



Social and Range Dominance in Gallinaceous Birds: Pheasants and Prairie Grouse

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The sea otter and harbor seal inhabit the same coastal waters and the rocky beaches and reefs. They provide an example of two fairly large, carnivorous, littoral mammals which are virtually non-competitive. There is only a slight overlap in their food habits in the same locality. The otter feeds largely on echinoderms and shell-bearing mollusks, whereas the harbor seal depends mostly on free-swimming cephalopods and fishes.

SUMMARY

Five sea otters collected at Amchitka Island, Alaska, in March were found to be feeding on green sea urchin (86 per cent by volume), fringed greenling (6 per cent), mussel (5 per cent), horse mussel (3 per cent), and traces of starfish, hermit crab, and limpet. Seven harbor seals inhabiting the same waters and beaches were feeding on fringed greenling (96 per cent), octopus (3 per cent), and traces of unidentified fish, Alaska pollack, other

Gadidae, and crabs. Octopus occurred in 5 of the 7 stomachs. The two littoral mammals are largely noncompetitive in their food habits.

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SOCIAL AND RANGE DOMINANCE IN GALLINACEOUS BIRDS— PHEASANTS AND PRAIRIE GROUSE¹

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Strife and intolerance are believed to affect the welfare and breeding potential of gallinaceous birds. Information on this phase of population dynamics is meager. Before antagonism can be developed between two or more species of gallinaceous birds, they apparently must be of similar size and form to stimulate the urge to fight or aggression short of fighting. In addition, gallinaceous birds in conflict must occupy the same range, and each must use similar cover types.

Ring-necked pheasants (*Phasianus colchicus*), sharp-tailed grouse (*Pediocetes phasianellus*), and prairie chickens (*Tympanuchus cupido*) were studied on the same range in the Nebraska Sandhills from 1937 to 1943. The author and assistants were in daily contact with these species during the winter and early spring months. Each winter a feeding station maintained near the headquarters of the Valentine National Wildlife Refuge served a large population of pheasants, 50-70 sharp-tailed grouse, and 5-10 prairie chickens. This setting afforded the opportunity to witness fighting among all three species on many occasions. The purpose of this

paper is to report techniques used in fighting and to state the results of such conflict.

INTERSPECIFIC DOMINANCE AND DISPLAYS

Sharp-tailed grouse were tolerant of other species, but when conflict developed, they were masters of the situation. They were able to dominate both pheasants and prairie chickens. Pheasants could dominate prairie chickens, but prairie chickens were unable to cope successfully with either the sharp-tails or the pheasants. These statements are based on observed cases of conflict over a period of six years.

During this period of years, ten cases were recorded involving combats between cock pheasants and prairie chickens at the winter feeding station, and two cases of fighting between a prairie chicken and a cock pheasant were observed on the booming territories of the prairie chickens. In these cases of conflict on the booming grounds the pheasant was the aggressor, going out to promote the fight. Eighteen cases were recorded of fights in which a cock pheasant and a sharp-tailed grouse were involved. The sharp-tails were victorious in all engagements with pheasants, while the prairie chicken always lost the fight to a pheasant. Sharp-tailed grouse and prairie chickens were observed on occasion to engage in sparring encounters at the winter feeding area, but the victorious sharp-tail appeared to consider it a playful affair. Conflicts between the two species of prairie grouse appeared to consist only of the establishment of a peck order among

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their own kind. Both species of grouse would be seen feeding together within an hour following a tussle.

Each of these species has a characteristic fighting style and form prior to and during combat. The pre-attack posture of sharp-tailed grouse is very similar to its dancing form. The body is slightly crouched and tipped forward; the head and neck extended, paralleling the ground; the wings slightly spread; and the tail held rather erect. From this position, a sharp-tail may dart out at an adversary in combat, or shuffle into its dance on the mating grounds. The male pheasant assumes a fighting posture in much the same manner as that of the domestic rooster or gamecock. It may pick at objects on the ground, circle or feint its opponent for an opening, then it suddenly charges, jumping up and striking its adversary with long, strong legs and sharp spurs. The style of the prairie chicken is identical to that of the pheasant except that it is clumsy and displays awkward footwork. Its short legs and lack of well-developed spurs render it quite ineffective in encounters with pheasants.

An encounter between a pheasant and sharp-tail starts with each bird assuming its typical pre-attack posture. The pheasant feints from side to side; the sharp-tail, set in its crouched position, may take very short steps toward the pheasant. Suddenly the two attack—the pheasant jumping up in typical cock manner to set his spurs; the grouse—in a very low crouch—quickly darting beneath the pheasant and coming up from behind to grasp the ring-neck's tail or rump. Having secured a firm bill-hold on the feathers, it hangs on doggedly. This sudden, unexpected turn of events apparently frightens and intimidates the pheasant, which struggles frantically trying to free itself of the grouse. The pheasant escapes only when the sharp-tail has pulled out all feathers within its grasp or has lost its hold. In cases where the grouse fails to grasp the pheasant, the fight may continue. Seldom did the most aggressive ring-neck make more than three passes at a sharp-tail before the latter was able to seize tail or rump feathers. The pheasant, once defeated, remained clear of any other sharp-tails.

Prairie chickens were most inclined to fight in late winter at the approach of the breeding season; at this time they would square off at a pheasant in typical rooster fashion. After some sparring, pheasant and prairie chicken would rush together and meet in mid-air. The pheasant was so much faster, inflicting punishment with its spurs, that the prairie chicken would take a very rough flogging before freeing itself from the situation. Being roundly defeated and pummeled, it would run and take to flight at its first opportunity. The cock pheasant would give chase, driving the prairie chicken for a distance.

Sharp-tailed grouse are tolerant toward prairie chickens, both occupying the same range in harmony, even though the former is socially dominant. In early fall and winter, flocking and association of

the two are common. The fact that both establish separate mating grounds is a factor contributing to tolerance and harmony during the breeding season when conflict would be more pronounced. The pheasant's aggressive nature, its selection of a territory and its tendency, as indicated below, to pursue for a mile are qualities detrimental to the prairie chicken.

Harger (1956) described the visit of a cock pheasant to a booming ground in Michigan, where the cock was observed chasing prairie chickens about and from the booming site. None of the birds present attempted to defend their area. I have seen similar instances where pheasants chased prairie chickens—the prairie chicken flying, thus avoiding the pursuing pheasant. Once these prairie chickens had fought with and lost to a pheasant on the winter feeding grounds in Nebraska, they never attempted to hold their own against future attacks. Instead they would fly off 25 to 50 yards and alight. Seldom did a pheasant have the opportunity or inclination to pursue further when sharp-tails were present. An aggressive sharp-tail would take up the fight and promptly put the pheasant in another frame of mind. The prairie chickens observed by Harger probably had been attacked and defeated on previous occasions and were now completely submissive to the pheasant. I have never seen prairie chickens refuse their first fight with a pheasant; but once defeated, they seldom accepted or defended repeated challenges. Had the site observed in Michigan been the dancing ground of the sharp-tailed grouse, I believe that the cock pheasant would have made only one visit to pick a fight. The sharp-tails having worked him over, he would have hesitated before coming to engage in a second encounter.

A cock pheasant will eventually drive all prairie chickens from a meadow or booming area during the spring breeding season. Dr. George B. Saunders and the writer, in May 1938, observed a cock pheasant drive a male prairie chicken more than a mile from its mate. The affair started when the pheasant and prairie chicken engaged in a very brief encounter. The grouse took to flight followed by the pheasant. The prairie chicken alighted at about 200 yards, only to be followed and put to flight. Each time it flew, it was pursued in flight by the pheasant. After several stops and starts, the grouse flew off to the distant hills. The pheasant ceased to follow. The female prairie chicken then followed, flying in the direction taken by the male. Subsequent observations on this meadow revealed that the two prairie chickens had disappeared. This instance of pheasant-grouse conflict occurred on a large isolated meadow valley located at the east end of Pelican Lake on the Valentine National Wildlife Refuge in Cherry County, Nebraska. The area, prior to its first invasion by pheasants in 1936, contained favorite booming grounds of the prairie chicken. Persistent attacks day after day disturbed the normal breeding behavior of the chickens, eventually driving them from long-established booming grounds.

POPULATION CHANGES

Small pockets of prairie chicken range exist in Indiana, Illinois, Michigan, Wisconsin, and Missouri. Extensive areas still exist in the Dakotas and Nebraska. Kansas, Oklahoma, and Texas also are reported to possess some prairie chicken habitat. The more eastern and isolated remnant localities represent the eastern and northeastern periphery of the tall-grass prairie. The more extensive western localities represent the western periphery of the tall-grass prairie of the Northern Great Plains where it blends into the drier short-grass region. Here to the west much of the area is not conducive to a high pheasant population, except where cultivation of farm crops is practical and where habitat changes are subjected to drastic shifts from poor pheasant to good prairie grouse years. Years of drought (1932-42) favored the pheasant and disfavored the prairie grouse, but we cannot discount the fact that prior to introduction of the pheasant, prairie chickens seemed to weather both dry and wet periods of the climatic cycle.

There is some evidence that, when a pheasant population invades the range of the prairie chicken, the chickens wane and may cease to exist. Prairie chickens showed a drastic decline on their former booming grounds in the Nebraska Sandhills during 1936-43 when the pheasants became common. When a change in habitat conditions occurred, starting in 1943, the pheasant population crashed (Sharp, 1953). Prairie chickens then increased beyond all expectations and, by 1954, they were just about as abundant as in years prior to 1929. Although this in itself is not conclusive proof of a cause and effect relationship in changing populations of pheasants and prairie chickens, many local observers who were in daily contact with both species believed that the return of the prairie chickens had much in common with the waning of the pheasants.

There are many factors influencing game-bird populations, and these same factors may in turn affect rodents or other associated species. During prolonged drought periods on the Great Plains (1932-42) (Nicholas, 1950), jack rabbits (*Lepus townsendii*) and pheasants were stimulated to successful reproduction in the Nebraska Sandhills. When the wet cycle returned (1943-54), rabbit and pheasant populations dropped, but these same wet years created conditions favorable for the prairie grouse. It is apparent that gallinaceous bird populations are influenced by climatic factors. There is some evidence also that an exotic galliform may effect changes in numbers or distribution of a native galliform regardless of favorable or unfavorable conditions that exist because of climatic cycles.

In order to understand what has happened in Nebraska since the pheasant was introduced, let us go back to the years prior to 1929. Laws were lax, and even local residents shot prairie chickens without much regard to future supplies. The birds'

population held up, and no one was particularly apprehensive of any drastic drop in numbers. Since 1930, people have become quite conservation-minded toward "their chickens." And today local residents, living on the western periphery of the prairie grouse range, have very little interest in shooting—even in areas where grouse have been plentiful since 1950.

Severe competition is known to exist between pheasants and prairie chickens, especially during the spring and early summer months when cock pheasants are actively defending their territories. This factor alone could eventually eliminate existing isolated pockets of prairie chickens. But the issue is a very controversial one among (1) the younger hunters, who would rather have only pheasant shooting; (2) the prairie grouse shooters, who prefer their "chickens"; and (3) the conservation-minded few, who desire to dedicate at least a few acres of our rich domain to the prairie chicken.

Strife created by the social and range dominance complex presents a serious problem on areas where conservationists are trying desperately to save even a remnant population of the prairie chicken.

SUMMARY

Observations were made on strife and intolerance within a mixed population of ring-necked pheasants, greater prairie chickens, and sharp-tailed grouse in the Nebraska Sandhills from 1937 to 1943. These species were observed during the winter and early spring months. Techniques used in fighting were observed and the results of such conflict were recorded.

Sharp-tailed grouse were able to dominate both pheasants and prairie chickens, and their success was due to a fighting style unlike that of pheasants or prairie chickens. Pheasants could dominate prairie chickens but the prairie chicken was unable to cope successfully with either the sharp-tails or the pheasants. Fighting form in pheasants and prairie chickens was identical. Sharp-tailed grouse, although socially dominant, were tolerant toward the prairie chicken.

Severe competition existed between pheasants and prairie chickens, especially during the spring and early summer months when male pheasants were defending their territories. This competition could eventually eliminate isolated pockets of prairie chickens in the states where they exist.

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