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Ruffed Grouse (*Bonasa umbellus*)

Description

The ruffed grouse or "partridge" is a medium-sized, heavy-bodied bird belonging to the Order Galliformes (includes grouse, quail, pheasants, turkeys, and domestic chickens). The grouse family (Tetraonidae) includes ptarmigan, sage grouse, prairie chicken, spruce grouse, blue grouse, and sharp-tailed grouse as well as the ruffed grouse.

The feathers on the upper body and top surface of the wings of a ruffed grouse are basically dark gray, brown, or almost black, with markings of lighter spots, streaks, or bars. A black, slightly iridescent ruff of feathers covers each side of the lower neck. The head and legs are completely feathered. The breast feathers are predominately grayish-white with relatively distinctive transverse bars of buff, brown or gray. From 6 to 11 continuous, narrow, wavy bars of brown and dark gray extend horizontally across the upper surface of the tail. A distinctive black 2.5-cm (1.0-in) wide band, bordered on each side by a thinner, lightly mottled band, extends across the tip of the tail. In some cases this tail band may be incomplete at the center 2 feathers.

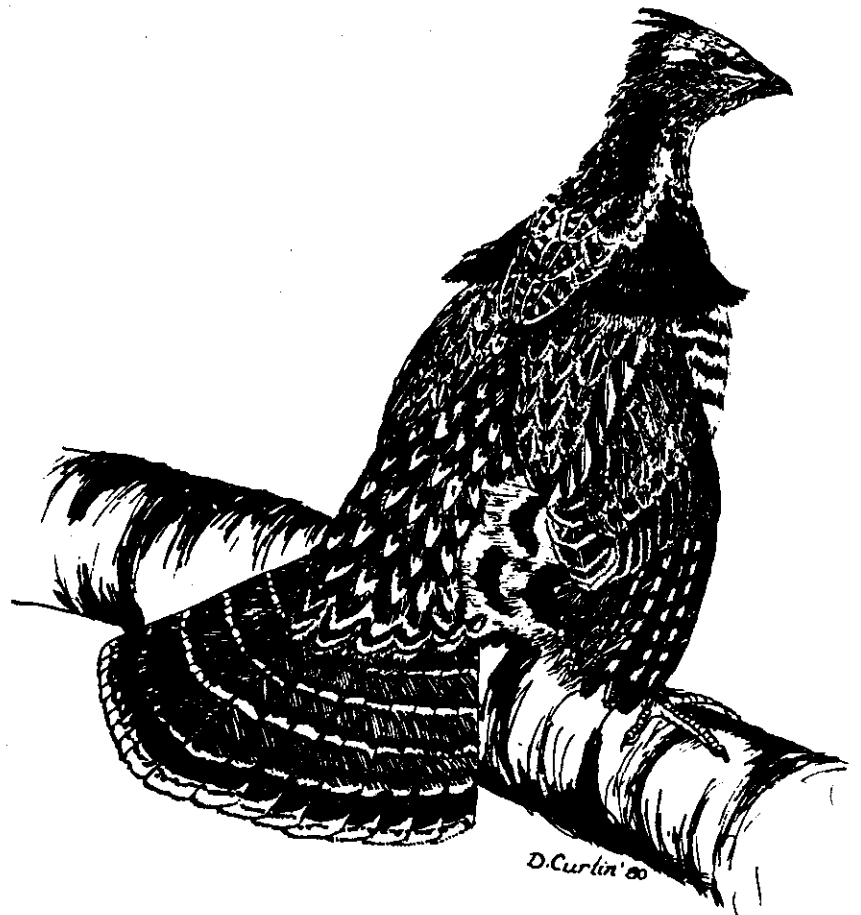
The overall body plumage of the grouse varies considerably between individuals from a dark gray phase to a chocolate-brown or red phase, or a variety of intermediate shades. Populations in specific areas may consist primarily of either the gray or red phase. A general rule of thumb is that the red phase occurs most frequently in milder climates, whereas the gray is most common where winters are more severe. However, two or more color phases are present in populations over the major portion of this species' range.

Researchers do not know the reason for or the advantage of the two primary color phases.

Some average physical dimensions of adult birds are: weight -- males 644 g (23 oz), females 588 g (21 oz); length from beak to tip of tail -- 43.2 cm (17 in); and wingspan -- 58.4 cm (23 in). Aside from the males being heavier and stouter, several subtle plumage characteristics can be used to determine the sex of birds in the field.

In general the color markings are more distinctive on males (cocks) than females (hens). Cocks have several clearly defined dark "necklace-like" bars across the upper chest, which are not as apparent on hens. The neck ruff is longer and more extensive on the cock. Examine the feathers on the bird's rump; if there are 2 or 3 spots, the bird is probably a male, if none or one, a female. Either sex may have a broken tail band at the center 2 feathers, but the band markings at that point are coarser in cocks and more diffuse in hens. The plucked central tail feathers of cock grouse taken in the fall are longer than 15 cm (5.9 in); these feathers of the hen are generally shorter. Since no single characteristic can be used conclusively, several traits should be examined when sexing grouse.

Young-of-the-year can be distinguished from adults by their more pointed 2 outermost wing primaries. These feathers are not moulted the first winter in subadults and contrast with the rounded tips of the other primaries.



Grouse might be confused with hen pheasants, but the latter are about 450 g (1 lb) heavier, are about 23 cm (9 in) longer, and have a much longer, pointed tail devoid of wide terminal band.

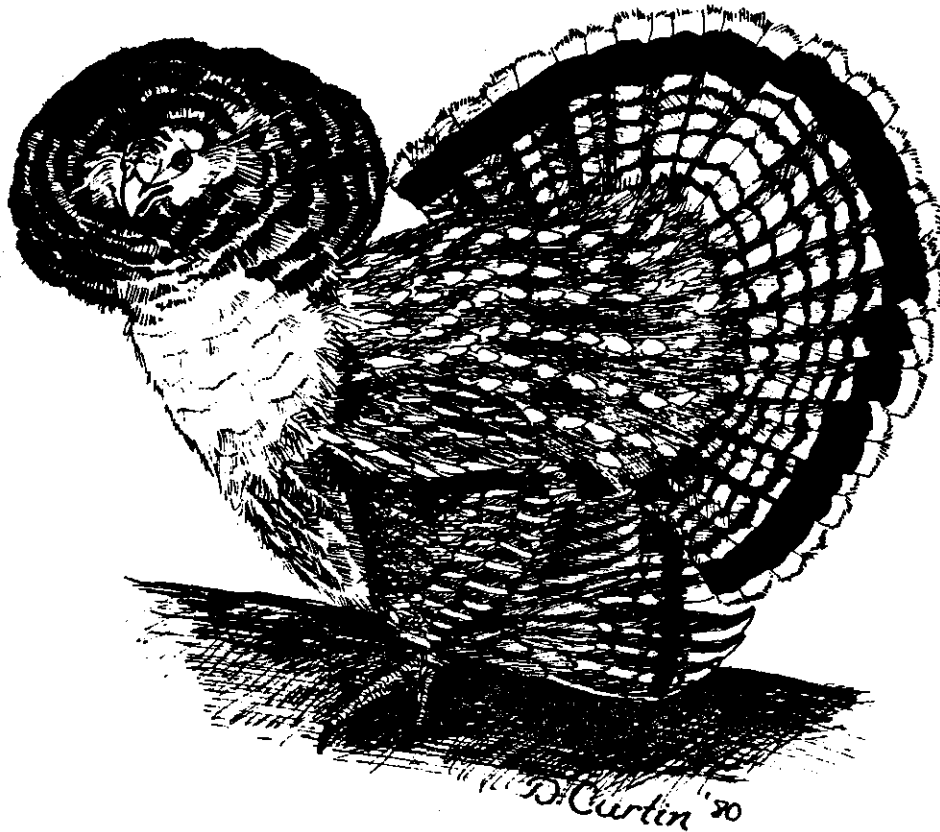
Distribution and Habitat

The ruffed grouse is the most widely distributed game bird in North America. In the east, ruffed grouse are found from Labrador south through New England to Georgia and Alabama, west to Minnesota and across southern Canada. In the west, they range south from the Canadian provinces through western Montana and Wyoming into central Utah. On the Pacific Coast, ruffed grouse occur on the west slopes of the Cascades and in the coastal ranges south to northwestern California and north to the Yukon River Valley in Alaska. In New York grouse generally are found wherever there is suitable habitat.

The habitat of ruffed grouse is young (early successional stage) forests in which succession is set back by clear-cut and patch-cut logging or fire. Grouse survival is usually poorer where conifers, especially pines, are abundant in the forest canopy.

Life History

Breeding season starts in late March, peaks in April and ends in early May. During this time a cock chooses a favorite displaying site, usually a large log, which affords a commanding view of the vicinity or is the focal point of his territory. From this site he attempts to attract receptive hens and repel rival cocks by drumming and strutting. With his back straight up and tail braced against the log, the cock thrusts his cupped wings sharply forward and back in a horizontal, slightly circular beat. The drumming sound produced in this manner starts with a few evenly spaced staccato thumps, increasing in frequency to a whirl; all of which lasts only about 10 seconds. Many people liken the sound to that of an old two-cylinder tractor starting up or someone frantically beating a rug. Although audible up to 0.5 km (0.3 mi), the sound is surprisingly difficult to locate accurately. When not drumming or upon the appearance of another grouse, the cock frequently struts the length of the log with his plumage fluffed, tail spread, and wings held low. Cocks are highly territorial at



this time and will not tolerate the presence of other cocks near their drumming sites. Their territories vary in size according to habitat quality. In excellent habitat there may be more than 40 drumming males per 2.6 km² (1.0 mi²). Poor habitat may hold only one-tenth as many drummers.

After mating, the hen typically selects a nesting site in a large-pole to sawlog size stand of hardwoods or mixed conifers-hardwoods, often situated in low-lying areas. Nests are simple depressions commonly located at the base of a stump or tree where the hen has a good field of view and an open escape route. The clutch of 10 to 12 creamy-buff, brown-flecked eggs (approximately the size of small chicken eggs) are laid over a period of about 17 days. If the hen is continuously disturbed or if the clutch is destroyed before the start of incubation she will usually reneest. The second nest will have a smaller clutch of 6 to 8 eggs. Hens appear to be somewhat territorial during nesting. Home ranges at this time average about 8.4 ha (21 A) with some overlap between adjacent hens. Most hens

begin laying in late April and hatching takes place in late May or early June after an incubation period of 24 days. The chicks are precocial, that is they are able to move about and feed soon after hatching. Hens and their broods abandon the nest within a day of hatching. Insects are a major food item of young birds and the grouse family makes use of forest openings or edges adjacent to openings where insects are most abundant. Hens with broods occupy home ranges of approximately 10 to 12 ha (25 to 30 A).

The females are attentive mothers as they move quietly through the forest occasionally chirping and pausing to keep the family together. Upon the appearance of a potential predator, the hen gives a warning call to the chicks, causing them to freeze in place. The hen then may charge the intruder and flail it with her wings or noisily feign a broken wing in an attempt to lead the intruder away from the hidden young.

At one week of age the chicks can fly well and at 16 weeks (about October 1) they are full-grown. The broods break up in early September, although all members of the family generally stay in the original home range. Then in late September or early October juveniles disperse from their natal home range to an average distance of 3 to 5 km (1.8 to 3.0 mi). The birds disperse in all directions, irrespective of population densities, thereby shuffling populations. Time of dispersal is probably controlled by photoperiod (number of daylight hours) and is believed to be triggered by an advancing weather front. Local populations may complete the shuffle in a period of just a few days during which individuals fly or walk in one direction out of their natal range to their new range. In doing so they often encounter unfamiliar, human-made habitats like residential areas or farms, and in a confused state they may crash into windows or other obstacles.

With the arrival of winter, grouse may shift their home range somewhat to account for availability of trees suitable for budding (eating buds) and roosting shelters. Flocks of 4 to 8 birds may form in areas of concentrated food supplies or ideal protective cover.

Grouse are well adapted for living in snowy areas. Small feathers grow on their feet that act as snowshoes, enabling grouse to walk on top of snow when other birds would sink. Grouse may keep warm at night by

burrowing into soft snow until they are completely buried and protected from the wind-chilled air above. Grouse are in some danger in their snow shelter should a crust form on the snow surface overnight, but they can survive for a week trapped in these burrows. If the snow is too hard for burrowing, grouse often roost in conifers.

The specific food items consumed by grouse vary with the age of the grouse, habitat availability, and season. During their first few weeks of life chicks almost exclusively eat insects (flies, caterpillars, leaf bugs, etc.) which are rich in protein. By the end of summer they switch to a primarily vegetarian diet. Adults consume large quantities of buds and catkins of aspen, birch and hophornbeam as these foods appear in the spring. Even though insects are readily available throughout the summer, adult grouse make very little use of them, preferring to eat the leaves, fruits, or seeds of aspen, cherry, sedges, strawberry, blackberry and raspberry. Their fall diet includes the fruits of thornapple, apple, cherry, viburnum, sumac, and dogwood; beechnuts; the buds of apple, birch, cherry, and hophornbeam. Common winter foods are cherry, aspen, birch, hophornbeam, and serviceberry buds. Because grouse can feed on a wide variety of buds through the winter and have extremely effective digestive systems, winter starvation is seldom a problem.

Many factors act to suppress grouse populations. Nesting success averages only 60% (not accounting for renesting) because snakes, weasels, mink, fishers, house cats, red and gray foxes, coyotes, red squirrels, bobcats, skunks, opossums, and raccoons commonly raid grouse nests. Young chicks can be victims of cold, wet spring weather or they may fall prey to any of the above predators, plus raptors such as the barred and great horned owls, goshawk, Cooper's, sharp-shinned and red-tailed hawks. Survival of chicks to early fall averages about 40%. Adult grouse are subject to predation by all of the above raptors and the larger mammalian predators.

Although grouse are afflicted by a number of parasites and diseases, none appear to affect populations seriously. Grouse are hosts to internal parasites such as nematodes (roundworms), cestodes (flatworms), trematodes (flukes), as well as at least 9 species of blood protozoa. Aspergillosis, tularemia, ulcerative enteritis, and fowl cholera are some of the known

diseases of ruffed grouse. As with most wildlife, diseases and parasites are most prevalent in dense populations and only become important mortality factors when the animals are also under stress from inadequate food supplies, severe weather conditions or severe competition caused by over-population.

In heavily hunted areas, up to 20% of the fall grouse population might be harvested, but over the vast majority of the range harvests are probably much less. Several studies have shown that even heavy fall hunting pressure, in extensive grouse habitat, has relatively little effect upon the following spring breeding population. Heavy hunting in winter, from late December on, may have a serious impact on grouse; hunters may be harvesting potential breeding birds already established in their activity centers.

Mortality rates commonly range from 60% to 70% between fall and spring, due to any combination of the mortality factors mentioned above. With such a high population "turnover" rate, it is a rare ruffed grouse that reaches its third year.

A quiet early morning or late afternoon stroll along a woods road is a good way to find the ruffed grouse. It is a common, active bird that makes its presence known in several ways. Cocks may drum at any time during the year, but are most active in spring and early fall. Drumming sites (large logs, mounds, or boulders) usually have a large number of accumulated droppings at one location and associated bark, leaves, or moss generally show sign of where the cock has been strutting. Fair amounts of patience and stealth are required for one to locate a drumming grouse but the opportunity to witness this display is well worth the effort.

Grouse eat a diet high in plant parts and, consequently, leave a fairly large number of conspicuous fecal droppings beneath roost trees, at drumming sites and in their snow burrows. As many as 75 chalk-colored, cylindrical, slightly curved droppings, each measuring about 3 cm long and 1 cm in diameter (1.2 by 0.4 in), may be found in one pile.

Prime feeding times for grouse are early morning and late afternoon, although food availability and weather affect feeding periods. Grouse usually establish a pattern of returning to a hawthorn thicket, an aspen stand or an apple orchard an hour or so before dark in the winter. These are good places to wait to observe the birds.

Depending upon the amount of human activity in an area or the experience grouse have had with humans, they may be relatively unafraid or quite skittish. Grouse frequently will become fidgety and give a few short "clucks" just before flushing and flying off. They have several different types of "clucks" and "chirps", but no real characteristic call. Anyone at all familiar with the ruffed grouse is well aware of their almost "explosive" flushing characteristic. The noise created by their sudden, rapid wingbeats upon flushing has sufficiently startled many hunters to permit the bird's successful escape. When flushed, grouse generally only fly 100 to 200 meters away. Ruffed grouse also are masters of just "slipping away" from danger by putting their head down and noiselessly running to cover.

Ecological Role

The ruffed grouse is classified by ecologists as a primary consumer; that is, it mostly eats plants. Because grouse feed on such a broad food base, food is seldom scarce in adequate habitat. This, together with the hen's capability of laying large clutches of eggs, gives grouse a high reproductive potential. In natural ecosystems this potential is seldom realized as many mortality factors have an effect on population growth. As an example, secondary consumers (predators) are generally available to take advantage of grouse as a food supply. Just as grouse utilize the vast quantities of fruit seeds, buds and leaves in their habitat, predators such as hawks, owls, foxes, and raccoons utilize grouse as a major prey item. Thus, one of the most important ecological roles of the ruffed grouse is to convert vegetable matter into flesh for predators to feed upon. Population levels of some of New York's most valuable furbearers, like the red fox and gray fox, and raptors, like the goshawk and great horned owl, are closely linked to population levels of common prey species such as the cottontail rabbit, snowshoe hare and ruffed grouse.

Grouse have evolved physical and behavioral characteristics, such as camouflaged plumage, snow roosting, explosive and highly maneuverable flight, and their "broken wing" act, that greatly increase their chances of survival against predators. When grouse populations are high, the number of birds taken by predators is also high; when grouse populations are low,

few birds are taken by predators. What is important is the relative proportion of the grouse population taken by predators, and that remains quite consistent from year to year. Predators may slow population growth, but they have never been shown to be responsible for declining grouse populations. Where predators are reduced or absent, other mortality factors act in a compensatory manner.

The ruffed grouse is one of many wildlife species inhabiting the U.S. and Canada whose population experiences drastic numerical change over approximately a 10-year cycle. The magnitude of the variation and the time period differs between geographic regions. Population densities of grouse in New York, in recent decades, have varied on the average about 350% from peak to low years. Several theories, such as sun spot activity or the occurrence of large acreages of grouse habitat reaching and surpassing the optimum stage of development have been suggested, but none conclusively explain the reason for the phenomenon.

Management

Specific land management practices for ruffed grouse vary according to several factors such as site characteristics (soil fertility, aspect, drainage), plant species occupying the site, age composition of trees on the site and current or desired use of the site (agriculture, timber production, multiple use, etc.). In general, habitat management for ruffed grouse is aimed at providing cover to protect the birds from predators. Research has also demonstrated that the most abundant ruffed grouse populations occur in areas where aspens are or have been a prominent part of the forest environment. In northern forests where continuous snow cover lasts from 2 to 4 months, such as in New York, the most successful management for ruffed grouse will be associated with the aspen ecosystem. This means providing young, dense sucker or sapling stands less than 10 years old for broods, and 10 to 25 year-old pole stands for wintering and breeding cover, in combination with nearby 25 to 40 year old, flower-producing mature aspen for winterlong food resources. These all must be present within the 6 to 10-acre activity center of the bird. Small conifers may provide some cover or protection from the elements in the winter. However, as conifers grow, particularly pines, they serve as cover

for hunting predators. In the end conifers do more harm than good because the predators can use them as perches from which to hunt grouse all year long. Forest management plans that include clearcutting blocks of timber less than 2 ha (5 A) in size are beneficial for grouse management.

Several states, including New York, have experimented with artificial propagation of ruffed grouse for stocking purposes. Grouse can be pen-reared, but released birds have high mortality rates and are relatively tame; therefore, artificial propagation of grouse for sport hunting is not a viable management option. Wild grouse that have been trapped and then released have better survival rates and retain their wildness, but costs of such programs are prohibitively high. Except for situations where current populations are geographically isolated from potential grouse habitat (for example, islands), habitat improvement is more economically efficient and ecologically sound than either the trap-and-transfer or game-farm rearing programs. Even relatively sparse populations of grouse are fully capable of explosive reproductive rates when suitable habitat is created. In addition, many wildlife species such as woodcock, deer, flickers, and robins benefit directly from land management practices conducted primarily for ruffed grouse.

Grouse hunters often request shorter seasons, reduced bag limits, or even closed seasons during periods of grouse scarcity. Research and experience have shown that fall hunting, in most instances, has an insignificant effect upon the rise or decline of grouse populations. The one exception is where grouse are confined to small, isolated areas that have easy hunter access and experience heavy hunting pressure. Also, evidence is mounting that long hunting seasons extending from October through February may be suppressing grouse populations by slowing the potential rate of increase or holding the population at a lower level than could be supported by the habitat.

Economic and Social Values

The ruffed grouse is a favorite of people who venture afield to see wildlife, regardless of season. In the spring the songs of other birds are periodically interrupted by the drumming of the cocks. Through the early summer the alert hens with their chicks in tow are as fine an example of

dedicated motherhood as any that can be found in nature. In the fall an occasional cock can be heard drumming as a prelude to his spring performances. A startling flush of a grouse is a common occurrence during many fall walks along forest paths. Their distinctive three-toed tracks make familiar trails in the winter's snow.

Small game hunters have deemed the ruffed grouse "King of the game birds". Grouse are fairly abundant in good habitat in the fall, yet very few hunters get their daily limit of birds in a hard day's hunt. The grouse's thundering takeoff and 50 to 65 KMPH (30 to 40 MPH) twisting flight through dense cover presents an unnerving and difficult target even for expert wing shots. The use of a well-trained bird dog improves a hunter's chance of success and adds to the enjoyment of the sport. The flesh of ruffed grouse is light and flavorful; easily on a par with any domestic fowl or other game bird.

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