

SOME NOTES ON SPRUCE GROUSE

(Dendragapus canadensis)

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One of the most frequently sought and least frequently found of New England's avifauna is the Spruce Grouse. All too often, when a bird is found, it is identified on the premises that a grouse that does not flee or a grouse observed in Maine, northern New Hampshire, northern New York, or extreme northern Vermont is a Spruce Grouse. Unfortunately, both premises are incorrect. A female Ruffed Grouse (Bonasa umbellus) will frequently stand her ground, display, and even charge at an unwelcome human intruder if chicks are anywhere in the vicinity. Furthermore, in all of the Spruce Grouse's New England range, the Ruffed Grouse is the more common grouse. This article is an attempt to provide some clues to the identification of the Spruce Grouse (especially the female), some hints on how to find this elusive bird in the White Mountains of New Hampshire, and some miscellaneous notes and observations.

There are five recognized subspecies of the Spruce Grouse (formerly Canachites canadensis): the nominate Hudsonian Spruce Grouse (Dendragapus c. canadensis), "Franklin's" grouse (D. c. franklinii), Valdez Spruce Grouse (D. c. atratus), Canada Spruce Grouse (D. c. canace), and Alaskan Spruce Grouse (D. c. osgoodi). (See The A.O.U. Checklist of North American Birds, Fifth Edition, 1957.) Since it is only the Canada Spruce Grouse that occurs in New Brunswick, Nova Scotia, southern Ontario, southern Quebec, New England, New York, and the north-central states, this discussion is confined to that subspecies except when, for lack of information, studies of the other subspecies must be used. For purposes of comparison in identification, only the Ruffed Grouse will be discussed, since it is the only other grouse occurring within the Spruce Grouse's range in the southern Canadian Maritimes, New York, and New England.

Identification. The adult male Spruce Grouse looks like no other bird that one is likely to encounter in New England. At first glance, the bird is chicken-like with gray upperparts, black breast, and black and white underparts. Closer inspection reveals that the color of the upperparts and wings is gray barred with black. The throat and breast are black, and on the sides of the breast and flanks, white barring appears and becomes increasingly heavier away from the center of the breast toward the tail, so that the undertail coverts appear white at first glance. Closer examination, however, shows them to be black with white tips. The tail itself is black with a terminal band that has been variously

described as chestnut (National Geographic Society's 1983 field guide, hereafter NGS, Robbins 1983, and Peterson 1980), as orange (Robinson in The Audubon Society Master Guide to Birding, 1983, hereafter MGB) as brownish (Johnsgard, 1973), or as tan (Ellison, 1968a). Also prominent over each eye is a scarlet-red comb, which varies in size from bird to bird.

The female, looking superficially like a Ruffed Grouse, presents a more difficult identification problem. While the base color of the female Spruce Grouse may be either red-brown or gray-brown, the red-brown birds predominate in New England. Pough (1951) notes that the browner (i.e., redder) birds predominate in the south, but we must remember that New England is the southern part of this bird's range. The base color is barred with black and buff, and as with the male, there are an increasing number of white-tipped feathers toward the tail. The tail of the bird is short and black and, in the Canada Spruce Grouse, has a terminal band that may be described as buff (MGB) or brown. (To my eye, it appears chestnut or cinnamon.) In New England, this fieldmark may be considered diagnostic. If it is not seen, assume that you are looking at a Ruffed Grouse.

Immatures look like the red-phase female (NGS) until they are between five and six weeks old. Ellison (1968a) says that at this age the postjuvinal breast feathers appear, and the chicks can be sexed by plumage. The male's postjuvinal breast feathers are black tipped with white while those of the female are tipped with white or buff and have one to three buffy bars on a black background. Pough indicates that by late August or early September, the young look virtually like the adults.

As with the female Spruce Grouse, the Ruffed Grouse is found in both red and gray phases, the red phase predominating in the southern part of the bird's range. But unlike the Spruce Grouse, northern New England is closer to the northern part of this bird's range. Thus many of our Ruffed Grouse are gray-phase birds. Since the color-phase is most noticeable in the tail, the tails of many of our Ruffed Grouse are dark, nearly black. This often makes the dark subterminal band of the Ruffed Grouse's tail unnoticeable, especially if the bird's tail is folded. Hence, observation of a dark-tailed bird does not in itself mean that the bird is a Spruce Grouse. If there is no chestnut terminal band, the bird is certainly a Ruffed Grouse.

Field guides usually emphasize the crest and ruff of the Ruffed Grouse. In the field, however, these are not always apparent. This is especially true of the female and of flying birds of either sex. Note also that, like the Spruce Grouse, male Ruffed Grouse often have small orange-red combs over the eyes. The presence of these combs is in no way

diagnostic for either species. The only field guides that show these on the Ruffed Grouse, however, are NGS, Robbins, and Pough. Again, throughout New England, if one does not see those field-marks that are characteristic of the Spruce Grouse, the bird is probably a Ruffed Grouse.

Habitat. Johnsgard (1973) presents an excellent summary of the variety of trees that numerous observers have shown support Spruce Grouse. Robinson and Maxwell (1968), studying birds in northern Michigan, showed that there is a propensity toward mixed forests of Jack Pine (Pinus banksiana) and spruces. In a later study Robinson (1969, page 113) found that "the birds chose areas of nearly pure conifers in which spruces (Picea mariana and P. glauca) were mixed with Jack Pines, the tree growth was sparser than on the area as a whole, and blueberries (Vaccinium angustifolium and V. myrtilloides) prevailed among the low vegetation." The findings of Lumsden (1961) and Lumsden and Weeden (1963) were identical. Ellison (1968b), studying populations in Alaska, found that two communities were favored: one of White Spruce (Picea glauca) and birches with grasses, spiraea, blueberry (V. uliginosum, known as Bog Bilberry in New England), and cranberry; and the other of Black Spruce (Picea mariana) with blueberry, cranberry, and lichen. Ellison also noted that Spruce Grouse were found in low stands of Black Spruce at the edges of bogs. MacDonald (1968), in a study of "Franklin's" Grouse in Alberta, found that the habitat consisted of Lodgepole Pine (Pinus contorta) interspersed with poplars. Brewster (1925), Forbush (1925-1929), and Fritz (1979), studying lowland populations in New England and New York, mention cedars and Larch (Larix laricina). Most observers mention the presence of Balsam Fir (Abies balsamea).

In evaluating such studies, one must be careful literally not to miss the forest for the trees. The proper conclusion seems to have been drawn by Robinson in MGB (1:272): Spruce Grouse require "large tracts of conifers, especially where living branches reach the ground and where there are numerous forest openings" (underlining mine). In his earlier study (1969), Robinson found that Spruce Grouse tended to shun mature stands of spruce and Jack Pine because the canopy was too closed and the lower branches too high. It is evident in the White Mountains, however, and is implied in Robinson's statement in MGB, that the maturity of the trees is not the issue, the height of the lower branches is. For the White Mountain populations, I would add that those areas inhabited by Spruce Grouse are usually quite flat. The factor that one must note is that these birds are dependent on the type of forest not on the species of trees. Precisely which species of trees make up the boreal forest changes as one moves from east to west across the continent. In the White Mountains, the forests in which Spruce Grouse occur are 90-95 percent Balsam Fir, the remainder of the trees being

Black Spruce, Heart-leaved Paper Birch (Betula papyrifera, var. cordifolia), Mountain-Ash (Sorbus sp.), with a very small number of Red Spruce (Picea rubens). In New England, such forests are found by going to the far north or, as in the case of the White Mountains, by going up. The effect of these habitat requirements is that in the White Mountains Spruce Grouse do not compete for habitat with Ruffed Grouse, which occur where the conifers are taller, in mixed and in hardwood forests. Robinson (1969) found the same to be true in his studies on the Yellow Dog Plains, and where there was a habitat overlap, it occurred in the winter when the Ruffed Grouse would encroach into Spruce Grouse territory. This means that if a Spruce Grouse is observed in habitat radically different from that described above, careful observation and notes should be made.

Voice. Although this bird is usually silent when encountered, there are, nevertheless, a number of different vocalizations used in different situations. The male has two challenge-calls. The first is a growling note usually described as "krrk, krrrk" (Robinson) or "kwerr, kwerr" (Johnsgard). Robinson, in MGB, calls this the lowest pitched sound of any North American bird. This may be a misprint, however, as this description is usually given not to the male's challenge-call but to his mating "hoot." [See page 2 of the insert in Peterson's recording, 1962 and 1975, A Field Guide to Western Bird Songs.] This latter note is very seldom heard, and its existence has even been disputed. Apparently the note is only uttered just before the male mounts the female for copulation and then only rarely. Its frequency is about 85-95 hertz, just within the low range of human hearing.

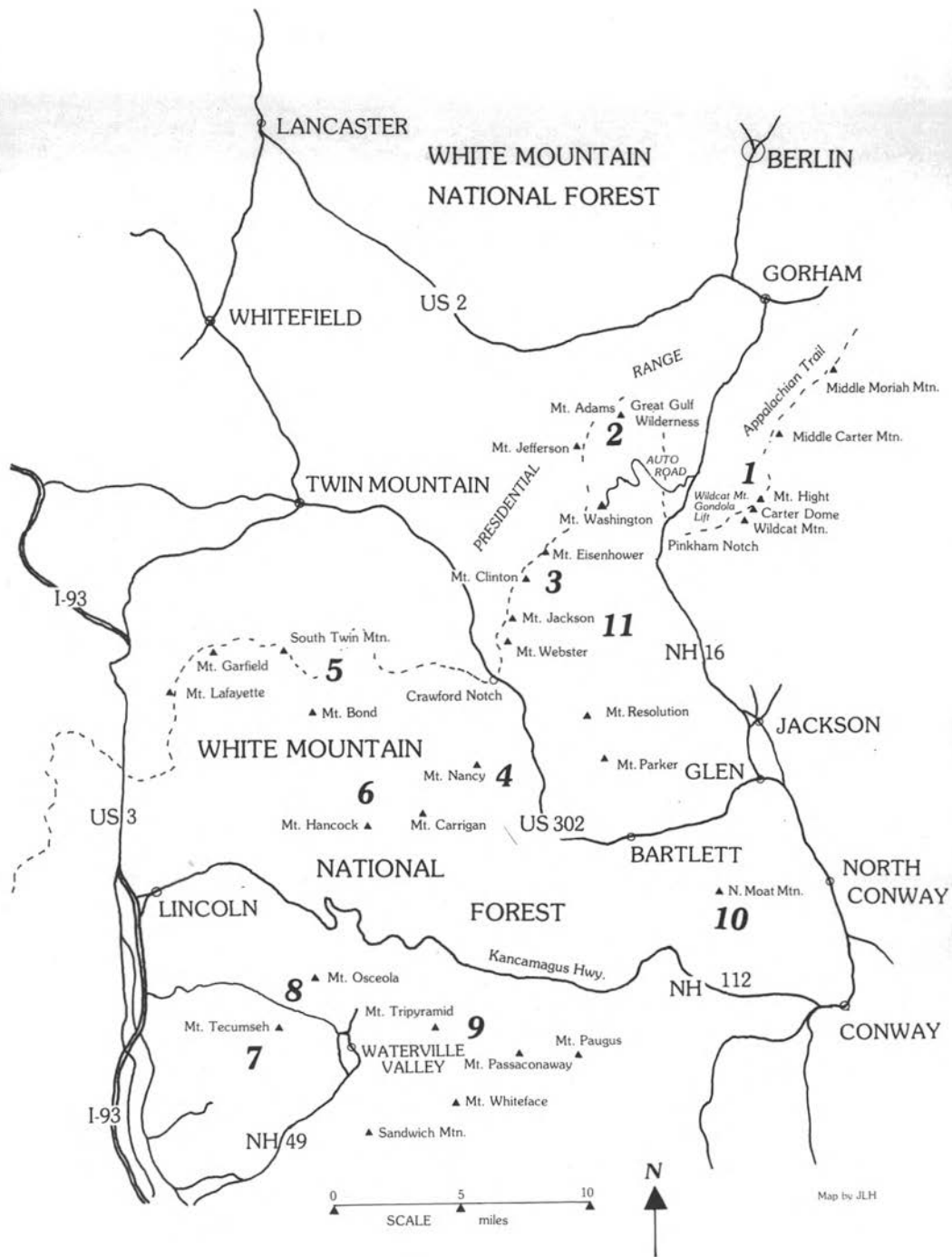
The female also has several calls. One, believed to be territorial, is described by Robinson as a "chicken-like prrp, prrrp, prrp, prrp, prrp, prrp, prp, prp, prp." MacDonald (1968) noted that this call always stimulated display behavior in the male. This call can be quite loud and to my ear has a trumpet-like quality. Johnsgard, in addition, describes a squeal or whine, a "pitting" note (which I think almost resembles the cluck of a chicken), and a guttural "kwerrr."

Displays. There are two different occasions for display behavior in the Spruce Grouse: aggression and courtship. While it is beyond the scope of this article to discuss either in detail, a few words might still be in order. Readers interested in further information are referred to either Lumsden (1961) or Johnsgard (1973). Johnsgard writes of an instance in which two males came into contact: the resident territorial male sleeked down his plumage, raised his tail, flashed his lateral rectrices and upper tail coverts, and uttered his challenge notes. The territorial male then lowered his head, stretched out his neck, lowered his tail, held his wings slightly away from his flanks, and charged

the intruder. Robert Stymeist reported similar behavior directed towards him while he was hiking on Mt. Jackson in the White Mountains on Labor Day Weekend, 1982 (personal comment).

Courtship displays, which usually take place in an opening in the forest, are far more complicated. The male fluffs out the feathers of the breast and throat, inflates the combs over his eyes, droops his wings slightly, and raises his tail which appears to move from side to side. This latter movement is effected by retracting the lateral rectrices on alternate sides while the central rectrices remain more or less stationary. Other gestures include symmetrical tail-fanning, tail-flicking, a head-bobbing in which the head is turned from side to side so that both combs are presented to the female, a wing-flicking, a neck-jerking, and a head-on rush. It is during this latter gesture that the deep hoot of the male is uttered. In addition to these displays that are performed on the ground, there are aerial displays in which the male flies up and down into and from a nearby conifer ("flutter-jump"). In Franklin's race, this latter maneuver is often accompanied by a double wing-clap.

In April 1982, Jane E. Herrman of the Franklin Institute of Philadelphia and I observed Spruce Grouse mating behavior on Mt. Clinton (elevation 3800'). Mizpah Hut, in which we took shelter, is usually closed at this time of year, but was open due to a construction project in progress. The snow depth was three to twelve feet. Under such conditions, snowshoes with instep crampons are absolutely essential and the carrying of full crampons and an ice axe is strongly advised. On April 26, at 5:15 A.M. (EDT), approximately thirty minutes before sunrise, from a line of Balsam Fir mixed with some American Mountain-Ash that separates two clearings to the east of the hut, we heard a trumpeting sound. We did not see the bird that made the sound but thought it to have been the territorial call of a female Spruce Grouse. At 5:22 A.M., a female Spruce Grouse was sighted in these same firs. The bird came to the edge of the clearing and flew low over the ground across it. At 5:25 A.M., a male Spruce Grouse emerged from the same line of firs and began to run across the clearing. His tail was spread and raised seventy to eighty degrees above the horizontal. The tail was widely spread in a fan of varying width (between sixty and a hundred degrees) and appeared to "wag" from side to side in the manner described in the preceding paragraph. The black feathers of the throat and breast were fluffed out, and the eyecombs were raised. The wings were slightly drooped. This corresponds to the strutting-display described by Lumsden (1961). A third bird, a female, emerged from the line of trees. The male then became agitated and flew to a nearby Balsam Fir, perching at the very top of the tree, fifteen to twenty feet above the ground. As the bird flew, his wings could be heard flapping, but there was no drumming and no "flutter-jump" display. The third bird then crouched and began to feed on balsam needles on the ground



in a leisurely manner. A fourth bird, a male, appeared from the woods. There was no display behavior from this bird, and he fed in the same leisurely manner as the third bird. At 5:40 A.M., all four birds flew off into the woods down the slope. The air temperature was 46 degrees Fahrenheit, the surface wind was calm, and the upper winds were from the south.

Lumsden (1961) believes that strutting is a "low-intensity aggressive display," which may or may not be triggered by the presence of the observers. I do not know whether the birds observed on Mt. Clinton were aware of us or whether they simply were not ready to begin mating. Neither male approached a female; there were no aerial displays; and other than the initial call by the female, there was no vocalization. It is unusual, however, that male birds would tolerate each other while in the company of a territorial female. It is possible that the males were attracted by the territorial call of the female, but that still does not explain the presence of the second female. I have not found in the literature any mention of group-mating or lek behavior in Spruce Grouse, and as there was no overt mating display, this does not seem to be the explanation here. However, if this was a family group from the previous nesting season, it was surprising to find them together so long into the next season. Robinson and Maxwell (1968) report March 8 as the latest date for their observation of a family group.

Where to find Spruce Grouse in the White Mountains of New Hampshire.

Like many other Galliformes, Spruce Grouse are chanced upon. However, one may improve the chances of finding a bird by searching those areas where Spruce Grouse are known to occur. The White Mountains of New Hampshire represent the southern extreme of the bird's range in eastern North America, but its distribution there is not uniform. Rather, there are disjunct, isolated pockets of population in suitable habitat throughout the mountains. Studies have shown that Spruce Grouse have a population density that ranges from seven pairs per square mile in Alaska (Ellison, 1968b), in Montana (Stoneberg, 1967), and in the Adirondack Mountains of New York (Fritz, 1979) to ten to twelve pairs per square mile in northern Michigan (Robinson, 1969). Fritz's paper is particularly instructive for the study of White Mountain populations of Spruce Grouse since the Adirondack populations are also in isolated pockets. Fritz found that there is movement in and out of the population pockets in the Adirondacks. But his study was of lowland populations. Whether there is movement from one population pocket to another when the pockets are located on ridges separated by deep valleys as is the case in the White Mountains is not known.

As has been stated, these pockets of population occur in flat areas of conifers in which Balsam Fir predominates. Whereas Fritz's study was of lowland populations, the best habitat in the White Mountains is concentrated on broad ridges at elevations of 3500'-4500'. All such ridges that are not above treeline have the potential for supporting Spruce Grouse. From the studies above, it is possible to estimate that the population of Spruce Grouse in the White Mountains probably numbers no more than one to two hundred birds. Some pockets are presented here.

Area 1: The Moriah-Carter-Wildcat ridge, especially the southern end. Spruce Grouse have been found on this ridge from Zeta Pass between South Carter Mountain and Mt. Hight southward across the long ridge that is the summit of Wildcat Mountain. This area is to the east of Pinkham Notch and can be approached via several routes. For the maximum time and distance on the ridge, take NH 16 north of the Appalachian Mountain Club (AMC) Pinkham Notch Camp to the trailhead of the Nineteen-Mile Brook Trail (about one mile north of the Glen House, on the right side of the road). Take the Nineteen-Mile Brook Trail east for 1.9 miles to the junction with the Carter Dome Trail. Take the Carter Dome Trail which, after another 1.9 miles of steady climbing, reaches the Carter-Moriah Trail in Zeta Pass. Turn right (south) on either the Carter Dome Trail (which bypasses the summit of Mt. Hight) or the Carter-Moriah Trail (which goes over the summit of Mt. Hight) and watch for the grouse. After passing over or around the summit of Mt. Hight, one comes to Carter Dome and then begins the steep descent into Carter Notch. There, about 3½ miles south of Zeta Pass, one finds the AMC Carter Notch Hut (see below for accommodations). Carter Notch also contains two tarns - unique in that they have no outlet stream, a set of ramparts created by a huge rock fall (or falls) from Carter Dome, and caves which contain ice year-round. To continue southward, take the Wildcat Ridge Trail out of Carter Notch and continue for about four miles. The first mile is extremely steep but afterward, the trail begins to level off and one should begin looking for Spruce Grouse again. About four miles south of Carter Notch, one comes to the gondola station of the Wildcat Mountain Ski Area. From here, one may return to Carter Notch and descend on the Nineteen-Mile Brook Trail or continue southward for two miles on the Wildcat Ridge Trail (very steep), which emerges from the woods on NH 16, or descend on the gondola. One may also ascend to Carter Notch Hut via the Nineteen-Mile Brook Trail thus bypassing the summits of Mt. Hight and Carter Dome or ascend from AMC Pinkham Notch Camp via the Lost Pond and Wildcat Ridge Trails. Those not wishing to hike may ride up and down on the Wildcat ski gondola (open in summer). The Carter-Moriah, Wildcat Ridge, and Lost Pond trails are part of the Appalachian Trail (AT) and as such are marked with a characteristic white blaze. Camping is restricted along this section of the trail but

there is a shelter and limited tent space at Imp Shelter, about four miles north of Zeta Pass. Accommodations are available at Carter Notch Hut but camping near the hut is prohibited. There is little or no water on the ridge except at the hut. See AMC Map #7, "Carter-Mahoosuc."

Area 2: Northern Presidentials. Here Spruce Grouse are most usually found on the broad buttresses or knees of the mountains surrounding the Great Gulf. I have seen the birds on the Wamsutta Trail on Mt. Washington, and Jefferson's Knees and the Buttress on Mt. Adams have similar habitats. Spaulding Lake on the upper floor of the Great Gulf itself looks promising. These areas are extremely isolated and the trails, especially the Six Husbands Trail, are exceedingly steep. The latter trail in particular should not be attempted by novice hikers. To reach this area, take NH 16 north of the AMC Pinkham Notch Camp to the entrance of the Mt. Washington Auto Road and park. Walk up the auto road to the trailhead of the Osgood Trail (a few hundred yards). Take this trail for 1.6 miles to its junction with the Great Gulf Trail. Turn left (west) on the Great Gulf Trail and continue for another 2.8 miles (4.4 miles from the start of the Osgood Trail). At this point, the Wamsutta Trail branches left (south), the Six Husbands Trail branches right (north), and the Great Gulf Trail continues straight ahead. Spaulding Lake is reached on the Great Gulf Trail 1.9 miles past this junction. To reach the Buttress Trail, turn right on the Six Husbands Trail, continue for 0.5 mile, and turn right (northeast) where the Six Husbands and Buttress trails diverge. Camping is restricted in the Great Gulf and a permit is required for overnight use. Check at the White Mountain National Forest (WMNF) Androscoggin Ranger Station on NH 16 just south of Gorham for permits and current regulations. There are no shelters or campsites in the gulf, and camping is prohibited at the old sites. Camping is also prohibited at Spaulding Lake. See AMC Map #6, "Mt. Washington."

Area 3: Southern Presidentials. For at least the past fifteen years, this ridge has been the most reliable place in the White Mountains for producing Spruce Grouse. The birds can be found anywhere from about midway along the Webster Cliff to the col between Mts. Clinton and Eisenhower. The best area, however, is between the quaking bog on the north side of Mt. Jackson and the main (northern) summit of Mt. Clinton (Pierce). A single bird observed in the Clinton-Eisenhower col in 1983 was unusual as the suitable habitat here is restricted to a very small area. The trail along most of this ridge is the Webster Cliff Trail, which can be reached from several points in Crawford Notch. At the southern end of the notch, the Appalachian Trail crosses US 302. On the east side of the road, the AT is called the Webster Cliff Trail. It is 2.8 miles from the road to the summit of Mt. Webster, and the trail is very steep. Better

approaches are found from the north end of the notch. Just to the south of Saco Lake at the north end of the notch, the Webster-Jackson Trail leaves the east side of US 302. At 1.4 miles from the road, this trail splits. The right fork continues down the bank and then straight ahead to the summit of Mt. Webster (1.1 miles farther), and the left fork follows the stream to the summit of Mt. Jackson (1.3 miles). The two summits are one mile apart on the Webster Cliff Trail, but it is a much rougher mile than it appears on a map. This area can also be reached from US 302 by taking the Crawford Path east from a point directly opposite the AMC Crawford Notch Hostel (open to the public, see section on accommodations below). Take the Crawford Path 1.8 miles to its junction with the Mizpah Cut-Off. Turn right on the cutoff and continue to the junction with the Webster Cliff Trail. Turn right for Mt. Jackson or left for AMC Mizpah Spring Hut and Mt. Clinton. Spruce Grouse can be found on the cutoff, between the hut and Mt. Jackson, or between the two summits of Mt. Clinton. Beyond the summit of Mt. Clinton, the Webster Cliff Trail ends at the Crawford Path, which continues north to Mt. Washington. The Webster Cliff Trail and the Crawford Path above its junction with the Webster Cliff Trail are part of the Appalachian Trail and are marked with the AT white blaze. On the ridge itself, there is no water except at the hut and at a spring in the Clinton-Eisenhower col. Camping is restricted on the ridge and prohibited above timberline. There are tent platforms at Mizpah Hut, and the hut facilities are available to the public (see accommodations). See AMC Map #6, "Mt. Washington." This area has been described in the American Birding Association Bird-finding Guide, page NH-2, and by this author in 1981 (BOEM, 9:53-65).

Area 4: Nancy and Norcross Ponds. In this area, Spruce Grouse can be found anywhere from the top of Nancy Cascades to the outlet (west end) of Norcross Pond. The habitat is extensive, but reports of Spruce Grouse are few. This area is best known as one where (Northern) Three-toed Woodpeckers are occasionally found and where Black-backed (Three-toed) Woodpeckers, Rusty Blackbirds, and Boreal Chickadees nest. The trailhead for the Nancy Pond Trail is on the west side of US 302, 5.2 miles west of the blinking light in Bartlett or approximately 10 miles south (east) of the AMC Crawford Notch Hostel. It is 4.0 miles to the western end of Norcross Pond, and the hike up the Nancy Cascades is very steep. There are no campsites or shelters along the trail, but camping is generally permitted. If you do camp, please stay away from the trail and water sources, and be careful with waste. The trail is abundantly supplied with water but a word of caution: Nancy and Norcross Ponds are active beaver ponds. Beavers are known to carry an organism called Giardia lamblia which produces severe diarrhea and stomach cramps in humans (giardiasis). Any water that flows from these ponds (such as Nancy Brook) should be treated in order to be

absolutely sure that it is safe. See AMC Map #6, "Mt. Washington."

Area 5: The skewed T-shaped ridge that connects Zealand Mountain, Mt. Bond, South Twin, and the Garfield Ridge. This area and the Southern Presidentials are the largest of the accessible Spruce Grouse habitats in the White Mountains south of US 2. The habitat is not continuous along the ridge, however, and Spruce Grouse will be found only in the flatter areas in the Balsam Fir forest. Most sightings have been east of the summit of South Twin Mountain. Recent sightings west of South Twin have been near the summit of Galehead Mountain and on the Skookumchuck Trail just below its junction with the Garfield Ridge Trail (July 1984). This is not an easy area to reach and return from in a single day. Access can be had from US 302 by turning south into the WMNF Zealand Campground and continuing to the end of the road (about 7 miles). From the parking area, hike in to the AMC Zealand Falls Hut on the Zealand Trail (2.7 miles) and Twinway (0.2 mile from the end of the Zealand Trail to the hut). Continue on the Twinway. It is approximately 2 miles from the hut to the summit of Zealand Mountain, 3 miles to the northernmost summit of Mt. Guyot, 6 miles to the summit of South Twin, and 7 miles to AMC Galehead Hut. From Galehead Hut, continue on the Garfield Ridge Trail 6.0 miles to the junction with the Skookumchuck Trail, which enters from the west about three-quarters of a mile north of the summit of Mt. Lafayette. This ridge can be approached from US 3 via the North Twin Trail-North Twin Spur, the Gale River Trail (both of these require driving down forest roads - see the AMC map), or the Skookumchuck Trail. To approach from the Kancamagus Highway (NH 112), enter the Wilderness Trail (the trailhead is about 4 miles east of Lincoln at a huge parking lot), continue for 5 miles (be sure to turn right - east - at Franconia Brook Campground) to the Bondcliff Trail, and continue for another 6 miles to the northernmost summit of Mt. Guyot. On this route, Spruce Grouse can be found in the col between Mts. Bond and Guyot. Just beyond the summit of Mt. Guyot, the Twinway both enters from the right and continues straight ahead. Both the Twinway and the Garfield Ridge Trail are part of the Appalachian Trail and marked with the AT white blaze. Accommodations are available at the AMC Zealand Falls, Galehead, and Greenleaf huts (see below), and camping is permitted at Guyot and Garfield Ridge Campsites. Camping is restricted elsewhere along this stretch of the Appalachian Trail. The only water on this ridge is at the huts, the campsites, Zeacliff and Garfield ponds (both untested), and a spring near the junction of the Garfield Ridge Trail and the Franconia Brook Trail. See AMC Map #5, "Franconia Region."

Area 6: The ridge connecting the summits of Mt. Hancock and Mt. Carrigan. This entire area contains good Spruce Grouse habitat, but save for the trail connecting North and South

Hancock, there are no trails. Beyond the Hancocks, this trip requires heavy bushwhacking. To reach the Hancocks, take the Hancock Notch Trail from the lower end of the hairpin turn on the Kancamagus Highway (about eight and a half miles east of Lincoln). Continue on this trail for 1.8 miles to the junction with the Cedar Brook Trail. Turn left on the Cedar Brook Trail, and in 0.7 mile, the Hancock Loop Trail enters on the right. The entire loop is 4.5 miles. It does not matter in which direction one travels since the birds are found between the peaks. There are no maintained campsites along these trails, and above the Cedar Brook Trail, there is little or no water. See AMC Map #5, "Franconia Region."

Area 7: Mt. Tecumseh - between the peaks and on the broad west summit. This area can be reached from the Mt. Tecumseh Ski Area in the Waterville Valley or from Tripoli Road in Thornton Gap. The Mt. Tecumseh Trail leaves from the ski area parking lot and reaches the main (east) summit of Mt. Tecumseh in 2.2 miles. From here, hike over to the west summit. The birds have been found along this ridge. The other end of the Mt. Tecumseh Trail leaves the south side of Tripoli Road about midway between I-93 and Waterville Valley. It is most easily reached by leaving I-93 at Exit 31 (marked Tripoli Road) and looking for the trailhead on the right. From this direction it is 3.2 miles to the main summit of Mt. Tecumseh including the hike over the west summit. There are no campsites on this trail and no water save at Eastman Brook near Tripoli Road. If, as is apparently true, the Spruce Grouse population on Sandwich Mountain has been extirpated (Ridgely, 1983, BOEM 11:135), then the Tecumseh population represents the southernmost population of Spruce Grouse in eastern North America. See AMC Map #4, "Chocorua-Waterville."

Area 8: Mt. Osceola - between the peaks. This area can be reached from Tripoli Road, from the Kancamagus Highway, and from Waterville Valley. From I-93, exit at the Tripoli Road exit and drive for about seven miles to the trailhead of the Mt. Osceola Trail (on the left). From the trailhead, it is 3.6 miles to the main summit and another 0.6 mile to the East Peak. From the Kancamagus Highway, take the Greeley Ponds Trail (on the right about seven miles east of Lincoln where the road makes a sharp bend to the left) 1.7 miles south to the Mt. Osceola Trail. From here it 1.2 miles to the East Peak, but this part of the Osceola Trail is very steep. From Waterville Valley, take the Greeley Ponds Trail from Depot Camp on Livermore Road. Walk down the old truck road for about one mile, then continue on the trail for another 2.4 miles to the Mt. Osceola Trail. There are no campsites on this trail and above Greeley Ponds, no sure water. Greeley Ponds is a protected area, and camping is prohibited. In 1981, three (Northern) Three-toed Woodpeckers were found at Greeley Ponds. See AMC Map #4, "Chocorua-Waterville." This area has also been described in the ABA

Area 9: The east-west ridge from Mt. Trip pyramid to Mt. Paugus. There are numerous places at higher elevations along this ridge where Spruce Grouse habitat occurs. Spruce Grouse were observed on the summit of North Trip pyramid in April 1983 (New Hampshire Bird Records, 1984, 2:4). The habitat on the Rollins Ridge between Mts. Whiteface and Passaconaway also looks promising. My only encounter with a bobcat was at Camp Rich on Mt. Passaconaway just above this ridge. There is a myriad of trails allowing access to this region from both the north and the south. There are also campsites on Mts. Whiteface, Passaconaway, and Paugus. Consult the AMC guidebook and Map #4, "Chocorua-Waterville," for the trail of your choice.

Area 10. I have heard a single report of Spruce Grouse on North Moat Mountain in North Conway. The road directions to this area are rather complicated and anyone wishing to visit this site should check the AMC White Mountain Guide (1983), pages 270-271, for road and trail directions. The AMC Map #4, "Chocorua-Waterville," may be useful, but it does not show the whole trail. The USCGS "North Conway" topographic map may also be useful, although it is out-of-date.

Area 11: The Montalban Ridge. The birds have been found anywhere along the ridge from Stairs Mountain northward to the point where the trail begins to climb steeply in its ascent of Boott Spur. Mt. Resolution, immediately to the south of Stairs Mountain has suitable Spruce Grouse habitat and the birds should be looked for there. The trail along this ridge is the Davis Path and it may be approached from several directions. The Davis Path itself begins on U.S. 302 just north of the Inn Unique in Notchland at the southern end of Crawford Notch. There is a large parking lot on the east side of the road. From here it is about four miles to Stairs Col and about twelve miles to the ascent of Boott Spur. From Bartlett, one may ascend on the Mt. Langdon Trail [trailhead can be found by going north at the blinker, crossing the Saco River, turning left (west), and looking for the trailhead immediately on the right] to the Mt. Parker Trail, and the Mt. Parker Trail to the Davis Path. From here the distance to Stairs Col is about four miles and twelve miles to the ascent of Boott Spur. From Glen, one can go 1.8 miles west of Glen Station "and a short distance east of the bridge over the Saco River, and follow an old CCC camp road west about 0.3 mile past an old covered bridge to a new housing development." (AMC White Mountain Guide, p. 110). From here, take the Mt. Stanton Trail 5.5 miles to its junction with the Mt. Langdon Trail, the Mt. Langdon Trail 0.5 mile to the Mt. Parker Trail and then continue north on the Mt. Parker Trail as described above. From the trailhead to Stairs Col is about seven and a half miles, to the climb up Boott Spur, about fifteen and a half miles. From Glen one

may also go to a point one mile west of the junction of US 302 and NH 16 (just east of the bridge over the Rocky Branch and turn north on the Jericho Road. Continue to the end of the road (the last four miles are dirt). From here, take the Rocky Branch Trail 1.8 miles to the Stairs Col Trail. Take this trail 1.9 miles to Stairs Col and turn right on the Davis Path. It is another eight miles to the steep ascent of Boott Spur. One can also pick up the Rocky Branch Trail on NH 16 at a new parking lot a few hundred yards north of the Dana Place, about five miles north of Jackson. From here it is four miles to the Isolation Trail which should then be taken 2.5 miles to the Davis Path. From here it is best to turn south (left) along the ridge. As of the summer of 1984, shelters were available at Mt. Langdon, Mt. Resolution, Rocky Branch #1 and #2, and Dry River #3. However, this is a wilderness area and as those shelters fall into disrepair, they will be removed. If you plan to spend the night, check with the Forest Service as to their current status. On the ridge itself, water is available at a few springs and at all shelter sites. These tend to be several miles apart, however, so it is advisable to carry a canteen. See AMC Map #6, "Mt. Washington."

The author would appreciate hearing about any other confirmed reports of Spruce Grouse in the White Mountains.

Accommodations in the White Mountains.

There are numerous motels, hotels, and inns throughout the White Mountains region. These are usually full, however, and it is suggested that reservations be made in advance. There are a few private campgrounds in the area, but all are outside the national forest and are designed for recreational vehicles. The state of New Hampshire runs campgrounds at Lafayette Place in Franconia Notch State Park and at Dry River in Crawford Notch State Park. The Forest Service runs Dolly Copp Campground in Pinkham Notch, Zealand/Sugarloaf Campgrounds on US 302 west (north) of Crawford Notch, and numerous campgrounds along the Kancamagus Highway. All of these campgrounds operate on a first-come-first-served basis. A small fee is charged.

In the backcountry, the White Mountain National Forest and the Appalachian Mountain Club maintain several shelter and tent sites. Those with a caretaker require a fee and have limited capacity. If the shelter area is full, the hiker will be asked to camp elsewhere. These areas are available on a first-come-first-served basis. Certain backcountry areas are designated "Restricted Use Areas." Check with the forest service at any ranger headquarters, WMNF headquarters in Laconia, or with the AMC for current regulations. Camping is permitted anywhere else in the national forest, but it is recommended that people camp at least 200 feet from any trail or stream.

The Appalachian Mountain Club operates several facilities in the White Mountain region. Their North Country Headquarters is at Pinkham Notch Camp in Pinkham Notch on NH 16, eleven miles north of Glen. Guests are provided with full bedding, breakfast, and dinner. Lodging is in bunkrooms so expect to share with other people. Bathrooms and showers serve the entire floor but are not coed. In 1984, rates were \$25.75 per night with discounts for club members and children under ten. Advance reservations are essential. For reservations call (603) 466-2727. The hostel in Crawford Notch is also available but far more rustic. Guests are provided with a mattress and a pillow in a large dormitory-style room. There are three smaller bunkhouses available on a first-come-first-served basis. Food is not provided, but cooking facilities and utensils are available. There are no showers. In 1984, the rates were \$6.00 per night with a discount for club members. Reservations are usually not required on weekdays but are often necessary on weekends. For reservations, call the number given for Pinkham Notch.

The club also runs eight huts in the backcountry. These are rustic by urban standards but quite luxurious by backcountry standards. Guests are provided with a mattress, pillow, three blankets, breakfast and dinner. Bunkrooms are coed, but the bathrooms are not. There are no showers. Since bedding is provided, it is not necessary to carry a sleeping bag, but sheets might make for more comfortable sleeping. Reservations are essential; so call the number given for Pinkham Notch. In 1984, the cost was the same as for Pinkham Notch, but arrangements can be made so that one takes only one meal.

There are two final notes of caution that have appeared previously in this magazine but that should be repeated here. The first of these relates to the mountains. Most of the areas at higher elevations in the White Mountains are extremely fragile. The alpine plants that you see growing alongside the trail are especially adapted to withstand the desiccating winds, bitter cold, and the deep snow common at those elevations. They grow close to the ground with leaves that are leathery, fuzzy, or very small. Their root systems are adapted to anchor them in soils that are only a fraction of an inch thick. But in spite of all of this, they are not adapted to withstand human impact. The extremely rare Dwarf Cinquefoil (Potentilla robbinsiana) grows in soil so thin that even a minor disturbance will uproot the plant and kill it. Known areas of its growth have been surrounded by scree walls and posted by the forest service to keep humans out. A patch of Diapensia lapponica, which might be sixty years old, can be destroyed by a single footstep. In an alpine bog such as the quaking bog on Mt. Jackson, there is nothing underneath the plants but peat. Plants can be submerged into the peat with hand pressure. If you are crossing an alpine bog, please do not walk on it; stay on the

boardwalk and observe the damage caused by people who did not. Approximately 65,000 people hike in the Presidential Range every summer. If every one of those hikers wandered uncontrolled, the very environment that brought them into the mountains in the first place would soon be destroyed. Please stay on the trails! Should you happen to stray, stay on the rocks. In the White Mountains, both good birding and good hiking etiquette must be observed.

The second note of caution applies to you, the hiker. The signposts in the White Mountains caution that these mountains have the worst weather in America. This is not hyperbole. Treeline at 4000'-4500' as opposed to 9000'-11,000' in the west should attest to this sufficiently. Save for Antarctica, the White Mountains have the worst weather in the world. Winds on Mt. Washington are above hurricane force one-third of the time. The fastest surface wind ever recorded on earth blew across its summit at 231 miles per hour. This mountain has killed more people than any other mountain on earth. The combination of high winds, cold temperatures (even in summer), and sudden storms is fatal to the unprepared. Stay off exposed ridges in thunderstorms. Be sure that you are carrying plenty of extra clothing (including hat and mittens), preferably wool. Carry sturdy wind and rain gear, a first aid kit, extra food, extra water, a compass (and know how to use it), a map, and an AMC White Mountain Guide. Always let someone else know your itinerary and when you expect to return.

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In addition to the above references, recent studies have been done on western subspecies by Boag, Ellison, and Keppie; and William Robinson has published a monograph (1980) entitled Fool Hen: The Spruce Grouse on the Yellow Dog Plains, University of Wisconsin Press.

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ANOTHER CHECKLIST AVAILABLE

A new checklist, prepared by Ruth Ogden of the Tucson Audubon Society, is a handy, pocket-sized booklet of twenty pages. The Check-list of North American Birds, United States and Canada Including Hawaii includes 917 species arranged in the sequence of the A.O.U. Checklist, Sixth Edition, with the new common and scientific names given as well as orders and families. There is an index, and introduced birds are marked with an asterisk. Published in 1984, it can be purchased from The Audubon Nature Shop, Tucson Audubon Society, 30-A North Tucson Boulevard, Tucson, Arizona, 85716 for \$1.00.