



Rabbit Rescue, Control and Management

Emergency Rabbit Action Plan



September 1st, 2021

This report was made possible by the Vancouver Foundation's Systems Change Develop Program



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Project Summary

Rabbitats Rescue Society received a Systems Change 'Develop' grant from the Vancouver Foundation to explore three complex and distinct but related problems -- abandoned pet rabbits, their feral offspring expanding in the environment, and the fast-moving Rabbit Hemorrhagic Disease Virus threatening these rabbits and native species.

Goals:

Overview Goals:

- Identify and determine root causes of these issues
- Make recommendations for systemic change.
- Establish an action plan going forward

Project Specific Goals:

- Amass contact lists
- Bookmark future funding
- Establish pathways to communication and education
- Establish cross-communication and solicit opinions in spite of the fragmented categorization of the rabbits (farm, pet wildlife)
- Address the polarized community responses
- Research the scope of the issues
- Identify common ground
- Suggest potential solutions
- Identify and address specific solutions within Rabbitats' capabilities

Collaborators

Key Collaborators:

- Iris Klimczuk (Rabbit Hemorrhagic Disease News Network)
- Pamela Alley (Rabbit Industry Council)
- Sasha Rink (Wildlife Rescue Association)
- Alberta Rabbit Alliance (formed by Rabbitats)

Research: Nellie Chong, Zach Champoux, Kyle Nernberg, Terrie-Lynn Laidlaw

Timeline / Methodology / Scope

- The initial concentration was on amassing lists of contacts across all platforms and identifying stakeholders
- Time was also spent researching and documenting potential funders on a detailed spreadsheet.
- Our existing 'Rabbit Hemorrhagic Disease News Network' proved to be a valuable source for new information on the virus and establishing veterinary and other science contacts.
- We researched a new set of stakeholders
- Our existing rabbit tracking map at <http://abandonedrabbits.com> was an asset (but with limitations).
- While our scope was initially international, once the virus closed in on Alberta and was found in Idaho and northern Oregon, we pulled back our focus to Western Canada.
- We formed the Alberta Rabbit Alliance and staged meetings to bring together the Alberta stakeholders, assist with feral rabbit rescue advice, and to attempt to establish a path to the RHDV2 vaccine.
- We unsuccessfully tried to collaborate with Alberta veterinary duplicate BC veterinary efforts (more below), but did facilitate vaccine for rescues
- Much of the research was conducted via discourse and informal polling in Facebook groups, Reddit and other social media sources.
- We initially planned formal surveys, however the University of Georgia launched a very extensive survey on RHDV2 in the spring of 2021, so we opted for just a survey soliciting opinions from our own sources including feral rabbits, a topic not covered by UofG.

Summary of Findings: (Poll Findings and Other Observations)

- Education on the virus and biosecurity is the priority across all fields, however it is also the best developed response.
- Paths to vaccination a priority across most fields, and not well developed
- Lack of research and data on RHDV2 was an issue for most of the reporting period.
- Fragmented categorization of the rabbits (farm, pet, wildlife) is an impediment in terms of responses, however all factions have decent educational channels with appropriate crossover.
- Feral rabbit colonies are a pressing concern across all these platforms and this area is not being addressed.
- There was an exceptionally strong response calling for people to stop abandoning pet rabbits although few alternatives were offered.
- Systemic causes have not been well researched
- Government agencies are fragmented

- Government responses in the US have been the strongest in the hunting and conservation fields, with agriculture and pets lagging behind
- The origins of feral rabbits have not been studied, making prevention not as well defined as it could be.
- We reached out to science sources but found biologists and higher learning institutions unaware of domestic feral rabbit issues and largely uninterested.
- Attempts to collaborate with the Invasive Species Councils (BC and Canada) were also largely unsuccessful likely for the same reasons as above.
- The BC gov't veterinarians response proved to be exceptional (and continues to be) and can be used as an example to other communities
- Abandoned pets in the environment require a different approach than their feral offspring.
- The plans put forward by Rabbitats in the past have not been well distributed nor well understood. Few stakeholders were aware of past rescue projects beyond UVic nor had they seen any Rabbitats materials.

Summary of Conclusions

1) RHDV2

Issue: RHDV2 is an emerging disease affecting all rabbits and the response is fragmented.

Root Cause: This is a new issue affecting multiple categorizations (pets, farm and wildlife) which rarely work in tandem. No one agency represents all rabbits and can conduct outreach to all rabbit platforms.

Systemic Change: RHDV2 requires an aggressive response and more awareness. Education on the virus and bio-security is important but it is also being ably handled across most platforms. Rabbitats has been a key player providing RHDV2 news to North America and will continue to do so, however more than this is beyond the scope and abilities of Rabbitats in the foreseeable future. While we would like to see a national or international rabbit alliance addressing these issues, it's clear we can't take on this role without it being at the expense of our local and regional efforts. We will, however, encourage others.

Issue Vaccinations are key, but not available, not affordable and/or not embraced or considered by rabbit guardians

Root Cause: The states and provinces are only able to order the vaccine when their area is affected, thus new areas are always unaware of the processes slowing the response. There are also no coordinated veterinary responses, so individual practices are having to navigate the protocols and officious paperwork and shoulder high shipping and brokerage cost as individuals

Systemic Change: Promotion and collaborative importation and distribution of a vaccine is the path for wider immunity at a lower cost for almost all segments. We can advocate for governments and/or veterinary associations to coordinate the importation of the vaccine and make all parties aware of the procedures and encourage practices to partner up on their orders.

We can also use our experience to educate and establish pathways for breeders and rescuers vaccinating large groups of rabbits.

Issue: Native species are at risk from RHDV2 and habitat loss to invasive European rabbits, but there is no collaboration between wildlife and domestic rabbit sources.

Root Cause: RHDV2 is new and wildlife sources have little knowledge or interest in domestic rabbits, and are unaware of their proximity to threatened native wildlife.

Systemic Change: Common ground includes removing vectors where possible (feral rabbits), and stemming the flow. Citizen science can be recruited to watch for infections and facilitate mapping that will show the locations of feral rabbit colonies. Attempts can be made to interest biologists and other science sources in the feral rabbit issue by providing them with ongoing information.

Issue: Cultural Divisions

Root Cause: Cultural divisions

Systemic Change: Moderate and collaborate wherever possible in a non-judgmental manner to bridge the gaps. Suppress extremism wherever possible.

2) Abandoned Pet Rabbits

Issue: Domestic rabbits are being abandoned or not contained in the environment

Root Cause: Rescues and shelters are full and turn away rabbits leaving guardians with few alternatives.

Examining the reasons behind the abandonment has revealed other complex issues that go deeper than just irresponsible or lazy people letting their pet or farmed rabbits loose.

Systemic Change: The systemic issue of abandoning pet rabbits can not be substantially affected or stopped with posters and other educational tools alone. Alternatives must be developed and provided to the guardians.

Issue: Neither animal control agencies nor rescues are diligently picking up abandoned rabbits, leaving unsterilized rabbits to breed giving way to the larger issue of feral colonies.

Root Cause: - Ambiguous and unfavourable laws, a lack of resources and strong House Rabbit Society adoption policies that are ultimately restrictive.

Systemic Change: Expand destinations, encourage and facilitate outdoor enclosures and housing rabbits in colonies. Facilitate meetings with shelters and rescues, influence animal control procedures for rabbit, increase rabbit housing and capacities.

3) Feral Rabbits In The Environment

Issue: Existing feral rabbit colonies are continuing to breed out of control.

Root Cause: While the initial lack of control of abandoned pets and breeder rabbits caused the feral issue, the current issue is that the feral colonies are not being controlled largely due to

restrictive and contradictory laws, fragmented jurisdictions, a lack of resources and a lack of knowledge.

Systemic Change: Establish and promote methods of control that will target whole colonies and prevent repopulation. Nurture an army of 'citizen science' reporters to identify the areas where control can be effective. Facilitate partnerships with residents, businesses, municipalities and other levels of government to encourage rabbit removal programs.

Issue: There is a profound lack of general knowledge re: domestic pet rabbits and especially feral rabbits loose in the environment.

Root Cause: Rabbits are not common pets, people don't go to great lengths to get them medical care, vet schools offer minimal teachings, and there are even few opportunities or desire to study the non-native European rabbits in the North American environment.

Systemic Change: Rabbitats, one of the few organizations dealing with ferals, can educate others on 'the habits of the rabbits' and encourage involvement from higher learning institutes and harness citizen science. We can study the origins of the loose rabbits and apply that knowledge to prevention.

Issue: Rabbitats is not getting it's message across about prevention re: the abandoned pets or control and containment options for feral rabbits.

Root Cause: The organization's volunteers are overworked and under-resourced, outreach has had to take a back seat.

Systemic Change: Rabbitats has reached the limit of what it can accomplish by volunteers alone. The organization needs paid staff to move forward, or scale down outreach even further.

Issue: There is a profound lack of research on feral domestic rabbits.

Root Cause: Rabbits are not on the radar of most institutions or programs.

Systemic Change: Encourage or facilitate (if possible) higher learning research by exploring research grants and partnerships.

Issue: Lack of advocacy and laws and policies favourable to rabbit control.

Root Cause: Wildlife and government personnel responsible for the rabbits have little knowledge of pet rabbits or an understanding of the pet rabbit and rabbit rescue communities, and rabbits have few advocates with the resources to change this. Animal welfare agencies and shelters do not prioritize rabbits and don't have much interest in rabbit advocacy.

Systemic Change: Enable advocates to work to revamp laws and policies to allow unencumbered rabbit control. Initiate sales restrictions for unsterilized rabbits, identification requirements and breeder licensing. Empower city shelters and rescues to provide alternatives for unwanted rabbits. Facilitate rabbit sanctuaries for existing feral rabbits with land and/or funding. Promote partnerships between provincial and municipal governments and with environmental non-profits, animal welfare agencies, institutions, corporations, small businesses and private citizens. Ask governments and citizens to be at least partly responsible for controlling rabbits on their properties

ACTIONS

Rabbitats has prioritized the following Action Plans:

Priority 1 - Promote a Broader Range of Rabbit Destinations

- Project manager or staff person to:
 - oversee outreach to largely rural sources
 - promote outdoor housing
 - *if possible, build a showcase enclosure
 - coordinate materials including templates, blueprints, illustrations, budgets and photo and video examples of multiple options (sanctuary enclosures, barns, coops) for distribution
 - liaison with interested parties and advise on construction, rabbit care
 - explore potential funding sources to assist potential destinations with construction costs, eg: small grants offered to entities willing to house 20 or more rabbits.
 - connect destinations with rescues

Comment: * previous attempts have produced low cost functional enclosures but without the desired sustainable features and lacking visual appeal.

Priority 2 - Mapping and Identification

- establish a Citizen Science mapping project
- hire a Project Coordinator to coordinate volunteers and keep the map updated
- watch for newly abandoned rabbits, signs of RHDV2, etc, and identify the areas most in need of rabbit control where Rabbitats can make an impact.
- budget: full time staff person or contract coordinator for one year

Comment: approach HCT for potential funding

Priority 3 - Rabbit Advocacy Campaign

- Hire a paid advocate
 - push for changes of laws and policies
 - publicize the rabbits' plights
 - work on professional Rabbitats presentations to gain respect from governments, biologists and funders.

Priority 4 - Veterinary Outreach (*vaccine, spay/neuter initiatives)

- Hire a Project Coordinator:
 - liaison with vets
 - encourage and assist with vaccine orders
 - connect rabbit guardian groups with interested veterinarians
 - coordinate or advise on vaccine and spay/neuter clinics

Comment: *this option combines the need for vaccinations and the need for sterilization.

Additional:

Large sanctuary history and options should be explored. While animal welfare agencies like the SPCA are reluctant to endorse large sanctuaries, in Rabbitats experience, large numbers in outdoor enclosures are easy to care for.

A 'Do You Know This Rabbit' campaign can help prevent abandonment by promoting photos and details of rescued rabbits in an effort to identify serial 'dumpers'.

Research funding initiatives can be explored and outreach done to higher learning institutions.

A local Richmond outreach project grant can establish a support campaign somehow thanking the Chinese community, which in turn can be shared. A 'Don't Feed The Rabbits' campaign can be started in the same manner.



SHARED LEARNING: BACKGROUND

Introduction

Abandoned pet rabbits have been prolifically surviving in the environment and forming colonies throughout the Lower Mainland, Vancouver Island and the BC interior predominantly over the last 15 years. The European rabbits and their offspring remain friendly and not well-equipped to avoid predators, but they breed like rabbits and thus their numbers continue to expand well into the thousands. They have always been a contentious issue with lovers and haters and no solutions forthcoming.

Leaving them be has caused growing numbers, property damage and stress to those witnessing the prolific and gruesome deaths of the friendly pets by cars and predators.

In 2018 a virus deadly only to domestic rabbits, Rabbit Hemorrhagic Disease or RHDV2, decimated their ranks on Vancouver Island but they are quickly repopulating.

In April of 2020, the virus re-emerged in domestic rabbits south of the border, this time with a deadly twist - it's crossing barriers and infecting native hares and cottontails. The virus kills most of the rabbits it infects and it is extremely contagious. The domestic rabbits are the conduit and their colonies ensure the rapid spread.

The European rabbits can be classified as pets, farm animals (for consumption and show) or even wildlife according to the provincial government. They can be much loved house pets, food on the table or invasive species threatening native species and

habitats. They are governed by a fragmented array of agencies and attitudes making a response to the threat a challenge.

Domestic colonies are found in pockets throughout North America, but nowhere near as prolifically as the Canadian west coast. The reason for our dense populations is currently unknown.

Few controls are in place to stop the release of the domestic rabbits into the environment and in many cases, policies within governments and other animal welfare agencies are hurting more than helping.

Legally the loose rabbits, likely a mix of abandoned pets and farm stock, immediately cross over to the wildlife designation as soon as they're released and the provincial government requires an officious permitting process to rescue them.

On a local level, city shelters rarely take in the unwanted pets and even more rarely pick up strays. Volunteer-run rescues, like Rabbitats, are under-resourced. This leaves many guardians no choice but to abandon them.

Citizens are at odds with passionate factions wanting to 'save the bunnies' while equally passionate property owners want to kill the 'pests' for destroying property. The disagreements lead to inaction.

The new development adds a whole new layer of environmentalists fearing for the native species and commercial breeders fearing for their stock.

Identification of Stakeholders

(also see RIC Education report)

Due to their near ubiquity, rabbits are used in clothing, for food, taken as pets, and live in the wild throughout the world as prey animals. The following section will explore and discern between some of their various stakeholders.

Commercial Breeders

Commercial Breeders who breed for meat and fibre are most interested in the economic implications associated with rabbit populations. Biosecurity is a top priority considering the spread of RHDV2. Given their numbers, vaccinating their rabbits is a challenge. They are concerned with feral rabbit control but more likely to choose the least expensive form.

The market for rabbit products includes meat for human and animal consumption (dog food, food for reptiles at zoos, etcetera). The fur is used for clothing fibre (angora), made into pet toys and other items. All these products can be infected with the virus and spread to other areas through this distribution.

Show and Hobby Breeders

Show and hobby breeders are generally rabbit fans. Hobby breeders will specialize in pet sales while show breeders prioritize genetics highlighting selective traits of their rabbits and often travel long distances to attend club events and rabbit shows. This represents a significant biosecurity hazard for the proliferation of RHDV2 cases.

Homesteaders / Backyard Breeders

Rabbits in these situations are often bred for personal meat consumption although they can also be bred for pet sales. They are often loose on properties, making biosecurity and containment more of a challenge.

Transporters

Rabbits are predominantly transported in the breeding industry transporting sold rabbits, but rescue groups also regularly move fostered and adopted rabbits to their new homes, and in some cases transport from one shelter to another. Transporters can be significant sources of moving infection.

Agricultural Associations

Agricultural associations in play include the American Rabbit Breeders Association (ARBA), an organization representing all breeders, and 4H, an organization that promotes youth husbandry education. Local and regional fair associations who oversee rabbit exhibitions also play large roles.

Animal Control

Animal control is effectively taxpayer funded shelters, along with the bylaw officers who trap and transport them, thus potential virus vectors. City shelters are often municipally regulated and the officers usually have little knowledge of rabbits. They are also victimized by confusing government policies that may or may not differentiate between abandoned pets, feral domesticated rabbits and true wildlife. Bylaw officers may or may not be tasked with disposal of deceased rabbits, whose bodies can be a major vector for RHDV2. Agencies include the British Columbia Society for Prevention of Cruelty to Animals (BC SPCA)

Pest Control

Pet control companies can be called out to deal with nuisance animals including both native and European rabbits.

Wildlife Rescue Groups

Wildlife rescues and rehabilitation centres will not deal with feral domestic rabbits but they do receive sick and injured native rabbits, and must be on high alert for RHDV2.

Pet Guardians

Pet guardians can range from casual rabbit owners (ie: families who bought a rabbit for their kids) to dedicated fans. The former can have little knowledge or concern for health and few rabbit connections. They consider the rabbit entertainment or property and will be unlikely to seek out veterinary care for a sick rabbit. Dedicated rabbit guardians are often members of the House Rabbit Society and prolific posters in

rabbit fan groups. They foster emotional bonds with their rabbits and ardently favour rescue and non-lethal rabbit control.

Hunters

Hunters have a vested interest in keeping their 'game' healthy and abundant. They are a major source of information regarding deaths or depopulation of native species, and can also be a vector to wild rabbits. Hunting groups sometimes release domesticated rabbits into the wild for the purpose of sport or training hunting dogs.

Veterinarians

Veterinarians are vital to the effective management and distribution of RHDV2 vaccines. They are collectively governed by national, state, provincial, and local veterinary associations. Agencies include the College of Veterinarians of British Columbia (CVBC) and the Society of British Columbia Veterinarians (SBCV-CVMA).

Animal Welfare Groups

General animal rescue organizations predominantly focus on cats and dogs, and may even consider feral domesticated rabbits as wildlife. Rabbit specific rescues have an intimate understanding of the difficulty associated with controlling feral domesticated rabbit populations and are best equipped to deal with them. Farm sanctuaries are a potential home for rescued rabbit colonies, though they are more likely to provide a home for cows, chickens, pigs, sheep, turkeys, and goats. Animal welfare groups favour non-lethal control but may take a more economical approach than pet guardians due to financial constraints.

Environmentalists and Conservationists

Environmentalists are primarily focused on preserving the environment and protecting it from human abuse. Conservationists view the environment as something to be used, seeking to take care of it so others can use it in the future. Both are concerned with the overall ecosystem balance and the spread of RHDV2 to native wildlife. Key players include invasive species councils and citizen scientists. Agencies include the Canadian Wildlife Health Cooperative (CWHC).

Government Agencies

Government agencies reflect the consensus of their respective constituents. They are largely interested in protecting agricultural economic interests and native wildlife from the spread of RHDV2. Key stakeholders include the Ministry of Agriculture (AGRI), Ministry of Forests, Lands, Natural

Resource Operations and Rural Development (FLNRORD), Canadian Food Inspection Agency (CFIA), and the Animal Health Centre (AHC).

Government veterinarians span both agriculture and wildlife. At the municipal level, the rabbits most often fall under the Parks.

Pet Stores, Other Sales

The domestic rabbit industry is valued by the U.S. Department of Agriculture at more than \$2 billion, mostly in pet supplies and care. Pet stores are a declining market for selling rabbits due to more live animal restrictions in place and increased use of online markets. Online markets such as Kijiji and Craigslist are used by breeders and people rehoming rabbits although some are also restricting their listings, eg: Craigslist will not allow rabbit sales except in the 'Farm & Market' section.

RHDV2

History

A new variant of the deadly Rabbit Hemorrhagic Disease Virus initially only affecting European rabbits (*Oryctolagus cuniculus*), the species kept as pets, was discovered to have jumped to native hares and rabbits in the Southwest States in early 2020.

A previous version of RHDV2 (Rabbit Hemorrhagic Disease Virus 2) killed an estimated 2000 rabbits in Delta, Richmond and mid-Vancouver Island but did not cross to wildlife.

The same strain also appeared in Washington State in 2019 and early 2020 where it decimated feral rabbit colonies, breeder barns and backyard pets, and struck a rabbit sanctuary killing over 100 rescued pets. Given proximity, ferry traffic, bird migration, wind patterns, and human activity, it likely spread from the British Columbia outbreak.

The RHD virus was first detected in China in the winter of 1983-84. Outbreaks occur periodically throughout the world and continually in some countries but have been quite rare in North America.

In 2010, a new strain, RHDV2 was discovered in France. This version was eventually found to have transmitted from the European rabbits to brown hares and other species.

The deadly southwestern variant (AZ1), first appeared in New Mexico in March 2020. Through the end of March 2020, cases of wild rabbit die offs throughout southern New Mexico were reported. Since that time, the AZ1 variant of RHDV2 has also spread to domestic rabbits, wild rabbits, or both in Arizona, Arkansas, California, Colorado, Georgia, Idaho, Montana, Nevada, Oregon, South Dakota, Texas, Utah, and Wyoming. A single case was found in Florida on December 30, 2020. In late June of 2021, the virus was found in rabbits rescued from a hoarding situation at a single residence in Cobb County, Georgia.

Mexico

Mexico is currently the envy of North America when it comes to a response to the virus. The country's federal government created and began deploying a vaccine within a year of the country's first confirmed RHDV2 case in April 2020 when a rabbit meat producer in Chihuahua reported deaths in his herd of 30 rabbits. They also aggressively traced the virus's entry to Mexico -- from Southern California and Arizona to Baja and Chihuahua.

As of April 15, 2021, Mexico had identified 269 cases in domestic rabbits in 15 states, and 27 cases in wild rabbits in 10 of those states. Most of Mexico's domestic cases have been small-scale rabbit meat producers. According to an article from the VIN News Service, Mexico has around 11,500 producers raising more than a million rabbits for meat. The majority are small "backyard" operations with limited sanitary and management practices. No large, technological operations have had an outbreak. There were also cases in two zoos and at two technical schools.

In every instance, the rabbits were euthanized, the premises sanitized, and no animals were allowed in or out for one to three months. Transporting rabbits or rabbit byproducts in Mexico currently is prohibited, as is the hunting of wild rabbits and hares.

Mexico was also at the forefront of disease prevention as well when RHDV1 entered the country in the late 1980s via frozen rabbit meat from China. It spread to domestic rabbits in several states but was eliminated in just a few years.

Canada

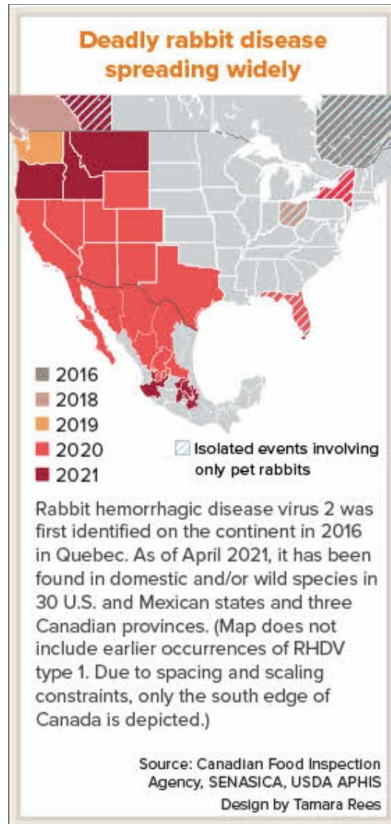
On April 24th, 2021, the RHDV2 variant was discovered for the first time in Canada when five indoor-only rabbits were found to have contracted the virus in Taber, Alberta. The source of the infection remains a mystery given that no new animals had been brought to the home in five months. Two rabbits brought into the home after the five deaths but before the diagnosis survived.

Virus Locations

Map 1: all reported instances of RHDV2 in North America as of May 5, 2021

Map 2: recent locations courtesy of abandonedrabbits.com

Map 3: the progressing outer range of the new RHDV2 variant

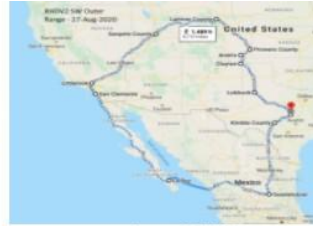




June 25, 2020



July 30, 2020



August 27, 2020



September 25, 2020



December 1, 2020



January 21, 2021



February 9, 2021



March 26, 2021



April 14, 2021



May 22, 2021



June 26, 2021

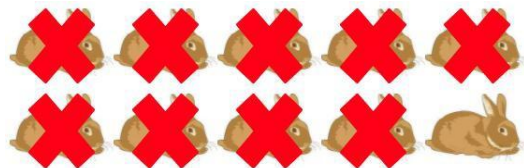
Limitations with Available Data

Rabbitats accrued our data through a number of sources over the past year. Three of these sources include abandonedrabbits.com, Rabbit Hemorrhagic Disease News Network, and RHDV2 North America Facebook group. There are a variety of dates to consider when a rabbit is diagnosed with RHDV2. First sighting, diagnosis, carcass collection, and confirmation are all dates that may be provided through these sources, often not in tandem. For this reason, we've encountered challenges with providing accurate dating for the spread of RHDV2 throughout North America. Deceased rabbits are not always counted. When a die-off is reported, only a few of the rabbits are tested and those are often the only numbers appearing on the reports.

RHDV2 Virology

RHDV2 has proven to be extremely virulent, causing fatality in 70-90% of reported cases.

To further compound the challenges associated with RHDV2, consensus is lacking around modes of viral transmission. The United States Department of Agriculture has released a statement claiming that feral domesticated rabbits act as conduit for this virus into native species. It is also believed to spread through predation and human transportation of rabbits.



According to the Wildlife Health Specialist Group, an organization commissioned by the IUCN Species Survival Commission, “[t]he origin of lagoviruses, including the recently emerged RHDV2, is not yet clear, and the emergence of this new lagovirus together with its impact on wild rabbit populations are of concern. Moreover, the rapid spread of RHDV2 and its potential to affect other Lagomorphs constitutes a threat not only to

lagomorphs... but also to species that feed on them.” While the potential threat to entire food chains is apparent, fragmented reporting makes determining the current impact quite difficult.

Impact on Native Lagomorphs

Species At Risk

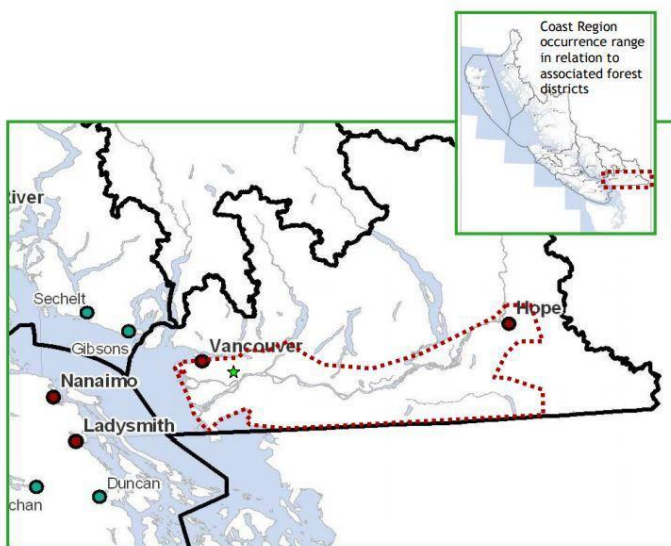
All lagomorphs including rabbits, hares and pikas, are at risk of infection and mortality from RHDV2. Some are more at risk than others. In some rare cases the numbers are low enough that biologists are attempting to vaccinate the wild rabbits. However in most cases the only protection will be observing and limiting infections, controlling feral colonies in proximity to the native species, and educating across all platforms about the virus and biosecurity.

Snowshoe Hare *Washingtonii*

According to Canadian Wildlife Services, the *Washingtonii* subspecies of the snowshoe hare is “Red-listed” in British Columbia. Red-listed refers to “any species or ecosystem that is at risk of being lost (extirpated, endangered or threatened).” This subspecies of rabbit is restricted to the Fraser lowlands in the extreme southwest of the BC coastal region. Although there is some question about the genetics, the *Washingtonii* subspecies is visually distinct from the snowshoe hare because its fur does not turn white during the winter season. According to a paper prepared by expert Pamela Zevit, “inter-species competition with naturalized Eastern Cottontails as well as domestic rabbits may be impacting remaining populations, particularly in conjunction with fragmentation effects.”

Burnaby Lake is one of the few areas in Metro Vancouver that still has a frequently observed population of *Washingtonii* snowshoes. Populations in Vancouver, Richmond (Lulu Island Bog) and Delta (Burns Bog) may already be gone.

Reports of abandoned pets and their feral offspring are being reported more frequently in Burnaby, including the Burnaby Lake area. Rabbitats is staying in close touch with the appropriate park associations, animal welfare groups and others to monitor the situation.



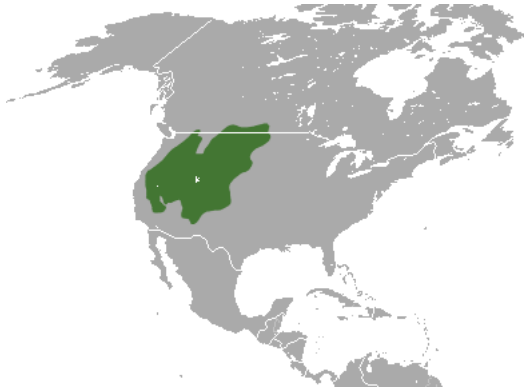
Snowshoe Hare washingtonii subspecies (*Lepus americanus washingtonii*) potential occurrence range for the Coast Region. Location of Burnaby Lake population – green star



Rabbits Abandoned (and Rescued) in Burnaby Lake Park

Nuttall's Cottontail

While not endangered, there is concern about the mountain cottontail or Nuttall's cottontail which has a limited range in Canada and is found in areas at risk for the virus. According to mammalogist David Nagorsen, “from a BC perspective I would be far more concerned about RHDV2 hitting Nuttall’s Cottontail a native cottontail restricted to the south Okanagan region and listed as Special Concern on schedule 1 of SARA.” Nagorsen was unaware of the growing feral rabbit colonies in BC.



Vancouver Island Status:

It is worth noting the lack of native lagomorphs on Vancouver Island. The only rabbits on the island are invasive eastern cottontails and abandoned european rabbits, the latter who have formed prolific colonies on the Island. As a result, we anticipate any feral rabbit responses to come from pet owners and those involved in agriculture, not wildlife or conservation sources concerned with protecting native habitats.

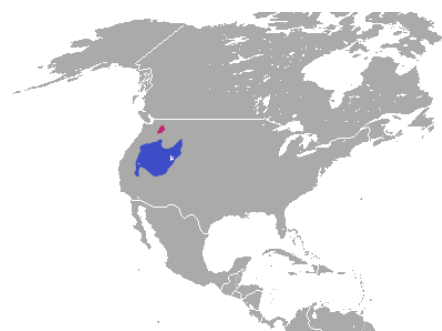
Alberta Status

The research conducted showed no endangered rabbits or hares in Alberta, but the virus is a concern to all their native populations. Alberta has three native species of lagomorphs. They are the cottontail rabbit, the snowshoe hare and the white-tailed jackrabbit.

Endangered Species - US

Pygmy Rabbits

The pygmy rabbit is a rabbit species native to the United States. It is also the only native rabbit species in North America to dig its own burrow. The range of the pygmy rabbit includes most of the Great Basin and some of the adjacent intermountain areas of western North America. One isolated population, the Columbia Basin pygmy rabbit, is listed as an endangered species by the U.S. Federal government. As such, Washington State is taking a proactive approach to protect its native rabbit population. State officials are trapping and vaccinating the entire Pygmy rabbit population in the Columbia Basin, in an attempt to prevent the spread of RHDV2. While Washington state's trap and vaccinate program will help prevent viral transmission, this solution is essentially a stopgap measure. However, it's currently the only measure for endangered species. Washington State is a hotbed for feral domestic rabbits which elevates the risk.



Riparian Brush Rabbits

In California, the endangered riparian brush rabbits are under threat due to a deadly virus that has spread in the San Joaquin River Wildlife Refuge. The brush rabbit is a species of cottontail rabbit found in western coastal regions of North America, from the Columbia River in Oregon to the southern tip of the Baja California Peninsula. While the overall population of brush rabbits is stable, the Riparian Rabbit subspecies is listed as an endangered species by the USFWS. California Department of Fish and Wildlife, Oakland Zoo, and the U.S. Fish and Wildlife Services are coming together to vaccinate the rabbits. This is necessary as the virus has the potential to be fatal which might result in their extinction.



Vaccine

Vaccine Procurement Issues and Government Restrictions

No vaccines are approved and licensed for use in Canada or the US and it's an arduous process to import them under special permits for emergency use.

Two different vaccines are currently being imported from Europe, Filavac and Eravac.

Both require annual boosters.

While the vaccine itself isn't terribly expensive -- the 50 dose multi-vial (only viable for two hours) costs just over \$100 CDN and ten single doses just over \$200 -- but the cost of refrigerated shipments from Europe is a significant factor in calculating the total price. Broker fees may also apply.

When RHDV2 first surfaced in BC in 2018, the agriculture and wildlife provincial veterinarians worked in tandem and the response was stellar.

BC's Chief Veterinarian ordered the vaccine for all the veterinarians in the province with the costs of one large shipment shared by all the recipients. This substantially reduced the financial burden and cut down on the emergency importation paperwork. .

In Oregon, a private veterinarian, Dr. Sheri Schlormann, organized a consortium of two dozen or so fellow veterinarians. She handled the paperwork and ordered enough vaccines for all those vets, and then distributed it. Her clinic set aside a weekend to vaccinate for breeders and rescues for just \$7.50 US per rabbit plus the costs of a tattoo or microchip. .

Without this type of a coordinated effort, each veterinarian must do the substantial paperwork and pick up the import costs for individual shipments. Some vets had described unshared shipping and brokerage fees in the thousands.

Rabbitats has been promoting this cooperative model to other jurisdictions and hopes to continue to do so..

Vaccine Availability

There are currently two vaccines available from Europe under the emergency import umbrella. To be licensed in North America is a costly process for the manufacturers. Neither the States nor Canada will approve the vaccine other than in areas experiencing

outbreaks. In response to queries about that policy, the USDA Animal and Plant Health Inspection Service responded with the following:

1. The European companies have limited capacity and are not interested in obtaining a US license because they are selling all the products they are able to produce into the limited market at this time. Over time, they may be able to scale up, but at this time we are directing the limited inventory into the areas where we feel the most risk currently exists. Even affected states are experiencing backorders and cost increases.

2. There is a firm working very hard on a vaccine in the US, and CVB is assisting in every way possible to get a licensed vaccine onto the market. A niche market like rabbits will likely not be attractive if multiple vaccines are readily available. By allowing the unlicensed vaccine in without restricting it, we may very well stop development of a cheaper, safer, more easily accessible alternative vaccine that is licensed for the US.

So if we open the door wide and say anyone can have the vaccine, in the short term there will almost certainly be an immediate shortage situation with backorders of many months, and we could drive away interest from a potential longer term solution which would be better for all.

Vaccine - Additional

Mexico is using a domestically produced vaccine that targets the new variant and they have been aggressively vaccinating their farm rabbits. The US is also exploring domestic production although this would be well in the future.

Alberta Rabbit Alliance

The Alberta Rabbit Alliance was formed with a core group consisting of rabbit rescues in Lethbridge, Calgary and Edmonton in response to their budding feral rabbit issues, the approaching virus and ultimately the virus being discovered in Alberta. We secured a

website URL, formed a Facebook a Facebook group and did outreach to breeders, veterinarians and other stakeholders with varying degrees of success. The group was ultimately used to facilitate vaccinations for several rescue organizations (200+ rabbits). Rabbitats and alliance members also helped Alberta advocates form a new rescue (Wild Rose Rescue) and connected them with established rescues. The group is helping with a project to rescue feral rabbits from Calgary neighbourhoods with support from the City of Calgary and an organization, the Canadian Animal Task Force, with strong sterilization options.

Domestic Rabbits in the Environment

Definitions:

Rabbitats considers rabbits 'feral' when they are born outside and not contained.

"Abandoned pets" are rabbits born in captivity and then set loose; the ferals are the offspring of abandoned pets.

We differentiate between feral rabbits, house rabbits and farm or hutch rabbits because we try to provide housing based on their comfort zones. A rabbit born outside prefers outside, house-born rabbits prefer life inside. (Farm and hutch rabbits can go either way).

'Feral' is Not 'Wild'

The feral rabbits are still, at this point, 'City Rabbits' not only because of their preferred location, but because they retain their 'pet' demeanors. The ferals for the most part still like to stay near humans (and away from predators) and remain friendly. They never fully revert to the 'wild'.

Recent studies show domestic rabbits have substantially different brain structures than even their wild European brethren.

As Charles Darwin wrote in 'On the Origin of Species,' "no animal is more difficult to tame than the young of the wild rabbit; scarcely any animal is tamer than the young of the tame rabbit."

The study showed the differences in behavior between wild and domestic animals to a large extent are genetically determined.

Legal Classifications:

European rabbits are classified as pets, agriculture and wildlife by various agencies, sometimes within the same jurisdictions. Agencies routinely pass the buck to other jurisdictions, leaving them uncontrolled.

Laws and Policies

In BC, provincial policy greatly contributed to the feral rabbit issue. While pets and farm rabbits fall under the Ministry of Agriculture, the Ministry of Forests, Lands, Natural Resource Operations deemed loose domestic rabbits 'wildlife' (Schedule C) when 'not continuously contained since birth'.

Until recently, they stated that a permit application was required to pick up even recently abandoned pets, but permits weren't granted unless the rabbits were exported to the U.S thus handcuffing non-profit rescues.

It also created confusion at the municipal level, while some shelters embraced rabbit control, others did not, citing the provincial 'wildlife' designation.

Recently FLNRORD eased the requirements so while the European rabbits remain under Schedule C, anybody can trap and possess them without a permit, but a permit is still required to adopt or transfer the rabbits to another party.

This still technically handcuffs rescues and animal control. While policy changes are expected at any time eliminating these problems, it's now too little, too late.

The rabbit populations have increased beyond the current capacities of these agencies. Alberta does not classify the loose rabbits as wildlife. The rabbits are overseen by regional governments.

Washington State appears to not classify them at all, other than as a non-native invasive species. A state representative for the Washington State Department of Agriculture confirmed that neither WSDA nor the Washington Department of Fish and Wildlife has authority to control non-native feral domestic rabbits as they "fall under a grey area." They also state they don't have the resources to depopulate all feral domestic rabbits.

Abandonment Prevention

Preventing abandonment is an obvious conclusion and the most common 'solution' presented across all platforms when discussing loose rabbits in the environment, but it is not as easy as it sounds. Some guardians mistakenly believe that they are 'setting their rabbits free' to live a happy life, but many more simply have no other choice. Tight rental housing markets and other stress factors are forcing guardians to give up their pets. But many municipal shelters won't take the rabbits and rabbit rescues are few and far between -- and full -- leaving people with few if any alternatives.

Origins of Abandoned Rabbits

Casual observations show that many abandoned rabbits were bought from pet stores or Craigslist, and many were the results of accidental litters. (Pet stores and breeders often mis-sex rabbits sold to new guardians). The sellers in these cases do not accept 'returns'. Reputable breed-specific breeders, however, are more likely to accept returns.

Rabbits acquired via rescues and shelters are spayed/neutered, and those sources routinely ask that the rabbits be returned at any point the guardian is no longer able to care for them.

Reasons For Abandonment

Housing in recent years has been the most prolific reason for rehoming pets.

Allergies have consistently been a reason for rehoming, although most often they're allergic to the hay the rabbits eat and not the rabbits themselves.

'Toys' the kids have grown tired of remains a common excuse. .

Affordability comes up more rarely, although it's a main consideration when faced with accidental litters. Guardians overwhelmed by accidental litters appears to be a common reason for abandonment.

Cultural Influences

Cultural influences are not a significant factor beyond the usual divide largely falling to urban vs. rural mindsets, eg: hunters and those consuming rabbit meat are less likely to take the welfare of a pet rabbit seriously and may be more prone to release rabbits to 'let nature take its course'. Strong cultural misconceptions and stereotypes involving Asians, particularly Chinese, being inclined to eat rabbits or provide substandard care have been proven unequivocally false via years of observance and direct experience, but they persist.

Alternatives to Abandonment

An informal survey of municipal shelters shows widely differing policies and actions at times inconsistent with their policies. Ultimately they were unable to take unwanted rabbits the majority of the time either due to policy, RHDV2 fears and lack of quarantine space, or space limitations. Rabbit rescues proved to be few and far between with the existing organizations perpetually full. Multiple-species rescues often had no interest or no resources in rabbits.

The most common rehoming vehicle has been private adoptions via Craigslist and other online sources. This is parallel to sales, with no regulation for sterilization, along with suspect sexing and potentially bad outcomes for the rabbits being taken for nefarious purposes.

Adoption, Relocation Limitations

Most shelters and rescues report adoptions of only one or two rabbits per month. Most also adhere to guidelines established by the House Rabbit Society, a powerful organization started 30 years ago in northern California, promoting rabbits as indoor pets. Those guidelines include indoor homes only, sterilized rabbits only, and often requirements to keep rabbits, a very social species, in pairs. Only a very small handful of 'sanctuary' style rescues housed rabbits in outdoor colonies, and one recently closed its doors. Outdoor colonies are predominant with homesteaders, meat breeders, but not pet rescue or even farm sanctuaries.

Messaging

The Invasive Species Council's 'Don't Let It Loose' and other educational and 'shaming' campaigns are not offering better alternatives. Most guardians will not euthanize their pets nor surrender them to labs and zoos as suggested by 'Don't Let It Loose'. It's distasteful to the guardian and certainly distasteful to a large segment of the general public. Most love their pets, and even many small breeders are reluctant to conduct lethal culls on unwanted stock. The guardians who don't love their rabbits and just want them gone won't be convinced by an educational campaign. Also, issuing warnings about rabbits not surviving is not effective on its own given the thousands of European domestic rabbits who appear to be thriving in the environment. They are in fact dying in droves, but they are breeding faster than they die. That is not included in the messaging.

Sterilization

It can be hard finding vet care for rabbits and it can be expensive so not only will financially stressed people turn a rabbit loose rather than assume the costs of treatment or euthanasia, only a small percentage of those rabbits are sterilized. The majority of veterinarians do not see rabbits. They are routinely dismissed by small animal vets and farm vets. Sterilization costs vary widely from province to province and from clinic to clinic, ranging from \$150 to \$600. Rabbits are not included in the majority of low-cost spay/neuter programs conducted by such organizations as the SPCA.

Rabbitats contacted UBC about a chemical sterilization program developed for pigeons but were told that rabbits, as induced ovulators, are a more difficult subject.

Rabbit Breeding

Organized rabbit breeding includes breeding for shows, pets and meat. Serious breeders, like those belonging to ARBA (American Rabbit Breeders Association which

also covers Canada) will raise purebred rabbits for pets or show. Some will accept returns. They will sell rabbits not suitable for show to pet guardians, but they don't spay or neuter them. They will often choose to euthanize their unwanted rabbits rather than turn them loose.

Large commercial meat breeders keep hundreds, if not thousands, of rabbits in barns or warehouses with little opportunity for escapees. Others, many of them 'homesteaders, will have small herds for personal consumption.

Casual breeders, commonly referred to as 'Backyard breeders', produce poor quality or crossbred rabbits for pets or meat, and often keep them poorly contained or not contained at all.

Many 'backyard breeders' start with accidental litters. These breeders are also more likely to move from a property and leave their rabbits behind, which has been the origins of a number of feral colonies.

Breeder Restrictions, Licensing

Few jurisdictions require breeders to be licensed or rabbits be identified with tools like tattoos or microchips although a few require pet rabbits to be sterilized. Rabbitats would like to see sales restrictions for unsterilized rabbits, identification requirements and breeder licensing. We have to stem the flow of unsterilized pets, especially from pet stores and unscrupulous breeders.

Abandonment and Feeding Laws, Enforcement:

While abandonment laws exist, they have never been enforced to our knowledge. Citizens feeding the loose rabbits also appear to do so freely despite the laws.

Feral Rabbit History

This topic has not been heavily researched, but based on our experience, early isolated overpopulation incidents, aside from colonies released by hunters, seem to have been

escaped or released farm stock or pet rabbits from out-of-control hoarding situations. In many cases, households have thought to have moved, leaving rabbits behind. The following collection of news articles demonstrates the history as the issue begins with isolated instances of feral colonies::

United States

- Billings, Montana, United States: [Abundance of bunnies is becoming a nuisance](#) (2004).
- Reno, Nevada: [Don't Dump Rabbits - Reno \(2006\)](#)
- Carson City, Nevada, United States: [Woman worried about feral rabbits](#) (2007).
- Long Beach City College, California, United States: [Readin', 'Ritin', and Rabbits](#) (2011).
- Culver, Oregon: [Oregon homeowner faces rascally rabbits](#) (2015).
- Juneau, Alaska: [Rampant Rabbits: Invasive, Overrun Valley Neighborhood](#) (2015).
- Whidbey Island, Washington: [Hundreds of Bunnies Plague Langley, WA](#) (2015).
- Las Vegas, Nevada: Southern Nevada Adult Health Mental Services Campus,: [Feral Bunnies Are Taking Over Las Vegas; V Animal's Sanctuary](#) (2015-now).
- Valdez, Alaska: [The problem that Valdez just can't shake: An infestation of bunnies](#) (2017).
- Cannon Beach, Oregon: [Feral rabbits overtake Cannon Beach and no agency has responsibility](#) (2019).

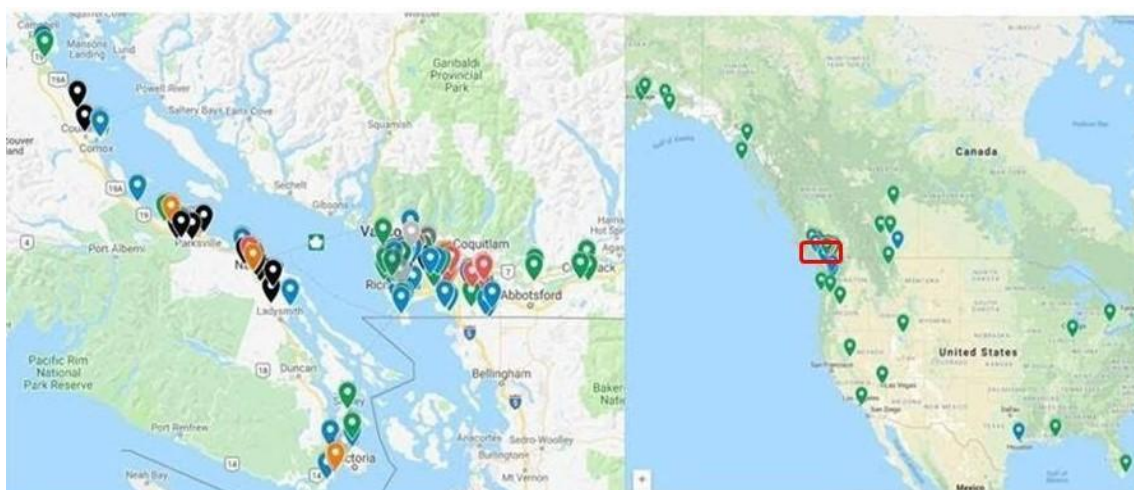
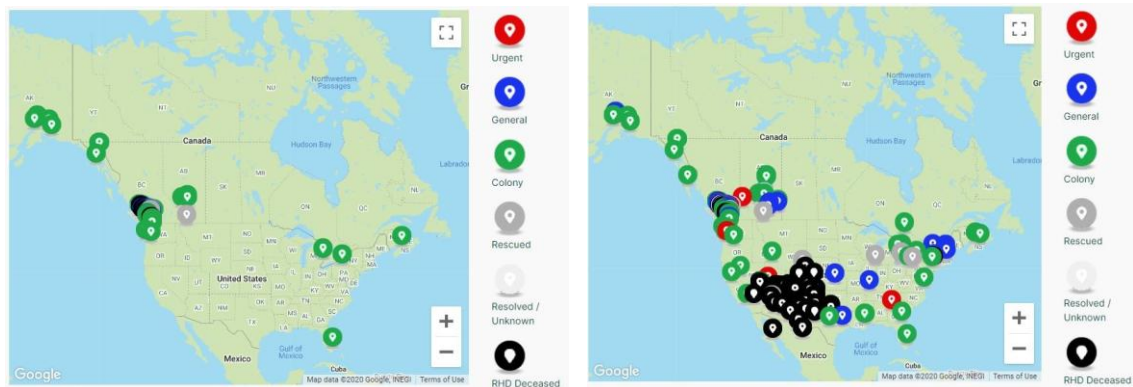
Canada

- Parksville, Vancouver Island, British Columbia: [Rabbits Over Populate Rath Trevor Beach Provincial Park](#) (1998).
- Victoria General Hospital, Victoria, British Columbia: [Rabbit saviour takes on hare hitman](#) (2000).
- Canmore and Banff, Alberta: [Bunnies are still swarming Canmore despite a cull; Feral Rabbit Management Program; The Canmore bunnies](#) (1980-now).
- Kelowna, British Columbia: [Rabbits](#) (2008).
- University of Victoria, Victoria, British Columbia, Canada: [Rabbits @ UVic; The Great UVic Rabbit Rescue; UVic Feral Rabbit Rescue Project](#) (2010).
- Delta, Vancouver, British Columbia: [B.C. city gets rid of rampant rabbits](#) (2012).
- Chilliwack, British Columbia: [Rabbit rampage sparks call for pet store ban](#) (2012).

- Richmond, British Columbia - [Feral Rabbit Problem Growing at Richmond Auto Mall](#) (2012)
- Sudbury, Ontario: [Rabbit colony takes over Garson neighbourhood](#) (2014).
- Vancouver Island University, Nanaimo, British Columbia: [Feral bunnies take over Vancouver Island](#) (2015).
- Powell River, BC: [Feral Rabbits Becoming A Problem](#) (2015)
- Calgary, Alberta: [Feral rabbits a concern in some Calgary neighbourhoods](#) (2016).
- Helmcken Overpass, Victoria, British Columbia: [Helmcken Overpass bunnies' days are numbered](#) (2016).
- Edmonton, Alberta: [Feral rabbits divide Edmonton neighbourhood](#) (2016).
- Calgary, Alberta: [Feral rabbit population booming in Calgary parks](#) (2019).
- Medicine Hat, Alberta: [Humane Society searches streets for pet rabbits abandoned by owners](#) (2019).
- Royal Bay neighborhood, Colwood, Victoria, British Columbia: [Colwood staff brief council on growing feral rabbit population in Royal Bay](#) (2020).
- Edmonton, Alberta: [Bunny colony grows at cemetery, threatened by syphilis and predators](#) (2020).
- Medicine Hat, Alberta: [Bunny Run Rabbit Rescue gives new life to feral rabbits](#) (2021).

Mapping

A mapping project was launched in 2017 by Rabbitats at <http://map.abandonedrabbits.com> to flag abandoned pet rabbits, feral populations and RHD virus deaths. This has provided some information about the fast-growing colonies of loose domestic rabbits. While they were overrunning moderate BC climates, they were also thriving in inhospitable climates like Nevada, Alaska and Alberta.



Mapping Issues

The Rabbits map on abandonedrabbits.com has been in development but with few resources, we have found serious limitations when it comes to accurately portraying the progression of the RHDV2 variants and the growth and expansion of feral rabbit colonies. Additionally, the map can accurately show recently abandoned pet rabbits but we lack the resources to monitor and act on these reports.

Negative Impacts of Feral Rabbits

Property damage is inevitable where feral rabbit colonies are found. As a result, property owners are livid about the damage and the mess. Rabbits at the University of Victoria were accused of destroying the school's playing fields and creating player safety hazards.

Richmond Auto Mall noticed damage to expensive trees following five years of feral colonies in the immediate area. Taxpayers cover the costs of repairing damaged city property, while property owners contend with rabbits eating gardens, plants, trees, and fences.

Rabbits attract predators like foxes, coyotes, and bobcats to urban neighbourhoods. The newest issue, the rabbits act as a conduit for the virus that will greatly affect pets, farm rabbits and wild rabbits including several at-risk native species.

Feral Rabbit Control

Trap, Neuter, and Release is prohibited in BC although it has been considered in Alberta. With the onset of RHDV2 spread by feral colonies, affecting native rabbits and hares, leaving rabbits in the environment is no longer considered a wise option. Pest control companies are unlikely to assist with trapping. British Columbia currently allows relocation, however according to FLNRORD staff, that policy is expected to change in the fall. Trap, neuter and contain proved to be the most acceptable method in a survey conducted by Rabbitats.

Current Feral Status

So far, rabbits are an urban problem, overrunning cities and not the countryside. They can be found burrowing under structures and living in the busier areas of popular parks. After decades the offspring are still domestic, which is in keeping with a recent study that found the brains of domesticated European rabbits are substantially different than their wild brethren.

Observations note that the litters have generally gotten larger over the last few years, and they seem to be more frequent. They are breeding every 31 days with 7 to 9 kits in a litter.

It was recently determined that young rabbits are spreading out by hitching rides in the undercarriages and chassis of cars. Mothers are also giving birth in the cars. This is making their spread less predictable.

Feeding Rabbits

Citizens continue to feed the feral rabbits, in spite of bylaws and regulations, and this may be accounting for the larger litters. (More study is needed). A 'Do Not Feed The Rabbits' education campaign is needed.

Lethal or Non-Lethal Control?

The rabbits are cute, much-loved house pets and (so far) an urban problem. There are very limited lethal options. These are urban rabbits. They can't be shot. Poison will kill the wildlife that eat the rabbits. Historically, lethal solutions have been met with resistance that have delayed or derailed lethal plans while the rabbits continued to breed. Lethal culls undertaken by citizens, businesses, campuses or governments have been met with protests, lawsuits and blockades along with rising costs as the rabbits continued to breed. Non-lethal solutions have been met with cooperation and public donations.

Pest Control Companies

Rabbitats contacted a selection of pest control companies and environmental consultants in BC and Alberta. We found that most will not remove rabbits, either humanely or lethally. They routinely suggested other ways to deal with feral domesticated rabbits include installing chicken wire fencing, live trap and relocation, contacting the SPCA, rabbit rescues, Fish and Wildlife Animal Services, or simply leaving them alone. Orkin indicated the rabbits were too hard to catch in their traps,

while a large environmental consulting firm indicated that while it may be possible to hire them for a project large enough to cover the costs of a team of biologists, they would be reluctant to do so because the situation was always so volatile.

Consultants and trappers in the past for large scale projects like Kelowna and Canmore, AB, have cost \$50,000 to \$60,000 per year. Humane euthanization adhering to SPCA standards is costly.

Control Methodology

Our experience has shown that feral rabbit rescue cannot be random. Complete areas need to be cleared of all rabbits and monitored to make sure they don't repopulate. All of the rabbits need to be removed from an area at the same time or they'll repopulate even faster. Rabbits will not trap part of a colony or an entire colony where other colonies are close by. This also means that businesses, property owners and stratas willing to fund the removal of the rabbits from their properties will find their efforts wasted without governments willing to do their share for nearby boulevards, parks and other public spaces.

Sanctuary Rescue

The majority of people polled supported a trap, neuter and contain policy for feral rabbit control.

While rabbit sanctuaries are few and far between, the ones in existence have been successful. When kept in a natural environment, the rabbits have been inexpensive to feed and easy to maintain. The most common issue has been inadequate housing, which is fixable.

In the distant past, problems with two entities getting overextended ended badly for the rabbits taken from the Victoria General Hospital in 2000. Both involved sanctuaries run by individuals and not established charities.

While the UVic rescue in 2010 was fought with infighting with a number of rescuers filing complaints about other rescuers, close to 1000 rabbits were successfully rehomed to sanctuaries and the project was successful.

Rabbitats began constructing inexpensive and secure sanctuaries in 2013 with few issues.

Currently roughly 600 rabbits are in our sanctuary system consisting of two main sanctuaries and several satellite operations.

Case Studies

Successful Rabbit Control

UVic - Two thousand domestic rabbits were estimated to be inhabiting the University of Victoria campus at its peak. The campus initially paid \$20,000 for a failed rescue/research program, then ordered a lethal cull. After the first 100 rabbits were killed, protests, injunctions and provincial regulations delayed the project, and international media attention allowed rescuers to raise funds and find sanctuary space on Vancouver Island and in Washington State and Texas. The project was plagued by rescue infighting but UVic remains rabbit-free.

Kelowna - The City of Kelowna was overrun with feral rabbits and in 2008 the City called an exterminator in spite of protests from the local community. The exterminator was caught stomping a rabbit and the ensuing protests caused the City to stop the cull and redirect the funds to a local rescue group. Roughly 800 rabbits were eventually housed in a number of enclosures hosted throughout the area. The city passed a bylaw requiring all rabbits for sale or adoption to be sterilized. After three years Kelowna was virtually rabbit-free. The rabbits remain under control.

Delta - The Vancouver suburb of Delta successfully trapped and sterilized hundreds of rabbits and released them into a contained park to live out their lives. The budget was set at \$60,000; however, actual costs were much lower than expected. The municipality noted the costs were far less than the annual costs of repairing the damage caused by the rabbits in the civic precinct. A spay/neuter law and diligent animal control has kept the rabbits in check.

Richmond Auto Mall - The Richmond Auto Mall saw 16 dealerships pool resources to come up with a sizable investment for the humane removal of 300+ rabbits over several years. They supplied spay/neuter funds and full vehicle support, and several dealerships also provided free space.

Edgewater Neighborhood - A group of condo owners in a gated community in Richmond ended up with two rabbits on their property and they quickly turned into a dozen or more. An instigator contacted Rabbitats and arranged for us to provide low cost spay/neuters and advertise looking for homes for the babies. They worked hard at fundraising and adoptions and managed to get most of the rabbits rehomed. Rabbitats took the rest. The area remains rabbit-free.

Dover Neighbourhood - Rabbitats Rescue Society entered into an agreement with the City of Richmond in December of 2019 to clear nuisance feral rabbits from the neighbourhood. A city rep met with various strata councils governing the majority of the residences and agreed to fund a control program with support from the stratas. Rabbitats Rescue Society determined the per rabbit cost to trap and care for the rabbits was \$300, split three ways with the City, the Neighbourhood and Rabbitats' donors sharing the cost. Subsequently 85 rabbits were either trapped or born from trapped mothers, and put into our sanctuary and adoption systems. A total of \$15,000 was paid through the City of Richmond.

Unsuccessful Rabbit Control

Canmore, AB - In 2011, the town of Canmore, Alberta, faced with a burgeoning feral rabbit population attracting predators and causing conflicts, budgeted roughly \$60,000 per year tendered to a lethal trapper. The town invited a rescue to take rabbits but did not allow them to share the budget. This was not sustainable, so eventually the rabbits were gassed. Residents not in favour of the lethal cull denied trappers permission to come on their property and the rabbits continued to multiply. Close to a half million dollars has been spent on the project, acknowledged as a failure by the town council.

Powell River, BC - Powell River had a small rabbit issue that neighbours feared would get out of control and a lethal cull was ordered in 2017. The trapper was unable to get all the rabbits, at least four were left behind, reportedly protected by neighbours against the lethal cull, and the rabbits have since repopulated to even higher number.

Vancouver International Airport - The Airport Authority quietly embarked on overnight rabbit culls in June of 2021, hiring a contractor to shoot the colony of feral rabbits in spite of Rabbitats' attempts to work with the airport's wildlife control division. Airport employees reported the cull to the media. The public outcry caused the near-immediate cancellation of the project.

Research

Very little research has been done on the biology and habits of domestic rabbits in the wild. Our conclusions are from frequent but casual observations. Research at a higher learning level is definitely required.