

**Autumn Raptor Migration 2010 at Big Bald Banding Station,
Cherokee National Forest, Unicoi County, Tennessee.**

2010 Annual Report to 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 1,902 passerines every autumn (2004-2010) of approximately 50 species. A raptor trapping station was begun in 2003 on Little Bald Mountain to sample the migrating birds of prey observed in conjunction with the peak of passerine migration. The raptor trap station was fully staffed in 2004 and has subsequently operated each autumn, annually luring and banding approximately 100 birds of prey of ten different species. The 2010 season is the seventh autumn that systematic raptor trapping has been conducted at Big Bald Banding Station. The Big Bald Hawk Watch also commenced in 2003, documenting the passage of 15 different species of raptors annually. In the past seven autumns, Big Bald Hawk Watch has counted a total of 15,665 birds of prey, with an average seasonal total of 2,238 migrating raptors.

Methods

Observation

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 <http://www.hmana.org/> and <http://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). The work is permitted under the USGS Bird Banding Laboratory through a sub-permit with Clifford (Bud) Anderson of the Falcon Research Group. All trapping and processing of raptors is completed by volunteers.

Results and Discussion

Raptor Observation (Hawk Watch)

During the three months of September, October and early November 2010, the Big Bald Hawk Watch logged 204.5 hours of observation on 48 weather permitting days. Big Bald Mountain is one of the highest altitude sites of eastern US hawk watches. Both rain and fog often hamper observation potential at Big Bald Hawk Watch. Eight of thirty days in September and six of thirty-one days in October were unsuitable for observation. The Hawk Watch was open for one day in November. Observation at Big Bald Hawk Watch was thwarted by weather on 23% of potential observation days (14 of 62 days) through-out the migration season.

A total of 17 volunteer observers contributed over 250 man hours of observation effort to gather these data. Primary observers are volunteers with several years of experience conducting hawk watch counts and doing hawk migration observations at Big Bald or other sites around the US. Primary counters at Big Bald in 2010 were Aaron Steed, Lynn Brandon, Marty Daniels, Kathryn Gunther and Mark Hopey. Assistant observers include volunteers helping to make observations and recording data during busy count days. Assistant observers included Kayla Bott, Tom Edwards, Becky Elkin, Lee Gregory, Chris Kelly, Cleo Mayfield, Joe McGuinness, Tedi McManus, Tom McKeig, Rebecca Pearson, Runner Pearson, Andrew Pearson and Jim Petranka.

A total of 2822 birds of prey were counted migrating past Big Bald in 2010 (Table 1). Fourteen species of raptors were identified. The most numerous raptor species observed was the Broad-winged Hawk, with 1834 total birds counted in 2010. The second most numerous bird species was the Sharp-shinned Hawk (291), with the majority passing during the third week of September. The last week of September is typically a busy migration week, but adverse weather conditions prevented operation during five of the seven days. Turkey Vulture was the third most numerous migrant counted (275), with a strong push of 49 birds counted on Nov 1, our last day of operation. The peak hawk watch day in 2010 was September 18th when 628 hawks were observed passing overhead. Broad-winged Hawks accounted for 93% (586) of all birds observed on that day.

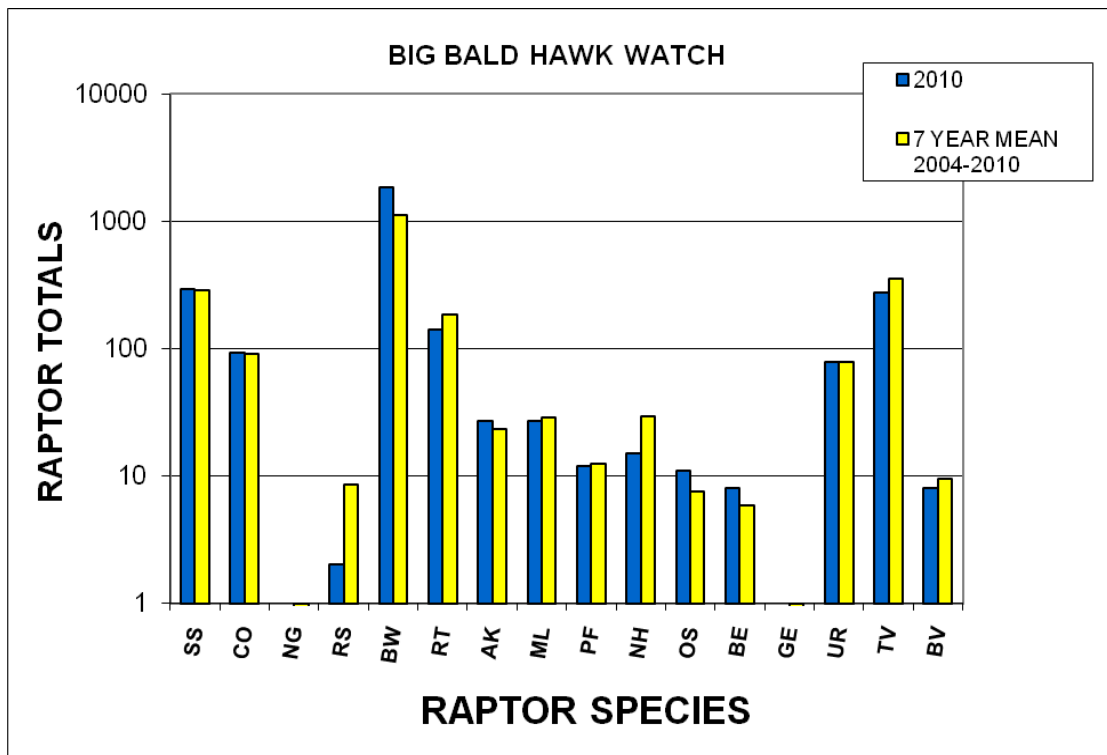
Events of note at Big Bald Hawk Watch in 2010 include documentation of migrating Golden Eagle (GOEA) for the third time in the past four years (2007-2010). One adult bird was observed in the northwest valley from the trapping blind on September 28th. Golden Eagle is an uncommon migrant in the southeastern US during autumn (Wheeler 2003) and this noteworthy observation is the earliest record from Big Bald Hawk Watch.

Table 1. Monthly totals of migrating raptors by species, observed in autumn 2010 at Big Bald Hawk Watch, Cherokee National Forest, Unicoi County, TN.

2010	SS	CO	NG	RS	BW	RT	AK	ML	PF	NH	OS	BE	GE	UR	TV	BV	TOT
SEP	159	57	0	1	1832	48	14	14	10	5	10	4	1	45	88	6	2294
OCT	132	36	0	1	2	86	13	13	2	8	1	3	0	33	138	2	470
NOV	0	0	0	0	0	6	0	0	0	2	0	1	0	0	49	0	58
TOTAL	291	93	0	2	1834	140	27	27	12	15	11	8	1	78	275	8	2822

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.

Migration counts of Sharp-shinned Hawk, Cooper's Hawk, Merlin and Peregrine Falcon returned to their annual averages (2004-2010), after the lowest recorded count numbers for these species in 2009 (Figure 1). Broad-winged Hawk numbers exceeded their annual species count mean by 63% and Osprey numbers were the second highest recorded in seven years. Bald Eagle count totals (8) matched that of 2009 as the highest seasonal count total for that species at Big Bald Hawk Watch. Red-tailed Hawk, Red-shouldered Hawk and Northern Harrier were all strongly below their seven year count mean.



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Figure 1. Total Raptors observed migrating past Big Bald Mountain in autumn, 2010, compared to seven year mean 2004-2010 total migrants charted on a logarithmic scale. Big Bald Hawk Watch, Cherokee National Forest, Tennessee

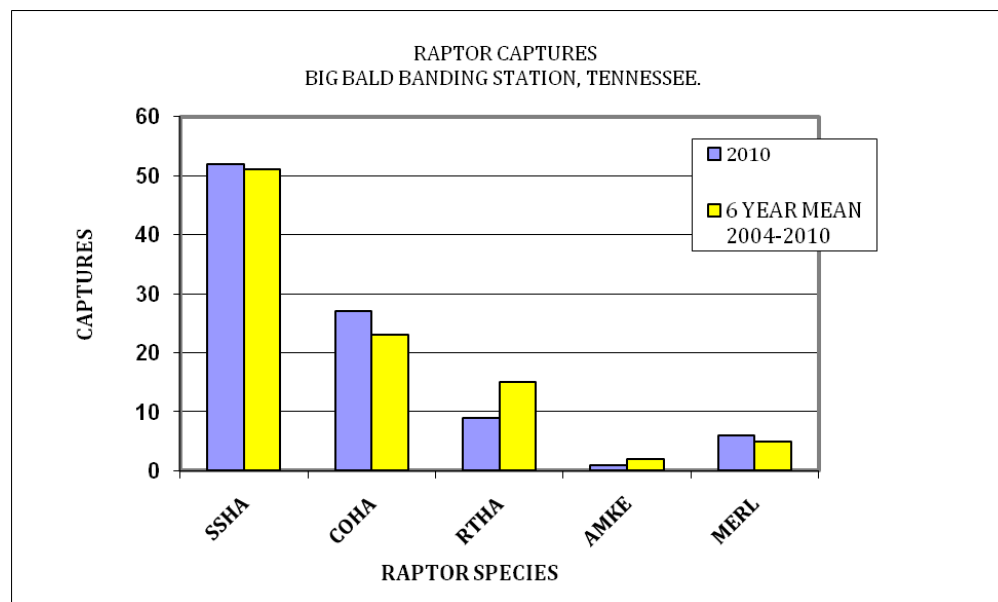
Raptor Trapping

Raptor trapping at Big Bald in 2010 was conducted during 39 trapping days, beginning September 13 and ending November 1. A total of 95 raptors were captured during 170 hours of trapping (Table 2). An unseasonable amount of wet weather in late September and early October resulted in fewer days of trapping, during what is often the peak of raptor migration. Of the nine days between September 25 and October 3, only three days were suitable for trapping. Opening times for the trapping blind were later in 2010 than in past years, with only 9 days of the 39 opening before 12:00, averaging 4.36 hr/day. This was due to either shortage of staff or weather factors. Trapping effort hours were the second lowest total in seven years of trapping at Big Bald Banding Station. Despite the wet weather and fewer hours, the total number of birds trapped was only slightly below the six year mean of 100 (excluding the outlier year of 2007).

Table 2. Raptor captures and trapping effort at Big Bald Banding Station, Cherokee National Forest, Unicoi County, Tennessee. 2004-2010.

<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

The five species of raptors trapped in 2010 are Sharp-shinned Hawk, Cooper's Hawk, Red-tailed Hawk, American Kestrel and Merlin (Table 3). Sharp-shinned Hawk, Cooper's Hawk and Merlin captures all slightly exceeded their six-year annual mean (2004-2010, excluding outlier year 2007). Red-tailed Hawk captures remained well below the six-year annual mean for the second consecutive year (Figure 2). No Peregrine Falcons were trapped at Big Bald in 2010 or 2009. Trapped raptor species diversity declined in the past four seasons, from eight in 2007 to only five species in 2010.



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

Figure 2. Totals captures of five raptor species in 2010 compared to six-year mean from 2004-2010 at Big Bald Banding Station, Cherokee National Forest, Tennessee.

Table 3. Trapped Raptor Species Totals for Autumn 2010 with 6-Year Trap Mean, Big Bald Banding Station, Cherokee National Forest, Unicoi County, Tennessee.

SPECIES	2010 TOTAL	6-YEAR MEAN*
Sharp-shinned Hawk	52	51
Cooper's Hawk	27	23
Red-tailed Hawk	9	15
American Kestrel	1	2
Merlin	6	5

*Mean of 2004-2010 totals, excluding 2007

The 2010 trapping season includes report of a Sharp-shinned Hawk originally banded at Big Bald in 2007 as a hatch-year male, and recaptured in October, 2008, in Ontario, Canada. The bird was measured and released unharmed by Holiday Beach Bird Observatory, located on the northwestern shore of Lake Erie, over 1000 kilometers from Big Bald (Figure 3). This raptor is notable as our first international recapture report and as the most distant recovery of any raptor banded at Big Bald. It is the first record of a juvenile raptor banded at Big Bald, that was recaptured as an adult while returning from its' presumed breeding grounds. A second Sharp-shinned Hawk return occurred on October 10, 2010, when an adult male originally banded during the final Big Bald MAPS session on July 31, 2010 was recaptured. It is unknown if this Sharp-shinned Hawk was an early migrant to the area during July or is a 'local' bird, breeding on or near Big Bald. These 2010 return records add to other Big Bald recovery records in helping to describe raptor migration movements through the southern Appalachians.

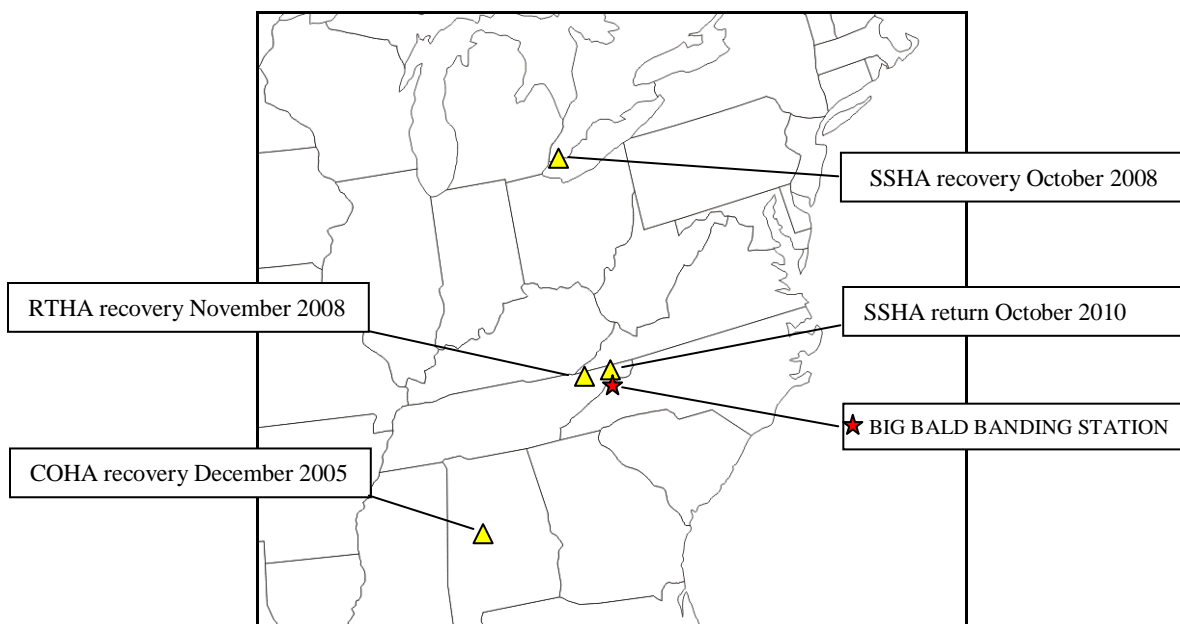


Figure 3. Raptor recovery and return locations in eastern North America of birds originally banded at Big Bald Banding Station, 2005-2010.

Summary

Big Bald Hawk Watch and the raptor trapping unit of Big Bald Banding Station completed its seventh autumn season of monitoring raptor migration trends in the southern Appalachians. The 2010 species counts for the Big Bald Hawk Watch were near equal or exceeded the mean annual total counts for all species (2004-2010), with the exception of Red-tailed Hawk, Red-shouldered Hawk and Northern Harrier. Raptor trapping totals in 2010 for Sharp-shinned Hawk, Cooper's Hawk and Merlin were slightly above the six-year mean and correlated closely with Big Bald Hawk Watch count results. Red-tailed Hawk trap totals were well below the six-year mean for the second consecutive year. Two Sharp-shinned Hawk return and recapture records will help define movements, destinations and routes of migrating raptors using the southern Appalachian Mountains. Data from Big Bald Hawk Watch and Big Bald Banding Station continue to establish baseline numbers and monitor trends of raptor migration through the southeast Appalachian mountain region.

Acknowledgments

Many thanks are extended to all the volunteers that safely operate the Hawk Watch and raptor banding station at Big Bald. Special appreciation is extended to volunteer Aaron Steed for serving as primary Hawk Watch observer in September and to Marty Daniels, for her continual participation in and support of the Big Bald raptor projects. 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 especially want to thank the *Appalachian Trail Conservancy* and the *Tennessee Ornithological Society* for their generous grant awards in 2010. The Big Bald Banding Station operates with the cooperation, permission and support of the US Forest Service, Cherokee National Forest. Big Bald Banding Station also receives support for its work from the Pisgah National Forest, Tennessee Wildlife Resources Agency, North Carolina Wildlife Resources Commission and the US Bird Banding Lab.

References

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