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917	Title Breeding Indices of Ruffed Grouse - Spring, 2006.	6/15/06

Abstract: Ruffed grouse breeding populations continue to be at extremely low levels. The 2006 drumming index for 8 survey control routes was 0.05 drumming males heard per stop (1 drummer heard/20 stops), less than 4% of levels recorded during the peak years of 1979-81. The 5-year mean drumming index (2002-2006) was 0.06 drummers per stop or approximately 1 drummer heard every 17 stops. For the first time since grouse population monitoring began on the Maumee Grouse Study Area in the early 1960's, no drumming activity centers were located. Prospects for population recovery are poor given the continual advancement of forest succession and the lack of active forest management on public forestlands in south-central Indiana, the core and remnant range of the ruffed grouse in Indiana. Ruffed grouse population levels are projected to drop below "viable population levels" within the next decade, or sooner, in portions of their existing range in south-central Indiana unless some intervention (e.g. timber harvests of sufficient intensity) or sizable natural disturbances occur across the forested landscape to create early successional forest habitats.

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Ruffed grouse (*Bonasa umbellus* spp.) breeding population indices (males heard drumming/stop) were estimated during the spring of 2006 along 10 roadside drumming trend routes in southern Indiana. The annual drumming activity center count was conducted at the Maumee Grouse Study Area located on Hoosier National Forest in Jackson/Brown counties. Roadside counts ranged from 0 to 0.20 male grouse (drummers) heard per stop (15 stops/route) (**Table 1**). The highest count (0.20 drummers/stop) was on the Hickory Ridge route, portions of which pass through an area that underwent significant wind damage in the spring of 1996 (10 years ago) and subsequent salvage cutting during 1997-98. All other drumming routes recorded ≤ 1 drummer/route. The upper range of the mean values for the roadside routes have been relatively low since when a downward trend in the grouse population became evident in the mid-1980's. In 2006, ruffed grouse were heard on 5 of the 10 routes with only 2 routes showed slight increases going from no males heard to 1 male heard on each route.

The combined mean for the 8 control areas was 0.05 grouse heard per stop (Drumming Index; DI) or 1 male grouse heard every 20 stops. The 2006 drumming index was only slightly better than the 2005 DI of 0.03, the lowest DI in the 27 continuous recorded years (**Table 2**), and the lowest DI since roadside drumming surveys were initiated in 1953. The 5-year mean drumming index (2002 to 2006) was 0.06 drummers per stop or approximately one drummer heard every 17 stops. Drumming indices for the control routes indicate grouse breeding populations have declined fairly steadily the last two decades and are now less than 4% of levels recorded during the peak years of 1979-81.

For the first time since grouse population monitoring began on the Maumee Grouse Study Area in the early 1960's, no drumming activity centers were located on the Maumee Grouse Study Area (**Table 3**). One grouse of unknown sex was flushed during the survey period. In 2004, only 1 activity center was located. In 1980,



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24 activity centers were identified and the estimated density was 5.8 grouse/100acres. Habitat on the Grouse Study Area is fairly reflective of habitat conditions on the Pleasant Run Unit of Hoosier National Forest. The 2 activity centers located in 2005 were associated with abandoned, overgrown field openings that were on the verge of “going by” as grouse habitat due to advancing forest succession. Since active vegetation management is not allowed under the current management prescription for this area of Hoosier National Forest, these small ephemeral pieces of grouse breeding habitat were expected to disappear.

Roadside drumming indices and Maumee density estimates show parallel downward trends over 2 decades (**Figure 1**). A population model analysis for ruffed grouse in Indiana projects that ruffed grouse will not exist at viable population levels within the next decade on the Hoosier National Forest under current trends in forest succession and management. Based on similar trends in grouse populations, forest succession, and land management, a similar fate probably faces ruffed grouse on adjacent public forestlands in south-central Indiana.

Early forest successional stages of seedling/sapling/pole size hardwoods are the primary components of habitat for ruffed grouse, American woodcock (*Scolopax minor*) and a host of other wildlife species that were historically created by either natural disturbances (e.g. tornadoes, fire storms, insect outbreaks) across a large continuous forested landscape or within transitional zones between grasslands and forests. These types of habitats and associated wildlife are undergoing significant and parallel declines in the eastern United States (See a series of papers in “Conservation of woody, early successional habitats and wildlife in the eastern United States” pages 407-494, Wildlife Society Bulletin Vol. 29, No. 2, Summer 2001). The population trends for American woodcock are nearly identical to those of ruffed grouse in Indiana (Kelley and Rau, 2006). Until public land managers again have the flexibility and the public support to use various vegetation or timber management tools to mimic or emulate natural disturbances on what remains of the contiguous forest ecosystem, we can expect further losses in early successional habitats and dependent wildlife species.

Literature Cited

Kelley, J.R. Jr., and R. D. Rau. 2006. American woodcock population status, 2006. U.S. Fish and Wildlife Service, Laurel Maryland. 15 pp.



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Table 1. Numbers of ruffed grouse heard on roadside drumming counts in Indiana between 4-20 April 2006.

County / Area	Total Routes	Total Stops	Cumm. Grouse		Cumm Total Drums	Highest Drum Count	Total No. Seen	Grouse Heard ^a		Drummings ^a	
			Total Grouse Heard	Highest Count				Per Stop		Per Stop	
								2005	2006	2005	2006
* Jackson, Brown, Monroe (Hickory Ridge, USFS)	2	30	5	3	10	5	0	0.20	0.20	0.33	0.33
*Owen-Putnam	2	30	1	1	2	2	0	0.07	0.07	0.20	0.13
*Perry Co. (Oriole-St. Croix-USFS)	2	30	0	0	0	0	0	0.00	0.00	0.00	0.00
*Washington State Forest	2	30	1	1	2	2	0	0.07	0.07	0.13	0.13
**Lawrence & Orange (Lost River E, USFS)	2	30	0	0	0	0	0	0.00	0.00	0.00	0.00
Martin & Orange (Lost River W, USFS)	2	30	0	0	0	0	0	0.13	0.00	0.27	0.00
**Morgan-Monroe State Forest	2	30	1	1	1	1	0	0.00	0.07	0.00	0.07
**Greene	2	30	0	0	0	0	0	0.00	0.00	0.00	0.00
**Orange (Lick Creek, USFS)	2	30	0	0	0	0	0	0.00	0.00	0.00	0.00
Jefferson	2	30	1	1	2	2	0	0.00	0.07	0.00	0.13

^a Indices calculated using route with highest count.

* Areas surveyed annually and used as controls to index overall population trends.

** New (1987) areas added as controls to broaden grouse range coverage.

Table 2. Drumming count indices along roadside control routes, 1979-2006.

Year	Male Grouse Heard Per Stop by Roadside Route *								
	HICKORY	OWPUT	PERRY	WASH	LR-EAST	MORGAN	GREENE	LICKCR	MEAN
1979	1.00	0.27	-	0.53	-	-	-	-	1.80
1980	1.27	0.53	0.60	0.73	-	-	-	-	0.78
1981	1.33	0.89	0.60	0.80	-	-	-	-	0.91
1982	0.73	0.40	0.20	1.07	-	-	-	-	0.60
1983	0.53	0.27	0.33	0.40	-	-	-	-	0.38
1984	0.93	0.20	0.33	0.00	-	-	-	-	0.37
1985	1.00	0.47	0.20	0.07	-	-	-	-	0.44
1986	1.00	0.33	0.13	0.07	-	-	-	-	0.38
1987	0.40	0.47	0.20	0.13	0.27	0.27	0.13	0.33	0.28
1988	0.33	0.13	0.07	0.07	0.33	0.33	0.27	0.47	0.25
1989	0.67	0.20	0.21	0.07	0.27	0.47	0.20	0.73	0.35
1990	0.47	0.20	0.13	0.13	0.37	0.47	0.27	0.47	0.31
1991	0.13	0.13	0.07	0.00	0.40	0.13	0.13	0.53	0.19
1992	0.13	0.13	0.13	0.00	0.27	0.07	0.27	0.40	0.18
1993	0.07	0.40	0.13	0.07	0.33	0.40	0.47	0.40	0.28
1994	0.20	0.07	0.07	0.00	0.40	0.27	0.53	0.40	0.24
1995	0.13	0.00	0.07	0.07	0.47	0.47	0.13	0.40	0.22
1996	0.13	0.27	0.07	0.00	0.33	0.27	0.07	0.20	0.17
1997	0.20	0.20	0.07	0.07	0.53	0.40	0.07	0.07	0.20
1998	0.27	0.07	0.00	0.07	0.53	0.07	0.27	0.07	0.17
1999	0.07	0.07	0.07	0.00	0.40	0.07	0.07	0.00	0.09
2000	0.13	0.20	0.00	0.00	0.27	0.07	0.20	0.13	0.13
2001	0.07	0.07	0.07	0.00	0.13	0.07	0.13	0.13	0.08
2002	0.07	0.00	0.07	0.27	0.00	0.00	0.20	0.20	0.10
2003	0.00	0.00	0.00	0.13	0.07	0.13	0.07	0.07	0.06
2004	0.00	0.00	0.07	0.13	0.13	0.13	0.00	0.00	0.06
2005	0.07	0.07	0.00	0.07	0.00	0.00	0.00	0.00	0.03
2006	0.20	0.07	0.00	0.07	0.00	0.00	0.07	0.00	0.05

* = Indices calculated using route with highest count.

HICKORY = Hickory Ridge (USFS), Lawrence and Jackson Counties

OWPUT = General area of Owen-Putnam St. Forest

PERRY = northern portion of Perry Co.(USFS)

WASH = general area of Jackson-Washington St. Forest in Washington County

LR-EAST = Lost River Unit - East, USFS, Lawrence and Orange Counties.

MORGMON = general area of Morgan-Monore St. Forest in Morgan county.

GREENE = eastern Greene County

LICKCR = Lick Creek Area, USFS, in Orange County.

MEAN = Arithmetic average value for all routes

Table 3. Spring breeding densities of ruffed grouse, Maumee Grouse Study Area.

YEAR	DRUMMING ACTIVITY CENTERS *	POPULATION DENSITY Per 40 ha (100 a) **
1969	12	2.9
1970	20	4.8
1971	16	3.9
1972	19	4.6
1973	9	2.2
1974	survey not conducted	
1975	14	3.4
1976	14	3.4
1977	18	4.5
1978	20	5.0
1979	17	4.3
1980	24	5.8
1981	20	4.8
1982	19	4.6
1983	11	2.7
1984	11	2.7
1985	11	2.7
1986	14	3.4
1987	10	2.4
1988	8	1.9
1989	8	1.9
1990	16	3.9
1991	9	2.2
1992	9	2.2
1993	7	1.6
1994	4	0.9
1995	4	0.9
1996	12	2.4
1997	8	1.7
1998	7	1.6
1999	10	2.3
2000	6	1.4
2001	5	1.1
2002	6	1.4
2003	2	0.5
2004	1	0.2
2005	2	0.5
2006	0	0.0

* Area covered varied from 800 to 1,000 acres; mean area covered = 875 acres.

** Assumes a 50:50 sex ratio and represents a minimum because of non-drumming males (Gulion 1981)

Figure 1. Indiana Grouse Population Trends

