

**Rabies Ad-Hoc Committee
Minutes
Tuesday, April 19, 2022**

Attendance:

Mary Ellen Bell, Elizabeth Dingley, Roo Dunn, Anna Hunt, Chris Marks, Marc Meyers

Minutes from March 29, 2022

Approved

Committee community reports

Harpswell (attached)

Roo Dunn provided a report from Harpswell - one rabid bat. Provide information on website. Concerns about budget, efficacy and effects of uneaten packets on marine life.

Phippsburg

Elizabeth Dingley provided a report from Phippsburg – three-four cases. Provide rabies information on website site and conducting clinic at town hall for vaccination.

Administrator Ross McClellan would support regional effort for ORV, but it would be tough for public and select board to get onboard.

West Bath

Elizabeth provided a report from West Bath – four cases in 2020. Rabies cases are tracked at City Hall. Not interested in regional effort for ORV.

Roo provided a report from Peter Smith (attached).

Discussion about European countries handling rabies, public education, what to do if there are attacks and whether or not the committee's work was complete.

Re: Questions from the Rabies Ad Hoc Committee in Bath

Terri Sawyer <tsawyer@town.harpswell.me.us>

Wed 06-Apr-22 13:33

To: Councilor Dunn <Ward4@cityofbath.com>

Cc: Kristi Eiane <keiane@town.harpswell.me.us>

Hi Roo,

I apologize for the delay in getting back to you. Below are answers to your questions.

1. To our knowledge, we have had one confirmed case of rabies in the past 5 years - it was a bat. The Maine CDC informed the Town.
2. We have information and links regarding rabies on the Town's website. We have signs at some Town properties that include language about not interacting with wildlife. We are updating our Outdoor Guide to Recreation this Spring and plan to add language in the Guide about rabies and wildlife interaction. We also have a subscriber list and when we are informed of a confirmed case, we send out a notice informing the public. Also, our ACO educates people when she receives calls with concerns of rabies. She gives the person the warden's number but also educates the caller.
3. We certainly have a file but we don't per se track them as we have been fortunate with a low confirmed case count.
4. The question about participating in the ORV program would have to be answered by our Board of Selectmen. If the Board decides it wants to consider it, the funding would be reviewed by the Town's Budget Advisory Committee in the fall and then voters would be the ultimate decision makers at a Town Meeting.

A few questions that come to my mind are:

1. With the packets being dropped by helicopter, how can we be sure that only the intended recipient eats the packet? You indicate it is unproven but may vaccinate other wildlife animals such as a fox or skunk - is it known that it won't harm other wildlife?
2. You indicated that the packet is not harmful to humans or pets - is there hard evidence?
3. What happens to our marine life if the packets end up in the ocean or the run off from the uneaten packets do?
4. How will it be determined if the program was successful? Is there data available pre-program that can be compared to data after the program?

If you have further questions or want to have a follow-up conversation, one of us could do so next week.

Thank you,

Terri Sawyer
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From: Councilor Dunn <Ward4@cityofbath.com>

Sent: Friday, April 1, 2022 1:07 PM

To: Terri Sawyer <tsawyer@town.harpswell.me.us>

Subject: Re: Questions from the Rabies Ad Hoc Committee in Bath

Thank you, Terri!

Our committee is aiming to compile a list of proactive, viable ways to address rabies related human-wildlife conflicts due. The first step in following up on the work done to date, is to gather information from our neighboring towns on the topic. Our last step will be to present our findings to the Bath City Council.

The questions we are posing to the communities identified by USDA as included for a vaccination program include Bath, Brunswick, West Bath, Topsham, Harpswell, and Phippsburg. Following the questions are a few additional points.

Many thanks for having a look,
Roo

Questions

1. Have you had an identified rabies problem in your town in the past 5 years? If yes, can you describe what happened and the actions taken to address it?
2. What do you currently do to inform your citizens about rabies and human-wildlife conflicts, and what kind of education and outreach do you do with your citizens?
3. Do you track and record rabies cases in your town? How?
4. Bath is considering using Oral Rabies Vaccines (ORV) as a method for vaccinating wildlife in the area. The estimate given to the city back in 2021 by USDA to deliver ORV to wildlife vector animals was approximately \$125,000/year, split by participating towns. This was a rough estimate that involved dropping ORV baits by helicopter in a 495 square km area.

Would (your town) be interested in participating in a regional ORV Program at a prorated cost? Comments?

Notes:

- The vaccine packets are a raccoon rabies vaccine in matchbox-sized packets covered in fish meal.
- Although not proven, this vaccine could immunize other species like fox/skunk (that Bath has had issues with in the past)
- While not harmful to humans or pets, Q&A hotline would be required to answer citizen concerns.
- Ideal timing could be August of each year.
- Large area (5-6 towns/495 square km) required to be an effective way of controlling rabies in wild animals in an area.

Peter F. Smith, PhD – 49 Green Street, Bath

I am a scientist by training and have professional background in public health including laboratory and infectious disease control and in veterinary diagnostics. I am not an expert in Rabies virus or wildlife management, but I am personally interested in promoting science-based decision making in our community. As I have heard about the city council's discussions around rabies control, I felt that the scientific literature could provide some help for policy makers in the current situation.

In this memo I have mainly focused on a comprehensive review article from 2017 (Maki et al. Vet Res (2017) 48:57) freely available online at PubMed Central and some associated abstracts, articles and government web sites (see links below). This peer-reviewed article was authored by scientists affiliated with Boehringer Ingelheim Animal Health, the manufacturer of the RABORAL V-RG oral rabies vaccine product.

The complexity of the rabies management programs described in the literature review is considerable. The extent to which ecological factors, such as reservoir species present and presence of land and water features as barriers to wildlife movement, complicate efforts should not be underestimated.

I suggest the group review the Maine CDC Maine Rabies Management Guidelines (updated 2017) – Pages 76-77 summarizing municipal responsibilities in rabies control. Many aspects of this may already be in place, and I think it is helpful for considering other actions that may be appropriate for dealing with rabies in our community.

High-Level Summary:

Several studies and many years of field experience demonstrate:

- The vaccine is generally safe, though not without risk to people with certain health conditions if they handle the vaccine.
- The V-RG vaccine is effective at instigating an immune response and protection against experimental rabies infections in foxes, racoons, and skunks among several other species.
- However, skunks do not readily take up protective immunity from vaccines administered through oral baits. This can present a particular problem in controlling rabies in animal communities of mixed species where skunks can become a reservoir frustrating the ORV efforts.
- Control of racoon rabies with programs that include ORV are complicated by ecological factors related to racoon behavior and other characteristics as well as by the presence of skunks as a reservoir species in many areas with racoon rabies.

Review of real-world field ORV programs shows:

- Multiple programs in Europe have apparently been successful at limiting geographical spread of rabies virus.
- In all cases these were intensive national or multi-national wildlife control programs that included use of ORV.
- In most cases foxes or other canids were the primary wildlife species managed.
- Successful programs in Texas used ORV as a component of rabies control efforts focused on foxes and coyotes.
- In the Northeast US, ORV efforts focused on racoons have been in place to mitigate the spread of racoon rabies to Canada, but how successful these programs have been is less clear.
- Smaller-scale programs in specific areas of the Northeast (Cape Cod, Long Island, Cape May) have been ongoing for several years. Better understanding of the costs and benefits of these programs could be valuable, but there does not appear to be a recent discussion of these cases in the scientific literature.
- In a majority of cases, ORV was one component of a larger, regional approach. This included public policy, social media, community education, and in some cases, ORV.

Additional Relevant Information:

Vaccine Safety:

Safety of the oral rabies vaccine in both target and non-target species is quite well established.

The V-RG vaccine is a recombinant viral vector rather than an attenuated rabies virus, so it cannot cause rabies infections. Human exposure to the vaccinia vaccine vector may pose risks in people with a contraindication for smallpox vaccination, including pregnant women, people with certain skin conditions, or people who are immune compromised.

Reported human contact with baits is relatively rare compared to the number of baits distributed. A large proportion of reported cases of human contact that did occur were related to humans removing packets from their dogs' mouths. In some of these cases, adverse skin reactions have occurred and in one case in the US a vaccinia virus infection resulting from vaccine contact was confirmed in an immunocompromised person.

Vaccine Effectiveness (controlled laboratory and field studies):

Foxes

Effectiveness of the vaccine in red foxes, grey foxes and arctic foxes has been shown in several laboratory and field studies.

Skunks

The Vaccinia-Rabies-Glycoprotein vaccine (V-RG) is effective at immunizing and protecting striped skunks from rabies virus challenge when administered by different delivery routes (e.g. injection), but skunks are relatively resistant to oral immunization. This may be because their feeding and foraging behaviors are different from the other animal species.

Spill-over of raccoon rabies virus commonly occurs in striped skunks and this species may play a role in maintaining circulation of the raccoon rabies virus variant in the wild.

“In the USA, rabid skunks also represent a significant public and animal health concern and pose unique challenges to disease control efforts. Skunks are a common non-target species observed during ORV programs targeting raccoons, coyotes and gray foxes. As with raccoons, several factors may affect successful ORV bait uptake in skunks, but generally skunks have demonstrated lower seroconversion rates in post-baiting monitoring compared to sympatric target species (e.g., a maximum estimate of 11% of skunks versus 32.8% of raccoons after distribution of RABORAL V-RG coated sachets at 75 baits/km², despite laboratory evidence that skunks mount an antibody response to ORV and tetracycline biomarker evidence that skunks do find and ingest vaccine-baits in the field setting.”

Maki et al. *Vet Res* (2017) 48:57

Raccoons

It has been demonstrated that the V-RG ORV could effectively immunize raccoons in the field setting, but bait vaccination effectiveness in field studies has been variable and depends on many different factors:

“Decades of field experience have proven that many variables affect the field effectiveness of an ORV programs for any particular species. However, optimizing and evaluating raccoon ORV programs has proven particularly challenging due largely to the diversity of habitats where raccoons and rabies management occurs as well as the complexity and the adaptability of this species to thrive at varying population densities across large geographic areas affected by raccoon rabies. The expanse and heterogeneity of raccoon habitats and other factors (e.g., presence of skunks in raccoon variant endemic areas) contribute to the challenge of achieving the USA strategic goal of stopping the spread and eventually eliminating raccoon rabies at the local, regional and national level.”

Maki et al. *Vet Res* (2017) 48:57

Vaccine Stability:

Stability of V-RG at operational temperatures studied in both laboratory and field experiments is well supported. Under field conditions, V-RG vaccine remained stable in baits over a period of one month, despite large variations in environmental temperatures including natural freezing and thawing cycles and warm summer temperatures. Based on the information in this review, it is reasonable to assume that the vaccine stability would not present a problem in most applications.

Review of field applications:

Europe

Several examples of ORV campaigns in Europe were reviewed which primarily focused on attempts to limit geographical spread of rabies in fox populations across large ranges. These included efforts in France, Belgium, Luxembourg (all foxes) and Ukraine (foxes and domestic dogs). Some of these efforts were quite successful in limiting geographic spread over periods of 10 years or more with ORV as a component of intensive wildlife rabies management programs.

Northeastern United States & Canada

ORV campaigns targeting raccoons were implemented by state or county agencies in Massachusetts, Florida, New York, Vermont, Ohio, New Jersey, and Maryland. The RABORAL V-RG vaccine was approved for use in raccoons in 1997 as a United States Department of Agriculture (USDA) licensed veterinary vaccine.

A federal cooperative ORV program began in 1998 led by USDA with national rabies management objectives of preventing wildlife rabies from spreading into naive areas of the country. Oral rabies vaccination zones were expanded into New England in an attempt to limit spread of racoon rabies into eastern Canada with some success, though outbreaks in Canada have continued to occurred.

There have been examples where rabies containment and elimination in island populations in Canada was successful with ORV together with other methods (such as trap-vaccinate-release).

Active USDA Animal Plant Health Inspection Service programs (latest data online is 2019) (include ongoing programs in Maine (Eastern Aroostook, Eastern Penobscot, and Northern Washington Counties) and New Hampshire (Northern Coos and Grafton Counties). Additional active programs in the Northeastern US include Cape Cod, Long Island and Cape May, New Jersey. These three examples appear to have a more localized objective of limiting spread of rabies into localized islands or peninsulas. Recent published studies on the costs and success of these programs is limited. There could be value in better understanding the true costs and benefits of these programs from government reports if they are available. There are ecological and human population similarities to the situation in Midcoast Maine, but a key difference is that these three programs are in areas where preventing spread of rabies to isolated land masses (islands or peninsulas) was the goal.

Sources and recommended reading

Maki et al. Vet Res (2017) 48:57

Oral vaccination of wildlife using a vaccinia–rabies-glycoprotein recombinant virus vaccine (RABORAL V-RG®): a global review <https://link.springer.com/content/pdf/10.1186/s13567-017-0459-9.pdf>

Maine Rabies Management Guidelines A compendium of rabies control measures and planning strategies compiled by the Maine Rabies Workgroup 4P P Edition, 2017

<https://www.maine.gov/dhhs/mecdc/infectious-disease/epi/zoonotic/rabies/documents/2017-Maine-Rabies-Management-Guidelines-4th-edition.pdf>

USDA Animal and Plant Health Inspection Service

<https://www.aphis.usda.gov/aphis/ourfocus/wildlifedamage/programs/nrmp/orv-information-by-state>