

Wildlife Management Activities in Big Levels, Augusta County, Virginia: An Overview

Roy E. Swartz & David M. Kocka

Virginia Department of Game and Inland Fisheries
P.O. Box 996
Verona, VA 24482

INTRODUCTION

Southeastern Augusta County, Virginia, referred to as "Big Levels", is a rough series of connected flat-topped mountains west of and somewhat isolated from the Blue Ridge Mountains. As their name suggests, the mountain summits are generally flat or gently rolling, eventually giving way to steep or moderately-sloped ridges with thick vegetation, rugged talus slopes, barren rock outcrops, and dense thickets until reaching more moderate terrain below. The bedrock geology ranges from quartzite to sandstone, but the lowest elevations override deep limestone formations. Springs and flowing streams are abundant over most of the Big Levels area. Numerous natural ponds or vernal pools exist at lower elevations. Big Levels is comprised primarily of stands of hardwoods, including various species of oak (*Quercus* spp.), hickory (*Carya* spp.), black gum (*Nyssa sylvatica*), and yellow-poplar (*Liriodendron tulipifera*) interspersed with pitch pine (*Pinus rigida*). The steeper slopes contain more chestnut oak (*Quercus prinus*), bear oak (*Quercus ilicifolia*), and thickets of mountain laurel (*Kalmia latifolia*), greenbriar (*Smilax* spp.), blueberries (*Vaccinium* spp.), and table-mountain pine (*Pinus pungens*). Thick stands of bear oak and mountain laurel occur at the highest elevations. Some magnificent stands of eastern hemlock are abundant along watercourses. American chestnut (*Castanea dentata*) was among the dominant species in most of Big Levels area but is now replaced with oaks and other hardwoods.

Pre-1900s

Historically, the Big Levels area was only marginally used for agriculture or grazing due to its poor soil produc-

tivity; most of this activity occurred along its fringes in the valley. The area is believed to have been a highly prized hunting ground by Native Americans because of its abundant wildlife populations (Thornton, 1969). All of the tribes in the Blue Ridge area assembled there for their winter hunts (USDA-Forest Service, 1941). Wildlife populations were subjected to significant exploitation once white settlers arrived. Sporadic attempts at mining iron and manganese deposits were made and abandoned in the 1800s and early 1900s. During this same period, the primary economic use was the extensive harvest of hardwoods to provide charcoal for at least five local iron furnaces. The few people who lived in the area subsisted by farming, hunting, berry picking, and probably moonshine production (Thornton, 1940). The last of the original herd of native deer on Big Levels was extirpated by a party of eight hunters during a severe winter in the early 1890s (USDA-Forest Service, 1941; Thornton, 1969).

1900-1940

The local wildlife conservation movement during the early 1900s was initiated by private conservation groups (e.g., Waynesboro Game and Fish Protective Association, Augusta County Fish and Game Association) to preserve and manage depleted or extirpated native wildlife populations. Creation of government agencies like the Virginia Commission of Game and Inland Fisheries, the U. S. Forest Service, and the U. S. Biological Survey (now the U.S.G.S. Biological Resource Division) resulted in preservation of wildlife habitat and professional wildlife management. A cooperative agreement in 1924 between the state of Virginia and the U.S. Government eventually led to the establishment of the 1,619 ha Big Levels State

Game Refuge in 1930 (Thornton, 1940). The state refuge was bounded roughly by the Coal road, Kennedy Ridge, Green Pond, and the headwaters of Falling Rock Creek see Fig. 1 in Mitchell et al. (1999).

Due to insufficient funds, the Game Commission was unable to completely fulfill its management obligations to conserve, protect, replenish, propagate, and increase the population of game birds and animals on this refuge. Responding to petitions and recommendations of sportsmen and interested citizens to greatly increase the refuge size and place it under federal administration, the Game Commission took the unusual position of endorsing President Roosevelt's July 1935 proclamation. With an additional 11,331 ha, the proclamation established the Big Levels Game Refuge within the George Washington National Forest, to be administered by the U. S. Forest Service (USDA-Forest Service, 1941). The proclamation required that the area "be set aside for the protection of game animals, birds, or fish; and whosoever shall hunt, catch, trap, willfully disturb or kill any kind of game animal, game or nongame bird, or fish, or take the eggs of any such bird on any lands so set aside, or in or on the waters thereof, except under such general rules and regulations as the Secretary of Agriculture may from time to time prescribe, shall be fined not more than \$500 or imprisoned not more than six months, or both". In March 1936, the Virginia General Assembly enacted Chapter 316 thereby transferring all rights concerning wildlife in Big Levels to the U.S. Government. To date, this law has never been rescinded. However, as described below, since the 1950s Big Levels has been managed similar to other national forest lands and not as a refuge. The refuge was originally established as both a demonstration area and an experimental area where wildlife problems could be researched cooperatively by State, Federal and private agencies.

The U.S. Forest Service and the Game Commission learned many lessons about cooperative management during the early years on Big Levels. From these lessons, a Cooperative Agreement between these two agencies was established in 1938 (Thornton, 1969). Cooperative wildlife management increased with additional funding. In 1938, the Pittman-Robertson Act provided states with additional funds for wildlife management. The National Forest Stamp Act of 1938 also required those who hunt, fish, or trap on National Forest lands to purchase a special stamp. The one dollar fee was used to help fund law enforcement and wildlife habitat work.

The earliest wildlife management efforts on the area emphasized restocking of game species along with law enforcement and predator control, including control of free-roaming domestic dogs. White-tailed deer (*Odocoileus virginianus*), black bear (*Ursus americanus*),

and beaver (*Castor canadensis*) were reintroduced by 1940. Thornton (1969) stated that Big Levels was the first location in Virginia where the stocking of white-tailed took place. However, Peery & Coggin (1978) and McDonald & Miller (1993) both indicate the first deer were stocked at a location in Rockingham County in 1926; both of these sources show 1933 as the first time that Augusta County received deer. Although of limited accuracy, population estimates were attempted before and after the stocking efforts on Big Levels (Table 1) (USDA-Forest Service, 1941). The entire boundary was wired and posted with signs. All access roads and trails were gated or closed permanently to general road traffic where feasible. Civilian Conservation Corps labor was used to improve roads and fire trails, construct water holes and lakes, plant erosion control trees and shrubs, establish salt licks for deer, build patrol cabins, and provide wildfire protection.

In the 1930s, biologists advocated developing sodded openings on 10% of the refuge area. These openings were seeded with various grasses and lespedezas, required little maintenance, and provided benefits to wildlife. Eventually about 81 ha were constructed, but the original goal of 10% was never achieved due to the high cost of clearing and development in the rough terrain (Thornton, 1969). For economic reasons, forest-wide clearing development is now generally done in association with active timber sales. The U.S. Forest Service constructed water impoundments and developed a recreation area that became the Sherando Lake Recreation Area. They also acquired land holdings within or close to the Big Levels Game Refuge to consolidate the land area (USDA-Forest Service, 1941).

Table 1. Estimated populations of selected species for 1935, 1940, and numbers stocked of selected species in Big Levels Game Refuge, Augusta County, Virginia.

SPECIES	1935 ESTIMATE	MINIMUM # STOCKED	
		1935-40	1940 ESTIMATE
White-tailed deer	30	56	320
Black bear	8	4	31
Beaver	0	2	4
Wild turkey	40	0	90
Ruffed grouse	300	0	700
Bobwhite quail	80	0	240

Many cooperative research projects were implemented on the refuge in its early years by wildlife biologists. Studies were conducted on ruffed grouse (Nelson et al., 1938), wild turkey (Martin et al., 1939), snakes (Uhler et al., 1939), and habitat development (Howard, 1938; Thornton, 1940; DeGarmo, 1941). Additional work not published from the area included the development of a new type of deer truck and holding pen, as well as a big game checking system (USDA-Forest Service, 1941; Thornton, 1969).

1940-1998

In 1955, a technique was developed for trapping native wild turkeys (*Meleagris gallopavo silvestris*). Big Levels was the first location where wild turkeys were captured for restocking other portions of their range (Coggin & Peery, 1975). During the late 1950s, black bear research involved trapping, measuring, and tagging for harvest during later hunting seasons (Harrison, 1958). This was the first trapping and tagging of black bears in the Commonwealth. Eventually, the refuge concept (i.e., no hunting) was gradually discarded as sustainable game populations increased and dispersed onto surrounding areas.

White-tailed deer became locally abundant in many areas, especially on adjacent farmlands and orchards of the Shenandoah Valley where crop damage was excessive and some action was required. In 1951, the first hunting season was allowed by the Game Commission for deer on Big Levels; it was a controlled hunt where the number of hunters was limited. This was the only place in Virginia where hunting pressure was controlled on national forest lands (Thornton, 1960). Antlerless deer were allowed to be harvested for the first time west of the Blue Ridge Mountains during the first three days of this five day season. A quota of 650 permits were issued, with a limit of 125 hunters per day. This resulted in 120 whitetails (85 antlerless) being harvested that year. U.S. Forest Service personnel collected harvest data at game checking stations at entrance/exit points for the area. The administrative problems associated with such a limited hunt eventually led to the opening of the area to all hunters by 1953. Deer were also trapped on Big Levels to be used for stocking other portions of the state. White-tailed deer populations, once plentiful on the refuge, were reduced by heavy hunting pressure for the first few years after the refuge was open to hunting. At the same time range conditions deteriorated because of much of the timber matured to pole stands (Thornton, 1969). These two factors led to the deer population being stabilized at lower levels. Although the intensity of the original wildlife habitat development program gradually lessened, the U.S.

Forest Service maintained a vigorous law enforcement effort on the Big Levels area for a long time with use of special federal game wardens.

Cooperative efforts for habitat work continued for many years. Large areas of bear oak on the summit were released mechanically from competing tree growth. Actual dates of this work could not be documented but post-treatment evaluations were conducted as late as March 1983 (M. Carpenter, personal communication). When first acquired, the area possessed little timber of commercial value. With the maturation of timber, harvesting was begun to develop even-aged forest stands and provide early succession habitat for wildlife. Growing markets for pole-sized hardwood timber created economic opportunities to cut stands in the area. Areas of eight ha or more were clearcut to be regenerated into even-aged stands of mixed pines and hardwoods (Thornton & Richards, 1968; Thornton, 1969). Funds derived from timber sales were often used for wildlife habitat improvements after completion of the sales. Timber harvesting provided a diversity of habitat for some wildlife species with stands of various ages instead of one age over the majority of the area. Increased understory growth and roads revegetated with grasses were other wildlife management benefits of these timber sales.

When the Big Levels Refuge was created, all access roads to Big Levels were closed to the public. Beginning in 1948, roads were opened to hunters and fishermen seasonally or only closed administratively during winter months. At present, the primary access roads are open most of the year. Although benefiting the public, road openings probably have been detrimental to wildlife and wildlife management. Vandalism, littering, dumping, poaching, and other human disturbances have been prevalent in recent decades.

In the 1980s and 90s, the public's environmental awareness shifted toward preservation. The wilderness movement stimulated the creation of the St. Marys Wilderness Area in 1984. This 4,087-ha watershed had occupied a large portion of the Big Levels Game Refuge created in 1935 but was difficult to manage due to its rugged topography. The wilderness concept provided primitive (non-mechanized) recreation experiences and solitude while preserving the natural environment and the scenic, scientific, educational, and historical values of the area. The most recent forest plan designates most of Big Levels between the Coal Road and the St. Marys Wilderness Area as a Special-Interest Area for its unique biological resources (USDA-Forest Service, 1993). The policy for special-interest areas allows maintenance of existing or replacement of wildlife improvements as long as their presence is compatible with management objectives. Vegetation can be manipulated for management of

biological values including threatened, endangered, or sensitive species and their habitat. Prescribed burning is allowed to meet objectives for habitat management and species maintenance. The area is classified as unsuitable for timber production. Parts of the Shenandoah Valley sinkhole pond system area, north of the Coal Road, is managed as a proposed Research Natural Area at present. Most of the other land north of the Coal Road is managed as early successional forested habitats for wildlife. Wildlife management in these areas has an objective of maintaining at least 5% of the area in grassy or herbaceous openings for deer or ruffed grouse. Timber harvests must average 3-4 ha and not exceed 8 ha. The Sherando Lake and Back Creek watershed are included in a dispersed recreation designation which allows for maintenance of existing wildlife improvements and limited timber management like group selection or individual tree cuttings, salvage cuts, or sanitation cuts, but only on nearly level terrain.

SUMMARY

The Big Levels area is recognized as a unique place where the cooperative wildlife management program began between the U. S. Forest Service and the Virginia Game Commission. The refuge was used as a demonstration area to test many new game management ideas, techniques, and regulations that are standards today. Among the "firsts" for Virginia which took place on Big Levels was the first controlled deer hunt, the first antlerless deer hunting west of the Blue Ridge Mountains, the first big game checking system, the first live-trapping of wild turkeys for stocking purposes in Virginia, and the first live trapping and tagging of black bear. As refuges were established in other areas of the National Forest to reintroduce and manage wildlife, they were all eventually integrated back into the same management plans as the rest of the forest. The early, labor intensive efforts to manage wildlife on relatively small areas developed into a more economical, landscape level approach to wildlife management on the entire National Forest.

ACKNOWLEDGMENTS

We thank Max Carpenter, retired VDGIF biologist, for providing information which helped fill in the gaps that existed in our files on Big Levels. This paper was funded in part by funds provided by Pittman-Robertson Federal Aid to Wildlife Restoration Project - W48D.

LITERATURE CITED

- Coggin, J., & C. Peery. 1975. The Wild Turkey in Virginia. Virginia Department of Game and Inland Fisheries, Richmond, VA. 133 pp.
- DeGarmo, W. R. 1941. A study in forest wildlife relationships. M.S. Thesis, Virginia Polytechnic Institute, Blacksburg, VA. 159 pp.
- Harrison, G. H. 1958. Trapping bear facts. Virginia Wildlife 19:10-13.
- Howard, M. C. 1938. Use of power in making small clearings in bear oak brush for wildlife. Journal of Wildlife Management 2:179-180.
- Martin, A. C., F. H. May, & T. E. Clarke. 1939. Early winter food preferences of the wild turkey on the George Washington National Forest. Transactions North American Wildlife Conference 4:570-578.
- McDonald, J. S., & K. V. Miller. 1993. A history of white-tailed deer restocking in the United States. Research Publication 93-1. Quality Deer Management Association. Greenwood, SC. 109 pp.
- Mitchell, J.C., D. M. Kirk, & D. M. Downey. 1999. Introduction to the symposium on the natural history of the Big Levels area: Shenandoah Valley sinkhole ponds and St. Marys River. Banisteria 13:5-9.
- Nelson, A. L., T. E. Clarke, & W. W. Bailey. 1938. Early winter food of ruffed grouse on the George Washington National Forest. U. S. Department of Agriculture Circular 504. Washington, D.C. 38 pp.
- Peery, C., & J. Coggin. 1978. Virginia's White-tailed Deer. Virginia Department of Game and inland Fisheries, Richmond, VA. 159 pp.
- Thornton, J. E. 1940. An ecological study of forest clearings on the Big Levels game refuge. M.S. Thesis, Virginia Polytechnic Institute. Blacksburg, VA. 125 pp.
- Thornton, J. E. 1960. The management of upland game on public lands in Virginia. Proceedings Annual Conference of Southeast Association of Game and Fish Commissioners 14:78-84.
- Thornton, J. E. 1969. Big levels -- a game management laboratory. Virginia Wildlife 30:4-5, 23.
- Thornton, J. E., & E. V. Richards. 1968. The thirtieth year. Virginia Wildlife 29:4-5, 23.

Uhler, F. M., C. Cottam, & T. E. Clarke. 1939. Food of snakes of the George Washington National Forest, Virginia. Transactions North American Wildlife Conference 4:605-622.

USDA-Forest Service. 1941. Management plan for the Big Levels wildlife management area, George Washington

National Forest, 1941-46. USDA Forest Service, Harrisonburg, VA. 18 pp.

USDA-Forest Service. 1993. George Washington National Forest final revised land and resource management plan. United States Department of Agriculture Forest Service. Harrisonburg, VA. 396 pp.