

**Autumn Raptor Migration 2015 at Big Bald Banding Station,
Cherokee National Forest, Unicoi County, Tennessee.**

2015 Annual Report to the United States Forest Service, Cherokee National Forest
Southern Appalachian Raptor Research, PO Box 305, Mars Hill, NC 28754

Introduction

Big Bald Banding Station (BBBS) is a migratory passerine monitoring station located high on Little Bald Mountain at 5328 feet above sea level (1624 m), inside the Appalachian Trail corridor in Cherokee National Forest, Unicoi County, Tennessee. Data regarding migrating birds using the Big Bald Mountain environment have been collected at this location since 1978. BBBS bands an average of 2,175 passerines every autumn (2004-2015) of approximately 60 species. The 2015 season is the twelfth autumn that systematic documentation of raptor migration through counts and raptor trapping has been conducted at Big Bald. A raptor trapping station was begun in 2003 on Little Bald Mountain for a period of 3 weeks, to sample the migrating birds of prey in conjunction with the peak of passerine migration. The raptor trap station became fully operational in 2004, operating for seven weeks and annually trapping and banding an average of 100 birds of prey of ten different species. The Big Bald Hawk Watch also started in 2004, documenting the passage of 15 different species of raptors annually. In the past twelve autumns, Big Bald Hawk Watch has counted a total of 35,465 birds of prey, with an average seasonal count total of 2,932 migrating raptors.

Methods

Raptor Counts (Hawk Watch)

Daily raptor migration counts are conducted near the summit of Big Bald Mountain, from approximately 1000 AM to 1700 PM, beginning the first week in September until early November. Weather conditions are an important factor, often limiting the amount of observation hours and days per month. Migration counts are conducted only on days of no precipitation and adequate visibility. Weather condition data, including temperature, wind direction, wind speed, visibility and cloud cover are recorded several times daily. Migrating raptors are identified to species and recorded by hour and direction of passage by experienced observers using binoculars and spotting scopes. On days when volunteer manpower is limited, migration observations are made from the raptor trap station blind. The raptor trap blind is located on the northern edge of a clearing, near the summit of Little Bald Mountain, approximately 1 km north of the Big Bald observation site. Daily raptor migration flight count totals are submitted to the Hawk Migration Association of North America via internet. These data are available for public research and raptor population trend analysis at www.hmana.org and www.bigbaldbanding.org.

Trapping and Banding

BBBS raptor trapping operates from approximately 1000AM until one hour before sunset, from the second week in September to early November, and is limited to days of no precipitation and adequate visibility. Migrating raptors are captured using lure birds and specialized mist nets. Captured birds of prey are fitted with a USGS metal leg band, measured, assessed for health condition and then released unharmed. Birds are processed in compliance with the North American Raptor Banders guide in the accepted manner for small raptors with age and gender established through feather observations and measurements (Pyle, 1997). Both passerine and raptor banding work is regulated by the USGS Bird Banding Laboratory under a master permit maintained by Mark Hopey (permit # 23821) of Southern Appalachian Raptor Research (www.bigbaldbanding.org). All trapping and processing birds is completed by qualified and experienced volunteers.

Results and Discussion

Raptor Counts (Hawk Watch)

During the months of September, October and November 2015, the Big Bald Hawk Watch logged 45 days of migration observation. Big Bald Mountain is one of the highest altitude sites of eastern US hawk watches. Both rain and fog often influence observation potential at Big Bald Hawk Watch. Seven of seventeen days in September and ten of thirty-one days in October were unsuitable for observation due to weather. Observation at Big Bald Hawk Watch was compromised or thwarted by weather on 29% of potential observation days (18 of 62 days) during the 2015 autumn season. A particularly wet period during the last week of September and first week of October prevented all raptor trapping and observation for 11 days, usually one of the busier periods of the season. Unusually mild temperatures in October and November 2015, allowed for more extensive trapping effort later into the autumn, even producing a few Red-tailed Hawk in late November and Cooper's Hawk captures into December.

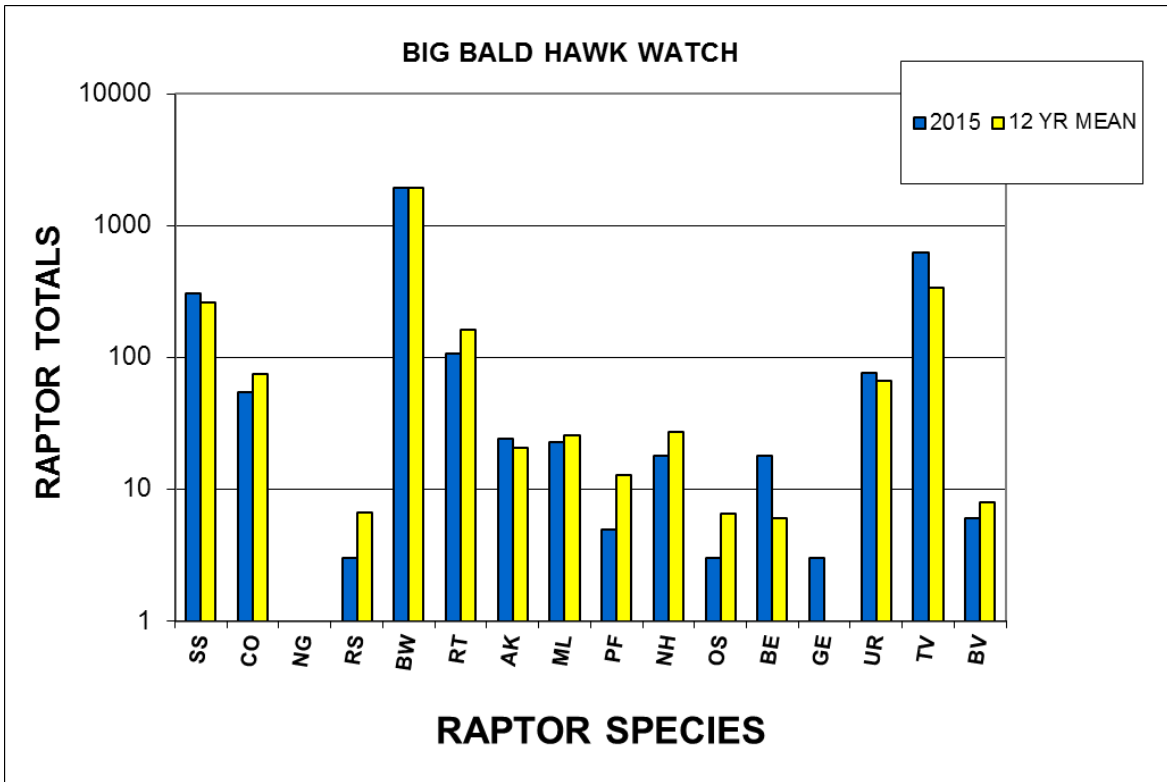
Dozens of volunteer observers contributed over 200 total hours of observation effort to gather hawk watch data. Primary and assistant observers are volunteers with several years of experience conducting hawk watch counts at Big Bald or other established sites. Primary hawk counters at Big Bald in 2015 are Kathryn Gunther, Mark Hopey and Lisa Olsen. Assistant hawk observers included Rick Blanton, Lynn Brandon, Peter Julius, Trevor Lauber, Tedi McManus, Crista Seidl, Clarke Walker, Aaron Wolesslagle, and students and teachers from Evergreen Community Charter School, Mountain Sun Community School, Mars Hill Elementary, Haywood Community College Wildlife Program and the University of Tennessee Wildlife Program.

Table 1. Monthly totals of migrating raptors by species, observed during autumn 2015 at Big Bald Hawk Watch, Unicoi County, TN.

2015	SS	CO	NG	RS	BW	RT	AK	ML	PF	NH	OS	BE	GE	UR	TV	BV	TOTAL
SEP	82	15	0	3	1933	16	11	13	0	10	3	10	0	53	55	3	2207
OCT	221	31	0	0	8	58	13	10	4	8	0	7	2	20	509	3	894
NOV	2	8	0	0	0	33	0	0	1	0	0	1	1	3	56	0	105
DEC	0	1	0	0	0	1	0	0	0	0	0	0	0	0	8	0	10
TOTAL	305	55	0	3	1941	108	24	23	5	18	3	18	3	76	628	6	3216

SS=Sharp-shinned Hawk, CO=Cooper's Hawk, NG=Northern Goshawk, RS=Red-shouldered Hawk, BW=Broad-winged Hawk, RT=Red-tailed Hawk, AK=American Kestrel, ML=Merlin, PF=Peregrine Falcon, NH=Northern Harrier, OS=Osprey, BE=Bald Eagle, GE=Golden Eagle, UR=Unidentified Raptor, TV=Turkey Vulture, BV=Black Vulture.

A total of 3216 birds of prey of fifteen species were identified and counted migrating past Big Bald during autumn 2015 (Table 1). This season's total count was the third largest in twelve years of monitoring at Big Bald Hawk Watch. The most numerous raptor species observed was the Broad-winged Hawk, with 1941 individual birds counted in 2015. The second most numerous migrant bird species was the Turkey Vulture (620), with the majority passing during the third week of October. Sharp-shinned Hawk was the third most numerous migrant counted (305). The peak hawk watch day in 2015 was September 23rd when 1,084 hawks were observed passing overhead at Big Bald. The seasonal total of 1941 Broad-winged Hawks was slightly above the twelve-years mean (Figure 1). Bald Eagle count total (18) was above the mean for the fourth consecutive year and represents a record-high season total count. Other raptor species with 2015 count totals above the twelve-year mean are Sharp-shinned Hawk, American Kestrel, Golden Eagle and Turkey Vulture. In 2015, migration count totals of Cooper's Hawk, Merlin, Northern Harrier, Red-shouldered Hawk and Osprey were below the twelve-year mean. Red-tailed Hawk counts continued a declining trend for the seventh consecutive year. Big Bald Hawk Watch counts also indicate a steady decline in migration count numbers for the two most common Accipiter species, Sharp-shinned Hawk and Cooper's Hawk (Figure 2).



SS=Sharp-shinned Hawk, CO=Coopers Hawk, NG=Northern Goshawk, RS=Red-shouldered Hawk, BW=Broad-winged Hawk, RT=Red-tailed Hawk, AK=American Kestrel, ML=Merlin, PF=Peregrine Falcon, NH=Northern Harrier, OS=Osprey, BE=Bald Eagle, GE=Golden Eagle, UR=Unidentified Raptor, TV=Turkey Vulture, BV=Black Vulture.

Figure 1. Total Raptors observed in migration during autumn 2015 compared to eleven year mean 2004-2015 charted on a logarithmic scale. Big Bald Hawk Watch, Tennessee.

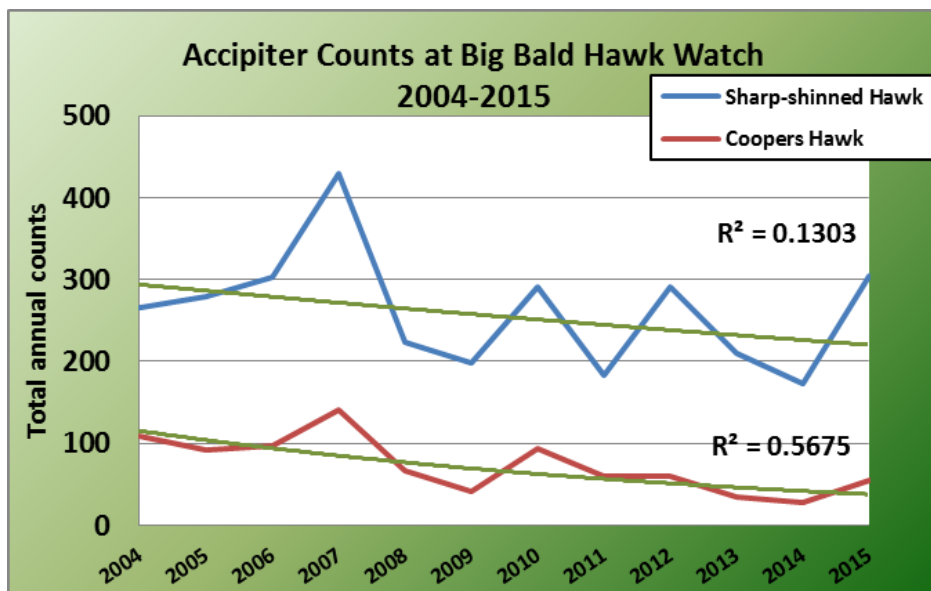


Figure 2. Annual Autumn Migration Count Totals for Two Species of Accipiter at Big Bald Hawk Watch from 2004-2015. Cherokee National Forest, Unicoi Co., TN.

Big Bald Hawk Watch has documented migrating Golden Eagles in seven of the past nine hawk watch seasons (2007-2015). Golden Eagle is noted as an uncommon migrant in the southeastern US during autumn (Wheeler 2003). Big Bald Hawk Watch observations correspond with increasingly frequent southeast region sightings by various observers during the past decade, indicating a positive population trend (Katzner et al. 2012).



Adult Golden Eagle at Big Bald in Winter 2012

Raptor Trapping

Raptor trapping at Big Bald in 2015 was conducted during 45 trapping days, beginning September 15th. A total of 100 raptors were captured during 193.5 hours of trapping effort (Table 2). Raptor trapping was compromised by weather on nearly 30% of potential trapping days (18 of 62 days) during the autumn season. Total trapping hours were comparable in total effort compared to 10 previous years of trapping at Big Bald Banding Station. The seven species of raptors trapped in 2015 in order of capture total are Sharp-shinned Hawk, Cooper's Hawk, Red-tailed Hawk, Merlin, Broad-winged Hawk and American Kestrel (Table 3). Two locally breeding adult Broad-winged Hawks were trapped in passerine nets. No Peregrine Falcons were trapped in 2015 and this corresponds with the lowest Big Bald Hawk Watch count total in 12 years of monitoring. The 2015 Sharp-shinned Hawk capture totals (68) were 19% above the eleven-year mean and accounted for 68% of total raptors trapped in 2015 at Big Bald. Conversely, Cooper's Hawk captures (15) were below the eleven-year annual mean for the fourth consecutive year. Red-tailed Hawk captures (8) were 46% below the eleven-year annual mean and remained below the eleven-year mean for the seventh consecutive year (Figure 3).



The 2015 season produced one notable raptor recapture, a Sharp-shinned Hawk originally banded at Big Bald as a hatch-year bird on September 20, 2013 was recaptured as an adult on November 10, 2015. To date, a total of eight recoveries, returns and encounters of Big Bald banded raptors have been recorded at various locations in the southeastern US, Canada and Puerto Rico (Figure 4). These data produced by raptor trapping at Big Bald Banding Station are helping to define movements of diurnal raptors from and within the southern Appalachians during autumn migration.

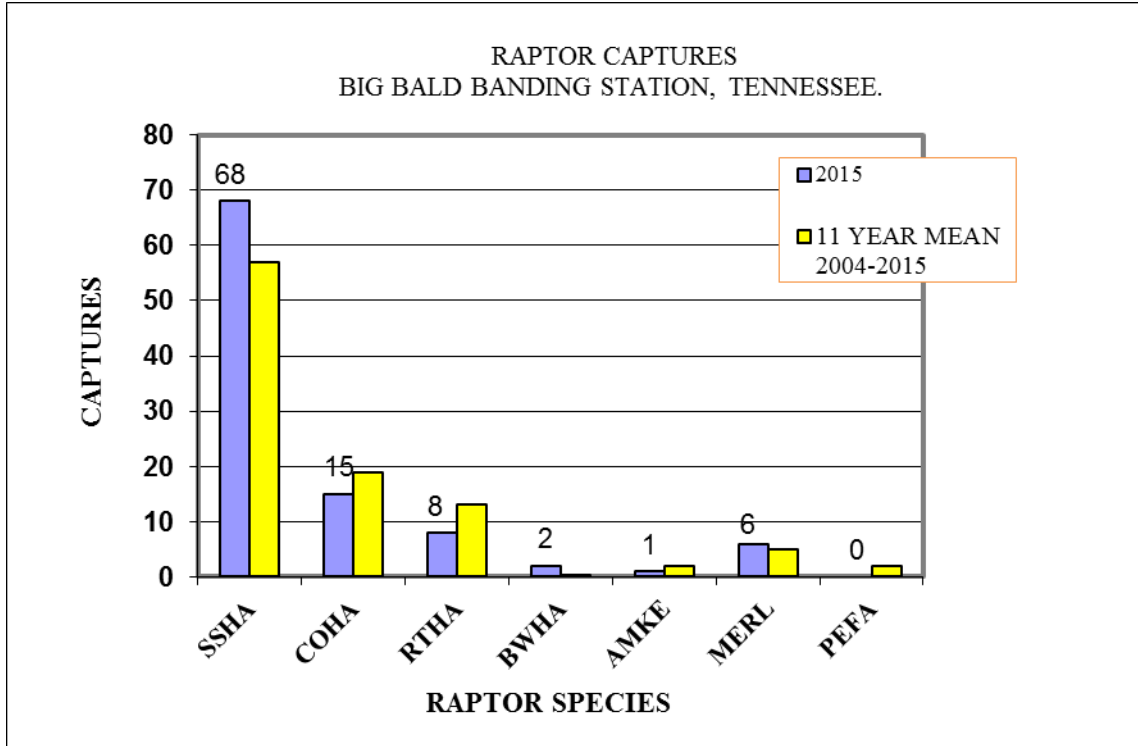
Table 2. Raptor captures related to trapping effort at Big Bald Banding Station, Cherokee National Forest, Unicoi County, Tennessee. 2004-2015.

<u>Year</u>	<u>Hours</u>	<u>Trap days</u>	<u>Total birds</u>	<u>Birds/ Hour</u>	<u>Birds/ Day</u>
2004	178	33	103	0.57	3.12
2005	273	35	86	0.32	2.45
2006	218	38	117	0.54	3.07
2007	258	49	225	0.87	4.59
2008	245	51	103	0.42	2.02
2009	153	34	94	0.62	2.80
2010	170	39	95	0.56	2.40
2011	147	33	83	0.52	2.52
2012	208	42	133	0.64	3.17
2013	183	36	110	0.60	3.06
2014	153	38	75	0.49	1.97
2015	193	45	100	0.52	2.22

Table 3. Trapped Raptor Species Totals for Autumn 2015 with 11-Year Trap Mean, Big Bald Banding Station, Cherokee National Forest, Unicoi County, TN.

SPECIES	2015 TOTAL	11-YEAR MEAN*
Sharp-shinned Hawk	68	57
Cooper's Hawk	15	19
Red-tailed Hawk	8	13
Broad-winged Hawk	2	0.4
American Kestrel	1	2
Merlin	6	5
Peregrine Falcon	0	2

*Mean of 2004-2015 totals, excluding 2007



SSHA=Sharp-shinned Hawk, COHA=Coopers Hawk, RTHA=Red-tailed Hawk, AMKE=American Kestrel, MERL=Merlin, NH=Northern Harrier, PEFA=Peregrine Falcon, RSHA=Red-shouldered Hawk

Figure 3. Total captures of seven raptor species in 2015 compared to eleven-year mean* from 2004-2015 at Big Bald Banding Station, Cherokee National Forest, TN.

*excluding the aberrant high year of 2007

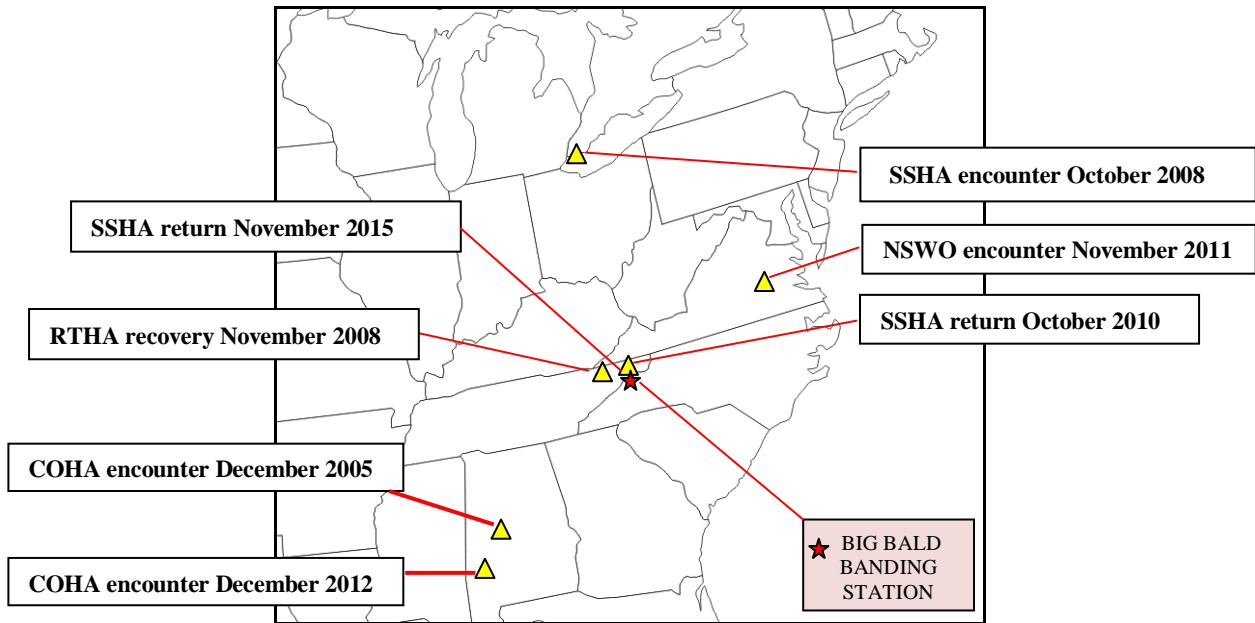


Figure 4. Recoveries, encounters and return locations in eastern North America of raptors originally banded at Big Bald Banding Station, 2005-2015.

Summary

Big Bald Hawk Watch and the raptor trapping unit of Big Bald Banding Station completed twelve seasons of monitoring autumn raptor migration in the southern Appalachians Mountains. The 2015 Big Bald Hawk Watch total counts recorded both good diversity and above average total bird numbers. Hawk watch posted the third highest migration count totals in 12 years of monitoring at Big Bald. Seven of fifteen species of migrating raptors observed posted total counts above the eleven-year mean of annual species counts at Big Bald (2004-2015). Raptor trapping seasonal totals were average in 2015, with Sharp-shinned Hawk trapping totals above the mean for the third consecutive year. Cooper's hawk and Red-tailed Hawk trap totals were helped by a mild weather extended season but totals remained well below the eleven-year mean. Trapping diversity was below average with no Peregrine Falcon trapped in 2015. Data collected at Big Bald Hawk Watch and Big Bald Banding Station continues to help establish baseline population numbers and monitor the population trends of raptors migrating through the southern Appalachian Mountains.

Acknowledgments

Many thanks are extended to all the volunteers and supporters of the Big Bald Hawk Watch, the Raptor Banding Project at Big Bald Banding Station and Southern Appalachian Raptor Research. Special appreciation is extended to volunteer Lisa Olson for her invaluable assistance during the 2015 migration season. Raptor trapping and Hawk Watch at Big Bald are supported by the generous donations of private individuals to Southern Appalachian Raptor Research, a non-profit 501(c)(3). We are especially appreciative of the consistent financial support from the Appalachian Trail Conservancy. The Big Bald Banding Station operates with the cooperation and permission of the US Forest Service, Pisgah National Forest. Big Bald Banding Station also receives support for its work from the USFS Cherokee National Forest, Tennessee Wildlife Resources Agency, North Carolina Wildlife Resources Commission, the Tennessee Ornithological Society and the US Bird Banding Lab.

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