

## White-tailed Ptarmigan (*Lagopus leucurcus*)

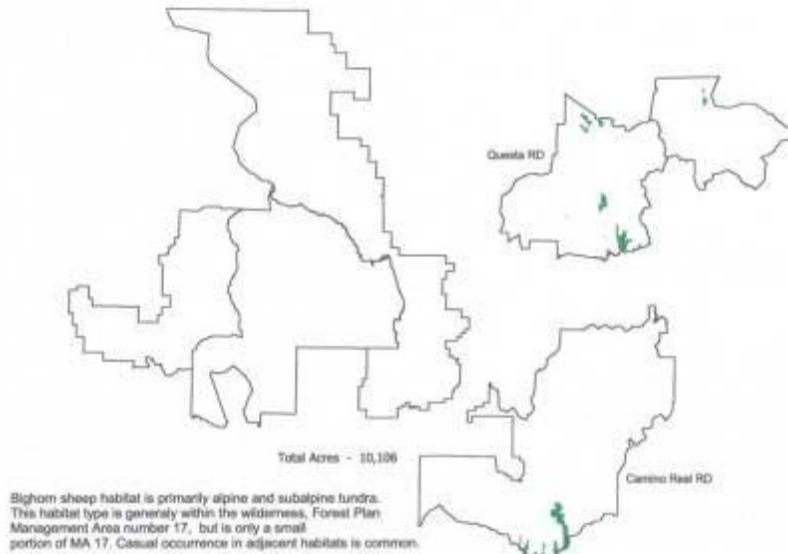
### Indicator Species Habitat

The white-tailed ptarmigan is an indicator species for the presence of alpine tundra and subalpine deciduous shrub (USDA 1986a, p.97). The white-tailed ptarmigan is the only ptarmigan confined to North America. Little is known about this avian species in New Mexico, for it lives on the windswept tundra, above 3350 meters (11,000 ft). Hens have been observed wintering as low as 2590 meters (8,500 ft). The presence of high elevation shrubby willows (*Salix* spp.) is likely the most important factor for successful overwintering of the species. Buds and twigs of various species of *Salix* provide the bulk of the food eaten by white-tailed ptarmigan. The shrubs should reach a minimum height of .5 meters. In areas where *Salix* is not readily available, alder catkins (*Alnus* spp.) become the dominant dietary component along with some needles of spruces, pines, and firs.

Habitat distribution should include TES units 340 and 341 on the Carson (USDA 1987). Key habitats include krummholz thickets and boggy meadows. Important willow species should include gray-leaf willow (*S. glauca*), and plane-leaf willow (*S. planifolia*). Also in the dwarf willow communities that occurs in tiny low mats on wet rocky habitats and can be easily overlooked are skyland willow (*S. petrophila*), arctic willow (*S. arctica*) and snow willow (*S. nivalis*)

Nesting habitat varies significantly. Some birds will use the cover of various shrubs and trees, while others will nest in the alpine meadows. After completing breeding activities in early July, most males and unsuccessful females move upslope from breeding areas to high, rocky and frequently exposed ridges. Feeding often occurs along the edges of melting snow packs. *Trifolium* and *Carex* are important forage during the summer months.

Winter ranges are at or near timberline and preferably consist of a willow-sedge (*Salix* spp. and *Carex* spp.) marsh, hairgrass (*Deschampsia*) meadow, sedge-grass (*Carex-Poa*) wet meadow and krummholz mosaic dominated by willow and dwarf Englemann spruce (*Picea engelmanni*) (Braun, et al. 1976). Summer ranges are those areas above timberline that ptarmigan move to in early July. Typically they are windswept ridges, with rocky 50% ground cover, with short grass-sedge meadows adjacent to late-lying snowfields (Braun 1971).



**Map 1. White-tailed Ptarmigan Potential Habitat Distribution on the Carson National Forest (USDA 1987)**

### **Management Activities or Natural Events That May Affect Habitat**

Negative: Loss of willow component, usually associated with domestic sheep grazing; use of tundra habitats by livestock, particularly sheep, and wilderness users (humans).

Positive: Fire use (prescribed natural fire); good grazing practices.

### **Plans, Regulations and Guidelines Supporting, Maintaining or Improving Habitat**

- *Carson National Forest Land and Resource Management Plan, Forest-wide Wildlife and Fish* requires that
- *Carson National Forest Land and Resource Management Plan – Management Area 9 (High Elevation Grassland)* says to “provide quality habitat for ptarmigan” and “willow is in the ptarmigan range and has a height of at least 0.5 meter.”
- *Wilderness Act* (1964) – Potential habitat for the ptarmigan is located entirely within the Pecos, Wheeler Peak and Latir Peak wilderness areas and the Columbine-Hondo Wilderness Study Area, and to some extent protection of ptarmigan habitat falls within the protections provided by the Wilderness Act.

### **Habitat Condition And Trend On The Carson National Forest**

This species is associated with the alpine tundra and subalpine deciduous shrub. The Carson Forest Plan EIS identifies 6,400 acres of occupied habitat (USDA 1986a, p. 97). It also states that habitats are marginal compared to areas further north in Colorado, and that localized extinctions of populations could occur when densities are low. No management actions have changed since the time of the Forest Plan to cause a change in the number of acres of available habitat on the Carson National Forest. The Terrestrial Ecosystem Survey data layer identifies that there are 10,106 acres of alpine tundra on the Forest (USDA 1987). This does not mean there is any change in the trend of available habitat, but is a result of a variation in habitat mapping.

Incidental observations show that portions of these habitats are still occupied. The most recent reports (photo verified) were in the Pecos Wilderness in 2002. **The overall habitat trend for the white-tailed ptarmigan on the Carson National Forest is stable.**

In New Mexico, the white-tailed ptarmigan exists only on the peaks of the Sangre de Cristo Mountains from the vicinity of Santa Fe northward to the Colorado border. This region includes the eastside of the Carson National Forest. The decline in ptarmigan numbers in New Mexico is due to many reasons. The use of tundra habitats by livestock, particularly sheep, and the increase use of wilderness areas by humans have had negative impacts on the species and its habitat.

Photos from as early as the 1920's indicate the alpine meadows in what is now the Pecos Wilderness were severely overgrazed. This condition is most likely the reason for the rare occurrence of the species today. Different behavioral patterns have been found to occur in areas of Colorado, which were intensively grazed by domestic livestock. When the upper ridges were heavily grazed there was no movement to these areas in the post-breeding season. Instead there was lateral or horizontal movement to rocky areas or movement downhill into rocky and wet places within the krummholz. Fall habitats are primarily the last places where snow has melted. Phenology of these areas is delayed because they are the last to become snow free in late summer, and consequently they are the only remaining source of green plants in the late fall (Braun 1979).

Clait E. Braun (former researcher for the Colorado Division of Wildlife) does not believe that grazing has had a negative effect on ptarmigan populations in Colorado (Braun 1979). His findings are that the movement pattern went from upslope in summer to lateral or down to find adequate forage. From his study there is no way to determine the extent of utilization or the duration of any severe utilization and how that would compare to the Pecos, Latir or Wheeler Peak wilderness areas. There is also the possibility that the rocky wet areas that are protected from grazing in his study may be more extensive in Colorado than in New Mexico. There is also a possibility the certain species of willow may have been more valuable and may not have persisted during the years of intensive grazing. Future studies may determine if the willow species found in Colorado are still present or to what abundance in historic habitats in New Mexico.

### **Carson National Forest**

In Braun's habitat evaluations of New Mexico, he was accompanied by several Forest Service personnel (Braun 1979). He concluded that the largest, continuous habitat in New Mexico for white-tailed ptarmigan is from Jicarita Peak to Pecos Baldy in the Pecos Wilderness. The best winter and breeding habitat in the state is from Jicarita Peak to Barbara Peak and back to the east. This was eventually a release site for this species in the Pecos Wilderness (see below).

Domestic sheep were removed from the Pecos Wilderness about 25 years ago. Today, cattle do not access the upper slopes, however they still graze the lower areas where *Salix* occurs. These *Salix* patches are in good condition and do not show signs of extensive use by livestock. The main competition for *Salix* on the upper slopes is from bighorn sheep, and to some extent elk. Although the ptarmigan and these species did naturally occur together, it is believed that the *Salix* has never effectively recovered from 75 years of heavy use prior to domestic sheep removal from the wilderness. The habitat condition and trend on the Carson National Forest for the white-tailed ptarmigan is generally poor and varies between a stable and downward trend.

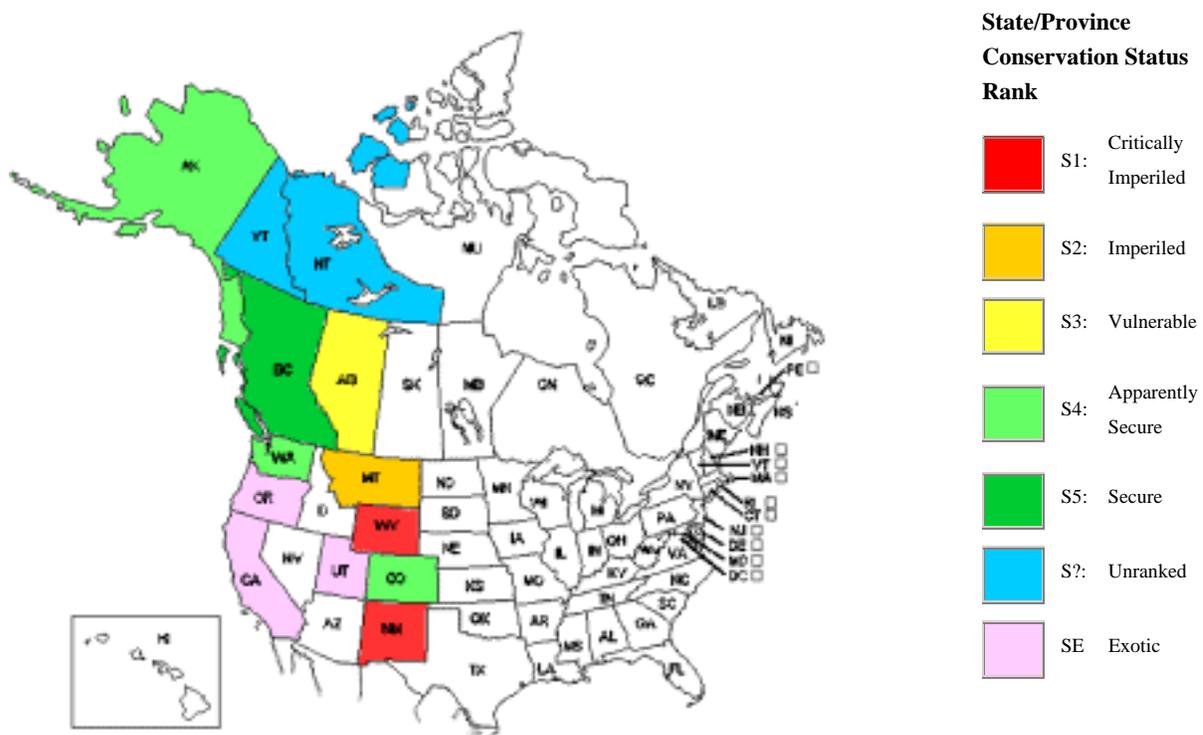
The presence of high elevation shrubby willows (*Salix* spp.) is likely the most important factor for successful over-wintering of white-tailed ptarmigan. Buds and twigs of various species of *Salix* provide the bulk of the food eaten by the species. Currently, combined rocky mountain bighorn sheep and elk forage utilization along specific areas of the alpine zone may be affecting recovery

of tall willow species needed for a minimum viable population of ptarmigan. Current willow populations needed for winter survival can only be found in a few spots of TES units 340 and 341 and comprises only than a "trace" of percent cover. Because of changes in livestock class from domestic sheep to cattle in all allotments that affect alpine habitats on the Carson National Forest, current livestock grazing utilization levels have no effect upon existing willow populations in areas where ptarmigan habitat occurs.

## **Population Trend And Viability**

The white-tailed ptarmigan is a resident of central Alaska, northern Yukon, southwestern Mackenzie, south to Kenai Peninsula; Vancouver Island, Canada, Cascade Mountains in Washington, and in the Rocky Mountains from British Columbia and Alberta south to northern New Mexico; introduced and established outside its native range in high central Sierra Nevada in California (Frederick and Gutierrez 1992); releases also have been made in the Willowa Mountains in Oregon, Pike's Peak in Colorado and Uintah Mountains in Utah. The ptarmigan is locally common over many parts of its range, but in New Mexico the species has become rare since the turn of the century. By the early 1900s, the white-tailed ptarmigan had become extremely rare throughout its New Mexico range and by the mid-1900s it was extirpated from the southern peaks and restricted to only a few peaks in the northernmost reaches of its former habitat. In Colorado the white-tailed ptarmigan is considered a fairly common game species and is regulated through hunting seasons. In New Mexico, however, the species is listed as endangered by the State and is protected.

The *NatureServe* database ([www.natureserve.org/explorer](http://www.natureserve.org/explorer)) documents that throughout its range, the white-tailed ptarmigan is listed as "G5", (i.e., globally secure and common, widespread and abundant) although it may be rare in parts of its range, particularly on the periphery (such as New Mexico). Reasons given for the G5 ranking are its large range and that it is common in many areas and there is no evidence of large-scale declines. It is not vulnerable in most of its range. Species with this rank typically occur in more than 100 localities, and there are more than 10,000 individuals. Within the United States, the white-tailed ptarmigan is listed as "N5" (i.e., secure and common, widespread, and abundant). In New Mexico, the species is listed as "S1" (i.e., critically imperiled). Ptarmigan are critically imperiled in New Mexico because of extreme rarity or other factor(s) such as very limited habitats, making it especially vulnerable to extirpation from the state. Typically this means only five or fewer occurrences or very few remaining individuals (<1,000) exist.



**Map 2. Distribution of White-tailed Ptarmigan in North America (NatureServe Explorer 2002)**

In 1979 Clait E. Braun conducted a literature search and habitat evaluations on white-tailed ptarmigan in New Mexico (Braun 1979). The following information is from his report: White-tailed ptarmigan were first collected in New Mexico sometime before 1866. The exact locations of these collections are unknown, but Bailey presumed the birds came from the Truchas Peaks. Other specimens were taken in the Wheeler Peak area and on Costilla Peak in 1904 (Bailey 1928). Ligon (1961) reported seeing ptarmigan on Wheeler Peak and Costilla Peak in 1926 and in 1952. Braun indicates that there were only four known specimens of white-tailed ptarmigan in museums in 1970. All were from north of Taos. Braun did observe the species as far south as the Pecos Baldy area in 1974. He does not agree with Bailey, and can find no data to suggest that ptarmigan were once common from Wheeler to the Colorado line.

In 1981, a successful reintroduction of the white-tailed ptarmigan was made in the Pecos Wilderness. The New Mexico Department of Game and Fish (NMDGF), along with the Colorado Division of Wildlife and the Forest Service, transplanted 43 birds into unoccupied habitat in the Truchas Peak area. Further sightings of adults and young show the reintroduction appears to have been successful, but precise data is lacking. Ptarmigans were reported to the NMDGF in only three of six years (1990-1995), but one report was of a 1993 nest near the transplant area (NMDGF 2001). The most recent Pecos sightings were of five individuals (photos provided) in August of 2002. These were located along the ridge between Horseshoe Lake and the East Fork of the Santa Barbara.

Ptarmigans are considered to be present only on Costilla, Latir, Wheeler, Truchas and associated peaks (Taos and adjacent counties). There are also unverified reports of sightings from the San Juan Mountains in Rio Arriba County. In addition to the areas listed above, the species was formerly reported in the Sangre de Cristo Mountains on Gold Hill, Santa Fe Baldy, Tesuque Peak

and Pecos Baldy. During the Rocky Mountain bighorn sheep study to determine population estimates in 1995, fresh ptarmigan sign was reported on top of East Pecos Baldy. Incidental observations show that portions of these habitats are still occupied. Since the severe winter of 1994 and 1995, no specific monitoring has been done to determine persistence of this population.

A viable population of ptarmigan should consist of at least 30 birds and have around 600 acres of critical winter range and at least 640 acres of summer range. **Actual population numbers and populations trends are unknown.** The fact that five birds were recently seen in the Pecos Wilderness provides some degree of confirmation that the species is surviving in an area where reintroductions took place in 1981.

As previously described, white-tailed ptarmigan habitat on the Carson NF is in poor condition, but with a stable trend. With little information on the species, its status and viability for the Carson National Forest are also unknown. Domestic sheep grazing has been eliminated in ptarmigan habitat that should eventually contribute to willow recovery, and subsequently an improved trend over time.

Management of existing bighorn populations should consider their impacts on *Salix*. A management strategy for improving and expanding willow habitat should be developed, and include a comparison study of the willow areas in Colorado where ptarmigan populations are healthy. Willow plantings in areas where recovery has been slow or negligible might also improve habitat conditions.

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