

## THE INTRODUCTION AND PRESENT STATUS OF CALIFORNIA QUAIL IN THE OKANAGAN VALLEY OF BRITISH COLUMBIA

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The distribution, habitat preference, abundance, and taxonomic status of California Quail (*Lophortyx californicus*) in central British Columbia have never been adequately described despite the importance of this quail there as a game species. Consequently a survey of the most extensive quail habitat in the interior, namely that in the Okanagan and Similkameen valleys, was conducted during the summer of 1963.

These valleys are unique in British Columbia, as the southern portions of each comprise the only representation of the Upper Sonoran Life-zone in the province (Brooks and Swarth, 1925). Detailed descriptions of the southern portion of the study area which has a distinctly desert quality and lies in the Osoyoos-Arid Biotic Area, as well as descriptions of the northern or Dry Forest Biotic Area, have been previously provided by Munro and Cowan (1947).

Specimens, notes, photographs, sight and sound records, and interviews with informed residents constitute the basis of the distributional account to follow. Information is presented on early introductions and on the subsequent spread of this exotic species. Evidence presented suggests that the distribution pattern, which was established early, is determined by aspects of climate, habitat, and patterns of land use.

### ACKNOWLEDGMENTS

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Dr. Ned K. Johnson of the Museum of Vertebrate Zoology kindly identified specimens of the racially mixed quail populations of this valley. My colleague Dr. D. A. Boag read the manuscript and offered helpful comments.

### TAXONOMIC STATUS

Racial identification of introduced California Quail have always been problematical due to the diverse origins of the original stock. Munro and Cowan (1947) report that specimens taken at Kelowna in 1932 were identified as *Lophortyx californicus brunnescens*, and one taken at Richter Pass in 1936 was identified as *L. c. californicus*. They also state that one collected at Okanagan Landing in 1942 was an intergrade between these two subspecies.

Two males (May 22, 4 mi. S, 3 mi. W Vernon and May 23, 2 mi. N Okanagan

Centre) and a female (May 26, Summerland) collected during this survey have been identified as *L. c. brunnescens*.

#### HISTORY OF COLONIZATION

Unless otherwise stated information on the early colonization of the Okanagan Valley is from the "Reports of Provincial Game Warden Commission, 1910-1956." The earliest record of introduction of California Quail in this valley is for 1912, when a few were liberated in the "Southern Okanagan" and they were reported to have done well. Strangely the first sight record of this species was made in 1911 by Mr. J. Fowle, who saw a male near Cossins Bay on the north end of Kalamalka Lake (fig. 1). The introduction of 1912 was an immediate success as reports indicate that by 1914 birds had "increased enormously" and in 1915 a short open season was allowed as the quail had by this time populated a 15-mile section in the Penticton region of the valley. Quail continued to spread and by 1920 were rapidly colonizing the cultivated areas around the shores of Okanagan Lake. By 1921 quail had reached Kelowna (Chichester, personal communication) and by 1923, according to Munro (unpublished field notes), they were "abundant from Naramata south." According to local residents quail were in the Okanagan Centre area in 1928. Munro further states that a "flock of 10 crossed the commonage road [south of Vernon] May 5, 1933—first time I have seen them this far north." Thus in the span of 21 years these game birds had completed their northward range extension of about 60 miles from their original release site.

The colonization of the valley to the south of Penticton is not as well documented but it is known that by 1928 quail were seen to the south of Oliver and by 1938 they were plentiful from Penticton to the United States boundary. Presumably birds also spread southward from the original release site and if they progressed at the rate of 2.4 miles per year, as the northward extension did, there would be ample opportunity for descendants of the released birds to cover the 34 miles to the border within the 26-year span. Nevertheless the possibility of quail moving northward from Washington, the hypothesis suggested by Munro and Cowan (1947), cannot be discounted.

The origin of the quail in the Similkameen Valley remains unclear, but by 1923 they were numerous enough there to warrant an open season.

#### PRESENT DISTRIBUTION

The general pattern of quail distribution in the Okanagan Valley was evidently established about 25 years following the first introduction and as can be seen from figure 1 these birds now occupy the bottomlands in a 95-mile strip adjacent to the several narrow lakes of this valley. Quail are definitely associated with orchards and irrigated areas and are rarely found above the 2000-foot contour line. Generally, irrigation is not practiced above this elevation and the habitat which is of the ponderosa pine-grassland type is not suitable to quail. The valley in its original primitive condition would have provided little quail habitat. Some original flora of the lowland benches may still be seen at the Experimental Farm at Summerland. Here these lowlands are either open stands of ponderosa pine (*Pinus ponderosa*) with a grassy understory or extensive treeless expanses of sagebrush (*Artemisia*), neither of which is good quail habitat. Where occasional brushy side canyons dissect these benches and on adjacent lands where the original flora has been replaced with orchards and irrigation systems, quail are abundant.

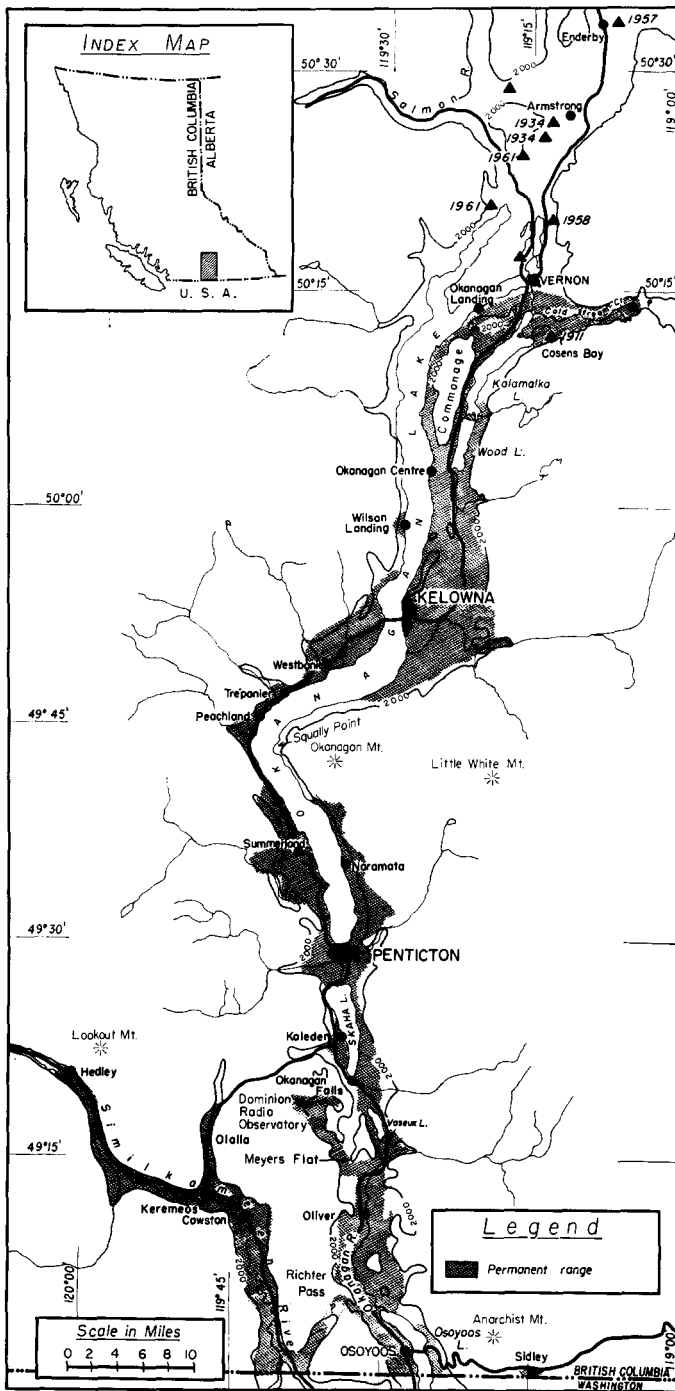


Fig. 1. Distribution of California Quail in the Okanagan and Similkameen valleys of British Columbia. Triangles indicate occasional occurrences.

Lowland areas adjacent to the lakes which do not harbor quail reflect various habitat deficiencies. The west shore of the northern half of Okanagan Lake as well as the east shore of Kalamalka Lake are very steep and coniferous cover extends to the water. The Squally Point region is steep, rocky, and dry and provides good habitat for Chukar Partridge and rattlesnakes but not for quail. The northeast shore of Osoyoos Lake is in the Indian reservation and has remained in its original condition, rocky and very dry, but it presumably would have become habitable to quail had irrigation been established. A limited area of original vegetation inhabited by quail is to be found on the height of land between Kalamalka and Okanagan lakes, locally known as the commonage. Here a few coveys occur in scattered thick stands composed of aspen (*Populus tremuloides*), rose (*Rosa*), Saskatoon berry (*Amelanchier*), and choke cherry (*Prunus virginiana*), but they do not occur in the coniferous stands here above 2000 feet.

Quail occupy areas away from the main valley in only two areas: in the Meyers Flat-Dominion Radio Observatory area northwest of Oliver, and in the Sidley area east of Osoyoos; the latter area is inhabited by a small, evidently disjunct, population.

The limiting factor preventing further lateral or altitudinal range extension is clearly related to local patterns of land use. The conversion of conifer stands, which fringe the valley floor, to irrigated orchards has created quail habitat where none existed previously. It seems that the establishment of such areas is now largely complete and at present irrigation is not practiced much above the 2000-foot level in this area.

The barrier to northward range extension is not dependent on human endeavor and appears to be a consequence of deficient natural habitat perhaps determined by some climatological factor. The vegetative cover changes abruptly as one travels north from Vernon. The south-facing slope of the Coldstream Valley is the last open grassy area seen. The conifer stands come to the creeks and lake shores northward from this point. Meteorological data from the Department of Agriculture (1962) used in constructing the climographs (fig. 2) clearly show that the weather is rather uniform throughout most of the Okanagan, but precipitation increases rapidly north of Vernon. The monthly mean temperature, surprisingly, increases slightly north of Vernon. Quail range, then, is correlated with a certain precipitation level. These birds do not occur in areas that receive more than 2.0 inches of precipitation during any winter month. They are restricted, at least in this valley, to areas that receive 15 inches or less of precipitation annually and to areas that receive less than 40 inches of precipitation per year as snow.

Quail are strictly ground feeders and lack structural or behavioral means of coping with thick snow cover, hence the amount of winter precipitation is probably immediately important to their survival. But it appears that the secondary effects of increased precipitation are more important in delineating the northern boundary of quail range through its effect on vegetation. In this valley the abrupt vegetational change north of Vernon effectively prohibits this species from extending its range to the north.

Cold temperature is probably not the factor responsible for delineating the northern range boundary, although it does act as a severe decimating factor even in good habitat during severe winters.

It is known that during very cold periods a large percentage of quail in local areas perish. Local residents south of Okanagan Landing state that when the temperature is around zero, 90 per cent or more of the birds of a local covey will freeze to death or

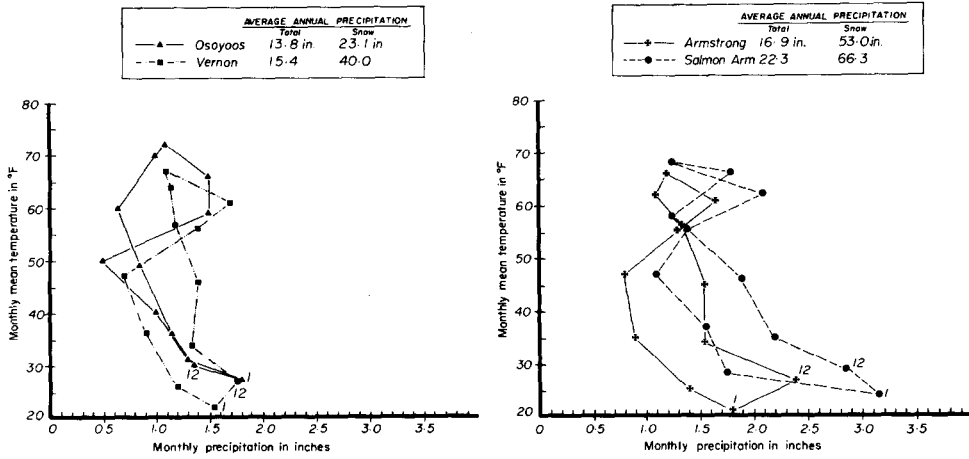


Fig. 2. Temperature-precipitation climographs for selected stations in the Okanagan Valley of British Columbia. Quail have been successful from Osoyoos to Vernon but have failed to colonize the valley from Armstrong to Salmon Arm. December and January are indicated by numerals on each climograph.

become so cold that they can be picked up by hand. If brought into a warmer area most of these birds recover fully in a short time.

EXTRALIMITAL RECORDS

Quail occasionally occur some distance from regularly occupied ranges. In the Similkameen Valley quail do not generally occur west of Hedley but there is a record of a single female observed by Mr. J. King (personal communication) in August of 1959 at Princeton, 20 miles distant from regularly inhabited range. In the northern area eight extralimital records are available and are indicated by triangles with dates on the range map. Most of these represent single birds and in no cases are coveys known to inhabit regularly any area to the north of Vernon. The northernmost record in this valley was provided by Mr. S. Sealey (personal communication) who saw a male in July, 1957, along the river immediately east of Enderby, a distance of 22 miles north of regularly inhabited range.

It is not an unreasonable assumption that these occasional sight records represent birds that have recently emigrated from established coveys within regularly occupied habitat. Movements of greater distances than these have been reported by Richardson (1941), who cites several instances of released banded quail being recovered from 20 to 31 miles distant and he also describes an extreme case of a 95-mile displacement.

POPULATION ESTIMATE

California Quail occupy a total area of 390 square miles or 249,600 acres in the Similkameen and Okanagan valleys. Assuming a density of one bird per acre, the area has a population of about 250,000 quail. The density figure per acre is not an unreasonable assumption as a population in central California studied for an eight-year period by Raitt and Genelly (1964) averaged almost exactly one bird per acre, and personal acquaintance with this area of central California indicates that the Okanagan Valley provides comparable or even better habitat for quail.

The authors cited have also shown that the removal of as high as 70 per cent of

the standing crop of quail will result in a population that is easily able to regain its former numbers by the following year. Data were also provided (Lewin, 1963) which show that intensive quail collecting in a restricted area has no deleterious effect on the general population. Quail quickly replenish their ranks both by reproduction and immigration from adjacent areas. Consequently it seems within reason to permit a harvest of around 175,000 quail per season in the Okanagan and Similkameen valleys. While biologically sound, a harvest of this proportion will never be achieved because of the proximity of good quail habitat to human activities. Orchardists are, understandably, reluctant to permit many hunters in their orchards in the fall.

#### SUMMARY

A survey of California Quail was conducted in the Okanagan and Similkameen valleys of south-central British Columbia during the summer of 1963. It was found that approximately 250,000 quail occur in an area of 390 square miles largely confined to a 95-mile-long strip of irrigated orchard land at elevations below 2000 feet from Vernon southward to the United States boundary.

Extralimital records indicate that quail are occasionally found as far as 22 miles from regularly inhabited range.

The history of colonization in this area following introductions is outlined. Quail were first liberated in the central area in 1912 and completed their northward range extension of 60 miles in 21 years. They also populated the southern end of the valley, a distance of 34 miles, within 26 years.

An analysis of the climate indicates that quail range is correlated with areas that receive no more than two inches of precipitation in any winter month and with areas that receive less than 40 inches of snow per year. Low temperature, while being a severe decimating factor at times, is thought not to be the barrier to northward range extension.

Deep snow is known to be a primary decimating factor for quail, but the importance of increase precipitation acting secondarily through vegetational change is clearly evident at the northern boundary of quail range in this valley.

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