

Committee  
on the Status  
of Endangered  
Wildlife  
in Canada

Comité sur le  
statut des espèces  
menacées  
de disparition  
au Canada

Ottawa, Ont. K1A 0H3  
(819) 997-4991

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**STATUS REPORT ON THE NUTTALL'S COTTONTAIL**

***SYLVILAGUS NUTTALLII NUTTALLII* AND *SYLVILAGUS NUTTALLII GRANGERI*  
IN CANADA**

BY

DAVE CARTER

AND

MARKUS MERKENS

STATUS ASSIGNED IN 1994  
BRITISH COLUMBIA POPULATION: VULNERABLE  
PRAIRIE POPULATION: NO DESIGNATION REQUIRED

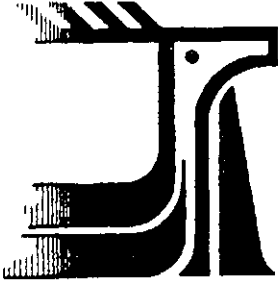
REASON: BRITISH COLUMBIA: LOCALIZED DISTRIBUTION, CONFINED  
TO NATIVE GRASSLANDS, HABITAT BEING LOST TO URBAN  
GROWTH  
PRAIRIE POPULATION: NO DESIGNATION REQUIRED

OCCURRENCE: BRITISH COLUMBIA, ALBERTA AND SASKATCHEWAN

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attribue un statut national aux espèces menacées de  
disparition au Canada.

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JUNE 1990

Ottawa, Ont. K1A 0B2 (819) 997-4991  
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**IN CANADA**

**BY**

**DAVE CARTER**  
**DEPARTMENT OF BIOLOGICAL SCIENCES**  
**SIMON FRASER UNIVERSITY**  
**BURNABY, BRITISH COLUMBIA**  
**V5A 1S6**

**AND**

**MARKUS MERKENS**  
**PAW RESEARCH SERVICES**  
**8463 12TH AVENUE**  
**BURNABY, BRITISH COLUMBIA**  
**V3N 2L8**

**STATUS ASSIGNED IN 1994**  
**BRITISH COLUMBIA POPULATION - VULNERABLE**  
**PRAIRIE POPULATION - NO DESIGNATION REQUIRED**

## A. ABSTRACT

Nuttall's cottontail, *Sylvilagus nuttallii*, is found throughout the intermountain and great plains region of western North America. Two distinct subspecies are found in Canada. One subspecies (*S. n. grangeri* or *pinetis*) can be found over much of southeastern Alberta and southwestern Saskatchewan and the second subspecies (*S. n. nuttallii*) is limited to the southern Okanagan and Similkameen valleys of British Columbia. Populations of Nuttall's cottontail in the prairie provinces are described as secure and stable in Alberta and Saskatchewan. British Columbia populations are reported to be low and somewhat vulnerable, but their distribution seems to have expanded during the last 20 years, suggesting that a stable or growing population exists. This report outlines the general biology and status of both sub-species in Canada. Major limiting factors of Nuttall's cottontail in Canada include the loss of habitat through expanding human settlement, increased agricultural land bases, modernized agricultural practices and grazing cattle. Other factors that may limit or reduce populations are competition with other species and loss of prime lowland habitat due to dam construction and flooding. Recommendations include identification and preservation of prime habitat and enhancement of disturbed habitat in British Columbia. Future research should examine habitat requirements and inventory populations in Alberta and Saskatchewan.

## B. DESCRIPTION

**Scientific Name:** *Sylvilagus nuttallii*

**Subspecies:** *S. n. nuttallii*, *S. n. grangeri*, *S. n. pinetis* (Chapman et al. 1975).

Diersing (1978) synonymized *grangeri* and *pinetis* as one race *S. n. pinetis*. In British Columbia the subspecies is *S. n. nuttalli* and in the prairie provinces the subspecies is *S. n. grangeri* or *pinetis*.

**Common Names** : Nuttall's cottontail, mountain cottontail

#### Black Hills cottontail

Nuttall's cottontail is medium to large in size (length 338-390 mm; weight 678-1,032 g). Coloration is pale grayish-brown above and white below. The upper shoulders and nape of neck are often bright buff. The tail is large (30-54 mm) with a grizzled top and white bottom and is usually carried so as to expose the white underside. The ears are short (54-65 mm) with rounded black tips and dense white fur inside. The hind legs are long and the hind feet are almost white in colour.

### C. DISTRIBUTION

#### North American

Nuttall's cottontail is found in the intermountain and great plains region of Western North America (Fig. 1). Its northern limit extends to just above the Canadian border (49th parallel) into British Columbia, Alberta and Saskatchewan. It can be found as far south as Arizona and New Mexico. Its east and west limits are approximately 108° longitude through the Great Plains and 123° longitude

along the eastern slopes of the Cascade-Sierra Nevada Range, respectively. It appears to be absent from the Selkirk Mountain Range and Rocky Mountain areas of British Columbia, Alberta, northern Idaho and north-western Montana. *S. n. nuttallii* can be found in the north-western area of the species range.

Chapman (1975) places *S. n. grangeri* in the Rocky Mountain, southern Sierra Nevada, and northern Great Plains areas, and *S. n. pinetis* in the south eastern area of the species range.

There have been a few changes in the distribution of this species in North America during the last century. The most important one is an extension of range to the north into British Columbia (Cowan and Hatter 1940) and into Alberta and Saskatchewan (Anderson, 1940). A reduction in range has been reported in North Dakota (Genoways and Jones, 1972). More recently, Chapman et al. (1982) suggested that the North American range of Nuttall's cottontail is stable outside of changes in North Dakota.

### Canadian

Two subspecies of Nuttall's cottontail are found in Canada (Fig. 2). Nuttall's cottontail inhabits the Okanagan and Similkameen valleys of south-central British Columbia (Carter et al 1993) (Fig. 3). Recent sightings now place the northern edge of their range within Okanagan Mountain Park, approximately 100 km north of the United States border (Dave Nagorsen, pers. comm.). It was first recorded in British Columbia in 1939 (Cowan and Hatter, 1940). The area was well surveyed prior to 1940 and the species was not present

at that time (Cowan and Hatter 1940). Range expansion may be related to a reduction in predator numbers or reduced competition. A reduction in numbers of white-tailed jackrabbits (*Lepus townsendii*) has occurred in the south Okanagan during the last 50 years which may have reduced competition for Nuttall's cottontails in the area. MacCracken and Hansen (1982) reported that the abundance of black-tailed jackrabbits and Nuttall's cottontails were inversely related and that they have similar winter diets (71% overlap), and may compete for food during the winter. It is also possible that Nuttall's cottontails inhabited British Columbia previously and that the northern limit of their range shifts depending on variation in long-term climatic conditions. Fossil evidence has not been examined to confirm or refute this possibility, but grassland habitats in British Columbia probably were more extensive in the past (Hebda 1982). Although, the range of Nuttall's cottontails in the province is larger than the distribution previously reported by Cowan and Guiguet (1966), this is probably the results of more intensive and systematic surveys conducted in the past ten years. The species is presently occupying all of the suitable habitat in the Similkameen and Okanagan valleys and is unlikely to expand its range.

*S. n. grangeri* or *pinetis* can be found in both Alberta and Saskatchewan where it is limited to southern regions. Nuttall's cottontail has enlarged its distribution in the prairies during the last century. It was first reported in southwestern Saskatchewan in either 1909 (Banfield 1974) or in 1900 (Diersing 1978). In 1990, it was common in southwestern Saskatchewan and southeastern

Alberta (Hugh Smith, pers. comm.). Smith (1993) published the most recent account of its range in Alberta and reported that Nuttall's cottontail is relatively common in areas of suitable habitat (Fig 4.). He specifically mentioned the Milk River valley and Writing-on-Stone Provincial Park as areas where they are common. In Saskatchewan, Nuttall's cottontail is reported to be common in the southwest corner of the province and its distribution is not thought to have changed in recent years (David Baron, pers. comm.). But published information regarding its distribution and abundance is lacking for this province and no census has been conducted.

#### **D. PROTECTION**

In British Columbia Nuttall's cottontail is considered vulnerable (Carter et al. 1993). It was placed on the provincial "Blue List" and is protected as wildlife under SBC 57 1982 and has been since 1966 under the previous act.

Saskatchewan and Alberta have no legislated protection for this species.

#### **POPULATION SIZE AND TREND**

There is very little information available about past abundances of Nuttall's cottontails in British Columbia. Long-time local residents and naturalists believe that Nuttall's cottontails have never been abundant in the south Okanagan (Carter et al 1993). From the information available, there appears to be no apparent reduction in their abundance that would be outside the normal variation of a



cottontail population. The staff of the Agriculture Canada Research Station at Summerland report the abundance of Nuttall's cottontails at that location to have increased recently to the point where they are now causing considerable damage to gardens at the station (G. Houg, pers. comm.). However, the available information indicates a stable population of Nuttall's cottontails in the rest of the south Okanagan.

Hugh Smith (pers. comm.) reports that populations of Nuttall's cottontails are stable in Alberta, but indicates that no work has recently been completed in the province.

According to David Baron (pers. comm.), no recent work on populations in Saskatchewan has been conducted. He was unable to make any inference as to what the current population trend is, but Dale Hjertaas (pers. comm.) suggested that the populations are stable and secure.

## **F. HABITAT**

### **Description**

Nuttall's cottontail inhabits thick sagebrush stands on ridges and slopes and can be found in dry washes below sage covered slopes (Dice, 1926; Orr, 1940; Ingles, 1965; Chapman, 1975; McKay and Verts, 1978b; Sullivan et al. 1989). In southern areas, it may also frequent conifer forests (Zevelof, 1988). It is generally found between 1200m and 2700m in elevation over much of its range. In British Columbia Nuttall's cottontail was found to occur below 700m in elevation (Carter et al. 1993). Two components vital to Nuttall's cottontail habitat are cover (e.g.

vegetation, rocks, debris) and sufficient food within cover areas or in close proximity to them. Sullivan et al. (1989) suggested that sagebrush habitat with at least 30% vegetative cover is critical for *S. nuttallii*. Forage in the form of grasses or other succulent vegetation must be sufficient in quantity to foster juvenile survival in the spring and summer, and in the form of forbs and woody plants in the winter to promote over winter survival (Chapman, 1975; MacCracken and Hansen, 1984). In British Columbia, Nuttall's cottontails were reported to be more abundant around rocky outcrops where they could use crevices as nest sites. They were also found to use areas under man made structures such as agricultural sheds and barns as nest sites (Carter et al. 1993).

#### **Distribution (Canadian)**

Habitat for this species is limited to southern portions of British Columbia, Alberta and Saskatchewan. In British Columbia, critical sagebrush dominated habitat is more or less limited to the Okanagan and Similkameen valleys. Nuttall's cottontails have been found as far north as Okanagan Mountain Park in the Okanagan valley (approximately 100 km north of the United States border) and 13 km north of Keremeos in the Similkameen Valley (Carter et al. 1993; Dave Nagorsen, per. comm.).

The shrubby bottom lands of southeastern Alberta and southwestern Saskatchewan provide suitable habitat. These areas form a network of coulees interspersed by large areas of agricultural land. During the last century, range

expansions to the north and east in these two provinces may have been due to agricultural practices. The suppression of fires and planting of shelter belts may provide food and cover for Nuttall's cottontails (Savage 1981).

### **Habitat Change**

#### ***British Columbia***

In British Columbia Nuttall's cottontails only inhabit the south Okanagan area of the province. This area comprises approximately 1,700 square kilometers, or, 0.2 percent of the area of the province. Presently less than 10 percent of the south Okanagan land area is in an undisturbed natural condition (Redpath, 1990). Of the undisturbed area in the south Okanagan, only 20% is grass or shrubland indicating that less than 2% of the area is undisturbed habitat for Nuttall's cottontail. The quality and quantity of natural habitat in the south Okanagan have been greatly reduced primarily through agricultural activities. Orchard and forage production and expansion have effectively removed large tracks of available habitat. In early years, growers would select orchard sites by how high and thick the sage would grow in an area, resulting in the removal of prime habitat areas for cottontails. Cattle grazing on open rangeland also affects habitat quality by removing much of the forage and cover available to cottontails. MacCracken and Hansen (1992) found dietary overlap of grazing cattle and Nuttall's cottontail to be substantial (more than 50%). Overall, there has been a huge reduction in the quantity and quality of suitable habitat for the Nuttall's cottontail in the last four decades. No substantial expansions of orchards,

cropland or rangeland has occurred recently in the south Okanagan. Urban growth however, is occurring at a fast pace and along with increased human population pressure to develop the remaining unprotected areas of natural habitat will increase. Between 1958 and 1981 land used for residential and general development increased from 4% to 15% in the Okanagan (Kerr et al. 1985).

### *Alberta*

No information regarding rates and amounts of habitat change was available for Alberta.

### *Saskatchewan*

Some habitats are being lost in Saskatchewan. Agricultural encroachment and flooding in some reservoirs seems to be removing land from cottontail habitat (D. Hjertaas, pers. comm.). No quantitative estimates on the rate of habitat loss or change are available.

### **Protection of Habitat**

A system of Ecoreserves and Provincial Parks exist in the south Okanagan and effectively remove land from agricultural use but these areas are small and highly fragmented. There are 21 protected areas in the south Okanagan of British Columbia (Hlady 1990). Four contain sagebrush/antelope-brush habitat suitable for Nuttall's cottontails. They are all small protected areas: the Vaseux-Bighorn National Wildlife Area (792 ha), Ecological Reserve 33 Field's Lease (4 ha), Ecological Reserve 100 Hayne's (101 ha) and the Nature Trust of British

Columbia lands at Vaseux Lake (210 ha). Nuttall's cottontails were seen in the Vaseux-Bighorn National Wildlife area in October 1990. Nuttall's cottontails also use Ecological Reserve 100, the Vaseux Lake Migratory Bird Sanctuary (282 ha) and the Osoyoos Oxbows Management Reserve (262 ha) (Hlady 1990). Recent reports indicate that Nuttall's cottontails also inhabits Okanagan Mountain Park (10,460 ha). However, Nuttall's is restricted to a small region of benchland in the extreme southern portion of the park.

The area of preferred sagebrush habitat currently protected in the south Okanagan (less than 1000 ha) is distributed in a number of small isolated patches. Sullivan et al. (1989) reported abundances of between 22.5 to 42.5 Nuttall's cottontails per 100 ha of sagebrush habitat in British Columbia. Assuming these densities are at ecological carrying capacity, the areas currently protected could support between 225 and 425 animals if they were interconnected by habitat corridors. Habitat outside of protected areas however, is on private land, crown grazing land, or Indian Reserve lands. No means other than acquisition seems to be appropriate for critical habitat protection, although enhancement of lesser habitat and habitat corridors is an option.

The level and adequacy of habitat protection in Saskatchewan and Alberta is not known. Nuttall's cottontails are reported to use Provincial Park land in Alberta (Smith 1986). In Saskatchewan, large areas of grassland habitat are protected by the Wildlife Protection Habitat Act. Grassland National Park also supports significant areas of Nuttall's habitat.

## G. GENERAL BIOLOGY

### Reproductive Capacity

The reproductive capacity of Nuttall's cottontail is very high. Patterns of reproduction conform to an "r"-strategy; producing many young per female per year. Density is regulated primarily through mortality and dispersal. Thus, exposure, predation and escape are essential features in understanding habitat relations. The breeding season varies depending on location, but usually spans the warmer months of spring and summer (see Carter et al., 1993 for summary). Females may breed within their first year (6.7% of juvenile females bred in one study (Powers and Verts, 1971)). The majority breed in their second and subsequent years. Juvenile or young of year reproductive activity has not been reported for male *S. nuttallii*, although other species of the same genus exhibit it (Chapman et al., 1982).

Various numbers for yearly litter production have been reported, ranging from 1 to 5 (Dice, 1926; Bailey, 1936; Orr, 1940; Cowan and Guiget, 1966). Although this species is more solitary than others of the same genus, breeding within local populations is synchronous (Powers and Verts, 1971; McKay and Verts 1978a) and ovulation is induced as with other species of *Sylvilagus* (Chapman et al., 1982). Breeding is also continuous, that is, conception usually follows after parturition of the previous litter (as cited in Chapman et al., 1982). This suggests that number of litters per year is limited by length of breeding season and gestation period. Gestation period has been reported to be 28-30 days

(Cowan and Guiget, 1956). Length of breeding season is limited by the length of the growing season of vegetation in the habitat occupied by a population and thus tends to be longer in more southern locations.

Litter size is quite variable, mean values from 2 to 6.6 young per litter have been reported (Dice, 1926; Davis, 1939; Orr, 1940; Hall, 1946; Jansen, 1946; Hall, 1951; Cowan and Guiget, 1966). Litter size is a function of number of ova shed, number of embryos implanted and number of embryos resorbed. These factors may be controlled by physiological processes mediated by habitat (forage) quality (McKay and Verts, 1978; Verts et al., 1984).

A fetal and adult sex ratio of 1 male : 1.05 females and 1 male : 1.18 females, respectively, was found for populations in Oregon (Powers and Verts, 1971). Neither of these ratios differed significantly from 1:1. Sullivan et al. (1989) found ratios ranging from 1:5.25 to 1.33:1 males to females in an Okanagan populations, but these figures were based on a very small sample size. The breeding system of cottontails is polygamous, and therefore a prevalence of females should not restrict population growth. Population age structure is reported to be variable temporally and spatially depending on habitat condition and juvenile survival (Chapman et al., 1982).

Population productivity for Nuttall's cottontail can be very high. In central Oregon, Powers and Verts (1971) reported that adult females had 4-5 litters during the breeding season and could produce 17-22 young per year. The number of litters and numbers of young may be lower in Canada due to shorter breeding

seasons. But the growth potential of this species is still high. Current reproductive rates for Nuttall's cottontails in the prairies are not available. In British Columbia a conservative estimate of 4 young per female per year is estimated (Carter et al. 1993).

### **Species Movements**

In fall and winter, cottontails often have a dispersing cohort (probably juveniles) (Chapman et al., 1982). Mass migrations have not been reported; however, populations of rabbits, including both jackrabbits, *Lepus californicus*, and cottontails, occurred in clumped distributions during winters after their annual population decline in southeastern Idaho (Knick, 1990). Although this species appears to be more solitary than others of the same genus, it may concentrate in prime areas (Chapman, 1975). The winter concentrations described by Knick (1990) were probably in prime winter habitat areas which provide adequate winter forage and cover. Concealment cover in winter is very important because Nuttall's cottontail do not moult into a lighter winter form, but rather remain a dull grayish brown colour throughout the year.

### **Cover/Food**

As mentioned, cover is an important feature of Nuttall's cottontail habitat. Both thermal and security cover are necessary year-round. Sullivan et al. (1989) Estimated that 30% shrubby vegetative cover was required. Proximity to rocky outcrops or other forms of structure that can be use for nest sites may be an element of preferred habitats.



This species may be considered as a generalist herbivore. Distinct seasonal patterns in forage selection have been reported (McCracken and Hansen, 1984; Verts et al., 1984). In spring and summer, grasses make up the majority of their diet whereas in winter, the majority consists of shrubs. Verts et al. (1984) suspected that Nuttall's cottontails change their diets in response to succulence of plant species as summer droughts progress. Early in the growing season, when grasses are succulent they make up the majority of the diet. As succulence decreases, forbs become more important. If a summer drought is interrupted by rain, then diets shift to include grasses again. This plastic behaviour is consistent with the reported generalist tendencies of the species.

#### **Mortality Factors**

Natural predators of this cottontail include bobcats, coyotes, foxes, several species of hawks and owls and the rattlesnake. Although it has been considered a peripheral prey species in areas where population numbers are low, Knick (1990) found that it was an important food source for bobcats during a jackrabbit, *L. californicus*, decline in southeastern Idaho.

Summer forage quality is suspected to affect natality and survival of young, especially in drought years. McKay and Verts (1978) found that drought induced maturation and desiccation of forage plants reduced natality of cottontails, possibly through curtailment of breeding or embryo resorption. They also suspected that drought was responsible for reduction in juvenile survival, especially those born in late season litters. It appears that succulent vegetation is

important, as much to supply food as water, during early development of juveniles particularly after gaining independence from maternal care.

During years of high natality and juvenile summer survival, population reduction in fall and winter have been associated with periods of extreme temperatures ( McKay and Verts 1978a). In Oregon 80% of Nuttall's cottontails surviving until 25 November disappeared during December 1972 when temperatures were as low as  $-32^{\circ}\text{C}$  (McKay and Verts, 1978a). Losses during this time were attributed to increasing snow depths and exposure.

#### **Adaptability/Behaviour**

Although this species is reported to be a generalist herbivore, it does have some specific habitat requirements. An abundance of escape cover interspersed within a grassland-type community seems to be important for this species. The escape cover may consist of a dense shrub layer, riparian thickets, forest litter and debris, rocky areas or burrows of other animals. The cover is also needed for resting and nest sites. These nests may be found in abandoned burrows of other species, natural crevices in rocks, under man made structures or depressions in the ground. Members of this species will not excavate their own burrows and therefore are limited by sites available.

Little has been reported on specific behaviours of the Nuttall's cottontail, although three very distinct behaviours have been described. The first of these is their rather elaborate "aerial" courtship behaviour (see Streubel, 1989 for description). Another distinct behaviour is their fright response. When

confronted by a predator or human, individuals will sprint away for a short distance (10-15 m) and remain motionless, often within cover, and allow their cryptic coloration to hide them. A more peculiar behaviour is that of "tree climbing". This arboreal activity is apparently linked to water acquisition, "either by licking droplets from the tips of boughs or ingesting 'waterlogged' foliage" (Verts et al., 1984). It is suspected that this behaviour has allowed the Nuttall's cottontail to adapt to the less hospitable regions along the western limit of its range.

#### H. LIMITING FACTORS

Habitat loss through urbanization and agriculture, environmental contamination and species competition all have the potential to cause a decline of this species. Although agriculture may have led to further expansion of this species' range into the prairie provinces, changes in levels and methods of agriculture may be reducing suitable habitat now occupied. Increased requirements for drinking water and hydro-electric power also consume habitat through construction of dams and lowland flooding. In addition, intensive use of chemical pesticides associated with agriculture may also adversely affect cottontail populations, both in the prairies and the Okanagan and Similkameen valleys. Species competition has also been identified as a factor reducing the range of the Nuttall's cottontail. Genoways and Jones (1972) suggested that the eastern cottontail, *Sylvilagus floridanus*, has displaced the Nuttall's cottontail in areas of

southwestern North Dakota. Given that *S. floridanus* inhabits southeastern Saskatchewan, any range expansion of it there may reduce the range of *S. nuttallii*. This concern was also raised by Sullivan et al. (1989) for populations in British Columbia. But this is unlikely as the ranges of the two species do not overlap in the province and are unlikely to in the future. Competition from snowshoe hares (*Lepus americanus*) is a possibility, but snowshoe hares tend to be very rare in habitats suitable for Nuttall's cottontails (Smith 1993). As mentioned previously competition from white-tailed jackrabbits is possible, but only in the prairie provinces as white-tailed jackrabbits have been extirpated from British Columbia.

## I. SPECIAL SIGNIFICANCE OF THE SPECIES

Nuttall's cottontail is not considered threatened in North America (Chapman et al. 1982). The bulk of its range occurs in the United States where its abundance and distribution is considered stable. Nuttall's cottontail is reported to be common throughout much of its range in the prairie provinces (H. Smith, per. comm.). In British Columbia, the distribution of Nuttall's cottontail is restricted to the south Okanagan, the northern limit of its range west of the Rocky Mountains. Thus, the survival of the species does not hinge on Canadian populations.

The degree of public interest about Nuttall's cottontail is moderate to low (Carter et al. 1993). This is likely because Nuttall's cottontails are nocturnal and

tend to remain in areas of thick cover thus reducing how many people see them. The scarcity of Nuttall's cottontail in British Columbia negates any positive or negative economic value they might have either as a game species or pest. In the prairie provinces the higher number of Nuttall's cottontail may increase its value as a game species along with increasing the possibility of it being a pest to agriculture.

Cottontails in general are not considered threatened in North America. The only species of cottontail rabbit that is considered threatened in North America is the New England cottontail (*Sylvilagus transitionalis*) (Chapman et al. 1982).

## **J. RECOMMENDATIONS/MANAGEMENT OPTIONS**

### ***Sylvilagus nuttallii nuttallii***

This subspecies exists only in the Okanagan and Similkameen valleys of British Columbia and its distribution is quite limited. Thus, the protection of existing sagebrush habitat in the south Okanagan is of primary importance. Every attempt should be made to protect critical habitat along the United States border so the British Columbia population does not become separated from populations in Washington State. Promotion of habitat regeneration may be achieved by removing suitable areas from access to cattle grazing or by attempting to regulate the intensity of cattle grazing in areas of suitable habitat. No estimate of time necessary to regenerate an area to prime condition is available. However,

reduction of summer forage consumption by cattle would likely promote juvenile survival in these areas.

A public education program would assist in the preservation of this subspecies in Canada. This subspecies of cottontail is no substantial threat to agriculture at this time and therefore should not be controlled. Growers in the area should be encouraged not to control this species. Also, increased public awareness about the status of the species would likely increase the amount of information available regarding the distribution and abundance of Nuttall's cottontails in the south Okanagan.

Further research should be directed toward studying various aspects of this species' biology in the Canadian area of its range. A thorough study of population dynamics could determine the major causes of mortality. Lack of succulent forage in summer and extreme temperatures in winter have been suggested as possible factors. Examination of habitat requirements may help to identify areas that will provide succulent forage throughout summer and thermal cover necessary for winter survival. Incorporation of these findings into management plans would assist in the promotion of more substantial and secure populations.

*Sylvilagus nuttallii grangeri* (or *pinetis*)

Little is known of the population and habitat status of this subspecies in Alberta and Saskatchewan. Both provinces seem to have stable populations. Given that the majority of land within the range of Nuttall's cottontail in Alberta

and Saskatchewan is under intensive agricultural use and some land is being lost to water reservoirs, the remaining areas should be inventoried to ensure that adequate habitat reserves exist. Another concern is the possible range reduction of Nuttall's cottontail in southeast Saskatchewan through competition with *S. floridanus*. Given the predicted trend of climatic change, this may be more of a problem than currently accepted.

## K. EVALUATION

### *S. n. grangeri* or *pinetis*

Government and other officials of both Alberta and Saskatchewan indicate that populations of Nuttall's cottontails are secure in both provinces (Table 1). Thus, no designation is required for prairie populations. But information about their current abundance and distribution needs to be gathered to support this conclusion.

### *S. n. nuttallii*

Nuttall's cottontails may be scarce but they are not threatened in British Columbia. Their numbers seem to be fairly stable (Carter et al. 1993). They should, however, be designated as vulnerable due to their limited distribution and the extremely limited amount of undisturbed sagebrush habitat present (Table 1). Increasing levels of development and urbanization in the south Okanagan presently threaten the remaining areas of unprotected Nuttall's cottontail habitat.

## L. ACKNOWLEDGMENTS

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J.A. Chapman  
Appalachian Environmental Laboratory  
Centre for Environmental and Estuarine Studies  
University of Maryland  
Frostburg, Maryland

B.J. Verts  
Department of Fisheries and Wildlife  
Oregon State University  
Corvallis, Oregon

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TABLE 1. Summary of Species Information for Nuttall's cottontail in British Columbia, Alberta and Saskatchewan.

PROVINCE	BRITISH COLUMBIA	ALBERTA	SASKACHEWAN
SUBSPECIES	<i>S.n.nuttallii</i>	<i>S.n.grangeri</i>	<i>S.n.grangeri</i>
RECENT CHANGES IN RANGE	stable	no change	no change
PROTECTION POPULATION TREND	protected stable	no protection stable	no protection stable
HABITAT quantity	low	no estimate available	some habitat being lost
quality	stable-low	no estimate available	altered by flooding otherwise stable?
Rate of Change	rapid urbanization	no estimate available	no estimate available
Protection	small ecoreserves Provincial Parkland	Provincial Parkland	Provincial Parkland
LIMITING FACTORS	habitat loss rangeland use for grazing and agriculture	habitat loss?	habitat loss competition <i>S.floridanus</i> ?
RECOMMENDATIONS	study population dynamics habitat requirements	inventory habitat and populations	inventory habitat and populations study possible competition with <i>S.floridanus</i>

**MANAGEMENT**

preserve current  
prime habitat  
protect lesser  
habitat from  
grazing to allow  
habitat regen.

**DESIGNATION**

vulnerable

none

none

Fig. 1. Distribution of Nuttall's cottontails in North America : 1, *S. n. nuttallii*; 2, *S. n. grangeri*; 3, *S. n. pinetis* (from Chapman 1975).

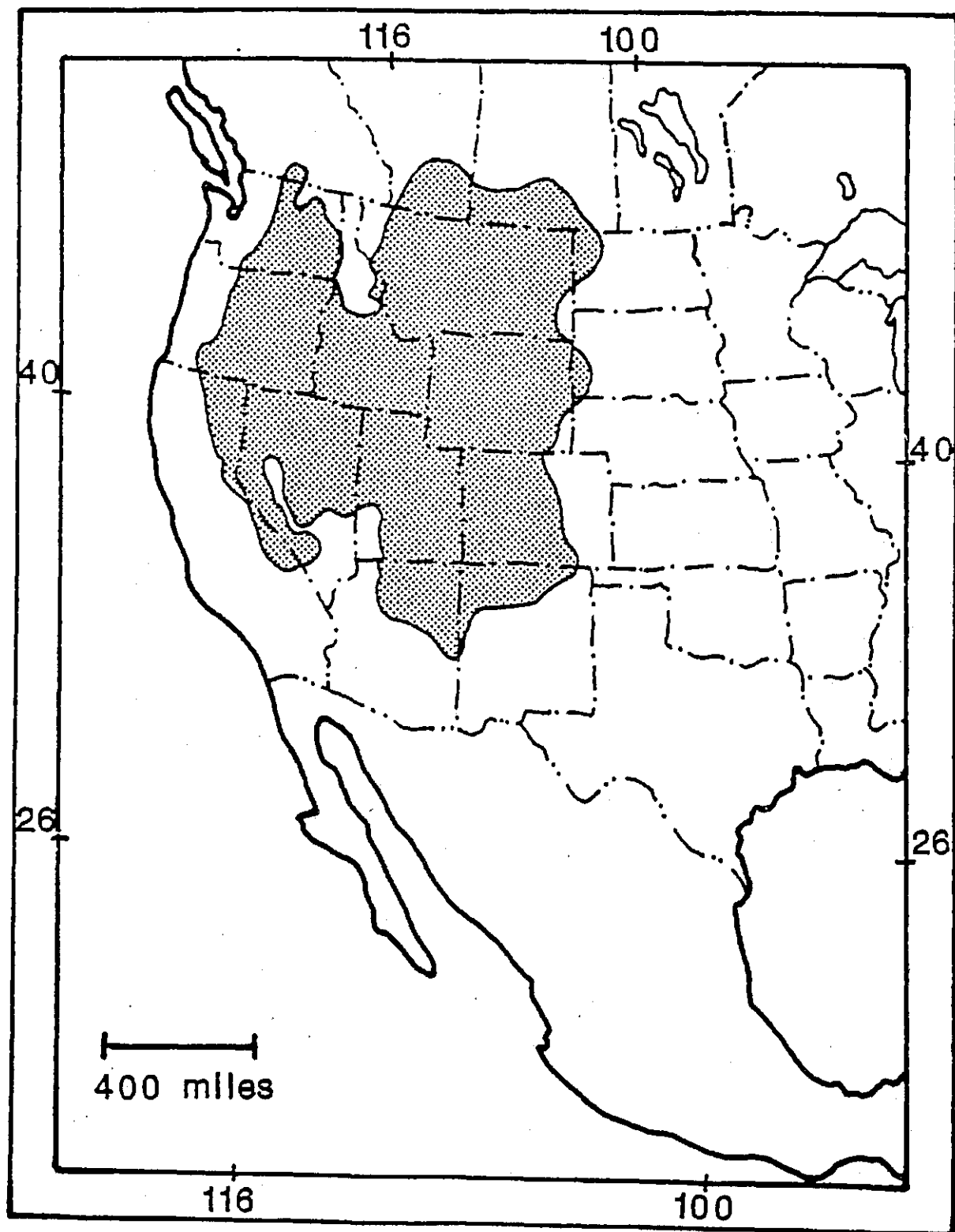


Fig. 2. Distribution of Nuttall's cottontail in Canada: 1, *S. n. nuttallii*; 2, *S. n. grangeri*. (from Banfield 1974).

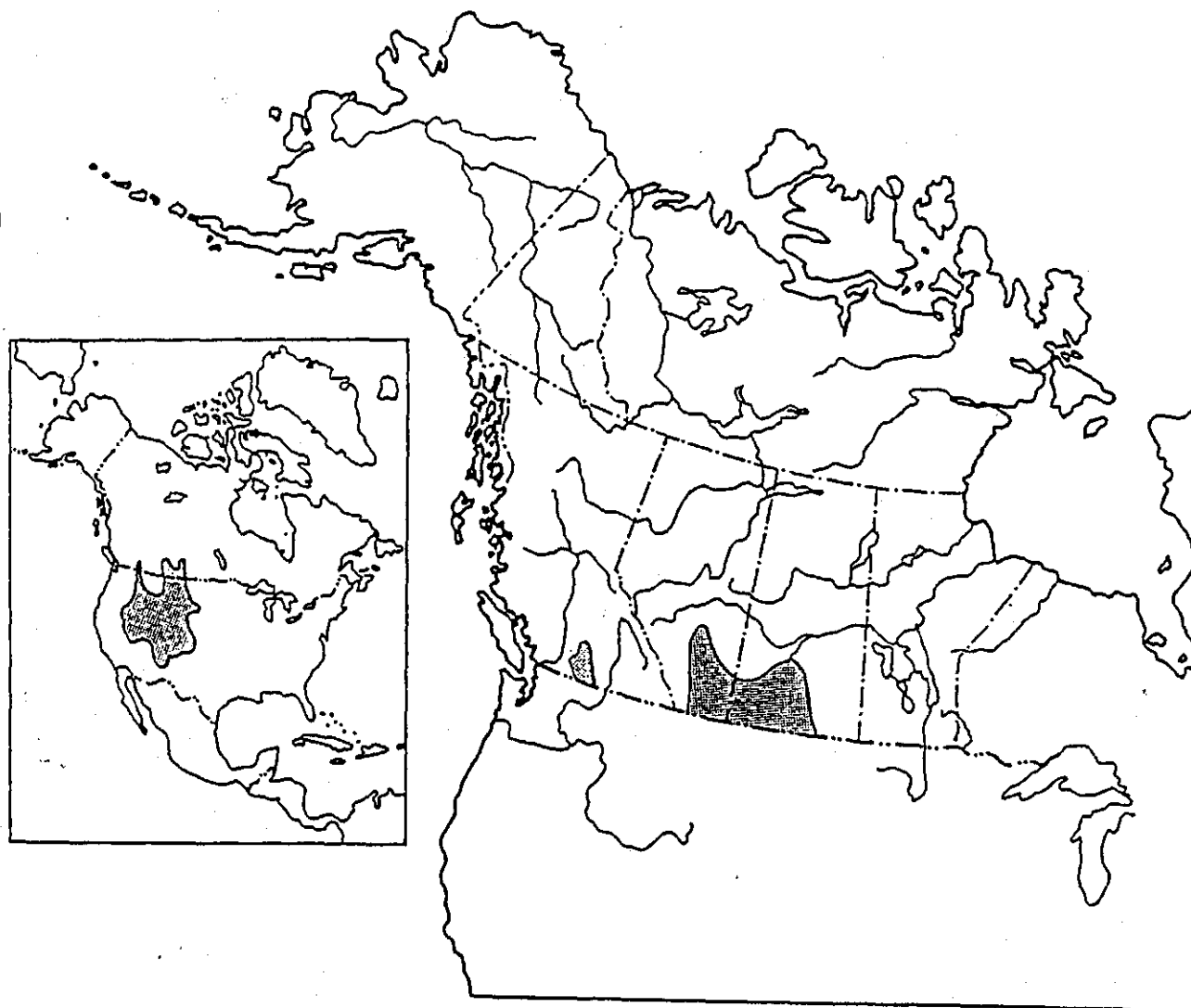




Fig. 3. Distribution of Nuttall's cottontails in British Columbia estimated in 1990 from museum records, sightings and pellet transects (from Carter et al. 1993).

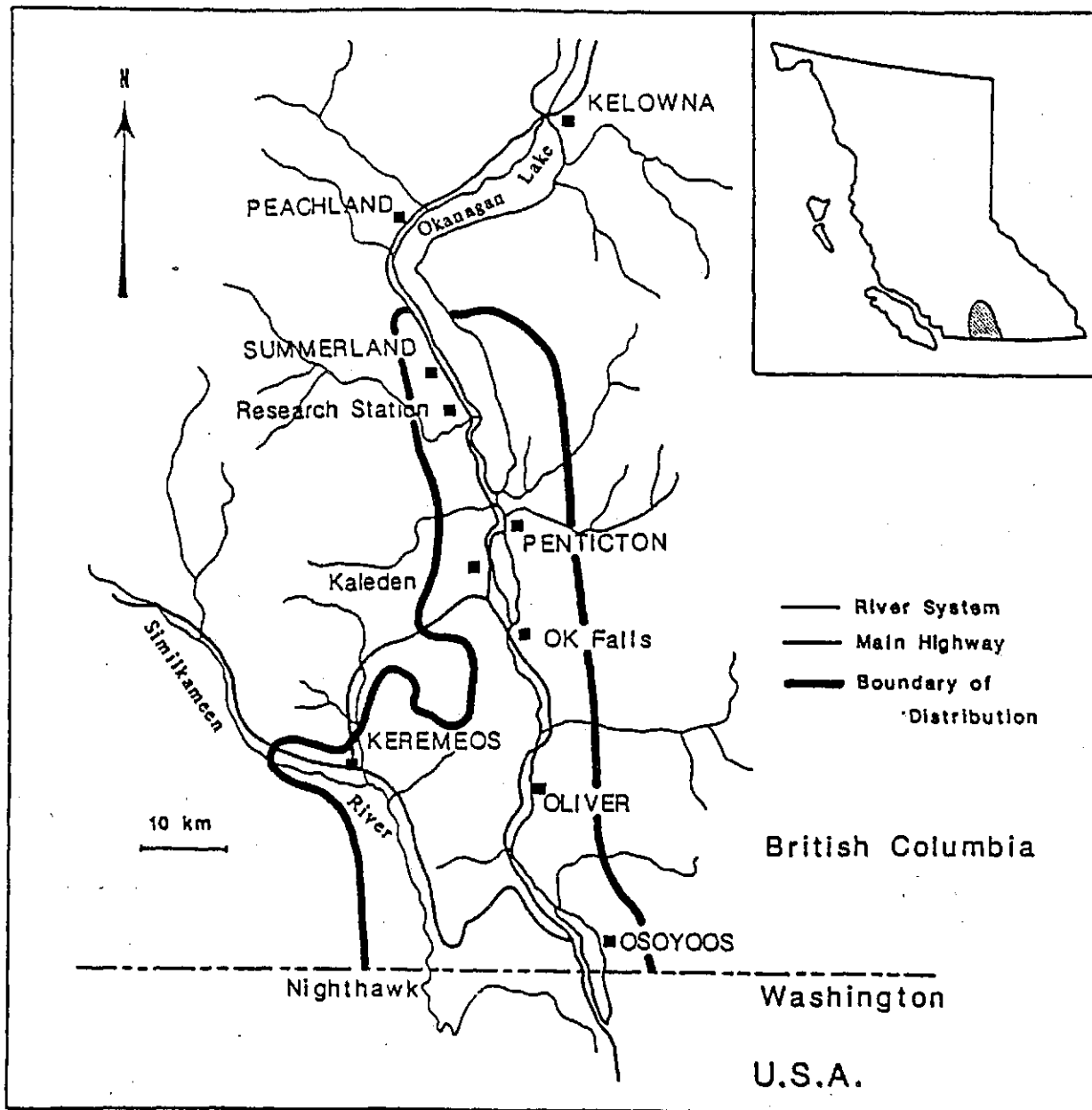


Fig. 4. Distribution of Nuttall's cottontails in Alberta (from Smith 1993).

