

GREATER SAGE GROUSE AT BOWDOIN NATIONAL WILDLIFE REFUGE, MONTANA

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Bowdoin National Wildlife Refuge (NWR) is located 256 km west of the North Dakota border and 63 km south of the Canadian border in the Milk River Valley of central Phillips County, Montana. Most of the 6273-ha refuge has been ungrazed by domestic livestock since the mid-1970s. The refuge is approximately one-half shallow marshes and lakes and one-half upland grasslands. Grasslands on Bowdoin NWR are composed of mixed-grass species interspersed with shrubs and forbs. Plains silver sagebrush (*Artemisia cana cana*) is the predominant sage on the refuge, but its density is low throughout most of the grasslands. Much of the plains silver sagebrush is heavily browsed by pronghorn antelope (*Antilocapra americana*).

Greater sage grouse (*Centrocercus urophasianus*) are indigenous to the area and have been observed on Bowdoin NWR since the refuge was established in 1936. Early records documented several sage grouse broods near the refuge headquarters in 1940 and several broods at unknown locations in 1958.

Lek surveys for sage grouse since 1980 have been unsuccessful, with no traditional strutting grounds known to occur on the refuge. Single male sage grouse were observed on sharp-tailed grouse (*Tympanuchus phasianellus*) dancing grounds on several occasions. A male sage grouse was observed strutting with six male sharp-tailed grouse on 9 April 1980 on the southwest side of the refuge. Three years later a single strutting male sage grouse was photographed with 26 sharp-tailed grouse on Big Island near the center of the refuge. A third instance occurred on 15 April 1997 when a single male was observed on a sharp-tailed grouse lek near the north

boundary of Bowdoin NWR, but no sharp-tailed grouse were present. Sharptails had last used that lek in 1987. A lone sage grouse was heard on a different sharp-tailed grouse lek on 3 May 1997, but that record was quite late in the breeding season and strutting was not observed. Several strutting grounds were reported within 32 km of Bowdoin NWR on 10 March 2000 in more dense stands of big sagebrush (*Artemisia tridentata*) and plains silver sagebrush in the Beaver Creek Valley. Bowdoin NWR apparently supports a low density of sage grouse.

The population, although small in number, appears stable. Brood observations since 1988 ranged from one to three broods in nine out of 14 years. Average brood size from 12 observations during the 14 years from 28 May through 13 September was 5.0 (range 2-8). The latest brood on 13 September had six chicks. Refuge personnel observed a brood of eight chicks on 16 July and 11 August. I attributed survival of chicks to the abundance and proximity of moist areas where lush forbs and insects were available for food.

Refuge employees, while conducting annual waterfowl nesting studies, nest drag from 160-510 ha of upland grass habitat, and occasionally flush lone sage grouse in front of the drag. One sage grouse nest was found on 6 June 1988. The nest of seven eggs was found in dense grass cover beneath one of only a few plains silver sagebrush plants in the area. The nest hatched at least four eggs by 27 June during one of the hottest months on record when daytime highs were $>32^{\circ}\text{C}$ on 22 days with 9 of those days $>38^{\circ}\text{C}$. Although this sage grouse nest survived despite the above-normal daytime temperatures, several nests

of other species dehydrated and were lost. Total precipitation in 1988 was 24.4 cm, far below the long-term average of 31.9 cm.

Harvest of sage grouse on Bowdoin NWR during the 1980-2001 period also has suggested a trend of population stability. The refuge has maintained an unstaffed hunter registration station since 1980. Hunters have been required to sign in and also report harvest of upland game birds when finished hunting. Sage grouse were reported in the harvest in 10 of 22 years with annual harvest ranging from zero to five birds. The longest period of no harvest was four years (1991-1994). Hunter opportunities to harvest sage grouse on the refuge may be limited since most sage grouse brood observations during the period were from the portion closed to upland bird hunting.

Sage grouse habitat on Bowdoin NWR may be less than optimum due to a low

density of plains silver sagebrush in grassland habitats. Those individual sage grouse choosing to breed and nest at Bowdoin NWR appear to be productive with good survival of chicks. The refuge is located within 32 km of prime big sagebrush and plains silver sagebrush habitat and grouse may disperse from those large blocks of sagebrush to better nesting cover on Bowdoin NWR.

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