

Pennsylvania Rabbit Hemorrhagic Disease Management Plan



Prevention. Surveillance. Management.

August 2022

Acknowledgments

We thank the many collaborators who assisted in the development of this Rabbit Hemorrhagic Disease Management Plan. They include the University of Pennsylvania's Wildlife Futures Program, the Pennsylvania Department of Agriculture, and many dedicated Pennsylvania Game Commission personnel. We also appreciate the thoughtful feedback that stakeholders have and will continue to provide.

Executive Summary

In early 2020, rabbit hemorrhagic disease (RHD) was detected for the first time in free-ranging wild hares and rabbits in the United States. RHD is a notifiable foreign animal disease (FAD) and due to its highly contagious nature and propensity to induce large-scale mortality events, is a serious threat to both domestic and wild lagomorph populations. The virus responsible for the current outbreak in wild populations in the Southwestern United States is RHD virus serotype 2 (RHDV2). As of February 2022, RHDV2 has become endemic in wild lagomorphs across 11 states: Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Texas, Utah, and Wyoming.

This Management Plan establishes a framework for preventing and surveilling for RHD within Pennsylvania, while presenting additional management strategies that may be deployed should the disease emerge in the Commonwealth. Its goals are first to minimize the effects of RHD on Pennsylvania rabbit and hare populations and secondly to increase the public's understanding of, support for, and participation in RHD management efforts. To accomplish these goals, the Game Commission must prevent, detect, and manage the disease, as well as conduct extensive public outreach throughout the Commonwealth. Management strategies to mitigate introduction and disease transmission include:

1. A ban on importation of wild lagomorphs and their parts or products into the Commonwealth from any jurisdiction where RHDV2 has been detected in wild or domestic lagomorphs in the past 12 months.
2. The rapid investigation of [RHD-suspect](#) cases.
3. The establishment of an [RHD-Disease Management Area](#) following an RHDV2 detection and within that area limit movement of wild lagomorph parts, increase surveillance, amend permits, and promote appropriate biosecurity practices.

Extensive communication efforts must also be made with engagement occurring at the local and statewide level to increase public understanding of the severity of RHD.

First developed in 2021 and approved by the Pennsylvania Board of Game Commissioners in April 2022, this Management Plan is a living document and will be reviewed at least annually to determine if objectives are being reached or if modifications are warranted. The management strategies within this plan are based on the best available science. While the most recent formal public comment period for this version of the plan concluded on October 31, 2021, stakeholders are encouraged to continue to provide input to ensure a shared investment in its outcomes. Through this collaborative approach, we are confident that wild native hares and rabbits will continue to thrive within Pennsylvania.

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Problem Statement

Rabbits and hares play a significant role in the ecosystem, both as herbivorous consumers of plants and as a source of food for carnivorous birds and mammals. They are also a valued game species. Rabbit hemorrhagic disease (RHD), which can potentially significantly reduce wild native rabbit and hare populations, could disrupt that ecological balance. When RHD is introduced to a population of lagomorphs, intraspecific social behavior and viral persistence in the environment facilitates rapid and widespread disease transmission which could be catastrophic to small or geographically isolated subpopulations. Complete eradication of the virus during an outbreak may be accomplished through depopulation, followed by cleaning and disinfection of enclosures and associated equipment, imposition of quarantines, and surveillance. While these strategies may be deployed for controlling or resolving outbreaks in captive populations, once RHD emerges in wild populations, eradication becomes nearly impossible. It is therefore of utmost importance that the Game Commission takes proactive measures to prevent this disease from entering Pennsylvania. At the same time, the Game Commission must be prepared to implement management strategies to contain and limit the impact RHD may have should it emerge in the Commonwealth.

Introduction

Agency Responsibility

The mission of the Pennsylvania Game Commission (Game Commission) is “to manage Pennsylvania’s wild birds, wild mammals, and their habitats while promoting hunting and trapping for current and future generations”. This responsibility is derived from the Constitution of the Commonwealth of Pennsylvania (Article I, § 27) and Game and Wildlife Code (Title 34) and affords the Game Commission with constitutional and legal authority in wildlife management actions. Given current knowledge of rabbit hemorrhagic disease (RHD) and its impacts on [lagomorph](#) populations in other states, it is the Game Commission’s responsibility to acknowledge RHD as a serious threat to Pennsylvania’s rabbit and hare populations, as well as take appropriate actions to mitigate the effects of the disease. The management strategies described in this Management Plan are intended for the long-term benefit and preservation of Pennsylvania’s lagomorph populations. It is with that responsibility in mind that this Pennsylvania Rabbit Hemorrhagic Disease Management Plan was developed.

Stakeholder and Partner Engagement

A variety of stakeholders have an interest in RHD and how disease management efforts will impact wild native lagomorphs in the Commonwealth. The Game Commission and these stakeholders share a desire to maintain healthy rabbit and hare populations in Pennsylvania.

State and federal government agencies responsible for natural resource management and agriculture have been engaged in discussions about how to best manage this disease. Certain agencies, such as the Department of Conservation and Natural Resources (DCNR), local parks departments, and the United States Department of Agriculture (USDA) - Forest Service, have an interest in RHD due to the impact lagomorphs have on habitat and how lagomorph health affects the public’s experience in the outdoors. Other agencies may be concerned because lagomorphs are consumed by people (e.g., Department of Health), kept in captive settings (e.g., Pennsylvania Department of Agriculture (PDA)), or because of potential human-wildlife conflict (e.g., USDA - Animal and Plant Health Inspection Service - Wildlife Services (USDA-APHIS-WS)). Some agencies have regulatory authority, but all make valuable contributions by providing perspective, expertise, and guidance, together forming a governmental partnership in managing RHD.

Engaging with non-governmental stakeholders is just as vital to the success of RHD prevention, surveillance, and management efforts. Hunters, sportsmen’s groups, landowners, wildlife watchers, retailers, academic institutions, and other interested parties must be involved in the process.

Hunters have a considerable impact on the Game Commission and Pennsylvania’s economy. License sales are an important part of the Game Commission’s operational budget and hunters have an estimated \$971 million impact on retail and tourism in Pennsylvania ¹. Hunters’ concerns that RHD may change their hunting experience are not unfounded. The Game Commission recognizes the importance of working with rabbit and hare hunters to achieve RHD management goals.

Landowners are another important stakeholder group and can be public (e.g., state parks, state forests, state game lands) or private (e.g., rural homestead, family-owned farm). There are 16.8 million acres of forestland in Pennsylvania, 70% of which is owned by private landowners. Parcels vary in size and landowners may have various management goals and/or land-use intentions. Hunting and fishing are one of the top reasons for land ownership and land leasing ². The Game Commission seeks to engage these diverse landowners to understand their interests and involve them in RHD management.

Wildlife watching is a growing activity in Pennsylvania and has a \$1.3 billion economic impact through retail sales and tourism. Observing wildlife connects participants to nature in many of the same ways as those who hunt, and generates concern for wildlife health and welfare ¹. Such core values are shared with the Game Commission. Wildlife enthusiasts can have a positive impact by influencing policy. The Game Commission recognizes the importance of this stakeholder group in managing RHD.

Academic institutions are valuable partners to engage in RHD management because of their research capacity, disease expertise, and diagnostic capabilities. The Game Commission maintains a partnership with the University of Pennsylvania through the Wildlife Futures Program (WFP). The molecular laboratory at the New Bolton Center, which is part of the Pennsylvania Animal Diagnostic Laboratory System and serves as the parent lab system for the WFP, has recently developed a RHD polymerase chain reaction ([PCR](#)) test that is available to the Game Commission. The WFP also has wildlife health technicians working in the field throughout the Commonwealth who are on the front lines of wildlife health surveillance.

Managing RHD in Pennsylvania requires a comprehensive approach that engages all stakeholders to identify and implement adaptive strategies. Information sharing will be critical to ensure stakeholder interests are understood and to gather support from the public. The Game Commission needs active participation in RHD management, such as hunters reporting suspect rabbit or hare mortalities, to accomplish disease surveillance objectives. Therefore, this Management Plan includes both a communication and an adaptive resource management component.

Disease Overview

RHD is a highly contagious disease of wild and domestic rabbits caused by a non-enveloped, single-stranded RNA calicivirus. RHD-causing viruses currently fall within three distinct pathogenic groups: RHDV, also referred to as classic RHDV or RHDVa; RHDV1 which is a subtype of RHDV; and [RHDV2](#), sometimes referred to as RHDVb.

The first RHD virus to have been identified, RHDV is believed to have emerged in Europe in the 1970s or 1980s. One of the first documented major outbreaks occurred in 1984 in China resulting in 14 million domestic rabbit deaths within nine months. RHDV only appears to impact wild and domestic European rabbits – domestic rabbits worldwide originate from European lineage – and is now endemic in Australia, New Zealand, Cuba, most of Europe, in addition to parts of Asia and Africa. While there have been past detections of RHDV in the United States, native North American lagomorphs do not appear to be susceptible.

In contrast to RHDV, RHDV2 is a distinct serotype that can affect both European and North American lagomorphs. It was first documented in France in 2010 and has since spread across Europe, parts of the

Mediterranean, the Middle East, Asia, New Zealand, Australia, and the United States. It was first detected in domestic rabbits in the United States in 2018 and was first found in wild U.S. lagomorphs in 2020.

The viruses that cause RHD are easily spread amongst hares and rabbits via direct contact with live or dead infected individuals, fomites (e.g., equipment, tools, enclosures, meat), and vectors (e.g., insects, birds, scavenging mammals). Infected lagomorphs shed the virus in their secretions (e.g., conjunctival, respiratory, salivary) and excretions (e.g., feces, urine). A lagomorph infected with RHDV2 can have detectable virus found throughout their body, so high-risk parts that may carry RHDV2 include living lagomorphs, as well as any lagomorph parts or products, such as the carcass, hide, pelt, and meat. The virus can persist in flies for up to nine days, for weeks in dried excretions/secretions, and for up to three months in carcasses. As such, eradication of the disease in wild settings is inherently challenging and wild populations must often naturally develop immunity before populations can recover.

Lagomorphs as young as a few weeks old are susceptible to infection. The incubation period for RHDV2 is 1-5 days and those infected with RHD often die suddenly. Any infected lagomorphs that do not die acutely may exhibit poor appetite, lethargy, fever, or bloody nasal discharge. Chronic infection can lead to liver disease, respiratory distress, diarrhea, weight loss, and death. Pathology of RHD-infected carcasses often reveals liver necrosis and hemorrhage. Infection is confirmed through detection of RHD virus antigen through enzyme-linked immunoassay (ELISA) or PCR testing of liver, lung, spleen, or whole blood, while past exposure can be determined via detection of RHD antibodies in whole blood.

There is no cure for RHD-infected lagomorphs; supportive treatment, if pursued, must be conducted in isolation while maintaining strict biosecurity to prevent disease transmission. Prevention of disease introduction is dependent on taking all proper biosecurity measures (e.g., cleaning, disinfection, PPE), never releasing domestic lagomorphs into the wild, and administering vaccines when appropriate. An unlicensed RHDV2 vaccine has been developed and in October 2021 received Emergency Use Authorization by the USDA's Center for Veterinary Biologics (<https://medgenelabs.com/rhdv2/>). This vaccine has been approved for use in Pennsylvania but only in captive domestic rabbits. Vaccination of domestic rabbits, keeping them indoors, and not providing outdoor-grown greens or forage from suppliers based in RHD-endemic areas are all steps that can be taken to safeguard domestic rabbit health.

Rabbit hemorrhagic disease is designated as a foreign animal disease (FAD) by the United States Department of Agriculture. As such, the [USDA oversees and coordinates any initial response](#), working closely with state and local agencies. FADs are diseases that are not normally present within animal populations of the United States. Most FADs can spread easily, have high morbidity and/or mortality rates, and can have significant negative economic impacts. Examples of other FADs include African swine fever, brucellosis, and foot-and-mouth disease. Initial investigation of a FAD-suspect case is performed by a Foreign Animal Disease Diagnostician (FADD). FADDs have successfully completed specialized training at the National Veterinary Services Laboratories (NVSL) and other educational requirements stipulated by USDA-APHIS Veterinary Services (VS).

Any initial detection of RHDV2 within any lagomorph species within the Commonwealth, or any state that is currently free of RHD, must be confirmed at the USDA Foreign Animal Disease Diagnostic Laboratory (FADDL) on Plum Island in New York. Subsequent RHD-suspect cases, if within that same

lagomorph species, can be tested at other diagnostic laboratories that are authorized to conduct such testing (e.g., University of Pennsylvania's New Bolton Center) without needing FADDL confirmation.

Disease Implications

Human Health

The viruses that cause RHD cannot infect humans. However, unexplained rabbit or hare mortalities can be caused by other zoonotic diseases, such as tularemia and plague, that can cause serious illness or death in humans. As such, humans should always avoid coming into contact with any sick or dead wildlife.

Livestock & Agriculture Industries

RHD does not infect any animals outside of those in the taxonomic order Lagomorpha. This order includes rabbits, hares, and pikas. RHDV2 can have devastating impacts on domestic rabbit production. Pennsylvania has historically been one of the top domestic rabbit producers nationally, so the economic consequences of this disease's introduction would be significant. The Game Commission holds no authority over domestic lagomorphs within the Commonwealth. Voluntary inspections of any rabbit slaughter facilities in Pennsylvania are conducted by the Pennsylvania Department of Agriculture (PDA) or USDA.

Domestic Rabbit & Hare Populations

RHD can easily be spread amongst and between domestic and wild populations. As such, the Game Commission and PDA will ensure that details surrounding any suspect RHD cases or detections in either wild or domestic populations will be communicated in a timely manner to facilitate a rapid and coordinated response. Outreach will have to occur to inform the broader veterinary community of any RHDV2 detections in either domestic or wild populations.

Native Wild Rabbit & Hare Populations

The exact impact RHD would have on Pennsylvania's wild native rabbit and hare populations is unknown. However, due to the ease with which the disease spreads, the high mortality rate following infection, and evidence of what has happened in the Southwestern United States, it is more than reasonable to assume that the emergence of RHD in the Commonwealth's wild populations would have significant ramifications.

Pennsylvania is home to three native wild lagomorph species: the eastern cottontail (*Sylvilagus floridanus*), the Appalachian cottontail (*Sylvilagus obscurus*), and the snowshoe hare (*Lepus americanus*). While the eastern cottontail is common across the landscape, the Appalachian cottontail and snowshoe hare are both habitat specialists. The Appalachian cottontail is a species of greatest conservation need and the hare is a species of conservation concern.

The snowshoe hare, with a specialized white pelt and foot morphology, has adapted to survive in cold environments and high elevations with long-lasting snow cover. Appalachian cottontails have also evolved to survive the cold climates of high elevations through physiological adaptations. These two species are found in areas with dense vegetation that provides food, thermal cover, and protection from predators, especially during winter. With limited suitable habitat found in Pennsylvania, their populations are fragmented across the Commonwealth.

Eastern cottontails, on the other hand, are found throughout Pennsylvania. Their range overlaps that of the snowshoe hare and Appalachian cottontail. Their extensive distribution is due in part to a long history of humans moving the species across the Commonwealth, as well as importing the species from other states. Since they are the most common and widespread lagomorph species in Pennsylvania, the eastern cottontail would be the most likely candidate to be identified in an initial RHDV2 detection and could introduce the disease to snowshoe hare and Appalachian cottontail populations.

The Game Commission is considering research to determine the genetic structure of eastern cottontails and associated landscape features. Research findings could better inform how RHD may spread amongst Pennsylvania's wild lagomorph populations and as such, better advise management strategies described within this Management Plan.

Hunting & Wildlife Conservation

Lower populations due to RHD can lead to reduced hunting and dog running opportunities. As RHD mortalities increase, rabbit and hare populations may not be able to sustain the same level of hunter harvest. Hunters and hunting dog owners may also choose to not hunt or run dogs in areas that are impacted by RHD, hunt elsewhere, or stop hunting altogether. Fewer rabbit and hare hunting opportunities and/or a decrease in hunter participation will negatively impact Pennsylvania's hunting traditions, potentially leading to lost revenue through license and hunting gear sales. Less revenue would be raised by the Wildlife Restoration Trust Fund via the Pittman-Robertson Act of 1937, now known as the Federal Aid in Wildlife Restoration Act, which raises funds through a nationwide 11% tax on the sales of long guns and ammunition, as well as a 10% tax on the sales of handguns. RHD may affect hunting activities resulting in unknown economic impacts.

History of Rabbit Hemorrhagic Disease Virus 2 in the United States

Early detections of RHDV2 in the United States were limited to domestic rabbits in Ohio (2018) and New York (2020), along with feral rabbits (also of European lineage) in Washington (2019). In 2020, a unique strain of RHDV2 unrelated to previous detections was confirmed as the cause of widespread morbidity and mortality in domestic rabbits as well as in wild free-ranging North American hare and rabbit populations. RHDV2 has since become endemic in wild lagomorphs across 11 states: Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Texas, Utah, and Wyoming. The same strain has been confirmed in multiple domestic rabbit populations in Florida, Georgia, Hawai'i, Kansas, Kentucky, Minnesota, Mississippi, New Jersey, New York, South Dakota, Tennessee, and Washington. As of August 2022, the source of the outbreak remains unknown.

As is sometimes the case with wildlife diseases, prolonged exposure to RHDV2 may eventually enable wild lagomorphs to develop natural immunity and their populations to rebound. However, despite lagomorphs' prolific reproductive cycle, a timetable for any recovery following an RHD outbreak is unknown, especially considering additional stressors experienced by Pennsylvania's snowshoe hare and Appalachian cottontail populations.

Rabbit Hemorrhagic Disease Management in Other States

Currently, an RHD-specific management plan has not been developed by the USDA, but the department does maintain a map of affected counties across the United States that tracks the current

outbreak. The Maryland Department of Natural Resources published a plan in late 2021 but the Game Commission is unaware of similar developments in other state agriculture or wildlife agencies. However, various wild population management techniques have been pursued in response to the current RHDV2 outbreak. State wildlife management agencies have been working closely with their wildlife viewing and hunting communities to encourage the reporting of diseased rabbits and the proper removal of harvests from the landscape to mitigate the spread of disease. The California Department of Fish and Wildlife, in collaboration with federal authorities, has vaccinated select subpopulations of riparian brush rabbits due to their endangered status. While no RHD vaccines are currently licensed for use in the United States, the USDA has issued Emergency Use Authorization to select veterinarians to import RHDV2 vaccines from Europe to administer to wild or captive native North American lagomorphs. More recently, Medgene Labs, a pharmaceutical provider in South Dakota, developed an RHDV2 vaccine that has also received Emergency Use Authorization. As of August 2022, this vaccine is available in 45 states and Washington D.C.

Rabbit Hemorrhagic Disease Management by Pennsylvania Department of Agriculture

On September 26, 2020, the Pennsylvania Department of Agriculture (PDA) issued an [interstate/international quarantine order for RHD](#) to mitigate the introduction of the disease to the Commonwealth from domestic rabbit sources. On February 5, 2022, PDA issued a [general quarantine order for RHD](#) to provide information on the RHDV2 vaccine from Medgene Labs.

Management Goals, Objectives, and Strategies

Goal 1: Minimize the risk of RHD introduction to Pennsylvania’s native wild rabbit and hare populations.

Objective 1.1: Prevent human-caused introductions of RHD into native wild lagomorph populations.

Strategy 1.1.1: Issue and enforce an [executive order](#) banning the import of wild lagomorphs and their parts or products into the Commonwealth from any jurisdiction where RHDV2 has been detected in wild or domestic lagomorphs in the past 12 months.

Strategy 1.1.2: Collaborate with the Pennsylvania Department of Agriculture to mitigate disease spillover risk from domestic to wild populations.

Objective 1.2: Rapidly investigate [RHD-suspect](#) cases in wild lagomorphs.

Strategy 1.2.1: Refine diagnostic testing strategies and expand testing capacity to provide rapid RHD diagnoses.

Strategy 1.2.2: Investigate any mortalities involving two or more wild lagomorphs when the cause of death is unclear.

Strategy 1.2.3: Collaborate with the United States Department of Agriculture and Pennsylvania Department of Agriculture on any field investigations of suspect or confirmed RHD cases.

Strategy 1.2.4: Engage stakeholders and Game Commission personnel to facilitate recognition of RHD-suspect cases.

Strategy 1.2.5: Ensure Game Commission personnel are properly trained and outfitted to conduct or support investigations.

Goal 2: Minimize the effects of RHD on Pennsylvania’s native wild rabbit and hare populations.

Objective 2.1: Determine the scale, scope, and limit potential disease spread following an RHDV2 detection.

Strategy 2.1.1: Establish an [RHD – Disease Management Area](#) (RHD-DMA).

Strategy 2.1.2: Increase RHDV2 surveillance of wild lagomorphs within the RHD-DMA.

Strategy 2.1.3: Modify existing executive orders or issue additional executive orders to limit or restrict movement of wild lagomorphs, parts, or products out of the RHD-DMA.

Strategy 2.1.4: Increase disease awareness, provide guidance to reduce human-driven disease transmission, and amend permit activity as needed.

Strategy 2.1.5: Document and investigate additional suspect RHD cases within the RHD-DMA to evaluate management strategies.

Goal 3: Increase stakeholder understanding of, support for, and participation in RHD management efforts.

Objective 3.1: Foster two-way communications and utilize human dimension techniques to assess stakeholder values and opinions on Game Commission RHD management efforts.

Strategy 3.1.1: Create a comprehensive [RHD Communications Plan](#) and review at least annually providing updates as needed.

Strategy 3.1.2: Identify stakeholders, their concerns, and utilize the best platforms to both address stakeholder interests and Game Commission communications objectives.

Strategy 3.1.3: Develop support for Game Commission RHD management activities by providing consistent information that clearly illustrates management objectives, the necessity of management actions, and how they impact stakeholders.

Strategy 3.1.4: Conduct educational outreach and marketing campaigns to communicate key messages about RHD.

Geographic Designations

In the following section, geographic areas are described that follow the Game Commission's response to an initial RHDV2 detection in either domestic or wild populations within Pennsylvania or in an adjacent state within 10 miles of the Pennsylvania border.

Rabbit Hemorrhagic Disease – Disease Management Areas

RHD – Disease Management Areas (RHD-DMAs) are created when RHDV2 is detected in wild or domestic lagomorphs in Pennsylvania. RHD-DMAs may also be created if there is an RHDV2 detection in a state adjacent to Pennsylvania that is within 10 miles of the Pennsylvania border. To designate an RHD-DMA, a buffer with a radius extending *up to* 10 miles is created around each new RHDV2 detection. This range accounts for the upper extent of [dispersal](#) distances documented in snowshoe hares.³ If a new detection is near the extent of an existing RHD-DMA boundary, either within or outside, the existing RHD-DMA's boundary could expand to encompass this latest detection. If a new detection is found within an existing RHD-DMA and its buffer falls entirely or mostly within the existing RHD-DMA, no change will be made to the existing RHD-DMA's boundary. Alternatively, a new detection well beyond the boundaries of any existing RHD-DMA will lead to the creation of a new RHD-DMA. The bridging of two separate RHD-DMAs may yield a new RHD-DMA or expansion of either of the two existing RHD-DMAs with potential dissolution of the more recently created RHD-DMA. Actual distance of an RHD-DMA boundary from RHDV2 detections will depend on epidemiologic and biological factors, as well as local geography and availability of easily identifiable physical boundaries (e.g., roads, rivers). If no additional RHDV2 detections occur along the periphery of an RHD-DMA for 12 consecutive months, the RHD-DMA boundary may be reduced. If no additional RHDV2 detections occur *throughout the entire* RHD-DMA for 12 consecutive months, the RHD-DMA may be dissolved.

Purpose: To reduce human-related activities that amplify and spread RHDV2, to increase the probability of early detection of RHDV2 in areas surrounding known RHDV2 detections through increased surveillance efforts, and to mitigate further shedding of the virus into the environment.

Management Strategies: Approaches to prevent amplification of RHDV2 within an RHD-DMA include modification, restriction, or revocation of permits issued by the Game Commission through executive order to prevent permittees from unwittingly contributing to RHDV2 transmission. Strategies to increase RHDV2 surveillance include collecting road-killed lagomorphs, facilitating voluntary submissions from hunters, potentially modifying seasons and bag limits, and increased effort by Game Commission or WFP personnel to collect samples (e.g., from an [RHD-suspect](#)) and properly dispose of carcasses.

Measures of Success: Public compliance with restrictions, limiting the geographic spread of RHDV2, early detection or containment of RHDV2, and reduction or dissolution of RHD-DMA(s).

Management Strategies

The following management strategies are intended to assist in controlling RHD by reducing potential disease transmission and limiting the geographic spread of the disease. RHD management strategies currently implemented by the Game Commission are described. Additional, more comprehensive RHD management strategies are also proposed.

Regulations on Wildlife Disease & Emergency Authority of Director

In early 2021, the Pennsylvania Board of Game Commissioners adopted an amendment to a section of the Pennsylvania Code to expand the Game Commission's ability to address wildlife diseases through executive order. [Section 137.34](#) grants the Director the emergency authority to take actions to mitigate risk factors and to determine the [prevalence](#) and geographic distribution of wildlife diseases, if the Director concludes that the introduction or spread of wildlife diseases poses a threat to human, domestic and wild animal, and environmental health and safety within or adjacent to the Commonwealth. Through executive authority, the Director may:

Institute importation and exportation restrictions to mitigate disease transmission risk factors
By [executive order](#) signed on July 9, 2021, the importation of any wild lagomorphs and their parts or products into the Commonwealth from any Commonwealth, State, Territory, or Country where RHDV-2 has been detected in wild or domestic lagomorph populations in the 12 months prior to the importation is prohibited.

Define and designate Disease Management Areas (DMA) in this Commonwealth
While there are currently no RHD-DMAs within Pennsylvania, within RHD-DMAs the following strategies may be pursued:

Allow the taking of wildlife without regard to established seasons and bag limits and methods of take.

Require mandatory disease testing or disposal of wildlife or wildlife parts.

Prohibit the movement of high-risk wildlife parts.

Prohibit the rehabilitation of wildlife.

Prohibit the use and possession of wildlife products.

Prohibit the feeding of wildlife.

Prohibit the issuance of new permits and allow the suspension or modification of existing permits to possess or transport live wildlife.

Limit Movement of Wild Lagomorphs, Parts, & Products

On July 9, 2021, an executive order titled [Rabbit Hemorrhagic Disease Importation Ban #1](#) was signed by Executive Director Burhans. It bans the importation of any wild lagomorphs and their parts or products into the Commonwealth from any Commonwealth, State, Territory, or Country where RHDV2 has been detected in wild or domestic lagomorph populations in the previous 12 months. Establishing the boundaries of RHD-DMAs and limiting movement of wild lagomorphs and their parts or products within RHD-DMAs will require the issuance of additional executive orders.

One strategy is requiring that rabbits and hares harvested within an RHD-DMA be field dressed within the RHD-DMA. Meat and pelts could be removed from an RHD-DMA following processing, but as the virus can persist in those tissues for extended periods of time, doing so risks introducing the virus to areas outside the RHD-DMA and therefore would be discouraged by the Game Commission.

Another strategy is promoting the appropriate disposal of carcasses and their parts within RHD-DMAs. Any unused (e.g., not retained for consumption, taxidermy mounts) carcasses or their parts (e.g., entrails) generated via field dressing or encountered during investigations of suspect RHD cases must be properly disposed of to reduce the amount of virus being introduced to the environment. Proper disposal options include incineration, deep burial (> 3 ft), or double-bagging and discarding in commercial trash. Disposal within the RHD-DMA is preferred but if that is not possible, all lagomorph carcasses or parts of carcasses must be double-bagged before leaving the RHD-DMA and then disposed of as soon as possible.

Amending Permits

The Game Commission issues and oversees many [special permits](#) to Pennsylvanians. Those permitted activities may accelerate or exacerbate disease transmission in the face of an RHD outbreak. As such, the Game Commission may suspend or modify existing permits, or forego issuing new permits. Action on permit activity may require the issuance of additional executive orders. Permits that may be addressed include, but are not limited to, falconry, field dog trials, rabbit trapping, menagerie, nuisance wildlife control operator, scientific study, wildlife importation, wildlife transfer, and wildlife rehabilitation.

Communications, Education, & Outreach

Developing and maintaining strategic partnerships is key to implementing successful RHD management efforts. The Game Commission is committed to informing Commonwealth citizens about wildlife matters in Pennsylvania and strives to be attentive and timely when responding to issues. Strong relationships, transparency, and rapid information sharing are crucial when facing an issue like RHD with its inherent complexities and potential for numerous long-term negative impacts.

Currently, RHD information can be found on the Game Commission's [website](#) and the agency is developing a comprehensive [RHD Communications Plan](#). Educational outreach material development

efforts are being spearheaded by the WFP. Along these lines, the Game Commission encourages the public to recreate responsibly by practicing the following behaviors:

Encourage Reporting

Individuals, whether within or outside of an RHD-DMA, are encouraged to immediately report sick or dead wild rabbits or hares to the Game Commission.

Promote Biosecurity

Individuals who access an RHD-DMA are encouraged to [clean and disinfect](#) clothing, footwear, gear, and any equipment that may have come into contact with wild lagomorphs before leaving the RHD-DMA.

Conclusion

RHD is a serious threat to rabbits and hares in Pennsylvania, along with the interests of a diversity of stakeholders. Management of a disease that can be transmitted so easily across the landscape, both through anthropogenic and natural means, is challenging. The implementation of the strategies described within this Management Plan will involve continual analysis, discussion, and review to ensure that priority goals and objectives are identified, and that appropriate responses are implemented. In addition, ongoing review of the latest scientific knowledge and management techniques will determine the most up-to-date and effective disease management strategies for Pennsylvania. This adaptive approach is critical as the biology and management of the disease may evolve. The Game Commission will strive to utilize the best available scientific information, and facilitate input and garner support from all stakeholders, to improve RHD management and fulfill its mission to manage and protect Pennsylvania's wildlife populations for current and future generations.

Definitions

Dispersal – The movement of individual animals from their birth site to their breeding site(s).

Lagomorph – An animal of the taxonomic order Lagomorpha which includes the families Leporidae (hares and rabbits) and Ochotonidae (pikas).

Polymerase Chain Reaction (PCR) – a diagnostic technique that can amplify small segments of genetic material (RNA/DNA) and subsequently detect viruses (e.g., RHDV2) and other pathogens.

Prevalence – In disease terms, the proportion of a population that has the disease. *Sample* prevalence is the proportion of all samples tested over a specific area and time frame that detect the disease. *Estimated* prevalence is the sample prevalence that, after correcting for sampling and other biases to most closely represent the actual population, is the best estimate of the true proportion of an entire population that has the disease.

Rabbit Hemorrhagic Disease – Disease Management Area (RHD-DMA) – a geographic designation created when RHDV2 is detected in wild or domestic lagomorphs in Pennsylvania or within 10 miles of the Pennsylvania border. To designate an RHD-DMA, up to a 10-mile radius buffer is created around each new RHDV2 detection. The purpose of an RHD-DMA is to reduce human-related activities that amplify and spread RHDV2, to increase the probability of early detection of RHDV2 in areas surrounding known RHDV2 detections through increased surveillance efforts, and to mitigate further shedding of the virus into the environment.

Rabbit Hemorrhagic Disease Suspect (RHD-suspect) – A lagomorph that is exhibiting clinical signs consistent with RHD infection, such as acute death, poor appetite, lethargy, fever, bloody nasal discharge, liver disease, respiratory distress, diarrhea, and weight loss.

Rabbit Hemorrhagic Disease Virus (Serotype) 2 (RHDV2) – One of the viruses that can cause rabbit hemorrhagic disease in lagomorphs. Unlike other RHD-causing viruses that only affect lagomorphs of European lineage, RHDV2 affects both European lagomorphs (domestic and wild) and North American native wild lagomorphs.

Acronyms

APHIS	Animal and Plant Health Inspection Service (within USDA)
DCNR	Department of Conservation and Natural Resources
FAD	Foreign Animal Disease
FADD	Foreign Animal Disease Diagnostician
FADDL	Foreign Animal Disease Diagnostic Laboratory
NVSL	National Veterinary Services Laboratories (USDA-APHIS-VS)
PCR	Polymerase Chain Reaction
PDA	Pennsylvania Department of Agriculture
RHD	Rabbit Hemorrhagic Disease
RHD-DMA	Rabbit Hemorrhagic Disease – Disease Management Area
RHDV2	Rabbit Hemorrhagic Disease Virus (Serotype) 2
USDA	United States Department of Agriculture
VS	Veterinary Services (within USDA-APHIS)
WFP	Wildlife Futures Program
WS	Wildlife Services (within USDA-APHIS)

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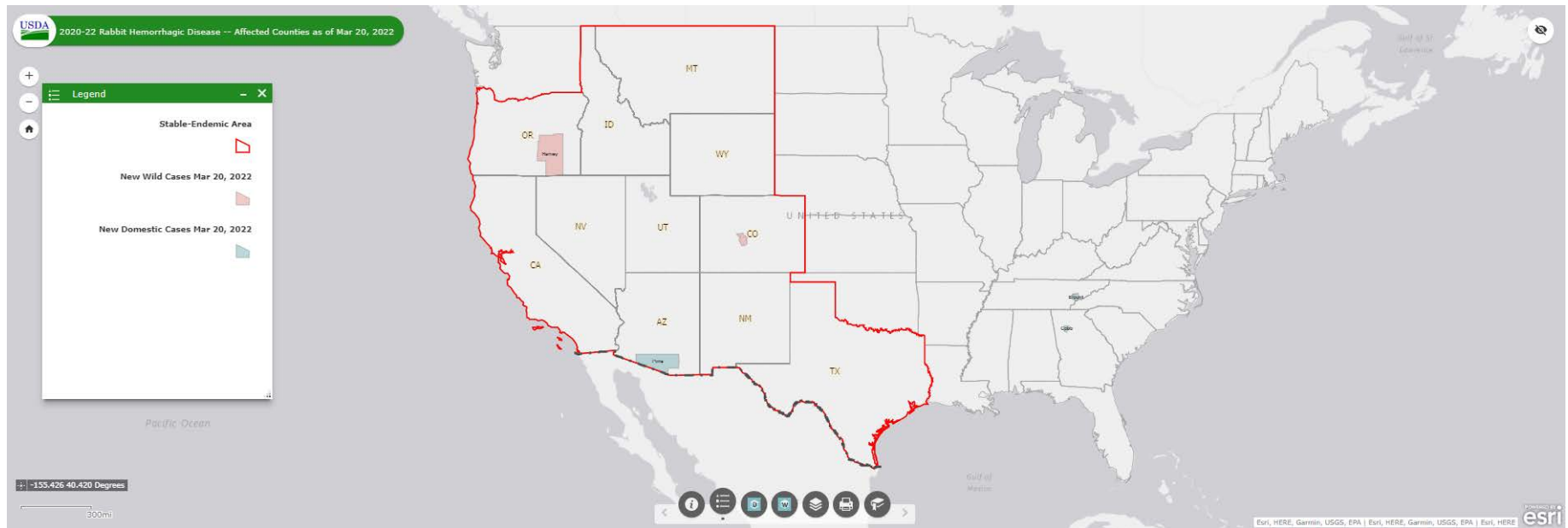
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Appendix A: Detection Maps

United States Department of Agriculture – Animal and Plant Health Inspection Service

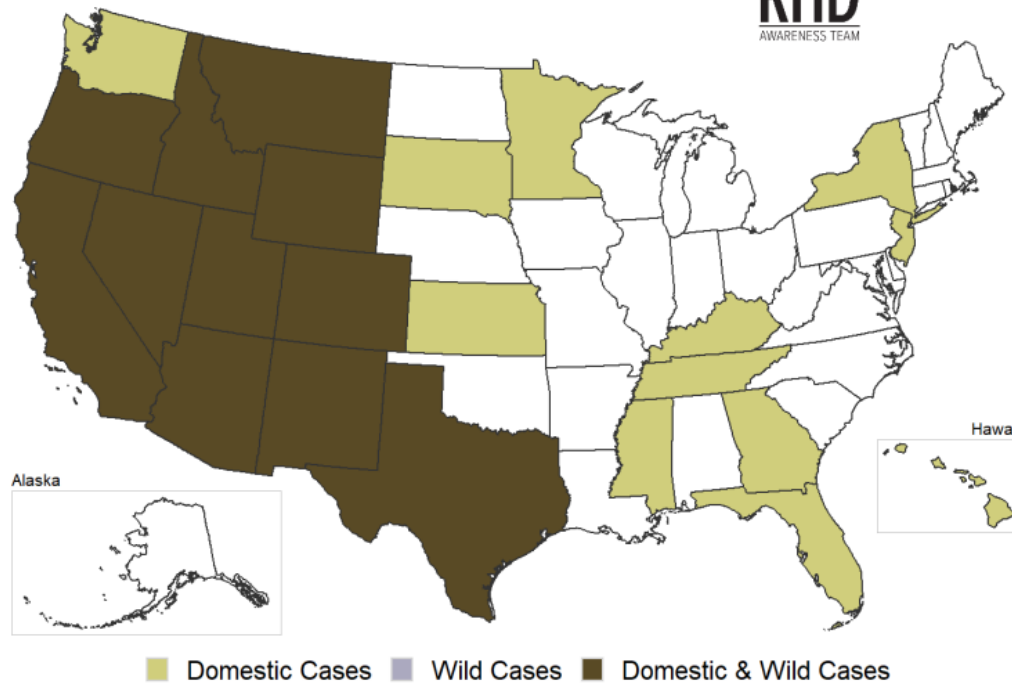
Visit <https://www.aphis.usda.gov/aphis/maps/animal-health/rhd> to see what areas of the United States have been affected by the RHDV2 outbreak that began in early 2020. The below screenshot is as of March 20, 2022.



University of Georgia – Rabbit Hemorrhagic Disease Awareness Team

Visit <https://rhdv2.org/where-is-rhdv2/> to see a time-lapse map documenting the spread of RHDV2 across the United States. The website is managed by the RHD Awareness Team which is comprised of faculty from the Georgia Warnell School of Forestry & Natural Resources, the University of Georgia College of Veterinary Medicine, and the Southeastern Cooperative Wildlife Disease Study.

RHDV2
August 2022



Data provided by USDA APHIS. Supplemental data reports (e.g., Press Releases) have been collated by Rabbits Rescue Society and WildRescue Inc. since the last USDA reporting periods (every 3 months).

See [RHDV2.org/resources](https://rhdv2.org/resources) for USDA data disclaimer.
Domestic cases include both domestic and feral rabbit cases.
Map Credit: Dr. Michel Kohl, RHD Awareness Team, University of Georgia.
Data last updated August 08 2022

Appendix B: Regulations

58 Pa. Code § 137.34

Wildlife disease and emergency authority of Director.

(a) The Director has emergency authority to take actions to mitigate risk factors and to determine the prevalence and geographic distribution of wildlife diseases, if the Director concludes that the introduction or spread of wildlife diseases poses a threat to human, domestic and wild animal, and environmental health and safety within or adjacent to this Commonwealth.

(1) The Director has emergency authority to:

(i) Institute importation and exportation restrictions to mitigate disease transmission risk factors.

(ii) Define and designate Disease Management Areas (DMA) in this Commonwealth.

(2) The Director has emergency authority within designated DMAs to:

(i) Allow the taking of wildlife without regard to established seasons and bag limits and methods of take.

(ii) Require mandatory disease testing or disposal of wildlife or wildlife parts.

(iii) Prohibit the movement of high-risk wildlife parts.

(iv) Prohibit the rehabilitation of wildlife.

(v) Prohibit the use and possession of wildlife products.

(vi) Prohibit the feeding of wildlife.

(vii) Prohibit the issuance of new permits and allow the suspension or modification of existing permits to possess or transport live wildlife.

(3) Notwithstanding paragraphs (1) and (2), the emergency authority of the Director will not be construed to extend to:

(i) The regulation of captive wildlife held under 3 Pa.C.S. Chapter 23 (relating to Domestic Animal Law) or the requirements of a lawful quarantine order issued by the Department of Agriculture.

(ii) The unilateral regulation of wildlife concurrently managed by the Commonwealth and the Federal government.

(b) It is unlawful for a person to violate a provision of an Executive Order issued by the Director under the authority of this section. A person violating this section will, upon conviction, be sentenced to pay the fine prescribed in the act.

58 Pa. Code § 137.34

The provisions of this § 137.34 adopted December 2, 2005, effective December 3, 2005, 35 Pa.B. 6526; amended December 23, 2011, effective December 24, 2011, 41 Pa.B. 6879. Amended by Pennsylvania Bulletin, Vol 51, No. 11. March 13, 2021, effective 3/13/2021

Appendix C: Executive Orders

Rabbit Hemorrhagic Disease Importation Ban #1: July 9, 2021

COMMONWEALTH OF PENNSYLVANIA
PENNSYLVANIA GAME COMMISSION

RABBIT HEMORRHAGIC DISEASE IMPORTATION BAN #1

EXECUTIVE ORDER

WHEREAS, Rabbit Hemorrhagic Disease (RHD) is a rapidly spreading, fatal disease in lagomorphs and is considered a foreign animal disease in the United States; and

WHEREAS, The viruses causing RHD can be transmitted by direct contact with infected rabbits and hares, or indirectly through carcasses, food, water, and any contaminated materials, and are very resistant to extreme environmental conditions; and

WHEREAS, RHD has been designated a “dangerous transmissible disease” of animals by order of the Secretary of Agriculture under the provisions of the Domestic Animal Law (3 Pa.C.S. §§ 2301 *et seq.*) at 3 Pa.C.S. § 2321(d); and

WHEREAS, The Pennsylvania Game Commission (Commission) has determined that eastern cottontails (*Sylvilagus floridanus*), Appalachian cottontails (*Sylvilagus obscurus*), and snowshoe hares (*Lepus americanus*), members of the family Leporidae, are native and familiar species to the public and important prey and game species with impacts on the vegetation structure of their ecosystems; and

WHEREAS, Rabbit Hemorrhagic Disease Virus Serotype 2 (RHDV-2), a unique variant of RHD, has been detected in the United States in recent years and can infect all ages of a wide range of domestic and wild lagomorphs, including North American wild species of hares, jackrabbits, and cottontails; and

WHEREAS, RHDV-2 has not yet been detected in wild or domestic lagomorph populations within the Commonwealth; and

WHEREAS, The Commission desires to prevent the emergence of RHDV-2 within the Commonwealth; and

WHEREAS, RHDV-2 is of particular concern to the Commonwealth because of its potential to have a detrimental impact on both wild and domestic lagomorph populations; and

WHEREAS, The Commission has determined that importation of potentially infectious wild lagomorphs, their parts or products, or contaminated equipment, items, or materials from locations where RHDV-2 has been detected in wild or domestic lagomorph populations into the Commonwealth poses an unacceptable risk of introduction and spread of RHDV-2 to the Commonwealth; and

WHEREAS, The Game and Wildlife Code (34 Pa.C.S. §§ 101, *et seq.*) regulations promulgated thereunder (58 Pa. Code §§ 131.1, *et seq.*) collectively provide broad authority to the Commission to regulate activities relating to the protection, preservation, and management of all game and wildlife and their respective habitats (*C.f.* 34 Pa.C.S. §§ 322, 2101, and 2102); and

WHEREAS, Section 137.34 of the Code (58 Pa. Code § 137.34) provides specific emergency authority to the Executive Director of the Commission to mitigate risk factors and determine the prevalence and geographic distribution of transmissible wildlife diseases of wild birds and mammals, excluding those species under Federal jurisdiction, if the introduction or spread of such diseases poses a threat to human, domestic and wild animal, or environmental health and safety within or adjacent to this Commonwealth; and

NOW THEREFORE, I, Bryan J. Burhans, Executive Director of the Pennsylvania Game Commission, pursuant to the authority vested in me by the Code and regulations promulgated thereunder, do hereby order and direct the following

1. The importation of any wild lagomorphs and their parts or products (meat, pelts, hides, carcasses, etc.) into the Commonwealth from any Commonwealth, State, Territory, or Country where RHDV-2 has been detected in wild or domestic lagomorph populations in the 12 months prior to the importation is hereby prohibited.

2. This Order shall not be construed in any manner to limit the Commission's authority to establish additional or further authorizations or limitations relating to the monitoring for RHD and mitigation of any risk factors associated with its introduction or spread.

3. This Order is effective immediately and shall remain in effect until rescinded or modified by subsequent order.

Given under my hand and seal of the Pennsylvania Game Commission on this 9th day of July, 2021.

Attest: *Lydia Gray*

Bryan J. Burhans
Bryan J. Burhans
Executive Director

Rabbit Hemorrhagic Disease Importation Ban #2: March 23, 2022

PENNSYLVANIA GAME COMMISSION

RABBIT HEMORRHAGIC DISEASE IMPORTATION BAN #2

EXECUTIVE ORDER

WHEREAS, Rabbit Hemorrhagic Disease (RHD) is a rapidly spreading, fatal disease in lagomorphs and is considered a foreign animal disease in the United States; and

WHEREAS, The viruses causing RHD can be transmitted by direct contact with infected rabbits and hares, or indirectly through carcasses, food, water, and any contaminated materials, and are very resistant to extreme environmental conditions; and

WHEREAS, RHD has been designated a “dangerous transmissible disease” of animals by order of the Secretary of Agriculture under the provisions of the Domestic Animal Law (3 Pa.C.S. §§ 2301 *et seq.*) at 3 Pa.C.S. § 2321(d); and

WHEREAS, The Pennsylvania Game Commission (Commission) has determined that eastern cottontails (*Sylvilagus floridanus*), Appalachian cottontails (*Sylvilagus obscurus*), and snowshoe hares (*Lepus americanus*), members of the family Leporidae, are native and familiar species to the public and important prey and game species with impacts on the vegetation structure of their ecosystems; and

WHEREAS, Rabbit Hemorrhagic Disease Virus Serotype 2 (RHDV2), a unique variant of RHD, has been detected in the United States in recent years and can infect all ages of a wide range of domestic and wild lagomorphs, including North American wild species of hares, jackrabbits, and cottontails; and

WHEREAS, RHDV2 has not yet been detected in wild or domestic lagomorph populations within the Commonwealth; and

WHEREAS, The Commission desires to prevent the emergence of RHDV2 within the Commonwealth; and

WHEREAS, RHDV2 is of particular concern to the Commonwealth because of its potential to have a detrimental impacts on both wild and domestic lagomorph populations; and

WHEREAS, The Commission has determined that importation of any wild lagomorphs or their products (meat, pelts, hides, carcasses, etc.), associated equipment or other items and materials from locations where RHDV2 has been detected in wild or domestic lagomorph populations into the Commonwealth poses an unacceptable risk of introduction and spread of RHDV2 to the Commonwealth; and

WHEREAS, The Game and Wildlife Code (34 Pa.C.S. §§ 101, *et seq.*) regulations promulgated thereunder (58 Pa. Code §§ 131.1, *et seq.*) collectively provide broad authority to the Commission to regulate activities relating to the protection, preservation, and management of all game and wildlife and their respective habitats (*C.f.* 34 Pa.C.S. §§ 322, 2101, and 2102); and

WHEREAS, Section 137.34 of the Code (58 Pa. Code § 137.34) provides specific emergency authority to the Executive Director of the Commission to mitigate risk factors and determine the prevalence and geographic distribution of transmissible wildlife diseases of wild birds and mammals, excluding those species under Federal jurisdiction, if the introduction or spread of such diseases poses a threat to human, domestic and wild animal, or environmental health and safety within or adjacent to this Commonwealth; and

WHEREAS, A previous executive order concerning the rabbit hemorrhagic disease importation ban within this Commonwealth was issued by the Commission on July 9, 2021; and

WHEREAS, The Commission has determined that further development of this ban is required to implement necessary updates to the Commission's RHDV2 Response Plan.

NOW THEREFORE, I, Bryan J. Burhans, Executive Director of the Pennsylvania Game Commission, pursuant to the authority vested in me by the Code and regulations promulgated thereunder, do hereby order and direct the following:

1. The importation of any wild lagomorphs and their products (meat, pelts, hides, carcasses, etc.) into the Commonwealth from any Commonwealth, State, Territory, or Country where RHDV2 has been detected in wild or domestic lagomorph populations in the 12 months prior to the importation or where RHDV2 has been declared endemic in domestic or wild lagomorph populations is hereby prohibited.

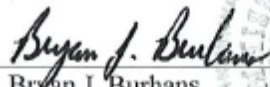
2. This Order shall not be construed in any manner to limit the Commission's authority to establish additional or further authorizations or limitations relating to the monitoring for RHD and mitigation of any risk factors associated with its introduction or spread.

3. The previous executive order concerning the rabbit hemorrhagic disease importation ban within this Commonwealth was issued by the Commission on this Commonwealth that was issued by the Commission on July 9, 2021 and published in the *Pennsylvania Bulletin* on July 24, 2021 at 51 Pa.B. 4034 is hereby rescinded in its entirety and replaced by this Order.

4. This Order is effective immediately and shall remain in effect until rescinded or modified by subsequent order.

Given under my hand and seal of the Pennsylvania Game Commission on this 23RD day of MARCH, 2022.

Attest: 


Bryan J. Burhans
Executive Director



Appendix D: Communication, Education, & Outreach

Successful management of RHD, like any wildlife disease, requires clear and timely communication. Any response will have a lasting impact on public perception of the Game Commission's ability to manage wildlife diseases and work collaborative with Commonwealth partners. The Game Commission proposes setting up an RHD Interagency Task Force to facilitate coordinated strategies and responses to promote successful outcomes.

The RHD Interagency Task Force shall be comprised of at least one representative from the Pennsylvania Department of Agriculture (PDA), the Game Commission, as well as other impacted Commonwealth and federal agencies (e.g., DCNR, USDA-APHIS). The Wildlife Futures Program and diagnostic laboratories may also be involved. While informal communication does and will continue to occur between PDA and the Game Commission on a regular basis, formal meetings will commence following any RHDV2 detections within Pennsylvania or any adjacent states. The desired outcome from these meetings is a coordinated response, consistent messaging, and providing up-to-date information to agency personnel, the media, non-governmental entities, and the public.

Stepwise Communication Actions

1. State veterinarians from the Game Commission and PDA will notify one another within 24 hours when an RHD-suspect case is encountered in either wild or domestic populations. FADDs will lead any RHD-suspect case investigations and submit to FADDL for RHDV2 testing if appropriate. An FADD investigation and submission to FADDL is only required for the first RHDV2 detection in a particular lagomorph species; subsequent cases can be investigated by non-FADDs and submitted to other approved diagnostic laboratories for RHDV2 testing. Only proceed to Step #2 if RHDV2 is confirmed.
2. After initial RHDV2 confirmation at FADDL or subsequent RHDV2 confirmations elsewhere, additional notifications within 24 hours of the detection will be issued in the following order:
 - a. The RHD Interagency Task Force
 - b. Agriculture and wildlife agencies in neighboring states
3. RHD Interagency Task Force will hold a formal meeting within 1 week from detection to discuss broader public announcement and implementation of disease response strategies. Agencies will commence development of a press release (may or may not be jointly issued).

4. State veterinarian from either the Game Commission or PDA will notify any members of the public *directly involved* with the submission (e.g., owner, hunter, landowner, lagomorph owner) of the detection. If phone or email notification to the public is not possible, notification may be made in writing.
5. State veterinarian from either the Game Commission or PDA will notify any additional stakeholders who may be involved in implementation of management strategies (e.g., legislators, academic partners, local municipalities).
6. Press release announcing the RHDV2 detection and upcoming management strategies is issued. Web component or specific email account may be included to facilitate public feedback.
7. Outreach will be conducted to encourage additional stakeholder groups to notify and educate their members.
 - a. The Game Commission will issue an advisory to impacted permittees, the Pennsylvania Association of Wildlife Rehabilitators, sportsmen's associations, and other stakeholders as needed.
 - b. PDA will issue an advisory to the broader veterinary community (e.g., alert to Pennsylvania Veterinary Medical Association), taxidermists, and other stakeholders as needed.
8. Investigate opportunities for in-person public engagement, whether through online discussion panels or public meetings in proximity to where detection occurred, to garner support for management strategies.
9. Field press inquiries, engaging additional Game Commission, PDA, or other agency/academic personnel as needed.

Rabbit Hemorrhagic Disease: The Facts (As of August 2022)

What is RHD?

RHD is a foreign animal disease, meaning it is not typically found in the United States and is of high concern to domestic and wild animal health. RHDV2 is one of two viruses that can cause RHD; it is a highly pathogenic and contagious calicivirus affecting hares, rabbits, and closely related species. RHDV2 was first identified in domestic rabbits in France in 2010 and since then. It has been responsible for mass die-offs in wild hare/rabbit populations in several countries including the United States and has now been declared in wild lagomorph populations in many western States.

How does RHDV2 spread?

The virus is extremely hardy and highly contagious. It can spread between hares/rabbits via

many pathways that include direct contact with an infected live or dead individual; ingestion of contaminated food or water; inhalation; contact with contaminated equipment, tools, and enclosures; viral movement by flies, birds, biting insects, predators, scavengers, and humans; and contact with urine, feces, and respiratory discharges from infected individuals. The virus can survive on clothing, shoes, plant material, or other items that could accidentally be moved from an infected area by humans or other animals.

How does RHDV2 affect hares/rabbits and what can we look for?

There is no specific treatment for the disease, and it is often fatal (potentially 75%-100%) with the potential to result in large, localized die-offs. Hares/rabbits that do not immediately die following infection may present with poor appetites, lethargy, and blood coming from their mouths or noses.

Is RHDV2 a public health concern?

RHDV2 is not infectious to people or domestic animals other than hares/rabbits. However, multiple dead or sick hares/rabbits can also be a sign of tularemia or plague, diseases that can cause serious illness in humans. Therefore, it is important that the public does not handle or consume any wildlife that is sick or has died from an unknown cause. It is also important to prevent pets from contacting or consuming wildlife carcasses.

Where exactly has RHDV2 been detected?

The United States Department of Agriculture's Animal and Plant Health Inspection Service maintains an RHD detection map at the following URL: <https://www.aphis.usda.gov/aphis/maps/animal-health/rhd>. A time-lapse map and additional RHDV2 information can also be found at <https://rhdv2.org/where-is-rhdv2>.

Public Recommendations (As of August 2022)

- Early detection and removal of RHD-suspect carcasses will be our best bet to mitigate any RHDV2 outbreaks. We encourage members of the public to report any hare/rabbit mortality events (two or more dead hares/rabbits at the same location with an unknown cause of death) to the Game Commission by calling 1-833-PGC-WILD or by using our online Wildlife Health Survey reporting tool at <https://www.pgcapps.pa.gov/WHS>. The public should not be encouraged to touch any sick or dead hares or rabbits.
- Once established, RHD can quickly spread among wild rabbit and hare populations. Currently, Pennsylvania is significantly isolated from affected wild populations. Therefore, the main risk of the disease being introduced to the Commonwealth is through the importation of infected rabbits or hares, their parts or products, or contaminated materials.
- Do not release hares or rabbits into the wild. Doing so may introduce disease into wild lagomorph populations. Release of any domestic or captive wild lagomorphs on state

game lands is in violation of Game Commission regulations (58 Pa. Code § 135.41 (c) (13)) and the unpermitted release of any captive wild lagomorphs on any lands in the Commonwealth, public or private, is in violation of Game Commission regulations (58 Pa. Code § 137.2 (a)).

- While RHDV2 is a threat to domestic rabbits, the Game Commission is not involved with domestic animals. The Pennsylvania Department of Agriculture (PDA) is involved with domestic rabbits to the extent that they are raised and slaughtered for meat and such facilities may voluntarily consent to USDA and/or FDA oversight. In addition to PDA, USDA, and FDA, private veterinary practices would also provide some oversight of domestic/pet rabbits. Any questions regarding disease surveillance or vaccination in domestic rabbits should be directed to those entities.
- Veterinary diagnostic laboratories are aware of the issue and any detections of RHDV2 in domestic hares/rabbits in PA will be reported to the Game Commission.
- While spread through natural means in the environment is a concern, relocation and establishment of the virus by people transporting infected hares/rabbits and contaminated materials is the main risk of RHDV2 being introduced and spreading throughout our native wild hare/rabbit populations.
- Clean and disinfect all surfaces and equipment that may have contacted hares/rabbits. These precautions are incredibly important as the disease can be easily transmitted amongst and between wild and domestic populations. Disinfection can be achieved after thorough cleaning by soaking for at least 10 minutes in a solution of 10% household bleach (1 part bleach : 9 parts water). These precautions are incredibly important as the disease can be easily transmitted amongst and between wild and domestic populations.
- If instructed to dispose of carcasses, either incinerate or bury them deep enough to prevent scavenging (> 3 ft). Carcasses can also be disposed of in the commercial trash. When handling any carcass, always wear gloves and double bag the carcass. The virus is very resilient and may remain on the landscape for months.