

## = White @-@ tailed ptarmigan =

The white @-@ tailed ptarmigan ( *Lagopus leucura* ) , also known as the snow quail , is the smallest bird in the grouse family . It is a permanent resident of high altitudes on or above the tree line and is native to Alaska and the mountainous parts of Canada and the western United States . It has also been introduced into the Sierra Nevada in California , the Willowa Mountains in Oregon and the Uinta Mountains in Utah . Its plumage is cryptic and varies at different times of the year . In the summer it is speckled in gray , brown and white whereas in winter it is wholly white . At all times of year the wings , belly and tail are white . The white @-@ tailed ptarmigan has a diet of buds , leaves , flowers and seeds . The nest is a simple depression in the ground in which up to 8 eggs are laid . After hatching , the chicks soon leave the nest . At first they eat insects but later move on to an adult diet , their mother using vocalisations to help them find suitable plant food . The population seems to be stable and the IUCN lists this species as being of " Least Concern " .

## = = Description = =

The white @-@ tailed ptarmigan is the smallest of the ptarmigans and the smallest bird in the grouse family . It is a stocky bird with rounded wings , square @-@ ended tail , small black beak and short legs with feathering extending to the toes . Adults are 11 @. @ 8 to 12 @. @ 2 inches ( 30 to 31 cm ) long , with the males being only slightly larger than the females . The average weight is 11 @. @ 6 to 16 @. @ 9 ounces ( 330 to 480 g ) . During the summer , the white @-@ tailed ptarmigan is a speckled grayish brown with white underparts , tail and wings . In the fall , the plumage has turned a much more reddish @-@ brown color and white feathers begin to grow through . By winter all the summer brown feathers are lost and the bird is completely white . A further molt in the spring precedes the breeding season and the bird returns to its summer plumage . The finely @-@ barred greyish coloration on the back makes it easy to distinguish this species from the much browner willow ptarmigan and rock ptarmigan . Both sexes maintain white tail and wing feathers all the year and males can be identified by their reddish eyecombs ( fleshy growths above the eye ) , also present year @-@ long . In general this bird is silent but it sometimes makes quiet , low @-@ pitched hoots and soft clucking noises .

## = = Distribution = =

The white @-@ tailed ptarmigan is an alpine species , a permanent resident of the high mountains above or near the timber line . It occupies open country and flies a great deal more than forest grouse , but still prefers running to flying . It ranges from Alaska and western Canada south to northern New Mexico . Males return from their wintering areas to establish territories on spruce @-@ willow timber line breeding grounds in April . Females arrive in early May and pairs are formed .

The white @-@ tailed ptarmigan is the only bird in North America to reside permanently in the alpine zone . Its habitat includes areas of boulders , krummholz , snowfields , rock slides , frost @-@ heaved soil and upland herbage . Even in winter it stays in high valleys and mountain slopes where alder , willow , birch and spruce poke through the snow cover .

The white @-@ tailed ptarmigan was introduced into the Sierra Nevada of California , Willowa Mountains in Oregon , and Uinta Mountains of Utah in the 1970s . It may have been native here during the early Pleistocene but became locally extinct due to climate changes with greater snow @-@ cover in spring impacting on its breeding season . Alternatively , it may have been unable to colonize the Sierra Nevada because of the barriers provided by the Columbia River and the Great Basin , and the low altitudes of the intervening South Cascades .

## = = Diet = =

This herbivorous bird 's diet varies seasonally . Nitrogen @-@ rich snow buttercup leaves are

avored in the spring season , while willow catkins , mountain avens flowers , and chickweed blooms , other flowers and leaves , lichens and berries form the majority of the ptarmigan 's diet in the summer . Once fall and winter arrive in the region , the ptarmigan feeds on pine needles , seeds , willow and alder buds and twigs . Winter food sources have a much higher cellulose content than does summer forage , so the ptarmigan relies on bacteria @-@ aided digestion in the cecum to extract essential nutrients . During the summer , the ptarmigan eats grit to assist in digesting plant material .

= = Breeding = =

White @-@ tailed ptarmigan males are usually monogamous and remain with the same mate for one breeding season . To attract females , a male will strut and display his tail feathers . The female builds a simple scrape nest on the ground , while the male acts as a sentry to guard the area . The nest is a shallow depression in a snow @-@ free area , generally protected from the wind and is softened with grasses and a few feathers . One side of the nest generally provides a quick escape route .

A clutch consists of two to eight eggs , which retain a cinnamon color for most of the incubation period , but develop brown spots when they are nearly ready to hatch . Males remain in the vicinity of the nest until the eggs hatch , a period of about 23 days . The precocial young leave the nest six to twelve hours after hatching . They are at first covered with down but become fully fledged in seven to ten days .

Ptarmigan chicks begin their lives eating insects . Once the chicks ' digestive tracts and ceca are more fully developed , their diets shift to one of flowers and leaves . Hens choose foraging patches where plant species containing proteins are abundant . The hens call their chicks to these plants , which are critical for the growth and development of the chicks . This suggests that the hens ' food calls assist in enhancing survival rates of juvenile ptarmigans . The young birds remain with their mother throughout the summer and autumn season .

= = Adaptations and status = =

The white @-@ tailed ptarmigan is well @-@ camouflaged when on the ground . In his pioneering 1909 book on the subject , Concealing @-@ Coloration in the Animal Kingdom , the American artist Abbott Thayer wrote :

There is perhaps no other bird which moults as gradually as the Ptarmigan , and this fact goes very far to strengthen the supposition that it has developed a peculiarly fluid and perfect system of perennial protective coloration . Figs . 8 , 9 , 10 and 39 show White @-@ tailed Ptarmigans , of the Rocky Mountains , in winter and transitional plumages ... Supremely beautiful and potent is the grass @-@ pattern of this same species in summer plumage ... This pattern ... is achieved by light @-@ brown marginal bands , with a few small internal spots , on the dark feathers of the upper parts ; the predominance of light and dark being gradually reversed as the lower breast is approached . The belly is entirely white , as are the quill feathers of the wings and tail .

The white @-@ tailed ptarmigan has feathers located on its feet to serve as protection from the extreme cold often experienced in the alpine tundra environment . In addition , these birds have feathers around their nostrils to warm the air prior to entry into the respiratory tract . The most obvious adaptation is this bird 's cryptic coloration , which enables it to blend in with its environment and avoid predation by golden eagles or other birds of prey . To conserve energy during the winter months , the ptarmigan avoids flight as much as possible and roosts in snowbanks .

The white @-@ tailed ptarmigan is listed as being of " Least Concern " by the International Union for Conservation of Nature . This is because , although populations may be in slight decline , its range is too wide and the total number of birds too large to fit the criteria for being listed as " Vulnerable " . This bird serves as an indicator species for the alpine tundra , and denotes overall ecosystem health . It is not a conservation concern and is abundant in alpine zones across North America , indicating that this region is not undergoing dramatic climatic , temperature , or

precipitation shifts . The lack of overgrazing by cattle , the lack of human development in alpine zones , the difficulty in accessing its remote habitat , the low densities at which it occurs and the laws regarding the limits to hunting bags allow the white @-@ tailed ptarmigan to thrive .

= = Taxonomy and etymology = =

The white @-@ tailed ptarmigan was given the scientific name Tetrao ( Lagopus ) leucurus by the Arctic explorer John Richardson in 1831 . It was later determined that Lagopus had sufficient distinguishing features to be regarded as a separate genus and the bird became Lagopus leucurus . Molecular studies have shown that Lagopus is monophyletic , with the rock ptarmigan ( Lagopus muta ) and White @-@ tailed ptarmigan being sister species . The position of the willow ptarmigan ( Lagopus lagopus ) is less clear cut , it showing some genetic divergence over its wide range .

The genus name Lagopus is derived from Ancient Greek lagos ( ????? ) , meaning " hare " , + pous ( ???? ) , " foot " , in reference to the bird 's feathered legs . The species name leucura was for a long time misspelt leucurus , in the erroneous belief that the ending of Lagopus denotes masculine gender . However , as the Ancient Greek term ????????? is of feminine gender , and the species name has to agree with that , the feminine leucura is correct . The species name leucura is derived from the Latinized version of the Greek leukos , meaning " white " and oura , meaning " tail " , in reference to the bird 's permanently white tail .