Habitat Use by Nuttall's Cottontails (*Sylvilagus nuttallii nuttallii*) at their Northern Range Edge (British Columbia, Canada)

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Herdman, Emily J., and Karen E. Hodges. 2017. Habitat use by Nuttall's Cottontails (*Sylvilagus nuttallii nuttallii)* at their northern range edge (British Columbia, Canada). Canadian Field-Naturalist 131(2): 133–140. https://doi.org/10.22621/cfn.v131i2.1827

In Canada, Nuttall's Cottontails (*Sylvilagus nuttallii nuttallii)* occur in southcentral British Columbia (BC), where they are federally listed as a species of Special Concern due to their presumed small populations and limited distribution in fragmented habitats. Their habitat use and movement patterns are poorly known at this northern edge of their distribution. We used live-trapping, radio-collaring, and fecal pellet surveys to examine Nuttall's Cottontails' use of remaining patches of native habitat as well as use of human-impacted areas. Cottontails were present in low densities and only about half of presumably suitable patches of native sagebrush-steppe were occupied. Cottontails were more likely to occur in shrubby habitat, but at a fine scale cottontails used areas that had a lower density of shrubs and finer substrates. Movement patterns differed significantly between areas of varying habitat quality, with longer movements in natural habitat. One radio-collared male cottontail used anthropogenic habitats adjacent to native habitat; this use corresponds with landowner reports. However, it is not clear whether Nuttall's Cottontails are able to use anthropogenically-impacted areas to maintain populations or in areas where such habitats are not near native habitats. Our results suggest that these animals are rare and occur primarily in remnant patches of shrub-steppe within BC.

Key Words: Nuttall's Cottontail; movement; pellet survey; fragmentation; peripheral population; sagebrush-steppe

Introduction

Nuttall's Cottontail, *Sylvilagus nuttallii nuttallii* (Bachman), is a species of shrub-steppe habitats of the North American Great Basin ecosystems that extend from southern British Columbia, Canada south to Utah, Nevada, and California, USA. In southern British Columbia (BC), Nuttall's Cottontails arrived and spread into the Okanagan and Similkameen valleys in the 1930s and 1940s, at the same time as White-tailed Jackrabbits (*Lepus townsendii*) were being extirpated from this region (Cowan and Hatter 1940; Sullivan *et al*. 1989; Carter *et al.* 1993; Nagorsen 2005). The Nuttall's Cottontail has expanded its BC range to include known areas of appropriate habitat since their first sighting in 1939, moving as far north as Keremeos and Okanagan Mountain Provincial Park (Carter *et al*. 1993; Nagorsen 2005). These cottontails are at the periphery of their northern range; the species is more common in the United States, with the range reaching as far south as Arizona and New Mexico (Chapman 1975). Nuttall's Cottontails can be locally abundant in parts of the USA range (McKay and Verts 1978a,b; Verts *et al.* 1984) and they are legally harvested in Washington and Idaho, adjacent to their Canadian range (WDFW 2015; IFG 2016).

Lagomorphs are significant prey in several ecosystems, including shrub-steppe habitats. In southern BC, Nuttall's Cottontails are likely prey for Coyotes (*Canis latrans*), Great Horned Owls (*Bubo virginianus*), Red-tailed Hawks (*Buteo jamaicensis*), Golden Eagles (*Aquila chrysaetos*), Badgers (*Taxidea taxus*), and Bobcats (*Lynx rufus*; COSEWIC 2006). Nuttall's Cottontails are not known to cause significant damage to agricultural crops in the Okanagan and Similkameen valleys where they are found in BC (Sullivan *et al*. 1989), but their use of crops may vary with the availability of natural food.

The BC population of Nuttall's Cottontails is listed as Special Concern under Canada's *Species at Risk Act* (SARA Registry 2017). Despite limited knowledge of their ecology and demography, this listing is based on presumed low numbers in a limited range, and the continued conversion of sagebrush-steppe habitat for agricultural and urban development (COSEWIC 2006). This rabbit species is under-studied, particularly in comparison to other closely-related leporid species. Nuttall's Cottontails are most commonly found in shrub-steppe habitats with Antelope-brush (*Purshia tridentata* (Pursh) DC.) and Big Sagebrush (*Artemisia tridentata* Nutt.; McKay and Verts 1978a; COSEWIC 2006). In BC, shrub cover is a strong predictor of cottontail occupancy (Sullivan *et al.* 1989). Nuttall's Cottontails prefer habitats with refuges in the form of rocky outcrops, where they can escape from predators (Powers and Verts 1971; Johnson and Hansen 1979). In the south Okanagan Valley, Nuttall's Cottontails are predicted to occur in shrubland and grassland habitats below 700 m elevation (Carter *et al.* 1993; COSEWIC 2006). Habitat use by Nuttall's Cottontails shows significant variation across their range. At the extreme southern extent of their range, in New Mexico, Nuttall's Cottontails move into higher elevations and use conifer-

ous forests; their habitat use is expanded enough that they may overlap with Snowshoe Hares (*Lepus americanus*; Frey and Malaney 2006; Malaney and Frey 2006).

The majority of research into Nuttall's Cottontail has occurred in the USA, raising questions about the extent to which cottontails in their northern range periphery use habitats in the same ways as more southern populations, or are subject to unique habitats and climatic conditions. Here, we address a knowledge gap about northern populations by surveying areas containing suspected high-quality habitats, as well as areas of atypical habitat but with previous sightings or other records. Our goals were to assess relative abundance and to characterize habitat features at two scales that predicted presence or absence of Nuttall's Cottontails.

Methods

Surveys for cottontails

Our pellet surveys took place in the south Okanagan and Similkameen valleys, BC (49.400°N, 119.669°W), from May to November in 2007 and 2008. The valleys occur in an area of ecosystem abutment; they contain forested habitats common to more northerly areas and those from the Great Basin ecosystems to the south. We surveyed areas predicted to be suitable Nuttall's Cottontail habitat based on past sightings and a literature review, resulting in three main habitat types being surveyed: grasslands (n = 19), habitats dominated by Antelope-brush (n = 8), and sagebrush shrubland (n = 12). We further restricted our sites to those below 700 m, as this is the elevation where forest begins to dominate and Snowshoe Hares become more common (Carter *et al.* 1993). Based on these restrictions, Geographic Information System (GIS) maps with habitat overlays were used to choose 33 sites distributed across the area suspected to contain Nuttall's Cottontails in the south Okanagan and Similkameen regions (Figure 1). In addition, six of the seven live-trapping sites described below were surveyed for pellets; we did not conduct pellet plots at the Naramata live-trapping site as plots had already been completed at a nearby location

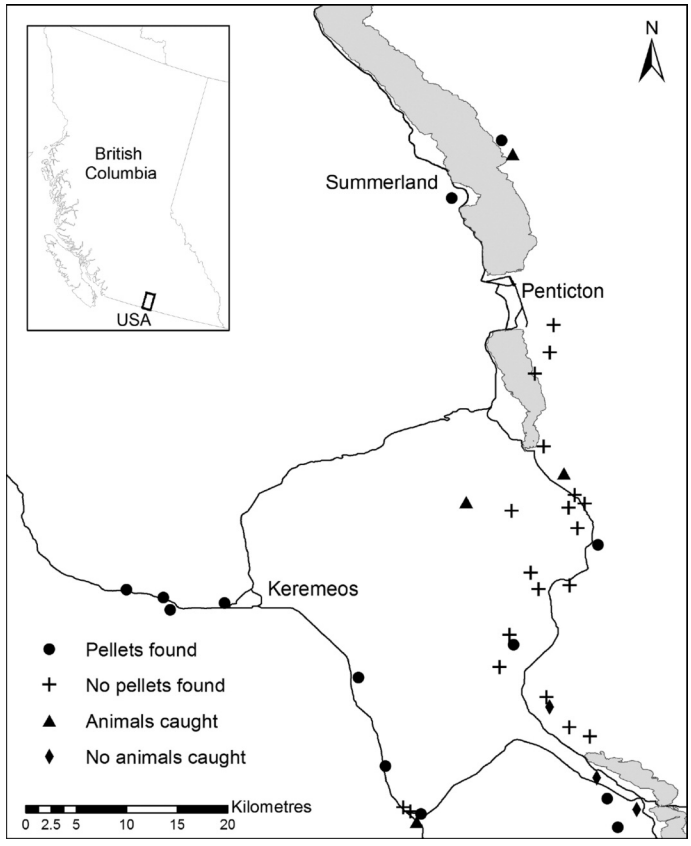

FIGURE 1. Map of south-central British Columbia (Okanagan Valley) showing sampled locations with and without documented presence of Nuttall's Cottontails (*Sylvilagus nuttallii nuttallii)* in 2007–2008. Dots indicate locations of Nuttall's Cottontail fecal pellets. Crosses were surveyed for pellets but none were found. Diamonds indicate sites that were trapped but where no animals were caught. Triangles indicate sites where Nuttall's Cottontails were captured. Six of seven trapped sites also had pellet surveys with pellets found; the seventh trapped site had pellets on a nearby site.

with natural habitat. At each location, we surveyed within a 31.5 ha rectangle (150 × 210 m). Many patches of natural vegetation in the study area are small and irregularly shaped as a result of agricultural and urban development, and these rectangles fit within these patches better than squares would have. The dominant agricultural crops in the region are tree fruits (cherries, apples, peaches, etc.) and wine grapes.

We used fecal pellet counts as a method to survey presence and relative abundance of Nuttall's Cottontails (following Krebs *et al.* 1987, 2001 for Snowshoe Hares). We surveyed 50 transects within each site, with starting points randomly selected in GIS prior to the fieldwork. In the field, we navigated with a handheld Global Positioning System receiver (eTrex, Garmin International Inc., Olathe, Kansas, USA) to the assigned point. At each point, the pellet plot was delineated using a nail placed at the point anchoring a string stretched due true north for 305 cm. Intact pellets were counted if at least half of the pellet was found within 2.55 cm on either side of the string. This produced a pellet plot of the dimensions recommended for lagomorphs (Krebs *et al.* 1987; BC Environment 1998). Pellets were counted only if they were intact and medium to dark brown. We are confident pellet counts represented recent (about one year) or current occupation of a site by cottontails; we had no sites that had only degraded or whitened pellets, so this decision rule did not lead to excluding evidence of cottontail presence. Because our sites were all in non-forested habitats, i.e., habitats that Snowshoe Hares would not use, all pellets were assumed to belong to Nuttall's Cottontails.

At each site, we surveyed vegetation at a pre-determined and randomized subset of 25 of the 50 pellet count locations. We characterized shrub cover to species; shrubs were defined as woody vegetation with multiple stems 50–200 cm tall. We estimated the percentage ground cover in the following categories: grasses, forbs, cactus, biological soil crust (including lichens and mosses), shrubs, dead wood, litter (dead leaves, needles, forbs), rocks (greater than 25 cm in diameter), cobble (5 cm to 25 cm in diameter), pebbles (2 mm to 5 cm in diameter), and fine substrate (less than 2 mm in diameter). These variables were comprehensive in characterizing ground cover in our study areas.

Live-trapping and radio-telemetry

During 2007–2008, we live-trapped for rabbits at seven pellet locations within the Okanagan Valley (Table 1, Figure 1). These sites were predicted to support Nuttall's Cottontail populations on the basis of habitat and elevation. At all but one location, > 48 traps were deployed in a grid with 30 m spacing between traps. The grid dimensions varied among locations because of the irregular shapes of habitat patches. At the Osoyoos Golf Course, we deployed 30 traps along a line because of limits in the amount and distribution of natural habitat adjacent to the course. We used collapsible live traps (Model 205, Tomahawk Live Trap, Hazelhurst, Wisconsin, USA) baited with alfalfa and apples or carrots and covered traps with wood or tarpaper to protect animals from sun or precipitation. Traps were set in the evening and checked within an hour of sunrise. Trapped animals were aged (juveniles versus adults, based on size), sexed (scrotal testes or engorged nipples or via everting the genitals to assess morphology), ear-tagged (Self-piercing Ear Tag 1005-4, National Band & Tag Company, Newport, Kentucky, USA), and weighed. Trapping was conducted at every site for at least six nights.

We radio-collared adult cottontails at the Osoyoos Desert Centre (three males, one female) and Osoyoos Golf Course (one male, two females). We used 16 g collars (less than 2.8% body mass; SOM-2380, Wildlife Materials Inc., Murphysboro, Illinois, USA). Each radio-collared animal was followed hourly from 1900–0700 h for a mean of eight nights (range 2–13). We attempted to avoid driving animal movement by remaining greater than 5 m away, using red lights, remaining

TABLE 1. Summary of live-trapping for Nuttall's Cottontails (*Sylvilagus nuttallii nuttallii)* in the south Okanagan Valley, BC. The numbers of traps per site varied because of differences in habitat areas and configurations.

Location	Trapping dates	Total trap nights	# traps	# individuals	# captures	Average pellets/plot	Habitat type
Osoyoos Desert Centre	May, July–Aug, Oct–Nov 2007 and Jan, Apr, Jul 2008	2760	72	34	124	22.31	Antelope-brush shrubland
Osoyoos Golf Course	Aug–Sept, Nov 2007 and Jan, Jul 2008	780	30	19	51	8.34	Antelope-brush shrubland
Bradley's	May–June 2007	597	87	1	1	0.05	Sagebrush shrubland
Blue Mountain	June–July 2007	816	48	0	0	0.20	Antelope-brush shrubland
Naramata	Sept 2007	252	42	0	0	—*	Orchard/sagebrush shrubland
Nighthawk	May 2007	504	72	0	0	1.34	Sagebrush shrubland
White Lake	June–July 2007	1104	48	0	0	0.00	Sagebrush shrubland

*This site was not sampled for pellets because an adjacent area of sagebrush shrubland was sampled.

quiet, and moving slowly. We could interpret from the radio-signal if animals moved in response to our approach and this was quite rare. We recorded the dominant habitat type (sagebrush shrubland, Antelope-brush shrubland, grassland, orchard, and junkyard) where cottontails were located. In addition, at a fine scale, we recorded the dominant vertical cover type and amount within a 5 m radius of the animal's location. We surveyed the vegetation after the animal had moved away from the fix location.

Statistical analyses

We used analysis of variance (ANOVA) to compare vegetation attributes across the different habitat types for the 39 pellet plot sites. We used logistic regression to relate fine-scale habitat characteristics and presence or absence of cottontail pellets. All calculations were performed using JMP 8 (SAS Institute Inc., Cary, North Carolina, USA). We calculated the average straight-line distance moved per hour for each radio-collared animal and compared these rates using a *t*-test between animals at the Osoyoos Golf Course and the Osoyoos Desert Centre.

Results

Nuttall's Cottontail pellets were found on 49% of sites surveyed (Figure 2). Over all sites, a mean (± 1 SE) of 1.24 ± 0.61 pellets was found per plot. For sites that had pellets, we found 2.54 ± 1.19 pellets per plot. Antelope-brush and sagebrush-dominated habitats were more likely to have cottontail pellets than were grasslands, although pellets were found on all habitat types (Figure 2).

At a fine scale, the three habitat types surveyed for pellets varied substantially in vegetation/ground cover characteristics. Unsurprisingly, percent shrub cover was lowest in grassland habitat (6.0 ± 1.4%), with Antelope-brush (17.9 ± 3.0%) and sagebrush (16.9 ± 2.3%) shrubland showing near equal amounts (ANOVA, $F_{2,36} = 5.77$, $P = 0.001$). Cobble and pebble ground cover was lower in Antelope-brush shrubland and litter was lower in sagebrush shrubland (Table 2). Rock outcrops are common throughout the Okanagan Valley and were present on all sites surveyed for pellets. The presence of pellets of Nuttall's Cottontails was best predicted by percent shrub cover and the percent of ground cover that was biological crust, shrub or fine substrate (Table 3). Cottontail pellets were positively associated with fine substrate, but negatively associated with shrub cover and biological crust.

We captured Nuttall's Cottontails on only three of seven trapped sites in 2007–2008, despite an effort of 6813 trap nights (Table 1). One site yielded only one capture. We had a capture rate of 5% for two other sites (Osoyoos Golf Course and Osoyoos Desert Centre), with 175 captures of 55 individuals (39 adults, 16 juveniles; 30 females, 23 males, 2 unknown) caught over 3540 trap nights. The three locations where cottontails were trapped had pellet densities of 10.23 ± 6.50 pellets/plot (mean ± 1 SE). The sites where no animals were captured had pellet densities of 0.51 ± 0.42 pellets/plot.

Radio-collared cottontails were tracked for an average of 70 locations per animal. Cottontails tracked at the Osoyoos Desert Centre moved an average straight-

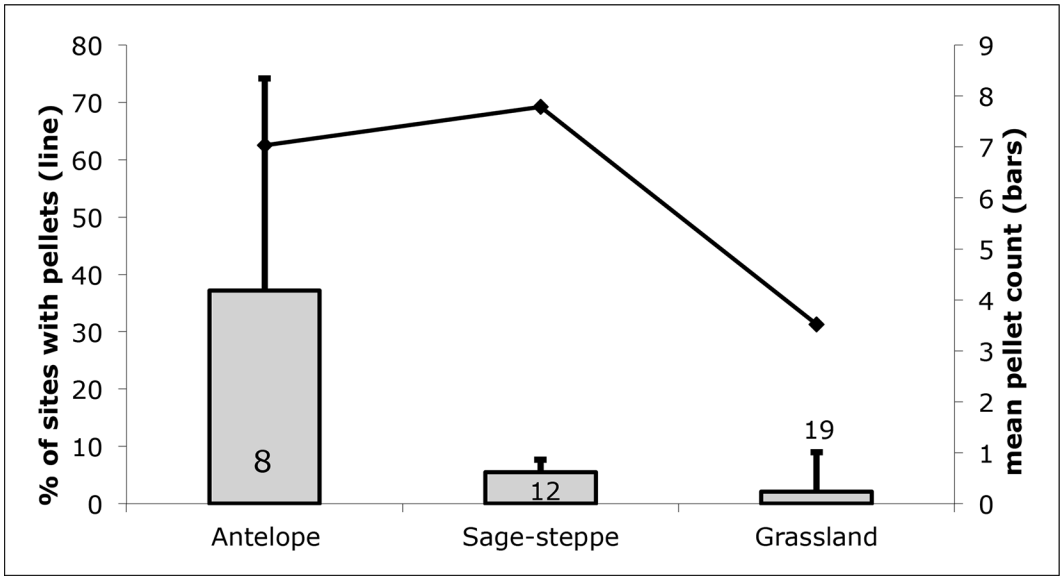

FIGURE 2. Mean Nuttall's Cottontail (*Sylvilagus nuttallii nuttallii*) pellet counts (bars) by habitat type (Antelope = Antelope-brush shrubland, Sage-steppe = sagebrush shrubland). Sample sizes are indicated for each habitat type and mean pellets ± SE are shown. Percent of sites with pellets is reported for each habitat type (line).

TABLE 2. Ground cover characteristics for each habitat type surveyed for Nuttall's Cottontails (*Sylvilagus nuttallii nuttallii)*. Values are reported as means across sites ± 1 SE. ANOVAs were used to compare habitat characteristics across habitat types.

Percent ground cover	Antelope-brush shrubland (n = 8)	Sagebrush shrubland (n = 12)	Grassland (n = 19)	$F_{2,36}$	P
Grass	23.2 ± 4.0	27.4 ± 5.1	27.4 ± 2.9	1.46	0.238
Cactus	3.2 ± 1.3	4.5 ± 2.7	0.9 ± 0.3	0.79	0.538
Biological crust	28.6 ± 5.6	25.0 ± 4.8	16.9 ± 2.6	2.24	0.086
Forbs	8.8 ± 1.9	10.0 ± 5.1	7.5 ± 1.6	0.17	0.952
Shrub	4.3 ± 1.6	3.9 ± 1.1	2.6 ± 0.6	0.58	0.680
Dead wood	5.2 ± 2.3	2.8 ± 0.6	4.7 ± 1.0	0.82	0.523
Rocks	1.0 ± 0.8	2.3 ± 0.6	6.2 ± 2.0	1.93	0.129
Cobble	1.1 ± 0.7	5.0 ± 1.9	6.8 ± 2.5	2.66	0.050
Pebble	0.9 ± 0.7	3.2 ± 0.8	5.1 ± 1.7	5.05	0.003
Fine substrate	12.7 ± 3.3	8.9 ± 4.0	10.5 ± 3.0	0.41	0.802
Litter	10.5 ± 4.8	3.3 ± 1.5	9.0 ± 3.0	3.40	0.020

TABLE 3. Logistic regressions quantifying the relationship between presence/not detected of Nuttall's Cottontail (*Sylvilagus nuttallii nuttallii)* pellets with measured habitat characteristics including both vertical shrub cover and 12 components of percent ground cover (including shrubs covering ground). Individual logistic regressions were completed for each habitat characteristic, followed by a stepwise multiple logistic regression to determine which habitat characteristics were involved in the best-fit model. The best-fit model included % shrub cover (P = 0.0006), % grass (P < 0.0001), % cactus (P = 0.0346), % deadwood (P = 0.0010) and % fine substrate (P = 0.0001). The best-fit model correctly classified 66.4% of sites into pellets presence versus pellets not detected categories.

Vegetation characteristics	β_0	Estimate	χ^2	P	% classified correctly
% vertical shrub cover	1.455	-0.114	7.208	0.018	78.1
% ground cover:					
Grass	-1.221	0.051	3.928	0.064	—
Cactus	0.293	-0.082	1.538	0.281	—
Biological crust	1.337	-0.056	5.205	0.033	70.0
Forbs	0.273	-0.020	0.408	0.541	—
Shrub ground cover	0.970	-0.267	5.574	0.038	68.1
Dead wood	-0.400	0.126	2.302	0.162	—
Rocks	0.380	-0.074	1.779	0.214	—
Cobble	0.579	-0.107	4.158	0.103	—
Pebble	0.035	0.020	0.105	0.748	—
Fine substrate	-0.752	0.096	7.595	0.030	75.0
Litter	-0.322	0.063	3.591	0.093	—

line distance of 51.0 ± 2.8 m/h while those at the Osoyoos Golf Course moved 34.2 ± 3.0 m/h (t = −4.1, P < 0.01). Cottontails at the Osoyoos Golf Course had access to anthropogenic habitat in the form of a junkyard, the golf course greens, and an orchard; most of the radio-collared animals restricted activity in anthropogenic habitat to the golf course greens. However, one male cottontail at the Osoyoos Golf Course often used both the junkyard and the orchard, with 66% of his locations within these non-native habitats. The natural habitat at both locations was dominated by Antelope-brush shrubland with patches of sagebrush shrubland and grassland. Cottontails at the Osoyoos Golf Course were located 74% of the time in Antelope-brush shrubland, 7% in sagebrush shrubland, and 19% in anthropogenic habitat. At the Osoyoos Desert Centre, radio-collared animals were located 53% of the time in Antelope-brush shrubland, 5% in sagebrush shrubland, 40% in grassland habitat, and 2% in anthropogenic habitat. Within a 5 m radius around each animal location, the amount of cover varied with habitat type. In grasslands this was 17.6 ± 0.8%, 9.5 ± 4.3% in anthropogenic landscapes, 74.8 ± 3.9% in sagebrush shrubland, and in Antelope-brush shrubland it was 67.8 ± 1.4%.

Discussion

Our results suggest that Nuttall's Cottontails occur at extremely low densities in scattered localities within our study area. Although we sampled sites of apparently suitable habitat, about half had no sign of cottontails. For sites that did have cottontails, the trapping rates and the very low pellet counts both indicate low densities. Similarly, opportunistic and low intensity surveys in 2009 found low numbers of cottontail pellets in only 10 of 18 sites in the south Okanagan (Marks and Young 2009). Given the fragmented nature of remaining shrub-steppe habitats in this region, we suspect Nuttall's Cottontail may occur in a metapopulation and that some patches are simply too small or too

isolated to support cottontails. Detailed demographic work would be necessary to confirm whether cottontail populations occur in discrete areas linked by dispersal, whether dispersal is high enough to reflect a connected but very low density regional population, or whether populations are actually isolated in habitat fragments. We note that the Management Plan for the Nuttall's Cottontail (Environment Canada 2015) specifies that key goals are to identify and protect habitats and connectivity corridors. This suggests that the patchy distribution of cottontails as a major concern for their management.

Nuttall's Cottontail pellets were more likely to be present in shrubby than in grassy habitat. This is consistent with previous research on this species both in BC and in the USA (McKay and Verts 1978a; MacCracken and Hansen 1982; Sullivan *et al*. 1989). Fecal pellets were more common in more open habitats within shrub-lands, i.e., with locally lower densities of shrubs and with fine substrate. This result agrees with Pierce *et al.* (2011), who found *Sylvilagus* spp. pellet densities in Utah were relatively high in sagebrush-steppe areas near to agricultural lands or in areas of steppe with lower shrub densities. We are not certain if these patterns arise because more open habitats have preferred forage plants, enable better predator detection, or have some other attraction for the animals. Given that cottontails eat grasses, forbs, and shrubs (MacCracken and Hansen 1984; Verts *et al*. 1984), our results showing preferred habitat types and microhabitats containing these resources may reflect foraging decisions. We believe different pellet degradation across sites can be ruled out as affecting our detection rates, because these arid environments are likely to prolong rather than shorten the persistence of fecal pellets and Snowshoe Hare pellets can persist for years in wet forests (Krebs *et al.* 1987).

Natural habitat patches in southcentral BC are found within a matrix of human-impacted habitat and developed areas, potentially impacting movement decisions by Nuttall's Cottontails. Nuttall's Cottontail use of these anthropogenic habitats in this study was dominated by a single radio-collared male who used orchards and a junkyard. However, informal discussions with landowners of orchards and wineries indicated that Nuttall's Cottontails make some use of these non-traditional habitats. Based on these conversations and our own observations, we do not think cottontails are making heavy use of these agricultural areas, although we did not survey these areas. In the context of metapopulations or patch-matrix analyses, we do not yet know if these agricultural landcovers enable cottontails to disperse among the remnant patches of high quality shrub-steppe habitat or whether they act as barriers to movement. We suspect movements by Nuttall's Cottontails between high-quality patches are limited, in part based on the low movement rates we detected and because other *Sylvilagus* species do not show high dispersal rates or distances (Robinson *et al.* 2016).

Within the two sites with radio-collared cottontails, animals had a much higher percentage of horizontal cover nearby when they were within Antelope-brush and sagebrush shrubland than when they were in grassland or anthropogenic cover types. We cannot tell if this pattern only reflects cover availability or also reflects actual selection at a fine scale for such cover, but we suspect both are at play. Crowell *et al.* (2016) found that captive Nuttall's Cottontails in Washington preferred eating near cover. The cottontails also showed significant differences in movement speeds in relation to availability of natural habitat. Nuttall's Cottontails at the Osoyoos Desert Centre, a prime area of natural habitat, had longer hourly movements than did animals near the Osoyoos Golf Course. We suspect these patterns reflect higher resource availability in the natural habitats; at the Osoyoos Golf Course, animals had quite limited natural patches of habitat and appeared to move within them, except for one male who regularly used anthropogenic habitats.

Our results are similar to patterns seen in other *Sylvilagus* species. Animals in this genus seem to prefer native environments, but are sometimes capable of using anthropogenic landscapes if there is a substantial amount of cover in the human-altered areas. For example, Eastern Cottontails (*S. floridanus*) foraging in college campuses and gardens in Illinois preferred areas with substantially higher shrub cover (Baker *et al.* 2015). The authors interpreted this as being at least partly an anti-predator tactic. Hunt *et al.* (2014) found Eastern Cottontails in a city park in Chicago occurred in higher densities and potentially had smaller home ranges than did animals in native habitats. But this context differed from ours in that the park was surrounded by development, rather than adjacent to wild habitats. In Missouri, Eastern Cottontails were positively associated with increasing urban cover near habitat fragments and negatively associated with Coyotes, suggesting habitat selection by cottontails is affected by predation risk (Jones *et al.* 2016). Robinson *et al.* (2016) examined Swamp Rabbits (*S. aquaticus*) in southern Illinois that use patches of bottomland hardwood and appear to exist in metapopulations with limited dispersal. For them, agricultural lands seem to be more of a barrier than habitat.

Collectively, our results suggest that there is a small, fragmented population of Nuttall's Cottontails in southcentral BC. Although cottontails can use some agricultural and recreational habitats, such sites did not seem to be as resource-rich or to support as many animals as native habitats. Near their southern range limit in New Mexico, Nuttall's Cottontails use higher elevation sites (> 3000 m) and even some forested areas. This suggests that cottontails are capable of using a wide range of habitats even if some types are clearly strongly preferred. In BC, we have not observed this breadth of habitat use by the cottontails. Instead, cottontails here seem to be quite limited in their distribution. As land conversion

continues in the south Okanagan, we expect some patches of natural habitat will see the extirpation of cottontails as patches become smaller, more isolated, or surrounded by habitat types that are more difficult for cottontails to cross. We encourage more survey efforts, radio-tracking, and genetic analysis to determine if the existing populations are isolated or connected. At present, it seems likely that ongoing habitat loss is severely damaging this species in BC.

Acknowledgements

We thank Stephanie Pascuzzo, Sharon Watson, Astrid Boeckelmann, Natalie Melaschenko, Adam Collins, Natasha Lukey, Jordan Edwards, and other volunteers who assisted with field work. We also thank Orville Dyer (British Columbia Ministry of the Environment) for help gaining land access and determining plot locations, the Canadian Wildlife Service, Parks Canada, The Osoyoos Golf and Country Club, The Osoyoos Desert Centre, BC Parks, the Nature Trust of British Columbia, The Dominion Radio Astrophysical Observatory (National Research Council of Canada), and private landowners for allowing access to their properties. Funding for this project was provided by Environment Canada and the University of British Columbia Okanagan. Trapping and radio-collaring were conducted under protocol A06-0322 of the Animal Care Committee of the University of British Columbia.

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Received 13 July 2016
Accepted 30 May 2017