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Short Duration Grazing and Duck Nesting: A Case History

By James O. Evrard

Introduction

Habitat management to increase duck production on Wisconsin wildlife lands has emphasized providing dense nest cover dominated by grasses. The Wisconsin Department of Natural Resources (DNR) planted over 5,000 acres of switchgrass (*Panicum virgatum*) from 1974-81 in an effort to provide dense nest cover (Gatti n.d.). Periodic disturbance of dense nest cover, such as cattle grazing, maintains the early stages of grassland succession and is believed to discourage nest predators and increase nest success (Miller 1971). Annual, season-long grazing, however, is detrimental to duck production (Kirsch 1969). A form of periodic grazing, short duration grazing (SDG), is reported to increase livestock carrying capacity while improving grassland condition (Savory and Parsons 1980) and possibly benefiting nesting ducks. I tested one management prescription of SDG as a dense nest cover management technique on one of Wisconsin's waterfowl production areas (WPA) over a three-year period. If successful, SDG could be an alternative to prescribed burning and mowing for managing dense nest cover on some public wildlife lands.

Study Area and Methods

The Lundy Pond WPA comprises 170 acres located 3 miles southwest of New Richmond in St. Croix County, Wisconsin. Grassy uplands surround Lundy Pond, a 35-acre, permanent, open-water wetland and another 10-acre shallow wetland dominated by cat-tails (*Typha* spp.). These areas were divided into 10 paddocks of 12-15 acres each (Fig. 1). The design resembled a wheel with the interior paddock fences being spokes extending into the center wetlands. The boundary fence was constructed of 4 barbed wires. Interior fences were made of barbed and electric wires. Gates were installed in the interior fences at their junction with the boundary fence. Interior fences were extended into the wetlands, with the hope that deep water, besides providing drinking water, would serve as a barrier to cattle movement.

Paddocks 1, 2, and 3 were dominated by bluegrass (*Poa* spp.) and had been continuously grazed for many years while in private ownership prior to public acquisition. Paddock 3 also contained a 0.5 acre shallow wetland. Paddock 4 had been a privately owned alfalfa (*Medigo sativa*) and bromegrass (*Bromus* spp.) hayfield that was mowed several times annually. Paddocks 6 and 7 were a mixture of blue- and switchgrasses that had been continuously grazed while privately held. Paddocks 5, 8, 9 and 10 were undisturbed planted nest cover. Paddock 5 had some switchgrass, but had more timothy (*Phleum pratense*) and contained a 2-acre woodlot. Paddocks 8, 9 and 10 were mostly switchgrass.

SDG was applied from 1984 through 1986. While not ideal for cattle production due to decreased forage palatability and nutritional value, SDG began on July 1 after most duck nests had hatched to avoid problems with nest destruction by trampling (Paine et al. 1993). Grazing ended on October 1, the opening of Wisconsin's waterfowl hunting season, to avoid conflicts with hunters using the WPA. Such seasonal grazing constraints would not necessarily apply to private lands.

Each paddock was grazed for 3 days, then the cattle were moved clockwise to the next paddock until the cycle for all 10 paddocks was completed in 30 days. Three cycles completed the SDG season. Each paddock was grazed by cow and calf Hereford cattle at densities of 12-18 animal units (AU) per acre.

Visual obstruction readings (VORs) (Robel et al. 1970) were taken in the spring following snowmelt, before and after each grazing period and in the autumn after plant growth had ceased. Elert (1985) correlated forage weight to VORs for 3 vegetation types (bluegrass, switchgrass and timothy-alfalfa) on the Lundy Pond WPA to estimate the forage removed by cattle.

Waterfowl response to SDG was measured by breeding pair and nest counts. Two to 3 times each May, wetland edges were walked in the early morning to flush and count all waterfowl present. Pairs, lone males, and flocks of up to 5 males were used to estimate breeding pairs (Dzubin 1969). A cable-chain drag was used to make 3 searches of 128 acres of upland nest cover for duck nests in May and June each year (Klett et al. 1986). Nests were marked and revisited to determine fates.

Results and Discussion

A severe drought occurred during the study, complicating efforts to evaluate the SDG treatment. Water levels in the 3 wetlands in the study area began declining in 1984. The 0.5- and 10- acre wetlands were dry and Lundy Pond retained only 4% of its surface water area by the time the drought ended.

In 1984, all ten paddocks were grazed using the SDG method after being idled the previous year, following acquisition of private inholdings within the WPA boundary. In 1985 and 1986, only paddocks 1-7 were grazed because of the lack of water deep enough to be a barrier for cattle in the 10-acre wetland. Since paddocks 8, 9 and 10 were not grazed, the cattle were held in a private pasture between paddocks 10 and 1 for 9 days in each cycle in 1985 and 1986. Thus the timing of grazing for paddocks 1-7 was comparable for the 3 years. In late 1986, low water levels in Lundy Pond allowed the cattle to move from paddock to paddock at will. As a result, the SDG experiment ended.

Vegetation. When sampled following snowmelt in April 1984, no real differences were observed between mean switchgrass VORs (9.2 inches) and mean VORs at Mallard (11.8 inches, t = -2.003, P = 0.06) and Blue-winged Teal (9.2 inches, t = -0.263, P = 0.80) nests. Switchgrass is important for early-nesting Mallards because they seek dead and dense residual cover from the previous year's vegetation growth for nesting (Evrard and Lillie 1987).

Mean VORs for the bluegrass, tame hay, and mixed grass paddocks were significantly lower than mean VORs at Mallard and teal nests. Despite these differences, 17 Blue-winged Teal and 1 Mallard nests were found in those paddocks. Ducks seek out the densest vegetation within nesting cover for their nest sites (Evrard and Lillie 1987).

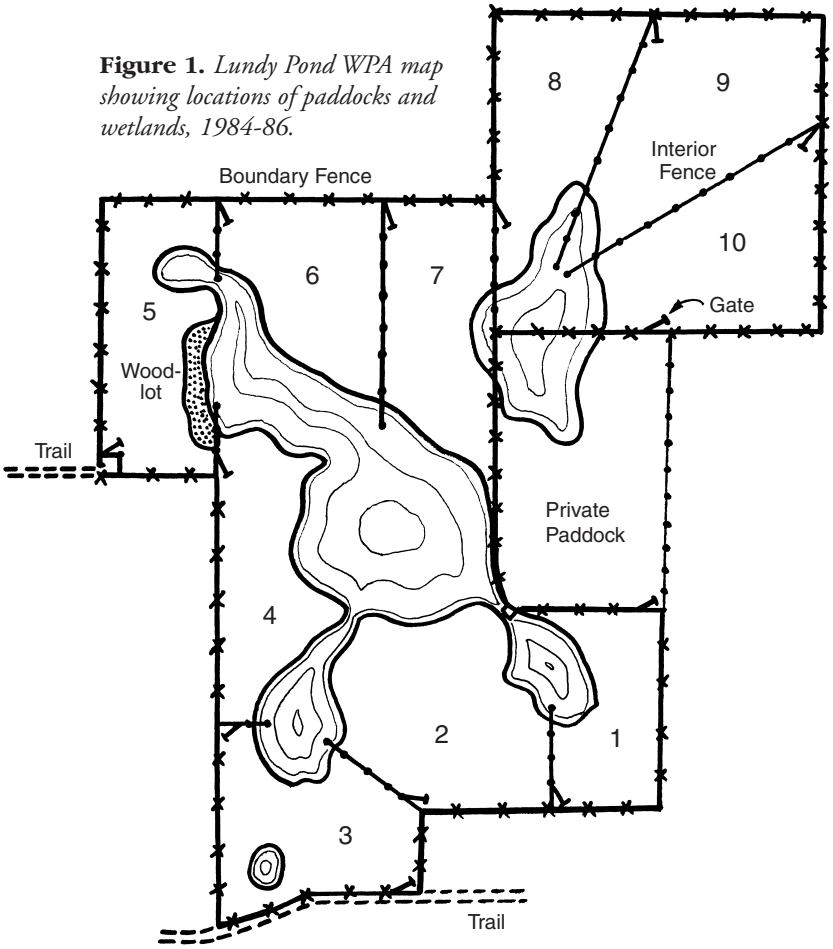

Figure 1. *Lundy Pond WPA map showing locations of paddocks and wetlands, 1984-86.*

Prior to initiation of SDG on 1 July, the VORs for all 4 types of nest cover — bluegrass, hay, mixed grass and switchgrass — had increased due to plant growth and were within acceptable Mallard and teal nesting parameters (Fig. 2). Blue-winged Teal initiate nesting in May after new vegetation growth offers some nest concealment. New vegetation growth is also important for renesting Mallards.

The 3 subsequent SDG cycles that ended by 1 October reduced VORs of the vegetation below acceptable nesting Mallard and Blue-winged Teal limits with the exception of the switchgrass paddocks. Snow compaction during the winter further reduced mean VORs for all cover by the following spring.

In 1985, mean April VORs for all cover types were below acceptable levels for Mallard nests and only switch grass was acceptable for Blue-winged Teal nests (Fig. 2). Only 3 duck nests were found. Mean VORs for hay and switchgrass were acceptable for both duck species nests when measured in June prior to the initiation of grazing. SDG in the blue grass, hay, and mixed grass paddocks again reduced October mean VORs. As would be expected, mean October VORs increased in the ungrazed warm-season switch grass paddocks. The continuing drought, which began in

1984, apparently reduced overall grass growth from April to June in 1985 compared to the previous year.

The same patterns were repeated in 1986. Even the switch grass paddocks, which were not grazed in 1985, had mean April VORs that were below acceptable levels for Blue-winged Teal. Only 1 duck nest was found. However, mean VORs for all cover types had increased by July to acceptable levels for Blue-winged Teal and the ungrazed switch grass was within acceptable levels for the Mallard.

Duck Nests. The number of Mallard and Blue-winged Teal nests found with the cable chain drag decreased drastically from 20 in 1984 to 3 in 1985 and only 1 in 1986. Only 1 (5%) of the 20 nests in 1984 hatched, but 2 (67%) of the 3 nests hatched in 1985 and the single (100%) nest found in 1986 hatched. Nests that failed to hatch were destroyed primarily by red fox (*Vulpes vulpes*). A fox den containing pups was found on the WPA during the study. Other nest predators seen in the WPA included the striped skunk (*Mephites mephites*), common raccoon (*Procyon lotor*), and American badger (*Taxidea taxus*).

There would be a 1-year delay in any effects of SDG upon nest cover as conducted in this study. During the study, most (80%) nests were established and either hatched or were destroyed before SDG was initiated on 1 July. SDG in 1 year affected residual nest cover the following year. The effects of 1984 SDG would have occurred in 1985. Despite the dramatic drop in nest density in that year, the number of breeding pairs were essentially unchanged from 1984 (4 Mallard, 10 Blue-winged Teal) to 1985 (3 Mallard, 13 Blue-winged Teal). Breeding pairs dropped considerably in 1986, however, to 2 Mallard and 6 Blue-winged Teal, most likely due to the drought which virtually eliminated open water in the WPA in that year.

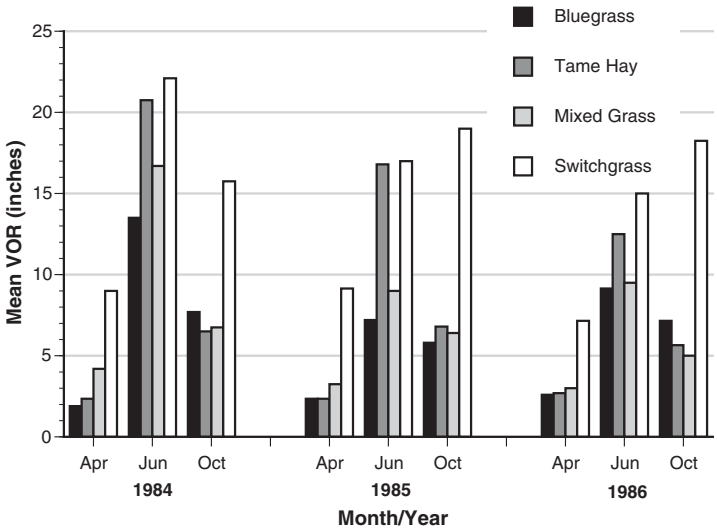

Figure 2. *Mean visual obstruction readings (VORs) of nest cover vegetation, Lundy Pond WPA, April-August, 1984-86.*

Duck nesting had largely ceased by the time cattle began grazing the WPA. However in 1984 and 1985, 5 nests were still active when SDG was initiated. Blue-winged Teal and Mallard nests would be exposed to trampling during 1 and possibly 2, 3-day grazing periods during the 33-35 days needed to lay a clutch of eggs and incubate them. Only 1 of 5 active nests were trampled during the grazing cycles.

Cattle. The cattle removed nearly 2.5 tons of forage per acre from all paddocks during the 3 SDG cycles in 1984. Tame hay yielded the most forage per acre (4.2 tons) followed by switchgrass (3.5 tons per acre) and bluegrass (1.2 tons per acre). Forage production declined to less than 1 ton per acre annually for all paddocks in 1985 and 1986 due to the drought.

An unexpected benefit of SDG was the apparent control of boxelder (*Acer negundo*) invasion into the paddocks. Box elder is a persistent woody invader of grasslands that is difficult to control by mowing and burning. The cattle appeared to seek out the tender leaves and shoots of boxelder seedlings and saplings.

Another unexpected benefit of SDG was the opening up of dense cat-tails in the wetland in Paddocks 8, 9 and 10. The trampling effects of the cattle seeking water in the wetland in 1984 crushed the cat-tails, creating open water where none existed before. This created habitat for several pairs of Blue-winged Teal in 1985. However, the paddocks were grazed for only 1 year, and cat-tails revegetated the open water areas by 1986, eliminating the pair habitat.

Conclusions and Management Recommendations

Drought and intense red fox predation complicated efforts to determine the effects of SDG upon waterfowl nest cover in this study. With the grazing conditions of a stocking of 12-18 AU per acre on a 30-day rotation from 1 July to 1 October, grass cover managed by SDG was acceptable in late April to nesting Mallards and Blue-winged Teal in only 1 of 3 years. Cattle management problems experienced could have been reduced with better paddock design. Additional research could determine the value of SDG for managing waterfowl nesting cover on public and private lands.

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