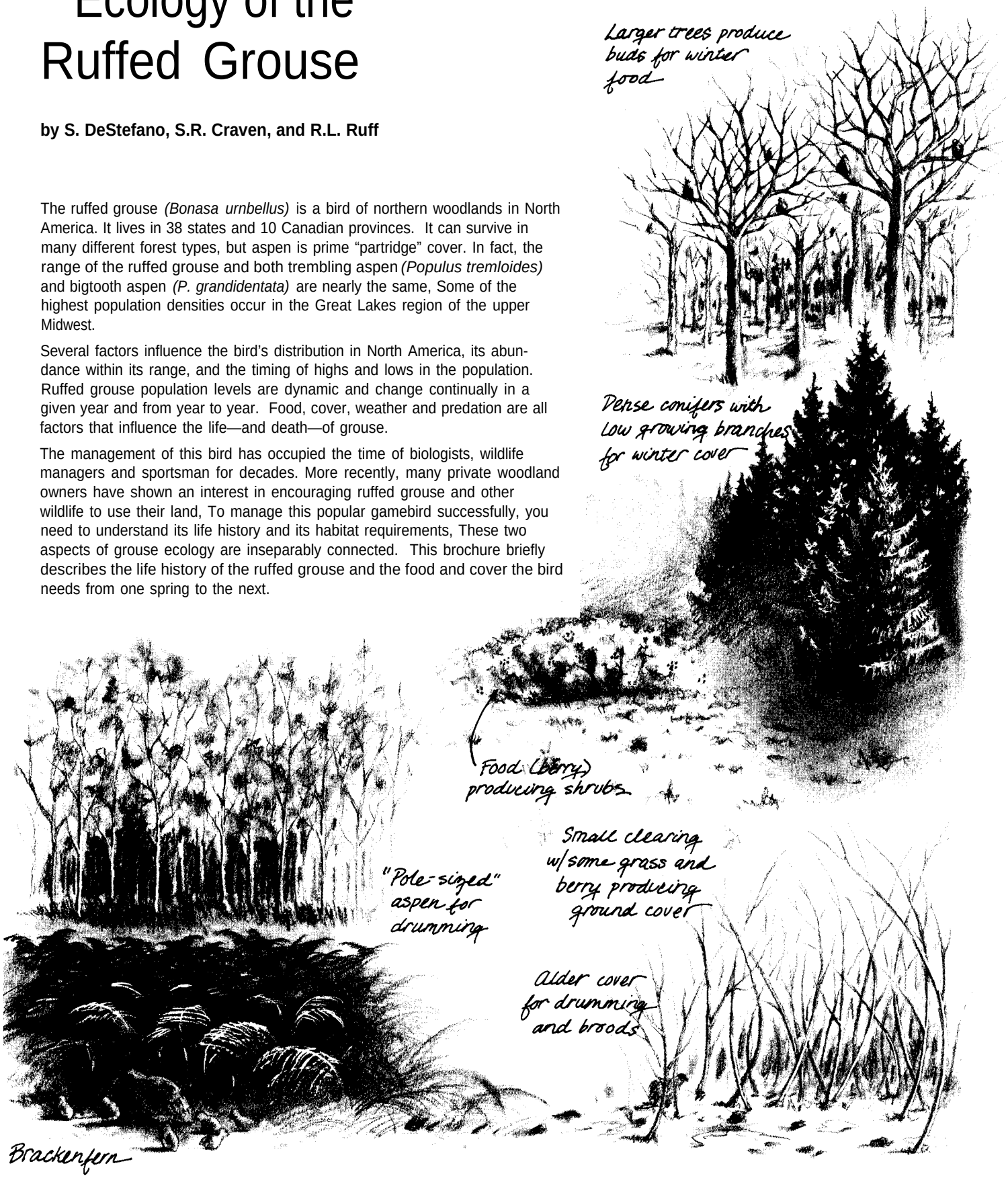
Ecology of the Ruffed Grouse

by S. DeStefano, S.R. Craven, and R.L. Ruff

The ruffed grouse *(Bonasa urnbellus)* is a bird of northern woodlands in North America. It lives in 38 states and 10 Canadian provinces. It can survive in many different forest types, but aspen is prime "partridge" cover. In fact, the range of the ruffed grouse and both trembling aspen *(Populus tremloides)* and bigtooth aspen *(P. grandidentata)* are nearly the same, Some of the highest population densities occur in the Great Lakes region of the upper Midwest.

Several factors influence the bird's distribution in North America, its abundance within its range, and the timing of highs and lows in the population. Ruffed grouse population levels are dynamic and change continually in a given year and from year to year. Food, cover, weather and predation are all factors that influence the life—and death—of grouse.

The management of this bird has occupied the time of biologists, wildlife managers and sportsman for decades. More recently, many private woodland owners have shown an interest in encouraging ruffed grouse and other wildlife to use their land, To manage this popular gamebird successfully, you need to understand its life history and its habitat requirements, These two aspects of grouse ecology are inseparably connected. This brochure briefly describes the life history of the ruffed grouse and the food and cover the bird needs from one spring to the next.



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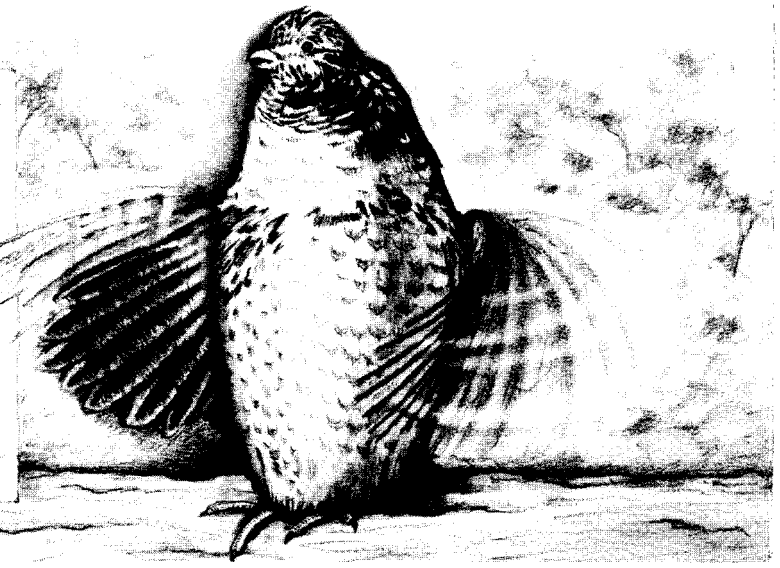


Spring

As snow melts from hillsides and ice breaks up on marshes and ponds, winter loses its grip on Wisconsin. Woodlands and wetlands fill with the sounds of wildlife: the chirping of spring peepers, the bugling of sandhill cranes, the winnowing of snipe, and the notes and calls of songbirds. Through all the chatter, a hollow-sounding thumping comes from a hidden spot in the woods. The life cycle of the ruffed grouse is beginning again.

Ruffed grouse males begin their spring ritual in late March or early April. They beat the air with their wings to create the hollow-sounding thump or "drum," slowly at first, and then progressively more rapidly. Although they drum throughout the year, drumming activity peaks in April and May, when daylight reaches a certain length. This is when the males advertise their territories to other males and attempt to attract females.

A male grouse chooses a drumming site that has certain characteristics. The most obvious is a log, stump or stone that serves as a drumming stage. Such a stage places the drummer six inches or more above the forest floor and improves his visibility and perhaps the distance from which his drumming can be heard. The best drumming habitat has a lot of vertical cover created by a dense stand of pole-sized saplings, and very little horizontal cover. Often the stage is surrounded by hazelnut *(Corylus arnericana),* prickly-ash *(Xanthoxylum americanum),* dogwood *(Corus* spp.), willow *(Salix* spp.), or other shrubs. The heavy vertical cover created by saplings and shrubs and the lack of horizontal cover provide excellent protection against predators. Avian hunters, such as great-horned owls *(Bubo virginianus)* or goshawks *(Accipiter gentilis),* have trouble flying through a dense stand of saplings, while the lack of horizontal ground cover allows the grouse to detect approaching mammalian predators or other grouse. Proper cover improves the chances of ruffed grouse survival.

The drumming male mates with several females, then his reproductive responsibilities end. Each hen incubates her eggs and raises the chicks on her own. She usually chooses a nesting site in medium-aged woods, often within the vicinity of a drumming male. The nest is little more than a shallow bowl in the ground, often at the base of a large tree. It is lined with whatever material is available, such as dried leaves, and some of her own feathers.

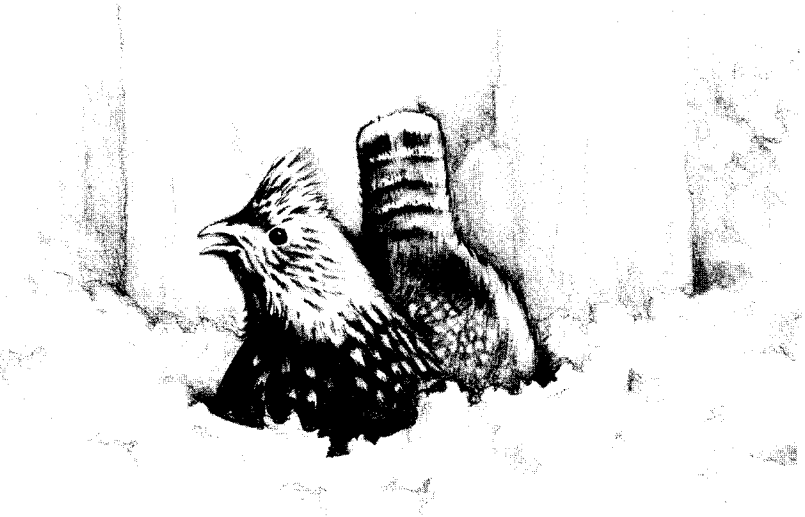
The hens lay from 9 to 14 eggs. An average clutch has 11 of the whitish or huffy-brown eggs. It takes 17 days to produce an average-sized clutch, and the hens incubate their eggs for 23 or 24 days.

During the nesting season, the adults eat high-energy foods, such as the emerging leaves and catkins of aspen trees. They also eat the young forbs of the forest floor. Incubating hens leave their nests in the early morning and again in the evening for brief visits to feeding areas, although they become less inclined to leave their nests later in the incubation period or during periods of inclement weather.

The eggs hatch about the first of June. The young hatch at the same time because the female waited until laying the last egg before starling to incubate and begin development of the chicks. After a few hours the newly hatched chicks are dry and the hen leads her brood away from the nest. They will not return. Unlike songbirds, grouse chicks are precocial; that is, they hatch at a well-developed stage and do not have to spend time growing in the nest.

Summer

For the next 8 to 12 weeks the hen leads her chicks around an area that may vary from 10 to 40 acres in size. If a predator threatens her young, she will try to distract it by feigning an injury. Each brood has its own territory, although some intermixing of broods does occur. The brood area is usually a stand of mixed hardwoods or an alder *(Alnus rugosa)* thicket. In central Wisconsin, grouse broods use upland stands of aspen and alder intensively. The brood hen prefers areas that are



sheltered but free of a lot of ground debris, such as fallen or cut trees, so that the young can move freely. An upland stand of aspen that is up to 15 years old can provide brood cover. Such stands often have a thick understory layer of ferns, especially bracken fern (Pteridium aquilinum), and this provides cover and at the same time allows the chicks to move freely among the stems.

Summer is a time of rapid development for ruffed grouse chicks. The young birds grow fast, and molt and produce a whole new set of feathers. This requires a large amount of energy. For this reason, the chicks' diet consists of up to 90% animal matter, primarily insects and other invertebrates. This diet also provides a lot of protein. Insects are abundant in moist areas, such as alder thickets, and these areas stay cool during hot summer months.

By mid-summer the chicks are well developed. They are noticeably larger and their natal plumage is almost completely replaced. There are also noticeably fewer of them alive. Numbers of ruffed grouse chicks decline naturally throughout the summer, especially when the birds are still very young. At this stage of life they are susceptible to many kinds of mortality: rainy, cold weather; predators; and accidents. By August an average brood that started out as 11 eggs may have only 6 remaining young. But this is all part of Nature's plan. The ruffed grouse is one species that makes a big initial "investment" by producing 11 eggs to ensure that some of the chicks will make it through the critical summer period and through the winter to breed the following spring.

In late August and early September, the remaining chicks are virtually identical in size and coloration to the adults. The young grouse are now less inclined to stick together in a tight brood, and they go wandering off by ones and twos to various areas in the brood territory. Brood members often get back together or join with individuals from different broods. The time for them to strike out on their own is coming soon.

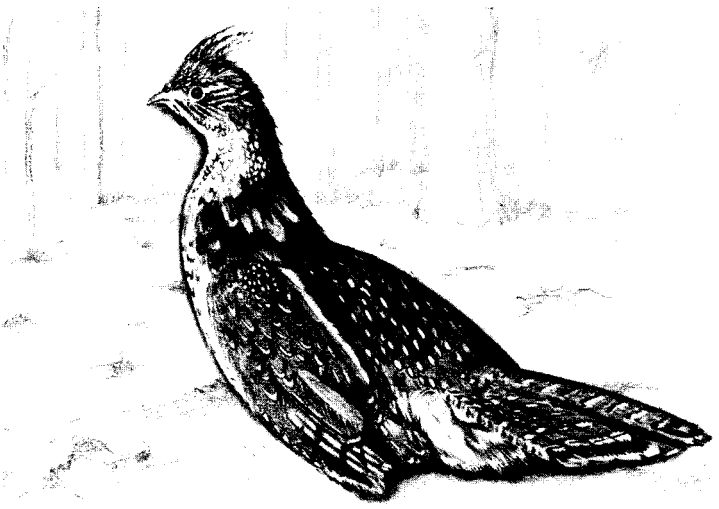
Fall

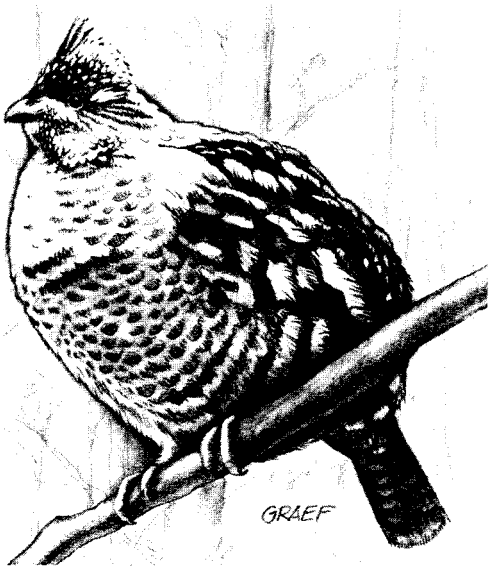
Early fall is a time of plenty for ruffed grouse. The berry crops have ripened in the warm sunshine, and a variety of plants are heavy with seeds and nuts. The birds have their pick of wild raspberries, blueberries, grapes and cherries; the fruit of dogwoods, viburnums and hawthorn; acorns; the seeds of sedges and clover; and the leaves of aspens, buttercup, partridgeberry, alder and others. At this time of year, ruffed grouse are true generalists in their diet.

The birds can be found in habitats associated with these food-producing plants. Aspen woods, alder thickets and stands of mixed hardwoods harbor grouse, and birds can be flushed from old orchards, grape tangles and along the edge of clearings where shrubs are common. But fall grouse can also be found in odd places and "non-habitat." This is probably due to a behavioral change in the juveniles.

After the broods have broken up in late summer, the young birds enter a period of dispersal in early fall. They leave their old brood territories and wander into new areas. The birds often travel alone or they may join other juveniles from the same or a different brood and wander with them. Juvenile females typically travel further from the brood area than juvenile males. The average distance traveled is 1 to 2 miles, and some birds move over 10 miles.

While traveling across the countryside, the young and inexperienced birds often find themselves in areas that do not offer much protection. They may wander into fields or open woodlands where there is very little shrub cover. Because of their movement in unknown habitats that offer little protective cover, the dispersing grouse are especially vulnerable to predators. Great-horned owls and goshawks feed on ruffed grouse, and red fox *(Vulpes fulva)* and bobcat *(Lynx rufus)* take a few. But such losses are also part of the overall ecological plan. Predators and their young eat ruffed grouse all year, but there are always enough survivors to breed in the spring.





Occasionally dispersing grouse turn up in really odd places—in the middle of a farm or on the edge of town, for example. Since the birds have no previous experience with houses and automobiles, it is easy to understand that they can become frightened or confused. Many a grouse has met its end by flying into the side of a house or trying to escape through a glass window, This has been called the fall "crazy flight," but it is probably just the normal reaction of a wild animal in an unfamiliar area.

By the time late fall arrives, the grouse that are still alive have survived the summer, intense predation and fall dispersal. The juveniles are now fully grown and wear the plumage of adults, A percentage will not make it past the hunter's gun or the stalking predator, but those that do will be next year's breeders. Many young males have established a drumming territory in their first fall, and some of the juvenile hens are *now* roosting in a spot where they will later hatch a clutch of eggs, A few faint snatches of drumming can be heard while the aspen leaves are falling,

At this time of year, grouse change their diet, Now that the variety and abundance of late summer and early fall foods have diminished, the birds leave their generalist eating habits behind to become specialists on tree buds, The buds of certain trees are usually available for the remainder of the year and are high in protein and certain minerals, Grouse eat aspen buds, especially of male trees that are 25 to 35 years old, and the buds of willow, cherry *(Prunus* spp.), birch *(Betula* spp.), apple *(Malus* spp.), maple *(Acer* spp.) and others. They also eat fruits and mast, such as dogwood berries and acorns, when available.

Winter

The day is gray, and snow swirls in the mid-December sky. Silhouetted in the dim light of late afternoon, a small flock of grouse fill their crops with buds and twigs in a stand of bare aspen. Winter is settling in for a long stay.

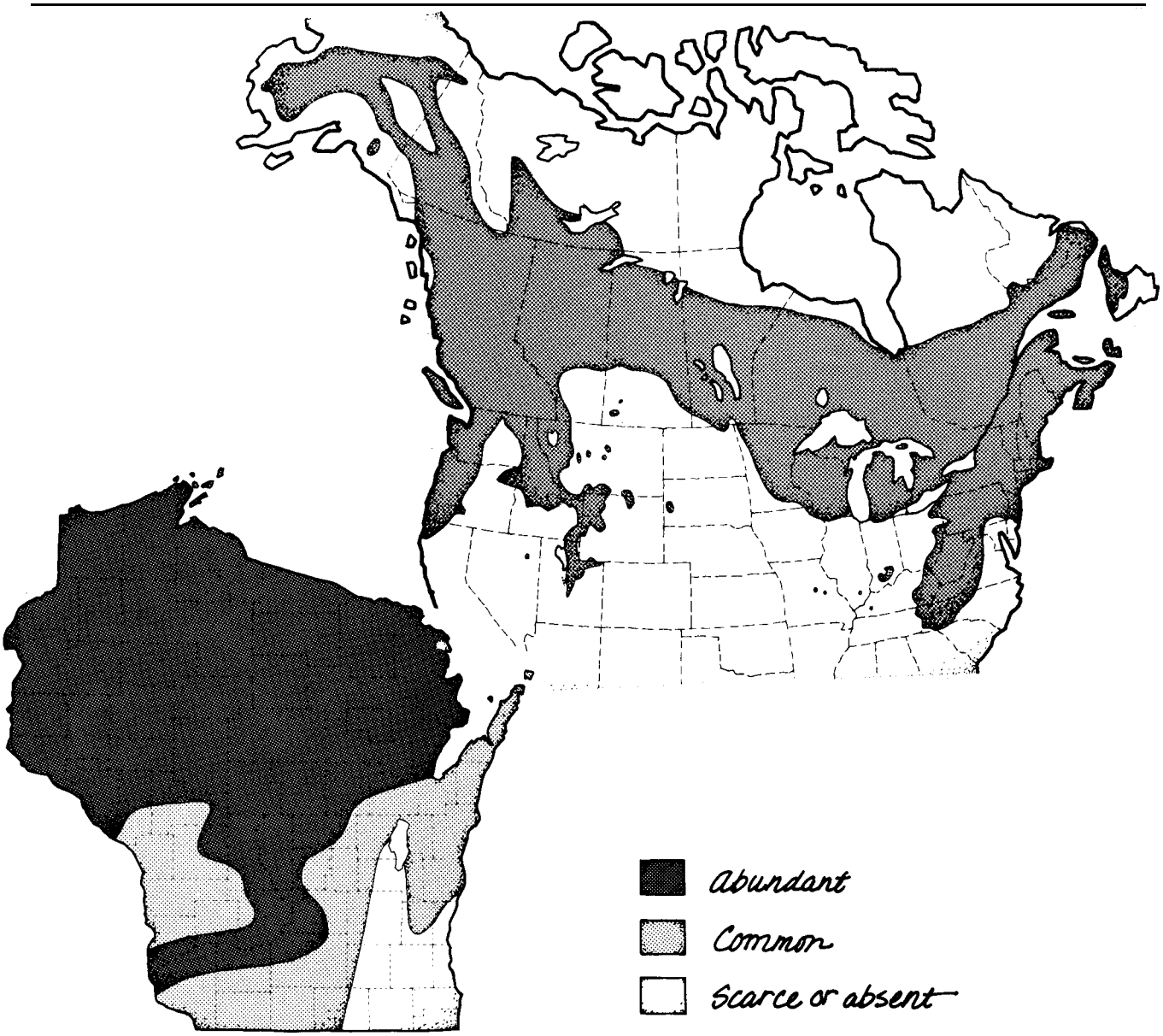
A number of things have happened to prepare the grouse for the cold. In late fall, feathers began to grow on their legs so that now the tarsi are fully feathered, This helps to conserve body heat, At the same time, fleshy tomblike projections along the edges of their toes, called pectinations, have developed to help the birds walk on soft snow or to roost for the night on a branch in some protected thicket. And, as we have already mentioned, the birds have switched to a diet of buds and twigs.

Ruffed grouse spend the winter months trying to keep warm, well fed and out of the way of predators. In the mornings, the birds leave their nightly roosting spot, which may be a young stand of conifers or a woodlot that is protected from the wind, to feed in a nearby stand of trees, They often form small feeding aggregations of up to 10 birds, Each bird fills its crop with buds and twigs and then returns to its roost to digest its meal in safety. The birds repeat the foraging expedition in the afternoon before settling in for the evening. With full crops, they digest food throughout the winter night. The digestive action increases their metabolism, which in turn produces body heat to help keep them warm.

Ruffed grouse usually roost in a protected wooded area, but when there is over 8 inches of powdery snow, they dive or burrow into a snowbank and spend the night there, A snow burrow is considerably warmer than a tree roost, There can be as much as a 45-degree difference in Centigrade temperature between the air and a burrow. A grouse may stay beneath the snow for a few days if the weather is especially severe. If a predator happens upon the burrow, the bird will probably burst through the snow and fly for safety, although ruffed grouse in snow burrows are often more susceptible to predation than birds roosting in trees.

The winter months pass slowly, but eventually the days lengthen and the sun warms the Wisconsin countryside. When about half the snow cover is gone and March breezes carry the promise of milder weather, a faint drumming can be heard in the woodlands. The life cycle of the ruffed grouse is beginning again.

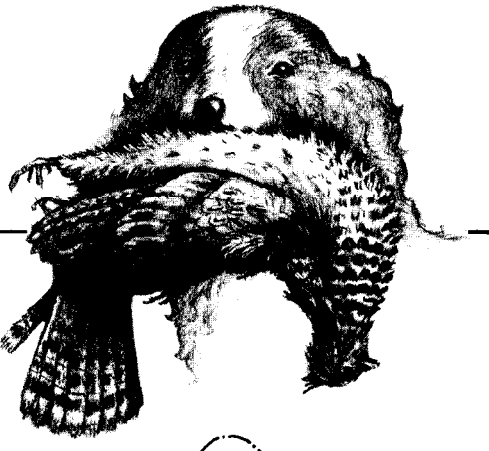
Distribution of Ruffed Grouse in
North America and Wisconsin

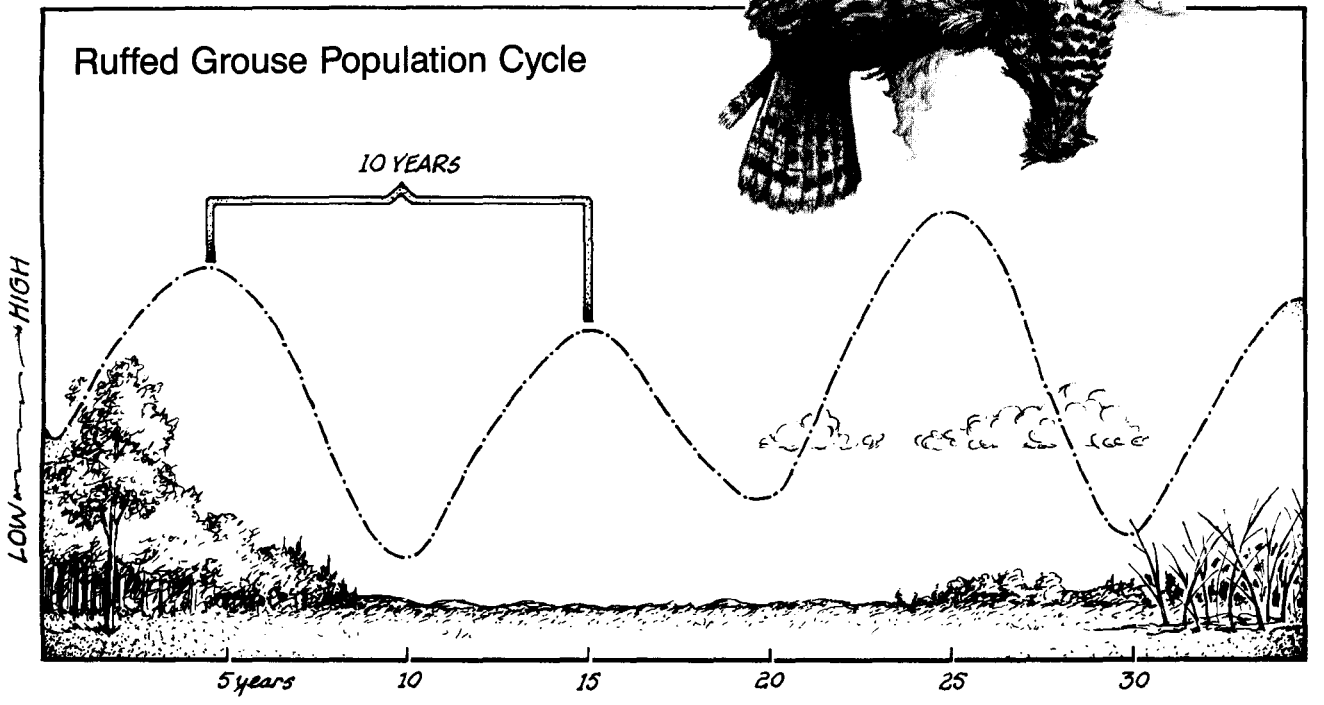


The Ten Year Cycle

When a population of ruffed grouse is examined over a period of several years, it becomes evident that there are not always the same number of birds present each year. Grouse populations can fluctuate widely, and in some parts of their range the highs and lows in numbers of ruffed grouse occur at very regular intervals—approximately every 10 years. Wildlife biologists have named this the Ten Year Cycle

The causes for this natural phenomenon are not completely known. It may be a combination of variation in weather, quantity and quality of food, and predation. Predators often take animals which are weak because of lack of food, severe weather, or disease. Proper amounts of cover and food can help to improve ruffed grouse survival.





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