

Fall Migration of Sharp-shinned Hawks (*Accipiter striatus*), Broad-winged Hawks (*Buteo platypterus*), and Red-tailed Hawks (*Buteo jamaicensis*) at Washington Monument State Park, Washington County, Maryland

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Abstract: The Washington Monument State Park hawk watch site, situated on one of the easternmost ridges of the Appalachian Mountains, is one of the more important autumn raptor migration sites in Maryland since it is located along a major raptor migration lead line. Using twelve years of data (2003–2014) from a three-month period, September through November, this paper seeks to establish the best dates for observing hawks at the site based on three target species: Sharp-shinned Hawk (*Accipiter striatus*), Broad-winged Hawk (*Buteo platypterus*), and Red-tailed Hawk (*Buteo jamaicensis*). Since observation periods varied from day to day, the number of hawks of a given species for each day was normalized to the number of hawks seen per hour for each day. In order to determine the best observation dates, I evaluated the data points in five-day intervals from 1 September to 29 November. The best dates to observe hawks were: Sharp-shinned Hawks, 26 September through 20 October (average 4.1–6.6 hawks per hour); Broad-winged Hawks, 11 September through 30 September (average 9.7–39.0 hawks per hour); and Red-tailed Hawks, 26 October through 9 November (average 5.4–9.3 hawks per hour). Expected peak dates for each species would be: Sharp-shinned Hawk, 18 October; Broad-winged Hawk, 19 September; and Red-tailed Hawk, 3 November. It was found that the peak dates tend to lag behind those at Hawk Mountain in Kempton, Pennsylvania for Broad-winged and Red-tailed Hawks by about two days and for Sharp-shinned Hawks by about eleven days.

INTRODUCTION

The Washington Monument State Park count site, located atop the monument dedicated to George Washington (N 39°32'48.79", W 77°36'35.75" [HMANA 2014a]) near Boonsboro, Maryland, is a great place for observing migrating hawks in autumn (Figures 1 and 2). It is situated on South Mountain along the Appalachian Trail and along one of the major raptor migration lead lines on the east side of the Appalachian Mountains following the ridges below Kittatinny Ridge in Pennsylvania.



Figure 1. Washington Monument. Washington Monument State Park, Washington County, Maryland, 8 November 2014.

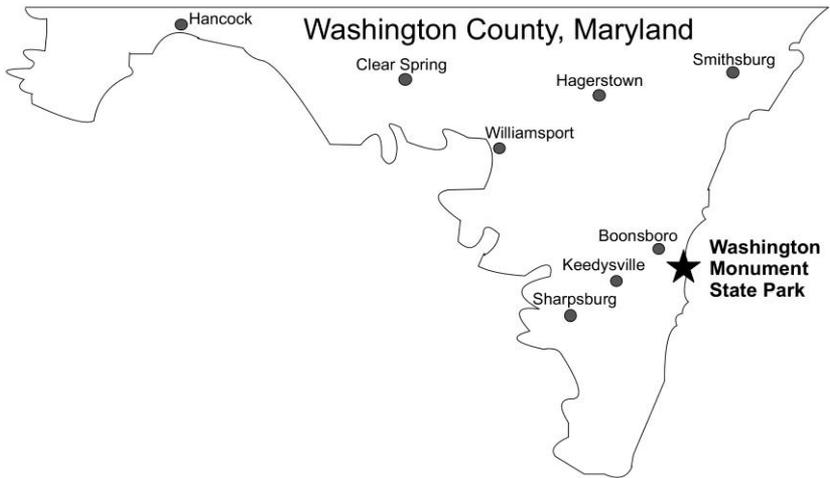


Figure 2. Washington Monument State Park. Washington County, Maryland.

One fall day many years ago, I noticed hawks moving south past Washington Monument atop South Mountain. When I mentioned this to Park Superintendent Marshall Moats, he replied, “We were putting a new roof on my station here in the park one afternoon when Broad-winged Hawks started to soar over us. We lay on our backs on the roof and counted over 4,000. We see some of the same hawks here that they see at Hawk Mountain [but] two or three days later.”

Using twelve years of data gathered at Washington Monument, this paper seeks to answer two questions. First, since time is precious to most of us, what are the best days to observe migrating hawks at the Washington Monument count site, and second, does the hawk migration at Washington Monument tend to lag behind that of Hawk Mountain in Kempton, Pennsylvania?

Autumn migration schedules are numerous in the form of charts and graphs. They are mostly diagrams with various-sized columns, dots, or lines, without any numbers as a frame of reference (Connor 1988, Brett 1991, Liguori 2005, and HMANA 2014a), except for the chart on Broad-winged Hawks in *The Birds of North America Online* (Goodrich et al. 2014). To work out my own schedules, I turned to the Hawk Migration Association of North America (HMANA) website, HawkCount.org, to obtain data on the daily observations at Washington Monument State Park (HMANA 2014b). From these data, I investigated the peak days for migration over a three-month period over twelve years for the three target species, Sharp-shinned Hawk (*Accipiter striatus*), Broad-winged Hawk (*Buteo platypterus*), and Red-tailed Hawk (*Buteo jamaicensis*).

METHODS

I reviewed daily data collected from 1 September through 29 November from 2003 through 2014 (12 years) on the HMANA (2014b) website for Washington Monument (Table 1). This web page is sponsored by the Washington County Bird Club, and the official counter has been J. Paul Newton. Except for Sharp-shinned Hawk, Broad-winged Hawk, and Red-tailed Hawk, and perhaps Cooper’s Hawk (*Accipiter cooperii*), the data for most raptor species seemed to be scattered and had no discernible pattern. Therefore, the first three species became the objective for this effort. The data points for Cooper’s Hawk seemed to track and lag those of Sharp-shinned Hawk. A total of 484 data points for Broad-winged Hawk, 788 data points for Sharp-shinned Hawk, and 801 data points for Red-tailed hawk were reviewed for this paper. The analysis of these data suggests the best range of dates for observing the hawk migration for these target species.

Table 1. Records of Broad-winged, Sharp-shinned, and Red-tailed Hawks by year and month at Washington Monument State Park, 2003-2014. A “record” refers to a one-day observation period.

| Species and Year | September | October | November | Three-month Total |
|----------------------------------|------------------|----------------|-----------------|--------------------------|
| Sharp-shinned Hawk (SSHA) | | | | |
| 2003 | 25 | 24 | 18 | |
| 2004 | 19 | 18 | 14 | |
| 2005 | 27 | 20 | 18 | |
| 2006 | 24 | 26 | 15 | |
| 2007 | 24 | 27 | 23 | |
| 2008 | 24 | 28 | 21 | |
| 2009 | 28 | 23 | 18 | |
| 2010 | 25 | 29 | 18 | |
| 2011 | 23 | 24 | 16 | |
| 2012 | 25 | 26 | 14 | |
| 2013 | 27 | 25 | 17 | |
| 2014 | 25 | 26 | 4 | |
| SSHA Monthly Subtotal | 296 | 296 | 196 | 788 |
| Broad-winged Hawk (BWHA) | | | | |
| 2003 | 25 | 15 | — | |
| 2004 | 19 | 14 | — | |
| 2005 | 27 | 11 | — | |
| 2006 | 24 | 15 | — | |
| 2007 | 24 | 18 | — | |
| 2008 | 24 | 18 | — | |
| 2009 | 28 | 15 | — | |
| 2010 | 25 | 18 | — | |
| 2011 | 23 | 15 | — | |
| 2012 | 25 | 18 | — | |
| 2013 | 27 | 16 | — | |
| 2014 | 25 | 15 | — | |
| BWHA Monthly Subtotal | 296 | 188 | — | 484 |
| Red-tailed Hawk (RTHA) | | | | |
| 2003 | 25 | 24 | 18 | |
| 2004 | 19 | 18 | 14 | |
| 2005 | 27 | 20 | 18 | |
| 2006 | 24 | 26 | 15 | |
| 2007 | 24 | 27 | 24 | |
| 2008 | 24 | 28 | 21 | |
| 2009 | 28 | 23 | 19 | |
| 2010 | 25 | 29 | 18 | |
| 2011 | 23 | 24 | 16 | |
| 2012 | 25 | 26 | 14 | |
| 2013 | 27 | 25 | 17 | |
| 2014 | 25 | 26 | 15 | |
| RTHA Monthly Subtotal | 296 | 296 | 209 | 801 |
| Monthly Total | 888 | 780 | 405 | 2073 |

Since daily observation periods varied in length from day to day, I normalized the number of hawks seen each day for each species from the HMANA tables into the number of hawks seen per hour for each given day. In order to determine the best observation dates, I evaluated the data by simply dividing the overall time frame into five-day intervals—1-5 September, 6-10 September ... 20-24 November, 25-29 November. I summed the available data collected for each species during these periods and found the average number of hawks seen per hour for each five-day interval. Unlike other charts referenced previously, I used a five-day interval as the optimal period to balance days with available count data with the relative precision needed to make useful comparisons.

In reviewing the data, I used 90% confidence intervals to discriminate interval count data because the data were collected in an informal manner at the Washington Monument site as compared to Hawk Mountain and other sites. By informal manner, it is meant that there was no consistent daily time period and some days went unreported. Several of the daily time intervals were excluded when the 90% criterion was used.

To determine the peak migration date for each of the three species, I summed species account data for each day across the twelve years and took the highest daily sum.

RESULTS

Table 2 shows the average number of hawks observed per hour in five-day intervals for Sharp-shinned, Broad-winged, and Red-tailed Hawks.

Based on this analysis, recommendations for the best dates to visit the Washington Monument hawk-watch site could be proposed. Table 3 shows the projected peak migration dates and peak day based on species occurrences expected to exceed more than three per hour. Although four of the daily time intervals exceeded the “three per hour” criterion (Table 2: SSHA, 21-25 October; RTHA, 21-25 October, 10-14 November, 15-19 November), they were excluded when the 90% criterion was used.

DISCUSSION

Local weather plays an important role in determining the best dates to observe hawks at Washington Monument, especially with regard to the passage of a cold front accompanied by two or three days of northerly and westerly winds. The day after a cold front passes is quite often the best day to see large numbers of migrating hawks. However, as a few data points show, Broad-winged Hawks may defy expectations and show up in numbers on an east-southeast wind (e.g.,

19 September 2011: 3,410 tallied; and 25 September 2011: 1,410 tallied) (HMANA 2014b).

Table 2. Hawks Observed Passing the Washington Monument. Average number observed per hour per five-day interval.

| Five-Day Interval | SSHA: Mean Individuals/Hour | BWHA: Mean Individuals/Hour | RTHA: Mean Individuals/Hour |
|--------------------------|--|--|--|
| 01-05 September | 0.2 | 0.9 | 0.2 |
| 06-10 September | 0.6 | 2.6 | 0.1 |
| 11-15 September | 1.1 | 17.2 | 0.2 |
| 16-20 September | 2.0 | 39.0 | 0.2 |
| 21-25 September | 2.7 | 22.8 | 0.2 |
| 26-30 September | 4.1 | 9.7 | 0.3 |
| 01-05 October | 4.1 | 0.4 | 0.4 |
| 06-10 October | 5.1 | 0.1 | 0.6 |
| 11-15 October | 5.5 | 0.0 | 1.2 |
| 16-20 October | 6.6 | | 2.2 |
| 21-25 October | 3.6 | | 3.6 |
| 26-30 October | 2.3 | | 6.9 |
| 31 October-04 November | 1.0 | | 9.3 |
| 05-09 November | 0.3 | | 5.4 |
| 10-14 November | 0.2 | | 4.1 |
| 15-19 November | 0.1 | | 4.8 |
| 20-24 November | 0.1 | | 3.0 |
| 25-29 November | 0.0 | | 1.5 |

Table 3. Peak migration dates and projected peak observational days at Washington Monument.

| Species | Peak Migration Dates | Projected Peak Day |
|--------------------|-----------------------------|---------------------------|
| Sharp-shinned Hawk | 26 September – 20 October | 18 October |
| Broad-winged Hawk | 11 September – 30 September | 19 September |
| Red-tailed Hawk | 26 October – 9 November | 3 November |

As mentioned earlier, the park superintendent once commented that birds appear at Washington Monument two or three days after passing Hawk Mountain. Was he right? According to Pete Dunne, the “magic date” for viewing Broad-winged Hawks at Hawk Mountain is 17 September (Dunne et al. 2012). Goodrich et al. (2014) also notes that the peak period at Hawk Mountain is from 15 to 18 September. The records reviewed for this report show the best day at the Washington Monument is 19 September, two days later than at Hawk Mountain.

According to Bildstein and Meyer (2000), the best day to observe Sharp-shinned Hawks at Hawk Mountain is on 7 October, as they report two-thirds have passed by 12 October. The best day at Washington Monument seems to be 18 October with the best daily interval from 16 to 20 October, after which the numbers seem to drop off very rapidly. I would not expect major flights of Sharp-shinned Hawks at Washington Monument to follow close upon those reported at Hawk Mountain because the migration of Sharp-shinned Hawks is not as concentrated as that of Broad-winged Hawks.

Compared to Broad-winged and Sharp-shinned Hawks, the fall migration of Red-tailed Hawks is more protracted over time, spanning from early September to late November at Washington Monument. The closest thing I could find for a peak migration date at Hawk Mountain was that the mid-point for Red-tailed Hawk migration is 1 November (Hawk Mountain 2015, data not shown). While at Washington Monument the best day is 3 November, based on averages, with the best period from 31 October to 4 November. Comparing migration at Washington Monument with Hawk Mountain for Red-tailed Hawks may be a poor relationship due to the protracted period of migration.

I could not find a correlation between the time of day and the numbers of passing hawks at Washington Monument. Broad-winged Hawks can appear in large numbers in the morning, at mid-day, or in the afternoon. I have found Sharp-shinned Hawks early in the morning at Washington Monument, but their numbers seem to taper off in the late afternoon. Red-tailed Hawks tended to appear in the warmest part of the day. From my experience, Red-tailed Hawks tend to follow the ridge in the cool mornings and then move away from it to drift southward in thermals as the air temperature warms.

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