

## **Preliminary Evaluation of Ruffed Grouse Restoration Efforts in Arkansas**

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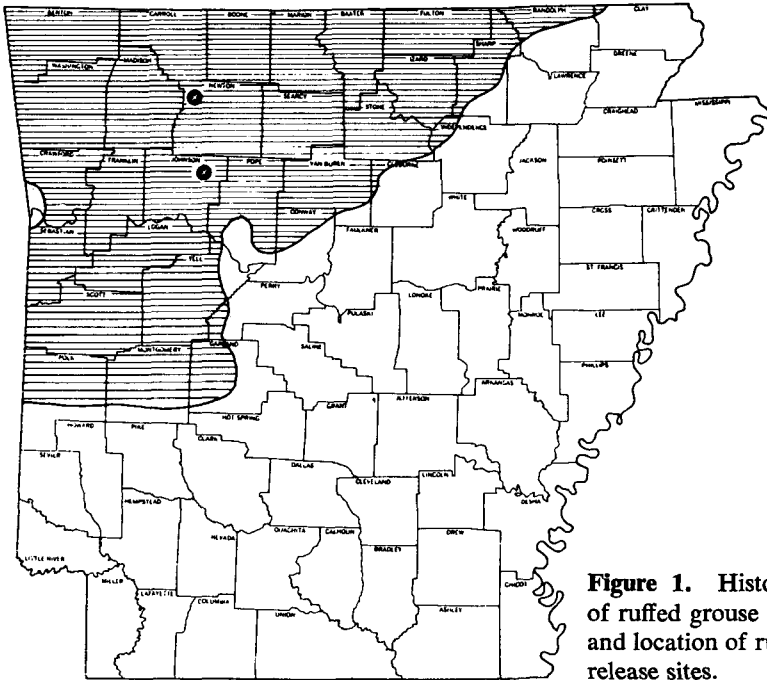
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*Abstract:* Ruffed grouse (*Bonasa umbellus*) restoration efforts were initiated in Arkansas in 1981, with the relocation of 50 wild-trapped birds from Cumberland Gap National Historical Park in Virginia to a release site in Newton County, Arkansas, along the Buffalo National River. In 1982, restoration efforts continued with the release of 67 wild-trapped grouse captured in Virginia and Minnesota. These birds were released on the Buffalo National River site and on the Ozark National Forest in Johnson County. Population monitoring, particularly winter censuses and spring drumming surveys, documented minimum first year survival rates of 24.0% and 20.0%, respectively, for the 2 release sites. From 1982 to 1983, the number of birds observed, indirectly and directly, on the Buffalo National River site during winter censuses and spring drumming surveys indicates the birds are not only maintaining themselves, but are increasing. During April 1983, 1 male, mirror-trapped, had survived for 18 months, and 2 of 5 birds observed were unbanded juveniles.

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The ruffed grouse, described as occupying a wider range of environmental types than any other non-migratory game bird in North America, occurred in numbers throughout northern Arkansas in the latter part of the nineteenth century (Bump et. al. 1947, Holder 1951). While the densities and importance of ruffed grouse to early settlers in Arkansas are obscure, historical records have caused several authors to include northern Arkansas in the historical distribution of ruffed grouse in North America (Bent 1932, Bump et. al. 1947, Aldrich 1963) (Fig. 1).



**Figure 1.** Historical range of ruffed grouse in Arkansas and location of ruffed grouse release sites.

Between 1900 and 1925, grouse evidently were extirpated from Arkansas, as no existing records report their presence after this date. The subspecies native to Missouri, the Widwestern ruffed grouse (*B. umbellus mediana*), in all probability was the subspecies once found in Arkansas (Hunyadi 1978). Factors which resulted in the extinction of ruffed grouse in Arkansas include habitat destruction in the form of the slash burn-graze agriculture practiced extensively in the past century and uncontrolled market and sport hunting.

Ruffed grouse restoration efforts in Arkansas from 1948 to 1950 using pen-raised grouse were unsuccessful. Ruffed grouse were last observed in 1959 in the Ozarks of Arkansas on what is now the White Rock Wildlife Management Area (Holder 1951, Harold Alexander pers. commun. 1982).

Recent successes in Missouri and Tennessee using wild-trapped birds have resulted in renewed interest in ruffed grouse restoration in Arkansas. Current knowledge of habitat conditions necessary to support ruffed grouse and techniques for establishing viable populations (Hunyadi 1978, White and Dimmick 1978, Lewis 1971, Lewis et. al 1968, Lewis 1966) have facilitated current efforts in Arkansas in restoring this native game bird.

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## Methods

The identification of potential ruffed grouse habitat was made by utilizing the criteria described by Hunyadi (1978) and Lewis (1971). Habitat analysis included the use of aerial photographs, topographic maps, past and future timber prescriptions, and ground inspection. The Newton County-Buffalo National River and Johnson County-Ozark National Forest release sites are on fertile, north-facing slopes within the Buffalo River and Piney Creeks drainages, and have had timber harvests within the past 12 years. The release sites are characterized by high stem densities (17,500 to 37,500/ha), numerous drumming logs and interspersed brood habitat.

Trapping techniques employed lily-pad traps and drift fences of 2.54 cm mesh  $\times$  30.5 cm poultry wire, varying in length from 15.2 m to 22.8 m (Hunyadi 1978, Gullion 1965, Chambers and English 1958). Lily-pad traps made of 2.54  $\times$  5.08 cm or 5.08  $\times$  10.16 cm weld wire fitted with funnels and .63-cm nylon mesh netting were used to capture ruffed grouse in Virginia and Minnesota. Traps were placed in relation to habitat edges and topography in both brood and drumming habitats. All captured grouse released in Arkansas were fitted with numbered, aluminum butt-end leg bands.

Winter surveys consisted of a search for tracks during the 1 fortuitous snowfall that occurred each year on the Buffalo National River site during February 1982 and January 1983. The surveys were conducted in the areas where the birds were released, and covered approximately 80 ha. The number of birds observed and flushed were also recorded. Drumming surveys were conducted from late-March through April in 1982 and in 1983. To document survival and reproduction spring trapping and direct observation (with spotting scopes) of drumming males was conducted in April, 1983. Chick distress calls were employed in attempts to document reproduction (Healy et. al 1980).

## Results

### Releases

During October and November 1981, Buffalo National River and Arkansas Game and Fish Commission personnel trapped 56 ruffed grouse at Cumberland Gap National Historical Park and released 50 birds (25 males and 25 females) at the Buffalo National River site in Newton County. In September and October 1982, an additional 54 grouse were trapped at Shenandoah National Park and 42 of the birds (22 males and 20 females) were released at the Buffalo National River site. Another 25 grouse, (17 males and 8 females) were trapped at the White Water Wildlife Management Area in Minnesota by Arkansas Game and Fish Commission personnel and released on the Ozark National Forest in Johnson County.

### Winter Censuses

Winter censuses, such as those described by Lewis et al. (1968), were conducted in 1982 and 1983. Following the 1981 release, a winter census was conducted in February 1982 at the Buffalo National River release site. Two birds were flushed and the tracks of a minimum of 10 other grouse were located. These indirect and direct observations of 12 birds in 1982 indicated a minimum survival rate of 24.0% (Table 1).

A winter census conducted in January 1983 at Buffalo National River resulted in the location of the tracks of 21 grouse and 19 flushes of a minimum of 14 birds. A minimum survival rate was not calculated.

A winter census conducted at the Johnson County release site on the Ozark National Forest was unsuccessful due to poor snow tracking conditions. However, a total of 5 grouse were observed by deer hunters and Commission personnel from November 1982 through February 1983, which indicated a minimum survival rate of 20% (Table 1).

**Table 1.** Release and winter census data for ruffed grouse reintroduced to Arkansas, 1981 to 1983.

Release site	N Released	Winter census			Minimum percent surviving
		N Tracks	N Flushed	N Observed	
Newton County- Buffalo Nat'l River	50 (1981)	10	2	2	24.0
Johnson County- Ozark Nat'l Forest	42 (1982)	21	19	14	—
	25 (1982)	0	0	5	20.0

\* Winter census taken in year following release.

### Drumming Surveys

Spring drumming surveys were conducted at the Buffalo National River site from late March through April in 1982 and 1983, and at the Johnson County site in 1983. Surveys conducted at the Buffalo National River site in 1982 resulted in the locating of 6 males. These birds were all located within 1.5 km of the release site. In the spring of 1983, a minimum of 18 drumming males were located.

Limited mirror-trapping for drumming males in April 1983 resulted in the capture of a banded male captured at Cumberland Gap National Historical Park and released at Buffalo National River in October 1981. It had survived for 18 months and was captured within 300 m of the release site. In addition, 2 drumming males observed with the aid of spotting scopes were determined to be a banded bird of undetermined age and an unbanded juvenile. Incidental observations of 2 ruffed grouse, a banded male and an unbanded bird of undetermined sex, provided the additional direct evidence of reproduction.

Drumming surveys conducted at the Johnson County release site in 1983 resulted in the location of 3 males. These birds were located within 2.0 km of the release site. Two additional grouse were flushed. These observations resulted in a minimum winter survival rate of 20.0% (5 birds); the same rate was recorded during the winter census.

### Brood Surveys

Brood surveys were conducted at the Buffalo National River site from June to August 1982. A total of 5 females which exhibited brooding behavior were located using recorded chick distress calls; however, no chicks or broods were observed. Brood surveys conducted on both release sites in 1983 were inconclusive in documenting reproduction (Healy et. al 1980).

### Summary

Ruffed grouse restoration efforts in Arkansas from 1981 through 1983 have resulted in the release of 117 wild-trapped birds at 2 release sites. Population monitoring indicated habitat conditions are suitable for grouse and reproduction has occurred. Increases in the number of birds observed, indirectly and directly, during both winter censuses and spring drumming surveys indicate the birds are not only maintaining themselves, but are increasing. The results of these limited restoration efforts have equaled or exceeded similar efforts in Missouri in the early 1960s (Lewis 1968).

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