

## Wildlife Management: Ruffed Grouse

The Ruffed Grouse (*Bonasa umbellus*), also called the partridge, is a medium-sized, heavy-bodied bird of the order Galliformes (which includes grouse, quail, pheasants, turkeys, and domestic chickens) and belongs to the family Tetraonidae (which includes ptarmigan, sage grouse, prairie chickens, spruce grouse, blue grouse, sharp-tailed grouse, and Ruffed Grouse). Techniques for managing the Ruffed Grouse vary according to site characteristics, but no matter what the management technique, the aim is almost always to provide protective cover.

### Physical Characteristics

The feathers on the grouse's upper body and the top surface of its wings are dark gray, brown, or almost black, with lighter spots, streaks, or bars. A black, slightly iridescent ruff of feathers covers each side of the lower neck, and the head and legs are completely feathered. The breast feathers are predominantly grayish white with 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, 1-inch-wide band, bordered on each side by



a thinner, lightly mottled band, extends across the tip of the tail.

The overall body plumage of the grouse varies considerably between individuals from a dark-gray phase to a chocolate-brown or red phase. Populations in specific areas may consist primarily of either the gray or red phase. 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.

Adult cocks (males) weigh 23 ounces, while the hens (females) weigh 21 ounces. The length from the beak to the tip of the tail is 17 inches, and the wingspan is 23 inches. Overall, the grouse is smaller than an average chicken.

Aside from the cocks being heavier and stouter, several subtle plumage characteristics can be used to determine the sex of birds in the field. The color markings generally are more distinctive on cocks than hens. Cocks have several clearly defined dark "necklace-like" bars across the upper chest, which are not as apparent on hens. The cock's neck ruff is longer and more extensive. Examine the feathers on the bird's rump; if there are two or three spots, the bird is probably a cock, if none or one, a hen. Either sex may have a broken tail band at the center two feathers, but the band markings at that point are coarser in cocks and more diffuse in hens. The central tail feathers of a cock grouse are longer than 6 inches; these feathers of the hen are generally shorter. Since no single characteristic can be used conclusively, examine several traits when sexing grouse.

You can distinguish juvenile grouse by their more pointed two outermost wing primaries. These feathers are not molted the first winter in juveniles and contrast with the rounded tips of the other primaries.

Grouse might be confused with hen pheasants, but the latter are about 1 pound heavier, 9 inches longer, and have a much longer, pointed tail devoid of wide terminal bands.

## Abundance and Distribution

The Ruffed Grouse is the most widely distributed game bird in North America. In the

East, you can find Ruffed Grouse from Labrador, Canada, 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 live 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 Maryland, you can find grouse in the western part of the state in Garrett, Allegany, Washington, and Frederick counties. Garrett County supports the largest population.

## Life History of Ruffed Grouse

### Breeding

Breeding season starts in late March, peaks in April, and ends in early May (Table 1). 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

**Table 1. Life History of Ruffed Grouse.**

Breeding	March through May
Nesting	Large-pole to sawlog size stand of hardwoods
Brood size	Average of 5 in the fall
Incubation	24 days
Flight	1 week old
Full grown	16 weeks old
Weight	21 to 23 ounces
Wingspan	23 inches
Home range	21 to 30 acres
Foods	Insects, pods, catkins, leaves, fruit or seed from aspen, cherry, sedges, strawberry, blackberry, and raspberry. Also fruit from apple, viburnum, sumac, and beechnuts.

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 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 3 miles, 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 square mile; 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 in low-lying areas. Nests are simple depressions 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) is 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 six to eight eggs. Hens appear to be somewhat territorial during nesting. Home ranges at this time average about 21 acres with some overlap among adjacent hens. In late April, most hens begin laying eggs, which hatch in late May or early June. 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. Hens with broods occupy home ranges of approximately 25 to 30 acres.

The females are attentive mothers and give warning calls to the chicks on the appearance of a potential predator. 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.

When they are 1 week old, the chicks can fly short distances, 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. In late September or early October, juveniles disperse from their natal home range to an average distance of 2 miles. The birds disperse in all directions, irrespective of population densities, thereby shuffling populations. 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. They often encounter unfamiliar, human-made habitats, such as 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 four to eight birds may form in areas of concentrated food supplies or ideal protective cover. Daily movements of Ruffed Grouse for feeding and roosting are generally less than one-third of a mile. The average home range of broods is about 40 acres. Seasonal movements from one range to another seldom exceed 1 to 2 miles.

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.

## Habitat

Ruffed Grouse are found in 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, dominate the forest canopy.

Good Ruffed Grouse range should contain three kinds of plants: shrubs and low-growing ground cover for rearing broods and for summer and fall foods; hardwoods for nesting and for fall, winter, and spring foods; and

conifers or brush tangles for winter cover. All three kinds should occur within an area of 40 acres, so they will be available in the daily travel limits of the birds.

Grouse prefer areas of dense growth, especially areas of young hardwood or conifer timber. They need the young, open stands to feed in; but during extreme weather, they need sheltered areas, such as pine, hemlock, or rhododendron thickets. Nesting cover usually consists of brush piles or root swells along the edge of hardwood areas having dense understory. Favorite nesting sites include the edges of rights-of-way, roads, abandoned fields, and cut-over areas.

## Food

Grouse eat a variety of food, depending on 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) that are rich in protein. By the end of summer, they switch to a primarily vegetarian diet. Adults consume large quantities of a variety of buds and catkins as they appear in the spring. Aspen, birch, and hop hornbeam are preferred foods. Even though insects are readily available throughout the summer, adult grouse prefer to eat the leaves, fruits, or seeds of aspen, cherry, sedges, strawberry, blackberry, raspberry, clovers, grapes, greenbrier, hawthorn, mountain ash, oaks, partridgeberry, willows, and witch hazel. Their fall diet includes the fruits of crabapple, apple, cherry, viburnum, sumac, and dogwood trees; beechnuts; and the buds of apple, birch, cherry, and hop hornbeam trees. Common winter foods are cherry, aspen, birch, hop hornbeam, and serviceberry buds. Because grouse can feed on a wide variety of buds through the winter and

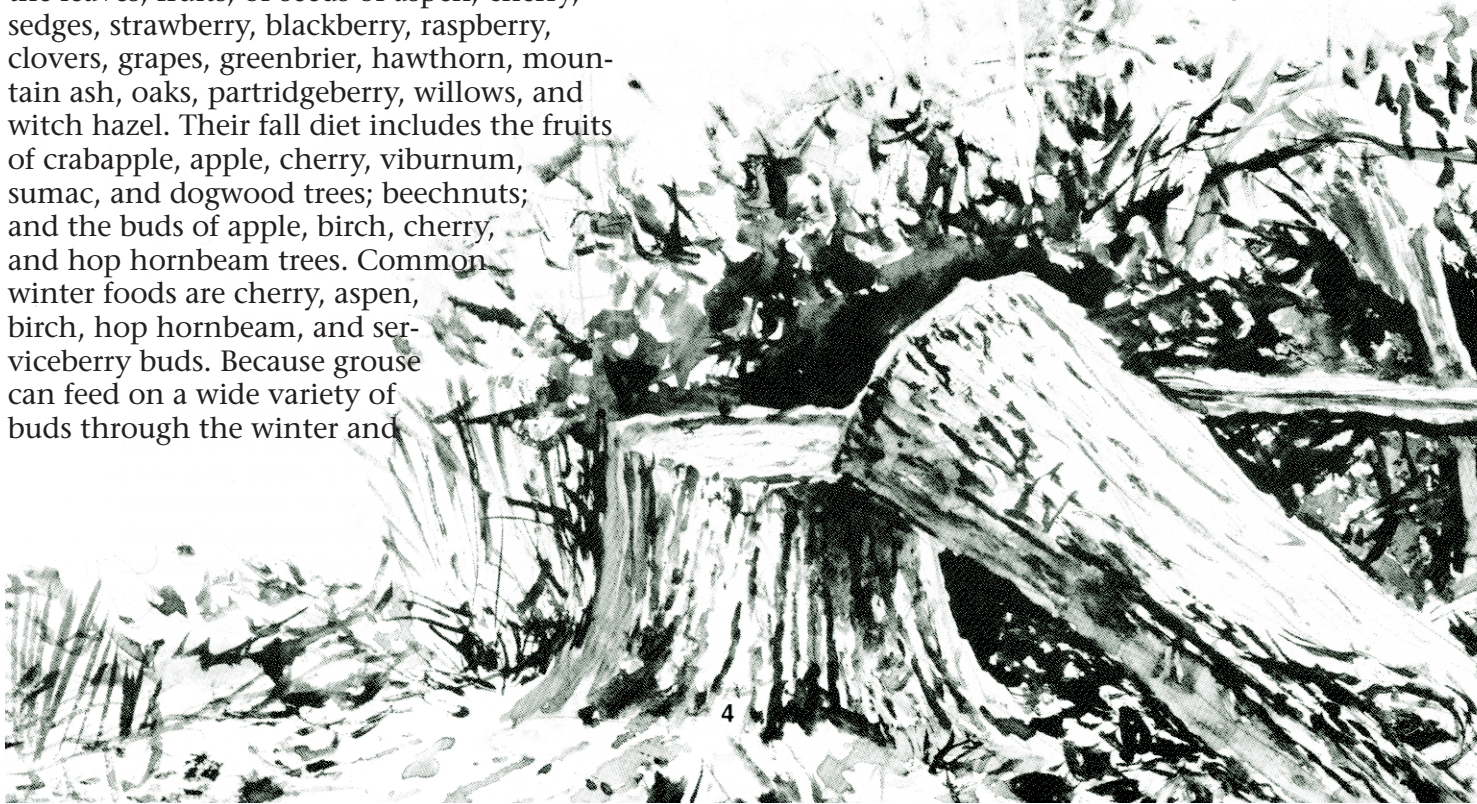
have extremely effective digestive systems, winter starvation is seldom a problem.

Because grouse eat a diet high in plant parts, they 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 1 inch in diameter, 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.

## Observing Ruffed Grouse

A quiet, early morning or late afternoon stroll along a wooded 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 indicate where the cock has been strutting. A fair amount of patience is required to locate a drumming grouse but the opportunity to witness this display is well worth the effort.

Depending on 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 can fly generally 30 to 40 miles per hour and only travel 100 yards away. Ruffed Grouse also are masters of slipping away from danger by putting their heads down and noiselessly running to cover.

## Mortality Factors

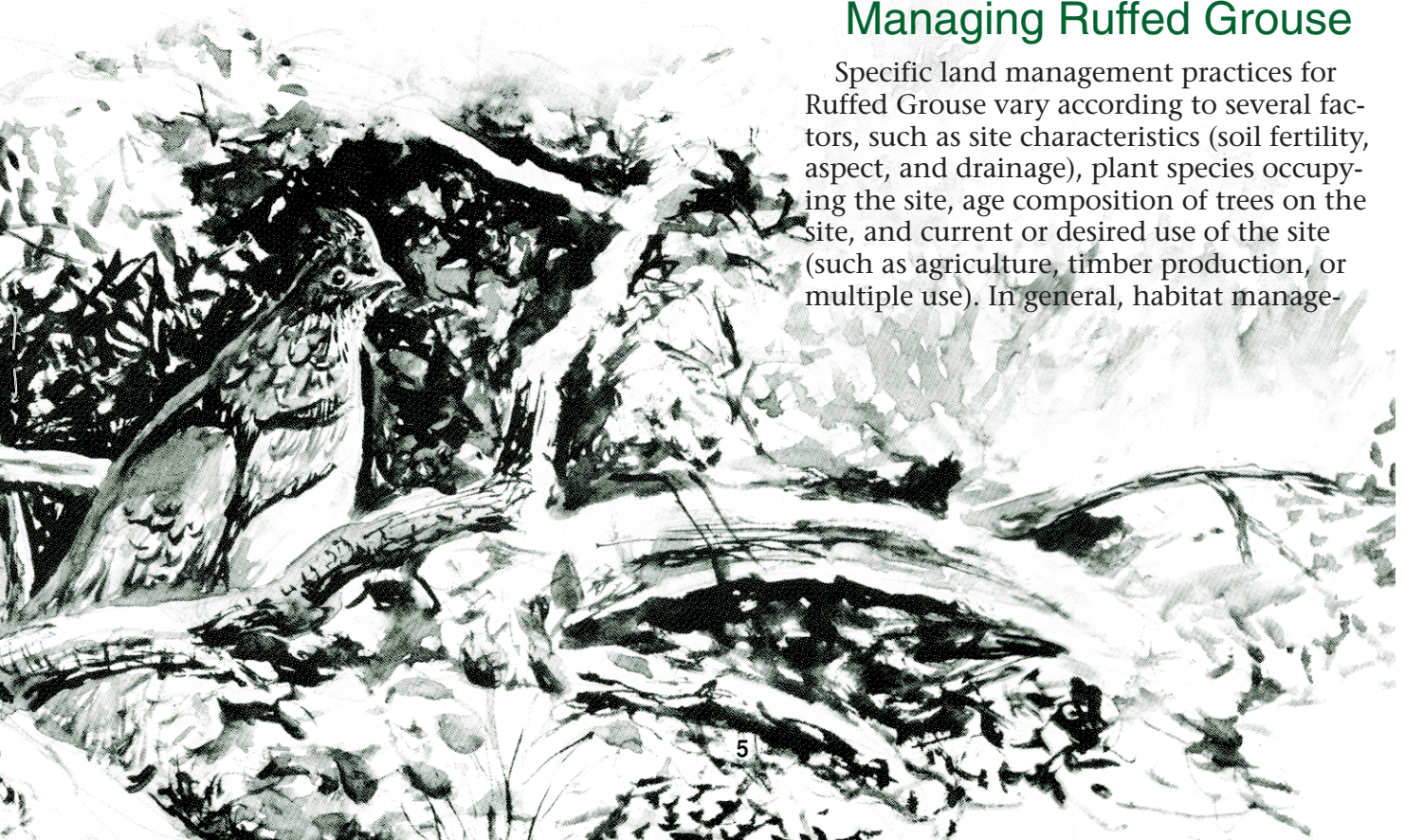
Many factors act to suppress grouse populations. Nesting success averages only 60 percent (not accounting for renesting), because snakes, weasels, mink, fishers, house cats, red and gray foxes, coyotes, red squirrels, bobcats, skunks, opossums, and raccoons commonly raid grouse nests. Grouse also fall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

In heavily hunted areas, up to 20 percent of the fall grouse population might be harvested, but over the vast majority of the range, harvests are probably much less.

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

## Managing Ruffed Grouse

Specific land management practices for Ruffed Grouse vary according to several factors, such as site characteristics (soil fertility, aspect, and drainage), plant species occupying the site, age composition of trees on the site, and current or desired use of the site (such as agriculture, timber production, or multiple use). In general, habitat manage-



ment for Ruffed Grouse is aimed at providing cover to protect the birds from predators. Research also has demonstrated that the most abundant Ruffed Grouse populations occur in areas where aspens are or have been a prominent part of the forest environment; however, this does not hold true in Maryland where aspen are not found in large areas.

In western Maryland, the most successful management for Ruffed Grouse will be associated with the young hardwood 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 hardwoods for winter-long 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 clear-cutting blocks of timber of less than 5 acres are beneficial for grouse management.

The vegetative habitat elements not present in a given management area must be established, and they must all be maintained for good grouse habitat. Try the following practices:

- Plant legumes and grasses, such as clover and orchardgrass, in 1/2-acre blocks or in strips approximately 120 feet wide along roads, field borders, or firebreaks. Establish 2 acres of these plantings for every 40 acres of habitat, and maintain them by mowing and top-dressing with fertilizer every 2 years during July and August.
- Make small openings and disk the soil to encourage perennial weeds, such as buttercups, dandelions, wild strawberries, and wild grasses. There should be about 3 acres of perennial weeds scattered throughout each 40 acres of habitat. They may be present in small openings or along fields, roads, or firebreaks; but you should maintain them by mowing every 3 to 5 years.

- Establish brushy thickets by releasing native shrubs and by cutting larger trees in 1/4-acre blocks, or 80-foot wide strips along roads, firebreaks, or field edges. This procedure should be followed on field borders to encourage such shrubs as barberry, crabapple, dogwood, viburnum, and autumn olive. These shrubs produce the majority of the grouse's food.
- Plant conifer patches scattered within a hardwood forest. One 1- to 5-acre block of pines for every 40 acres is ideal. At least 2 percent, but not over 25 percent, of the forest should be in conifers.

Use the following general practices to provide needed habitat for grouse:

- Cut back borders around fields, along roads, logging trails, and firebreaks. Fringe cutting where applicable will benefit nesting cover.
- Plan timber management so that a maximum amount of sunlight can reach the forest floor. Make sure not to cut good food-producing plants, such as juneberry, thorn apple, mountain ash, cherries, dogwoods, viburnums, beechnut, and hazel. In mature stands where thinning is not profitable, harvest the area on a planned schedule. Clear-cutting 10- to 20-acre strips, 660 feet wide, is the most desirable harvesting method. Space the harvesting cuts evenly throughout the entire area.
- Plant fruit-producing shrubs or maintain fruit-producing shrubs around borders or fields, along old roadbeds, in cut areas, and other open areas.
- Leave 30-foot strips every 600 feet in coniferous plantations and plant berry-producing shrubs or clover.
- Manage fire and grazing in woodlots by using a limited amount of grazing and controlled burning to benefit the understory vegetation; but be sure not to destroy the fruit-producing shrubs used by grouse.
- Stabilize and seed logging roads, log decks, firebreaks, and power lines with grasses and legumes.
- Provide nesting and escape cover in all large open areas, such as pastures or abandoned fields. The cover can be any

kind of vegetation, as long as it affords protection for the birds. Each 5-acre unit of open land should have at least 2 acres of cover, preferably in long strips.

- Set aside and ensure that no cutting or other timber management work is conducted in greenbrier thickets and grape thickets.
- Provide daylighting of roads, logging roads, trails, and firebreaks wherever possible.
- Preserve and manage good food-producing trees, such as apples, cherries, beechnuts and hazelnuts, during timbering operations. Also release those trees showing good potential for growth by cutting or killing surrounding trees whose crowns come within 10 feet of the crown of the desired tree.
- Prune every 3 years during the dormant season (November through February) to increase fruit production by removing all dead, dying, and diseased wood, all root and branch sucker shoots, and the weaker branches from crotches on stems 3 inches or greater.

## Artificial Propagation

Several states have experimented with artificial propagation of Ruffed Grouse for stocking purposes. Grouse are very difficult to raise in captivity. Those grouse that are pen-reared, however, 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 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.

## Understanding the Ecological Role of Grouse

The Ruffed Grouse is 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 because 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, such predators as hawks, owls, foxes, and raccoons utilize grouse as a prey item. Thus, one of the most important ecological roles of the Ruffed Grouse is to convert vegetable matter into flesh upon which predators can feed.

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 United States 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. Maryland's population is not as truly cyclic as are those further north. Population numbers do vary in Maryland from season to season as a result of weather or changing vegetative conditions, rather than a well-defined cyclic phenomenon.

## Adapted from:

Goff, G.R., D.J. Decker, J.W. Kelley, and R.A. Howard Jr. 1982. "Ruffed Grouse: New York's Wildlife Resources." No. 2. Department of Natural Resources, New York State College of Agriculture and Life Sciences, Cornell University; Ithaca, NY.

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**Fact Sheet 598** Planting Crops for Wildlife

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**Fact Sheet 600** Field Border Management

**Fact Sheet 601** Eastern Cottontail Rabbits

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**Fact Sheet 603** Ring-necked Pheasants

**Fact Sheet 604** Ruffed Grouse

**Fact Sheet 605** Mourning Doves

**Fact Sheet 606** Eastern Wild Turkeys

**Fact Sheet 607** Tree Squirrels

**Fact Sheet 608** Black Bears

**Fact Sheet 609** Wood Ducks

**Fact Sheet 610** Dabbling Ducks

**Fact Sheet 611** Diving Ducks

**Fact Sheet 612** Canada Geese

**Fact Sheet 613** Songbirds

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