

### Avian Monitoring in the Allegheny Highlands

A third year of avian monitoring was completed within the 18,000-acre Warm Springs Mountain Restoration Project (WSMRP), a collaborative initiative spanning lands owned by The Nature Conservancy (TNC) and the George Washington and Jefferson National Forest (GWJNF). Developed by the Central Appalachians Fire Learning Network (FLN) partnership, the WSMRP strives to restore the historical fire regime in Appalachian pine-oak forests through controlled burns and to monitor the landscape-scale responses of associated bird and plant communities. Since 2008, FLN partners have conducted controlled burns on four units totaling nearly 6,000 acres within the project area. An additional 880 acres were burned by a managed wildfire.



Allegheny Highlands Program Director Marek Smith and Science Technician Laurel Schablein conduct a point count survey in a post burned area. Surveys were conducted between the hours of 5:00 and 10:30 am. *Photo Marek Smith TNC*



Glenwood-Pedlar Ranger District Assistant Fire Manager Ted Docev conducts firing operations on the 4200-acre Big Wilson controlled burn in April 2012. *Photo Beth Buchanan USFS*

### Methods

Using the same permanent plots sampled for pre- and post-burn forest structure and composition monitoring, one hundred seven avian point counts were conducted during peak breeding season (mid-May through mid-June). All individual birds detected within a 100 meter fixed radius circle over a ten minute survey period were recorded. Through a time of detection protocol, individuals were tracked across ten subintervals to account for differences in detectability (e.g., differing rates of song, observer effects, time of day effects) using standard mark-recapture analyses in Program MARK.

### Highlights of 2013 Avian Monitoring

- Increasing trends in species diversity for burned plots over a three-year period (Figure 1)
- Preliminary increases in abundance for species associated with early successional habitat (Figure 2)

2011	2012	2013
52 Species	47 Species	51 Species
783 Individuals	893 Individuals	948 Individuals



Notable sightings in the 2013 bird monitoring surveys included nesting Cedar Waxwings and Pine Warblers. *Photos © Dick Rowe*

## Results

TNC staff and volunteers counted a higher number of individuals than in previous years with a total of 949 individuals detected this spring. Total counts since this study was initiated in 2011 have averaged 870 individual birds and 50 species. Species diversity was high across the entire landscape, increased from 2011 to 2013, and was higher on burned plots (Figure 1). Preliminary abundance estimates for focal species fluctuate by species and across years (Figure 2). On plots that have been burned during the past five years, preliminary increases in abundance for Ovenbird, American Redstart, Eastern Towhee and Pine Warbler are evident. Relationships between vegetative changes in the landscape and avian community response will be explored in subsequent analyses.

### Relative abundance of focal species by year.

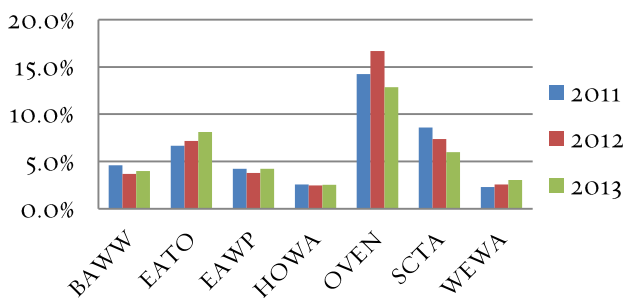


Figure 2: Relative abundance of focal species from years 2011-2013 throughout 107-plots in the avian monitoring program. Relative abundance measures species evenness and is a component of species diversity.

### SPECIES HIGHLIGHT

**Scarlet tanagers** nest in high outer branches of mature deciduous trees in both deciduous and mixed forests of Eastern North America and winter in Central and South America. They forage along branches in dense canopy for insects. The species is sensitive to habitat fragmentation and is more vulnerable to nest parasitism by Brown-headed Cowbirds in smaller tracts of forest. Scarlet Tanagers are a management indicator species in the GWJNF. In the 2013 survey, 64 Scarlet Tanagers were counted.

## Shannon-Weiner Diversity Index yearly and burned versus unburned

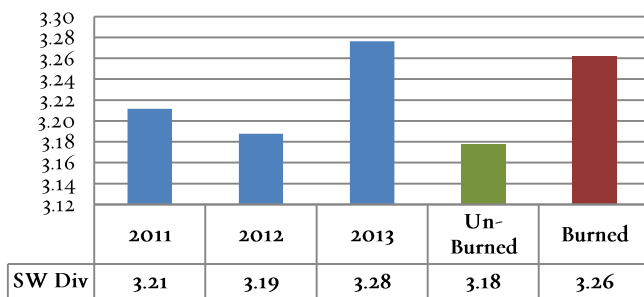


Figure 1: Avian species diversity from years 2011-2013 and between burned and un-burned plots. Higher SW values indicate higher diversity.

### Focal Species

All individual birds detected in plots were recorded, but analysis of relative abundance and density was conducted for seven focal species chosen for their abundance, high detection probabilities, foraging niches, and nesting habitat preferences. Estimated population trends for these species may indicate changes in habitat condition and help inform management decisions.

Focal Species	Foraging Habitat	Nesting Habitat
Scarlet Tanager (SCTA)	Canopy	Outer tree branches
Eastern Wood-pewee (EAWP)	Midstory	Tree limbs
Black-and-white Warbler (BAWW)	Tree bark	Ground
Hooded Warbler (HOWA)	Foliage	Shrub
Worm-eating warbler (WEWA)	Understory	Ground
Ovenbird (OVEN)	Ground	Ground
Eastern Towhee (EATO)	Ground	Among leaf litter

