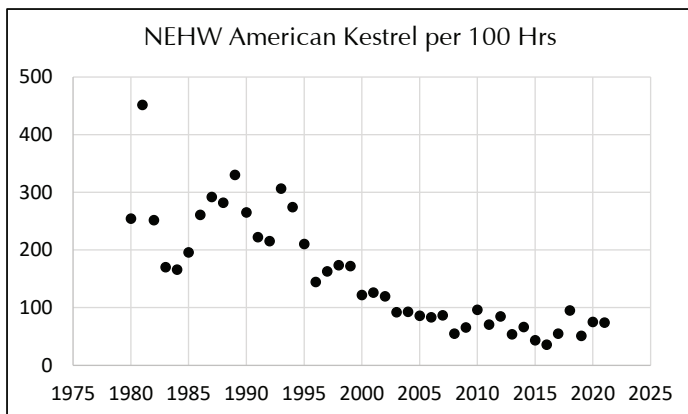
Goldens have definitely increased well beyond the counts in the 1980's, but have not shown any clear trend since the mid-1990's. For sites that count Goldens, there were 14 this season with above average counts, five with average counts, and 10 with below average counts. While I-84 had an amazing 27 Goldens at our western-most boundary, a trio of sites—Chestnut Ridge, Hook Mountain, and Quaker Ridge—had a total of 42. These sites are relatively close in proximity, within 12.5 miles, suggesting a possible concentrated pathway for this species through the southern Connecticut/New York region. With the memory of my '3 Goldens-1 Bald' view still poignant, I will certainly have fun watching for future concentrations along that pathway!



Species—Flying Steady

This season had average counts for six species. The counts for Cooper's Hawk (4889, 48/100 hrs.) and Peregrine Falcon (802, 8/100 hrs.) are consistent with their distributions over the years. Both species increased from the 1980s to the 1990s and have remained more or less steady since then. Osprey (6256, 62/100 hrs.) and Northern Harrier (2045, 20/100 hrs.) are also average for the last 10 years. However, both had previously declining trends for 20 to 25 years. So, a 10-year average is good news. The declines have stabilized.





Two other species have similar long-term trends, with declines in years before the last decade. The trends for Merlin (2488, 24/100 hrs.) and American Kestrel (7524, 74/100 hrs.) are different in that their counts this year are averages for the last 20 years, meaning the declines occurred before then. At that time the Merlin decline was not as noticeable as the Kestrel decline. Merlins dropped by 25% over the five years from 1998 to 2003, while Kestrels dropped almost 50%. That drop for Kestrels was felt across the NorthEast, as the species was the 3rd most prevalent at that time, and spread across the landscape, from the coastline to the mountains. The Kestrel count this season was higher than it has been in nine other years. That, together with the average for 20 years, suggests that Kestrels may actually be stable.

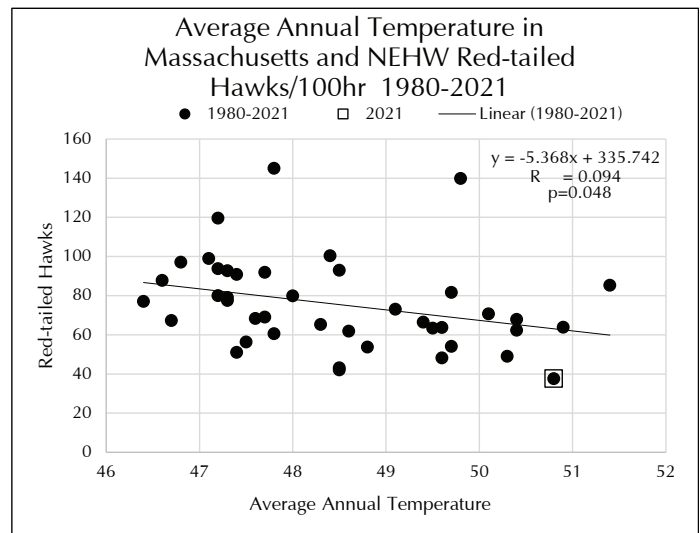
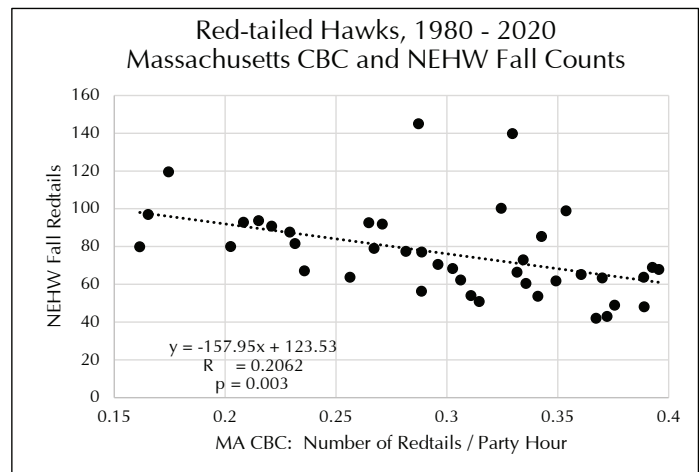
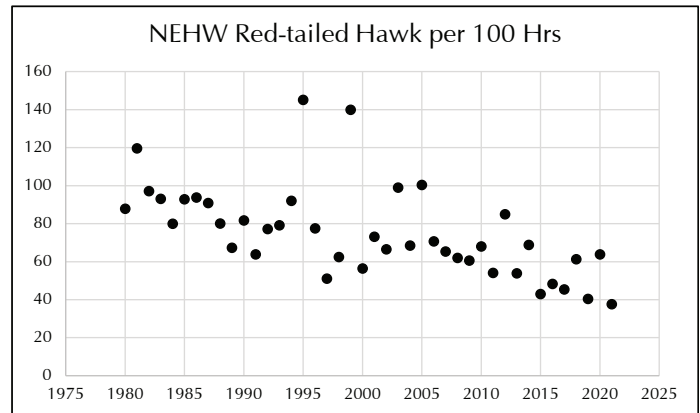
In comparison, Merlins migrate mostly along the coast. Having only noticed reduced numbers of Merlins at Fire Island in more recent years, I was surprised to see that the decline in the NorthEast had actually occurred 20 years ago. A comparison of Fire Island data to the NEHW data shows that my impression is correct. FIRE had consistently good numbers from 2000 to 2012, when the NEHW numbers had dropped from the previous decades, and reduced numbers since 2012 when the NEHW data has remained more or less steady. This suggests that more Merlins are now moving inland, and balancing the drop seen on the barrier beach. This season's Merlin count is better than eight other seasons and relatively stable over the last 20 years. We can take a deep breath, welcome the stable trends for these two falcons, and enjoy those Kestrels hover-hunting along the dunes or flying over mountain tops and the Merlins zoom-chasing straight down the middle!

Species—Flying Low: four still down, plus record low

This season brought one record low count, plus four additional species that are below average. Red-tailed Hawk (3822, 38/100 hrs.) hit a new record low. The other below average species include Sharp-shinned Hawk (20,607, 203/100 hrs.), Northern Goshawk (52, 0.5/100 hrs.), Broad-winged Hawk (107,402, 1056/100 hrs.), and Rough-legged Hawk (6, 0.1/100 hrs.).

Red-tailed Hawks—record low, again! changing migration patterns?

This is the 3rd record low count for Redtails/100 hrs. since 2015. While it is not a record low for actual counts, the lower actual counts occurred



during the 1980s when the average effort was 4100 hours, compared to our current 10-year average of 10,481 hours. A decline in migration counts can reflect a population decline, or a shift in migration pathways, or a change in migration patterns. As global warming has impacted winters in the NorthEast, we have seen more Redtails overwintering across the region, suggesting a change in pattern. Are there fewer Redtails migrating because winter conditions are now suitable for staying in the NorthEast? Is global warming really a contributing factor?

To answer the first question, historical data from Audubon's Christmas Bird Counts (CBC) was available for Massachusetts at the link noted below. Using this as representative of the NorthEast, the number of Redtails per party hour was compared to our NEHW Redtails/100 hrs. This shows a significant negative correlation ($r = -0.454$, $p=0.003$). As the number of overwintering Redtails has increased, the number of migrating Redtails has decreased.

Why is this happening? Drew often pointed out the number of Redtails moving on days after big snows up north. With snow extent, depth, and timing more difficult to access than temperature, the average annual temperature is used as a gross measure of global warming and the subsequent living conditions encountered by Redtails during winter. To be consistent with the CBC data, the average annual temperatures for Massachusetts from 1980 to 2021 were compared to our migration data. Once again, we find a negative correlation ($r = -0.306$, $p=0.048$). As temperatures increase, the number of migrating Redtails decreases. Your data has given us evidence to support the change in migration patterns of Redtails! Neat!

Audubon CBC source: <https://netapp.audubon.org/CBCObservation/Historical/ResultsBySpecies.aspx?l>

Sharp-shinned Hawks—declining faster along the coast? . . . this decade?

Sharp-shinned Hawks have been declining in the NorthEast since 1980. Using a graph of your data, we can see that the long-term decline is quite steep, a loss of about 20 Sharpies/100 hrs. The 20-year decline is about half of that, at a loss of 10 Sharpies/100 hrs. That's almost good news. However, the decline increased to a loss of 16 Sharpies/100 hrs. in the last 10 years. There is obviously still cause for concern for this species. This year's count of 203 Sharpies/100 hrs. is the same as last year's count and better than only three other years—2019, 2017, and 2016. So, Sharpies are still near bottom.

In the regional distribution discussion above, we found that there were fewer Sharpies along the coast this year. Recall the question: "Could the decline have impacted a population that migrates along the coast to a greater extent than those that migrate inland?"

One way to consider this possibility is to explore changes in the Sharpie numbers from the 1980s to the 2010s, and compare that to the distance

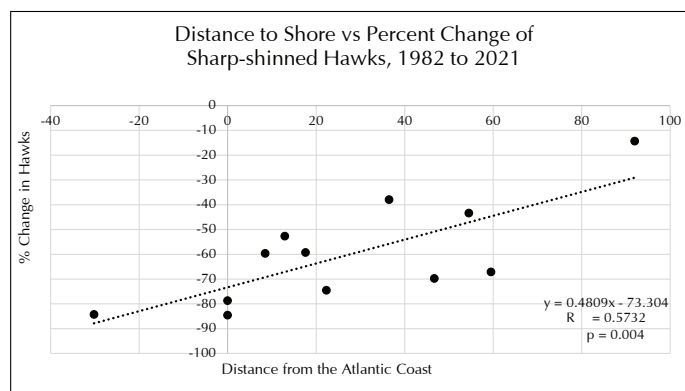
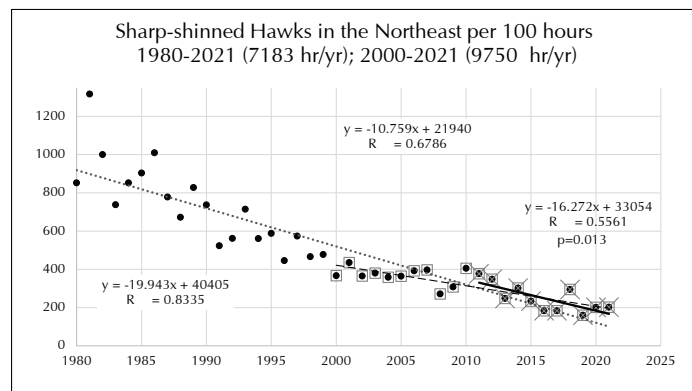
NEHW Site Comparisons: Change in Sharp-shinned Hawks and Distance to the Atlantic Coastline

Site	No. Years 1980s,2010s	DistanceTo Shore (mi)	% Change 1980s>2010s
Fire Island	10,10	-30.2	-84.3
Lighthouse	10,10	0	-78.6
Harpswell	10,8	0	-84.5
Quaker Ridge	10,10	8.5	-59.6
Chestnut Ridge	10,10	12.9	-52.7
Hook Mt.	10,10	17.6	-59.2
Montclair	10,10	22.3	-74.5
Mount Peter	10,10	36.5	-37.9
Wachusett	10,10	46.7	-69.7
Pack Monandack	7,10	54.5	-43.3
Blueberry Hill	10,10	59.5	-67.1
Putney Mt.	8,10	92	-14.3

A negative % change means there was a loss in numbers.

each site is from the Atlantic coast. Not all of our sites had data from the early 1980s, so the 10 years from 1982 to 1991 was selected to include more sites. For each site, data for those 10 years was compared with data from our last 10 years, from 2012 to 2021. We have nine sites with coverage for all the early years. Additionally, there are two sites with at least seven of the first 10 years covered. Since we are looking at averages of Sharpies/100 hrs., seven of 10 years is an acceptable representation of those years. Of the 11 sites with adequate early coverage, all had 10 years of coverage from 2012 to 2021, except Harpswell Peninsula, which closed in 2019.

The distance of each site from the closest part of the Atlantic shoreline was obtained using Google Earth. The table of sites is arranged in order of increasing distance from the coast. Note that Fire Island has a negative distance since it is off the coast, about 30 miles from the closest shoreline. Decades ago, Drew and I watched hawks at Democrat Point on Fire Island to see what the hawks did when they approached the open water at the west end of the barrier island. Merlins flew straight across, but Sharpies circled around repeatedly. Observing Sharpie encounters with gulls, we realized they were avoiding predation by gulls. The Long Island Sound, therefore, is a substantial barrier for Sharp-shinned Hawks. Both Lighthouse Point and Harpswell Peninsula are on the coast, and the distances of our other sites vary nicely, with the largest distance being Putney Mountain, at 92 miles from the coast.



For each site, the percent change in the average Sharpies/100 hrs. from the 1980s to the 2010s was then compared to the distance from the coast, with significant results ($r = 0.757$, $p = 0.004$). The graph looks a bit strange because the percent changes are all negative, and there is a negative distance. Sites near 0, towards the left, are the closest to the coast, and sites further to the right are further inland. Likewise, the sites closer to the bottom of the graph represent the biggest losses of Sharpies, and those closer to the top represent the smallest losses. The graph shows that there really has been a bigger decline of Sharpies along the coast than inland in the NorthEast!

How can that help us now, when the numbers are still so low? First, we can hope for a recovery. And, if that recovery occurs, we might be able to watch it in reverse, spreading from inland out to the coast. I am concerned that bird flu may dampen a recovery soon. But I would like to think that the six Tuesday Sharpies that Drew and I counted at Fire Island in 2021 is a remnant of that hardy population that dared the gulls as they crossed the Sound. I remain hopeful, and look forward to enjoying each very special barrier beach Sharpie that passes overhead next season!

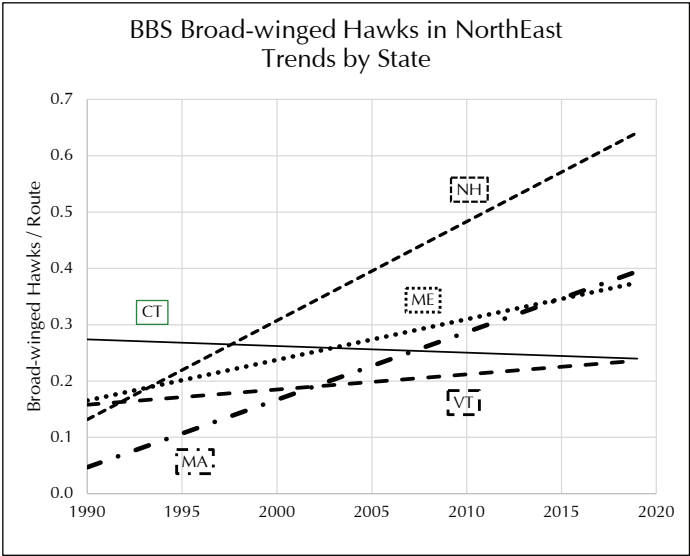
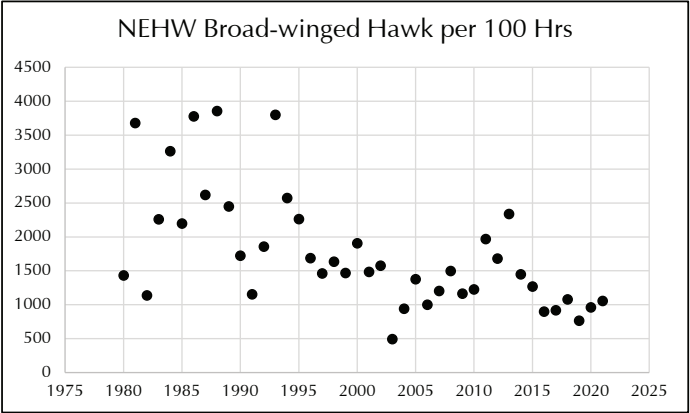
Others Flying Low—Goshawks, Broadwings, and Roughlegs

The other three species that are still flying low, below average, are Northern Goshawk, Broad-winged Hawk, and Rough-legged Hawk. At 0.511/100 hrs. this season, Northern Goshawk has essentially tied the record low of 0.508/100 hrs. in 2019. Similar to Redtails, Goshawks did not have a record low for actual counts. There were three other years with fewer. In the 2020 NEHW Report we concluded that our counts for Goshawk are monitoring residents instead of migrants. With continuing low counts, breeding populations may be in jeopardy.

After a year with no Rough-legged Hawks in 2020, we are pleased to see their return in 2021, with six counted. This is, of course, still below the 10-year average of 11, but a respectable showing for a species that breeds to the north and is most often seen in our region during winter months.

Broad-winged Hawks—migrants declining while breeders increase?

Broad-winged Hawks are once again at low numbers, with this year’s count of 1056/100 hrs. better than only seven other years. The concern is the pattern developing with all of the last six years at low counts. In the 2020 NEHW Report we noted that, although our migrants are declining, the Breeding Bird Survey (BBS) shows increasing numbers in the NorthEast. How can this happen? We know Broadwings winter south of the U.S., so somehow these birds are leaving our region undetected. In 2019 we looked at the distribution of the data and found that more of our hawks migrated to the north and west, resulting in below average counts for our southern-most sites. Exploring how this might be related

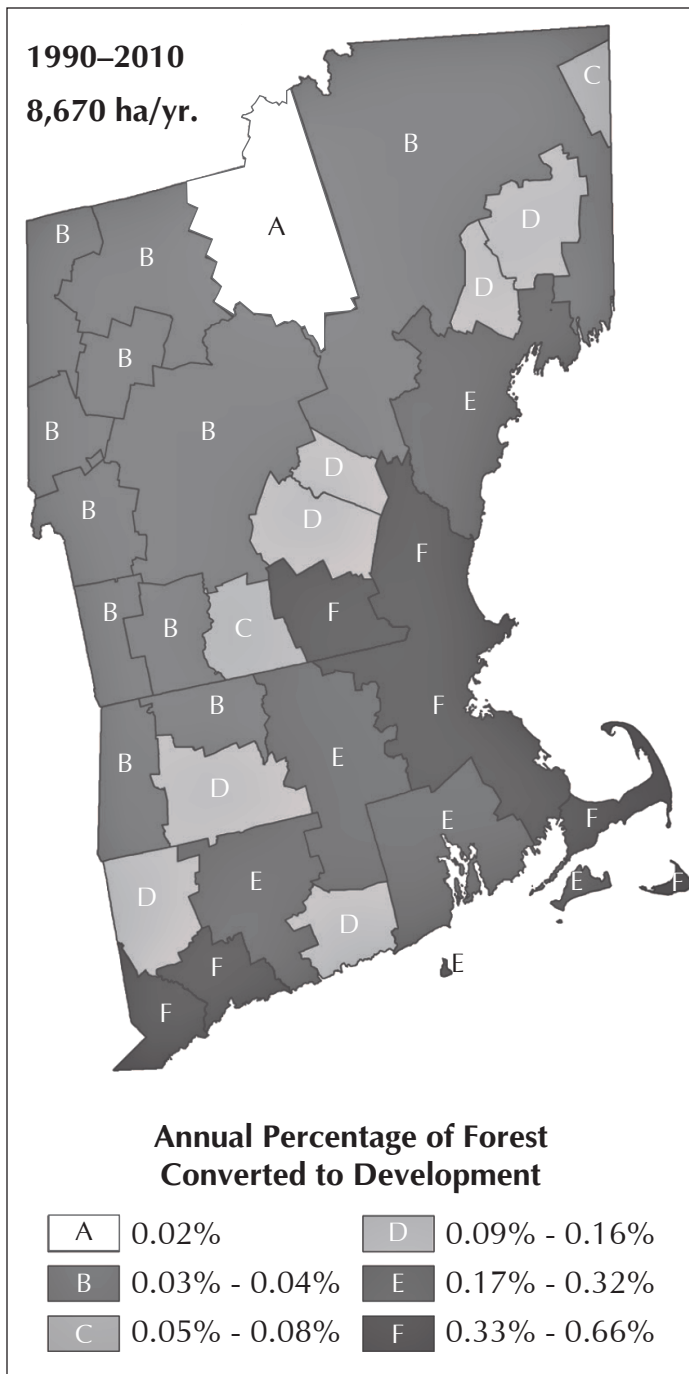


BBS BROADWING TRENDS BY STATE

State/Province	r	p	Trend
Nova Scotia	0.383	0.079	Moderate positive
New Brunswick	0.167	0.524	None
Quebec	0.303	0.196	None
Maine	0.563	0.003	Strong positive
New Hampshire	0.774	0.000	Strong positive
Vermont	0.191	0.461	None
Massachusetts	0.666	0.000	Strong positive
Connecticut	-0.053	0.759	None

to climate change, we found that Broadwings across our regions are negatively correlated to average high temperatures in those regions. As the temperature decreased, from south to north, the Broadwings increased. How does this fit with the BBS increase in breeding Broadwings? If the Broadwings are increasing, why haven’t we just seen more at all our watch sites? An in-depth analysis of BBS Broadwings in each state is revealing. The BBS data covers from 1990 to 2019. To include all five states on the same graph with the least confusion, only the trend lines are shown. In 1990, Connecticut (solid line) had more Broadwings than any of the other states. Maine (dotted) and Vermont (heavy dash) were next, followed closely by New Hampshire (dashed). Massachusetts (dot/dash) had the least Broadwings. In 2019, 30 years later, three states had significant increases: New Hampshire and Massachusetts had the biggest increases, with Maine not far behind. Vermont increased somewhat, and Connecticut declined somewhat. So, the population shifted north, seemingly from Connecticut to Massachusetts, New Hampshire, and Maine. It’s interesting that there is no shift toward Vermont in the west.

Why the shift? Broadwings breed in Northeastern forests. Have the forests changed in ways that would cause the shift? It seems that they have. An article in 2017 by Jonathon R. Thompson, et al, *Forest Loss in New England*, describes how forests have been lost to development. <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0189636#sec009>



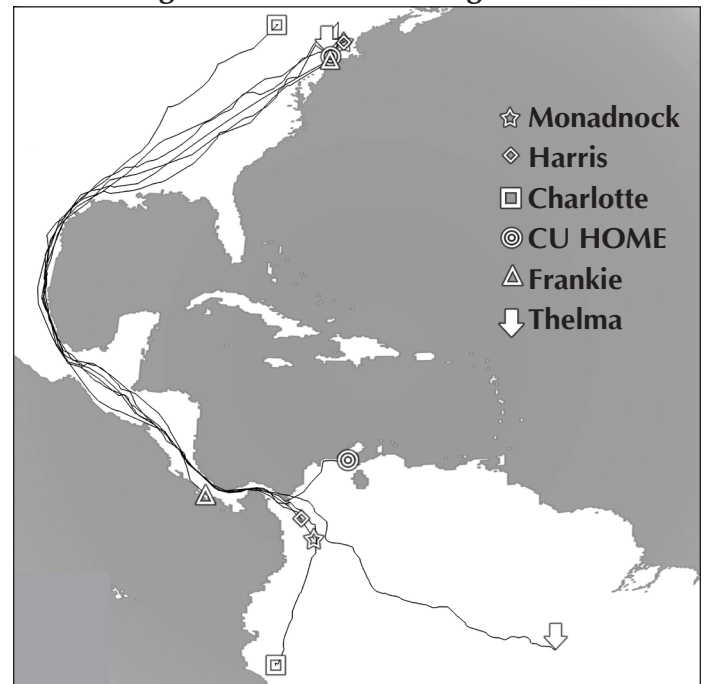
<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0189636>

The loss is greatest along the coast from Cape Cod to southern Maine, and virtually all of Connecticut has lost some forest to development. In contrast, all of Vermont, the northern reaches of New Hampshire, and parts of Maine had little loss to development. So, Broadwings have increased in the same states that lost more forest to the south but still have the least impacted forest available in their north. Vermont, with little change in Broadwings, may be too far from the impacted regions to its south. This fits well with our experiences of more northerly Broadwings. But, if Broadwings migrate south or southwest, we should also get them migrating throughout the NorthEast. Perhaps they follow the forests in migration as well, tending more westerly than southwesterly, thereby passing out of our region rather than through it.

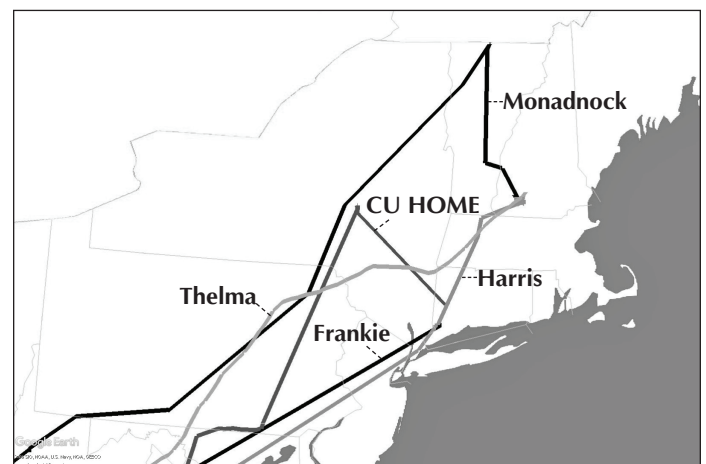
As it happens, NEHW participated in a Broadwing study conducted by Hawk Mountain during the Fall of 2021. We funded some of the telemetry and had Board members directly involved. Under the direction of Dr. Laurie Goodrich and Dr. Rebecca McCabe from Hawk Mountain, Larry Fischer, our NEHW Vice President, and Julie Brown, a Board member, participated in finding and banding five Broadwings from the NorthEast that successfully reached Central and South America. A sixth from Ontario is also included in the first map. See the Hawk Mountain web site for full color images: <https://www.hawkmountain.org/conservation-science/active-research/raptor-conservation-studies/broadwing-movements>

The data from the telemetry is perfectly timed to help us better understand migration of our Broadwings. The full map shows us so much about the flyways and destinations of our birds. But we are most interested in how the birds move through the NorthEast. Did they get counted? Which watch sites did they pass?

Broad-winged Hawk Autumn Migration 2021



On a closer look at the northeastern portion, we can see all five of the Broadwings: Monadnock, Harris, and Thelma from New Hampshire, and CU HOME and Frankie from Connecticut. Frankie's path is difficult to see because Harris traveled almost the same route and overlaps Frankie on the map. Most notable is the diversion northward of Monadnock and CU HOME. A sample of five cannot alone represent a population.



Nevertheless, 40% of these birds traveled north before heading southwest, leaving the western boundary of the NorthEast further north where we have fewer watch sites. Could they be following a preferred forest, perhaps in post-breeding dispersal prior to migration? The other three birds (60%) traveled southwest. Could their route be bounded by the edge of less disturbed forest defined in the Thompson study? So, have we answered our original question—why are migrants declining when breeders are increasing? It definitely seems like the shift to the northern portions of the NorthEast contributes to that. The further north the Broadwings breed, the more likely they will leave the NorthEast north of most of our watch sites. I can easily imagine breeders in the northern portions of Vermont, New Hampshire, and Maine following the southwestern portion of the Monadnock and CU HOME routes. If that is happening, we are missing many more Broadwings now than we did in the 1990s! And, we need more watch sites up north! Of course, we know that wind and thermals contribute to Broadwing migration patterns. So, we can expect Broadwings to continue flying across the whole NorthEast. But we should also expect that concentrations will occur further north than they did in the 1990s. Thank you, Hawk Mountain, thank you Larry and Julie. You are providing much needed information for our understanding of the Broadwing migration here in the NorthEast.

Links: <http://www.battaly.com/nehw/reports/NEHW2020.pdf>
<http://www.battaly.com/nehw/reports/NEHW2019.pdf>
<https://www.pwrc.usgs.gov/BBS/RawData/>
<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0189636>
<https://www.hawkmountain.org/conservation-science/active-research/raptor-conservation-studies/broadwing-movements>

The Specialties—Five Species!

We had five specialties this season—two Mississippi Kites, one Zone-tailed Hawk, four Swainson's Hawks, one Snowy Owl, and one Short-eared Owl! Wow! That's an impressive season.

The two **Mississippi Kites** were both seen on the same day, Sep 19, at Lighthouse Point and at Montclair. Interestingly, it is possible that it was the same bird. It passed Lighthouse before 8 am and Montclair at 3 pm. If it was the same bird, it traveled 74 miles at a bearing of 248.3° in about 7.5 hours. At about 10 mi/hr, that seems quite reasonable for a Kite. On the other hand, we know that Mississippi Kites now breed in small numbers in the NorthEast, so having two different Kites in Fall migration also seems quite reasonable.

One of the rarest of all our specialties, a **Zone-tailed Hawk** was seen at I-84 on Sep 7. This is our first Zone-tailed since Sep 20, 2015 at Lighthouse Point. Neat! Hopefully, there will be more in the future.

Much less rare, we documented four **Swainson's Hawks** this season. Chestnut Ridge had the first on Sep 4. Then, Interlakes School had the second on Sep 16, when they also counted 5800 Broadwings. Lighthouse Point then topped off our Swainson's season with two birds, one on Sep 19, and one as late as Nov 5. It was definitely a good Swainson's season!

Our other two specialties were owls. A **Short-eared Owl** was seen flying over the marsh at Lighthouse Point on Nov 15. A **Snowy Owl** flew along the Fire Island dunes on Nov 23, only to be harassed later by crows. While all our specialties seem like bonuses to the season, for me the late season owls punctuate what's right about hawk watching. We get to enjoy the raptors in the season of each species, and the owls help us end the season with an extra boost, another species and another wonderful experience in the world of raptors.

Watch List—Sharpies and Goshawks Still Low!

The NEHW Watch List is a reminder of the species that are most at risk. A species is added to the List when it has a record low year. The only species with a record low this season is Red-tailed Hawk, which is already on the list. Also, Northern Goshawk tied its record low this season, but it is also already on the list. Thus, there are no new additions to the list.

Species are arranged from lowest to highest according to the Watch List value, WL. A check mark indicates a Record Low and has a value of 1, and the numbers indicate the rank for that season above the record low. WL is simply the sum for that species. The species with the lowest WL values are most at risk of decline.

NEHW Watch List: Declining Species

	2015	2016	2017	2018	2019	2020	2021	WL	Status
Sharp-shinned Hawk	✓	✓	✓	6	✓	4	5	19	M
Northern Goshawk	4	20	✓	4	✓	3	2	35	R
Northern Harrier	4	✓	✓	14	✓	8	11	40	M
American Kestrel	✓	✓	5	15	3	10	10	45	M
Red-tailed Hawk	✓	2	2	9	✓	14	✓	30	xCS
Osprey	3	✓	3	9	2	5	9	32	xFs

Check mark indicates a Record Low year. The numbers indicate the rank above record low when record low = 1. WL = sum of all years. The lowest possible count = number of years. Species with lower WL are at greater risk of continued declines in migration counts. Status: M=migrant, R=resident, x=population not threatened, CS=climate shift, FS=flyway shift

Sharp-shinned Hawk remains the most at-risk species, with a WL of 19, four record low counts in the last seven years, and low rankings in the remaining three years. There is definitely still cause for concern. Our second most at-risk species is Northern Goshawk, with a WL of 35, two record lows, and one record tie. This species is declining in the NorthEast, as it is throughout its range. See p. 28 and 29 of the 2020 NEHW Report for a discussion of the status of Goshawks as residents. Goshawk exchanged places with Northern Harrier, a reverse of last year. Harriers have a WL of 40 and three record lows. This season's rank of 11 suggests less concern, but the species is generally quite variable, so future lower counts can be expected. With somewhat less concern, we continue to watch Harriers.

Next in line is the American Kestrel, with a WL of 45. Since Kestrels were at average this season and last season (2020), and counts in the last three of four years were better than eight to ten other years, we may be approaching a point where we can remove it from the Watch List. For now, it remains. Red-tailed Hawk and Osprey continue with low WLs, but neither population is believed to be in danger. Their low numbers likely reflect changing patterns in migration, as discussed in other Reports.

Bird Flu is an issue of concern for our raptors, especially those on our Watch List. The Center for Disease Control has already documented bird flu in 19 raptor species in the U.S., including six in the NorthEast: Bald Eagle, Cooper's Hawk, Great Horned Owl, Peregrine Falcon, Red-tailed Hawk, and Turkey Vulture. This is likely to add stress to all populations of raptors, especially our declining populations. Your continued counting will help us monitor any impacts in the years to come.

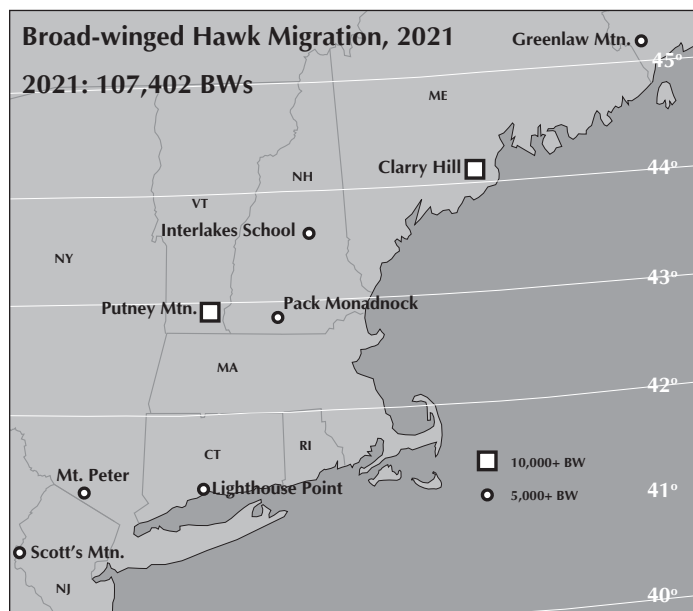
Link: <https://www.cdc.gov/flu/avianflu/data-map-wild-birds.html>

Broadwing Distribution, 2021—When and Where?

We counted 107,402 Broadwings (1056/100 hrs.) this season, about the same as in 2020 (963/100 hrs.). Also similar to last year, we had eight sites with more than 5000 Broadwings. However, this year two of the eight

sites had more than 10,000. This is the first year since 2018 with any site reaching the 10,000 mark, and both sites almost reached 15,000! The two big Broadwing sites were Clarry Hill (14,584) and Putney Mt. (14,668). The other six sites were Greenlaw Mt. (7089), Interlakes School (7212), Pack Monadnock (6055), Mount Peter (6769), Scott's Mountain (7747), and Lighthouse Point (5378).

On the map, this looks like a normal season, with Broadwings across the NorthEast. Yet, it includes two big surprises. Interlakes School only counts on two days and both days had good flights this year, and Lighthouse Point hasn't had a count over 3700 since 1994!

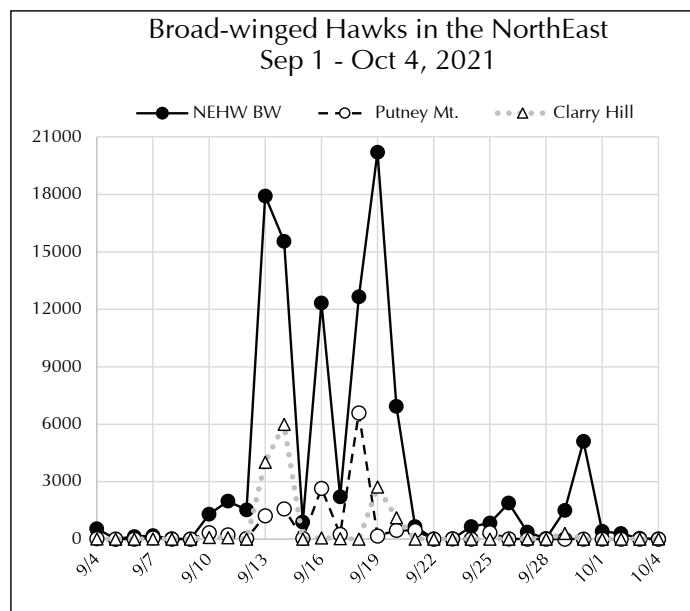


The days of flight also had some surprises. Most of the flight this season was from Sep. 13 to 21, which is quite normal. But, Lighthouse Point had its big day on Sep. 30, with 4996 Broadwings.

The season began on Sep. 10. The wind shifted to the northwest, the rain cleared, and watchers started counting double and triple digit Broadwings. It was our first day with more than 1000 Broadwings across the NorthEast. Two days later on Sep. 12 we had our first 1000 Broadwing day at a single site, way up north at Greenlaw Mt. Then on Sep. 13 we had the first of five big days, with three days above 15,000 Broadwings, and two days above 10,000. Our peak day was 20,205 on Sep. 19, the last of our big days.

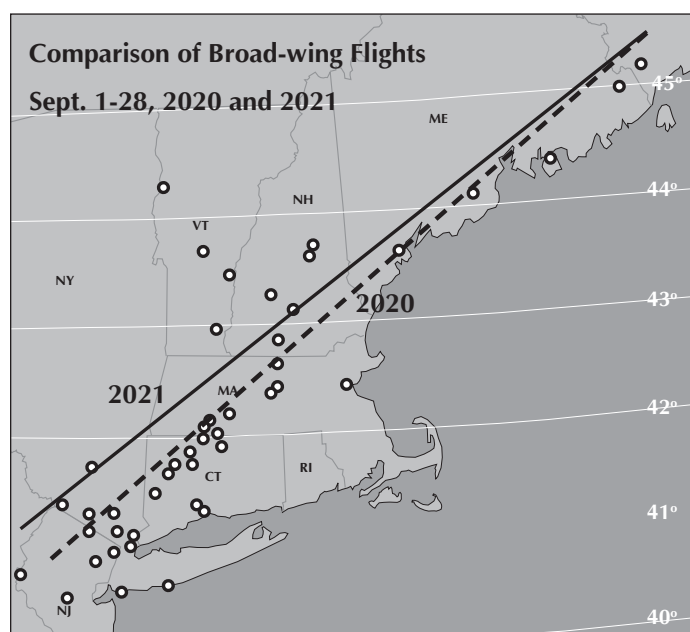
There were 14 sites with at least one day of more than 1000 Broadwings. The highest single site count was 6596 at Putney Mt. on Sep. 18.

Recall that our Regional Distribution Table and bubble graphs showed a different pattern of distribution for Broadwings this season. The Broadwing Flight Period Table (page 26) shows this distribution very well. Each site with more than 1000 Broadwings is shown on the table in bold. Notice how those bold counts are distributed. Until Sep. 18 there was no site south of Wachusett that had 1000 Broadwings! From Sep. 18 onward, there were only six days of 1000 at six sites, and five of those six sites are along our western boundary. Compare this to 2020 when there were 13 days with 1000 Broadwings at 10 sites, three of which are along our western boundary. This season had Broadwings concentrated up north and to the west, different from last season when they were distributed throughout the NorthEast. Another way to visualize this difference is with trends generated by plotting the sites with 5000 and more Broadwings. Remembering that trend lines only show a general midline for each distribution, we can see that more Broadwings flew over more hawk watch sites in 2020 than in 2021 simply because they flew further south



in 2020. The distribution this season was what has become the 'expected alternative', a greater concentration further north.

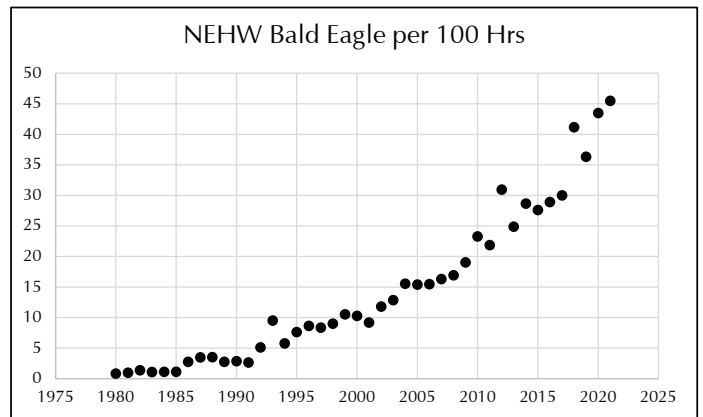
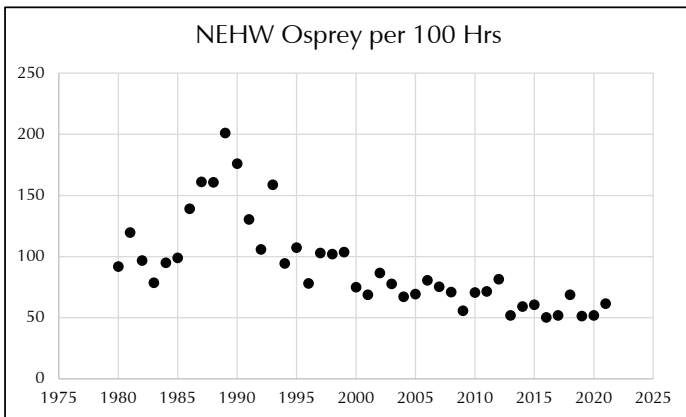
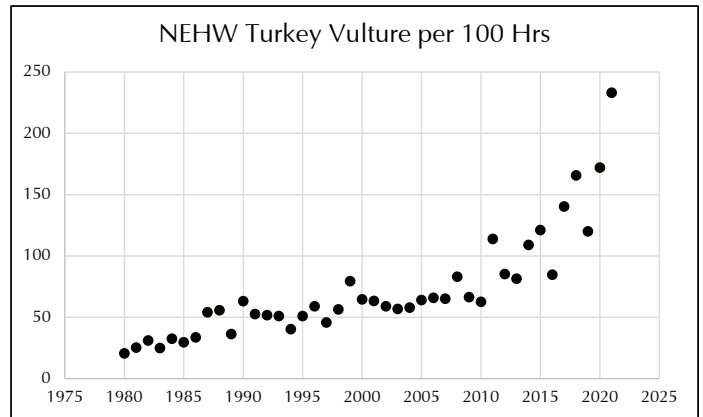
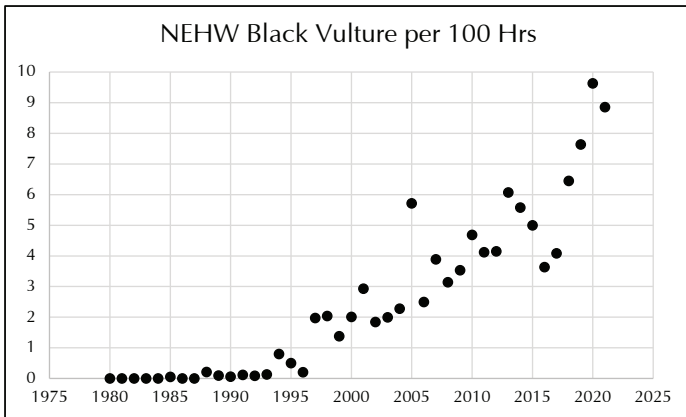
This year's big surprise came late in the season at Lighthouse Point, on Sep. 30. From Sep. 20 to Sep. 28 weather conditions were poor, with south winds and rain, and there was little Broadwing activity. On Sep. 29 there were north winds, and five sites had triple digits. Only two were north/northeast of Lighthouse—Clarry Hill with 301 and Wachusett with 536. This was a hint of what was to come the next day at Lighthouse. While we have no hawk watch sites north of Lighthouse to help us understand how the 4996 Broadwings made their way to the coast on Sep. 30, there were reports from other locations along the coast. There were double and triple digit Broadwings in places along the Connecticut shoreline, as documented on ebird.org, including 234 at Milford CT and 189 at East River Preserve. Further west, there were 209 seen at Randall's Island, and 1200 at Belvedere Castle in Central Park. Just as we experience the phenomenon of Broadwing kettles in wonder, this was an opportunity for city dwellers to appreciate.



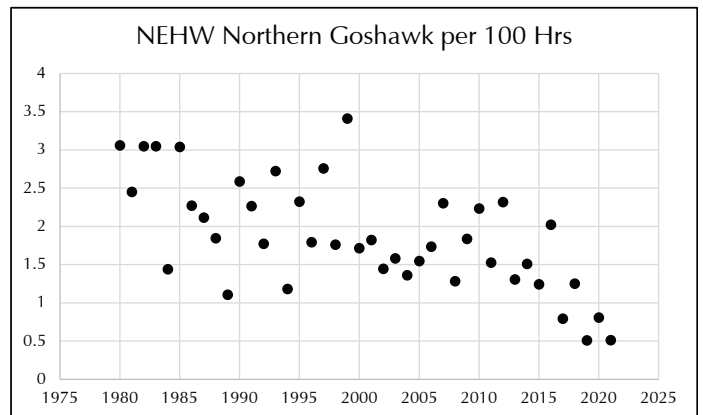
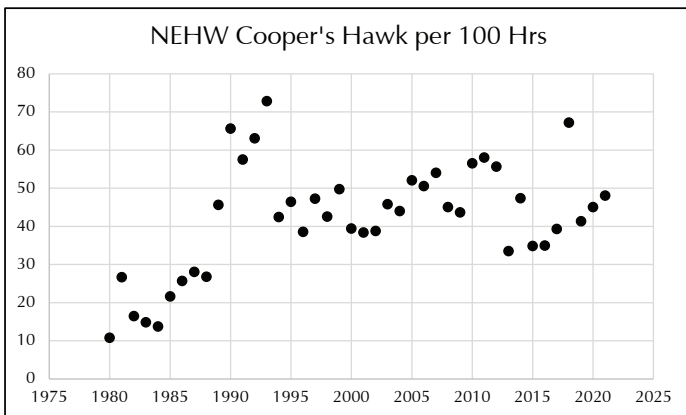
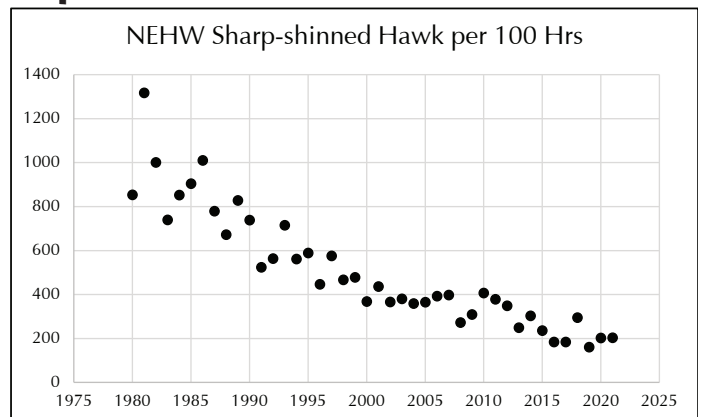
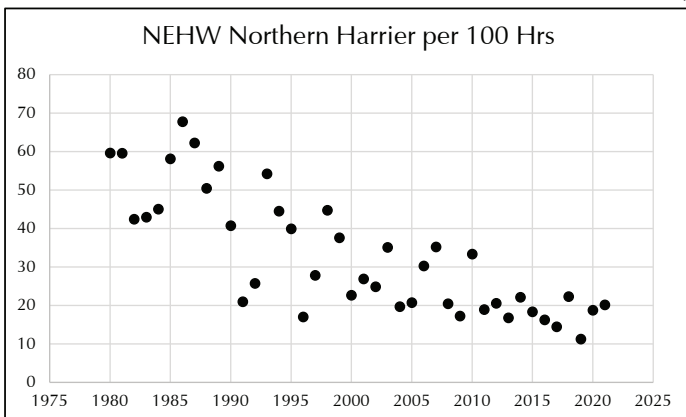
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NorthEast Hawk Watch Fall Migration Trends, 1980–2021

Vultures, Osprey, Bald Eagle

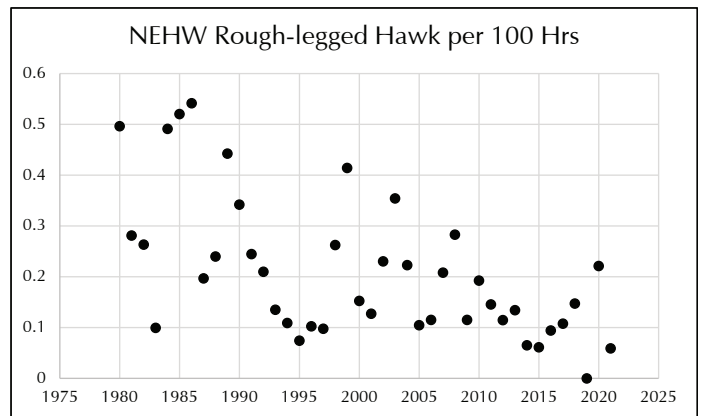
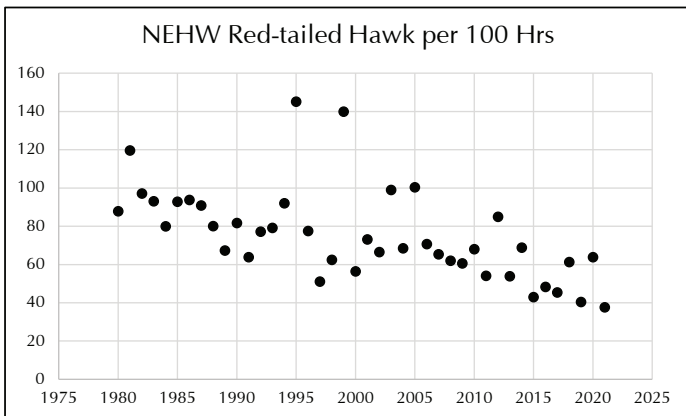
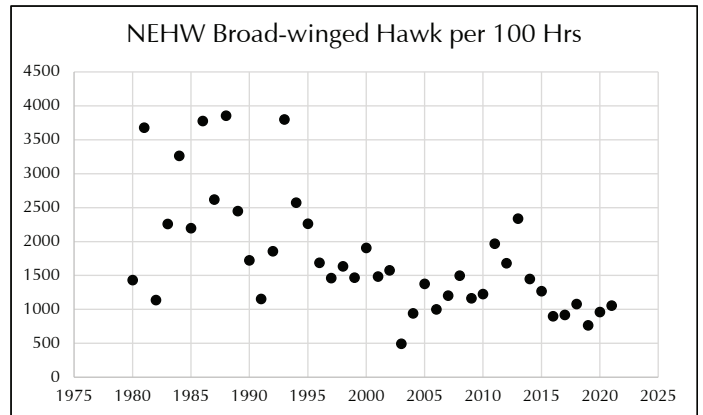
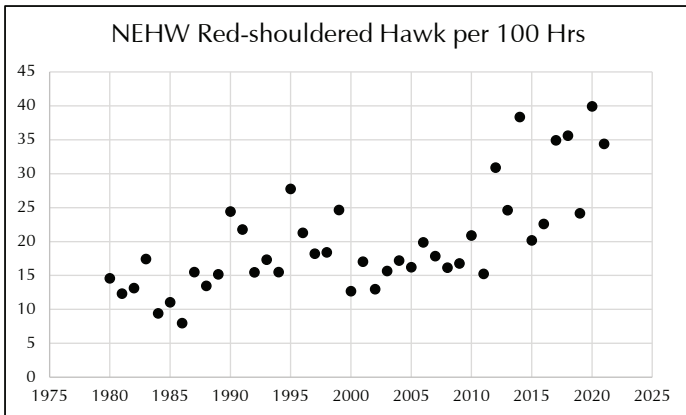


Harrier, Accipiters

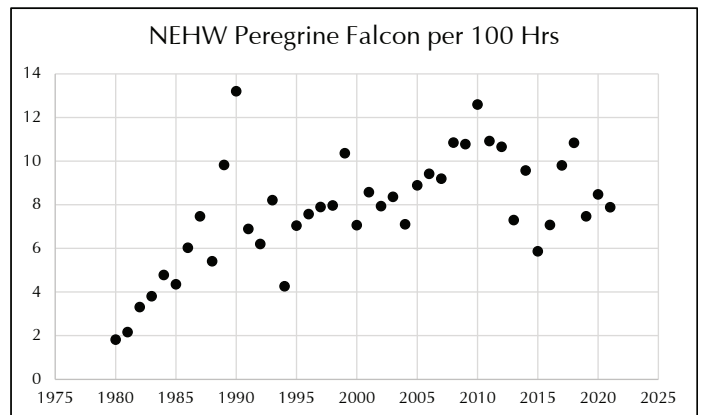
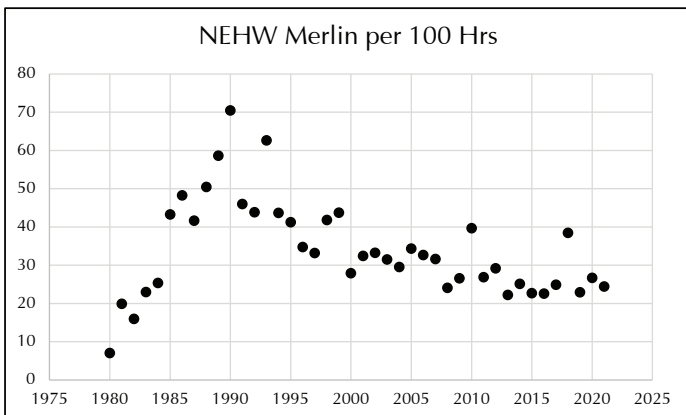
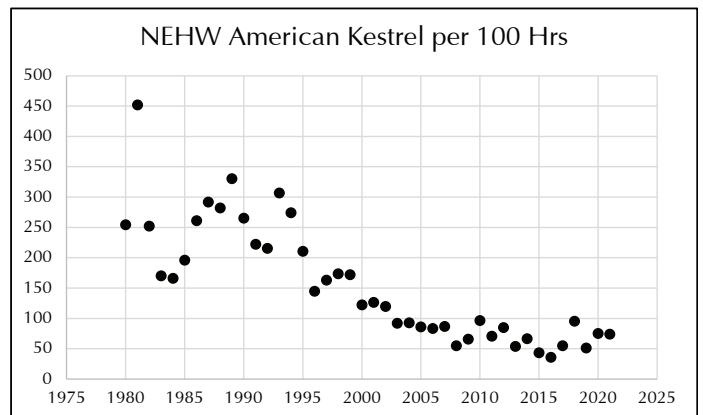
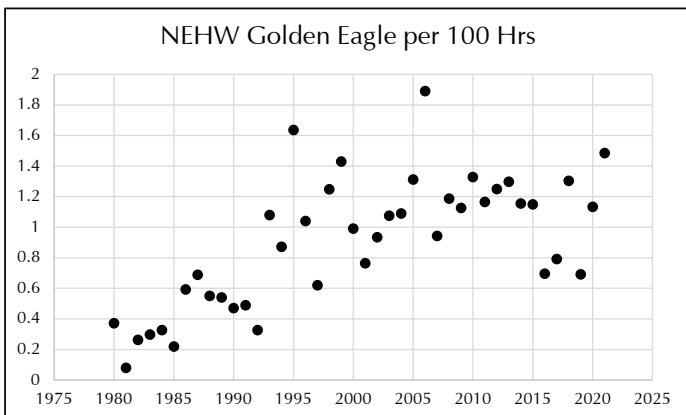


NorthEast Hawk Watch Fall Migration Trends, 1980–2021

Buteos



Golden Eagle, Falcons



Notes from ebird.org include:

At Randall's Island: "Awe-inspiring kettles of Broad-winged Hawks flying south. I did my best to count."

Dmitriy Aronov

At Belvedere Castle: "Flock migrating south westerly one group 92, single individuals, [anot]her group of 26. Another 64+ 38 more + 15 + 32 + 27 + 10—

400 total + 135 + 28—I lost count but this was with Linnaean."

Kristin Ellington

Whether our Broadwings come along concentrated flyways or spread out across our landscape, we continue to wonder at their spectacular flights. And, we can't wait to count again next season! See you on the mountain! . . . and along the shore!

Broad-winged Hawk Comparative Counts during Flight Period, Fall 2021

September		10	11	12	13	14	15	16	17	18	19	20	21	22,23	24	25	26	27,28	29	30	10/1
Winds,Manchester,NH		NW	WSW	W	NW	N>S	S	S>ENE	NE	NNW	N>S	S>N	S	S,SE	SE	S>N	NW	SSW	NNW	NNW	
45	Greenlaw	115		1306	4930		508			127	17						1	18	1	1	1
44	Cadillac Mt.				30	201		12			58	8							3	2	
	Mt. Philo	9	31		45	636		2444			147										
	Clarry Hill	86	77		4023	5992		71	32		2722	1122					5	23	301	3	
43	Interlakes							5802	1410												
	Concord School				6	24			90												
	Putney Mt.	334	232	45	1229	1581	47	2657	258	6596	166	468	450	15	5	342	16	6	1		
42	Pack Monadnock	70	355	11	953	1636		5		477	1240	1006	12	4		40	53	2	8	2	
	Mount Watatic	67	173	55	932	1059		40		530	1124	708	18			33	9				
	Helderberg	107	79	17	805	216	247	649	333	417	75	1									
	Wachusett	68	59	3	1902	344	2	7		184	1049	58	8			6	30	1	536	3	9
	Barre Falls		13		26	137	4			50	16	7	3			4					
	Shatterack	6	14	4	144	572	4	1		292	66	70									
	Blueberry Hill		46		573	64				108	106	12				28	5		19	2	
	Booth Hill				82					130											
41	Poquonock					63		1		7	6	8							14	1	
	Mohonk	6			6	467		270		222		372	82			105		5			
	Chestnut Hill	28			942	113	7	120		706	416	10	1								
	Botsford Hill	2	9	5	47	172	37			47	197	99	7			1	22				
	I-84			2	319	139				1052	41	65					25		10		
	Bear Mountain	3		3	4	154	3	35	3		416	34	29	4				10			
	Mount Peter	102	178	36	358	612	15	153	2	30	3888	991	12		48	57	157	23	23	1	
	Chestnut Ridge	36	296	4	110	277	5	8	1	263	781	45	8	2		12	48	176	108	4	12
	Hook Mountain	9	74		31	335		2	1	47	101	289	7		2	2	28	19	1	12	2
	Quaker Ridge	68	81	1	81	37	1			234	634	9	3		1	2	72	81	93	19	17
	Purple Chickadee	19	5	1	50	22		14		21	1337	54			1	34	91	20	16	4	1
40	State Line	3	79	2	9	18	1	13		112	249	23	3	1	2	2	34	4	48	19	75
	Lenoir		8	1						4	79	58				1					
	Wildcat Ridge	16	52	2		7	2	16		16	1225	445			5	52	10		26		
	Montclair	38	3		52	9				23	170	9	3	1	3	3	315	4	103	24	43
	Scott's Mt.	44	103	34	142	584	13	9	82	875	3761	961	13	5	584	112	259	10	10		2
	Washington Valley	43								81	85		1		2		683		135	14	14
CO	Lighthouse Point								1	2	31				6	1			47	4996	236
	TOTAL	1302	1984	1533	17916	15547	896	12329	2213	12655	20205	6932	660	32	653	842	1887	402	1504	5109	412
Winds, Bradley CT		NW	SW	W	NW	SE	S	NNE	N	NNE	N	NE	SSE	SE-r	SW-R	V/VNW	S,SW-r	NNENNW			

Rain: Sep 1, 5, 9, 22, 23, 24, 28

Peak Daily Site Counts—Fall 2021

BROAD-WINGED HAWK			RED-SHOULDERED HAWK			SHARP-SHINNED HAWK			AMERICAN KESTREL			OSPREY								
Putney Mt.	9/18	6596	Montclair	11/4	68	Pack Monadnock	9/28	237	Lighthouse Point	9/29	272	Fort Tilden	9/10	208						
Clarry Hill	9/14	5992	Quaker Ridge	11/4	68	Chestnut Ridge	10/19	217	Fort Tilden	9/26	255	Fort Tilden	9/3	182						
Interlakes Scool	9/16	5802	State Line	11/5	63	Chestnut Ridge	9/26	202	Fire Island	9/30	210	Lighthouse Point	9/18	109						
Lighthouse Point	9/30	4996	I-84	10/27	56	Chestnut Ridge	9/30	202	Fire Island	9/29	198	Lighthouse Point	9/17	107						
Greenlaw	9/13	4930	Pack Monadnock	10/23	54	Chestnut Ridge	9/29	190	Fire Island	9/19	175	Lighthouse Point	9/19	81						
Clarry Hill	9/13	4023	Quaker Ridge	11/5	51	Hook Mountain	10/1	182	Cadillac Mt.	9/19	160	Lighthouse Point	9/3	78						
Mount Peter	9/19	3888	Hook Mountain	10/28	45	Lighthouse Point	9/30	177	Lighthouse Point	9/30	139	Fire Island	9/10	73						
Scott's Mt.	9/19	3761	Quaker Ridge	11/3	42	Hook Mountain	9/30	173	Lighthouse Point	9/26	132	Fort Tilden	9/19	72						
Clarry Hill	9/19	2722	Quaker Ridge	11/24	41	Hook Mountain	10/8	165	Lighthouse Point	9/19	117	Fire Island	9/19	70						
Putney Mt.	9/16	2657	Quaker Ridge	10/28	40	Scott's Mt.	10/9	164	Fort Tilden	9/19	110	Lighthouse Point	9/26	67						
Mt. Philo	9/16	2444	Chestnut Ridge	10/24	39	State Line	10/19	146	Lighthouse Point	9/13	105	Lighthouse Point	9/13	65						
Wachusett	9/13	1902	Chestnut Ridge	10/29	39	Chestnut Ridge	10/20	145	Fort Tilden	9/30	100	Lighthouse Point	9/25	64						
Pack Monadnock	9/14	1636	Hook Mountain	11/1	38	Cadillac Mt.	9/14	137	Fort Tilden	9/29	91	Lighthouse Point	9/29	62						
Putney Mt.	9/14	1581	Hook Mountain	11/6	38	Quaker Ridge	9/29	119	Cadillac Mt.	9/13	84	Fort Tilden	9/26	53						
Interlakes Elementary	9/17	1410	Quaker Ridge	11/29	37	Chestnut Ridge	10/18	118	Lighthouse Point	9/10	80	Lighthouse Point	9/30	51						
Purple Chickadee	9/19	1337	Chestnut Ridge	11/24	36	State Line	9/30	117	State Line	10/8	70	NORTHERN HARRIER								
Greenlaw	9/12	1306	State Line	10/28	35	State Line	10/8	114	Fire Island	10/1	68									
Pack Monadnock	9/19	1240	Chestnut Ridge	10/28	34	Quaker Ridge	9/26	112	Fort Tilden	10/18	67				Fort Tilden	10/19	35			
Putney Mt.	9/13	1229	Chestnut Ridge	11/5	34	Chestnut Ridge	9/27	111	Fire Island	9/26	64				Lighthouse Point	10/19	33			
Wildcat Ridge	9/19	1225	Montclair	11/3	34	Quaker Ridge	9/30	109	Chestnut Ridge	9/19	63	Fire Island	9/30	29						
Mount Watatic	9/19	1124	GOLDEN EAGLE			Lighthouse Point	10/18	109	Cadillac Mt.	9/14	60	Fire Island	9/19	26						
Clarry Hill	9/20	1122				Pack Monadnock	9/19	105	MERLIN			Chestnut Ridge	10/20	22						
Mount Watatic	9/14	1059				Hook Mountain	9/20	105				Fire Island	10/1	21						
I-84	9/18	1052				Chestnut Ridge	11/4	8				Mohonk Preserve	10/7	104	Fire Island	9/26	93	Lighthouse Point	9/29	18
Wachusett	9/19	1049	Hook Mountain	11/4	7	Chestnut Ridge	10/2	102	Fire Island	9/29	75	Lighthouse Point	9/30	17						
Pack Monadnock	9/20	1006	I-84	11/1	4	Chestnut Ridge	10/8	101	Fire Island	10/18	63	Chestnut Ridge	10/19	16						
Mount Peter	9/20	991	I-84	11/15	3	Cadillac Mt.	9/19	100	Fort Tilden	10/18	62	Fort Tilden	10/20	15						
Scott's Mt.	9/20	961	Purple Chickadee	11/3	3	COOPER'S HAWK			Fire Island	10/17	60	Clarry Hill	9/16	14						
Pack Monadnock	9/13	953	Cooper	10/19	2				Fire Island	9/19	55	Fire Island	9/19	55	Fire Island	9/29	14			
Chestnut Hill	9/13	942	Pack Monadnock	11/3	2				Lighthouse Point	9/30	127	Fire Island	9/10	48	TURKEY VULTURE					
Mount Watatic	9/13	932	Scott's Mt.	11/1	2				Lighthouse Point	10/27	79	Lighthouse Point	9/29	42						
Scott's Mt.	9/18	875	Quaker Ridge	11/3	2	Lighthouse Point	9/29	64	Fort Tilden	10/19	38	Mount Peter	10/23	853						
Helderberg	9/13	805	16 more days with 2 GE			Lighthouse Point	10/23	58	Fire Island	10/19	38	Washington Valley	10/24	417						
Chestnut Ridge	9/19	781	BALD EAGLE			Hook Mountain	10/8	50	Fire Island	10/6	37	Clarry Hill	10/23	395						
Mount Watatic	9/20	708				Quaker Ridge	10/6	48	Fire Island	10/14	36	Clarry Hill	10/6	372						
RED-TAILED HAWK						Lighthouse Point	10/11	46	Fire Island	10/23	32	State Line	10/24	345						
						Clarry Hill	11/20	39	Fire Island	9/27	32	Lenoir	10/7	339						
			Putney Mt.	10/28	125	Mt. Philo	9/16	33	Fire Island	10/5	30	Chestnut Ridge	10/23	339						
			Greenlaw	10/25	60	Scott's Mt.	11/1	29	Lighthouse Point	9/10	28	Montclair	10/19	337						
I-84	11/1	58	Clarry Hill	10/24	29	Lighthouse Point	10/19	41	Fire Island	10/11	27	State Line	10/21	334						
Putney Mt.	10/29	53	Mount Watatic	9/19	28	Lighthouse Point	10/18	40	Fort Tilden	9/10	23	Montclair	10/24	330						
I-84	11/23	48	Quaker Ridge	9/19	27	Quaker Ridge	10/7	39	Fort Tilden	9/26	22	State Line	10/19	285						
Putney Mt.	10/24	40	Clarry Hill	9/14	27	Chestnut Ridge	10/19	39	Fire Island	10/1	21	Hook Mountain	10/23	281						
Lighthouse Point	11/8	39	Cadillac Mt.	9/14	25	State Line	10/8	39	PEREGRINE FALCON			Blueberry Hill	10/23	268						
Clarry Hill	11/5	38	Lenoir	10/17	25	Lighthouse Point	10/5	38				BLACK VULTURE								
Clarry Hill	10/28	37	Cadillac Mt.	9/3	25	NORTHERN GOSHAWK									Lighthouse Point	9/29	19			
Putney Mt.	10/23	36	Clarry Hill	11/8	24				Lighthouse Point	9/30	11	Helderberg	9/14	47						
Scott's Mt.	11/1	36	Wachusett	9/19	24				Cadillac Mt.	9/29	2	Lighthouse Point	10/5	10	Washington Valley	9/24	40			
Clarry Hill	10/24	35	Greenlaw	9/10	24				Clarry Hill	10/4	2	Fire Island	10/14	8	Washington Valley	10/18	40			
Pack Monadnock	10/23	32	Clarry Hill	11/5	23	Greenlaw	10/5	2	Lighthouse Point	10/19	8	Hook Mountain	10/22	35						
I-84	10/27	32	Interlakes School	9/16	20	Greenlaw	10/19	2	Montclair	9/23	8	I-84	11/10	26						
Clarry Hill	10/29	31	ZONE-TAILED HAWK			44 days with 1 NG			1	Fire Island	9/26	7	Hook Mountain	11/2	24					
Putney Mt.	11/5	31				ROUGH-LEGGED HAWK						Fire Island	10/28	7	State Line	10/22	21			
Pack Monadnock	10/29	30										Pack Monadnock	9/26	7	Hook Mountain	10/28	21			
SWAINSON'S HAWK												State Line	10/16	7	Hook Mountain	10/31	21			
												Chestnut Ridge	10/8	6	I-84	10/27	19			
Chestnut Ridge	9/4	1	SNOWY OWL			Washington Valley	10/17	1	Putney Mt.	9/30	6	MISSISSIPPI KITE								
Interlakes Scool	9/16	1				Fire Island	11/3	1	Pack Monadnock	10/23	1				Fire Island	10/18	6			
Lighthouse Point	9/19	1				SHORT-EARED OWL			Wachusett	10/28	1				Lighthouse Point	11/6	6			
Lighthouse Point	11/5	1							Lighthouse Point	11/5	1				Blueberry Hill	11/3	1	Putney Mt.	9/30	6
Lighthouse Point						Clarry Hill	11/20	1	State Line	10/12	6	Lighthouse Point	9/19	1						
												Montclair	9/19	1						

OS	BE	NH	SS	CH	NG	RS	BW	RT	RL	GE
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[illegible]

TV	OS	BE	NH	SS	CH	NG	RS	BW	RT	RL	GE	AK	MI
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Mount Watatic Fall 2021 - Ashby, Massachusetts																			
Date	HRS	BV	TV	OS	BE	NH	SS	CH	NG	RS	BW	RT	RL	GE	AK	ML	PG	UR	TOTAL
9/4	6.0	0	0	0	8	0	1	1	0	0	42	0	0	0	0	0	0	3	55
9/10	7.0	0	0	0	3	1	5	0	0	0	67	0	0	0	0	0	0	1	77
9/11	7.5	0	0	2	7	0	2	1	0	1	173	0	0	0	0	1	0	2	189
9/12	6.0	0	0	3	6	0	2	1	0	0	55	0	0	0	0	0	1	4	72
9/13	8.0	0	0	2	11	3	3	5	0	0	932	1	0	0	2	7	0	0	966
9/14	6.5	1	0	8	12	1	15	6	0	2	1059	0	0	0	4	7	0	6	1121
9/15	6.0	0	0	9	3	2	1	0	0	0	0	0	0	0	1	2	1	0	19
9/16	4.5	0	0	1	9	1	7	5	0	0	40	0	0	0	1	2	0	1	67
9/17	6.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9/18	8.5	0	0	2	10	4	30	11	0	0	530	1	0	0	16	1	0	2	607
9/19	9.5	0	3	5	28	5	21	8	0	0	1124	0	0	0	28	6	2	5	1235
9/20	7.0	1	2	5	9	2	32	4	0	0	708	2	0	0	6	1	1	3	776
9/21	6.0	0	1	2	6	0	15	5	0	2	18	0	0	0	3	1	1	2	56
9/25	7.5	0	0	4	13	1	5	8	0	0	33	0	0	0	7	2	0	4	77
9/26	6.0	0	7	0	4	0	19	2	0	0	9	0	0	0	4	0	0	3	48
10/2	6.0	0	1	1	2	0	8	2	0	0	0	0	0	0	0	1	0	1	16
10/11	6.0	0	23	0	2	0	13	7	0	0	0	0	0	0	4	2	0	0	51
11/5	6.0	0	11	0	4	0	2	3	0	7	0	13	0	1	0	0	0	0	34
18	120.5	2	48	44	137	20	181	69	0	12	4790	17	0	1	76	33	6	40	5476

TV	OS	BE	NH	SS	CH	NG	RS	BW	RT	RL	GE	AK	ML
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Date	HRS	BV	TV	OS	BE	NH	SS	CH	NG	RS	BW	RT	RL	GE	AK	ML	PC	UR	TOTAL
8/20	4.5	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8/21	5.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8/24	6.0	0	0	3	0	0	2	0	0	0	4	1	0	0	0	0	0	0	10
8/25	7.3	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
8/27	5.8	0	0	0	0	0	0	0	0	0	17	0	0	0	0	0	0	0	17
8/28	5.8	0	0	5	0	0	0	1	0	0	2	0	0	0	0	0	0	3	11
8/30	2.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8/31	5.8	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2
9/2	6.8	0	0	2	6	2	1	1	0	0	14	0	0	0	2	1	0	1	30
9/3	6.3	0	0	2	10	0	4	3	0	0	56	0	0	0	2	0	0	1	78
9/4	8.5	0	0	6	3	1	0	2	0	0	43	1	0	0	0	0	0	0	56
9/5	1.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9/6	7.0	0	0	12	7	0	0	0	0	0	33	0	0	0	1	0	0	2	55
9/7	7.0	0	0	2	4	0	0	1	0	1	10	0	0	0	2	0	0	1	21
9/8	6.0	0	0	0	0	0	2	0	0	0	6	0	0	0	1	0	2	0	11

Continued on next page...

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Wachusett Fall 2021 - Princeton, Massachusetts

Date	HRS	BV	TV	OS	BE	NH	SS	CH	NG	RS	BW	RT	RL	GE	AK	ML	PG	UR	TOTAL
9/10	6.8	0	0	2	14	1	4	1	0	0	68	2	0	0	6	7	0	9	114
9/11	6.8	0	0	13	1	0	2	0	0	0	59	2	0	0	0	1	0	2	80
9/12	5.0	0	0	0	0	0	1	0	0	0	3	0	0	0	0	0	0	0	4
9/13	7.8	0	0	3	14	1	12	2	0	0	1902	3	0	0	10	1	2	1	1951
9/14	6.0	0	0	10	0	0	2	3	0	0	344	2	0	0	7	5	1	1	375
9/15	5.8	0	0	2	4	0	0	0	0	0	2	1	0	0	0	1	0	2	12
9/16	4.5	0	0	12	6	2	3	2	0	0	7	1	0	0	5	1	1	4	44
9/17	4.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9/18	8.0	0	0	14	17	2	14	9	0	1	184	15	0	0	32	5	4	12	309
9/19	11.3	0	0	9	24	6	31	13	0	3	1049	7	0	0	19	8	0	17	1186
9/20	7.0	0	0	13	12	0	45	10	0	0	58	2	0	0	8	4	0	14	166
9/21	7.0	0	1	8	4	0	2	2	0	1	8	0	0	0	2	0	0	1	29
9/22	3.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9/23	4.0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1	0	0	3
9/25	7.0	0	0	4	4	0	0	4	0	0	6	4	0	0	2	1	1	3	29
9/26	7.0	0	0	5	5	2	23	1	0	0	30	3	0	0	8	2	0	11	90
9/27	8.0	0	0	2	1	0	5	1	0	0	1	0	0	0	1	0	0	2	13
9/28	4.8	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
9/29	7.0	0	13	9	8	1	55	13	0	2	536	2	0	0	30	3	1	15	688
9/30	6.0	0	12	1	3	0	17	3	0	0	3	0	0	0	6	2	1	5	53
10/1	6.8	0	8	2	4	2	21	9	0	0	9	3	0	0	8	1	1	6	74
10/2	4.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
10/3	4.8	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
10/6	7.5	0	122	6	2	2	35	25	0	0	2	4	0	0	8	5	2	8	221
10/7	7.0	0	54	9	8	1	12	2	0	0	0	0	0	0	7	4	2	9	108
10/8	7.0	0	49	1	3	1	16	6	0	0	1	4	0	0	4	2	0	4	91
10/9	6.8	0	7	1	1	0	7	0	0	0	0	0	0	0	1	0	0	3	20
10/10	5.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10/11	7.0	0	25	0	1	0	2	0	0	0	0	1	0	0	1	0	0	2	32
10/12	7.0	0	2	0	8	0	6	10	0	1	0	4	0	0	0	3	0	0	34
10/13	7.0	0	34	2	0	0	3	1	0	0	1	0	0	0	1	0	0	1	43
10/14	7.0	0	129	1	2	1	15	2	0	1	0	11	0	0	3	1	4	8	178
10/15	6.8	0	50	1	3	0	1	1	0	0	0	0	0	0	1	0	0	2	59
10/16	4.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10/17	5.8	0	7	0	4	0	3	2	0	0	0	3	0	0	3	1	0	1	24
10/18	6.0	0	4	0	12	0	4	3	0	1	0	0	0	0	3	0	0	3	30
10/19	5.5	0	1	0	1	1	0	0	0	0	0	0	0	0	1	0	0	4	8
10/20	6.8	0	15	0	0	1	4	3	0	0	0	0	0	1	0	0	0	2	26
10/21	4.0	0	37	0	0	0	1	0	0	0	0	2	0	0	0	0	0	1	41
10/22	6.8	0	27	3	2	0	2	1	0	0	0	2	0	0	1	0	1	1	40
10/23	6.8	0	82	2	6	0	5	3	0	2	0	3	0	0	1	0	1	6	111
10/24	6.8	0	38	1	5	0	18	4	0	10	0	17	0	0	3	0	1	11	108
10/28	7.8	0	166	0	6	0	11	8	0	8	0	23	1	1	0	0	0	5	229
10/29	7.3	0	31	0	0	1	5	3	0	12	0	8	0	1	2	1	0	5	69
10/31	7.0	0	6	0	0	0	0	0	0	1	0	4	0	0	0	0	0	0	11
11/1	6.0	0	0	0	4	0	1	1	0	1	0	4	0	0	0	0	0	0	11
11/3	6.0	0	3	0	3	0	2	1	0	2	0	3	0	0	0	0	0	5	19
11/4	7.0	0	10	0	2	0	4	4	0	2	0	11	0	0	0	0	0	2	35
11/5	5.3	0	4	0	0	0	1	1	0	2	0	6	0	0	0	0	0	4	18
11/6	6.3	0	7	0	0	0	0	3	0	0	0	10	0	0	0	0	0	10	30
11/8	6.0	0	0	0	1	0	0	0	0	1	0	4	0	0	0	0	0	0	6
11/10	5.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
11/11	2.0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
11/13	4.8	0	3	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	4
11/20	1.3	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	1	3
11/25	4.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12/5	4.3	0	0	0	5	0	1	0	0	2	0	0	0	1	0	0	0	0	9
12/14	4.0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	3
73	434.8	0	948	170	232	28	406	166	0	57	4458	174	1	5	193	63	25	213	7139

Pinnacle Rock Fall 2021 - Medford, Massachusetts

Date	HRS	BV	TV	OS	BE	NH	SS	CH	NG	RS	BW	RT	RL	GE	AK	ML	PG	UR	TOTAL
8/31	7.5	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
9/2	4.5	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	1	4
9/3	7.0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	2	4
9/4	5.8	0	0	2	0	0	1	0	0	0	6	0	0	0	0	1	0	2	12
9/5	1.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9/6	6.8	0	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	3
9/7	9.3	0	0	5	0	3	0	0	0	0	0	0	0	0	0	0	0	0	8
9/8	10.0	0	0	9	0	1	0	0	0	1	0	0	0	0	0	0	0	1	12
9/10	9.3	0	0	2	2	0	0	0	0	0	0	0	0	0	0	1	0	0	5
9/11	8.5	0	0	5	0	0	1	1	0	0	0	0	0	0	0	0	1	0	8
9/13	5.0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
9/15	8.5	0	0	3	0	2	2	1	0	0	0	0	0	0	0	0	0	0	8
9/19	6.3	0	0	2	1	0	0	3	0	0	0	0	0	0	0	0	0	0	6
9/26	8.5	0	0	1	0	0	7	1	0	0	0	0	0	0	4	2	0	1	16
9/27	3.8	0	0	1	1	0	1	1	0	0	0	0	0	0	0	0	0	1	5
9/29	9.0	0	0	1	0	0	4	1	0	0	0	0	0	0	0	0	0	2	8
9/30	6.8	0	0	2	1	1	2	1	0	0	0	0	0	0	0	0	0	0	7
10/1	7.0	0	0	2	0	1	5	2	0	0	0	0	0	0	0	0	0	1	11
10/2	9.0	0	0	5	1	0	2	2	0	0	0	0	0	0	0	0	0	1	11
10/7	6.0	0	0	0	1	0	2	0	0	0	0	0	0	0	0	1	0	0	4
10/14	4.0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	1	1	0	4
10/17	7.0	0	12	3	3	1	12	7	0	3	0	1	0	0	5	0	2	3	52
10/18	3.0	0	0	2	0	0	2	1	0	0	0	0	0	0	1	1	0	1	8
10/23	7.3	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	2
10/24	8.0	0	2	1	0	0	3	3	0	0	0	0	0	0	0	1	0	1	11
10/31	3.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11/1	5.5	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	3
11/5	6.8	0	3	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	5
11/8	3.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11/10	6.5	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
11/14	3.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11/16	4.8	0	1	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	4
11/19	4.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11/20	6.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	213.5	0	18	50	14	11	46	28	1	4	6	6	0	0	10	8	5	17	224

Poquonock Fall 2021 - Poquonock, Connecticut

Date	HRS	BV	TV	OS	BE	NH	SS	CH	NG	RS	BW	RT	RL	GE	AK	ML	PG	UR	TOTAL
8/3	1.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
8/6	3.3	0	0	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	3
8/7	0.9	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8/8	1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8/10	0.5	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8/11	2.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8/13	2.2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8/15	4.1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8/17	1.5	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	3
8/18	1.3	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8/19	2.3	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8/25	0.6	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
8/30	3.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8/31	5.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
9/2	3.3	0	0	0	1	0	0	0	0	0	2	0	0	0	0	0	0	1	4
9/3	0.8	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
9/6	4.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9/7	3.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
9/8	2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9/10	3.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9/12	0.5	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
9/14	5.3	0	1	3	0	0	0	0	0	0	63	0	0	0	1	0	0	0	68
9/15	2.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9/16	3.1	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	2
9/18	4.4	0	0	1	0	0	0	0	0	0	7	0	0	0	0	2	0	0	10
9/19	6.4	0	0	0	0	0	0	1	0	0	6	0	0	0	1	0	0	1	9
9/20	5.3	0	1	0	0	0	0	1	0	0	8	0	0	0	1	0	0	0	11
9/21	4.7	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2
9/23	1.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9/24	2.3	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
9/25	3.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9/26	2.5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2
9/27	4.4	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
9/28	1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9/29	9.7	5	6	0	1	0	1	0	0	0	14	0	0	0	0	1	0	0	28
9/30	4.9	0	0	0	2	0	0	0	0	0	1	0	0	0	0	0	0	0	3
10/6	1.5	0	3	0	0	0	1	0	0	0	1	0	0	0	0	0	0	2	8
10/7	3.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10/8	4.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10/9	1.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10/10	2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10/11	3.3	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
10/12	4.0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
10/14	8.7	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1	0	0	3
10/15	4.7	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
10/16	4.2	0	2	1	0	0	0	0	0	0	0	1	0	1	0	0	0	0	5
10/17	7.2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	3
10/18	4.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10/20	0.5	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
10/21	1.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
10/22	3.3	1	14	0	0	0	0	0	0	1	0	2	0	0	0	0	1	1	20
10/24	1.1	0	0	0	0	0	0	0	0	1	0	2	0	0	0	0	0	0	3
10/28	1.0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	4
10/29	1.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10/31	3.3	2	5	0	1	0	0	0	0	0	0	2	0	0	1	5	6	2	12
55	168.4	9	38	13	7	2	6	3	0	2	108	8	0	1	5	6	2	14	224

Mohonk Preserve Fall 2021 - New Paltz, New York

Date	HRS	BV	TV	OS	BE	NH	SS	CH	NG	RS	BW	RT	RL	GE	AK	ML	PG	UR	TOTAL
9/2	5.5	0	0	1	15	0	1	2	0	0	8	0	0	0	1	0	0	0	28
9/4	6.5	0	0	1	6	0	0	0	0	0	4	7	0	0	0	1	0	0	19
9/10	5.5	0	0	0	13	0	0	0	0	0	6	0	0	0	5	1	0	0	25
9/13	6.0	0	0	0	1	1	2	2	0	0	6	0	0	0	7	0	0	1	20
9/14	6.5	0	0	4	7	2	2	0	0	0	467	1	0	0	7	2	0	0	492
9/16	6.5	0	0	0	6	1	1	1	0	0	270	0	0	0	7	0	0	1	287
9/18	5.5	0	0	4	3	2	2	3	0	0	222	2	0	0	1	0	0	0	239
9/20	6.0	0	0	2	3	0	11	3	0	0	372	0	0	0	7	0	0	0	398
9/21	6.5	0	0	1	7	3	32	5	0	0	82	0	0	0	7	0	0	1	138
9/25	6.0	0	3	0	8	0	15	1	0	0	105	0	0	0	7	0	1	1	141
9/27	3.0	0	0	1	3	0	4	2	0	0	5	0	0	0	4	0	0	0	19
10/2	6.5	0	16	4	1	1	24	4	0	0	0	1	0	0	1	0	1	1	54
10/7	7.0	0	12	0	2	5	104	11	0	0	2	1	0	0	4	1	0	0	142
10/8	5.0	0	2	0	4	3	45	3	0	0	0	4	0	0	1	0	0	1	63
10/13	6.0	0	5	0	2	1	40	0	0	0	0	1	0	0	1	1	0	0	51
10/19	6.0	0	30	0	3	1	52	4	0	0	0	5	0	0	3	1	0	1	100
10/20	5.5	0	0	0	6	1	35	2	0	0	2	0	3	0	1	1	0	0	51
10/24	6.0	0	66	0	2	0	21	6	0	1	0	7	0	0	1	0	0	1	105
10/28	4.5	0	47	0	1	1	2	1	0	1	0	5	0	0	1	0	0	1	60
19	110.0	0	181	18	93	22	393	50	0	8	1552	30	0	1	67	6	2	9	2432

Chestnut Hill Fall 2021 - Litchfield, Connecticut

Date	HRS	BV	TV	OS	BE	NH	SS	CH	NG	RS	BW	RT	RL	GE	AK	ML	PG	UR	TOTAL
9/8	1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9/10	4.5	0	0	2	0	0	0	0	0	0	28	0	0	0	0	0	0	0	30
9/11	2.5	0	0	1	2	0	2	0	0	0	0	0	0	0	0	0	0	0	5
9/12	2.8	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	2	5
9/13	5.8	0	0	2	9	0	5	8	0	0	942	0	0	0	1	0	1	1	969
9/14	4.0	0	0	1	0	0	0	0	0	0	113	0	0	0	1	0	1	1	117
9/15	3.8	0	0	1	0	0	3	1	0	0	7	0	0	0	1	0	0	2	15
9/16	4.5	0	0	2	3	0	4	1	0	0	120	0	0	0	0	0	0	1	131
9/17	1.3	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
9/18	6.0	0	0	2	4	2	5	0	0	0	706	0	0	0	4	0	0	1	724
9/19	6.0	0	0	2	8	2	5	0	0	0	416	0	0	0	2	0	0	3	438
9/20	6.0	0	0	0	1	0	3	0	0	0	10	0	0	0	1	1	0	0	16
9/21	4.5	0	0	2	2	0	1	0	0	0	1	0	0	0	0	0	0	0	6
9/25	2.5	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2
9/27	1.3	0	0	0	1	0	4	0	0	0	0	0	0	0	1	0	0	0	6
11/19	57.0	0	0	15	32	0	0	1	0	0	0	0	0	0	0	0	0	0	1
16	0.8	0	0	15	32	4	35	11	0	0	2343	0	0	0	12	1	2	11	2466

TV	OS	BE	NH	SS	CH	NG	RS	BW	RT	RL	GE	AK
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Date	HRS	BV	TV	OS	BE	NH	SS	CH	NG	RS	BW	RT	RL	GE	AK	ML	PG	UR	TOTAL
9/4	2.3	0	0	0	1	0	0	0	0	0	3	2	0	0	0	0	0	3	9
9/13	2.5	0	0	2	0	0	0	1	0	0	30	0	0	0	2	0	1	0	36
9/18	1.3	0	0	2	0	1	1	0	0	1	2	0	0	0	0	0	0	0	7
9/26	4.5	0	0	2	2	0	7	3	0	2	23	0	0	0	0	1	1	2	43
4	10.5	0	0	6	3	1	8	4	0	3	58	2	0	0	2	1	2	5	95

[illegible]

Mount Peter Fall 2021 - Warwick, New York																			
Date	HRS	BV	TV	OS	BE	NH	SS	CH	NG	RS	BW	RT	RL	GE	AK	ML	PG	UR	TOTAL
9/2	6.0	0	0	2	1	0	0	0	0	0	2	1	0	0	0	1	0	0	7
9/3	7.0	0	0	1	4	0	0	0	0	2	9	0	0	0	1	0	0	0	17
9/4	6.0	0	0	1	2	0	0	0	0	0	43	0	0	0	0	0	0	0	46
9/5	3.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9/6	7.0	0	0	5	2	0	0	0	0	0	14	0	0	0	1	0	0	0	22

[illegible][illegible]

OS	BE	NH	SS	CH	NG	RS	BW	RT	RL	GE	
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Chart 24 - 13 Month Flows

Hook Mountain Fall 2021 - Nyack, New York																			
Date	HRS	BV	TV	OS	BE	NH	SS	CH	NG	RS	BW	RT	RL	GE	AK	ML	PG	UR	TOTAL
8/20	4.5	0	0	6	4	0	0	0	1	0	0	3	0	0	0	0	0	0	14
8/24	2.5	0	0	3	0	0	0	1	0	0	0	0	0	0	0	0	0	0	3
8/25	3.5	0	3	4	1	0	0	1	0	0	12	0	0	0	1	0	0	0	22
8/27	2.8	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2

OS	BE	NH	SS	CH	NG	BS	BW	BT	BL	GE
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8/30	4.5	0	0	5	3	0	0	1	0	0	7	0	0	0	1	0	0	0	17
8/31	6.0	0	0	5	1	0	1	1	1	1	1	0	0	0	3	0	0	0	13
9/3	7.0	0	0	8	2	0	1	0	0	1	24	0	0	0	1	0	0	0	37
9/4	6.5	0	0	8	4	1	0	0	0	0	41	1	0	0	1	0	0	1	57
9/5	4.3	0	0	3	1	1	0	0	0	0	1	0	0	0	0	1	0	0	7
9/6	7.0	0	0	12	3	1	2	1	0	0	4	1	0	0	2	1	0	0	27
9/7	7.0	0	0	24	0	0	2	2	0	1	1	0	0	0	1	1	0	0	32
9/8	3.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9/10	6.0	0	0	12	8	0	0	5	0	1	9	0	0	0	5	0	2	0	42
9/11	9.5	0	2	27	3	2	2	1	0	0	74	0	0	0	26	5	0	0	142
9/12	5.5	0	0	12	3	0	0	0	0	0	1	0	0	0	1	1	0	0	18
9/13	8.0	0	0	21	8	3	8	1	0	2	31	1	0	0	10	3	0	0	88
9/14	7.0	0	0	19	1	4	14	1	0	0	335	0	0	0	36	4	0	0	414
9/15	4.5	0	0	2	3	0	0	0	0	0	0	0	0	0	0	1	0	0	6
9/16	5.3	0	0	9	2	0	0	0	0	0	2	0	0	0	6	0	0	0	19
9/17	7.5	0	0	4	0	3	10	0	0	0	1	0	0	0	3	3	1	0	25
9/18	9.0	0	0	12	4	3	27	0	0	0	47	0	0	0	5	0	0	0	98
9/19	9.0	0	0	8	9	7	41	2	0	1	101	1	0	0	23	2	0	0	195
9/20	8.0	0	0	5	4	12	105	4	0	0	289	0	0	0	23	5	1	0	448
9/21	7.0	0	0	5	1	4	28	5	0	0	7	0	0	0	3	1	1	0	55

Continued on next page

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Hook Mountain Fall 2021 - Nyack, New York

Date	HRS	BV	TV	OS	BE	NH	SS	CH	NG	RS	BW	RT	RL	GE	AK	ML	PG	UR	TOTAL
9/24	4.5	0	0	7	2	1	2	0	0	0	2	0	0	0	0	3	0	0	17
9/25	9.0	0	0	1	0	0	13	0	0	0	2	0	0	0	5	1	0	0	22
9/26	5.0	0	0	19	2	3	21	6	0	0	28	0	0	0	19	0	0	0	98
9/27	6.0	0	11	14	4	3	42	3	0	0	19	0	0	0	18	1	0	0	115
9/28	2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9/29	5.0	0	0	3	1	0	23	3	0	0	1	0	0	0	3	0	0	0	34
9/30	8.0	0	5	9	9	5	173	10	0	2	12	0	0	0	3	1	2	8	239
10/1	9.5	0	0	12	5	5	182	21	0	2	2	0	0	0	2	1	0	0	232
10/2	7.0	0	28	2	5	2	33	5	0	1	0	1	0	1	3	3	2	0	86
10/3	6.5	0	0	2	1	1	9	10	0	1	0	1	0	0	3	0	1	0	29
10/5	6.5	0	0	0	1	1	77	14	0	1	0	1	0	0	0	2	1	0	98
10/6	12.0	0	0	9	2	0	78	25	0	1	3	0	0	0	11	3	1	0	133
10/7	7.3	2	0	5	4	4	75	9	0	3	4	1	0	0	3	4	1	3	118
10/8	5.8	0	17	11	4	6	165	50	0	5	0	0	0	0	29	9	1	0	297
10/9	6.0	0	84	10	6	2	34	16	0	0	4	2	0	0	4	5	0	0	167
10/10	3.0	0	0	2	2	0	4	0	0	0	0	1	0	0	1	0	1	0	11
10/11	6.5	0	49	6	11	6	62	16	0	0	0	1	0	0	3	2	1	0	157
10/12	5.8	0	0	1	1	1	20	6	0	0	0	0	0	0	0	1	0	0	30
10/13	5.5	0	0	2	1	2	0	1	0	0	0	0	0	0	0	0	0	0	6
10/14	7.5	0	0	1	6	1	45	3	0	1	0	1	0	0	1	2	1	1	63
10/15	6.8	0	0	3	0	1	86	10	0	0	0	1	0	0	4	0	0	0	105
10/16	8.0	0	40	12	5	1	32	10	0	0	0	3	0	0	2	1	0	0	106
10/17	7.0	16	6	2	8	1	10	1	0	0	0	7	0	0	11	2	3	0	67
10/18	5.0	0	0	3	2	2	30	9	0	0	2	3	0	0	4	2	2	0	59
10/19	6.5	0	30	0	1	3	61	11	0	1	0	0	0	2	0	3	2	0	114
10/20	4.0	0	0	0	1	5	12	1	0	0	0	1	0	0	3	0	0	0	23
10/21	7.0	0	36	1	1	5	26	1	0	0	0	2	0	0	1	0	0	0	73
10/22	7.8	35	21	4	1	2	18	16	0	3	0	0	0	0	3	0	0	0	103
10/23	8.0	18	281	3	4	3	45	5	0	26	0	3	0	0	6	0	3	0	397
10/24	7.5	0	148	4	1	3	26	11	0	8	0	4	0	0	0	1	2	0	208
10/25	7.0	0	115	2	2	8	38	5	0	7	0	1	0	0	0	1	1	0	180
10/27	6.5	0	54	3	3	2	10	4	0	32	0	13	0	0	0	0	1	0	122
10/28	7.5	21	90	3	4	3	41	13	0	45	0	3	0	0	1	0	0	1	225
10/29	6.0	0	60	1	3	2	14	7	0	14	0	0	0	0	0	1	2	0	104
10/30	4.0	0	0	1	2	1	8	4	0	13	0	0	0	0	2	1	0	0	32
10/31	6.5	21	36	2	3	0	2	0	0	1	0	8	0	0	0	0	0	0	73
11/1	7.0	0	31	2	1	0	9	3	0	38	0	4	0	0	0	0	0	0	88
11/2	6.5	24	14	0	2	0	0	0	0	2	0	0	0	0	0	0	0	0	42
11/3	4.0	0	0	0	2	0	1	1	0	5	0	0	0	0	1	0	0	0	10
11/4	6.5	10	23	1	8	0	7	3	0	31	0	8	0	7	0	0	3	1	102
11/5	6.0	12	9	1	1	3	5	4	0	6	0	3	0	2	0	0	0	0	46
11/6	10.0	7	47	1	1	0	1	0	0	38	0	3	0	0	1	0	0	0	99
11/7	6.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11/8	7.0	0	0	0	0	2	0	0	0	7	0	0	0	0	0	0	0	0	9
11/9	5.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11/10	5.5	0	3	0	2	1	4	0	0	1	0	1	0	0	0	0	0	0	12
11/11	6.0	0	10	1	0	2	3	3	0	19	0	4	0	0	0	0	0	0	42
11/13	6.0	0	58	1	11	1	3	0	0	11	0	11	0	0	0	0	0	0	96
11/14	4.5	0	2	1	7	0	4	3	0	0	0	0	0	0	0	0	0	0	17
11/15	6.0	0	0	0	0	2	1	0	0	0	0	2	0	0	0	0	0	0	5
11/16	5.0	8	0	0	0	0	2	0	0	1	0	0	0	0	0	0	0	0	11
11/18	6.3	3	14	0	0	0	1	1	0	2	0	0	0	2	0	0	1	1	25
11/19	6.3	3	3	0	1	0	1	0	0	2	0	5	0	0	0	0	0	0	15
77	482.1	180	1330	383	209	137	1800	350	0	337	1069	104	0	14	299	78	37	16	6343

Quaker Ridge Fall 2021 - Greenwich, Connecticut

Date	HRS	BV	TV	OS	BE	NH	SS	CH	NG	RS	BW	RT	RL	GE	AK	ML	PG	UR	TOTAL
8/31	1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9/2	9.0	0	0	3	1	2	0	0	0	0	6	0	0	0	1	0	0	0	13
9/3	8.0	0	0	7	0	3	0	0	0	0	17	0	0	0	2	0	0	0	29
9/4	6.0	0	0	7	4	0	1	0	0	0	38	0	0	0	1	0	0	0	51
9/6	9.0	0	0	16	0	1	0	0	0	0	3	0	0	0	2	0	0	0	22
9/7	8.0	0	0	6	0	1	1	0	0	0	4	0	0	0	2	0	0	0	14
9/8	8.0	0	0	9	2	0	0	1	0	0	0	0	0	0	0	1	0	0	13
9/9	10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
9/10	9.0	0	0	4	1	0	1	0	0	0	68	0	0	0	8	3	0	0	85
9/11	10.0	0	0	49	8	0	4	1	0	3	81	0	0	0	4	0	0	0	150
9/12	4.0	0	0	3	1	0	0	0	0	0	1	0	0	0	0	0	0	0	5
9/13	9.0	0	0	4	2	5	5	1	0	1	81	0	0	0	12	2	0	0	113
9/14	8.0	0	0	4	3	1	4	0	0	0	37	0	0	0	5	1	0	0	55
9/15	8.0	0	0	20	1	0	1	0	0	0	1	0	0	0	3	0	2	0	28
9/16	8.0	0	0	11	5	0	3	1	0	0	0	0	0	0	5	4	0	0	29
9/17	9.0	0	0	5	0	1	6	0	0	0	0	0	0	0	8	5	0	0	25
9/18	9.0	0	0	28	9	5	47	5	0	0	234	1	0	0	18	3	0	0	350
9/19	11.0	0	0	21	27	4	85	21	0	0	634	2	0	0	61	2	1	1	859
9/20	10.0	0	0	16	5	2	48	0	0	0	9	0	0	0	17	2	2	0	101
9/21	10.0	0	0	6	1	1	14	2	0	0	3	0	0	0	3	0	1	0	31
9/22	9.0	0	0	1	0	0	3	0	0	0	0	0	0	0	0	1	1	0	6
9/23	8.0	0	0	0	1	0	1	2	0	0	0	0	0	0	1	2	1	0	8
9/24	9.0	0	0	5	3	0	3	2	0	0	1	0	0	0	0	1	0	0	15
9/25	9.8	0	0	8	4	0	8	3	0	5	2	0	0	0	16	2	0	0	48
9/26	9.0	0	1	2	3	3	112	9	0	0	72	0	0	0	34	4	0	2	242
9/27	8.0	0	0	8	1	4	31	3	0	0	81	0	0	0	13	2	1	0	144
9/28	7.5	0	0	2	0	0	10	0	0	0	0	0	0	0	0	2	1	0	15
9/29	10.5	0	6	3	5	3	119	13	0	0	93	1	0	0	35	0	1	0	279
9/30	8.5	0	3	2	6	2	109	18	0	0	19	0	0	0	10	0	0	0	169
10/1	9.0	0	5	5	8	2	67	11	0	1	17	0	0	0	26	0	0	0	142
10/2	9.8	0	1	6	3	5	11	1	0	3	10	2	0	0	5	0	0	3	50
10/3	3.7	0	2	6	1	0	5	0	0	2	16	0	0	0	1	2	0	0	35
10/4	6.0	0	0	0	0	1	3	0	0	0	0	0	0	0	0	0	0	0	4
10/5	8.0	0	8	2	0	1	16	13	0	0	9	0	0	0	4	1	0	0	54
10/6	8.0	1	32	14	3	4	27	48	0	3	5	0	0	0	35	0	3	0	175
10/7	9.5	0	140	29	11	1	9	7	39	0	2	10	2	0	51	2	1	0	385
10/8	8.0	0	18	17	5	0	84	32	0	0	0	1	0	0	33	5	0	0	195
10/9	7.4	0	1	0	6	0	17	6	0	2	0	0	0	0	8	3	2	1	46
10/10	5.1	0	0	1	2	0	4	5	0	0	0	1	0	0	0	0	0	0	13
10/11	7.0	6	7	0	0	0	41	13	0	6	7	0	0	0	0	0	0	0	80
10/12	8.0	2	20	5	1	2	9	7	0	0	0	0	0	0	1	0	0	0	47
10/13	8.0	0	0	0	0	0	0	2	0	0	0	0	0	0	1	2	0	0	5
10/14	9.0	3	31	0	2	2	97	14	0	1	0	1	0	0	10	2	1	0	164
10/15	8.0	0	23	3	2	0	38	5	0	0	3	0	0	0	8	0	0	0	82
10/16	8.0	2	9	2	7	0	9	2	0	0	0	0	0	0	2	1	0	0	34
10/17	8.2	4	52	3	4	0	18	11	0	0	0	4	0	0	7	1	0	3	107
10/18	8.0	0	30	2	3	3	49	10	0	0	0	2	0	0	5	5	2	0	101

State Line Fall 2021 - Alpine, New Jersey

Date	HRS	BV	TV	OS	BE	NH	SS	CH	NG	RS	BW	RT	RL	GE	AK	ML	PG	UR	TOTAL
9/3	4.0	0	0	4	0	0	0	0	0	0	26	0	0	0	1	0	1	0	32
9/4	4.0	0	0	6	0	0	0	0	0	0	37	1	0	0	0	1	1	0	46
9/7	8.0	0	0	11	2	0	1	2	0	0	7	0	0	0	10	1	3	0	37
9/8	8.0	0	0	21	1	0	0	0	0	0	0	0	0	0	5	1	3	0	31
9/9	2.0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
9/10	6.0	0	0	9	4	0	0	3	0	0	3	3	0	0	3	2	1	0	28
9/11	8.0	0	0	21	4	1	0	0	0	0	79	3	0	0	24	2	2	0	136
9/12	7.0	0	0	25	2	0	0	0	0	0	2	0	0	0	1	0	0	1	31
9/13	7.0	0	0	16	3	1	2	1	0	0	9	0	0	0	5	1	0	0	38
9/14	8.0	0	0	15	1	0	2	4	0	0	18	0	0	0	48	3	3	1	95
9/15	7.0	0	0	21	2	0	0	0	0	0	1	1	0	0	6	0	0	0	31
9/16	8.0	0	0	34	9	2	3	1	0	0	13	0	0	0	25	2	0	0	89
9/17	6.5	0	0	18	10	0	1	1	0	0	0	0	0	0	2	1	0	0	33
9/18	7.0	0	0	19	2	3	18	5	0	0	112	0	0	0	7	0	0	0	166
9/19	8.0	0	0	15	5	1	45	4	0	0	249	3	0	0	16	2	0	0	340
9/20	7.0	0	0	10	5	6	46	11	0	0	23	1	0	0	26	4	0	0	132
9/21	8.0	0	0	13	5	0	7	7	0	0	3	1	0	0	20	0	1	2	59
9/22	8.0	0	0	9	3	1	1	1	0	0	1	0	0	0	11	0	2	0	29
9/23	5.0	0	0	11	2	1	1	0	0	0	0	0	0	0	1	1	0	0	17
9/24	7.0	0	0	12	6	0	3	7	0	0	2	1	0	0	4	4	0	0	39
9/25	5.0	0	0	4	0	0	2	2	0	0	2	1	0	0	3	0	1	0	15
9/26	7.0	0	0	11	7	3	79	4	0	0	34	2	0	0	19	1	0	0	160
9/27	7.0	0	0	5	2	1	26	6	0	0	4	0	0	0	16	1	5	0	66
9/28	2.0	0	0	1	1	1	2	0	0	0	0	0	0	0	2	1	0	0	8
9/29	8.0	0	0	7	4	3	72	12	0	0	48	2	0	0	14	0	3	0	165
9/30	8.0	0	0	5	8	2	117	13	0	1	19	1	0	0	9	2	1	0	178
10/1	6.0	0	0	7	4	1	49	20	0	2	75	0	0	0	21	1	0	0	180
10/2	5.0	0	20	12	1	4	6	0	0	1	91	0	0	0	8	0	1	1	145
10/3	6.0	0	0	5	0	7	19	6	0	1	4	0	0	0	8	2	1	0	53
10/4	5.0	0	0	4	3	0	0	0	0	0	0	0	0	0	1	1	0	0	9
10/5	7.0	0	17	4	1	2	31	7	0	0	20	1	0	0	7	0	4	0	94
10/6	7.5	0	7	6	0	3	49	3	0	1	18	1	0	0	10	1	1	0	100
10/7	7.5	0	0	4	0	7	86	13	0	2	11	1	0	0	19	4	1	0	148
10/8	8.5	0	28	22	2	4	114	39	0	2	1	3	0	0	70	1	4	0	290
10/9	6.0	0	0	13	7	2	22	11	0	1	2	4	0	0	6	1	3	0	72
10/10	2.5	0	0	3	5	0	4	1	0	0	0	0	0	0	1	0	0	0	14
10/11	7.0	0	6	12	14	1	16	10	0	1	0	7	0	0	2	1	0	0	70
10/12	8.0	0	76	3	0	0	22	7	0	2	2	4	0	0	3	0	6	0	125
10/13	5.0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	2
10/14	7.0	0	6	1	4	0	44	11	0	2	0	2	0	0	6	0	0	0	76
10/15	6.0	2	26	3	1	0	16	6	0	1	0	2	0	0	8	1	3	0	69
10/16	8.0	0	22	3	4	0	5	2	0	1	1	3	0	0	7	2	7	0	57
10/17	7.0	5	47	2	1	0	12	4	0	2	0	2	0	0	3	1	1	0	80
10/18	6.0	0	70	4	1	0	30	6	0	4	0	3	0	0	4	2	0	0	124
10/19	7.0	0	285	9	11	7	146	8	0	1	0	9	0	0	7	1	0	0	484
10/20	9.0	0	221	2	7	2	97	17	0	4	0	6	0	0	5	3	0	2	366
10/21	8.0	0	334	7	4	2	50	10	0	6	0	8	0	0	6	4	1	0	432
10/22	6.8	21	65	1	2	0	4	5	0	2	0	3	0	0	0	1	1	1	106
10/23	7.0	0	202	0	8	2	20	9	0	4	0	2	0	0	2	1	1	0	251
10/24	6.0	0	345	1	3	1	40	11	0	6	0	2	0	0	1	2	2	0	414
10/25	7.0	0	136	3	2	0	13	4	0	1	0	2	0	0	3	2	1	0	167
10/26	3.3	0	101	1	2	1	2	0	0	1	0	2	0	0	1	0	0	0	111
10/27	7.0	0	162	1	2	0	10	11	0	11	0	6	0	0	0	0	0	0	203
10/28	8.0	0	101	0	7	5	27	12	0	35	0	13	0	0	2	1	1	1	205
10/29	6.0	1	30	2	19	0	5	11	0	2	0	26	0	1	0	1	1	0	99
10/30	4.0	0	8	1	5	1	3	1	0	0	0	10	0	0	0	0	0	0	29
10/31	5.0	0	27	1	1	0	0	0	0	0	0	1	0	0	0	0	0	0	30
11/1	7.5	0	38	0	8	0	3	1	0	6	0	10	0	0	0	0	1	0	67
11/2	5.8	0	48	0	3	0	3	1	0	0	0	2	0	0	0	1	0	0	58
11/3	7.5	0	87	1	4	0	5	4	0	11	0	4	0	1	0	1	1	0	119
11/4	8.0	0	119	0	5	0	9	2	0	26	0	3	0	0	0	0	0	0	164
11/5	6.5	9	88	0	6	0	11	5	0	63	0	6	0	0	0	1	0	0	189
11/6	5.0	0	65	0	2	0	0	2	0	10	0	7	0	0	0	1	0	0	87
11/7	4.0	0	28	0	1	1	2	1	0	2	0	3	0	0	0	0	0	0	38
11/8	4.0	18	61	1	1	0	3	1	0	3	0	8	0	0	0	0	0	0	96
11/9	6.0	0	31	2	3	1	1	0	0	13	0	4	0	1	0	0	0	0	57
11/10	5.8	0	15	0	7	0	3	2	0	6	0	6	0	0	0	0	0	0	39
11/11	5.0	0	18	1	2	4	3	1	0	4	0	7	0	0	0	0	1	0	41
11/13	4.0	0	49	2	10	0	3	0	0	2	0	6	0	0	0	0	0	0	72
11/14	4.0	0	10	1	0	0	1	1	0	3	0	2	0	0	0	0	0	0	18
11/15	5.0	0	47	2	11	0	1	1	0	1	0	4	0	0	0	0	0	0	67
11/16	4.0	0	80	1	15	0	1	0	0	3	0	3	0	0	0	0	0	0	103
11/17	6.0	1	50	1	3	0	0	1	0	1	0	2	0	0	0	1	0	0	60
11/18	5.5	0	45	0	4	0	0	0	0	1	0	4	0	0	0	1	0	0	55
11/19	4.5	0	35	0	0	0	3	0	0	7	0	9	0	0	0	0	0	0	54
11/20	4.0	0	23	0	0	0	0	2	0	17	0	5	0	0	0	0	0	0	47
11/21	3.0	6	33	1	6	0	0	0	0	6	0	1	0	0	0	0	0	0	53
11/24	6.5	0	40	0	8	0	2	5	0	23	0	12	0	0	0	0	0	0	90
11/26	2.0	0	35	1	11	0	1	1	0	4	0	4	0	0	0	1	0	0	58
11/27	5.0	3	38	0	9	1	0	4	0	15	0	21	0	0	0	0	1	0	92
11/29	4.5	0	36	0	2	0	0	3	0	11	0	3	0	0	0	0	1	0	56
11/30	4.0	0	8	0	3	0	0	0	0	2	0	2	0	0	0	0	0	0	15
82	496.5	66	3469	477	333	85	1426	368	0	337	917	281	0	3	489	71	72	10	8404

Lenoir Wildlife Sanctuary 2021 - Yonkers, New York

Date	HRS	BV	TV	OS	BE	NH	SS	CH	NG	RS	BW	RT	RL	GE	AK	ML	PG	UR	TOTAL
8/15	2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
8/28	14.0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2
9/5	13.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9/6	3.0	5	1	25	7	0	0	0	0	0	1	0	0	0	0	0	0	0	39
9/11	3.3	2	0	6	1	0	0	5	0	0	8	0	0	0	5	0	0	0	27
9/12	4.3	2	0	20	8	0	3	0	0	0	1	0	0	0	3	0	0	0	37
9/18	5.0	0	0	9	3	0	4	0	0	0	4	0	0	0	7	0	1	0	38
9/19	7.0	2	0	10	6	0	12	1	0	1	79	1	0	0	11	0	0	0	123
9/20	4.0	0	1	3	0	0	6	0	0	0	58	0	0	0	7	1	0	0	76
9/25	2.5	0	0	4	0	0	4	0	0	0	1	0	0	0	0	2	0	0	11
10/2	6.0	0	5	34	15	1	5	0	0	0	51	0	0	0	5	1	1	0	118
10/3	3.0	0	0	0	0	0	3	0	0	0	0	0	0	0	3	1	0	0	7
10/7	4.5	2	339	9	3	1	10	1	0	0	67	2	0	0	22	2	0	0	458
10/9	6.5	0	12	1	4	0	14	5	0	1	1	1	0	0	8	3	0	0	50
10/10	1.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10/16	1.0	0	0	0	0	0	5	0	0	0	0	0	0	0	1	0	0	0	6
10/17	5.0	17	56	4	25	0	14	3	0	1	0	1	0	0	3	0	1	0	125
10/24	2.0	0	0	0	0	0	5	0	0	0	0	0	0	0	1	0	0	0	0

Montclair Hawk Lookout Fall 2021 - Montclair, New Jersey

Date	HRS	BV	TV	OS	BE	NH	SS	CH	NG	RS	BW	RT	RL	GE	AK	ML	PG	UR	TOTAL
10/13	8.3	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
10/14	8.0	0	7	0	3	1	40	15	0	0	1	0	0	0	7	2	1	0	77
10/15	8.0	0	103	2	0	1	18	10	0	0	1	0	0	0	4	0	1	0	140
10/16	5.0	0	0	0	1	2	3	1	0	2	0	2	0	0	1	0	1	0	13
10/17	6.0	0	78	0	7	0	23	7	0	3	0	7	0	0	10	0	0	0	135
10/18	7.0	3	2	4	0	0	10	7	0	1	0	5	0	0	4	1	1	0	38
10/19	8.0	0	337	4	7	2	51	27	0	1	1	15	0	0	7	5	1	0	458
10/20	8.0	5	268	0	5	0	42	27	0	5	1	16	0	0	1	3	3	1	377
10/21	8.0	0	47	6	2	2	8	13	0	0	0	2	0	0	1	0	0	0	81
10/22	8.0	0	65	1	0	0	10	15	0	5	0	6	0	0	0	1	1	0	104
10/23	3.0	13	0	0	1	0	7	6	0	2	0	3	0	0	0	0	0	0	32
10/24	6.0	7	330	0	3	2	14	6	0	7	0	0	0	0	1	0	0	0	370
10/25	8.0	0	15	0	0	1	8	4	0	1	0	0	0	0	1	2	1	0	33
10/27	8.3	0	43	0	2	2	4	8	0	7	0	4	0	0	0	0	0	0	1
10/28	8.0	1	217	1	3	2	15	15	0	29	0	6	0	0	0	2	0	0	291
10/29	8.0	0	24	0	2	0	6	5	0	7	0	7	0	0	1	1	0	0	53
10/31	4.0	0	0	0	2	0	4	3	0	5	0	3	0	0	0	0	0	0	17
11/1	8.0	2	2	0	1	0	10	5	0	7	0	7	0	0	0	0	0	0	34
11/2	8.0	0	1	0	1	0	0	1	0	0	0	3	0	0	0	0	0	0	6
11/3	8.0	0	21	2	2	1	6	8	0	34	0	16	0	0	1	1	0	1	93
11/4	8.0	0	35	2	1	0	6	9	1	68	0	8	0	0	0	0	0	0	130
11/5	8.0	2	34	0	0	1	6	3	0	16	0	5	0	0	0	0	0	0	67
11/6	6.0	0	126	0	2	0	4	3	0	16	0	3	0	0	0	0	0	0	154
11/7	3.0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
11/8	7.5	0	6	0	0	0	2	1	0	0	0	4	0	0	0	0	0	0	1
11/9	8.0	0	1	0	0	0	1	1	0	2	0	0	0	0	0	0	0	0	5
11/10	8.5	0	3	0	0	0	1	1	0	1	0	0	0	0	0	0	0	0	6
11/11	8.0	0	0	0	0	0	4	2	0	5	0	1	0	0	0	0	0	0	13
11/13	4.0	0	2	0	3	1	2	0	0	0	0	1	0	0	0	0	2	0	11
11/14	3.0	0	8	0	4	0	0	1	0	0	0	4	0	0	0	1	1	0	19
11/15	8.0	12	5	0	2	0	0	0	0	0	0	2	0	0	0	0	0	0	21
11/16	8.0	5	15	0	0	0	1	3	2	0	0	0	0	0	0	0	1	0	27
11/17	8.0	0	5	0	0	0	1	3	0	0	0	0	0	0	0	0	0	0	9
11/18	8.0	8	2	0	0	0	3	1	0	2	0	1	0	0	1	0	0	0	18
11/19	8.0	5	15	0	7	1	2	3	0	11	0	8	0	0	0	2	2	0	56
11/20	4.0	0	25	0	1	0	1	0	0	4	0	0	0	0	0	0	0	0	31
11/21	4.0	0	4	0	0	0	0	0	0	3	0	1	0	0	0	0	0	0	8
11/22	8.0	15	12	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	28
11/23	8.0	3	19	0	0	0	0	0	0	33	0	16	0	0	0	0	0	0	71
11/24	8.0	0	3	0	2	0	1	1	0	34	0	25	0	0	0	0	0	1	67
11/25	4.0	0	20	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	23
11/26	4.5	0	8	0	1	0	0	0	0	2	0	1	0	0	0	0	0	0	12
11/29	8.0	3	12	0	2	0	2	2	0	6	0	3	0	0	0	0	0	0	30
11/30	5.0	0	2	0	0	0	1	0	0	3	0	0	0	0	0	0	1	0	7
84	597.3	85	1975	217	190	61	831	423	1	337	915	194	0	0	270	73	64	20	5657

Other: 9/19 1 Mississippi Kite

Scott's Mountain Fall 2021 - MCR Harmony Twp., New Jersey

Date	HRS	BV	TV	OS	BE	NH	SS	CH	NG	RS	BW	RT	RL	GE	AK	ML	PG	UR	TOTAL
9/2	6.5	0	0	1	3	0	2	0	0	0	6	0	0	0	0	0	1	0	13
9/3	6.8	0	0	1	1	1	8	1	0	1	25	1	0	0	0	0	0	2	41
9/4	7.3	0	0	4	0	1	0	1	0	1	60	3	0	0	1	0	0	1	72
9/5	6.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9/6	6.0	0	0	6	6	0	7	3	0	2	27	7	0	0	1	0	0	2	61
9/7	7.3	0	0	7	6	2	3	1	0	0	24	2	0	0	0	1	0	1	47
9/8	7.3	0	0	2	0	0	2	2	0	0	0	1	0	0	0	2	0	2	11
9/9	6.8	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2
9/10	7.3	0	0	1	4	1	4	1	0	0	44	0	0	0	5	0	2	0	62
9/11	7.5	0	0	9	1	0	0	1	0	1	103	2	0	0	0	0	0	0	117
9/12	7.0	0	0	13	1	1	2	1	0	1	34	2	0	0	6	3	2	1	67
9/13	7.5	0	0	1	3	0	2	2	0	2	142	3	0	0	3	2	1	1	162
9/14	8.0	0	0	19	1	4	2	2	0	0	584	0	0	0	8	4	0	1	625
9/15	7.0	0	0	11	2	0	1	1	0	0	13	0	0	0	5	2	0	1	36
9/16	7.5	0	0	1	1	0	19	3	0	2	9	0	0	0	1	1	0	0	37
9/17	7.5	0	0	5	1	0	10	1	0	1	82	0	0	0	2	1	0	1	104
9/18	8.3	0	0	1	8	0	4	4	0	1	875	1	0	0	2	3	0	4	903
9/19	8.3	0	0	4	11	1	13	3	0	3	3761	1	0	0	11	0	0	3	3811
9/20	7.3	0	0	1	6	0	38	5	0	3	961	0	0	0	15	4	2	1	1036
9/21	7.5	0	0	5	1	4	45	2	0	1	13	0	0	0	4	0	1	1	77
9/22	7.0	0	0	1	4	0	8	0	0	0	5	0	0	0	4	0	2	2	26
9/23	2.5	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	4
9/24	7.5	0	0	3	3	1	40	4	0	5	584	0	0	0	4	1	0	3	648
9/25	7.0	0	0	2	3	0	19	1	0	6	112	0	0	0	4	3	0	1	151
9/26	8.0	0	0	5	5	0	72	7	0	1	259	0	0	0	49	2	0	1	401
9/27	7.0	0	0	3	5	1	20	3	0	1	7	0	0	0	1	0	0	1	42
9/28	7.8	0	0	4	1	0	11	1	0	1	3	0	0	0	4	1	0	0	26
9/29	7.0	0	0	2	6	0	60	4	0	1	10	1	0	1	11	0	1	2	99
9/30	7.0	0	0	1	6	1	69	3	0	1	0	1	0	0	5	0	1	1	89
10/1	7.0	0	0	1	3	0	35	3	0	0	2	0	0	0	1	0	1	0	46
10/2	8.0	0	0	8	2	1	35	1	0	1	0	1	0	1	2	0	1	0	53
10/3	7.5	0	0	4	0	0	31	7	0	1	0	1	0	0	1	0	0	4	49
10/4	5.0	0	0	1	0	0	3	0	0	0	0	0	0	0	0	0	0	0	4
10/5	7.8	0	0	1	0	0	4	0	0	0	0	0	0	0	1	2	0	1	9
10/6	7.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10/7	7.5	0	0	0	9	4	86	5	0	4	0	1	0	0	0	3	1	2	115
10/8	7.0	0	0	1	7	2	55	5	0	4	0	7	0	0	2	0	0	1	84
10/9	8.5	0	0	0	3	2	164	15	0	0	1	0	0	0	19	7	3	0	214
10/10	6.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10/11	6.5	0	0	0	6	0	68	3	0	1	0	3	0	0	2	4	0	0	87
10/12	7.3	0	0	0	1	4	41	4	1	1	0	2	0	0	1	0	0	1	56
10/13	7.0	0	0	0	1	0	8	1	0	2	0	0	0	0	0	0	1	1	14
10/14	7.0	0	0	2	5	1	30	6	0	2	0	1	0	0	1	0	0	1	49
10/15	7.3	0	0	1	3	0	32	5	0	1	0	0	0	0	1	0	0	1	44
10/16	6.3	0	0	0	2	0	29	2	0	3	0	1	0	0	1	2	2	1	43
10/17	7.0	0	0	0	3	2	70	2	0	2	0	1	0	0	14	2	2	1	99
10/18	6.5	0	0	0	5	0	13	3	0	1	1	8	0	0	2	2	1	3	39
10/19	7.8	0	0	0	4	0	54	2	0	0	0	6	0	0	2	0	1	2	71
10/20	8.0	0	0	0	6	2	51	10	0	1	0	4	0	0	4	1	2	0	81
10/21	7.0	0	0	2	2	2	38	6	0	1	0	3	0	0	0	0	2	1	57
10/22	8.3	0	0	1	5	0	27	3	0	2	0	7	0	0	2	1	0	1	49
10/23	7.5	0	0	0	0	1	12	5	0	4	0	2	0	0	0	0	0	2	26
10/24	7.5	0	0	1	0	2	24	3	0	0	0	1	0	0	0	1	0	0	32
10/25	6.3	0	0	0	7	0	32	1	0	0	0	3	0	0	0	1	0	0	44

Lighthouse Point Fall 2021 - New Haven, Connecticut

Date	HRS	BV	TV	OS	BE	NH	SS	CH	NG	RS	BW	RT	RL	GE	AK	ML	PG	UR	TOTAL
9/26	9.8	0	2	67	7	1	68	44	0	0	1	0	0	0	132	15	1	10	348
9/27	6.0	0	0	10	0	5	13	3	0	0	0	0	0	0	10	5	1	0	47
9/28	5.0	0	0	5	1	4	8	8	0	0	0	0	0	0	6	7	0	1	40
9/29	11.0	2	15	62	17	18	98	64	0	47	8	0	0	272	42	19	27	691	
9/30	10.3	0	35	51	65	17	177	127	0	3	4996	6	0	139	7	11	26	5660	
10/1	10.0	0	39	31	11	9	50	34	0	0	236	2	0	20	1	1	22	456	
10/2	7.3	0	0	22	1	13	7	1	0	0	0	0	0	8	1	1	2	56	
10/3	6.5	0	0	7	0	2	5	3	0	0	0	0	0	3	2	0	0	22	
10/5	7.3	7	32	20	10	1	30	38	0	3	35	8	0	13	2	10	9	218	
10/6	6.3	0	1	5	0	0	3	7	0	0	0	1	0	0	2	1	0	20	
10/7	6.0	0	0	12	0	0	24	19	0	0	0	0	0	6	2	0	0	63	
10/8	8.5	0	5	12	5	4	5	12	0	0	0	2	0	12	3	5	6	71	
10/9	9.3	2	11	20	8	5	24	43	0	1	0	3	0	13	6	2	1	139	
10/10	5.3	0	0	4	0	1	2	1	0	0	0	0	0	1	0	0	0	9	
10/11	7.0	0	0	12	1	3	41	46	0	1	0	3	0	4	2	2	0	115	
10/13	6.0	0	0	0	1	0	2	7	0	0	0	0	0	0	0	0	0	10	
10/14	7.0	0	31	6	3	0	32	28	0	0	0	0	0	8	4	6	4	122	
10/15	7.0	0	0	0	0	0	1	0	0	0	0	0	0	0	2	1	0	4	
10/16	6.3	0	0	2	0	1	2	7	0	1	0	2	0	0	0	0	0	16	
10/17	9.8	0	6	6	5	2	45	37	0	0	0	2	0	39	14	3	8	167	
10/18	8.8	0	0	3	8	11	109	40	0	0	0	2	0	31	12	1	8	225	
10/19	7.5	0	3	7	0	33	96	41	0	0	2	1	0	18	10	8	3	222	
10/20	5.0	0	0	6	2	1	22	10	0	0	0	0	0	4	5	1	0	51	
10/21	7.0	0	0	1	0	5	6	5	0	0	0	0	0	1	2	0	0	20	
10/22	7.5	0	0	3	1	3	7	5	0	0	0	0	0	0	3	0	0	25	
10/23	9.5	0	25	15	14	2	39	58	0	1	1	19	0	18	5	3	12	212	
10/24	5.8	0	4	2	3	2	6	9	0	0	0	2	0	0	0	2	1	31	
10/25	2.5	0	0	0	0	2	0	0	0	0	0	0	0	0	1	0	0	3	
10/27	8.8	2	8	8	5	10	68	79	0	2	0	8	0	3	2	6	0	201	
10/28	10.0	1	27	3	11	6	26	32	0	19	0	23	0	0	6	1	4	159	
10/29	7.0	0	0	0	0	0	3	4	0	0	0	4	0	0	0	1	1	13	
10/30	2.0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2	
10/31	7.0	0	4	0	0	3	3	2	0	0	0	1	0	0	0	0	0	13	
11/1	7.5	0	0	3	2	1	17	12	0	1	0	1	0	2	1	1	0	41	
11/2	7.0	0	0	0	0	0	2	3	0	0	0	0	0	0	1	1	1	8	
11/3	7.0	0	2	2	14	1	12	13	0	1	1	10	0	0	3	2	2	63	
11/4	7.0	0	4	1	4	1	14	6	0	5	0	5	0	0	0	0	0	42	
11/5	7.0	0	64	0	8	7	17	10	0	15	0	8	0	2	0	0	0	153	
11/6	8.0	0	0	1	3	5	5	9	0	0	1	7	0	0	2	6	0	39	
11/7	8.0	0	3	0	6	0	9	2	0	0	0	7	0	0	0	0	0	29	
11/8	8.0	0	23	0	7	3	18	17	0	15	0	39	0	1	0	0	1	133	
11/9	5.0	0	0	0	0	1	1	0	0	0	0	1	0	0	0	0	0	4	
11/10	7.3	0	5	0	2	2	3	3	0	0	0	4	0	0	1	0	0	20	
11/11	7.3	0	0	0	0	1	2	2	0	2	0	1	0	0	1	0	0	9	
11/13	5.8	0	0	1	0	0	0	2	0	0	0	0	0	0	0	1	0	4	
11/14	4.0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	2	
11/15	4.0	0	0	0	0	2	0	0	0	1	0	0	0	0	0	0	0	4	
11/16	8.0	2	1	0	5	1	5	3	0	3	0	5	0	0	1	0	2	64	
11/17	5.8	0	0	0	4	0	0	0	0	1	0	7	0	0	0	0	0	12	
11/18	4.0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	
11/19	7.8	0	8	0	0	3	2	2	0	5	0	7	0	0	0	1	4	32	
11/20	4.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
11/21	2.5	0	0	0	0	0	0	0	0	0	0	2	0	0	1	0	0	3	
11/23	6.0	0	0	0	1	1	5	2	0	9	0	5	0	1	0	0	2	6	
11/24	5.0	0	1	0	5	2	8	2	0	20	0	13	0	1	0	1	0	54	
11/25	5.0	0	0	0	0	3	0	2	0	1	0	0	0	0	0	0	0	6	
11/26	6.0	0	0	0	0	2	0	2	0	0	0	0	0	1	0	0	1	6	
11/27	7.3	0	0	0	8	1	2	2	0	0	0	1	0	0	0	0	0	14	
11/28	4.3	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	
11/29	6.5	0	0	0	5	1	6	1	0	15	0	7	0	0	0	0	0	45	
11/30	2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	
12/1	5.3	0	0	0	0	0	0	3	0	5	0	7	0	0	0	0	0	15	
12/3	5.5	0	0	0	2	0	2	6	0	0	0	4	0	0	0	1	0	15	
12/7	2.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
92	586.0	16	360	1148	323	263	1250	1007	0	130	5378	239	0	6	1180	253	129	230	11916

1 Mississippi Owl on 9/19 , 2 Swainson's Hawk on 9/19 and 11/5, 1 Short-eared Owl on 11/13

Other: 1 Mississippi Kite on 9/19, 2 Swainson's Hawk on 9/19 and 11/5, 1 Short-eared Owl on 11/15

Fire Island Fall 2021 - Islip, New York

Date	HRS	BV	TV	OS	BE	NH	SS	CH	NG	RS	BW	RT	RL	GE	AK	ML	PG	UR	TOTAL
9/2	3.5	0	0	3	0	0	0	0	0	0	0	0	0	0	1	0	0	0	4
9/3	10.3	0	0	36	1	1	0	0	0	0	0	0	0	0	2	6	0	0	46
9/4	4.8	0	0	7	0	1	0	0	0	0	0	0	0	0	0	2	0	0	10
9/7	4.8	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2
9/9	1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9/10	9.5	0	0	73	0	1	0	0	0	0	0	0	0	0	19	48	2	0	143
9/11	5.0	0	0	4	0	0	0	0	0	0	0	0	0	0	2	5	0	0	11
9/12	5.0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	1	0	0	3
9/13	9.5	0	0	9	0	1	0	0	0	0	0	0	0	0	5	10	0	0	25
9/14	7.0	0	0	9	0	0	0	0	0	0	0	0	0	0	6	11	1	0	27
9/16	5.5	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
9/17	6.0	0	0	9	0	1	0	0	0	0	0	0	0	0	0	8	4	0	22
9/18	6.5	0	0	17	0	3	0	1	0	0	0	0	0	0	2	13	2	0	38
9/19	8.5	0	0	70	0	26	1	0	0	0	0	0	0	0	175	55	2	0	329
9/20	8.0	0	0	2	0	0	0	0	0	0	0	0	0	0	2	11	0	2	17
9/21	6.5	0	0	2	0	0	1	0	0	0	0	0	0	0	1	1	0	0	5
9/22	4.0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
9/23	5.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9/24	6.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	3
9/25	5.0	0	0	1	0	0	0	0	0	0	0	0	0	0	2	5	0	0	8
9/26	8.0	0	0	35	0	7	0	2	0	0	0	0	0	0	64	93	7	0	208
9/27	8.5	0	0	1	0	5	0	0	0	0	0	0	0	0	7	32	3	0	48
9/28	5.3	0	0	2	0	1	0	0	0	0	0	0	0	0	7	10	5	0	25
9/29	10.0	0	0	34	0	14	3	1	0	0	0	0	0	0	198	75	4	0	329
9/30	6.5	0	0	22	0	29	17	1	0	0	0	0	0	0	210	20	4	0	303
10/1	6.5	0	0	13	0	21	4	0	0	0	0	0	0	0	68	21	5	0	132
10/2	8.0	0	0	7	0	0	0	1	0	0	0	0	0	0	2	7	2	0	19
10/3	5.0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	3	1	0	6
10/4	5.0	0	0	3	0	4	0	0	0	0	0	0	0	0	1	4	0	0	12
10/5	8.3	0	0	20	0	1	0	1	0	0	0	0	0	0	3	30	5	0	60
10/6	7.0	0	0	26	0	9	2	0	0	0	0	0	0	0	3	37	4	0	81
10/7	5.0	0	0	7	0	1	0	0	0	0	0	0	0	0	2	3	0	0	13
10/8	6.0	0	0	1	1	2	1	1	0	0	0	0	0	0	4	6	5	0	21
10/9	8.0	0	0	4	0	2	0	0	0	0	0	0	0	0	2	10	0	0	18
10/10	3.5	0	0	3	0	0	0	0	0	0	0	0	0	0	0	4	1	0	6

Recent Year Counts for Major Sites (with previous year averages abd % change in 2021)

Region 45

Greenlaw Mountain - St. Andrews, New Brunswick (ave for 2011 - 2020, % change in 2021)

YR	DYS	HRS	BV	TV	OS	BE	NH	SS	CH	NG	RS	BW	RT	RL	GE	AK	M	PF	UR	TOT	XTOT	PH	XPH
2016	46	324	0	249	110	92	120	514	16	22	3	6990	211	1	2	147	34	11	87	8609	1370	27	4.2
2017	49	325	0	492	142	90	64	571	11	13	6	1989	151	0	2	166	34	30	102	3865	1384	12	4.3
2018	48	342	1	374	162	199	95	572	12	28	5	600	272	2	4	164	45	28	100	2663	1688	8	4.9
2019	40	271	0	293	173	133	34	456	10	6	1	3040	112	0	0	134	24	21	72	4510	1177	17	4.4
2020	42	285	0	366	138	207	78	464	12	20	3	5035	216	3	1	136	29	25	89	6822	1421	24	5.0
2021	40	274	0	630	125	225	65	469	8	12	6	7089	148	0	1	183	34	12	73	9080	1361	33	5.0
ave10	45	284	0.1	274.5	153	96	70	557	10.7	16	3.6	3648.9	192	0.6	1.2	163	36.8	22	82.6	5328	1405	19	5.0
%chg	-11	-4	-100	130	-18	135	-8	-16	-25	-23	67	94	-23	-100	-17	12	-8	-46	-12	70	-3	74	0

Cooper - Cooper, Maine (ave for 2011-2020, % change in 2021)

YR	DYS	HRS	BV	TV	OS	BE	NH	SS	CH	NG	RS	BW	RT	RL	GE	AK	ML	PF	UR	TOT	XBWV	PH	XPH
2016	12	57	0	31	3	15	4	6	6	0	0	20	0	0	1	6	3	0	0	95	44	1.7	0.8
2017	24	134	0	82	1	8	2	2	1	0	0	0	0	0	0	3	2	0	0	101	19	0.8	0.1
2018	16	89	0	32	0	13	0	0	0	0	0	4	0	0	0	1	1	1	1	53	17	0.6	0.2
2019	12	55	0	26	0	5	0	0	2	0	0	9	0	0	0	0	0	0	0	42	7	0.8	0.1
2020	14	51	0	17	0	0	1	0	1	0	0	6	1	0	0	3	1	0	0	30	7	0.6	0.1
2021	22	86	0	32	0	3	0	2	2	0	0	17	0	0	2	7	1	0	0	66	17	0.8	0.2
ave 9	9.3	48	0	23	0	5.1	1.5	1	1.1	0	0	9.7	0.1	0	0.1	3.5	0.8	0.1	0.9	47	15	1.4	0.4
%chg	137	78		42	-100	-41	-100	43	82			75	-100		1900	100	25	-100	-100	40	13	-46	-53

Region 44

Cadillac Mountain - Acadia National Park, Maine (ave for 2011-2020, % change in 2021)

YR	DYS	HRS	BV	TV	OS	BE	NH	SS	CH	NG	RS	BW	RT	RL	GE	AK	ML	PF	UR	TOT	XBWV	PH	XPH
2016	42	192	0	49	126	57	80	582	25	3	1	1490	37	0	1	330	54	17	55	2907	1368	15.1	7.1
2017	60	255	0	92	109	113	75	683	18	2	3	585	63	0	0	395	55	37	130	2360	1683	9.3	6.6
2018	60	270	0	133	102	75	79	544	18	7	2	429	20	0	0	495	24	33	139	2100	1538	7.8	5.7
2019	51	274	0	193	155	150	67	1112	22	2	0	363	19	0	0	542	53	22	138	2838	2282	10.3	8.3
2020	56	257	0	159	123	99	85	758	19	10	1	1039	38	0	0	468	56	24	94	2973	1775	11.6	6.9
2021	48	225	0	274	142	204	66	593	13	6	0	395	18	0	0	449	49	21	119	2349	1680	10.4	7.5
ave10	55	250	0	107	137	75	96	831	19	7	1	1073	42	1	0	465	59	25	98	3034	1855	13	8
%chg	-12	-10		157	4	173	-31	-29	-32	-10	-100	-63	-57	-100	-100	-3	-17	-16	21	-23	-9	-18	-1

Mount Philo State Park - Charlotte, Vermont (ave for 2018-2020, % change in 2021)

YR	DYS	HRS	BV	TV	OS	BE	NH	SS	CH	NG	RS	BW	RT	RL	GE	AK	ML	PF	UR	TOT	XBWV	PH	XPH
2018	3	19	10	28	1	5	1	1	11	0	14	190	29	3	0	2	0	3	49	347	119	19	6.43
2019	16	87	3	44	39	118	20	67	14	0	1	3213	8	0	0	54	6	8	24	3619	359	41.7	4.1
2020	7	37	0	163	7	60	6	25	6	0	1	982	10	0	0	37	4	5	14	1320	175	35.7	4.7
2021	15	60	0	347	30	77	13	37	4	0	7	3319	24	0	0	59	2	0	20	3939	273	65.4	4.5
ave3	9	47	4	78	16	61	9	31	10	0	5	1462	16	1	0	31	3	5	29	1762	218	32	5
%chg	73	27	-100	343	91	26	44	19	-61		31	127	53	-100		90	-40	-100	-31	124	25	104	-11

Clarry Hill - Union, Maine (ave for 2011-2020, % change in 2021)

YR	DYS	HRS	BV	TV	OS	BE	NH	SS	CH	NG	RS	BW	RT	RL	GE	AK	ML	PF	UR	TOT	XBWV	PH	XPH
2016	39	296	0	594	310	313	89	597	67	4	27	12526	280	1	8	178	38	30	26	15089	1969	51.0	6.7
2017	44	328	0	716	228	315	102	760	49	7	34	3969	370	1	6	211	31	25	31	6855	2170	20.9	6.6
2018	36	286	0	884	231	468	95	1014	71	6	27	2358	316	3	8	216	33	34	28	5792	2550	20.3	8.9
2019	36	304	1	1271	299	449	64	735	38	4	36	6782	201	0	2	288	44	17	33	10265	2211	33.8	7.3
2020	36	303	0	1414	194	590	174	977	48	8	45	8414	609	14	10	248	22	24	55	12846	3018	42.4	10.0
2021	37	294	0	2219	253	405	142	644	48	6	56	14584	287	1	5	130	20	19	27	18846	2043	64.1	6.9
ave10	33	258	0	678	241	305	94	728	56	5	35	9025	284	2	5	166	30	24	27	11706	2003	48	8
%chg	11	14	-100	227	5	33	51	-12	-14	20	62	62	1	-52	-2	-22	-33	-21	-1	61	2	34	-10

Region 43

Interlakes School - Meredith, New Hampshire (ave for 2010-2020, % change in 2021)

YR	DYS	HRS	BV	TV	OS	BE	NH	SS	CH	NG	RS	BW	RT	RL	GE	AK	M	PF	UR	TOT	XBWV	PH	XPH
2016	2	6	0	10	2	5	0	5	0	0	0	163	0	0	0	0	0	0	7	192	19	32.0	3.17
2017	2	10	0	12	1	4	0	12	0	0	0	123	1	0	0	0	1	2	2	158	23	15.8	2.3
2018	2	10	0	28	1	5	0	1	1	0	0	76	8	0	0	0	1	0	5	126	22	13.3	2.3
2019	2	10	0	14	5	7	1	2	0	0	0	476	1	0	0	0	0	0	3	509	19	50.9	1.9
2020	2	9	0	18	4	5	0	15	0	0	0	895	0	0	0	0	0	2	1	940	27	104	3.0
2021	2	15	0	25	12	29	1	53	2	0	2	7212	0	0	0	14	1	0	2	7354	117	490	7.8
ave10	2	9	0	17	3	4	0	8	1	0	0	267	2	0	0	0	0	1	5	307	24	32	2
%chg	-9	60		49	275	684	900	546	122		1900	2,605	-100			4,567	400	-100	-57	2,296	398	1416	216

Concord School - Concord, New Hampshire (ave for 2010,2012-2020, % change in 2021)

YR	DYS	HRS	BV	TV	OS	BE	NH	SS	CH	NG	RS	BW	RT	RL	GE	AK	M	PF	UR	TOT	XBWV	PH	XPH
2016	6	26	0	32	0	1	0	5	2	0	0	215	2	0	0	2	0	0	8	267	20	10.2	0.76
2017	6	24	0	41	2	0	0	1	0	0	0	19	1	0	0	2	0	0	6	72	12	3.0	0.5
2018	5	20	0	16	0	3	1	7	0	0	0	63	4	0	0	1	0	1	6	102	23	5.0	1.1
2019	6	28	0	17	2	3	0	1	0	0	0	86	7	0	0	0	0	0	4	120	17	4.4	0.6
2020	3	7	0	17	1	1	0	5	0	0	0	51	9	0	0	0	0	1	33	118	50	16.9	7.1
2021	5	24	0	32	3	0	0	4	0	0	0	120	10	0	0	0	0	0	8	177	25	7.3	1.0
ave10	6	20	0	23	1	1	0	3	1	0	0	60	5	0	0	1	0	0	14	110	27	6	2
%chg	-18	20		39	233	-100	-100	29	-100	-100	-100	99	104			-100		-100	-44	61	-6	18	-41

Putney Mountain - Putney, Vermont (ave for 2011-2020, % change in 2021)

YR	DYS	HRS	BV	TV	OS	BE	NH	SS	CH	NG	RS	BW	RT	RL	GE	AK	ML	PF	UR	TOT	XBWV	PH	XPH
2016	69	554	4	425	120	132	73	1385	101	46	30	6434	590	3	7	146	36	25	0	9557	2694	17	5
2017	71	562	2	460	139	151	51	1456	105	7	32	11728	428	1	5	181	45	32	0	14823	2633	26	5
2018	70	508	0	514	148	144	77	1840	147	23	43	12045	588	2	16	298	56	30	0	15971	3412	31	7
2019	71	583	2	331	95	83	59	1075	57	8	27	5721	393	0	6	164	48	22	0	8091	2037	14	3
2020	70	592	0	327	103	172	70	1255	72	15	44	5958	552	0	11	187	51	40	0	8857	2572	15	4
2021	72	590	2	935	161	206	71	1573	95	7	53	14668	573	1	11	211	48	34	0	18649	3044	32	5
ave10	69	519	1	373	148	108	67	1451	124	24	36	6394	517	2	9	193	46	31	0	9522	2754	18	5
%chg	5	14	150	151	9	92	7	8	-23	-70	48	129	11	-58	28	9	5	10	-100	96	11	72	-5

Region 42

Pack Monadnock - Peterborough, New Hampshire (ave for 2011-2020, % change in 2021)

YR	DYS	HRS	BV	TV	OS	BE	NH	SS	CH	NG	RS	BW	RT	RL	GE	AK	ML	PF	UR	TOT	XBWV	PH	XPH
2016	70	527	0	322	242	136	92	1126	163	48	117	10530	294	1	5	167	96	49	78	13466	2614	26	4.96
2017	72	515	0	324	219	163	82	1179	142	16	181	8744	341	2	7	166	106	64	68	11804	2736	23	5.31
2018	66	455	0	98	181	176	64	668	124	11	126	6756	246	2	22	171	58	31	108	8842	1988	19	4.37
2019	79	557	0	268	171	180	54	1027	105	9	181	7840	223	0	4	185	64	64	128	10503	2395	19	4.3
2020	74	558	0	172	162	185	108	1325	180	12	223	8815	293	0	5	257	143	30	122	12032	3045	22	5.46
2021	76	548	2	641	182	227	85	1291	157	13	223	6055	329	1	11	165	100	57	66	9605	2907	18	5.3
ave10	72	524	0	185	217	135	86	1163	143	28	146	9922	339	1	9	171	93	47	82	12767	2659	25	5
%chg	6	5		246	-16	68	-1	11	10	-53	53	-39	-3	11	22	-3	7	21	-20	-25	9	-29	0

Mount Watatic - Ashby, Massachusetts (ave for 2011-2020, % change in 2021)

YR	DYS	HRS	BV	TV	OS	BE	NH	SS	CH	NG	RS	BW	RT	RL	GE	AK	M	PF	UR	TOT	XBWV	PH	XPH
2016	14	92	0	168	75	51	7	157	24	0	1	3040	2	0	0	30	6	2	30	3593	385	39.2	4.2
2017	11	85	0	1	51	41	14	178	33	0	0	5039	0	0	0	68	22	1	33	5481	441	64.9	5.2
2018	12	84	1	11	52	52	8	176	33	0	4	3874	3	0	0	39	9	4	25	4291	405	50.9	4.8
2019	14	95	0	9	33	64	6	201	23	1	8	2069	2	0	0	46	13	1	10	2486	408	26.2	4.3
2020	18	125	0	48	74	103	8	267	55	0	5	5986	16	0	0	82	13	3	23	6683	649	53.6	5.2
2021	18	121	2	48	44	137	20	181	69	0	12	4790	17	0	1	76	33	6	40	5476	636	45.4	5.3
ave10	11	73	0	27	46	44	6	155	30	0	3	3822	5	0	0	35	12	2	19	4206	358	70	5
%chg	67	64		80	-4	213	213	17	128	-100	300	25	262			116	182	173	108	30	78	-35	13

Helderberg Escarpment - Voorheesville, New York (ave for 2011-2020, % change in 2021)

YR	DYS	HRS	BV	TV	OS	BE	NH	SS	CH	NG	RS	BW	RT	RL	GE	AK	ML	PF	UR	TOT	XBWV	PH	XPH
2016	13	115	0	0	15	12	2	7	4	0	0	652	5	0	0	8	0	0	38	743	91	6.5	0.8
2017	12	75	26	40	8	17	6	12	7	0	1	907	21	0	0	5	3	4	40	1097	124	15	1.7
2018	12	78	42	110	15	33	9	24	41	0	0	951	59	0	0	18	7	11	35	1357	254	18	3.3
2019	16	102	98	201	16	52	3	30	33	0	3	1181	112	0	1	16	9	23	137	1915	435	18	3.3
2020	11	68	50	175	8	50	12	38	39	0	0	2383	154	0	0	18	7	11	107	3052	444	45	6.5
2021	11	70	104	264	8	49	6	17	45	0	0	2946	140	0	0	18	2	4	34	3637	323	52	4.6
ave10	13	90	27	57	17	29	6	24	15	0	1	1659	40	0	0	12	4	7	56	13	13	13	12.5
%chg	-12	-22	292	364	-52	68	5	-29	210	-100	-100	78	251		-100	48	-51	-38	-40	-12	-12	-12	-12

Wachusett - Princeton, Massachusetts (ave for 2011-2020, % change in 2021)

YR	DYS	HRS	BV	TV	OS	BE	NH	SS	CH	NG	RS	BW	RT	RL	GE	AK	M	PF	UR	TOT	XBWV	PH	XPH
2016	42	261	3	215	166	163	17	451	106	0	18	6962	64	0	0	107	32	35	125	8465	1285	32	4.93
2017	57	328	1	293	144	117	23	322	121	1	14	10348	99	0	0	132	19	37	118	11789	1147	36	3.5
2018	47	258	6	267	100	135	17	281	132	0	13	5042	65	0	1	121	44	21	82	6327	1012	25	3.92
2019	64	391	7	404	133	148	10	359	114	0	12	2832	85	0	0	141	52	34	152	4484	1241	11	3.18
2020	73	433	14	783	129	156	45	427	160	0	93	6955	199	3	3	226	61	27	168	9451	1699	22	3.93
2021	73	435	0	948	170	232	28	406	166	0	57	4458	174	1	5	193	63	25	213	7139	1733	16	3.99
ave10	47	281	4	228	150	124	22	347	102	1	19	10531	66	1	1	119	32	26	106	11878	1115	45	4
%chg	56	55	-100	316	14	88	29	17	64	-100	205	-58	162	100	317	62	96	-3	101	-40	55	-63	1

Pinnacle Rock - Medford, Massachusetts (ave for 2011-2020, % change in 2021)

YR	DYS	HRS	BV	TV	OS	BE	NH	SS	CH	NG	RS	BW	RT	RL	GE	AK	M	PF	UR	TOT	XBWV	PH	XPH
2016	18	72	0	6	6	10	5	103	42	0	1	9	0	0	0	6	6	1	10	205	190	2.9	2.7
2017	20	97	0	2	9	7	9	95	29	0	1	0	2	0	0	6	1	4	19	184	182	1.9	1.9
2018	24	136	0	19	13	22	15	276	69	0	4	9	20	0	0	17	12	5	66	547	519	4.0	3.8
2019	18	96	0	5	5	18	1	22	9	0	1	0	25	0	0	3	3	3	10	105	100	1.1	1.0
2020	12	32	0	4	51	5	10	117	60	0	2	0	8	0	0	4	4	7	16	288	284	9.1	8.9
2021	34	214	0	18	50	14	11	46	28	1	4	6	6	0	0	10	8	5	17	224	200	1.0	0.9
ave10	18	80	0	7	14	9	5	105	31	0	1	3	11	0	0	7	5	3	19	220	210	3	3
%chg	86	166		157	270	63	108	-56	-10		186	82	-47		-100	35	78	56	-10	2	-5	-66	-68

Barre Falls - Barre, Massachusetts (ave for 2011-2020, % change in 2021)

YR	DYS	HRS	BV	TV	OS	BE	NH	SS	CH	NG	RS	BW	RT	RL	GE	AK	ML	PF	UR	TOT	XBWV	PH	XPH
2016	55	243	0	290	45	43	27	267	60	1	10	1123	145	0	0	36	22	8	49	2126	713	8.7	2.9
2017	54	256	2	334	39	52	8	192	63	1	16	2159	153	0	1	41	11	6	34	3112	617	12.2	2.4
2018	49	219	0	156	45	58	13	341	65	1	11	1134	148	0	4	55	20	4	35	2090	800	9.5	3.6
2019	31	160	0	88	31	22	4	120	22	0	2	295	23	0	2	18	8	4	19	658	275	4.1	1.7
2020	33	181	0	274	24	42	6	153	38	0	5	587	59	0	0	26	13	3	33	1263	402	7.0	2.2
2021	19	85	0	50	17	34	1	68	15	0	1	261	27	0	0	16	9	0	11	510	199	6.0	2.3
ave10	46	223	0	214	79	52	19	430	85	2	18	4201	155	0	2	70	20	9	37	5396	980	24	4
%chg	-59	-62	-100	-77	-79	-35	-95	-84	-82	-100	-95	-94	-83	-100	-100	-77	-56	-100	-70	-91	-80	-75	-45

Shatterack Mountain - Russell, Massachusetts (ave for 2011-2020, % change in 2021)

YR	DYS	HRS	BV	TV	OS	BE	NH	SS	CH	NG	RS	BW	RT	RL	GE	AK	ML	PF	UR	TOT	XBWV	PH	XPH
2016	39	190	0	491	46	15	8	299	38	3	33	1755	132	0	1	32	11	5	12	2882	636	15	3.34
2017	25	132	0	100	17	20	12	189	28	1	21	1904	58	0	0	34	11	2	5	2402	398	18	3.03
2018	33	175	0	336	38	54	15	321	51	0	38	3080	116	0	4	44	10	5	14	4126	710	24	4.06
2019	33	150	0	194	32	62	16	210	36	0	13	2565	6	0	2	61	13	4	9	3223	464	22	3.1
2020	30	161	0	256	17	40	10	210	41	0	23	2966	82	0	5	25	10	5	14	3704	482	23	2.99
2021	22	109	0	146	30	13	7	97	30	0	11	1173	5	0	0	21	4	2	17	1556	237	14	2.17
ave10	30	156	0	228	45	32	15	344	37	1	20	2957	77	0	2	44	12	7	15	3836	651	24	4
%chg	-28	-30		-36	-34	-59	-54	-72	-20	-100	-45	-60	-94		-100	-53	-66	-70	13	-59	-64	-41	-49

Blueberry Hill - Granville, Massachusetts (ave for 2010-2016, 2018-2020, % change in 2021)

YR	DYS	HRS	BV	TV	OS	BE	NH	SS	CH	NG	RS	BW	RT	RL	GE	AK	ML	PF	UR	TOT	XBWV	PH	XPH
2015	47	205	0	190	46	32	28	327	39	1	24	1694	87	0	5	111	13	4	7	2608	724	13	3.53
2016	9	44	0	59	3	5	2	12	8	0	3	3	17	0	1	8	0	0	2	123	61	2.8	1.38
2018	13	52	0	104	5	5	8	107	27	1	11	1108	58	0	0	28	8	2	14	1486	274	29	5.32
2019	1	7	0	0	1	3	0	14	2	0	0	485	0	0	0	2	0	0	2	509	24	73	3.43
2020	36	182	1	127	22	46	21	173	38	4	48	2456	111	0	1	108	25	2	17	3200	616	18	3.38
2021	35	160	0	618	23	9	14	180	30	2	22	966	27	1	1	82	14	6	18	2013	429	13	2.69
ave10	41	211	0	164	69	27	31	355	49	3	25	2499	142	0	2	141	15	5	20	3548	884	23	4
%chg	-14	-24	-100	277	-67	-67	-55	-49	-39	-35	-12	-61	-81	150	-57	-42	-7	15	-9	-43	-51	-44	-31

Booth Hill - West Hartland, Connecticut (ave for 2008-2017, % change in 2021)

YR	DYS	HRS	BV	TV	OS	BE	NH	SS	CH	NG	RS	BW	RT	RL	GE	AK	ML	PF	UR	TOT	XBWV	PH	XPH
2013	2	11	0	0	5	5	0	19	1	1	0	3526	0	0	0	2	2	1	0	3562	36	324	3.27
2014	2	9	0	4	2	3	0	6	0	1	0	1659	0	0	0	2	1	0	0	1678	15	197	1.76
2015	3	15	0	5	4	9	1	20	2	0	1	1454	0	0	0	3	2	1	0	1502	43	100	2.87
2016	3	18	0	21	11	17	0	18	0	1	0	414	0	0	0	3	0	0	0	485	50	27	2.78
2017	2	9	0	12	5	9	3	10	0	0	3	380	4	0	0	16	0	0	0	442	50	49	5.56
2021	2	11	0	11	2	3	1	1	1	0	2	212	4	0	0	0	0	0	0	237	14	22	1.27
ave10	2	11	0	5	6	8	1	18	1	1	0	1291	0	0	0	4	1	0	0	1334	38	135	4
%chg	0	4		125	-64	-63	13	-94	13	-100	350	-84	800		-100	-100	-100	-100		-82	-63	-84	-66

Region 41
Poquonock - Poquonock, Connecticut (ave for 8 years from 2008-2009, 2011-2012, 2017-2020, % change in 2021)

YR	DYS	HRS	BV	TV	OS	BE	NH	SS	CH	NG	RS	BW	RT	RL	GE	AK	ML	PF	UR	TOT	XBWV	PH	XPH
2012	8	19	0	0	2	0	0	0	0	0	0	107	0	0	0	1	1	0	0	111	4	6.0	0.2
2017	13	30	6	10	6	1	0	1	1	0	3	732	1	0	0	2	2	1	0	766	18	25.5	0.6
2018	33	133	7	25	11	7	2	9	9	0	2	51	32	0	3	7	3	3	5	176	93	1.3	0.7
2019	47	183	7	51	14	13	2	13	3	0	9	90	12	0	1	8	7	1	7	238	90	1.3	0.5
2020	64	203	13	73	17	17	5	13	8	0	6	616	29	0	2	6	5	2	5	817	115	4.0	0.6
2021	55	168	9	38	13	7	2	6	3	0	2	108	8	0	1	5	6	2	14	224	69	1.3	0.4
ave8	57	247	11	59	15	17	8	32	13	2	12	480	52	1	2	12	6	6	11	738	189	6	1
%chg	-4	-32	-14	-35	-15	-60	-75	-81	-77	-100	-83	-78	-84	-100	-58	-58	2	-64	23	-70	-63	-77	-40

Middle School - Torrington, Connecticut (ave for 2011-2020, % change in 2021)

YR	DYS	HRS	BV	TV	OS	BE	NH	SS	CH	NG	RS	BW	RT	RL	GE	AK	ML	PF	UR	TOT	XBWV	PH	XPH
2016	18	78	1	0	9	1	1	7	7	0	0	277	0	0	0	3	3	0	17	326	48	4.2	0.6
2017	13	52	6	0	6	7	1	5	6	0	0	890	0	0	0	6	0	0	5	932	36	18.1	0.7
2018	9	43	0	0	7	3	1	3	9	0	1	1419	0	0	0	6	1	0	12	1462	43	34.0	1.0
2019	11	37	0	0	1	2	0	4	3	0	0	247	1	0	0	3	0	1	3	265	18	7.1	0.5
2020	15	45	0	0	4	3	0	4	5	0	2	588	0	0	0	3	0	0	5	614	26	13.7	0.6
2021	7	16	0	1	1	2	2	0	2	0	0	50	0	0	0	0	0	0	6	64	13	3.9	0.8
ave10	15	58	2	1	10	6	1	13	8	0	1	2050	1	0	0	6	2	0	12	2112	60	34	1
%chg	-53	-72	-100	11	-90	-66	122	-100	-74	-100	-100	-98	-100		0	-100	-100	-100	-50	-97	-78	-88	-17

Johnnycake Mountain - Connecticut (ave for 2010-2018, 2020 % change in 2021)

YR	DYS	HRS	BV	TV	OS	BE	NH	SS	CH	NG	RS	BW	RT	RL	GE	AK	ML	PF	UR	TOT	XBWV	PH	XPH
2015	14	58	2	4	59	40	2	58	9	0	5	1430	0	0	2	49	1	3	2	1666	230	28.7	4.0
2016	15	66	35	109	48	49	2	56	42	0	5	1010	18	0	0	46	2	2	0	1424	270	21.7	4.1
2017	6	30	13	5	27	15	3	13	5	0	2	1144	4	0	0	9	0	0	0	1240	78	42.0	2.6
2018	4	26	4	44	21	20	5	33	19	0	0	1708	9	0	0	17	3	3	0	1886	130	72.5	5.0
2020	15	63	3	0	18	37	1	22	16	0	4	328	0	0	1	25	0	1	22	478	147	7.6	2.3
2021	3	8	3	16	7	10	1	0	1	0	2	39	5	0	0	0	0	0	14	98	40	11.9	4.8
ave10	10	45	9	24	43	31	4	56	13	0	2	2439	4	0	1	31	2	2	2	2661	189	66	5
%chg	-69	-82	-68	-32	-84	-67	-71	-100	-92	-100	11	-98	35		-100	-100	-100	-100	483	-96	-79	-82	4

Mohonk Preserve - New Paltz, New York (ave for 2009-2012, 2015-2020, % change in 2021)

YR	DYS	HRS	BV	TV	OS	BE	NH	SS	CH	NG	RS	BW	RT	RL	GE	AK	ML	PF	UR	TOT	XBWV	PH	XPH
2016	67	303	17	236	94	106	48	740	137	3	35	3776	250	0	1	74	32	33	16	5598	1569	18.5	5.2
2017	59	314	11	471	79	105	43	645	115	2	52	4059	305	1	7	50	28	20	19	6012	1471	19.2	4.7
2018	32	161	3	108	81	100	30	751	108	1	34	4453	170	0	3	78	29	15	6	5970	1406	37.1	8.7
2019	44	208	2	174	50	151	28	357	101	1	38	1030	92	0	1	104	22	23	13	2187	981	10.5	4.7
2020	30	176	33	317	54	97	47	320	67	0	26	2846	91	0	1	116	21	6	10	4052	856	23.0	4.9
2021	19	110	0	181	18	93	22	393	50	0	8	1552	30	0	1	67	6	2	9	2432	699	22.1	6.4
ave10	30	140	7	135	44	60	23	316	57	1	20	1961	98	0	2	50	15	10	15	2812	709	20	5
%chg	-36	-21	-100	34	-59	55	-3	24	-13	-100	-59	-21	-69	-100	-33	33	-60	-80	-40	-14	-1	11	30

Chestnut Hill - Litchfield, Connecticut (ave for 2011-2020, % change in 2021)

YR	DYS	HRS	BV	TV	OS	BE	NH	SS	CH	NG	RS	BW	RT	RL	GE	AK	ML	PF	UR	TOT	XBWV	PH	XPH
2016	19	83	0	0	18	36	2	59	5	0	0	1509	1	0	0	24	0	1	16	1671	162	20.1	1.9
2017	16	74	0	0	10	17	1	27	0	0	0	1631	0	0	0	14	1	0	3	1704	73	23.0	1.0
2018	9	40	0	0	6	17	1	47	6	0	0	2818	0	0	0	16	0	2	4	2917	99	73.4	2.5
2019	18	66	0	0	14	9	1	38	7	0	0	1792	0	0	0	7	1	0	3	1872	80	28.4	1.2
2020	16	47	0	0	12	20	1	28	11	0	0	2639	0	0	0	9	3	0	3	2726	87	57.9	1.8
2021	16	57	0	0	15	32	4	35	11	0	0	2343	0	0	0	12	1	2	11	2466	123	43.3	2.2
ave10	15	63	0	0	20	20	2	40	6	0	0	3439	3	0	0	11	1	0	8	3551	112	60	2
%chg	6	-9		-100	-23	57	122	-13	77	-100		-32	-100		-100	8	25	567	38	-31	10	-28	17

Botsford Hill - Bridgewater, Connecticut (ave for 2011-2020, % change in 2021)

YR	DYS	HRS	BV	TV	OS	BE	NH	SS	CH	NG	RS	BW	RT	RL	GE	AK	ML	PF	UR	TOT	XBWV	PH	XPH
2016	13	54	0	0	14	9	3	51	4	0	0	885	0	0	0	7	5	0	11	989	104	18.5	1.9
2017	11	44	0	0	19	12	2	60	4	0	0	1264	1	0	0	15	6	0	10	1393	129	32.0	3.0
2018	11	53	0	0	17	12	4	63	4	0	0	2571	0	0	0	10	1	0	9	2691	120	50.5	2.3
2019	14	49	0	0	13	29	0	55	2	0	0	2240	1	0	1	8	1	0	14	2364	124	48.0	2.5
2020	15	46	0	0	7	14	2	24	3	0	0	865	0	0	0	11	0	1	2	929	64	20.4	1.4
2021	15	54	0	0	16	17	2	30	7	0	0	645	0	0	0	6	2	1	18	744	99	14	1.85
ave10	14	59	0	0	24	16	3	81	7	0	0	2985	0	0	0	13	3	0	12	3144	160	49	3
%chg	6	-10			-34	6	-39	-63	3			-78	-100		-100	-52	-31	400	57	-76	-38	-71	-30

I-84 Overlook - Greenville, NY (ave for 2012, 2014-2020, % change in 2021)

YR	DYS	HRS	BV	TV	OS	BE	NH	SS	CH	NG	RS	BW	RT	RL	GE	AK	ML	PF	UR	TOT	XBWV	PH	XPH
2016	1	7	2	5	0	4	0	0	1	0	0	0	86	0	4	0	0	0	0	102	95	14.6	13.6
2017	5	23	9	9	0	23	1	19	6	1	13	0	297	0	10	0	0	1	0	389	371	17.3	16.5
2018	3	16	0	16	2	27	2	92	13	0	1	0	222	0	4	18	1	3	0	401	385	25.5	24.4
2019	2	9	0	2	0	16	3	7	0	0	4	0	179	0	1	0	0	0	1	213	211	23.0	22.8
2020	26	127	6	74	5	209	18	203	49	0	21	120	484	0	9	23	5	3	2	1231	1031	9.7	8.1
2021	33	186	56	339	45	168	17	211	69	0	80	1670	268	0	27	47	25	5	1	3029	964	16.3	5.2
ave8	6	27	2	14	1	39	3	40	9	0	5	15	172	0	5	5	1	1	1	313	282	14	13
%chg	474	599	2,535	2,365	5,043	327	467	423	700	-100	1500	11,033	55		484	817	2,757	400	100	869	242	16	-61

Bear Mountain - Fort Montgomery, New York (ave for 2011-2020, % change in 2021)

YR	DYS	HRS	BV	TV	OS	BE	NH	SS	CH	NG	RS	BW	RT	RL	GE	AK	ML	PF	UR	TOT	XBWV	PH	XPH
2016	63	338	0	0	46	142	5	141	27	1	6	333	40	0	4	35	7	11	11	809	476	2.4	1.4
2017	40	215	0	0	42	108	6	117	28	2	0	1828	9	0	0	23	2	11	13	2189	361	10.2	1.7
2018	45	238	0	0	55	66	8	374	56	0	16	1217	86	0	5	48	11	12	28	1982	765	8.3	3.2
2019	48	186	1	0	43	79	5	116	30	0	38	4051	63	0	0	28	5	14	13	4486	434	24.2	2.3
2020	37	158	0	63	35	71	7	150	36	0	13	442	51	1	3	44	8	8	10	942	437	6.0	2.8
2021	42	174	0	145	42	77	6	218	36	0	13	702	14	0	2	68	12	5	11	1351	504	7.8	2.9
ave10	54	286	0	6	48	81	8	236	33	1	15	1389	72	0	3	36	7	8	14	1958	563	8	2
%chg	-22	-39	-100	2202	-13	-4	-24	-8	11	-100	-13	-49	-80	-100	-33	89	62	-38	-21	-31	-10	-1	40

Mount Peter - Warwick, New York (ave for 2011-2020, % change in 2021)

YR	DYS	HRS	BV	TV	OS	BE	NH	SS	CH	NG	RS	BW	RT	RL	GE	AK	ML	PF	UR	TOT	XBWV	PH	XPH
2016	69	488	84	337	98	95	35	1104	94	0	104	5894	478	0	3	52	15	13	42	8448	2133	17.3	4.4
2017	74	480	96	320	111	85	26	841	121	1	122	6874	232	0	4	83	18	26	36	8996	1706	18.8	3.6
2018	66	419	79	504	134	112	35	1469	176	2	213	5071	508	0	6	159	15	23	24	8530	2876	20.4	6.9
2019	74	479	136	426	123	163	27	693	82	0	203	7360	443	0	9	85	8	14	28	9800	1878	20.5	3.9
2020	70	453	109	850	121	177	42	1048	85	0	149	3864	465	0	1	121	20	13	30	7095	2272	15.7	5.0
2021	70	473	77	1584	122	140	46	871	114	0	119	6769	113	0	4	125	8	11	17	10120	1690	21.4	3.6
ave10	71	455	99	375	131	110	38	1148	114	1	136	6711	434	0	5	121	19	17	43	9500	2315	21	5
%chg	-1	4	-22	322	-7	27	22	-24	0	-100	-12	1	-74		-20	3	-57	-33	-60	7	-27	2	-31

Chestnut Ridge - Bedford, New York (ave for 2011-2020, % change in 2021)

YR	DYS	HRS	BV	TV	OS	BE	NH	SS	CH	NG	RS	BW	RT	RL	GE	AK	ML	PF	UR	TOT	XBWV	PH	XPH
2016	100	670	64	1308	104	47	39	473	148	7	78	945	129	0	2	85	22	14	90	3555	1238	5.3	1.8
2017	84	589	29	3098	263	149	90	1270	373	1	494	2133	265	0	13	334	120	32	343	9007	3747	15.3	6.4
2018	84	578	86	3414	314	159	103	1932	346	2	272	4278	454	0	3	446	84	27	151	12071	4293	20.9	7.4
2019	89	632	29	2589	233	137	59	1414	248	1	439	3363	168	0	9	240	101	25	151	9206	3225	14.6	5.1
2020	87	640	41	3423	248	233	138	2123	473	0	802	3140	207	0	14	368	90	37	124	11462	4858	17.9	7.6
2021	89	665	59	3798	364	265	201	2759	616	0	555	2501	78	0	15	468	96	27	114	11917	5559	17.9	8.4
ave10	94	654	68	2783	303	124	98	1791	350	5	356	5762	318	0	10	322	63	28	180	12561	3948	19	6
%chg	-5	2	-13	36	20	114	104	54	76	-100	56	-57	-75	-100	58	45	52	-3	-37	-5	41	-7	37

Hook Mountain - Nyack, New York (ave for 2011-2020, % change in 2021)

YR	DYS	HRS	BV	TV	OS	BE	NH	SS	CH	NG	RS	BW	RT	RL	GE	AK	ML	PF	UR	TOT	XBWV	PH	XPH
2016	77	461	46	245	353	194	91	1424	207	19	165	2777	159	0	5	156	81	30	22	5974	2906	13.0	6.3
2017	72	412	55	124	236	190	69	1161	149	1	94	4952	55	0	3	196	65	59	6	7415	2284	18.0	5.6
2018	69	415	127	780	166	159	112	2337	204	5	439	3279	200	0	8	217	94	37	3	8167	3981	19.7	9.6
2019	64	362	36	232	133	119	35	799	132	0	54	873	22	0	1	139	21	24	8	2628	1487	7.3	4.1
2020	82	515	201	972	302	291	124	1357	223	1	390	4590	271	0	8	370	66	27	15	9209	3446	17.9	6.7
2021	77	482	180	1330	383	209	137	1800	350	0	337	1069	104	0	14	299	78	37	16	6343	3764	13.2	7.8
ave10	74	432	73	369	271	170	96	1641	189	4	203	4798	130	0	5	225	66	35	12	8289	3049	19	7
%chg	5	12	146	261	41	23	43	10	85	-100	66	-78	-20		159	33	18	7	33	-23	23	-32	10

Quaker Ridge - Greenwich, Connecticut (ave for 2011-2020, % change in 2021)

YR	DYS	HRS	BV	TV	OS	BE	NH	SS	CH	NG	RS	BW	RT	RL	GE	AK	ML	PF	UR	TOT	XBWV	PH	XPH
2016	98	733	24	673	461	159	104	1600	343	8	566	3484	197	0	7	284	75	28	62	8075	3894	11.0	5.3
2017	97	720	24	1743	321	172	86	1532	378	2	1006	3008	304	0	8	418	93	21	74	9191	4416	12.8	6.1
2018	96	674	62	1344	592	317	142	2456	489	4	648	9342	271	0	8	628	133	32	73	16541	5793	24.5	8.6
2019	96	695	53	1332	431	215	75	1535	306	0	370	4599	228	0	3	268	66	25	49	9557	3573	13.7	5.1
2020	93	641	39	2167	238	215	95	1771	312	1	602	6912	255	0	6	447	69	21	37	13187	4069	20.6	6.3
2021	90	689	78	1868	358	231	104	1721	422	0	635	1562	124	0	13	483	89	33	11	7732	4224	11.2	6.1
ave10	93	705	36	1311	480	204	130	2284	415	4	574	8314	277	0	9	430	92	29	85	14676	5015	21	7
%chg	-3	-2	119	42	-25	13	-20	-25	2	-100	11	-81	-55	-100	49	12	-4	14	-87	-47	-16	-48	-15

Purple Chickadee - Ringwood, New Jersey (ave for 2017-2020, % change in 2021)

YR	DYS	HRS	BV	TV	OS	BE	NH	SS	CH	NG	RS	BW	RT	RL	GE	AK	ML	PF	UR	TOT	XBWV	PH	XPH
2017	22	117	3	24	12	10	3	73	56	0	0	858	2	0	0	17	8	3	7	1076	191	9.2	1.6
2018	32	170	1	142	13	13	13	201	139	1	12	971	45	0	4	49	11	7	23	1645	531	9.7	3.1
2019	26	127	19	133	13	22	4	146	58	1	35	628	75	0	3	43	9	7	30	1226	446	9.6	3.5
2020	46	247	27	304	27	59	17	408	176	0	67	2937	107	0	1	89	24	15	80	4338	1070	17.6	4.3
2021	55	303	17	313	48	66	37	491	186	0	114	1759	58	0	6	115	21	14	70	3315	1226	11	4
ave4	32	165	13	151	16	26	9	207	107	1	29	1349	57	0	2	50	13	8	35	2071	560	12	3
%chg	75	83	36	108	195	154	300	137	73	-100	300	30	1		200	132	62	75	100	60	119	-5	29

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State Line - Alpine, New Jersey (ave for 2011-2020, % change in 2021)

YR	DYS	HRS	BV	TV	OS	BE	NH	SS	CH	NG	RS	BW	RT	RL	GE	AK	ML	PF	UR	TOT	XBWV	PH	XPH
2016	82	450	60	1311	856	160	74	1258	239	5	353	1010	539	1	1	227	61	61	106	6322	3941	14.0	8.8
2017	76	445	45	1628	448	219	71	818	266	2	286	1216	431	0	0	288	70	57	97	5942	3053	13.4	6.9
2018	76	467	26	3388	956	373	98	1794	572	1	388	3210	634	0	1	685	124	86	73	12409	5785	26.6	12.4
2019	75	446	65	2290	420	186	53	834	261	2	186	1368	491	0	1	359	56	46	43	6661	2938	14.9	6.6
2020	80	430	41	1780	278	190	66	897	267	1	355	1295	519	1	1	318	60	63	4	6136	3020	14.3	7.0
2021	82	497	66	3469	477	333	85	1426	368	0	337	917	281	0	3	489	71	72	10	8404	3952	16.9	8.0
ave10	73	438	65	1687	546	160	74	1433	283	3	262	2468	457	0	1	378	62	62	116	8057	3836	18	9
%chg	13	13	2	106	-13	109	14	0	30	-100	28	-63	-39	-100	131	30	15	17	-91	4	3	-8	-9

Lenoir Wildlife Sanctuary - Yonkers, New York (ave for 2008-2009, 2011-2015, 2018-2020, % change in 2021)

YR	DYS	HRS	BV	TV	OS	BE	NH	SS	CH	NG	RS	BW	RT	RL	GE	AK	ML	PF	UR	TOT	XBWV	PH	XPH
2014	23	63	12	223	40	58	8	120	19	0	30	61	75	0	0	25	2	0	2	675	379	10.8	6.1
2015	23	69	23	481	33	56	7	51	28	0	39	10	51	0	1	7	5	4	0	796	282	11.5	4.1
2018	25	95	39	621	211	114	18	267	61	0	45	3115	75	0	0	146	12	16	2	4742	967	50.2	10.2
2019	24	92	58	210	95	76	2	59	16	0	9	45	32	0	0	40	3	5	2	652	339	7.1	3.7
2020	46	176	119	419	163	118	4	136	38	1	70	375	135	0	1	52	7	18	2	1658	745	9.4	4.2
2021	22	98	33	477	126	75	2	91	20	0	13	271	10	0	0	78	10	3	0	1209	428	12.4	4.4
ave10	32	103	45	498	103	72	9	162	35	0	33	790	75	0	1	50	8	9	3	1892	560	19	6
%chg	-32	-6	-26	-4	23	4	-78	-44	-43	-100	-61	-66	-87		-100	58	25	-66	-100	-36	-24	-35	-21

Wildcat Ridge - Hibernia, New Jersey (ave for 2011-2020, % change in 2021)

YR	DYS	HRS	BV	TV	OS	BE	NH	SS	CH	NG	RS	BW	RT	RL	GE	AK	ML	PF	UR	TOT	XBWV	PH	XPH
2016	62	316	15	0	62	62	6	313	100	3	15	1264	60	0	1	32	9	2	0	1944	665	6.2	2.1
2017	40	189	26	0	40	23	3	129	43	0	2	502	20	0	1	14	7	6	16	832	304	4.4	1.6
2018	31	166	31	0	49	32	14	280	83	2	7	3031	43	0	0	24	9	3	38	3646	584	21.9	3.5
2019	47	252	27	0	40	30	5	284	114	1	16	840	104	0	2	32	8	10	37	1550	683	6.2	2.7
2020	48	235	50	206	21	50	7	118	132	1	8	1499	72	0	2	27	5	5	28	2231	476	9.5	2.0
2021	52	253	30	20	42	56	5	314	98	0	25	1911	48		2	35	20	6	36	2648	687	10.5	2.7
ave10	48	265	28	46	81	56	12	401	105	1	13	3505	57	0	1	46	10	6	17	4383	805	16	3
%chg	9	-4	8	-56	-48	-1	-58	-22	-7	-100	88	-45	-15		82	-23	108	2	117	-40	-15	-35	-9

Montclair Hawk Lookout - Montclair, New Jersey (ave for 2011-2020, % change in 2021)

YR	DYS	HRS	BV	TV	OS	BE	NH	SS	CH	NG	RS	BW	RT	RL	GE	AK	ML	PF	UR	TOT	XBWV	PH	XPH
2016	83	572	21	1044	182	102	31	671	167	2	174	1074	75	0	1	127	53	23	24	3771	1632	6.6	2.9
2017	88	670	61	2866	251	184	51	1187	321	1	418	2396	298	0	1	296	126	82	44	8583	3260	12.8	4.9
2018	91	600	80	1863	272	160	53	1090	340	2	347	5442	174	0	1	324	92	45	9	10294	2909	17.2	4.8
2019	84	619	99	491	125	102	13	362	185	1	103	1208	133	0	0	119	52	34	9	3036	1238	4.9	2.0
2020	83	569	193	2241	155	153	53	565	353	1	287	848	285	0	0	180	150	47	23	5534	2252	9.7	4.0
2021	84	597	85	1975	217	190	61	831	423	1	337	915	194	0	0	270	73	64	20	5657	2682	9.5	4.5
ave10	85	583	73	1487	280	144	49	1126	267	1	282	4043	206	0	2	267	93	46	41	8406	2803	15	5
%chg	-1	2	16	33	-22	32	26	-26	58	-9	19	-77	-6		-100	1	-22	39	-52	-33	-4	-36	-8

Scott's Mountain - MCR Harmony Twp., New Jersey (ave for 2011-2020, % change in 2021)

YR	DYS	HRS	BV	TV	OS	BE	NH	SS	CH	NG	RS	BW	RT	RL	GE	AK	ML	PF	UR	TOT	XBWV	PH	XPH
2016	88	604	0	0	148	240	80	1168	158	10	96	10431	586	1	8	97	43	40	116	13222	2791	21.9	4.6
2017	89	624	0	0	169	274	81	1460	242	13	228	6786	477	1	13	167	54	61	96	10123	3337	16.2	5.3
2018	87	582	0	0	217	259	72	2018	273	11	152	8466	598	0	15	195	58	50	114	12498	4032	21.5	6.9
2019	91	599	0	0	182	244	72	967	177	8	257	4966	467	0	14	121	50	43	91	7659	2693	12.8	4.5
2020	90	592	0	0	196	255	92	1579	229	8	394	4893	749	1	28	191	63	47	133	8858	3965	15.0	6.7
2021	90	620	0	0	137	313	79	1544	185	4	210	7747	415	0	17	209	62	37	82	11041	3294	17.8	5.3
ave10	88	591	0	0	216	240	94	1784	222	9	192	10237	668	0	15	181	64	43	123	14088	3851	24	7
%chg	3	5			-37	30	-16	-13	-17	-57	9	-24	-38	-100	13	15	-3	-13	-33	-22	187	-26	-19

Washington Valley - Martinsville, New Jersey (ave for 2017-2020, % change in 2021)

YR	DYS	HRS	BV	TV	OS	BE	NH	SS	CH	NG	RS	BW	RT	RL	GE	AK	ML	PF	UR	TOT	XBWV	PH	XPH
2017	33	172	0	108	41	94	17	427	52	0	154	1224	63	1	5	152	35	6	0	2379	1047	13.8	6.1
2018	37	200	4	33	86	155	60	1105	198	2	249	3188	99	0	4	304	82	10	0	5579	2354	28.0	11.8
2019	43	205	107	125	92	155	23	302	143	0	163	933	90	0	2	161	62	1	1	2360	1195	11.5	5.8
2020	48	233	0	70	116	178	40	863	142	0	210	5132	158	0	1	565	113	26	1	7615	2413	32.8	10.4
2021	31	124	80	541	38	120	41	582	104	0	117	1080	30	1	2	209	81	11	3	3040	1339	24.5	10.8
ave4	40	202	28	84	84	146	35	674	134	1	194	2619	103	0	3	296	73	11	1	4483	1752	22	9
%chg	-23	-39	188	544	-55	-18	17	-14	-22	-100	-40	-59	-71	300	-33	-29	11	2	500	-32	-24	14	27

Fort Tilden - Queens, New York (ave for 2018-2020, % change in 2021)

YR	DYS	HRS	BV	TV	OS	BE	NH	SS	CH	NG	RS	BW	RT	RL	GE	AK	ML	PF	UR	TOT	XBWV	PH	XPH
2018	7	59	0	17	30	6	103	708	105	0	5	12	9	0	0	1210	332	16	0	2553	2524	43.3	42.8
2019	15	95	0	10	232	8	33	149	51	0	3	7	14	0	0	401	242	20	0	1170	1153	12.3	12.1
2020	20	134	0	4	454	16	95	261	53	0	11	7	14	0	0	728	230	29	0	1902	1891	14.2	14.1
2021	32	198	1	7	879	13	160	257	63	0	5	4	11	0	0	836	295	32	3	2566	2554	13	12.9
ave3	14	96	0	10	239	10	77	373	70	0	6	9	12	0	0	780	268	22	0	1875	1856	23	23
%chg	129	106		-32	268	30	108	-31	-10		-21	-54	-11			7	10	48		37	38	-44	-44

Coastal Region

Lighthouse Point - New Haven, Connecticut (ave for 2011-2020, % change in 2021)

YR	DYS	HRS	BV	TV	OS	BE	NH	SS	CH	NG	RS	BW	RT	RL	GE	AK	ML	PF	UR	TOT	XBWV	PH	XPH
2016	96	611	10	496	764	234	294	2434	1013	7	155	213	433	1	3	460	305	148	344	7314	6595	12.0	10.8
2017	91	588	12	527	1084	181	263	2136	1080	2	298	441	243	2	0	1070	277	124	377	8120	7140	13.8	12.1
2018	103	631	4	239	1630	342	439	3634	2272	3	243	225	409	1	3	1717	475	215	589	12440	11972	19.7	19.0
2019	96	614	0	337	1035	232	183	1658	1509	4	159	208	291	0	2	657	229	99	295	6899	6354	11.2	10.3
2020	97	634	43	524	932	229	255	2321	1127	0	209	190	321	0	2	963	275	139	388	7918	7161	12.5	11.3
2021	92	586	16	360	1148	323	263	1250	1007	0	130	5378	239	0	6	1180	253	129	230	11916	6162	20.3	10.5
ave10	95	628	15	462	1028	219	301	3012	1323	4	190	965	389	1	4	975	310	162	401	9759	8318	16	13
%chg	-3	-7	9	-22	12	48	-13	-58	-24	-100	-32	457	-38	-100	62	21	-18	-20	-43	22	-26	30	-21

Fire Island - Islip, New York (ave for 2011-2020, % change in 2021)

YR	DYS	HRS	BV	TV	OS	BE	NH	SS	CH	NG	RS	BW	RT	RL	GE	AK	ML	PF	UR	TOT	XBWV	PH	XPH
2016	75	475	2	1	349	10	159	195	55	2	0	0	6	0	0	300	1016	121	8	2224	2221	4.7	4.7
2017	74	457	0	0	836	11	144	92	52	0	1	0	1	1	0	712	1177	216	6	3249	3249	7.1	7.1
2018	75	452	0	0	496	14	249	480	84	0	0	0	1	0	0	985	1590	172	3	4074	4074	9.0	9.0
2019	71	414	0	0	418	8	118	130	71	0	0	0	3	0	0	423	884	103	4	2162	2162	5.2	5.2
2020	77	416	0	0	685	14	182	166	44	1	1	0	4	0	0	1155	1099	147	9	3507	3507	8.4	8.4
2021	76	456	0	0	501	8	232	106	32	0	0	0	0	0	1	880	886	116	4	2767	2767	6.1	6.1
ave10	69	429	0	0	467	8	164	215	51	0	0	0	2.4	0	0	647	1137	155	7	2856	2855	7	7
%chg	10	6	-100	-100	7	1	41	-51	-37	-100	-100	-100	-100	-100	900	36	-22	-25	-42	-3	-3	-10	-10

Thoughts on Wing Shape, Flight Style and Migration of North American Raptors

Drew Panko

Every year a paper or two is published in the Ornithological literature that captures my interest and has implications for all bird watchers and hawk watchers in particular. This year there were several and I'd like to share them with you. But first I will summarize my own view of raptor flight styles and their functions by looking at a few examples.

How and why do hawks fly the way they do? Each species has its typical pattern. Some soar on flat wings, some with a dihedral, some with a lot of flapping, some with very little. What determines the way that each species flies? Is it purpose—hunting, migrating, defending territory, pair bonding etc.? Or is it the environment—winds, landscape, topography, time of day, temperature, fog, clouds, etc.? Evolution has acted over the eons to select those flight styles for each species that enable that species to succeed and produce young for the next generation.

In my opinion (with no evidence) hunting is the primary determinate of the preferred flying style for a particular species. Being able to spot, capture and kill prey is critical for survival and even more important during the nesting season when (usually) the male must do all the hunting for himself and for the brooding female and the young when they hatch.

The size of the raptor and its prey is critical. A large hawk needs large prey and larger prey is present in lower density than smaller prey. Just locating the prey over a large area is a problem that is solved by flying, and it is an advantage if the flying consumes only a small amount of energy. This leads to raptors using low energy flight, such as gliding, soaring and hunting from perch, with a minimum of flapping to locate prey. The capture of prey and the habitat that it occupies may require particular flying techniques. To capture other birds in the air requires fast flying. To capture mammals in the open on the ground, the raptor's flying speed will easily exceed the prey's running speed, so is not as important as a stealth approach and being very maneuverable, to be able to follow dashing and dodging prey. In forested habitats, capturing mammals does not require sustained high-speed flight, but maneuverable flight is even more important, as hazards to flight, trees, bushes and branches must be avoided.

Migration is much less demanding on efficient flight strategies. It can be initiated sooner, or the distance shortened, or the migration time extended if more hunting time during migration is needed.

Some examples may illustrate these generalities:

Peregrines: open country birds, hunt mainly from perch.

When a flying bird is spotted, a Peregrine outflies it with rapid tail chase, or by gaining an altitude advantage and pouncing. It usually uses flapping flight, but it also uses extended glides, and will soar in rising air. A great video showing this is a Peregrine attacking a Bald Eagle at Stateline Hawk Watch: http://www.battaly.com/video/BE_PG_aerial_show/BE_PG_action.m4v



There are numerous examples of Peregrine flight from Mt Tom in this long video about a breeding pair: <https://www.youtube.com/watch?v=RNHGTTrHul1Q>

Peregrines can and will capture prey and consume it while flying. Some populations undertake very long migrations often with extended periods overwater. Overwater flights are often taken for hunting (prey has nowhere to hide), as well as for migration. When overwater, extended periods of flapping are required. Peregrine is a consummate flapper with soaring used to survey and defend territory and to migrate over land. Flapping is used for extended high-speed prey chases and long overwater flights.

Sharp-shinned Hawk: hunts birds in the forest, often in the canopy.

Sharpshins rely on surprise and bursts of high-speed flight to catch prey. They sometimes use low-level flight and natural or man-made obstructions for cover when approaching prey. As the Peregrine of the forest, the Sharpie tail-chases other birds for a living, but unlike the peregrine does it in the forest environment. The prey here are quickly caught, or disappear into the abundant cover provided by the forest. Flight stamina or extended high speed flight is not required in hunting.

Broad-winged Hawk: hunts small mammals and amphibians from perch in forested habitats.

This hunting technique has no great selection pressure on flying. Broadwings' flight style is likely specialized for long distance migration – soaring. Broadwings are the Sharpies of the forest that prey on non-flying prey. They do not need high speed flight or stamina. Short drops onto slow moving prey taken unaware is how they make their living. This allows them to specialize in soaring for long migration distances.

Turkey Vultures: searches by soaring at low speed, detecting carrion by odor and sight.

Vultures have to search large areas for carrion. Their solution is to soar at reasonable height and speed in order to detect food, often by smell. Soaring is the type of flight with the lowest energy expenditure and quickly covers long distances. To keep the energy expenditure low, the bird should be large, because large birds expend less energy per unit time than small birds. The low energy cost of soaring enables large birds to cover large distances, not possible with flapping flight. Indeed, the life history traits of large raptors such as Eagles, Buteos, and Vultures are possible only because of soaring. Having an anatomy specialized for soaring also allows for easy migration. The pronounced dihedral is an adaption for stable low-speed flight. And the slow speed flight is required for the detection of the prey below. This is also very evident with Northern Harriers in low-level low speed hunting flight.

It seems to me that some combination of wing shape (wide/narrow and pointed or rounded) and wing loading (raptor mass divided by total wing area) would be the most important determinants of how a raptor would fly. Evolution would facilitate these physical characteristics to optimize what prey the raptor specialized in and the best method of finding and capturing the prey.

Using these examples, we can generalize to other species.

All the **accipiters** mainly hunt birds. As the accipiters increase in size from Sharpie to Goshawk, the prey increase in size as well. Sharpies and Goshawks hunt in heavily wooded areas and Coopers, although they nest in wooded areas tend to hunt in more open areas, particularly edges of vegetated areas. Therefore, the flight style and wing shape is very similar in all three species. The amount of soaring they do increases from Sharpie to Goshawk.

All the **falcons** mainly hunt birds as the peregrine does, with prey size increasing from Kestrel to Gyr. The Merlin hunts just like a Peregrine but even faster and more often. It will often use vegetation to hide its approach to prey it may not be able to see. And, using its air-speed, it breaks into a rising glide and, clearing the obstacle uses a descending glide to regain speed and pounce. It seems to be unable to resist attacking anything in the air within about 50 feet of it. If it is big enough to see...a dragonfly or butterfly, it will attack. If it is too large to be prey like an Osprey or Peregrine, it will still attack. Once, down on Fire Island, while I was standing in vegetation just taller than my head, and with Yellow-

rumped Warblers flying past by the hundreds, I saw a Merlin barreling in at top speed aiming at a Yellow-rump. Perfectly gauging its flight, the Merlin adjusted its height and hit it. But it didn't sink its talons into the little warbler, it balled its talons and, striking upwards, hit one wing of the warbler and sent it tumbling back down into the vegetation. I was totally taken back by this behavior until I recalled that the Merlin had a bulging crop and likely couldn't eat another mouthful. But it couldn't let the warbler fly in its air space either, and just knocked it out of the sky.

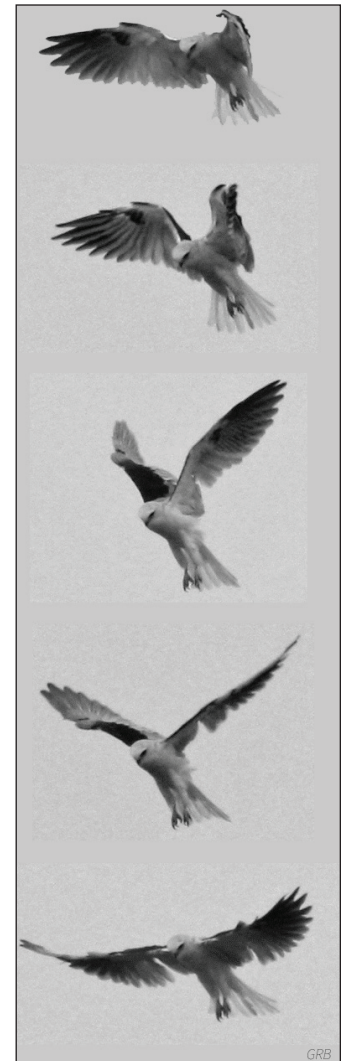
While both Merlins and Peregrines often fly fast in horizontal flapping flight, I think the Merlin's average flight speed is higher than that of the Peregrine's. I was in phragmites about 6 feet high at Jamaica Bay and a Peregrine came bursting by just 10 feet over my head in high-speed, flapping, horizontal flight. Again, I was temporarily taken aback until, not 20 feet behind the Peregrine was a Merlin flapping at top speed, tail-chasing the Peregrine! The Peregrine may be the master of the stoop and the fastest bird in the air during one. But the top dog in horizontal flapping flight in my book is the Merlin.

The Kestrel deviates from the other falcons in several important ways. Insects are important prey in the warmer seasons. They also generally catch prey on the ground instead of in flight from perch and they commonly hover.

Hovering can be done in two ways, flapping and non-flapping. Kestrels use flapping hover most often into the wind or still air to locate prey. They usually locate prey on the ground from perch although they will often take flying butterflies and dragonflies when they are encountered by chance in flight. And usually, if they are migrating, also eat them in flight. Often the hover is used to relocate prey spotted from perch but lost by the time the Kestrel gets to pouncing position. The higher use of flap-hovering form of flight by Kestrels seems to me to indicate a lighter wing loading compared to other falcons. A Kestrel flap-hovering is seen 25 seconds into a slide show, mostly of watchers at Fire Island. (There is also Raven attacking a Cooper's Hawk at 1:40 into the same video.)

http://www.battaly.com/fire/20th/lunch/2016/slideShow_A_E.mp4

Gyrfalcons, Red-tails and Rough-legs use flap-hover on rare occasions. A most memorable memory I have is a Bald Eagle coming over a flock of hundreds of American Coots and, as they panicked below him, he (she) tried to hover with flapping and while looking down, try to pick out one for dinner...it failed. Non-flapping hover (often referred to as 'sky-hooking' is commonly used by Red-tails. <https://birdsoftheworld.org/bow/species/rethaw/cur/foodhabits>



White-tailed Kite in hover flight at Stratford Point, CT

Essentially, I think, hovering is a strategy dependent on winds. They could be using both the horizontal and any vertical component of the wind to provide lift, and adjust their lift to maintain their height by increasing and reducing their wing area and keep their position by adjusting their drag, often with their tail and body orientation. Their visual attention is directed to the ground below, suggesting that they are just using the air currents as a perch to search the ground below.

Trudy has a wonderful video on her site showing a RT hovering and then descending on prey: http://www.battaly.com/hook/video/RT_hover_drop_skinny.mp4

It clearly shows how the RT was supported by rising air, and then falls by reducing wing area. And while you are there check out the use of the glide to attack our owl decoy at Hook: http://battaly.com/hook/video/RTaction/RT_action_Hook_slomoUpClose_720.mp4

But there is a weakness with my theories. It doesn't explain some pointed-wing birds that mainly soar. I'm thinking of Swallow-tailed Kites, and the videos that show them soaring. (<https://birdsoftheworld.org/bow/species/swtkit/cur/introduction> and <http://www.battaly.com/trip/2015Florida>)

It is also true for Magnificent Frigatebird (almost a raptor) and they do it mostly over water (<https://birdsoftheworld.org/bow/species/magfri/cur/introduction> and <http://www.birdsongid.com/video/Frigatebird>) And, I'm sure there are others that I've missed.

We could continue with more examples but let's take a look at some of the recent papers.

First, "Energy Economy in Flight" a review article in *Current Biology* by Emily L.C. Shepard, et al. <https://www.cell.com/action/showPdf?pii=S0960-9822%2822%2900226-3>

Dr. Shepard summarizes the results of recent studies on soaring in all types of birds, including results of attaching data loggers to birds making it possible to track their flight. In her words: "Animal-attached loggers can reconstruct flight paths with subsecond resolution, as well as record wingbeat frequency and amplitude, which relate to flight costs. This is shedding new light on the energy in the air, how animals exploit it, and how this in turn shapes their flight costs and movement decisions". It is exciting to read this research and how it was done, but it has been obvious for a long time that soaring is a very energy efficient way for a raptor to gain altitude and travel long distances with very low energy expenditure. What is very important is that she points out why there is a big difference in the importance of soaring for large birds compared with small ones. Again, in her words: "The power requirements for flapping flight increase steeply with body mass, whereas gliding appears to be about three times the basal costs irrespective of bird size. What's more, large birds have low mass-specific basal costs. As a result, while starlings may achieve power savings of 40% by switching from flapping to gliding flight, those savings will be more like 90% for condors. This explains why the use of soaring flight tends to increase with bird body mass, with ospreys and sparrowhawks flapping 25–40% of the time on migration, compared with only 5% in larger eagles and vultures."

This translates to the commonly observed phenomenon of small raptors moving long distances by flapping while larger raptors use soaring. This paper makes the case, with very interesting new data, that larger birds soar more, and soaring is an energy efficient way to travel. While none of its findings are new or unexpected, it does enhance our understanding with numerical data.

Watching kestrels hunt and migrate along the shore, there is only one place that they regularly soar. This is very near the end of the barrier beach where a large dune stands out and will cause rising air when hit by wind. The kestrels are faced with a decision when they come to the end

of Fire Island. They can fly out over the ocean or turn north and take the shortest path to Jones Beach, a parallel barrier beach. Now, Merlins and Peregrines just head out overwater without missing a wing beat. But the kestrels seek out the dune and spend a significant amount of time circle soaring to gain altitude before flying the shortest, direct route to Jones Beach. They have been flap-flying at low altitude for many miles along Fire Island, and will resume the same once they are on Jones Beach. Why the circle soaring to gain altitude? The first consideration is that they do not want to cross a significant body of water—likely because of the possibility of gull predation. Now one gull doesn't have much chance of taking a kestrel or sharpie, but over the water, a group of gulls can cooperate and, by repeatedly diving on a small raptor, drive it lower and lower until it hits the water, and then they pounce on it. The kestrels (and sharpies) counter this by soaring and gaining altitude over the dune before crossing overwater.

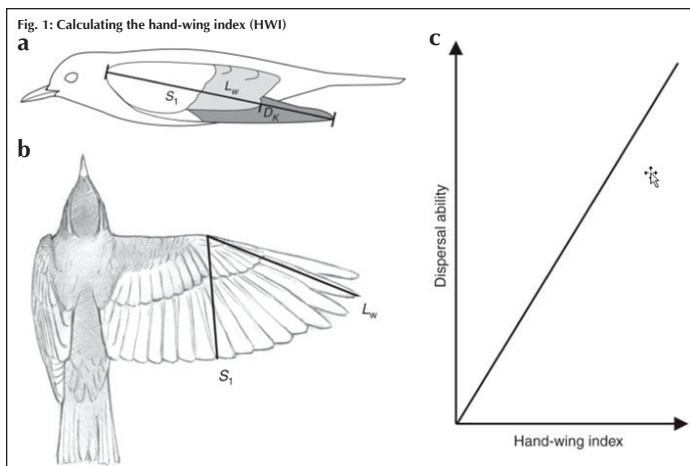
The soaring provides them with altitude and at little energy expenditure. Therefore, they will be fresh and rested when finally deciding to undertake the overwater flight. The altitude is very useful, it provides good visibility of the path to be taken and whether and where any gulls are. In addition, the altitude provides a cushion if they are set upon while making the crossing. And finally, the altitude can be traded for speed to outrun any attacking gulls. I can't recall seeing any larger raptors, Merlins, Peregrines, Harriers or Osprey, soaring before going overwater.

Using these examples, we can speculate on the origins of their preferred flight style and their wing size and shape. Another article was published in 2020 that contributes to this: "Ecological drivers of global gradients in avian dispersal inferred from wing morphology" Catherine Sheard, et al, available at <https://www.nature.com/articles/s41467-020-16313-6>

I have had an interest in wing morphology since my earliest days as a hawk watcher. The shape of a hawk's wing seems to correlate with many characteristics of the species. The shape of falcon wings is different from the shape of eagle and buteo wings, and their manner of flight is different as well. Many times, I have read in the popular bird literature that the narrow pointed wing of falcons is an evolutionary adaptation for fast flight, and broad rounded wings are an adaption for soaring. But I've never seen scientific evidence for this. Sheard proposes something new to me, the hand-wing index, HWI, and I hoped that this would be the key for understanding wing shape and its relation to flight style.

Sheard et al, goes a step further, from her abstract: "Here we present a global dataset of avian hand-wing index (HWI), an estimate of wing shape widely adopted as a proxy for dispersal ability in birds. We show that HWI is correlated with geography and ecology across 10,338 (>99%) species, increasing at higher latitudes and with migration, and decreasing with territoriality. After controlling for these effects, the strongest predictor of HWI is temperature variability (seasonality), with secondary effects of diet and habitat type. Finally, we also show that HWI is a strong predictor of geographical range size. Our analyses reveal a prominent latitudinal gradient in HWI shaped by a combination of environmental and behavioural factors, and also provide a global index of avian dispersal ability for use in community ecology, macroecology, and macroevolution." I was very excited to read this and I hoped she would provide the science we needed to explain which birds soar on the basis of wing shape. However, I was disappointed, as I think her conclusions not useful for understanding my questions about the flight styles and wing shape of North American raptors. So let us take a closer look at her methods and findings.

A visual depiction of the measurements for hand-wing index (HWI) are shown in Fig. 1 (taken directly from the article). Using the variables in the diagram, $HWI = D/L \times 100$.



a Diagram showing linear measurements used to calculate HWI taken on a standard museum study skin (secondary feathers shown in pale grey; primary feathers in dark grey). Wing length (L_w) is the distance from carpal joint to the tip of the longest primary feather; secondary length (S_1) is the distance from carpal joint to the tip of the first secondary feather; Kipp's distance (DK) is the difference between L_w and S_1 . **b** Open wing of a passerine bird showing how L_w and S_1 are related to the wing's span and width, and hence to its aspect ratio. **c** Because it is correlated with the aspect ratio, HWI is in theory positively associated with flight efficiency and key aspects of dispersal ability, including dispersal distance and gap-crossing ability.

It is an index obtained by dividing the distance between the tip of the first secondary feather and the tip of the longest primary feather by the length of the wing chord (distance from the wrist joint to the longest primary) and multiplying by 100.

In this paper they measured the HWI for every species they could locate in museums... a total of more than 9,900 different species! Certainly, a whole lot of work and a great achievement!

Notice also that the graph of dispersal ability and Hand-wing Index above is not based on data. I do not know what it is based on, but the best I can come up with is that it is purely hypothetical.

Luckily, we need only to concern ourselves with North American (N. Am.) Raptors. I took all their data, separated out the N. Am. raptors, added common names, and included it as Fig 2, below. I also posted the Excel file at: <http://www.battaly.com/nehw/reports/panko/HWI-NAraptors.xlsx>

Note that I reduced the number of decimal places given in the table, since no one can measure the wing of a bird to nine or ten significant figures. Also, she notes that most species were represented by measurements on only 4 individuals of that species with no separation by sex or sub-species.

Sheard states, "Finally, we also show that HWI is a strong predictor of geographical range size". A quick check of HWI and range on the table for some selected species is not encouraging. Black Vulture (HWI = 14.3) has a very low HWI and a moderate range, while Mississippi Kite (HWI = 53.6), with a very large HWI, has a range less than a third of the BV. Peregrine and Prairie Falcon with similar HWIs (55.4 & 50.5) have very different ranges (6250 and 390). Further confounding is a comparison of two species with similar ranges but different migratory patterns. Osprey (range = 4156) undergoes large migration movements and Golden Eagle (range = 4098) stays within most of its range year-round. We know that statistical relationships describe general patterns and individual examples may not quite fit that pattern. But, for me, having so many raptor examples

Hawk Species	HWI	n	Mass (log)	Range	Hawk Species	HWI	n	Mass (log)	Range
NEW WORLD VULTURES					BUTEOS & ALLIES				
Black Vulture	14.3	4	3.27	1872	Grey Hawk	Not Available			
Turkey Vulture	26.9	5	3.18	2566	Common Black Hawk	30.7	4	2.99	288
Calif Condor	41.1	4	3.93	8	Harris's Hawk	30.8	4	2.93	691
					Red-shouldered Hawk	33.4	4	2.78	416
OSPREY					Broad-winged Hawk	36.9	4	2.66	518
Osprey	42.2	4	3.17	4156	Swainson's Hawk	46.6	4	2.98	1177
					White-tailed Hawk	34.8	4	2.95	953
KITES					Zone-tailed Hawk	40.3	3	2.87	698
Swallow-tailed Kite	46.9	4	2.62	1236	Red-tailed Hawk	34.1	4	3.04	1507
Mississippi Kite	53.6	4	2.44	506	Ferruginous Hawk	41.3	4	3.16	286
Hook-billed Kite	21	5	2.46	995	Rough-legged Hawk	41.8	4	2.98	1086
White-tailed Kite	41.6	4	2.54	1035					
Snail Kite	39.1	5	2.56	1107					
					AQUILA EAGLES				
SEA EAGLES					Golden Eagle	37	4	3.63	4098
Bald Eagle	42.7	4	3.46	1077					
					FALCONIDAE				
HARRIER					Crested Caracara	23.7	#	3.03	807
Northern Harrier	44.5	4	2.59	3107	American Kestrel	43.7	4	2.06	2438
					Merlin	48.9	4	2.28	2842
ACCIPITERS					Peregrine Falcon	55.4	4	2.88	6250
Sharp-shinned Hawk	32.5	4	2.12	1286	Prairie Falcon	50.5	4	2.85	390
Cooper's Hawk	32.3	4	2.63	867	Gyr Falcon	47.5	4	3.16	1452
Northern Goshawk	36.5	4	2.94	3029	Aplomado	44.6	5	2.53	1208

Table 1: A small portion of Sheard's table available in full from same web source as her paper. HWI and body Mass (log) have been rounded off to 3 figures, she gives no units for Mass or Range numbers. "n" stands for sample size. Temperature, precipitation, prey type, migration, etc. on her original table are not included here.

Fig. 4: Predictors of Hand-Wing Index (HWI) in Birds (n-9273 species)

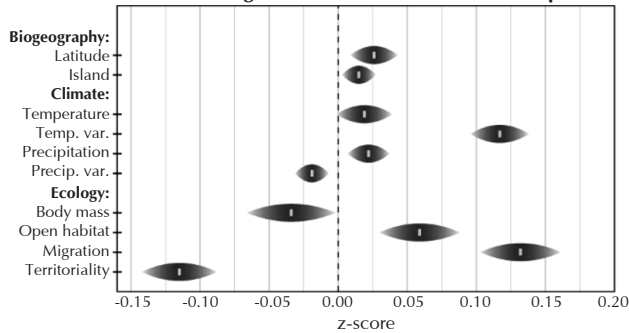


Fig. 4: Shown are z-scores and 95% credible intervals (CI) computed with Bayesian phylogenetic mixed models; the dashed line represents a coefficient of 0. High z-score indicates positive association with HWI; low z-score indicates negative association with HWI. Climatic variables are calculated for each $1^\circ \times 1^\circ$ grid cell of geographical range and averaged. Temperature = annual mean temperature, Temp. Var. = variation in monthly temperature values over a year (standard deviation), Precipitation = annual precipitation, Precip.Var. = variation in monthly precipitation values over a year (coefficient of variance), Open Habitat = grasslands, deserts, coasts, oceans. Dietary categories are omitted for ease of interpretation. See Supplementary Table 1 for more information.

that do not seem to fit the generality certainly detracts from her statement that “HWI is a strong predictor of geographical range size.”

Her claimed results are summed up in Fig 4. (There is no Fig 3—I am using her numbering for figures to make it easier if you’d like to go to her paper and read it.)

I am not qualified to evaluate her use of statistics or attest to its validity because I have no background or experience with “Bayesian phylogenetic mixed model” statistics. But if we assume that she has done and interpreted the statistics properly, she sums up her findings for all birds, not just raptors:

- 1) A bird’s HWI increases (more pointed wing) as the temperature variation in its habitat increases.
- 2) A bird’s HWI increases (more pointed wing) as its migration distance increases.
- 3) A bird’s HWI decreases (more rounded wing) as its territoriality increases.
- 4) She also repeatedly refers to the “HWI, a standard index of dispersal ability in birds”, yet states “The extent to which HWI is associated with average dispersal distance for each species requires further empirical testing...”

A very important aspect of this paper is that nowhere is there a discussion of wing-span, wing width, inner wing length and/or width, wing-loading or aspect ratio of wings. My interpretation is that the authors do not consider them important determinants in the flight of birds. And perhaps they are correct when you are lumping all birds together. But I think something is missing when you leave them out when considering how raptors fly. I am willing to concede that HWI may be the most important factor in speed of flapping flight but surely wing area and wing-loading are important factors in soaring flight. I don’t have a source for wing area of raptors. If you know of a source, please point me to it. When you compare the HWI of two birds that spend the majority of time in the air soaring, the California Condor (HWI = 41.0) and BV (HWI = 14.3), it’s hard to believe that the HWI can be useful in describing wing characteristics of soaring birds. Likewise, two other birds with similar HWI’s have very different modes of flight, the ML (HWI = 48.9), a high-speed flapper, and Swallow-tailed Kite (HWI = 46.9),

a frequent soarer. For the flight style of the Swallow-tailed Kite, see: <https://macaulaylibrary.org/asset/452886>

<https://www.youtube.com/watch?v=6txk9MGVBCY>

I have to conclude that the HWI is not the way to understand a raptor’s flight style.

I do not find this surprising, since the HWI is purely a gross indicator of the shape of the outer wing of a bird. I expect that other measures, such as wing area, aspect ratio and wing-loading, are better predictors of flight style. And I’d love to have the numbers for these variables to play with—without going to museum collections and doing the measurements myself.

But the huge data base Dr. Sheard supplies is a great accomplishment and may be useful in a different context.

So, perhaps the HWI does not give us the help we need to understand raptor flight. But two references given in her paper are much more promising.

1. Lockwood, R., Swaddle, J. P. and Rayner, J. M. V. Avian wingtip shape reconsidered: Wingtip shape indices and morphological adaptations to migration. *J. Avian Biol.* 29, 273–292 (1998). (This paper strongly disagrees with my hypothesis that it is prey capture rather than migration that determines wing shape. I will have to reconsider it carefully.) <https://www.jstor.org/stable/3677110>

2. An older but excellent reference which uses wing-span, aspect ratio and wing-loading (but not HWI) to explain the physics of bird flight is: *Modelling the Flying Bird, Theoretical Ecology Series, Volume 5* by C.J. Pennycuik 2008 Elsevier Academic Press, Boston. ISBN: 978-0-12-374299-5

3. Both of these are more technical and slower reading but promise to be more informative in the end. I have to thank Dr. Sheard for pointing me to these references and also her unprecedented data collection for nearly every species of bird and for making this data easily available at:

Sheard, C., Neate-Clegg, M.H.C., Alioravainen, N. et al. Ecological drivers of global gradients in avian dispersal inferred from wing morphology. *Nat Commun* 11, 2463 (2020). <https://doi.org/10.1038/s41467-020-16313-6>

Also: Data availability: The morphological and ecological data used in this study is available at <https://doi.org/10.5281/zenodo.3747657>. Range information and migration data is publicly available from www.birdlife.org; climate data from www.worldclim.org; phylogenetic data from www.birdtree.org; territoriality, habitat use, and additional migratory data from Tobias, J.A. et. al. Territoriality, social bonds, and the evolution of communal signaling in birds. *Front. Ecol. Evol.* 4, 74 (2016)

Finally, there are two other papers that are well worth reading:

West Nile Virus and North American Raptors by Nick Bolgoino in *Hawk Migration Studies*, Vol. 47, No. 2 <https://view.publitas.com/hmana-1/hawk-migration-studies-vol-47-no-2/page/18-19>

And:

Demographic implications of lead poisoning for eagles across North America by Vincent A. Slabe <https://www.science.org/doi/10.1126/science.abj3068>

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Red-shouldered Hawk by Iain MacLeod