University of Nebraska - Lincoln
DigitalCommons@University of Nebraska - Lincoln

Great Plains Wildlife Damage Control Workshop Proceedings | Wildlife Damage Management, Internet Center for

4-1-1987

Control of One Native Animal Species To Benefit Another Native Species

John T. Lokemoen
Northern Prairie Wildlife Research Center, Jamestown, North Dakota

Follow this and additional works at: http://digitalcommons.unl.edu/gpwdcwp

Part of the Environmental Health and Protection Commons

Lokemoen, John T., "Control of One Native Animal Species To Benefit Another Native Species" (1987). *Great Plains Wildlife Damage Control Workshop Proceedings.* Paper 79.
http://digitalcommons.unl.edu/gpwdcwp/79

This Article is brought to you for free and open access by the Wildlife Damage Management, Internet Center for at DigitalCommons@University of Nebraska - Lincoln. It has been accepted for inclusion in Great Plains Wildlife Damage Control Workshop Proceedings by an authorized administrator of DigitalCommons@University of Nebraska - Lincoln.

Control of One Native Animal Species To Benefit Another Native Species

John T. Lokemoen[2]

This paper expresses my feelings on the topic of controlling one native animal species (small carnivores) for the benefit of another native species (waterfowl). The relationship between the predator and prey has always been an interesting one. During much of man's experience with wildlife, predators were generally feared and persecuted. It was almost universally agreed that killing predators resulted in larger game populations, which man wanted for food or sport.

These basic beliefs were seriously challenged by several authors in the 1930's and 1940's. Errington studied bobwhite quail in Wisconsin and Iowa and devoted many years to muskrat research in Midwest marshes. Errington became a strong believer that game animal numbers were a reflection of habitat quality. Early in his career Errington (1934) concluded that predators only preyed on bobwhite quail that were surplus to the carrying capacity of the habitat. Errington (1942) pointed out that some birds renested, and that helped compensate for loss to predators. In later papers Errington noted that muskrats suffered severe mortality, but suggested that most of the animals that died would have died anyway because of population pressures or other reasons. Other authors believed the predation on nests was a biological safeguard because it extended the nesting season so all birds would not be killed by a catastrophic storm. Kalmbach (1937) theorized that if crows had not destroyed nests then something else would.

The primary thought that dominated Errington's papers was that predation is a natural force that affects prey but has little significance for prey populations. He advised against extreme attitudes on the subject of predator control on behalf of waterfowl. During this same period Edminster (1939), Bump et al. (1947), and Crissey and Darrow (1949) were studying ruffed grouse in the eastern United States. These biologists concluded that ruffed grouse egg success increased where predators were controlled, but the fall population of ruffed grouse did not increase. Crissey and Darrow (1949) saw a temporary increase in ruffed grouse numbers on Valcour Island where predators were moved, but a slump in the population occurred when disease occurred two years later. About this same time other authors were pointing out that bounty payments on predators resulted in few increases to game numbers.

In total, the above-named authors had an important influence on the theory regarding predation. The papers published by these people produced a philosophy dominant in the 1950's and 1960's that controlling predators was ineffective in benefitting game populations. Game populations were thought to be primarily affected by habitat. The attitudes generated by the studies of the 1930's and 1940's probably reached a peak in the early 1970's when the Leopold (1964) and Cain et al. (1972) reports were issued. These reports examined predator and rodent control programs of the U.S. Department of Interior and resulted in bans on techniques for controlling predators such as the use of strychnine poisons. In most of the areas of the United States habitat management became the primary practice of the game manager. Predator control was seldom used. It seemed that only the first tenet of the Leopold report, which stated "all native animals are resources of inherent interest and should be cared for," was remembered. **The second tenet, which said that local population control is an essential part of management where species cause significant damage to other resources, crops, or human health or safety, was forgotten.**

Habitat management is indeed a primary tool of the game manager. If managers could dictate the pattern of food, cover, and water in the Dakotas, the resulting ecosystem would be naturally productive of wildlife, and there would be less concern for other management options such as predator control, disease control, bag limits, or shooting hour limits. However, this is not a viable option, and management practices have to be primarily applied intensively on the few acres of land that wildlife people control.

In the eastern Dakotas management of waterfowl by wetland protection alone has not been effective in increasing duck populations. Where wetlands exist Cowardin and Johnson (1979) estimated that the mallard population on unmanaged areas was decreasing at a rate of 2% yearly. In a managed situation with wetland and planted nesting cover, the population of mallards was increasing about 12% annually. Where there was a combination of wetlands, planted cover, and predator control, the mallard population increased at a rate of 263% annually. In eastern North Dakota, Johnson and Sargeant (1977) calculated that 10 to 20% of the mallard hen population was killed by red foxes each spring. This loss may be more mallards than are killed by hunters in the fall.

---

[1]Talk presented at the 8th Great Plains Damage Control Workshop. (Rapid City, SD, April 28-30, 1987).

[2]John T. Lokemoen is Wildlife Biologist, Northern Prairie Wildlife Research Center, Jamestown, ND.

In any discussion of predator management as a tool, the following four major arguments are presented against the use of control: 1) Removing predators has little effect on reproductive success; and, even if reproductive success does increase, the population is held in check by other factors. 2) Reducing numbers of predators upsets the delicate natural balance. 3) Predators are necessary to remove the weak and diseased and thereby maintain healthy survivors. 4) If predators were removed small animals would increase abundantly.

In rebuttal to point 1), several studies have reported increases in game populations as a result of predator management. At Agassiz National Wildlife Refuge, Balser et al. (1968) found increased duck production on that part of the refuge where predators were removed. In California, Gladding et al. (1945) studied the Dunes Lake Club, where valley quail increased greatly when there was a reduction in grazing, increased feeding, and predator control. When predator control was stopped, the quail population slumped almost to zero. On a 100 square mile area in South Dakota where red fox, striped skunk, badgers, and raccoons were controlled, pheasant population averaged 132% higher. Population of ducks on that 10 square mile block rose from about 7 pairs of mallards per square mile to some 44 pairs of mallards per square mile. The population increase was probably a reflection of production one year, and homing of those hens and their young the next year.

In regard to Errington's comment that predators take only prey that is surplus to the population, Lack commented that all Errington's figures showed is that predators took more bobwhite quail when they were abundant than when they were scarce.

Point 2), the balance of nature concept, we often see perpetuated by popular magazines; scientists have called this idea a myth, with good reason. Ehrlich and Birch (1967) pointed out that even in natural situations animal populations undergo dynamic periodic, seasonal, and even daily changes. At a particular site one population may increase greatly or become extinct within a short period. In the Dakotas, for instance, the prairie chickens were introduced to the states as breeding birds, rose to high populations, and declined to near zero in the last 100 years. In this paper I was supposed to talk about the effect on natural predators. However, it is difficult to list the natural complement of predators because several, such as the red fox and raccoon, are new or much increased over pristine conditions. Several species, such as the grizzly bear and plains wolf, are gone, and new ones, including rats, cats, and dogs, have been added.

Point 3) states that the predators take the weak, injured, or diseased, but it might be more accurate to say predators take animals that are vulnerable. In the eastern Dakotas, the animals that are vulnerable are the hens that put nests in narrow shelterbelts, fence rows, and the like where red fox and striped skunk routinely patrol.

In conclusion, I believe it is reasonable to affect one population of animals negatively to benefit another. We live in a highly altered environment in which habitats and wildlife change daily. Wildlife managers must be allowed to manipulate all aspects of the environment if they are to have a strong impact on managed animal populations. If managers are limited in the management tools they can use, they will be severely limited in results achieved. When predator control is accomplished it should be done with the following constraints: 1) Predators should not be reduced on large areas that are natural and contain vegetation or animals that were there when man arrived. 2) There should not be any use of hit-or-miss bounty systems. I think we know that the bounty system as applied in the past is not effective in benefitting game populations. 3) Predators should not be controlled where an endangered species might be affected negatively.

Intensive management would have to be practiced on selected areas containing good habitat. Upland nesting waterfowl is an excellent group to manage because it responds well to intensive management. To increase waterfowl production, predator management used to take place only for a short time of the year, mid-March to early July. From previous studies only three animals were responsible for most of the upland nest losses--red fox, striped skunk, and raccoon--so we probably need to apply predator management to only these species. Predator management may have to be different from the forms it has taken in the past. Animals may have to be live-trapped and moved, excluded by fencing, or deterred by chemicals.

LITERATURE CITED

Balser, D. S., G. H. Dill, and H. Nelson. 1968. Effect of predator reduction on waterfowl nesting success. J. Wildl. Manage. 32:669-682.

Bump, G., R. W. Darrow, F. C. Edminster, and W. F. Crissey. 1947. The ruffed grouse life history, propagation, and management. 915 p. New York Cons. Dept.

Cain, S. A., J. A. Kadlec, D. L. Allen, R. A. Cooley, M. H. Hornocker, A. S. Leopold, and F. H. Wagner. 1972. Predator control - 1971: Report to the Council on Environmental Quality and the Department of the Interior by the Advisory Committee on Predator Control. 207 p. Univ. of Mich. Press, Ann Arbor.

Cowardin, L. M., and D. H. Johnson. 1979. Mathematics and mallard management. J. Wildl. Manage. 43:18-35.

Crissey, W. F., and R. W. Darrow. 1949. A study of predator control on Valcour Island. New York State Cons. Dept., Div. Game and Fish. Research Series 1. 28 p.

Duebbert, H. F., and J. T. Lokemoen. 1980. High duck nesting success in a predator-reduced environment. J. Wildl. Manage. 44:428-437.

Edminster, F. C. 1939. The effect of predator control on ruffed grouse populations in New York. J. Wildl. Manage. 3:345-352.

Ehrlich, P. R., and L. C. Birch. 1967. The "balance of nature" and "population control." American Naturalist 101:97-107.

Errington, P. L. 1934. Vulnerability of bob-white populations to predation. Ecology 15:110-127.

Errington, P. L. 1942. On the analysis of productivity in populations of higher vertebrates. J. Wildl. Manage. 6:165-181.

Gladding, B., D. M. Selleck, and F. T. Ross. 1945. Valley quail under private management at the Dune Lakes Club. California Fish and Game 31:166-183.

Johnson, D. H., and A. B. Sargeant. 1977. Impact of red fox predation on the sex ratio of prairie mallards. 56 p. USDI Fish and Wildlife Service Wildlife Research Report No. 6.

Kalmbach, E. R. 1937. Crow-waterfowl relationships. USDA Bureau of Biological Survey Circular No. 433.

Leopold, A. S. 1964. Predator and rodent control in the United States. Trans. N. Am. Wildl. and Nat. Resource Conf. 29:27-47.