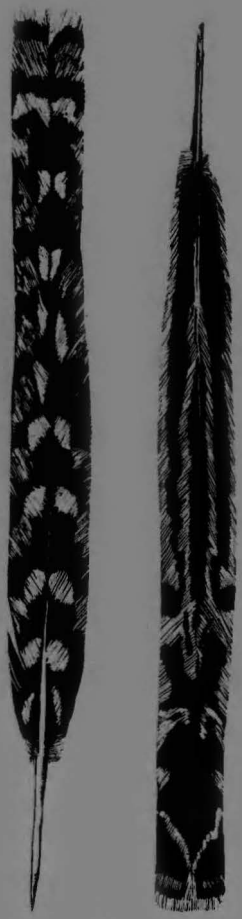
UPLAND GAME BIRDS OF FOREST AND TUNDRA

ALASKA DEPT OF FISH AND GAME
Juneau Alaska



Upland Game Birds of Forest and Tundra

by Robert B Weeden
Laurence N Ellison
art: R T Wallen

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Walter J. Hickel, Governor
DEPARTMENT OF FISH AND GAME
Augie Reetz, Commissioner
DIVISION OF GAME
Joseph C. Greenley, Director

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INTRODUCTION

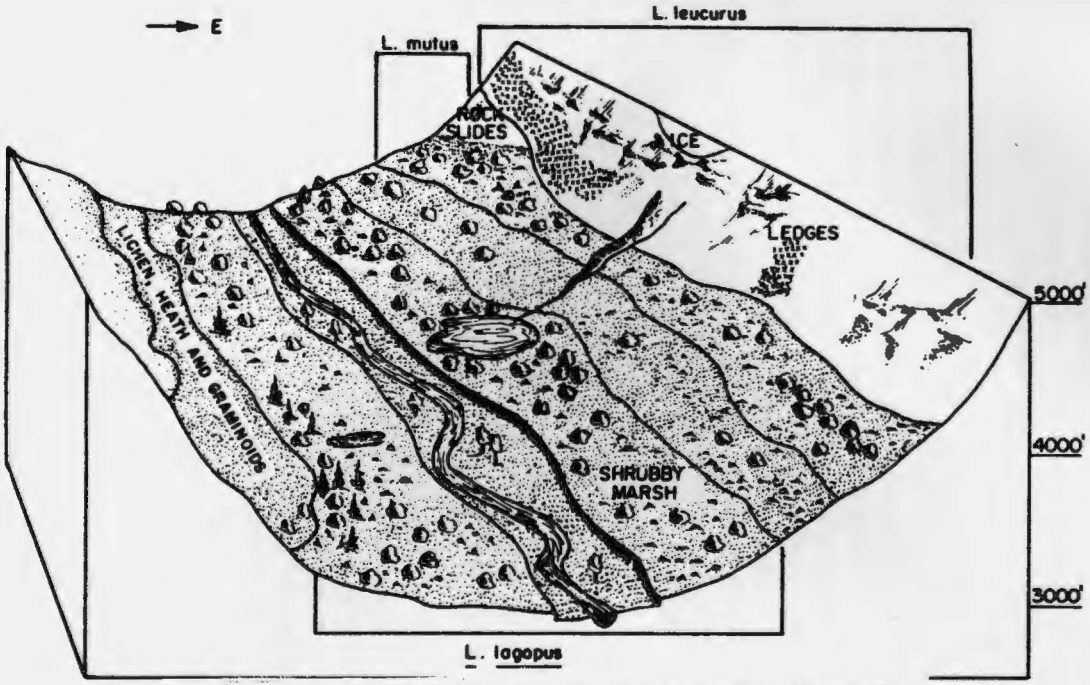
Few people realize the wealth of upland game birds in Alaska, and fewer are familiar with the lives of these fascinating creatures. We hope this booklet gives Alaskans a chance to get acquainted with grouse and ptarmigan—to learn to tell one kind from another, and to appreciate the individual way each species survives in the complex world of nature.

Grouse and ptarmigan form one division of the large family of pheasant-like birds, being distinguished from other divisions by the presence of feathers on the nostrils and lower legs. Scientists think grouse originated in Asia, although fossils over 40 million years old have been found in North America. Today there are eleven species of grouse in Eurasia and seven in North America. No species of grouse spans both continents. One ptarmigan, the white-tailed ptarmigan, is unique to North America; the two other species are almost circumpolar.

Grouse and ptarmigan hold well to a dog, fly rapidly when flushed, and are fine table fare. These characteristics have made them favorites of sportsmen all over the northern hemisphere. Ptarmigan and grouse are sought eagerly by recreational hunters in Alaska, and are important to some people for food as well. In some parts of the State, the difference between getting ptarmigan and not getting them sometimes is the difference between eating and not eating. Biologists, like hunters and photographers, appreciate these birds as a part of the natural scene in Alaska. Intriguing and valuable studies have been concerned with grouse and ptarmigan, among the most successful of all terrestrial birds as full-time colonizers of arctic and subarctic lands.

We have no record of the effect of people on ptarmigan or grouse through the centuries before Caucasians came to Alaska. When Europeans explored the Territory, they found ptarmigan widely distributed but variable in abundance, much as we observe today. Events are moving swiftly in modern Alaska. Many of these events—increasing pressure by recreational hunters, widespread fires, fire protection, logging, reindeer grazing, agriculture, dam-building—will change living conditions for wild animals. Whether we can maintain game birds as part of our natural legacy depends on our foresight, our recognition of wildlife's values, and our ability to execute planned programs of management that fit in with the jig-saw-puzzle pattern of contemporary land use.

There isn't a label on every mosquito, saying "This package contains 5% of the daily minimum protein requirements of young grouse . . . " but blue grouse chicks act as though there were. Caterpillars, flies, beetles, ants, and other insects are important to every young grouse during their first fantastic spurt of growth, serving as sources of ready-made protein easily converted into the building blocks of feathers and muscles.



Ptarmigan Habitat Profile, Mile 75 Haines Road, Chilkat Pass, British Columbia

Each kind of ptarmigan is built to use the arctic or alpine environment in a slightly different way from its cousins. This means that when the three species live on the same mountain, they instinctively go to different areas where they will get along best. Typically, willow ptarmigan choose the wettest, brushiest places close to timberline. White-tails go far uphill to boulder-strewn plateaus, rock slides, and the edges of snowfields. Rock ptarmigan choose the middle ground.

Spring was more hope than reality on June 5, 1961, as this male willow ptarmigan watched his world, unafraid, from a thin willow thicket at mile 60 Haines Road, B. C. Still padding across the thawing snowdrifts in his winter snowshoes, he raised his red combs and cackled gutterally, leaving no doubt who bossed this tiny corner of alplands.

Willow Ptarmigan


Walden

WILLOW PTARMIGAN *(Lagopus lagopus)*

Just before Alaska became a state, school children throughout the Territory were asked to select an official bird for Alaska. When the votes were counted, the willow ptarmigan headed the list. The choice was a good one—and almost inevitable. What other bird is such an obvious part of the Alaskan scene, summer and winter, from the flat arctic shores of Barrow and Wainwright to the rugged mountains of the Alaska Range and the Panhandle? What other northern bird is more easily endowed with a human personality than the handsome, vigorous, gregarious willow ptarmigan?

Like other ptarmigan, the willow ptarmigan nests in sparsely timbered or treeless areas. It favors willow-lined waterways, either on the coastal plains of western and northern Alaska or in subalpine areas throughout the rest of the State. Tall bushes are an important feature of most good willow ptarmigan country. These birds choose wetter places and more luxuriant vegetation for breeding than do the other two species of ptarmigan. In winter, too, willow ptarmigan stay close to shrubby slopes and valleys—often at lower altitudes than the breeding ranges.

Willow ptarmigan populations are accessible from the road system in a number of places in Alaska. Several trails lead to ptarmigan country from roads close to the State capital, Juneau. The Haines Road, now being maintained year-round, follows the floor of Chilkat Pass for 20 miles or more, beginning (if you are travelling north) about 65 miles from Haines; willow ptarmigan are common along this stretch of road nearly all year. A few miles north of Valdez the Richardson Highway snakes its way to the crest of Thompson Pass and winds through good ptarmigan country for nearly 10 miles. Willow ptarmigan can be found in the willow thickets and grassy openings along higher parts of the road between Palmer and Willow, in the Little Susitna and Susitna River valleys, all summer. Parts of this road are maintained in winter as well. The Denali Road from Paxson to Cantwell is a good route into summer range of ptarmigan, and the Richardson Highway from Paxson to Black Rapids gives access to populations of willow ptarmigan both summer and winter. The visitor to Mount McKinley National Park is likely to see families of willow ptarmigan at river crossings along the length of the Park road. Further north, willow ptarmigan can be seen anywhere along the isolated road system fanning out from Nome, and are seen occasionally at timberline at various places along the Steese and Taylor Highways, both of which span the highlands between the Tanana and Yukon Rivers.

Willow ptarmigan live also in many areas far from the highway system in Alaska. Some "hot spots" that are favorite hunting places for Alaskans are the mountains at the east end of Skilak and Tustumena Lakes on the Kenai Peninsula, the northwest side of the Alaska Peninsula, the Kotzebue Sound region, and various places in the Brooks Range, notably Anaktuvuk Pass.

Only another ptarmigan can distinguish cocks from hens when willow ptarmigan are in winter plumage. Then, both sexes are white with black tails. It is different during the rest of the year. Beginning early in May the cocks develop a beautiful cape of chestnut-red feathers. They court the hens in this plumage, not completing the change to the brown summer plumage until the hens are nearly finished incubating the clutch of eggs. No sooner does the male get this first set of dark chestnut feathers, however, than a new generation of lighter brown feathers grows on its neck and breast. This new set is never completed, because by early August the cock is beginning to grow white feathers of the coming winter plumage. In mid-August, therefore, many male ptarmigan are a patchwork of four sets of feathers: a few old winter feathers on the wings, new white feathers on toes and belly, and parts of the two brown sets just mentioned.

Under the driving spur of the reproductive urge, cocks become less and less tolerant of each other throughout March and April. Early in spring the males stake claims to parcels of ground which they defend in good weather, but spring snowstorms will send these males back into flocks. Later on, usually by late April or early May, the birds establish permanent territories which they defend in fair weather or foul. Hens arrive on the breeding grounds a bit later than males. They select their nesting area (often the same one used the previous year) and a mate; by late May the first eggs are laid under a shrub at the edge of an opening. The cocks stay on their territories throughout June, although the intense strutting and tail-fanning and aerial chasing, typical of the courtship period, wanes after the hens begin to incubate. Late June and early July are hatching times for most Alaskan ptarmigan.

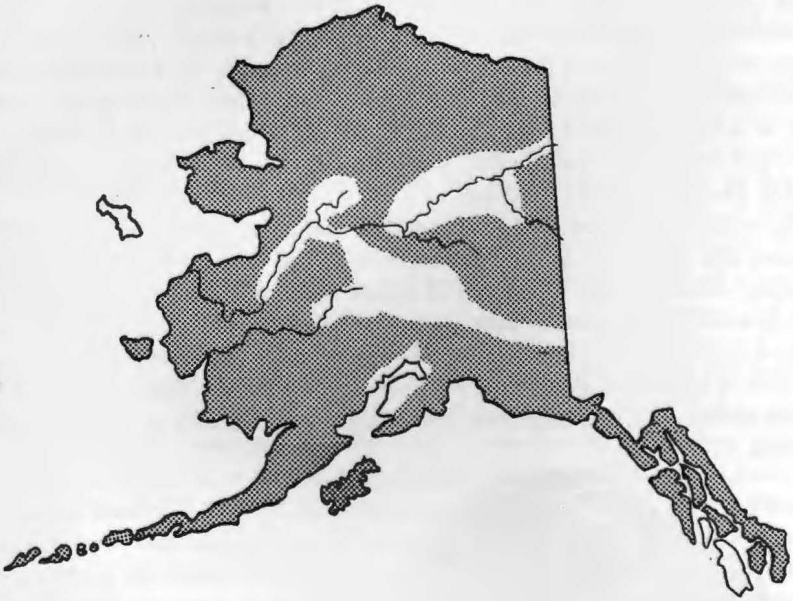
Male willow ptarmigan usually help to care for their chicks—a habit that no other North American grouse or ptarmigan has. Sometimes, in fact, cocks will take over all family responsibilities if the hen is killed. Both adult willow ptarmigan are vigorous in their defense of the brood. One of the thrills in store for the Alaskan traveller is the chance to watch the excited antics of a female ptarmigan as she tries to distract attention from her chicks, or to duck the flailing wings of the cock as he dives at the two-legged intruder, cackling gutterally as he flies.

Despite all of this care, young ptarmigan encounter many things that can kill them unless they are vigorous and lucky. Poor weather too soon after hatching, the quick pounce of the fox and the swift swoop of the hawk, chance separation from the family, and diseases like coccidiosis, all can be fatal. It isn't surprising that 65 to 80 percent of all chicks die before they are 11 months old. A ptarmigan's life expectancy brightens a little once it reaches maturity; the loss of adults averages 50 to 60 percent per year. At that rate, a 4-year-old ptarmigan is a fortunate bird. The abundance of ptarmigan at any time is the result of the extent of losses and the success of reproduction during the previous two years. Ptarmigan numbers can build up with astonishing speed, given favorable conditions, but often decline just as rapidly.

Families of willow ptarmigan join to form flocks in August and September. The ptarmigan then begin to move around more than in the nesting season. Females and males tend to separate in late September and October, the females, usually in small groups, seeking food and shelter at lower altitudes. In most parts of Alaska these movements to and from summer ranges encompass only a few miles—perhaps 20 to 30. In other parts of the State good wintering places are a long way from the breeding grounds. For example, hens nesting or reared on the north slope of the Brooks Range move up to 100 miles southward in late fall, wintering in the low hills and wooded valleys north of the Yukon River (in central and eastern parts of the Brooks Range) or in the valleys of the Noatak and Kobuk Rivers to the west. Males of these same populations also largely abandon summer ranges, but do not go as far to the south as do the females. The south-tending migrations take place in September, October, and November. The northward movements begin in February, reach a peak in April, and are finished by late May.

The willow ptarmigan has an appropriate name. Not only are willows a conspicuous and important part of nesting habitat, but they are also the bird's most important source of food. The leaves of willow shrubs often outrank any other item eaten in summer. In winter the buds, twigs, and catkins of willows provide four-fifths or more of the food of most willow ptarmigan. Since moose and snowshoe hares also depend heavily on willows for sustenance, it is fortunate that willow shrubs are so widespread in Alaska, and have such excellent abilities to recover after severe browsing.

The thick, wide bill is a trademark of all willow ptarmigan. Another peculiarity is the white patch behind the male's bill, lasting only 2 or 3 weeks in spring, as lingering white winter feathers resist the outthrusting chestnut plumage of early summer. The upper cock was just beginning to seriously defend his territory at mile 104 Taylor Highway on April 30, 1961. The other male, the same one as depicted in the last drawing, had lost all but one or two winter feathers on its head by June 5.



Range of the Willow Ptarmigan in Alaska

Willow ptarmigan have the widest range in Alaska of any upland game bird, although rock ptarmigan are a close second. The only big areas without willow ptarmigan are in the broad, forested valleys of the Interior (but even there you can sometimes find willow ptarmigan in winter) and the thick woods of southeast Alaska. The same species also lives in Canada, Scotland, Scandinavia, and Russia.

When a hen goes back to her egg-warming duties, after a quarter-hour or so of feeding, her mate often goes with her part way. By some mysterious signal, the female warns him off before he and his conspicuous pinto coat get too close to the nest. This pair was drawn from specimens taken at Eagle Summit, Steese Highway, in June.

Rock Ptarmigan

ROCK PTARMIGAN *(Lagopus mutus)*

Rock ptarmigan breed in hilly or mountainous tundra throughout Alaska. They prefer slopes and high valleys where shin-high shrubs form a patchy pattern with low herbs and grasses. The summer range of rock ptarmigan often abuts that of willow ptarmigan, with the "rocker" breeding on higher, drier, rockier ground. In winter most male rock ptarmigan are at the lower edge of breeding ranges. The hens move to the low hills fringing large valleys, where they spend the winter in shrubby openings in the forest.

Rock ptarmigan can be seen in the same areas along the road system as the willow ptarmigan, but are more common at higher elevations. Twelve-mile and Eagle Summits on the Steese Highway, and Mount Fairplay on the Taylor Highway, also are places where the traveller can expect to find rock ptarmigan.

These birds don their winter plumage early in October in central and northern Alaska, and are still in the predominantly white garb until early May. Cocks have a black mask from bill to ear in winter, effectively contrasting with the scarlet, fleshy eyebrow and white body plumage. Most hens have no mask, but about one female in five has a partial black stripe fore and aft of the eye. As is the case in willow ptarmigan, both sexes have black tail feathers tipped with white. Many people have remarked on the fact that living rock and willow ptarmigan are sometimes almost pink or rosy in winter. This glowing color, which fades slowly after death, may be caused by natural oils on feathers of the living bird, perhaps emphasized by the low angle of the sun's rays at northern latitudes.

By early May, female rock ptarmigan begin to show their new, brown summer feathers on crown and neck. When the hens begin incubating their clutch early in June, they are almost completely brown except for the white wings. Males keep the winter plumage until early June, then molt quickly to the finely-barred, dark brown summer plumage. The molts of ptarmigan are closely attuned to reproductive activities. This is most obvious when cold and cloudy spring weather delays nesting. In such years, the entire molting schedule of both the male and the female is delayed by the same number of days as reproductive activities. This delay may even persist into the fall.

Adult ptarmigan get a new set of wing feathers once each year, in summer. Males begin to molt their primaries, or flight quills, about June 15, while the hens are still nesting. The molt begins with the inner primaries, and progresses slowly outward along the wing. Cocks usually have completed the new set of wing feathers by early September. Unlike ducks and geese, which drop their quills in such rapid succession that they are flightless for a time in mid-summer, ptarmigan never lose the ability to fly. (They do slow down, however, especially during wet weather!) Hens that nest successfully do not begin to get their new flight feathers until just after the chicks hatch. When a hen's nest is destroyed, however, she begins molting within a few days' time.

Nests of rock ptarmigan usually are under low shrubs, although some hens nest where there is no vegetation sheltering them. Eggs are laid at intervals of 24 to 30 hours in mossy depressions shaped by the twistings and scratchings of the hen. The eggs frequently are covered when the hen is off the nest before incubation begins. Full clutches contain from three to eleven eggs; the number in a clutch varies not only with the individual but from year to year as well. Incubation lasts from 20 to 22 days. Nests are used only once. Re-nesting–second attempts to nest made when the first nest is destroyed–seems to be rare among Alaskan ptarmigan.

Chicks hatch late in June in most of Alaska. In warm weather the hen leads the chicks from the nest about twelve hours after they hatch. The young live off nutrients stored in their bodies for a day or two after hatching, meanwhile learning to peck at bits of food shown to them by their mothers. The phenomenal growth and development of young ptarmigan during the first month of life is proof that the chicks learn the lessons of food-gathering very well. They double or triple their weight in ten days, and develop a working set of flight feathers in the same length of time.

Hens lead their broods erratically from one good location to another, usually staying within one-half mile of the nest but sometimes moving that far in one day. Chicks normally stay with their parent until late August, but in crowded brood-rearing areas some exchanges of chicks take place. Late in August and throughout September flocks of ptarmigan–numbering from 20 to 250 or more birds–gather and move from place to place. At the end of this period of mixing of local populations, females withdraw from the flocks and move to their low-altitude wintering areas.

Winter flocks seem to be nomadic, wandering from place to place according to weather, snow conditions, food supply, and perhaps other impulses about which we have no knowledge. Eating, keeping away from predators, and waiting out storms are the main daily activities of ptarmigan in winter. Feeding takes up most of the daylight hours, because rock ptarmigan have to eat the equivalent in food of one-tenth to one-fifth of their body weight each day to stay alive.

From October to May, Alaskan rock ptarmigan eat little else except buds and catkins of dwarf birch. When the warming sun of May brings life to the buds of bearberry, mountain avens, and lousewort, and sends the first spiders scuttling out across the wet snow, ptarmigan are quick to change their diet. By late June, green things and insects are eaten exclusively. But northern summers are brief; by mid-August, the ptarmigan turn to berries and seeds, and by late October ptarmigan crops are bulging with birch catkins.

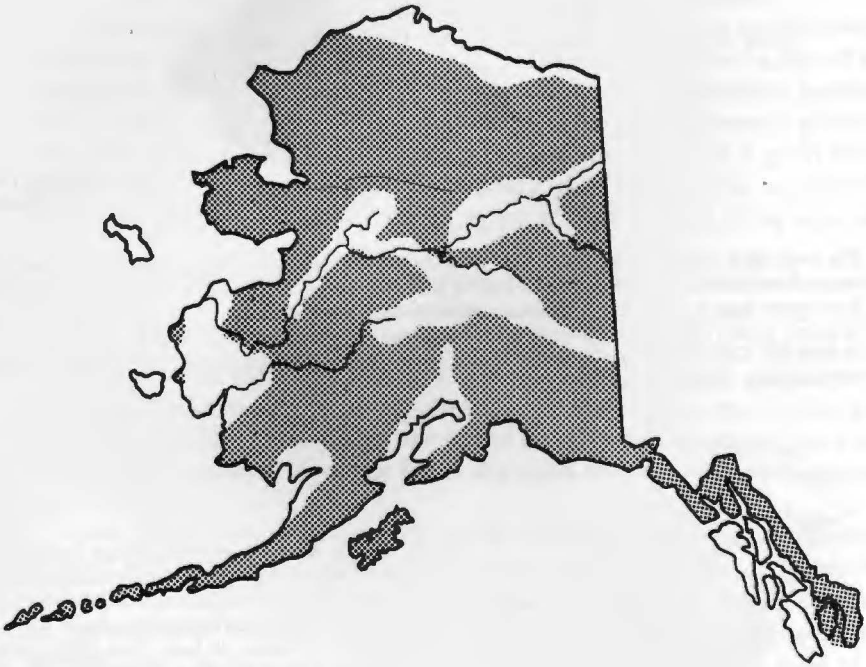
Typical winter male

Male, September 20, 1961
Eagle Summit

The only dark feathers rock ptarmigan grow in fall are the black ones forming a neat stripe or mask from bill to eye. Males always have a full loral stripe, but only 20 to 25 percent of hens have more than a scattering of feathers black at their base. This stripe is imitated by a swipe of charcoal under the eyes of people caught without sunglasses in the blinding light of Alaska's snowfields. Cock ptarmigan may use it as a mark of sexual distinction as they swagger through the courtship displays of spring.

Fine, bristly feathers, almost without barbs, grow from the toes of ptarmigan, forming unique snowshoes for easy flotation on soft snow. For hard, crusted snow, ptarmigan have sharp claws, shed and regrown each summer, to help them cling on steep slopes and dig their roosting burrows and feeding craters.

Grouse don't have feathers on their toes, although sharp-tails have very long, bristly feathers low on the foot that almost completely cover the toes. Instead, grouse have rows of little finger-like projections of hardened skin fringing each toe. These effectively widen the bearing surface when the bird strides across snow.



Range of the Rock Ptarmigan in Alaska

Rock ptarmigan, found in nearly all treeless areas of Alaska except wet, coastal tundras, range through Canada, Greenland, Iceland, Scandinavia, Scotland, the Alps, Russia, and northern Japan. Some races occupy vast areas in midsections of continents, but inherited, recognizable differences in color and size have developed in places where ptarmigan live in isolated island situations. The classic example is in Alaska's Aleutian Island chain, where seven races of rock ptarmigan have been described.

Sitting oddly still, like unthawed lumps of snow on the brown hillside, two white-tailed ptarmigan recover from their fright after a falcon arrows across their steep valley. From long experience, ptarmigan know the safest thing to do when a falcon hunts is to sit absolutely still; in the air, their gleaming bodies draw the hawk like a magnet. Ptarmigan are afraid of eagles, too, but, knowing their own prowess in the air, ptarmigan prefer to fly rather than hope the eagle will not see them.

White-tailed Ptarmigan

WHITE-TAILED PTARMIGAN *(Lagopus leucurus)*

White-tailed ptarmigan are true birds of the mountains. They live above timberline almost all year in the young mountain ranges of southcentral and southeastern Alaska; many white-tails probably stay on the high slopes even in winter. In the breeding season they live at higher altitudes than any other grouse or ptarmigan, making their living in rugged country full of boulder fields, snowfields, glaciers, cliffs, and rockslides. Plants on the summer range of white-tailed ptarmigan are low, prostrate, and often separated by patches of frost-heaved soil or rock. The birds usually move lower in late fall, spending the winter on slopes or in high valleys where alders, willows, birches, and occasional spruces project above the snow.

There are not many places in Alaska where people can see white-tailed ptarmigan in less than a few hours' hiking. Some of the more accessible populations are on Mt. Juneau and at the heads of other valleys near Juneau; in Chilkat Pass, especially at miles 56-62 and at mile 90 Haines Road; at Rainbow Mountain, mile 209 Richardson Highway; in Thompson Pass, north of Valdez; in Mount McKinley National Park; and near Independence Mine, north of Palmer on the Palmer-Willow (Fishhook) Road.

Unlike the other two species of ptarmigan, the white-tails' seven pairs of tail feathers are pure white. Since they are shed only once each year, in midsummer, these feathers are a year-round trademark of the species. These birds are almost pure white in winter; even the shafts of the wing feathers are pale instead of black as in the other ptarmigan. The summer plumages of both male and female are quite different from the other species, the back feathers being much more finely barred ("vermiculated") and the overall color tone being greyish instead of brown. White-tails, weighing only three-fourths of a pound when mature, are the smallest of the entire grouse family.

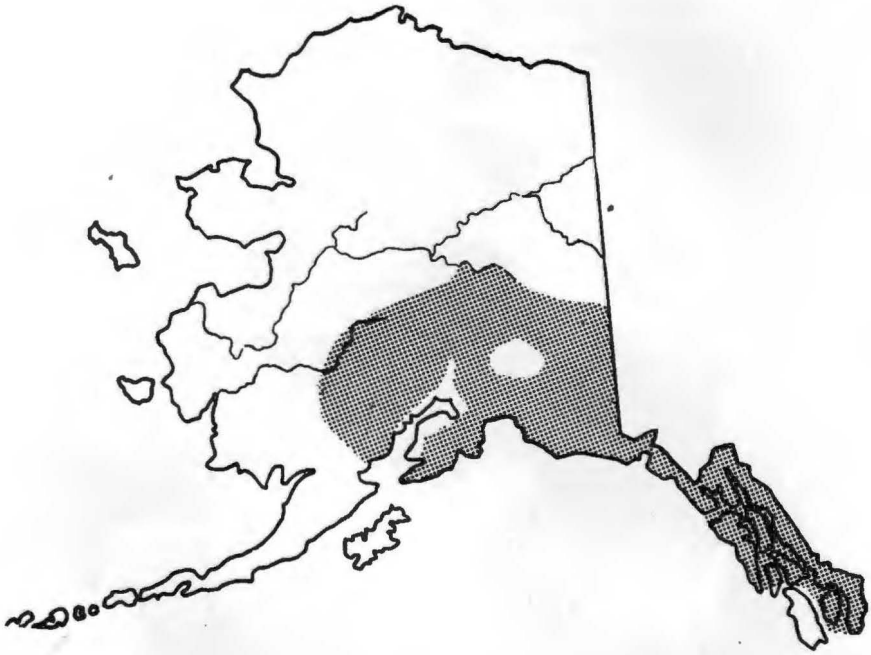
Late in April the screaming calls of white-tailed ptarmigan echo across the rock-strewn slopes and cliffs of the high country, signaling the annual round of sparring between males, and the mating of male and female. (According to a man who watched white-tails in Montana, the female does not always nest within the area defended by the male.) Nests, containing five to ten eggs, often are on narrow, mossy ledges or against big boulders where the sun's warmth is radiated from the rock face. White-tailed ptarmigan in southcentral Alaska lay eggs about three weeks earlier than do white-tails at the southern end of the species' range in Montana, Colorado, and New Mexico. The reason may be that snow melts sooner from the habitat of the Alaskan white-tail.

Broods of young white-tailed ptarmigan, under the care of the hen, stay high on the breeding grounds all summer. They like moist areas, especially around the edges of melting snowpatches and below glaciers. Plant growth is delayed in these places, so that when the broods feed there they are taking advantage of the youngest, most nutritious vegetation on the entire summer range. The water itself may be important

to the ptarmigan as well, and insects probably are more abundant in moist than dry places. Rock slides and boulder fields also are important features of good summer habitat for white-tails, because the chicks hide from predators in crevices between large stones.

White-tailed ptarmigan eat large quantities of tender leaves in summer, with lesser amounts of flowers, buds, and insects. Seeds and berries are taken commonly in August and early September. The birds change to a diet of buds and twigs in late fall. White-tailed ptarmigan apparently are not as specialized regarding winter foods as are rock and willow ptarmigan in Alaska, because they eat alder catkins, willow buds, and dwarf birch buds seemingly with equal gusto. In the southern Rocky Mountains, some white-tailed ptarmigan even eat the needles of alpine firs in winter, though this is rare.

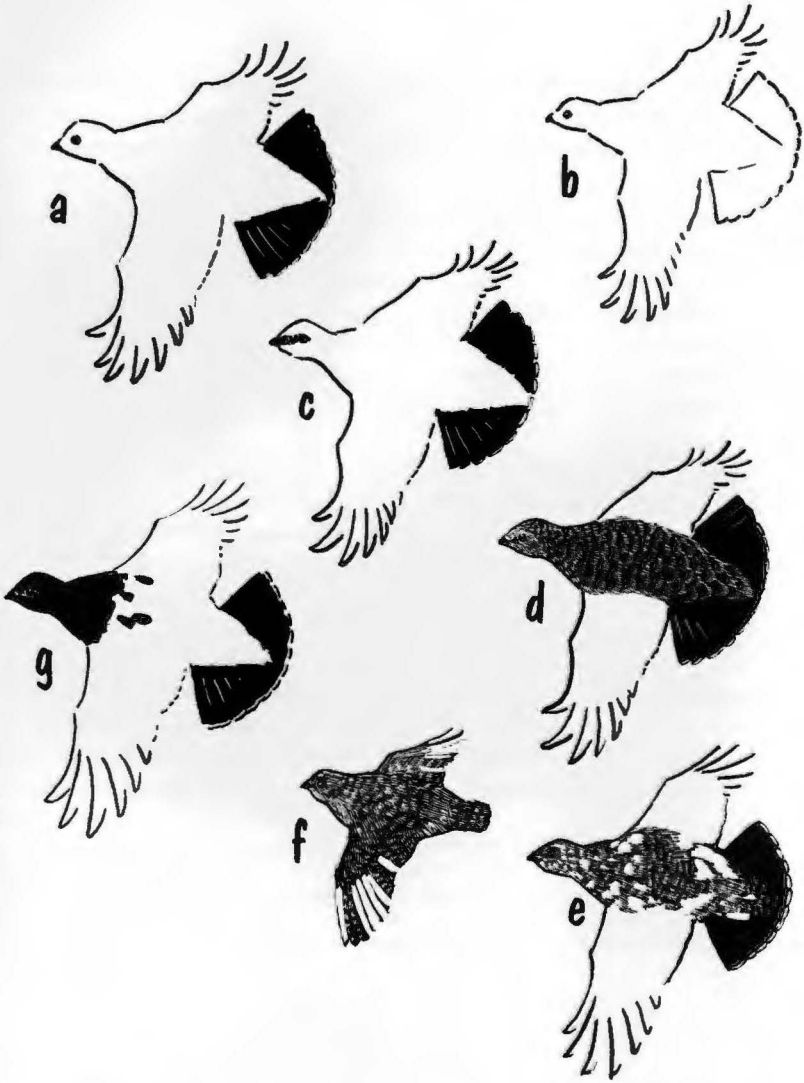
The white-tailed ptarmigan is a fascinating creature to naturalists who roam the western mountains. Not only does it still have the aura of mystery surrounding birds whose lives are poorly understood, but what little is known about the species suggests that it is very different from rock and willow ptarmigan. Its plumages, summer and winter, are quite unlike those of the other ptarmigan; its voice and size also set it apart. White-tails may live much longer, on the average, than other ptarmigan. They are not semi-migratory or nomadic to the extent willow and rock ptarmigan are, and may not fluctuate as widely in numbers from year to year. Even in some small details of anatomy, such as the relatively small size of the heart, the white-tailed ptarmigan is unique in the ptarmigan group. It seems that the white-tail must be very old, as a species, and must have been in the process of adapting to alpland existence for many millions of years.



Range of the White-Tailed Ptarmigan in Alaska

White-tailed ptarmigan are found only in western North America. They are products of millions of years of evolution in rugged mountains, and have never learned to compete successfully with other ptarmigan anywhere except in these rocky alplands. The five races of white-tails range from extreme northern New Mexico (where they live at 12,000 - 14,000 feet), Mount Rainier, and Vancouver Island, to southcentral Alaska and central Yukon.

White-tailed ptarmigan may have evolved from a group of rock ptarmigan, isolated by glaciers in alplands of the western states. In the process of adapting to new conditions, they developed stronger, wider bills than their ancestors. Now, when the three kinds of ptarmigan forage on common winter range, white-tails eat the widest variety of buds and twigs. While rock and willow ptarmigan concentrate on dwarf birch and willow, white-tails eat both of those and alder catkins as well. The upper drawing is from a hen seen at mile 58 Haines Road in June. The other is a male from Thompson Pass, near Valdez, shot on November 24, 1964.



At every season, all mature ptarmigan have white wings. Only chicks between 10 and 40 days of age have brown flight quills. Identification of different species, unless the bird is in hand, is hard even with experience. The white tail easily identifies the smallest species; this is a dependable character all year long. Winter-plumage ptarmigan with black masks are rock ptarmigan—but not all rockers have this marking. a. Winter Plumage. Willow; b. Winter White-tail c. Winter Rock; d. Summer Rock; e. Fall Rock; f. Rock Chick; g. Spring Willow.

With tail held high like a Spanish dancer's fan, and with neck feathers flared out to show the purplish air-sac surrounded by its bright halo of white plumes, this cock blue grouse is convinced of his irresistability. The brownish hen is so sure of her allure she doesn't even bother to show off. If the time is right, mating will occur with casual rapidity, and the male will fly back to his broken-topped Sitka spruce overlooking Eagle River Valley near Juneau, to amuse himself by intimidating other. males.

Many kinds of birds use their tails as recognition and display signals, and upland game birds are no exceptions. It isn't surprising, therefore, to find that most species, and particularly cocks, have distinctively colored tails. The blue grouse male's slatey-blue tail, with the greyish tip, is a dead give-away for that species.

Blue Grouse


Wallen

BLUE GROUSE *(Dendragapus obscurus)*

The somber, wet, evergreen forests of southeastern Alaska from Haines to Ketchikan are the home of Alaska's biggest grouse, the blue grouse or "hooter." Practically every island and cape has its population of these fine birds, although, oddly enough, there are no authentic records from Prince of Wales Island. Big timber is important to blue grouse, as it provides food and shelter in the winter months. Muskegs and alpine meadows are equally essential for the superior summer and fall feeding areas they offer. Hens with their chicks seem particularly fond of sunlit forest edges.

Blue grouse can be found in spring within easy walking distance of Juneau and Petersburg or along the road systems near those towns. Many trails maintained by the Forest Service turn the formidable task of hiking in southeastern Alaska into a real pleasure.

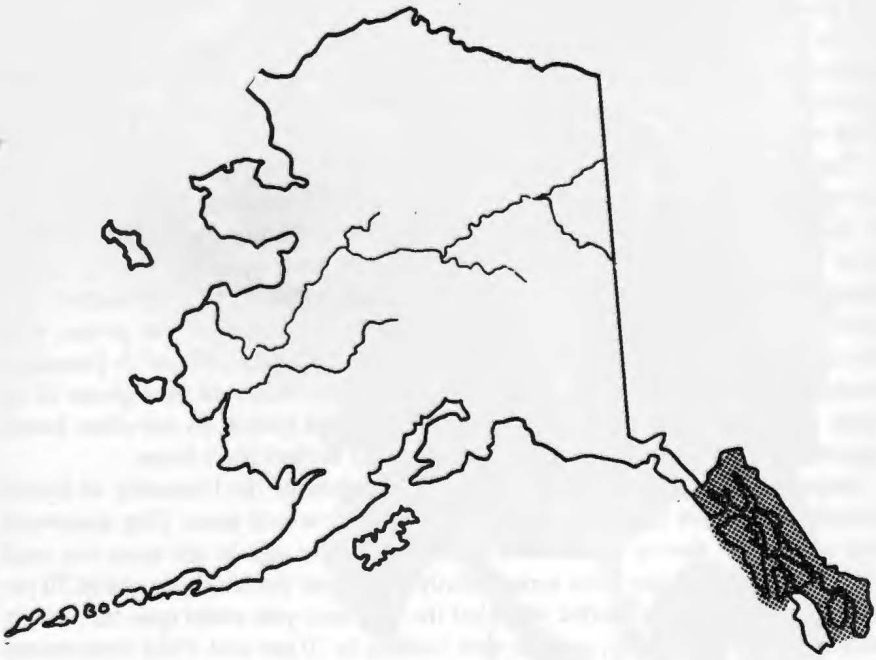
The male blue grouse, tipping the scales at 3 pounds, is a handsome bird, with its yellow comb standing out against the slaty blue of the head, and with its long black tail tipped with pale grey. The females are browner than the males, and are only a little over two-thirds as big.

The life of the Alaskan blue grouse is poorly known. Many people have heard the boy-with-the-empty-cider-jug hooting of blue grouse, beginning just after the Ides of March, when the old males are concentrated in the upper half of the timbered zone of the mountains. In late June, blue grouse hens with their downy chicks frequent the edges of muskegs, slashings, and roads. Then, in August and September, deer hunters and goat hunters begin to see families of blue grouse, with the chicks well grown, in the alpine meadows near timberline, almost in ptarmigan country. But where are the adult males all summer? Where do blue grouse of all types spend the winter? Where are the yearling males (which do not often breed, apparently) in spring when the adults are courting? We just don't know.

Some fascinating work is being done by biologists of the University of British Columbia who have kept blue grouse in captivity for several years. They discovered that even when downy chicks were handled carefully and in the same way each year, the survival of the birds varied greatly. One year the biologists reared 70 per cent of the chicks they started with–but the very next year could raise only 11 per cent. The following season, survival went back up to 70 per cent. Field observations showed the same trends in wild populations, with two summers of good survival separated by a summer of poor survival. The British Columbia scientists are now working to find out whether the differences in survival were due to changes in the vigor of the chicks, which, in turn, stemmed from a change in the health of females just before nesting began.

Blue grouse have considerable potential as game birds, especially in late winter and early spring. Stalking the cocks while they are calling from the treetops offers a challenge to legs and lungs rarely equalled elsewhere in Alaska. The Department of Fish and Game has recognized the recreational benefits from this unique type of hunting, and has extended the open season to include at least a month of the hooting period of male blue grouse.

Blue grouse eat many berries in August and September, as well as other vegetation, but soon afterward change to a diet of conifer needles. Sitka spruce and two kinds of hemlock—western and mountain—provide most of the food of these grouse until May, when fresh growth again is available. The adaptability of the digestive tract of these grouse is amazing, considering the rapid change in fall from a succulent diet of berries to the dry, fibrous fare of evergreen needles. There must be a tremendous seasonal turnover in the kinds of one-celled plants and animals of the intestines that do most of the conversion of incoming food to usable nutrients.



Range of the Blue Grouse in Alaska

Alaskans know blue grouse as birds of the dense coastal forests of the Panhandle, or of alpine meadows and lowland muskegs within this thick green mantle. Unquestionably, the species is closely tied to evergreen woods, but many of the prime breeding grounds of these birds are almost devoid of tall trees; e.g. the logged and burned lands of eastern Vancouver Island and the sagebrush foothills and valleys of eastern Washington and Oregon. Throughout its range, however, the blue grouse spends winters in conifer woods.

The mottled olives, brown, and blacks, accentuated by patches of white on tail and face, make the spruce grouse cock a sleek, handsome bird. This young male was found nipping the tips of white spruce needles early in April 1965, near Big Delta. It probably had spent the past winter, its first, in the same few acres of mixed evergreen-hardwood forest. In a month it would feel the first stirrings of the mating urge, but very likely would never display vigorously enough to attract a hen. Next year . . . .

The rusty-orange band at the tip of the dark tail is the spruce grouse's trademark throughout its whole range, except for a renegade form of the West. This bird, the Franklin's grouse, has blackish tail feathers with unmarked tips. Left, spruce grouse; right, Franklin's grouse.

Spruce Grouse

SPRUCE GROUSE *(Canachites canadensis)*

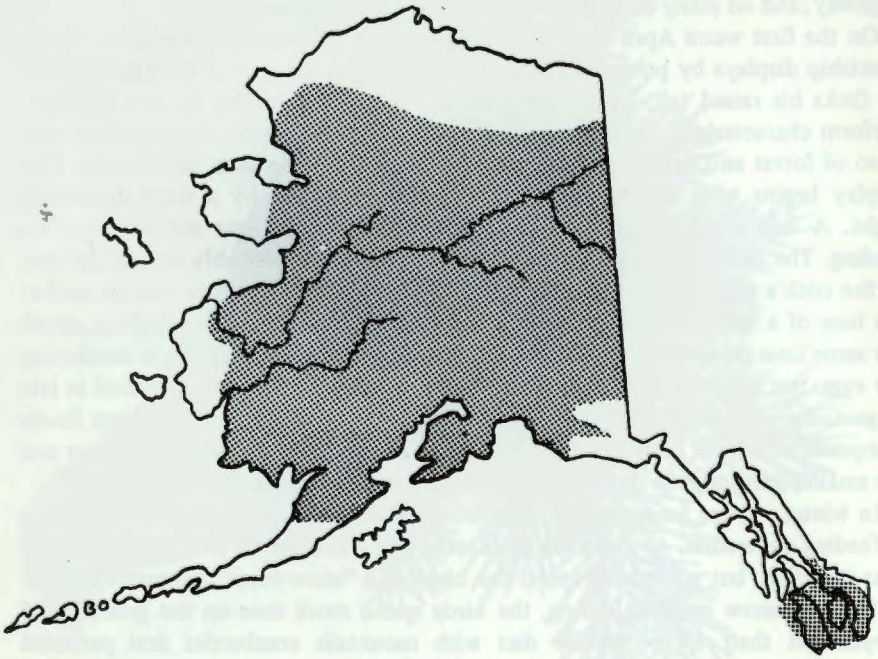
Spruce grouse, popularly known as "spruce hens" or "spruce chickens," inhabit white spruce-paper birch woodlands, black spruce bogs, and, in southeastern Alaska, Sitka spruce-hemlock forests. The spruce grouse of southeastern Alaska lacks the rusty band on the tail which characterizes other Alaskan spruce grouse, and the birds in the Panhandle region have white-tipped feathers overlying the tail.

In the fall, spruce grouse are often seen along roadsides throughout their Alaskan range. Favorite places for hunters and bird-watchers are on the Steese Highway between mile 120 and 148; along the Livengood Road, especially near Manley Hot Springs; from Ester to Nenana on the Nenana Road out of Fairbanks; along the Alaska and Taylor Highways near Fortymile; near Glennallen on the Glenn Highway; and on many secondary roads on the Kenai Peninsula.

On the first warm April days that promise winter is abating, the male begins his courtship displays by pompously strutting on the ground or in a tree. Occasionally he flicks his raised tail, emitting a sharp rustling sound. In May he also begins to perform characteristic aerial displays, signifying that he "owns" the immediate acre or so of forest and that no other displaying cock is to trepass in this domain. The display begins with the bird strutting in a tree, followed by a steep downward flight. A few feet above the ground the bird checks his flight and flutters to a landing. The fluttering wings create a soft drumming that probably attracts the hen to the cock's territory. In May, five to nine eggs are laid in a shallow nest located at the base of a spruce tree or beneath a log. Hatching occurs about mid-June, about the same time the cock stops displaying. The cock neither participates in incubating the eggs, nor assists in rearing the chicks, but often joins the hen and brood in late August. By early September it is not unusual to see an adult male with large flocks composed of several hens and broods. These family flocks disband in October and the smaller groups settle on wintering areas, often in dense stands of spruce.

In winter, spruce grouse spend most of the daylight hours in spruce trees loafing or feeding on needles. At night the birds roost either in a spruce tree or on the snow near its trunk, but sometimes spend the night in a "snow-roost" beneath the snow surface. As snow melts in spring, the birds spend more time on the ground, and supplement their spruce needle diet with mountain cranberries that persisted through the winter. Principal summer and fall foods include mountain cranberries, blueberries, crowberries, green leaves, especially blueberry leaves, and assorted flowers and seeds. Chicks eat a lot of insects in the first few weeks after hatching. Broods seem to like areas with a dense ground cover of blueberry, perhaps because the plants are tall enough to hide the chicks but low enough to let the hen watch for predators. Spruce grouse need a large amount of grit to make the change from a fall diet of berries and leaves to a winter diet of fibrous needles. During September and October, adults and young pick up grit in early morning along roads, streams, and lakes. Some of the birds travel several miles to get grit. These autumn movements are the longest in the bird's whole life, as spruce grouse stay in the same few acres of ground the rest of the year.

No one knows yet why there are a lot of grouse in an area one year, and very few the next year or two years later. These ups and downs occur among grouse even in places far from roads and towns. There doesn't seem to be much to worry about concerning the periodic crashes of grouse populations; long experience has shown that the birds will soon be abundant again if their habitat remains unchanged. The birds are in real trouble, however, if nesting cover, brood rearing areas, feeding places, or roosting sites are lost because of changes wrought by man or nature. Wildfires have been the most important cause of loss of spruce grouse habitat in interior Alaska. This species will benefit greatly from the fire protection now given to the land by Federal and State land management agencies. It is important to remember that prolonged fire protection leading to the development of extensive mature forests, will decrease the amount of habitat for ruffed and sharp-tail grouse.

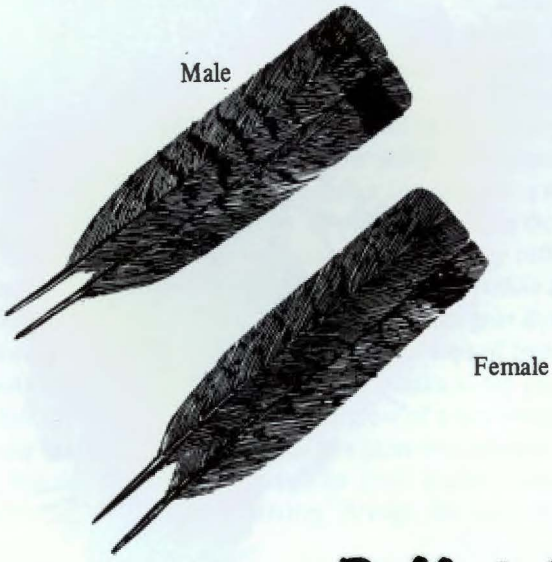


Range of the Spruce Grouse in Alaska

Nearly every good-sized patch of boreal forest in North America has its population of spruce grouse. From Nova Scotia to Alaska, from Michigan to Northwest Territories, woodsmen have known this grouse ever since the first days of human settlement. It is a little strange that over the countless centuries since these birds evolved (from what?), none have ever successfully pioneered the northern forests of Siberia. In fact, none of North America's grouse, nor any of Eurasia's, have established colonies on other continents.

Crouched amid the dry ferns on a windblown cutbank, this ruffed grouse turned its body to catch the wan rays of a mid-November sun near Ester. The first sign of its awareness of my approach was a compression of the body as the ruffled feathers were pulled flat. Then the ragged crest slowly raised, the bird shuffled its feet closer under its body, and with the explosive force for which this grouse is famous, it hurtled away through the aspen copse.

The mottled brownish or greyish tail of cock ruffed grouse has a dark band near the tip of each feather. When the tail is spread, this band shows as an unbroken arc from one side to the other. Hens usually have the same marking, except that the two central tail feathers lack the dark band. If it weren't for occasional uncooperative males with "broken" tail bands, this would be a gambler's delight. These illustrations are approximately one-half life size.



Ruffed Grouse

RUFFED GROUSE *(Bonasa umbellus)*

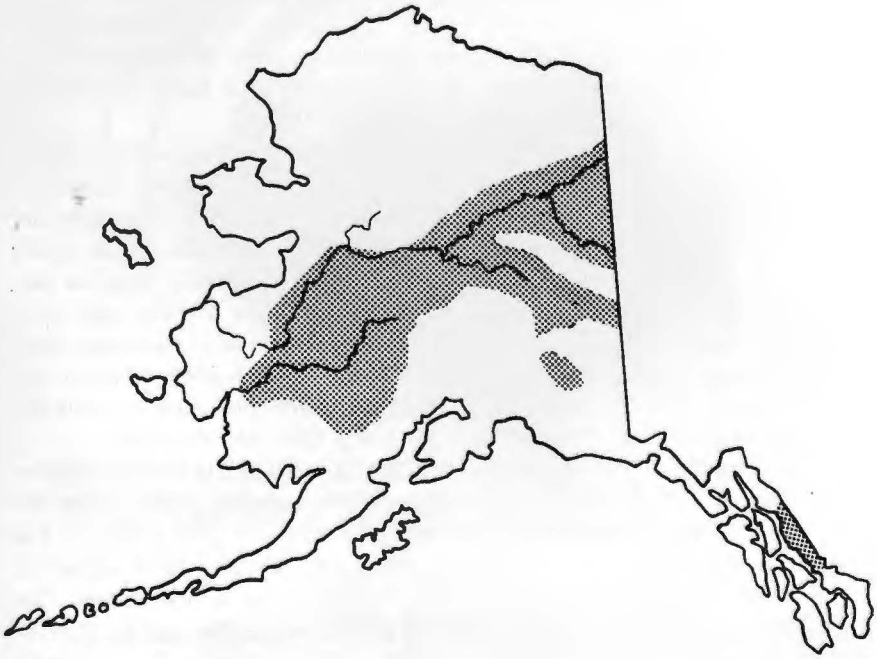
The throbbing drum of the ruffed grouse pulses in spring through the woodlands of central Alaska wherever stands of aspen and birch break the uniformity of the northern spruce forest. Fairly dry, south-facing slopes are favorite places for this grouse. In such situations it finds the variety of plants it needs–aspens and willows for winter food; a scattering of spruces for shelter in winter; and a host of small, flowering plants in sunlit glades for the chicks to eat and to hunt among for insects. The ruffed grouse can be found also in willow thickets along streams and rivers, and in the open birch woods on gravelly soils of the Yukon and Tanana River Valleys.

Like most Alaskan grouse, the ruffed grouse establishes and advertises its ownership of a plot of ground in spring. Males drum from particular places in their territory, usually from a log, stump, or rise of ground. Careful study of ruffed grouse in northern states has revealed that the territories actually are established by older cocks in autumn. These dominant cocks are the first to begin drumming in spring. The first-year males, most of them unable to establish themselves on good territorial ground, "wait in the wings" until an older male is killed or until the sexual urge wanes among the early breeders.

Only a handful of nests of ruffed grouse have been found and reported in Alaska, so most of our knowledge of the summer activities of the species comes from other places. Hens apparently like to nest beside a stump or under a fallen tree, especially along the edges of forest openings. The nests usually are not close to the male's drumming site. The young hatch in about three weeks and quickly leave the nest with the hen. Family groups–the hens and their chicks–like shrubby and moist places at the woodland fringe. The broods stay together until late September, when young birds disperse in what is known as the "fall shuffle." Ruffed grouse do not form large flocks in fall and winter, as ptarmigan and sharp-tailed grouse usually do, but sometimes groups of six to ten birds stay together for weeks at a time.

People who hunt ruffed grouse often hang up their guns in late October because the birds seem to vanish from the woods at that time. Certainly ruffed grouse are hard to find on bright winter days, even when the birds are quite common. The experienced outdoorsman looks for these grouse after the sun goes down, because it is then that they leave their daytime roosts to fly into the tops of trees to feed. One of the most enjoyable winter experiences in central Alaska is the sight of three or four of these handsome birds outlined against the glow of a late evening sky, busily harvesting their daily crop of aspen buds. And the skier who accepts the invitation of a bright, crisp March day will, if he traverses good grouse habitat, be doubly rewarded by the sight of ruffed grouse bursting through the roof of their daytime roosts in the snow.

An interesting thing about ruffed grouse is that they come in two color tones–the so-called red and grey phases. Red-phase individuals in Alaska are not as richly colored as those from the eastern United States, but the back, and particularly the tail, are definitely reddish brown. Grey birds lack the red-brown color in the tail, and are paler throughout the body. Apparently both color types can occur in one family group. Scientists in Minnesota now believe that the grey birds have the advantage over the red ones whenever snow is on the ground for long periods every winter–they don't get killed by predators as often. This may explain why the grey phase ruffed grouse dominate in Alaska.



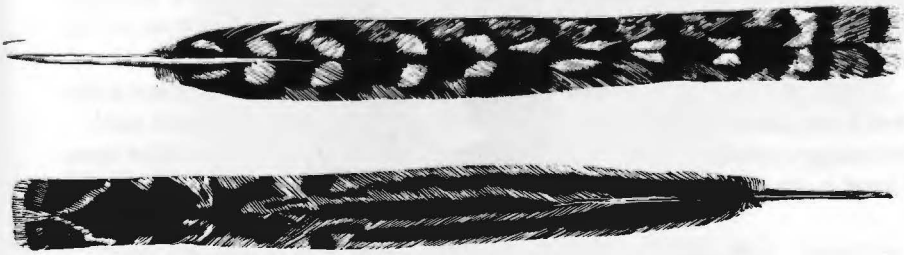
Range of the Ruffed Grouse in Alaska

The ruffed grouse has been fairly successful at colonizing the northern forests, too, but unlike the spruce grouse, it has an affinity for hardwood stands that has allowed it to spread southward into the mid-section of the United States. In the North, it occupies far fewer square miles than the spruce grouse, because its chosen habitat is less widespread.

The springtime dance of the sharp-tail is one of the most fantastic sights in the North. Cocks gather at dawn on a dancing ground, or "lek," the dominant males in the center, subordinate males on the edges. For several hours the birds will go through their stereotyped routines, feet drumming, bodies circling, tails rasping, airsacs bulging and popping like corks from a case of champagne. The hens come singly or in small groups, and they, too, have their hierarchy of dominance.

The short, stiff, dun-colored tails of sharp-tailed grouse are totally unlike those of any other Alaskan upland game birds. The sharp-tail can open and close its tail so fast that it produces a dry, rustling, castanet sound. When fanned and erect, the stubby tail looks like a ridiculous caricature of the magnificent tails of other grouse. The two central feathers point to the sky like fingers; it is these feathers, drawn here, that give a clue to the sex of the bird. Typical hens have a cross-barred or mottled pattern the full length of these central tail feathers, whereas males usually have longitudinal stripes extending at least halfway along the feather. A man guessing at the sex of sharp-tails on this basis would be right roughly 8 or 9 times out of ten.

Female



Male

Sharp-tailed Grouse

SHARP-TAILED GROUSE *(Pediocetes phasianellus)*

Gold is where you find it–and so are sharp-tailed grouse. Many an itinerant midwesterner is startled to see a sharp-tail perched high in an Alaska spruce tree, or emerging from dense brush along a swamp road. As a matter of fact, this grouse occupies a vast area of forest from Ontario to Alaska, far north of the prairie border with which people usually associate it. In these subartic regions the sharp-tail prefers burned-over ground, scrubby woodlands at timberline, and wet, sedgy, almost treeless areas known as muskegs. Sunny, grassy places are important features of breeding grounds, and mature birch trees, where the grouse feed, are often found in winter range. Sharp-tails will also feed in unharvested grain fields in central Alaska, as long as the grain shows above the snow.

Althrough the sharp-tail is not easy to find anywhere in Alaska at present, some places are locally known for their consistent production of coveys of this bird. The Tanacross-Tok-Northway area is one such hot-spot, and the brushlands from Shaw creek to Delta Junction and from Delta Junction to Donnelly Dome are another. The marshy ground near Fort Wainwright and North Pole has some sharp-tails on it, and these birds often are seen by local residents in winter. These birds are also scattered along high, fairly open ridges west of Livengood on the road to Manley Hot Springs, on the Johnson Road south of Eielson Air Force Base, and on other summits or "domes" in the vicinity of Fairbanks.

Male sharp-tails, which weigh about 1½ pounds when mature, are somewhat bigger than females. The two sexes look very much alike, except that the central pair of tail feathers of the male usually are striped longitudinally rather than cross-barred as in females, and the cock's breast feathers have a pointed, instead of rounded, black band.

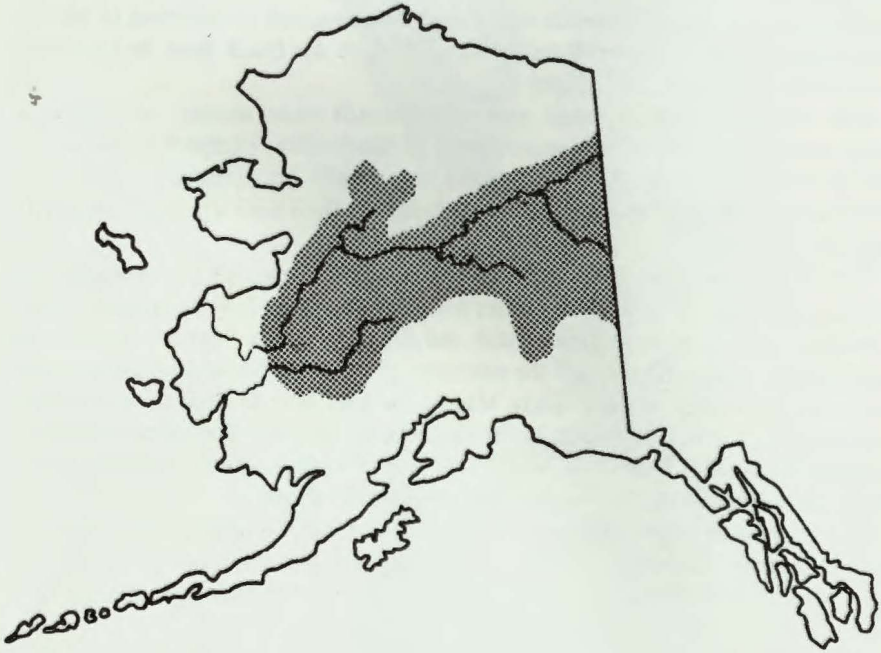
The close kinship of sharp-tailed grouse and prairie chickens is obvious when courting time rolls around. Both species court in communal dancing grounds, where dominant males strut with fanned tails and drooping wings, "dance" on stiffened legs, and hoot in an effort to get the attention of the hens. No other Alaskan grouse has such a courtship pattern. Early May is the best time to look for sharp-tailed grouse on their dancing grounds in interior Alaska. Activity is at its peak about an hour before sunrise. Sharp-tails in the Tok area of eastern Alaska habitually court along roadsides, making observation and photography simple.

Male sharp-tails mate with several females on the dancing ground, and a hen may mate with more than one cock. Hens take on the task of incubating eggs and rearing the young. It is doubtful that males even know where the nests are, as hens often choose a place far from the courting area.

When several inches of snow cover the ground, the flocks, which formed early in the fall, begin to move about. Adult males seem to stay quite close to dancing grounds in winter, while females and young wander more widely. Like other grouse and ptarmigan, this species takes advantage of the insulation and concealment provided by the fluffy snows of central Alaska by roosting at night in snow burrows or hollows.

In winter, Alaskan sharp-tailed grouse rely heavily on paper birch buds and catkins for food, varying their diet when they can with grass seeds, waste barley, aspen buds, and berries. Nothing is known about their diet in summer here at the northwestern outpost of their range. The crops of sharp-tailed grouse taken in September usually hold cranberries, blueberries, bearberries, grass, grains, leaf fragments of various sorts, and insects (especially grasshoppers and water beetles).

Sharp-tailed grouse have been so uncommon over most of interior Alaska in recent years that nearly a generation of sportsmen has come and gone since hunting for "chickens" was really profitable. Although good records are rare, central Alaska apparently had many more sharp-tails in the 1920's and 1930's. Perhaps this period of abundance was related to the widespread wildfires that swept repeatedly over huge sections of the Tanana and Yukon Valleys after the turn of the century. Sharp-tails may have thrived in the years when grasses and shrubs dominated the burns, only to decline again when the trees closed in and the ground cover changed. Alaska may never see huge flocks of these birds again. However, there is little danger that huntable populations will disappear entirely, as timberline and muskeg habitats are a stable part of the Alaskan scene.



Range of the Sharp-Tailed Grouse in Alaska

The interior valleys and their foothills harbor practically all of Alaska's sharp-tailed grouse, although occasional wanderers have shown up on the Kenai Peninsula. The race found in this State also lives in Yukon and extreme northern Alberta. Six other races, or suspecies, occupy lands extending east across central Canada to the Great Lakes region, south to Nebraska, New Mexico, Nevada, and Oregon. The sharp-tail is very much like the more southerly prairie grouse; in fact, the two birds often hybridize.

Question: How can a bird without teeth digest dry, hard twigs?
Answer: By swallowing rocks.

All grouse and ptarmigan have big, muscular gizzards containing a thick-walled sac full of small pebbles. As the muscles contract the stones roll around, grinding and chipping the fibers of leaves, buds, and twigs, preparing the food for chemical digestion. The stones are selected for hardness; usually quartz and chert predominate. Chicks begin picking up pebbles a few days after hatching, and renew their supply periodically throughout life. In the North, where snow covers most of the ground for months, grouse and ptarmigan retain grit particles for a long time. By late winter even the hardest pebbles are ground and polished like gems.

Left: Rock Ptarmigan *Right: Spruce Grouse (.7x actual size)*

A ptarmigan's bid for immortality lies in a cup of moss, glossy, smooth, vulnerable. For three weeks the eggs will lie there, their fate centered on the warm, naked belly of the incubating hen. All of the fancy machinery man has ever devised has failed to duplicate successfully the effectiveness of a bird for warming eggs.

Left: White birch, Betula papyrifera. Catkins and leaf buds eaten in winter by sharp-tailed grouse.

Right: Dwarf birch, Betula nana, B. glandulosa. Rock ptarmigan heavily dependent on this shrub for winter food; also used by white-tailed ptarmigan in winter.

Top: *Alder, Alnus crispa. Flower catkins eaten by white-tailed ptarmigan in winter.*

Bottom: *Aspen, Populus tremuloides. Buds, especially flower buds, a mainstay of ruffed grouse in winter.*

Top: *Mountain hemlock, Tsuga mertensiana. Needles eaten by blue grouse from October to May.*

Bottom: *Western hemlock, Tusga heterophylla. Blue grouse also eat the needles of this hemlock in winter.*

Left: White spruce, Picea glauca. Needles of white spruce and black spruce, P. mariana, are almost the sole winter food of interior and north coastal spruce grouse populations.

Right: Sitka spruce, Picea sitchensis. The sharp needles of this tree are an important winter food of Alaskan blue grouse.

Left: High-bush cranberry, Viburnum edule. Red, pungent berries eaten by ruffed, spruce, and sharp-tailed grouse in fall.

Right: Willow, Salix spp. Several species of willow are important foods of willow ptarmigan all year and of white-tailed ptarmigan and ruffed grouse in winter.