

## Narragansett Bay Coyote Study

### REPORT AND RESOURCE KIT FOR COEXISTING WITH COYOTES

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December 31, 2023

This contains extracts from the final report on a multi-year project, initiated in 2005 by Dr. Numi Mitchell of The Conservation Agency, to improve the conditions of human-coyote interactions in Rhode Island, and elsewhere, through a better understanding of coyote ecology.

The project final report submitted to Rhode Island Department of Environmental Management included a main text and appendices A-M. Some of that information is proprietary and some of it is relevant entirely to project administration, so the present document includes the main text plus appendices H, I, J, and M containing a whole range of results, perspectives, and tools that could be of value to those trying to lead their community toward safe coexistence with coyotes. All contents are copyright of Numi Mitchell unless otherwise noted. Contact The Conservation Agency or Rhode Island Natural History Survey for reuse, which we will be pleased to help you with.

This project was funded by the U.S. Fish & Wildlife Service, Wildlife and Sport Fish Restoration Program (grant # F17AF01143), the Rhode Island Department of Environmental Management Division of Fish and Wildlife, Prince Charitable Trusts, Rhode Island Foundation Fund for Animal Welfare, Rhode Island House of Representatives, Rhode Island Natural History Survey, Potter League for Animals, and Norman Bird Sanctuary.

Funders for earlier phases of the study include The Conservation Agency, van Beuren Charitable Foundation, Bafflin Foundation, Michael Paine Conservation Trust, West Greenwich Animal Hospital, ESRI, the Town of Jamestown, The Providence Plan, Trimble, Jamestown Educational Foundation, Ali Packer Dunn Memorial Fund, and Naval Station Newport, and many private contributors.

# Science-Based Coyote Management: Achieving Safe, Sustainable, Coexistence, and Population Control



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## EXECUTIVE SUMMARY

Effective management tools for opportunistic coyotes are needed throughout the United States. When it began, in 2005, the Narragansett Bay Coyote Study capitalized on newly-developing technology for real-time GPS tracking that would support the study of resource related population growth and help develop strategies to reduce negative human-coyote interactions. Initial results described pack dynamics and resource utilization, including the importance of anthropogenic resources, in island towns in Narragansett Bay. Since 2017, NBCS has had funding from the U.S. Fish & Wildlife Service, Wildlife and Sport Fish Restoration Program (grant # F17AF01143) and support of the Rhode Island Department of Environmental Management Division of Fish and Wildlife to carry out a statewide expansion of the project's investigations. Since then, coyotes were collared and tracked using GPS and other techniques, and their spatial and demographic dynamics were observed across gradients of both landscape development and food availability.

The overwhelming findings are that human-provided food subsidies for coyotes are virtually omnipresent and contribute substantially to negative human-coyote interactions. Also, large, reliable, anthropogenic food resources are clearly the driver for coyote population growth and the determinant of coyote packs' use of space (density).

Research findings indicate that the success of any Coyote Management Plan will turn on three critical points: 1) field and natural experiments showed coyote territory size decreased when anthropogenic (human-provided) food subsidies became available and increased when they ceased to be available, with a swing of greater than 33%; 2) when anthropogenic food resources were removed, and the territory increased in size, the numbers of coyotes in the territorial group (pack) did not change significantly, thus effectively reducing coyote density; and 3) among anthropogenic food subsidies, large and reliable subsidies such as improperly disposed farm livestock remains and unrecovered roadkill deer had the most effect on territory size. The study found deer remains present in 50% of scat samples analyzed statewide, and seasonality and behavioral data suggests most is from roadkill.

Coyote management based on lethal control is not likely to be effective due to fundamentals of coyote reproductive biology and spatial ecology in addition to public perceptions and practical restrictions, and lethal control efforts are typically followed by rapid coyote population rebound. We are confident that food subsidy prevention/removal will be an essential feature of the most effective coyote management in Rhode Island.

NBCS continues to write and submit, for peer-reviewed publication, papers based on the study that will support a successful Coyote Management Plan for Rhode Island. Appendices to this document include scientific papers, data, protocols, and communication tools. When implemented, coyote management along these lines will lower coyote absolute and effective populations throughout the state and decrease negative human-coyote interactions.

## ACKNOWLEDGEMENTS

This research was carried out with major funding from the U.S. Fish & Wildlife Service, Wildlife and Sport Fish Restoration Program (grant # F17AF01143) and with the support of the Rhode Island Department of Environmental Management Division of Fish and Wildlife. Additional funders include Prince Charitable Trusts, Rhode Island Foundation Fund for Animal Welfare, Rhode Island House of Representatives, Rhode Island Natural History Survey, Potter League for Animals, and Norman Bird Sanctuary.

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Thanks are due to the numerous volunteers who made substantial contributions to many aspects of this work both before and during the period of USFWS funding. Thanks for advice, support, and material contributions go to Charles Allott, Doug Auclair, Roland Bellotti,Carolynn Brunette, Jolie Colby, Sara Churgan, Jane Garnett and David Booth, Natasha Harrison, Dave Hornoff, Gerald Krausse, Julia Landstreet, Betsy de Leiris, Lyn Malone, Edith McBean, Glenn and Eli Mitchell, Kristin Pauly, Amy Pratt, Diana and Fred Prince, Brad Shear, Christie Smith, and Angela G. Weber. Thank you to the boards of directors of The Conservation Agency and the Natural History Survey for guidance throughout.

Before the present phase of this study, teachers brought study materials to local schools and helped us to understand the public's role and interest in the research and to develop stakeholder engagement techniques and materials used presently. Thank you to those teachers and also to the town administrators and town and city council members, and police and animal control officers, from Barrington, East Providence, Jamestown, Portsmouth, Middletown, and Newport for their help before and after the commencement of the present phase of the study. Particular thanks to Police Chiefs Edward Mello (Jamestown), Anthony Pesare (Middletown), Thomas Lee (Portsmouth), Gary Silva (Newport) who were instrumental in early adoption and enforcement of recommended "no-feeding" ordinances.

Thank you to the landowners across Rhode Island, including farmers, land trusts, municipalities, and others, who generously permitted access to their properties, and frequently added help with vehicles, utilities including water, power, and on-site monitoring. Particular thanks to those who participated in our experiments or modified practices as a result of our findings: Kevin Breene, Nate Cahoon, Dave Carpenter, Harry and Gail Chase, Sam Chase, Steve DeCastro, Joseph Dutra, Jan and Michelle Eckhart, Louis Escobar, Kelly Hanks and family, Dan and Agnes Keeting, Vivi and William "Hutch" Hutchinson, Stuart MacDonald, Jay Peckham, Ralph and Amy Pratt, Martha and George Neale, Nick and Paul "Cricket" Robertson, Mike Rodrigues, Julie and Henry Sharpe, Max Sherman, Bruce Vanicek, and Dottie Woodcock. Thank you to Providence Parks, Roger Williams Park Zoo, Providence Police Department Mounted Command, and the

Roger Williams Park Botanical Center, and for accommodating field activities and making sites available for associated public outreach.

This research was carried out under scientific collecting and trapping permits issued by Rhode Island Department of Environmental Management Division of Fish and Wildlife. We are particularly indebted to Spencer Tripp, trapper, and Charles Brown, lately the furbearer biologist at Rhode Island DEM, for advice and help in the field, and Jay Osenkowski (Deputy Chief of Wildlife, RIDEM) for advice on and support of our work. Lastly, we appreciate the contributions, during the establishment of the project, of our Animal Welfare Committee: Michael Lapisky (Acting Chief, Division of Wildlife, RIDEM), James Lazell (former President of The Conservation Agency), Christopher Hannifin (RI State Veterinarian, retired), and Scott Marshall (RI State Veterinarian).

**Science-Based Coyote Management:  
Achieving Safe, Sustainable, Coexistence, and Population Control  
December 31, 2023**

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The following Recommended Coyote Management Strategy (RCMS) draws on 18 years of research on coyote behavior and ecology in Rhode Island in rural, suburban, and urban landscapes by the Narragansett Bay Coyote Study (NBCS). The project was initiated at The Conservation Agency and rapidly developed cooperative affiliations with other organizations, principally the RI Natural History Survey, University of Rhode Island, and RI Department of Environmental Management (RIDEM). NBCS was conceived and designed to address coyote management issues in Rhode Island, but the findings and RCMS should be applicable to other states with mixed urban-rural landscapes.

Coyotes began colonizing rural Rhode Island in the mid-1960s. By 2005, when the study began, coyotes had increased their footprint and were establishing a presence in suburban and urban areas. Coyotes rapidly established a fearsome reputation, among a naïve public that had never encountered them before, for preying on unprotected or vulnerable companion animals. From historic coyote encounters in the western and southwestern United States to the edges of their current distribution, attempts at lethal control have been the default response to coyote establishment in urban, suburban, and rural areas.

It is well established that lethal control of coyotes does not provide a solution; it is well documented that coyote populations rapidly rebound. It is also well documented that coyotes, like most top predators, manage their own numbers based on food availability.

Biologists at The Conservation Agency have conducted decades of research determining resource requirements of endangered species (endemic Florida Keys rodents, Caribbean rock iguanas, Asian pangolins) using fine scale tracking techniques. Similar strategies were applied by NBCS in Rhode Island to see which environmental variables coyotes were leveraging to increase population size. NBCS scientists followed GPS-collared coyotes to understand what they relied on for food, reproduction, and shelter. They looked at how coyotes move through the landscape, how they use the habitats within each area they occupy, and what attracts them to residential areas.

The answer was evident: coyotes were using a plethora of anthropogenic food resource subsidies and populations were increasing. After developing foundational data for more than a decade, NBCS received Pittman-Robertson funding from RIDEM in 2017 to conduct research designed to determine if it was possible to manipulate coyote numbers by removing access to manageable food resources – specifically those provided in some way by humans.

Our resulting scientific publications, No Feeding Ordinance, and Police Protocol templates, and the report on “Safe Cycle,” a tested bio-secure method for dead livestock and deer disposal, are integral to the RCMS and attached here (Appendices A-I). The work of NBCS and our many community partners demonstrates that municipalities can safely and successfully control coyote populations as well as coyote traffic through neighborhoods by diligently removing anthropogenic food subsidies.

The most challenging task ahead is changing habitual human behaviors that were not an issue before coyotes arrived in the east (see Appendix J for a discussion of the issues and strategies). This plan involves enlisting officials and residents to prevent, to the greatest extent possible, access to food resources that we currently provide to coyotes: compost, garbage, livestock waste, roadkill deer, small domestic animals, or accessible pet, livestock, wildlife, or human food resources.

This Recommended Coyote Management Strategy is science-based and supported by six critical papers published or being prepared for publication in peer reviewed scientific journals (Appendices A-F) that detail our findings and explain and validate the methods and recommendations provided here in summary form. Details and explanations about the science and conclusions can be found in the supporting work. A glossary of terms is provided in Appendix K. Appendix M contains resources developed during the course of the project that might be valuable for future steps toward coyote management including on videos, exhibits, and signage.

### **NBCS - Recommended Coyote Management Strategy**

In the Recommended Coyote Management Strategy, we suggest a “Passive Coyote Management” approach that could be encapsulated as follows:

**If we aggressively manage ourselves and the food resources we provide to coyotes, the coyotes will manage themselves. Coyote populations will drop to levels sustainable by natural resources.**

The following outline and appendices are intended to provide help in developing and implementing a Coyote Management Plan for Rhode Island and its municipalities. If the recommended steps are taken, and new norms are established and sustained, NBCS research has shown that coyote population density and habituation issues should decrease. To the extent plan implementation involves human societal changes, these must be permanent and maintained, or coyote population growth and problem behaviors will recur responsively.

#### **Coyote Behavioral Assets**

- Coyotes are naturally afraid of people.



- Coyotes avoid areas without food or shelter.
- Coyotes guard areas with food (sleep nearby, decrease territory size if resource is big enough).
- “Resident” coyotes live in a family group (pack) with an average of 2-3 adults.
- Regardless of young produced, the pack size of territorial residents resets annually to an average of 3 individuals by March.
- They defend a territory: the area they depend on for food, shelter, and reproduction.
- Alpha coyotes can live for years and can influence how offspring use territory and forage.
- If anthropogenic food resources are reduced, coyotes will increase territory size. This reduces population density and coyote traffic because the same number of individuals are spread over a larger area. Pack size does not increase with territory size.

### **Coyote Behavioral Challenges**

- Coyotes have from 2 – 7 offspring annually: the more food, the more pups.
- All, some, or none survive depending on availability of resources.
- Most become transient by December (onset of subsequent breeding by alphas) and disperse.
- Transients are always available to colonize any vacancy created in pack territories.
- Abundant food will delay dispersal and winter pack sizes will increase.

### **Societal Challenges**

- People need to change habitual behaviors (Appendices H, J). Both outreach and enforcement will be needed.
- Sustained regular funding is required for enacting recommendations including plan promulgation and ongoing outreach, enforcement, and carcass/waste disposal solutions.

### **Human Behavior-Change: A New Normal**

- Accompany vulnerable pets outdoors.
- Secure garbage and compost.
- Avoid spillage of seed or feeds.
- Clean up fallen fruit or vegetables, prune fruit trees to five feet.
- No animal feeding outdoors unless supervised and limit quantities to what will be completely consumed or is placed in a way that is inaccessible to coyotes.
- Secure fencing for small animals and small or breeding livestock.
- Ensure farm livestock carcasses are not accessible to coyotes, assisting farmers with waste disposal if needed.

- Where unrecovered deer strikes on roads are substantial, contract a state or municipal road-kill recovery team coupled with an alkaline hydrolysis depot for bio-secure disposal of animal waste (Appendix G).

### **Ordinances, State Laws, and State Regulations**

- Establish Municipal “No-Feeding” ordinances (Appendix H, template)
- Establish identical state law or regulation as appropriate.
- Check for conflicting laws or regulations that undermine the goals or enforceability of the “No-Feed” statutes such as those concerning livestock or deer carcass piles, bait stations for coyote hunters, feral cat feeding.
- Nuisance wildlife permits and Hunting Regulations should discourage or limit the taking of alpha coyotes.
- Establish police and state response protocols (Appendix I, template)

### **Lethal control of individuals**

- Removing alpha coyotes (the breeding male and female) should be avoided unless they are recognized as both aggressive and habituated. If alphas - the primary defenders of territory - are lethally removed transients flow in unrestricted.
- Learn to recognize the problem coyote or coyotes. Typically, these are young of the year or subadults that have been fed by people. Older experienced alphas are generally shy of people.
- Lethal control of problem individual coyotes, both habituated and aggressive, should be conducted by professionals in urban and suburban settings.
- Problem individual coyotes should not be relocated.

### **Hunting**

- Hunting and trapping coyotes, in areas where it is safe and legal to do so, has a beneficial effect of selecting for populations of coyotes that avoid humans or, in the case of misses, educating them to avoid people. This reduces residential coyote traffic and habituation.
- Hunting and trapping of furbearers are known to reduce density related diseases (e.g., mange, distemper).
- Hunting regulations or nuisance permits should restrict the take of alpha coyotes unless they are demonstrated to be nuisance individuals. Note: Alpha coyotes can be recognized by the following general characteristics: alpha males have a deep chest and thick neck, alpha females are smaller than males with a barrel-shaped belly (straight across from chest to thighs), they travel in pairs November through March; when feeding, alphas eat first, and group associates (subdominants) wait at distance or return later; as primary hunters and territory defenders alphas are generally the first-

responders to hunting calls (e.g., fawn “bawls,” rabbit squeals) and will approach and stare, associates tend to respond to imitations or recordings of vocalizations (e.g., howls, yipping, sirens).

- RIDEM Hunting Regulations (250-RICR-60-00-9.17K) specify that “Feeding and baiting wildlife, including the leaving out of food of any kind where accessible to wildlife, is not permitted at any time for any purposes.” This rule has an exception (9.17.K.7) stating “The placement or use of carcasses or meat parts thereof is allowed on private property for the purpose of hunting coyote.” This regulation should be modified to limit use of carcasses by type, amount, and length of baiting period. It is critical to avoid large, reliable livestock or deer carcass piles that increase coyote population size or traffic or engender livestock predation or nuisance behavior (Appendices A, B, and C).

**The report submitted to RIDEM and USFWS contained Appendices A-M. This redacted version includes only M.**

## **Appendices**

- A. Mitchell Numi, Hess Kyle R, Strohbach Michael W, Pratt R, Gregg David W. *In prep.* **The effect of anthropogenic food subsidies on coyote (*Canis latrans*) territory size.**

This paper shows that coyotes in Rhode Island that are heavily subsidized by food resources provided by humans have smaller territories. Smaller territories accommodate more packs (or breeding groups) per unit area. When large, reliable anthropogenic food subsidies were removed, the coyote packs we studied typically increased the size of their territory. We concluded that, if the same number of coyotes remain in the group after the expansion, coyote density can be decreased by food resource removal.

- B. Mitchell NC, Hess KR, Strohbach MW, Gregg DW. *In prep.* **Relationships between coyote pack size, territory size, and anthropogenic food subsidies create a potential for effective and sustainable coyote management.**

This paper supports work from other projects across North America that conclude group size depends on food availability/competition and social tolerance of the alpha pair. Group size in resident coyote packs does not increase with territory size. This is our second critical paper supporting the concept that removing anthropogenic food subsidies will result in a decrease in coyote population density.

- C. Mitchell Numi, Hess Kyle R. *In prep.* **Using a graphic signature from GPS data to locate significant food resources for coyotes.**

Attached: data from weekly surveys of activity and feeding hotspots for NBCS coyotes. Preliminary data, draft manuscript in progress.

- D. Hess Kyle R, Mitchell Numi C, Strohbach Michael W, Gregg David W. *In prep.* **Analysis of eastern coyote (*Canis latrans*) diet from scat content: unintended roadside subsidies.**

Results of scat analysis show approximately 50% of scats collected contain deer hair. Seasonal results indicate most is likely from scavenging, not predation. Preliminary data; draft manuscript in progress.

- E. Mitchell N, Strohbach MW, Pratt R, Finn WC, Strauss EG. 2015. **Space use by resident and transient coyotes in an urban–rural landscape mosaic.** *Wildlife Research* **42**:461-469

Major points: Transient coyotes are drifters, existing in narrow corridors around the periphery of land defended by resident coyotes, waiting for opportunities to move in. Living along roadsides, and in suboptimal shelter sites, transients will crowd in to prime undefended areas when lethal control is used on resident packs – particularly alphas, the primary defenders of a pack’s territory. If alpha coyotes are removed, coyote density rebounds quickly and can even increase.

- F. Mitchell NC, Strohbach MW, Sorlien MN, Marshall SN. 2022. **Confluence and Implications of Cats, Coyotes, and Other Mesopredators at a Feral Cat Feeding Station.** *Society & animals* **30**:721-741.

Major points: Cat colonies are a major anthropogenic source of food for coyotes. Feeding feral cats on the ground caused increased coyote presence and reliance on cat food, coupled with high cat-mortality, likely from coyotes. Feed cats where coyotes cannot reach the food and coyotes will reduce visits, causing less coyote traffic around the colony.

- G. **Safe Cycle Report** – Results from a successful 2011 NRCS Conservation Innovation Grant to study the potential for using alkaline hydrolysis to convert an 80 US ton annual food resource for coyotes – roadkill deer - into pathogen-free fertilizer.

- H. **No-Feed Ordinance Template**

- I. **Police Protocol Template**

- J. **Human factors in management of wildlife in Rhode Island**

- K. **Glossary** – terminology used in related documents.

- L. **Narragansett Bay Coyote Study Field and Laboratory Protocols** — methodologies developed and deployed while conducting lab and field research. Prepared by Hess, KR and Mitchell, NC: A manual of methodologies prepared for RI DEM for use in continuing or future studies.

- M. **Resources** — Reports on videos, exhibits, volunteers, and signage developed during the project.

## **Human factors in management of wildlife in Rhode Island**

**David Gregg, Executive Director, Rhode Island Natural History Survey**

**Numi Mitchell, Executive Director, The Conservation Agency**

Coyotes have been established residents of coastal New England since the 1970s. Eastern coyotes have proven to be highly adaptable. Their adaptability allows them to opportunistically consume everything from small mammals and birds to livestock and pets, fruits and vegetables, carrion, and garbage. As they forage, coyotes exert important beneficial influences on region's ecosystem, for example they help control the populations of deer and rodents and with them the ticks that carry lyme disease.

Despite the positive ecological values we have recently come to recognize in predators such as the coyote, from time immemorial humans have naturally felt discomfort around wild predators, especially when in close conspicuous contact. The more coyotes get food from humans, the bolder and more conspicuous they become, and the more conspicuous coyotes are, the more people want to do something about them, to make themselves feel safe again. Coyote extermination intuitively makes sense to people as a way to solve the perceived problem. This is no different in today's developed towns and cities than it was in our rural and agricultural past.

Hunting and trapping coyotes have been practiced for centuries for recreation, to harvest fur, or to control predators. Where legal and safe to do so, hunting can keep coyotes wary of humans or it can be used as a means of lethal control to eliminate problem coyotes. But we now know, from the NBCS's work, that for controlling overall coyote populations, especially in suburban situations, lethal control methods, be they firearms, traps, or poisons, do not make a long-term difference in their populations. It is an important management question to ask what extent modest control effects compensate for their expense and risk, considering Rhode Island's mixed landscapes and dense human population.

The Narragansett Bay Coyote Study began research on coyotes in Rhode Island out of concern that misunderstandings or misinterpretations of coyote behavior were leading to unnecessarily aggressive reactions by humans to interactions with coyotes in relatively densely developed suburban landscapes. NBCS also understood that humans, even those generally well intentioned towards wildlife, were not in a position to prevent or avoid negative interactions with coyotes without a better understanding of the ways coyotes respond to anthropogenic features they find present in the landscape. NBCS research has led to the belief that it is this mutual mismatch in understandings between coyotes and humans, not an inherent incompatibility, that produces negative outcomes for humans and especially for coyotes.

In relatively densely developed landscapes like Rhode Island the interconnectedness between human behavior and wildlife behavior is inevitable. Though the relationship is mutual, we must recognize that we humans, not wild animals, bear primary responsibility for mitigating circumstances that produce negative human-wildlife interactions, for practical reasons if not for moral ones.

To this end, therefore, one strategy is to learn more about coyotes—how and when they breed, how they define and defend their territories, and how they become so acclimated to humans—in hopes of finding more efficient ways to prevent problems and reduce fear while preserving coyotes' ecological benefits. This is the main thrust behind NBCS's nearly 20-year research effort and this research has identified in coyotes' behavior and ecological relationships certain pressure points to leverage. Nonetheless, the research indicates that the most significant leverage for coyote management lies in modifying human behavior. Therefore, if coyote management for co-existence is to be successful, it is essential that efforts be viewed through a lens of human factors. A human factors approach aims to produce success by placing peoples' unique capabilities and limitations at the center of any action plan.

Human factors are at play in the creation of the anthropogenic food problem, and they also condition everything related to the response of humans to being managed. A relatively simple analysis can identify and prioritize actions for anthropogenic food reduction strategy, for example cleaning up roadkill or preventing access to restaurant dumpsters, but reasonably predictable world view conflicts, organizational dynamics, and interpersonal relationships, among other human factors, repeatedly slow, prevent, or reverse progress in implementation of even the simplest management steps.

Successful implementation of coyote management actions will rely on tools from human factors management such as:

- carefully crafted messaging to change the weight of coded words and messages
- development of systems to cope with phenomena such as high turnover in certain residential and commercial neighborhoods and in municipal and private land management staff
- opportunities such as events to empower residents, especially hyperlocal leaders
- fostering of peer-to-peer learning and mutually supportive relationships among public officials including police, ACOs, and RIDEM officers.
- widely spread but low tempo social media campaign to change the overall social frame around wildlife interactions to bring extreme views towards a productive science-proven approach
- systems level, resilient, integration of new programs and capital infrastructure such as SafeCycle, a critical component for coyote density reduction in Rhode Island

Changing human behavior is a complex process, and a combination of strategies or channels will be most effective. Communications consultants to NBCS have recommended that regardless of strategy or channel, messages focus on safety and community norms.

*Educational campaigns:* Reaching adult residents through their children is a well understood strategy. NBCS and its partners including CoyoteSmarts and Potter League have worked to develop and deliver in-school educational campaigns. Characters such as the flea-bitten but well-recognized “Rhody Coyote” used by NBCS can increase receptivity to relevant facts, suggest behavior changes that might otherwise be ignored, and reduce irrational fears.

*Signage:* By thinking through human motivations, clear and informative signs can be installed where wildlife feeding is a common issue. For example, when coyotes denned near a playing field in Providence, in a relatively visible area, we anticipated that people would be drawn to the pups and feeding would be likely. We created engaging signs, in both English and Spanish, specifically addressing the issue. At oceanside State Parks in Newport and Jamestown we established signage prohibiting dumping of fish remains at boat ramps, which NBCS tracking had showed was attracting coyotes to public spaces.

*Community engagement:* Organized educational programs targeting children can be complemented by community engagement that makes didactic presentations to adult residents. The CoyoteSmarts website contained materials we wanted the adult residents to access and so we endeavored to make the CoyoteSmarts “brand” visible through a variety of channels including letters to the editors of local newspapers, social media, and tabling at community events.

*Social norms marketing:* Social norms marketing is a strategy that aims to influence behavior by highlighting what is considered typical or acceptable within a particular social group. Highlight positive social norms by emphasizing responsible wildlife viewing and appreciation without interference. Reinforce the idea that a behavior is socially approved and supported. Showcase stories and examples of communities successfully preserving wildlife by not feeding them. Use statistics or testimonials to correct misperceptions about what others in the social group are doing. Identify peers for audiences/stakeholders being targeted and engage them through social networks including social media. Emphasize the alignment of the desired behavior with existing community values such as safety of children and pets.

*Alternative activities and stakeholder collaborations:* Provide alternative activities for people to engage in that promote wildlife appreciation without direct feeding. For example, one could use public programs at nonprofits with overlapping missions, such as Audubon Society of Rhode Island or Save the Bay, to amplify the no-feeding message. Also, businesses with brands aligned

with the project could be encouraged to use project messaging in promotions or merchandising or to sponsor project activities.

*Monitoring and enforcement:* Monitoring and enforcement of regulations is critical but insufficient in itself. NBCS has been successful working with local authorities to establish or strengthen regulations against feeding wildlife and this should be continued and expanded. Officials who will be enforcing wildlife regulations are critical stakeholders for coyote management efforts and should be engaged positively and consistently including through training, peer-to-peer communications, and positive reinforcement. Negative human-wildlife encounters cannot be eliminated through enforcement but active participation at several levels by enforcement personnel is essential to success.

*Incentives:* Media opportunities could focus on residents, business owners, or local leaders who take positive steps to reduce the way their own setup, be that a dumpster, compost pile, or farm yard, impairs the safety of the community. In any social marketing campaign, especially one designed to get people NOT to do something (in this case not to attract coyotes), it is productive to give people things to do: “share this with people you know,” “keep your eyes open,” “let us know where the coyotes are.”

*Other issues—Be non-confrontational first:* Human factors management tells us that to manipulate conscious community actors, it is especially important to approach them with empathy and a positive attitude regardless of the proximity or relevance of coercive approaches or the likelihood they will eventually become necessary. People are more likely to be receptive to the message when it is presented in a non-confrontational and informative manner.

*Other issues—Cultural competence and social sensitivity:* It is essential that human factors management approaches be tailored to specific cultural and social contexts. For example, coyote feeding the project documented at Miantonomi Park in Newport has a completely different cultural and social context than coyote feeding it documented in Newport Neck. Because of existing social dynamics, approaches tailored for one could be ineffective or quite possibly counterproductive in the other. Consider cultural nuances when designing policies.

*Other issues—Continuous monitoring, evaluation, and adaptation:* Human factors can be hard to isolate, and it can be hard to understand how multiple, overlapping considerations affect each other, especially once management is brought to bear and, theoretically at least, variables are beginning to change. It is essential, therefore, to monitor key variables and conditions, both on the coyote side and the human side, and to develop and use methods for continuous evaluation and adaptation. Regularly assess the effectiveness of interventions through field observations, community surveys, and stakeholder feedback. Monitoring targets and methods should be part of any campaign’s design from the outset. Build in time and budget to adjust strategies based on evolving needs and challenges in the community.



*Other issues—Timescale:* Changing humans' relationship to wildlife, including coyotes, is culture change and culture change is slow. Emphasis should be given to initiatives that change language and social norms in line with coyote management strategies. Efforts should be made to create government and agency policies and systems that have coyote management strategies organically contained within them. Language, norms, and systems have high persistence and because they do not necessarily require constant explicit inputs, they are more likely to last beyond the few years of any particular funded campaign.

*Other issues—Well-rounded team skillsets:* It will be essential that authorities endeavoring to manage coyotes in Rhode Island integrate into the project, early and deeply, people and organizations with a broad range of expertise beyond wildlife biology/ecology. Sociologists, anthropologists, or other experts in cultural understanding and communication should be genuinely engaged. Substantial expertise in marketing, especially social marketing, should be engaged in a sustained manner.

The central role of human factors in both the coyote “problem,” as the community had constructed it, and its solution was recognized in 2012. At that time, Prince Charitable Trusts contracted Action Media, a communications consultant, to work with the Narragansett Bay Coyote Study and its partners at that time, including Rhode Island Natural History Survey, and Potter League for Animals. The goal was to refine the project’s public facing communications with an eye to maximizing its effects on human attitudes and behaviors related to coyotes and access to anthropogenic food. Recommendations focused on reframing the project and the problem and on the most powerful social norms. The Action Media report contains many observations and suggestions that could be useful with respect to human factors and the development and successful implementation of a Coyote Management Plan in Rhode Island, and it is attached here.

# ActionMedia MEMO

October 4, 2012

## Coyote Control: Communications Framing & Recommendations

### Framing the Issue:

Establish the context in all communications, that this is a public safety and health issue. These are wild animals that pose specific threats and have caused specific harm. Make clear that this is a relatively recent threat to public safety -- it has gotten worse in the past 3-5 years and will continue to get worse unless we control the problem. Note that the context of public safety also applies to any misguided attempt to exterminate or, in the Navy's case, to chase off coyotes.

Define the issue. The coyote population is growing in number and in boldness, because they hardly have to hunt anymore: they're opportunistic scavengers, and they're finding easy pickings throughout the Island. Eliminating these food sources will reduce the number of coyotes – those that remain will have to hunt for mice and other wild animals, and to keep away from humans.

In all communications, evoke values of

- ✓ Security
- ✓ Responsibility to neighbors
- ✓ Love of animals
- ✓ Appreciation of nature

Because this is a public safety issue, the responsibility of neighbors is to not create a public safety threat or nuisance. Because this is a public safety issue, the safety of household pets is an aspect of the safety of our families. Because this is a public safety issue, the appropriate "environmental" values pertain to our ability to safely enjoy our beautiful natural surroundings.

Use the values, context and definition of the issue as a platform, or a perspective, from which to develop messages in any medium (most importantly including face-to-face interactions) to all audiences.

## Language Choices

### **“Co-existence”**

Although this is an accurate word for describing the result of successful management, it is not consistent with the recommended frame, and not helpful in generating support for action. Coyote extermination intuitively makes sense to people as a way to solve the problem. Most of them, of course, are unaware of the reasons that won't work. But for many, the meddling of scientists, environmentalists or animal lovers is suspect from the start. They see themselves as common sense, get-it-done people, versus those who want to abdicate, make nice, or co-exist with the pests.

Don't talk about co-existence. Talk about control and management, and about reducing the numbers of packs, keeping coyotes away from humans, and securing public safety.

### **“Good coyote”**

Materials about the issue describe coyotes with a variety of adjectives. Coyotes are said to be “good”, “normal”, “natural” or its opposite “naturalized”, “problem”, “nuisance”, “subsidized”, “pack-less”, “transient” “rogue” and “resident” coyotes. Describing the animals in these ways can make sense from a broad, science-based management perspective, one that recognizes that success is inter-species co-existence. But using these terms to advance those solutions generates confusion. And it tends to define the issue as the coyotes themselves. The issue isn't the coyotes, it's the food.

Talk about “coyotes” as “wild coyotes” and “wild animals”. They hunt, and they're good at it. But they don't hunt if they don't have to. Because the coyotes have too much easy food to scavenge, they're producing a surplus of pups, pushing them out of the pack to try to scavenge on their own.

Only distinguish among coyotes by known individuals, and by pertinent facts about life-cycle: alpha, adolescent, breeding pairs, pups, etc.

### **“Anthropogenic Food Sources”**

Never utilize a big word if a diminutive alternative is just as efficacious.

However, a term being unfamiliar should not in itself disqualify it from general discourse: if the word increases the clarity of our communication, and especially if it resonates with what people already know. For example, “attractant” is a crucial word to use, because the more familiar “food” is too limited a picture. Everyone knows the word “attract”, and can readily agree we don't want to attract coyotes. These wild animals are opportunistic feeders, with a widely varied diet. They eat mostly meat but also fruit, berries, insects. They'll eat garbage, road kill, pets, whatever they can find: easy pickings.

## Story Outline

We have too many coyotes, too close for comfort. Both the number and the boldness of coyotes on the Island are increasing, and it's worse than it was five years ago. This is true throughout New England, where coyotes have established themselves as top predator.

Coyotes are hunters and scavengers. The more food available, the more pups they have, and the smaller defended territory of each pack. The result: more coyotes per square mile, more coyotes near humans.

Trying to wipe out coyotes doesn't work, and never has. Attempting to reduce the population in this way creates more available habitat, and more coyotes will move in.

We can control the coyotes and reduce their population by forcing them to hunt for mice and their other natural prey. We have to eliminate the foods that attract them to human settlement areas, the easy pickings that make it possible for a pack to feed on a relatively small territory. The result will be a bigger territory for each pack, fewer packs, fewer pups.

## The Broader Context

The notes above on framing and composing messages are intended as a starting point, for constructing a wide range of communications. Different messengers will be appropriate for different audiences and occasions. And the same speaker may well change the specifics of their messages, depending on the circumstances. But all the entities and individuals working on this issue should hold themselves and each other accountable for a disciplined approach, to telling a consistent, inclusive, and mobilizing story.

As referenced above, this is not just a local problem. The successful management of coyotes around Narragansett Bay will have a significant benefit for residents throughout New England, where coyotes are expanding their territory and encroaching on human areas. This larger geographic context is part of the story explaining why eradication won't work, and should also be brought to the fore in seeking state engagement, and seeking a broader range of funding sources: the interests are regional, and the success of this project will be adaptable to other regions.

Additionally, successful strategies to manage coyote populations will help build broader recognition of the role of humans in the biosphere, and the role of the wild in our lives. The public education efforts of The Potter League, the RI Natural History Survey, Land Trust and conservation organizations should explicitly include information about coyotes in the local ecosystem, and make the links between our impact on this predator, and human impacts on the habits and habitat of other wild animals.

## Recommendations

### **Create and budget communications campaign.**

To date, NBCS has managed every aspect of the effort, without sufficient resources to do so. Apart from the direct expenses of a more visible community presence, managing and producing the work needs staff (less than full-time) with communications experience. There may be some advantages in housing the coyote control communications effort outside NBCS, which has limited administrative infrastructure. In any case, the visible messengers for this communications work can't be limited to or seen as representing the interests of NBCS. The implications of this work for coyote and wildlife management elsewhere in the region might generate financial support from regional and national funders, as well as potential state and Federal sources.

### **Protocols and Public Education.**

A social marketing campaign to educate residents and visitors about coyotes and public safety will have two purposes: to change specific individual behaviors; and to create the perception of a public expectation that everyone – including governmental entities, major property owners, and community institutions, as well as pet-owners and home owners – will do their part. This public education should be managed to influence elected officials and other decision-makers.

Implementing protocols for police and animal control absolutely requires those entities to inform the public about them. The request to public safety agencies to adopt and promote the recommended protocols should be made as much as possible by peers from other municipalities. Create opportunities for police and animal control officials to meet with each other, and for City Councilors to hear from staff from their own and neighboring communities, and where appropriate from their elected counterparts in other communities.

Municipalities should make commitments to educating the public about the protocols, for example, with resident mailing pieces from one or more city agencies. Each time they do so, the City Council should be publicly praised, and encouraged to do something more.

Public agencies should pay production and distribution costs in such a case, but it will be strategic for design and content to be centrally developed as part of a privately funded coordinated campaign. This educational campaign should at minimum include advertising in local print and on-line media. The paid advertising budget should be planned for consistent presence over a year or two, timed to coincide with periods of higher coyote activity, and with varied content unified by campaign design and themes (eg, content related to feral cats, to garbage, to feeding wild animals, etc.)

Although the project already has excellent video footage, we do not recommend investing in non-research related video or tv advertising. A print campaign will include materials that can be readily re-produced and re-distributed by other entities, in their newsletters and mailings. Developing it as paid advertising will also be helpful when the campaign approaches local media about what they might do as media partners in the effort, continuing to engage their readership on the issue in an on-going way. It would also be a good idea to produce some radio public service announcements, with a limited purchasing budget, to reinforce the impression that this information is everywhere available. Local on-line media of course should be used as well, directing traffic to websites as noted below. We also recommend signage at public trails, reinforcing the message that coyotes ought to hunt their natural prey, not mooch off picnickers.

The campaign should also include articles in local and regional general interest publications. One of the objectives of this project is to create a local example of successful management for replication elsewhere. This is an excellent story, and could be pitched successfully to regional and national travel, science, agriculture, outdoor recreation, and nature magazines of many kinds. Such publicity will both set the groundwork for eventual promotion of this approach elsewhere, and will reflect credit on the elected and community leaders involved in this work, strengthening their hand to continue it.

Public education materials should drive visitors to a Tracker website. This should be an open access platform, easy for people to use, to get frequent updates from NBCS (which will be using this site to drive additional traffic to its own website), and to report their own sightings, experiences, and photos. Simplest and perhaps most effective may be to do this as a dedicated Facebook page. In any social marketing campaign, especially one designed to get people NOT to do something (attract coyotes), it's productive to give people things to do: share this with people you know, keep your eyes open, let us know where the coyotes are. The traffic on this site will in itself be a message to targeted decision-makers, that the problem is real and the public is engaged. And of course the content on it can include material especially intended for targeted audiences, whether decision-makers at the Navy base or individuals who persist in contributing to the public hazard.

## **The Navy**

There are two key strategic messengers for attempting to influence actions taken by the Naval base for coyote control: from above, through the Senate and Congress; and from the municipalities, in whose interest Federal legislators are acting. This suggests two complimentary strategies: to make it a primary objective to secure the strongest possible participation from the municipalities, so that they can be recruited to bring

pressure on the Navy; and to identify some immediate action the Navy might easily take, that should be brought to the attention of congressional representatives. This action should be viewed as a “gateway” toward establishing conditions under which the Navy will eventually participate fully in science-based coyote control.

### **Safe Cycle**

This objective is extremely important not only because of its effectiveness, but because it defines the problem in its broader regional context – easy pickings throughout Rhode Island, and elsewhere in the eastern states. To be strategic, targeted communications to a few key individuals at DEM and USDA will need to be developed by NBCS and its partners, and many of these should be delivered by strategic messengers: those the targets are accountable to.

Recruit farm and tourism interests, other state government officials, and municipal and regional authorities to communicate with the target audiences both by private direct correspondence and by public statements calling for action. Both successes and obstacles to implementing and funding a Safe Cycle program should be made as public as possible, framed in terms of the responsibility (others) are, or are not, taking to protect public safety.

### **Talk it up.**

Apply the framing principles at every opportunity, in informal conversation with others as well as in response to printed or other public statements and news opportunities. Much of the strategy for implementing best management practices involves individual decision makers in their public capacity. One of the strongest influences on them is their perception that “people are talking about it.” While some of the recommendations above will take some time to implement, it’s important to recognize that this campaign has already begun, has been going on for some years, and now is ratcheting up. Use all current communications resources to promote a new “common sense”: leaving food out that attracts coyotes is a public safety hazard.

## Appendix M: Resources

### VIDEOS

As described in the original Project Narrative, videos have been an important component of the project from its inception. Videos help engage stakeholders for the purposes of finding and characterizing potential field sites, recruiting volunteers, investigating hotspots, and mitigating food subsidies to create the post- conditions of the experiment. Videos also help disseminate results.

Some videos were produced and released before the commencement of this project, and their presence benefited the project as described above; NOTE HOWEVER, that the resources related to production of THOSE videos was not paid for by this grant nor were their inputs counted as match. Nonetheless, the metrics for those videos help to communicate the significant role of videos and the scale of the overall stakeholder engagement created by the project.

Video Title	1st Posting Date	Platform	Views (a/o 2023-12)	Watch Time (hrs)
Coyote Poop: There's A Lot of Meaning to Scat	2/16/2021	YouTube-RINHS	5,643	171.6
Coyote Ecology: Collaring Clouseau	1/7/2022	YouTube-RINHS	199	9
Why Not Just Shoot Them?	3/9/2021	YouTube-RINHS	428	26.8
What To Do If You See a Coyote	3/6/2017	YouTube-RINHS	303	11.6
Creating Urban Coyotes 1st ed	3/6/2017	YouTube-RINHS	56	1.2
Why Not Just Shoot Them?	2/22/2017	YouTube-Numi Mitchell	732	55.2
What To Do If You See a Coyote	2/22/2017	YouTube-Numi Mitchell	49,410	2,300
Creating Urban Coyotes 1st ed	7/25/2016	YouTube-Numi Mitchell	6,892	171
Narragansett Bay Coyote Study-3 coyotes react	7/30/2016	YouTube-Numi Mitchell	2,836	36
Creating Urban Coyotes 2nd ed	2/22/2017	YouTube-Numi Mitchell	1,172	34
			67,671	2,816.4



*What to Do If You See a Coyote?*  
<https://youtu.be/qpG-4W2mtYQ>



#### TRANSCRIPT

Coyotes have been hunted and trapped throughout history and usually are very afraid of humans sometimes they get habituated and lose their fear of people. This is because they often find food in residential areas. In this case you might see them walking down the road or lounging on a lawn and active during the day. This video is designed to help you scare coyotes out of your territory and be more comfortable living around them.

Oh no is that those coyotes back again ... shoo, shoo, shoo...go away  
I think I'm gonna have to call the police.

Hello Police Department, what is your emergency?

Oh, hi, yeah, there are coyotes in my yard and they won't leave. I'm afraid to go outside.

Don't worry ma'am, sometimes coyotes just don't know to be afraid of people.

There is a website that tells you what to do if coyotes won't leave. Check out CoyoteSmarts.org.

CoyoteSmarts.org, okay thanks.

You're welcome.

Huh, let's give it a try ... here it is, CoyoteSmarts.org. Public & Pet Safety: What to Do If You See a Coyote. The guidelines to follow... crossing a yard or street ... lounging in a yard or approaching... Yeah! Be as big and loud as possible, do not run or turn your back, wave your arms, clap your hands and shout in an authoritative voice shake or

throw a coyote shaker... a soda can filled with pennies or pebbles and sealed with duct tape. Yeah I can do this. Coyote shaker, yeah, what else do?

Yeah. These should work nicely. I'm going to put these outside. I'll be all ready for them when they come back!

Oh you're back, alright guys, I'm coyote smart now!

Right, set thanks Frank

hi yeah get out of here yeah keep going, yeah get back to your own place, ah ah ah

That's an example of how acting big mean and loud works to scare coyotes out of your territory. Why does it work? Because you're speaking their language. Coyotes are territorial. Here in the Narragansett Bay we're studying six family groups of coyotes. All of them have territories which they aggressively defend against other coyotes. How do they do it? By barking and chasing and acting as big mean and loud as they can. When you're loud and aggressive, you're speaking their language; they will understand you and they will leave. Don't ever let coyotes lounge around and get comfortable in your yard and or in your neighborhood. Actually chasing them away is a kindness. Keep our wildlife wild.

If you want to know more, you can go to [CoyoteSmarts.org](http://CoyoteSmarts.org) or Google the Narragansett Bay Coyote Study.

*Creating Urban Coyotes*

<https://youtu.be/w0E37tGkDkQ>

This video was uploaded in two slightly different formats on Dr. Mitchell's YouTube channel and these are indicated here as 1<sup>st</sup> edition and 2<sup>nd</sup> edition. The transcript is for the 2<sup>nd</sup> edition.

TRANSCRIPT

The NBCS focuses on coyote behavior at the interface between habitat and human communities by tracking GPS collared coyotes. The goal is to develop science-based strategies for coexistence and management.

[Music]

One of the studies collared coyotes, called Cliff, is frequently seen by Middletown and Newport residents. Data from Cliff and other coyotes shows that feeding coyotes trains them to lose their natural fear of people and tempts them to forage in town. Once habituated to people, fed coyotes are inevitably euthanized in the interest of public safety. Tracking Cliff has shown that during the winter he eats mostly geese rabbits and deer that he and his family catch in the wild sections of their 3.5 square mile territory. During the summer busy season he seems to do better in town. He checks open dumpsters and backyards for food leavings or offerings. He has a regular route along the main streets of town. Feeding them is never a favor. Be a good neighbor, don't feed. Check that your community keeps all trash food items and small pets secured from coyotes. Keep our wildlife wild.

*Coyote Troubles...Why Not Just Shoot Them?*  
<https://youtu.be/iKiDCGzuugk>



#### TRANSCRIPT

[On-screen caption] This film is about management of coyote populations in urban and suburban environments. It is not about coyote hunting or trapping for recreation, fur harvesting, or predator control.

*Music and video (Autumn, Winter, Spring, Summer)*

Narrator: In the 21st century coyotes can be found throughout the eastern United States. Before European settlers came to America and cleared the forests another native canine lived here. Wolves used to be a top predator in eastern North America. Now the forests have come back and along with the trees have come deer, turkey, beaver, fisher, and yes a wild canine. Only this time it's the eastern coyote.

Coyotes are a native species that used to be confined to the Great Plains. The eastern coyote was descended from them with a small amount of wolf and dog DNA woven in during a period of interbreeding many years ago. Coyotes have been established residents of coastal New England since the 1970s. Eastern coyotes have proven to be highly adaptable. They opportunistically consume everything from small mammals and birds to livestock and pets, fruits and vegetables, carrion and garbage. As they forage, coyotes can exert important beneficial influences on the whole ecosystem. They help control the populations of deer and rodents and with them the ticks that carry Lyme disease. Their habitat has also expanded to include a variety of natural and human

surroundings: forests and fields, scrublands, and wetlands, suburban backyards, and even built up urban areas.

Dr. Numi Mitchell, of The Conservation Agency in Jamestown, Rhode Island, has been studying coyotes in the suburban environment for over 15 years. She has seen solutions to the “coyote problem” come and go including lethal control and the coyotes are still here because of the coyote's own biology. But biology might make it possible to manage their populations by managing their food supply. Want to get involved in Dr. Mitchell's research we're looking for coyote hot spots. We want to set up field cameras, put on tracking collars, and sample scat to learn about coyote population, territory, and diet. If you live in Rhode Island and know where there's a lot of coyote activity, contact us, watch the project page, call the Howl Line. or send sightings online.

From time immemorial humans have naturally felt discomfort around wild predators such as coyotes. The more coyotes get food from humans, the bolder and more visible they become, and the more conspicuous coyotes are, the more people want to do something about them, to make themselves feel safe again. This is no different in today's developed towns and cities than it was in our rural and agricultural past. Hunting and trapping coyotes has been practiced for centuries for recreation, to harvest fur, or to control predators, and it's legal in many areas. Hunting can keep coyotes wary of humans or it can be used to eliminate problem coyotes, but for controlling overall coyote populations, especially in suburban situations, it is not always effective.

The forests are back and can't be cleared again. The eastern coyote has very different biology and behavior than wolves. Maybe if we knew more about coyotes... how and when they breed, how they define and defend their territories, and how they become so acclimated to humans, we could find more efficient ways to prevent problems and reduce fear while preserving coyotes' ecological benefits... to safely co-exist.

Annie: Hi Numi!

Numi: Hi Annie, come on in!

Annie: Thank you, so what are we doing today?

Numi: Well, I'm trying to animate why shooting coyotes doesn't work...

Annie: So why has the coyote population become such an issue?

Numi: Well, we didn't have them here to start with, and they came in from the west, and people are pretty alarmed by them because they are predators and of course they eat pets. And they are actually becoming really abundant.

Annie: So what are people doing to control the population now?

Numi: Unfortunately it's the old default, which hasn't worked in 150 years - its lethal control: shooting, trapping, poisoning. And it just doesn't work.

Annie: So why hasn't the shooting worked?

Numi: Because of the biology of the animals. This is something we are working on with our tracking.

Annie: What about their biology makes this method impractical?

Numi: Well, they are territorial, and there are also these coyotes that are called "transients" which make a problem.

Annie: So what do their territories consist of?

Numi: In this picture I drew Aquidneck Island with ten coyote families, and those families are called packs. They each have a territory that they defend. The animals that defend it are the two most important animals in the pack: the alpha male and the alpha female. They also breed and have the puppies, but most of the year they live together defending this territory every night, exploring around defending the boundaries making sure no other coyotes come in. And then there are also beta coyotes in the family group.

Annie: And the betas?

Numi: Babysitters. When the coyotes have puppies, they'll take care of them while the male and female hunt.

Annie: How many puppies do the alphas have in a year?

Numi: Well that depends on how much food, and that is a really important point. Because they have as many pups as the food resources will support. So if there is more food, the female will have more pups - up to seven of them, or if there is less food, she might only have two or three pups.

Annie: So what are these transients you were talking about?

Numi: By Fall, these seven puppies are getting large and eating a tremendous amount and stressing out the parents and the betas. They are also getting hormones and challenging their parents, so the parents kick them out. And they become transients. Maybe one or two stay and become betas, but the rest are just wandering the island, in between territories trying to find a place to live. They are looking for a place to colonize, looking for a way in. And if all of these packs, family groups that I've shown here, have say five pups that become transient, then we have 10 packs x 5 pups = 50 transient coyotes available to come in.

Annie: Wow, yeah, that a lot! So what about them makes shooting impractical?

Numi: What happens is with lethal control, often people shoot out the animals that are defending a territory and keeping other coyotes out. If you shoot a hole in that territorial boundary and 50 transients available to colonize, a lot of those animals will flow in and you'll actually have more coyotes than you had to start with.

Annie: So how do we manage coyotes?

Numi: Basically by managing ourselves. We provide so many food subsidies to coyotes, it's unbelievable. If we stop providing food like farm livestock waste, garbage, dumpsite foods, cat food, cat colonies, pet food outdoors... the coyote populations will drop to a level sustainable by natural food resources - like mice. Therefore, they won't be going into residential areas and interacting with humans. If we manage ourselves, coyotes will manage themselves. So, what we tell people is this Annie:

Annie and Numi together: Be a good neighbor, don't feed coyotes, keep our wildlife wild!

*Collaring Clouseau the Coyote*  
[https://youtu.be/6F8FIY\\_WoDI](https://youtu.be/6F8FIY_WoDI)



## TRANSCRIPT

[On-screen caption] HEADS UP: This video shows a wild animal that's being trapped, sedated, and examined. The protocols used are developed and supervised by veterinarians and we know from the tracking that this coyote was fine afterwards. Nonetheless, particularly sensitive people might be bothered by this video.

[On-screen caption] IMPORTANT NOTE: The general public should NOT get into contact with wild animals. The scientists in this video are trained for this work and have decades of experience. The Narragansett Bay Coyote Study holds Rhode Island scientific collector and trapper permits, has landowner permission, uses rabies pre-exposure prophylaxis, and uses special traps under supervision of a veterinarian.

Hi everybody i'm David Gregg and I'm the Director of the Rhode Island Natural History Survey. The Survey is the home of a coyote ecology research project that's been running for about three and a half years now and I just got a call from Dr. Numi Mitchell, the project coordinator and apparently they have a coyote in a trap over in Newport and the project staff are on their way there. They're gonna put a satellite collar on the coyote and see what it gets up to. Let's go see.

You want to be a staff photographer? You want my phone it might be...

Here's Dr. Numi Mitchell, President of The Conservation Agency and lead scientist and project director for the Narragansett Bay Coyote Study.



There's a trap set in Newport and they've been keeping an eye on it remotely using a cell-enabled trail cam.

Guess what, i think this is something, yeah

With her is Kyle Hess wildlife biologist assistant with the Natural History Survey. The coyote is quickly netted and restrained with an animal control pole, a dark blanket is draped over him, and a sedative is administered. Within a couple of minutes the animal is sedated and it is safe to handle it.

The team inspects the coyote to confirm it is uninjured and basically healthy, then he is weighed and measured, his teeth are inspected, and a blood sample is taken. There are three components on the collar, the electronics payload includes GPS receiver, satellite communications, and a short range radio tracker. The largest piece is the battery. It has to power the setup for an entire year. Finally there is a release that allows the collar to be removed remotely once the study is through or if the scientists monitoring the signal notice anything amiss.

I love Telonics

The tracking collar is made super tough to last a year on an animal that lives with pack mates who really like chewing on things. It is attached using stainless steel and brass hardware. After it is confirmed that the collar fit is good, the antidote to the sedative is administered and within a minute or two the coyote is up and headed for the bushes.

Whenever the tracker shows a coyote has spent an unusual amount of time in a spot, one of the project's staff goes out to investigate this hot spot...what's so attractive? This is how the collard coyotes are giving us a window into their world  
[Music]

*Coyote Poop: There's a lot of meaning to scat*  
<https://youtu.be/-FcjFqLN45Y>



## TRANSCRIPT

Hey everybody, I'm David Gregg and I'm taking a walk down to another building at East Farm just downhill from our office and I'm going to meet Kyle Hess, who's the assistant on our coyote project. Kyle has been working on and analyzing coyote scat to learn about diet and he's been doing some analysis and I want to see what he's found. I thought you might be interested to tag along so let's go look at some coyote poop

Hey Kyle. Hi David, how's it going? Good. How are you doing. I'm great.

All right, so I'm here to look at the scat lab. Is this the place? This is the place all right. Cool, when we get our samples from the field, they go in the freezer. Yummy.

Yup, here's an example here we code them with the date, the person who collected them, and the scat for that day. And how many do you have now in the freezer? We have over 200 scats now, I believe. Let me take a look at the database here. Yes, we have 209 right now. These fields are all from the collector app that we use so these are actually from the field data that we put in and what I'm looking for right now is the presence or absence of deer.

Okay the samples so so the hair present was filled out by the collector actually. I added these three fields hair confirmed here and other yeah everything prior to that all of these other fields right so they say it's this like here, it's got possible food resources other food.

Yeah, so these are things that would have been entered by the collector in the field. Right on the predominant contents hair fur scat color matrix. What's the color for? Well, we're gonna find out. We've kind of tried to include every variable that might be useful and we're gonna see if color is associated with a particular type of food, whether they're eating pet foods. Absolutely.

They're from all over the state we sent volunteers and fellows across the state in every town and had them collect mostly in places where we thought there would be a good chance of finding coyote scat, lots of coyote reports, for that area. Right, Cool, here it is. I'm careful not to read where it was collected or what the collector felt was in the sample because i don't want to bias the results and I pick it apart. So you aren't washing it down and filtering yet at this point? No, that's going to come later but right now we're just looking for physical evidence of deer and i make notes if there's other things present in there like woodchuck or meadow vole or anything like that. The fur makes it through the digestive system really well so fur is the main thing but there can be bone for sure. In fact a lot of the rodent remains I find are bone so that could be a big help if we find that this one has deer hair in it.

So the quick and dirty answer is yes this one has deer, but i am picking through it pretty extensively just so I can make a note if there are other species present in here and this one looks like it has some human material possibly here. By which you do not mean human material. I don't mean a human, but anthropogenic, human-created product. So there's a big chunk of plastic right here, okay, which we've been finding a lot of unfortunately.

I think that's actually animal tissue we had a protocol for people to analyze scat for volunteers from URI to do the analysis, and then COVID hit and they can't do that. Right. So this is very much a preliminary step, yeah, so right now this is just kind of a proof of concept to see that we can get it all to work out, what kinds of things you can find in there, and what tools we'll need to do it effectively. Right.

So the main thing we will wash out is the matrix which is the essentially the meat that they were eating which will possibly be identifiable perhaps by color, we don't know yet, but beyond that there's not much you can do with the matrix so once we've weighed it and we have everything we need from that we'll wash that out and just have the undigestable. People think coyotes are carnivorous but they aren't, right now they are omnivores and I found already today I found probably 90 of the samples had seed or anthropogenic material or I found bird feathers so it's just they eat whatever they can get their hands on.

So this is a really interesting sample because we have multiple species represented here we have probably meadow vole, we have a rabbit. Is that a skull in the lower right the brown thing, we do have a jaw here somewhere, seeds, no it's a leaf, yeah seeds there. It's always there evidence of deer in there is that when there's no evidence of deer in this one we have woodchuck hair for sure we have rabbit fur, possibly a rabbit jawbone. We're gonna confirm that there are seeds throughout. Couldn't identify the species of bird but we have some hollow bones and some just kind of brown feathers so not the neighborhood chicken no definitely not chicken. I think you had a coyote that was preying on chickens over in Portsmouth? Yeah they really like backyard chickens so i'm sure when we get to those the scat samples from Portsmouth we're gonna find a lot of farm animals represented there. This fur here is probably vole, we found a lot of woodchuck fur in this one too.

One of the reasons we're collecting scat is because we want to know about diet but coyotes themselves use scat in different ways so how do coyotes use their scat? They'll use scat to mark their territory if they we often find them at a trail intersection so really it's kind of like this is my spot. So they go specifically to a trail intersection to poop and then...? Yep, they'll actually go right on a food item if there's you know a carcass that they want to say is theirs; they go right on the food right on top of it. I did a sample earlier today that was found on a seagull carcass, you know it seems pretty intentional. That's totally cool, right on top of that. So yeah there's a lot of meaning to scat.



# Development Guide for “Coexisting with Coyotes” Exhibit

An Overview of the Planning Process and Exhibit Contents  
for a Science Education and Public Engagement with Science Exhibit  
at the Roger Williams Park Zoo in Providence, Rhode Island

Prepared by Carolyn Decker

Spring 2021

Rhode Island Natural History Survey

Kingston, Rhode Island

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## Executive Summary

Public engagement with science is an important component of the Narragansett Bay Coyote Study (NBCS), an ongoing scientific research project that seeks to understand the role of anthropogenic food sources on coyote populations in Rhode Island, particularly in urban environments. This development guide describes a proposed exhibit, “Coexisting with Coyotes,” designed for the Conservation Corner area at the Roger Williams Park Zoo (RWP Zoo). The purpose of the exhibit is to engage members of the public with content about coyotes in Rhode Island with three themes: coyote safety, coyote science, and coyote ecology. The exhibit is intended to improve the usage of the currently underutilized Conservation Corner area at the zoo and enhance visitors’ experience at the zoo through a fun, informative, and interactive multimedia educational exhibit. The primary audience for the exhibit includes local residents in the Greater Providence area, a population well represented among visitors to the RWP Zoo.

Preliminary data from the NBCS shows that the residents of the Greater Providence area influence the movements of coyotes in their urban environments by leaving food attractants (i.e., pet food, trash, compost) outdoors. These food attractants subsidize the food needs of coyotes and habituate this wildlife species to anthropogenic sources of sustenance. Habituated coyotes tend to be more dangerous to people and pets. One of the goals of the NBCS is to research the movements of coyotes when such food attractants are available and when the food attractants are removed or reduced. Getting public participation in this change is a vital part of the research project and serves the dual purpose of creating safer communities for people, pets, and wildlife, while providing opportunities for public engagement with science.

This guide and all exhibit contents except where otherwise noted were developed by Carolyn Decker as a component of a Science Writing Internship at the Rhode Island Natural History Survey in fulfillment of the Graduate Certificate in Science Writing and Rhetoric at the University of Rhode Island. The guide includes a critique of the current Conservation Corner area, a description of the exhibit design planning process, and a description of the proposed exhibit including all exhibit elements and assessment tools.

## Critique of Current Exhibit Layout

The current exhibit has design weaknesses that could be improved under the Coexisting with Coyotes exhibit. The exhibit area is roughly rectangular and semi-enclosed under a terrace-style roof. The exhibit area extends off the Zoo Lab building across from the Meller-Danforth Education Center. Most visitors approach Conservation Corner (as shown in Figure 1) after leaving the Faces of the Rainforest Exhibit or the Alex and Ani Farmyard. The exhibit is in a high-traffic area located near facilities like the food vendors and restrooms. According to zoo staff, the current exhibit has been on display roughly ten years and is generally regarded as under-utilized in terms of its potential. The photographs shown here were taken by Carolyn Decker on the afternoon of March 13, 2021.

Figure 1: Overview of Current Conservation Corner Exhibit



The exhibit lacks clear expectations for how visitors should progress through the space. Most of the exhibit is poorly lit (half in shadow), limiting the visual appeal to enter the exhibit area. Little to no clear expectations are set for how visitors should interact with this space, let alone the information on the panels. The benches and planters indicate some privacy for a moment in the shade or a quiet conversation, but they appear as if placed as an afterthought without regard to the visitor’s experience with the exhibit content. The uneven paint, haphazard placement of objects, and lack of cohesion undermine the exhibit and leave an impression of shabbiness.

Visitors are implicitly expected to enter under the Conservation Corner sign on the right then progress counterclockwise through the exhibit space to view the seven static information panels on display. Arrows hint at this, as do footprint markers for social-distancing guidance, but these markers do not solve the problem. Based on some brief observations during a visit to the Zoo, most visitors simply walk past the right side of the exhibit, avoiding the area altogether. Those that do stop pause briefly at the first set of panels then exit through the right-hand side of the exhibit, only engaging with about a quarter of the exhibit content.



Figure 2: Main panels visible near exhibit entrance



The perpendicular layout of the panels also detracts from engagement with the information. While the text and images are aesthetically pleasing and educational, there is little clear order or actionable goal communicated to readers. Most attention is directed to the “Karner Blue Butterfly Project,” “American Burying Beetle Project” panels on the outermost part of the exhibit (Figure 2).

Figure 3: Rear wall of exhibit with panels, bench, and obsolete elements



The other five panels on “Bird Conservation,” “Conservation Every Day,” “What is an SSP,” “Purple Loosestrife Project,” and “Saving Red Wolves” are largely hidden from view (Figures 3, 4, 5). The primary sightline into the rear shaded part of the exhibit (Figure 3) is a defunct red box that was formerly part of

a solar panel display, adding confusion as to the purpose of this exhibit. The left rear corner of the exhibit is completely unused, barring a small text-heavy sign (Figure 8).

Figure 4: Unused rear corner of exhibit along Zoo Lab classroom window



If visitors progress through the exhibit along the intended path, they exit through a more enclosed space where the Purple Loosestrife and Red Wolf panels are displayed on the reverse side of the Karner Blue and Burying Beetle panels (Figure 7). This area feels constrictive and creates an incentive to move through quickly so as not to block other visitors or stand in front of the Zoo Lab door (Figure 10).

Figure 5: Exhibit panels on neglected internal side of exhibit



Figure 6: View along internal half of exhibit toward intended exit



Lastly, the current exhibit feels disconnected from other elements and intentions of the zoo. Yet, its location at the ‘top’ of the zoo near other dynamic exhibits and buildings like the Faces of the Rainforest (background in Figure 6) and the Education Center (Figure 7) provides an opportunity to engage visitors midway through their visit with important science and conservation topics. The exhibit currently seems constrained to the rectangle under the terrace roof, despite the adjacent area of opportunity along the Education Center fencing that could serve as additional space to connect concepts and experiences (Figure 7). Using this high-traffic area could better pull visitors into Conservation Corner.

Figure 7: View of exhibit toward Education Center and main visitor traffic flow



## Proposed New Exhibit: Coexisting with Coyotes

### Who is involved?

1. Rhode Island Natural History Survey (RINHS)

The [RINHS](#) is a 501©(3) non-profit organization founded in 1994 dedicated to the preservation of Rhode Island’s biota, ecological communities, and geological systems. The RINHS provides environmental education, scientific data collection and management, and coordinates communication among scientists, educators, decision makers, and members of the public.

For the Coexisting with Coyotes project specifically, all contents were prepared by Carolyn Decker, a master’s student at the University of Rhode Island under the guidance of RINHS executive director Dr. David Gregg.

2. Narragansett Bay Coyote Study (NBCS)

The NBCS is an ongoing scientific study started in 2004 led by Dr. Numi Mitchell in partnership with the RINHS and The Conservation Agency. The primary aims of the study are to document the movements and habitat use by coyotes (*Canis latrans*) in Rhode Island, particularly on Conanicut Island, the Aquidneck Islands, and in Greater Providence. Public engagement with science and education are important components of the study, prioritized in Dr. Mitchell’s [Coyote Smarts website](#), the [NBCS Facebook page](#), as well as the Coexisting with Coyotes exhibit.

3. Roger Williams Park Zoo (RWP Zoo)

The [RWP Zoo](#), founded in 1872, is an AZA accredited zoo and 501(c)(3) non-profit organization focused on conservation and environmental education. The RWP Zoo is located in the City of Providence within the urban greenspace of Roger Williams Park. The zoo offers live animal exhibits of over 160 wildlife species as well as off-display conservation efforts of native New England species. The zoo includes an area called “Conservation Corner” where the Coexisting with Coyotes exhibit will be displayed. RWP Zoo Manager of Interpretation and Graphics, Leigh Picard, and Graphic Designer, Brett Cortesi were collaborators in developing this plan.

### Science Communication Goals

The Coexisting with Coyotes exhibit completely replaces the existing elements in Conservation Corner with new content. The beams and benches remain, but the current panels, wooden frames, solar battery box, and wooden planters will be removed. These changes are necessary to support the new science communication goals:

- 1) **Behavior Change:** Motivate audience to avoid feeding coyotes and practice coyote safety.
- 2) **Increase Science Engagement:** Inform and engage audiences in scientific research in Rhode Island.
- 3) **Increase Wildlife Knowledge:** Educate audience about coyote ecology and life history information.

These goals are explored in more detail in the Exhibit Objectives table designed in accordance with the RWP Zoo’s exhibit planning practices. This table maps out four elements of exhibit design to describe the intended aspects of what audiences “Learn,” “Experience,” “Feel,” and the intended “Behavior Changes” audiences undergo via the exhibit.



Exhibit Objectives: Conservation Corner  
(Coexisting with Coyotes)

Theme: If we never feed coyotes, humans and coyotes can coexist more safely in urban, suburban, and rural areas.

Learn	Experience	Feel	Behavioral Changes
<p><b>Coyotes are natural in Rhode Island</b> in urban, suburban, and rural habitats and play an important role as predators. People and coyotes can coexist.</p> <ul style="list-style-type: none"> <li>• Who are coyotes? (how to ID)</li> <li>• How do coyotes compare to dogs and wolves?</li> <li>• What do coyotes eat?</li> </ul> <p><b>Scientists are studying coyotes and you can help!</b></p> <ul style="list-style-type: none"> <li>• Scientists like Dr. Mitchell use GPS collars to track coyote movements and learn</li> <li>• You can document coyote sightings online to participate in conservation science.</li> <li>• You can make a difference and help keep your family, neighbors, and wildlife safe.</li> </ul> <p><b>Wildlife need our care</b> to live safe and healthy lives in the habitats we share. Our actions have consequences in nature.</p>	<p><b>Discovery and fun</b></p> <ul style="list-style-type: none"> <li>• Combination of <b>comic-style</b> coyote characters and <b>real-life images</b></li> <li>• <b>Silhouettes</b> engage sense of what we can and can't see</li> </ul> <p><b>Visual</b> story through pictures and words about coyote conservation in Rhode Island</p> <p><b>Auditory</b> engagement:</p> <ul style="list-style-type: none"> <li>• “Never Feed Coyotes” song</li> <li>• Coyote vocalizations</li> </ul> <p>Sense of <b>scale and relationships</b>:</p> <ul style="list-style-type: none"> <li>• Life-size cutouts to compare sizes of people and coyotes</li> </ul> <p><b>Connection</b> to other aspects of the zoo and one’s own home and habits:</p> <ul style="list-style-type: none"> <li>• Red Wolf exhibit</li> <li>• Trash bins (stickers about not feeding coyotes)</li> </ul>	<p><b>Curious</b> about wildlife</p> <p><b>Inspired</b> to take action/help</p> <p><b>Connection</b> to nature/environment</p> <p><b>Understanding</b> about coyotes (less afraid, more aware of safe behaviors)</p> <p><b>Interested/Motivated</b> in science</p> <p><b>Confidence, trust, and pride</b> in RWPZ and other local conservation organizations (RINHS, The Conservation Agency,</p>	<p><b>Never feed coyotes!</b></p> <ul style="list-style-type: none"> <li>• Keep trash and compost covered</li> <li>• Avoid leaving pet food outdoors</li> <li>• Keep pets inside (including cats)</li> </ul> <p><b>Participate in science</b> by reporting coyote sightings on <a href="http://coyotesmarts.org">coyotesmarts.org</a></p> <p>Become an <b>advocate</b> for wildlife and conservation locally in Rhode Island</p> <p>Shift perceptions about wildlife (especially predators) leading to an <b>evaluation and reconsideration</b> of daily actions, resulting in an <b>application of new practices</b></p>

Identifying the science communication goals and objectives of the exhibit were important pre-planning steps in the design phase of this project. We used backward design principles (Figure 8) in establishing the goals, objectives, and tactics of the project (Dudo & Besley, 2016). In support of our three *goals*, our main *objective* was to situate within the emotional and institutional framework of the zoo as a place of discovery and curiosity and fun for families and individuals. Our *tactics*, which will be outlined in the discussion of the proposed exhibit elements in this guide, include the visual, auditory, and tactile content of the exhibit such as the text and images of the informational panels and other interactive materials in the exhibit space.

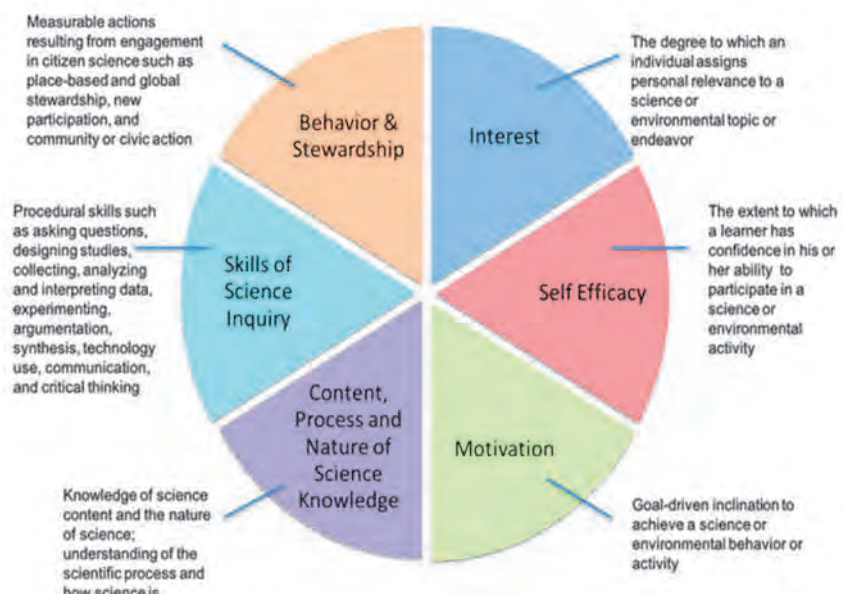
Figure 8: Backward Design in Public Engagement with Science (Dudo & Besley, 2016)



To achieve these objectives and goals, evaluation is a critical part of the exhibit (See the Evaluation section of this guide). The primary tool for evaluating the success of the exhibit in achieving these objectives and goals will be a visitor questionnaire. Zoo interpretive staff can use this brief questionnaire to interview zoo guests upon exiting the exhibit space (See the Post-Visit Survey section of this guide.) Other assessment tools will be use of the hashtag #NeverFeedCoyotes on social media, and website traffic to Dr. Mitchell’s CoyoteSmarts website, both of which will be referenced within the exhibit. The ultimate behavior change goal in publics’ feeding of coyotes will be assessed within subsequent phases of the Narragansett Bay Coyote Study.

Other important considerations when designing this exhibit included aspects of visitor engagement and participation with science. Philips et al (2018) group these aspects in terms of behavior and stewardship, interest, self efficacy, motivation, content regarding the process and nature of scientific knowledge, and skills of science inquiry (Figure 9). This exhibit aims to incorporate all of these aspects of engagement and participation to varying

Figure 9: Learning Outcomes and Considerations for Citizen Science (Philips et al., 2018)



degrees, thereby meeting visitors ‘where they’re at’ in their current feelings or perceptions about conservation science, wildlife, and personal involvement with science. This approach centers the experiences of visitors in a pluralistic manner, expecting visitors to engage with the exhibit with different perspectives, histories, and levels of familiarity with the subject matter. Our design also allows for flexibility of participation and engagement for visitors who visit only select portions of the exhibit, stay for varying period of time, and care about varying topics and themes in different ways.

### Exhibit Concept Planning

Planning the Coexisting with Coyotes exhibit required careful concept mapping. We used inspiration from Belcher’s (1991) museum exhibition concept planning diagram (Figure 10). The concept map asks designers to identify the main topics of a given exhibition, related subtopics, and the connections and progression for how a visitor navigates the topics from their initial orientation to the space to their exit via a finale and, potentially, a related purchase. Through multiple rounds of revision and discussion, we arrived at a similar concept map (Figure 11) specifically related to the proposed exhibit in Conservation Corner. The three main themes of 1) Coyote Safety, 2) Coyote Science in RI, and 3) Coyote Ecology were identified with related subtopics to shape the content of exhibit panels. While we left the orientation element somewhat undefined at the early phase of planning, we modified the finale/sales portion of the diagram with a pivot toward a fourth component of 4) Ways to Get Involved through participation in science, supplementary education materials, and related merchandise. This pivot was important in making sure we were targeting our goals and objectives throughout all components of the exhibit.

### Accessibility and Inclusion

Accessibility and inclusion were priorities from the beginning of project planning. In designing the project, we considered the intended audiences as predominately local families visiting the zoo from the Greater Providence area. Although the zoo receives visitors from around the world, we prioritized the local audience because those publics are those most important to engage with our messages about safely coexisting with coyotes in Rhode Island and effecting the behavior change around never feeding coyotes. We worked with zoo interpretive staff to better understand their core audiences of zoo members and local visitors in terms of demographics and current trends in visitor engagement.

Within this audience-centric design approach, we aimed to ensure that the materials and contents of the exhibit were accessible and inclusive. All text within the exhibit was designed to be understandable at a 5<sup>th</sup> grade reading level. We used the Flesch-Kincaid test to evaluate the reading level of exhibit text. We also arranged the height and size of the exhibit elements to be accessible to those with vision impairments in terms of the fonts, colors, and size of text and photographs. The placement of exhibit elements was also designed in consideration of visitors using wheelchairs and strollers. Although the exhibit is primarily presented in English with some Spanish text included in the proposed panels and post-visit survey, additional physical and digital materials should be prepared multiple languages commonly spoken among Rhode Island residents such as English, Spanish, and Portuguese.

Figure 10: Blank Exhibition Concept Planning Diagram (Belcher, 1991)

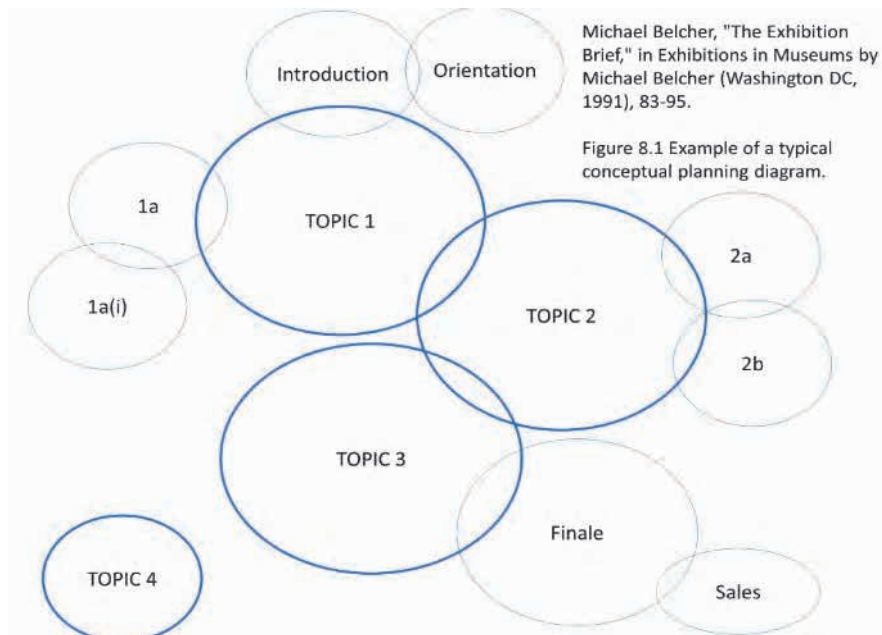
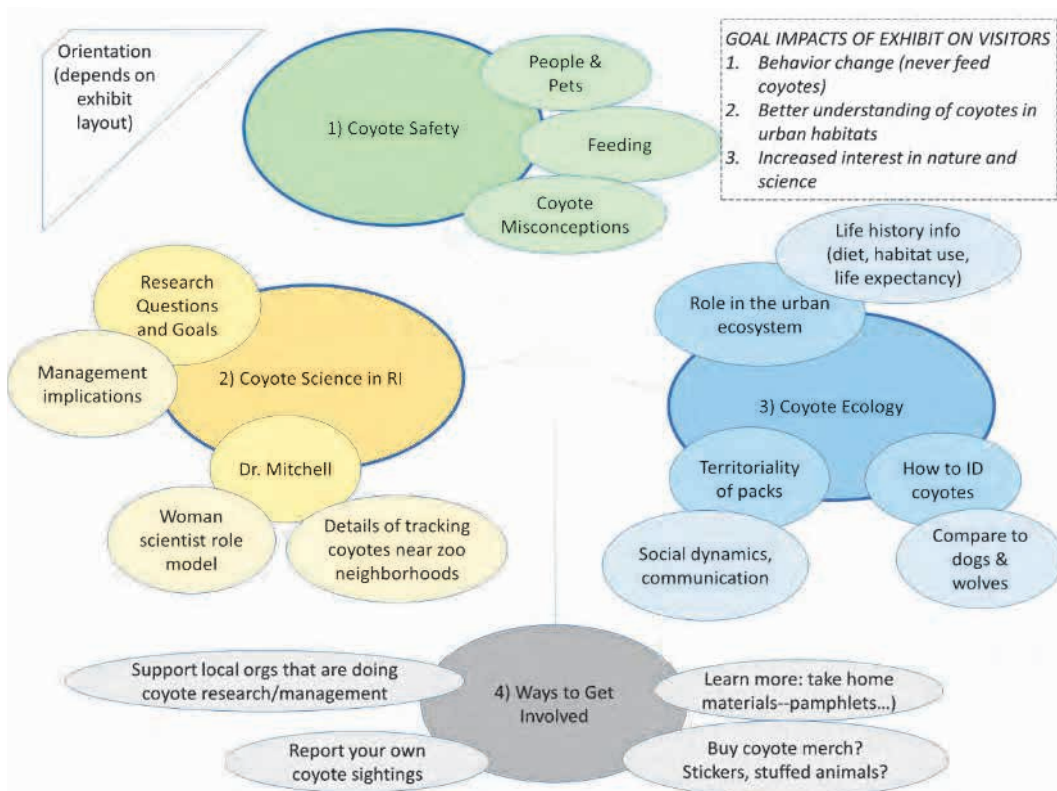


Figure 11: Coexisting with Coyotes Concept Planning Diagram





## Exhibit Floor Plan

Mapping the proposed exhibit is important for effectively using the available space and considering options for the layout of exhibit elements. Figure 12 depicts an aerial view of the concept layout for the Coexisting with Coyotes exhibit. This map was created in ArcGIS Pro, a geographic information systems software. The proposed panels are color coded thematically and arranged to support multiple pathways by visitors according to different levels of engagement. Panels are not to scale, presented here only for illustrative purposes.

Figure 12: Concept layout for Coexisting with Coyotes Exhibit



This layout allows for more organic and inviting movement through the exhibit space. The ideal (maximum) path of engagement moves among the panels 1-11 in number order, though progressing in that order is not required. The benches and directional audio element in the northeast rear corner invite moments of privacy, rest, reflection, and fun. By replacing the current rectangular back-to-back panels with the two triangular sets of panels, visitors better intuit the full experience of the exhibit and the availability of content. This design also encourages visitors to navigate through the space multiple times, offering a sense of discovery and curiosity consistent with our exhibit goals and objectives.

Figure 13 depicts a conceptual mock-up of the proposed exhibit from the visitor’s perspective at ground level. This superimposed image emphasizes the panels that are visible from the main point-of-entry into the exhibit area. The colorful panels and open layout invite visitors to explore the exhibit space. Enhanced lighting and a lighter wall color on the rear wall of the exhibit will further brighten the space and make visitors feel welcome and interested in the exhibit contents.

Figure 13: Conceptual Mock-up of Proposed Exhibit from Ground-View



### Primary Exhibit Elements

The exhibit consists of eleven main elements, six of which are 36 inches high by 18 inches wide printed vinyl and MDO wooden panels (panels 1, 2, 3, 7, 8, 9) that form the two triangular displays. Another panel on the rear wall of the exhibit (panel 5) is made of the same material. The other two flanking panels on the rear wall (panel 4 and panel 6) are interactive elements that will require electric power and will include electrical components. Adjacent to panel 6 will be a directional audio overhead speaker. The remaining two primary elements are a smaller sign that accompanies a life-size steel or wooden coyote cutout. All eleven of these elements are described in detail in the subsequent pages of this guide. The panels are standalone static educational materials with prompts for further participation via other modes (websites, hashtags, etc.).

In addition to the elements described here, lighting must be improved in the exhibit space. Currently, the rear of the exhibit space is shadowed and uninviting. By placing wired or solar-powered spotlights along the beams of the trellis ceiling, improved lighting would enhance visitor engagement with the space. Likewise, a brighter color on the rear wall of the exhibit, such as a warm tone of white or beige would still complement the proposed elements and the existing infrastructure of the space.

Panel 1

Panel 1 is the orientation to the rest of the exhibit, introducing visitors to the color-coded main themes of the exhibit: coyote safety, science, and ecology. The green background thematically ties Panel 1 to the coyote safety theme.

The cartoon coyote character “Scratch” welcomes visitors. This character, originally drawn by Dr. Numi Mitchell, is a cute and funny guide intended to engage children and families throughout the exhibit. A map of Roger Williams Park and a silhouette of a more realistic coyote occupy the left half of the panel to introduce the concept of coyotes (even unseen) coexisting in our familiar urban habitats.

The panel shares a few fun facts about coyotes marked by pawprint bullet points and emphasizes the main goal to encourage people to “never feed coyotes.” If visitors only pass by the exhibit and passively interact with panel 1, the main message has still been conveyed.

Visitors can move from Panel 1 organically to any other place in the exhibit, though Panel 2 is the next intended stop in Conservation Corner.



Panel 2

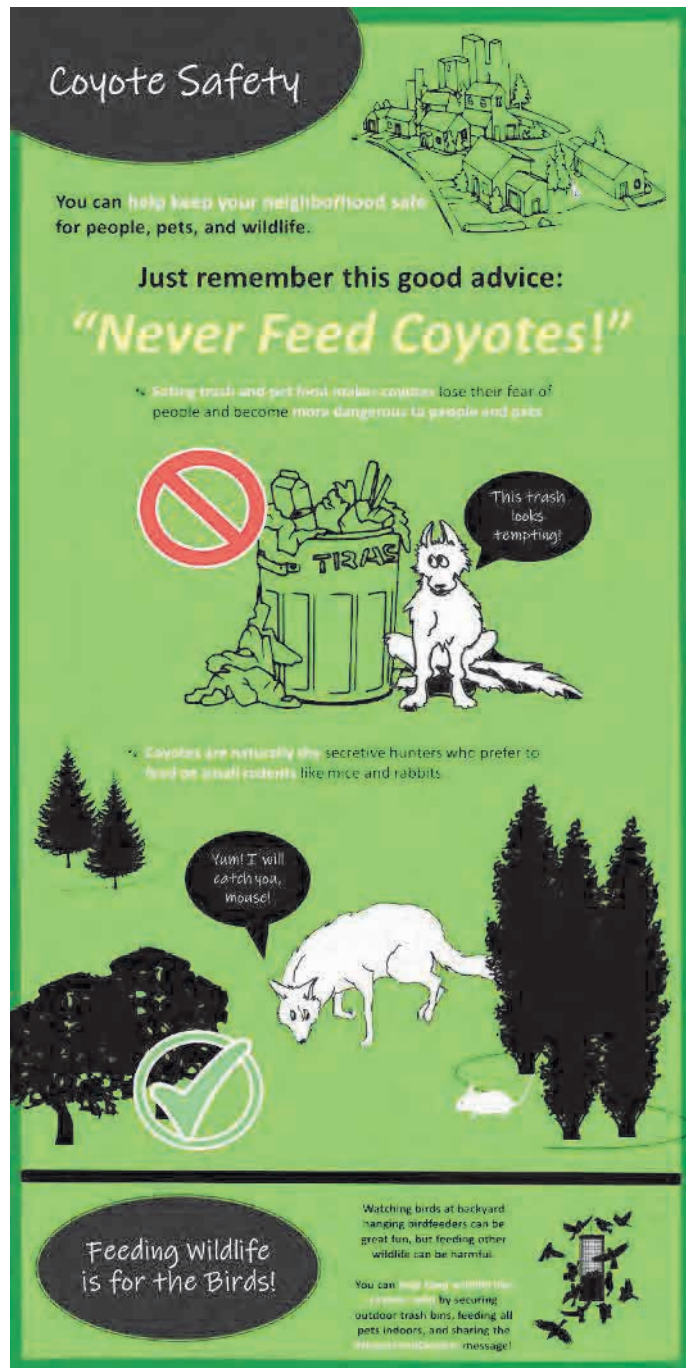
Panel 2 expands on the coyote safety theme by centering on the concept of feeding wildlife. The panel has a green background and uses a mix of text and black and white images including Scratch the cartoon coyote.

The panel title reinforces the theme of Coyote Safety. The main text and image in the top center and top right depict an urban neighborhood with the reminder to help keep the neighborhood safe and "never feed coyotes."

The panel contrasts Scratch about to eat anthropogenic trash (a human-based food attractant) versus hunting a mouse (natural feeding habits). Brief text provides some explanation of the detrimental impacts of feeding coyotes.

The bottom subsection including "Feeding Wildlife is for the Birds" is a tongue-in-cheek way to suggest visitors rethink their ideas about providing food to wild animals.

From Panel 2, visitors are intended to next view Panel 3, positioned at the station immediately to the right within the exhibit.



Panel 3

Panel 3 begins the coyote science theme with a focus on Dr. Numi Mitchell and the research of the Narragansett Bay Coyote Study (NBCS). The yellow background of the panel signals the change in theme. Scratch the cartoon coyote introduces visitors to the scientists. Two large photographs of Dr. Mitchell with collared coyotes from the study depict a scientist in action enjoying her work and caring for the animals.

A brief Question: Answer section (3 questions) provides deeper context for Dr. Mitchell’s research goals, why she likes being a scientist, and why people should care about coyotes. While text-heavy, this Q&A is targeted to engage those with moderate to high levels of curiosity about being a wildlife scientist and aims to further increase their science self-efficacy and interest, especially with a woman scientist as a role model.

In the bottom half of the panel, Scratch provides a brief explanation of a map showing Whinny the real-life coyote’s movements in the Washington Park neighborhood and Roger Williams Park—the areas near the zoo and potentially the home neighborhood of many zoo visitors. This map aims to show visitors how the scientific data on coyote movements can be depicted and land the message that coyotes and humans both exist in urban environments.

**Coyote Science**

This is my friend Dr. Mitchell (left) and her assistant Mr. Hess (right), scientists from the Narragansett Bay Coyote Study (NBCS).

By safely putting a GPS collar on my cousin "Whinny," scientists learn about where coyotes live!

This map shows Whinny's movements in 2020 around the Washington Park neighborhood and Roger Williams Park.

Hey Scratch! Do you like my new necklace? Dr. Mitchell says I can wear it for a whole year!

Looks great! Good job being a part of coyote science!

**Q&A with Dr. Mitchell**

Q: What is your research goal?

A: We want to help keep families, pets, and communities safe through effective coyote management.

Q: What is the best part of your job?

A: I love spending time in the outdoors learning about wild animals, researching how people and animals can coexist.

Q: What advice would you give young scientists?

A: Coyotes are a natural part of the environment. As top predators, they help control pests like rodents, deer, and geese.

**GPS Tracking Whinny the Coyote**

Daylight Movements  
Nighttime Movements  
Night Movements

The image of Scratch and a collared alert coyote in the bottom quarter show a cute exchange that is intended to assure visitors that the collars do not harm the coyotes.

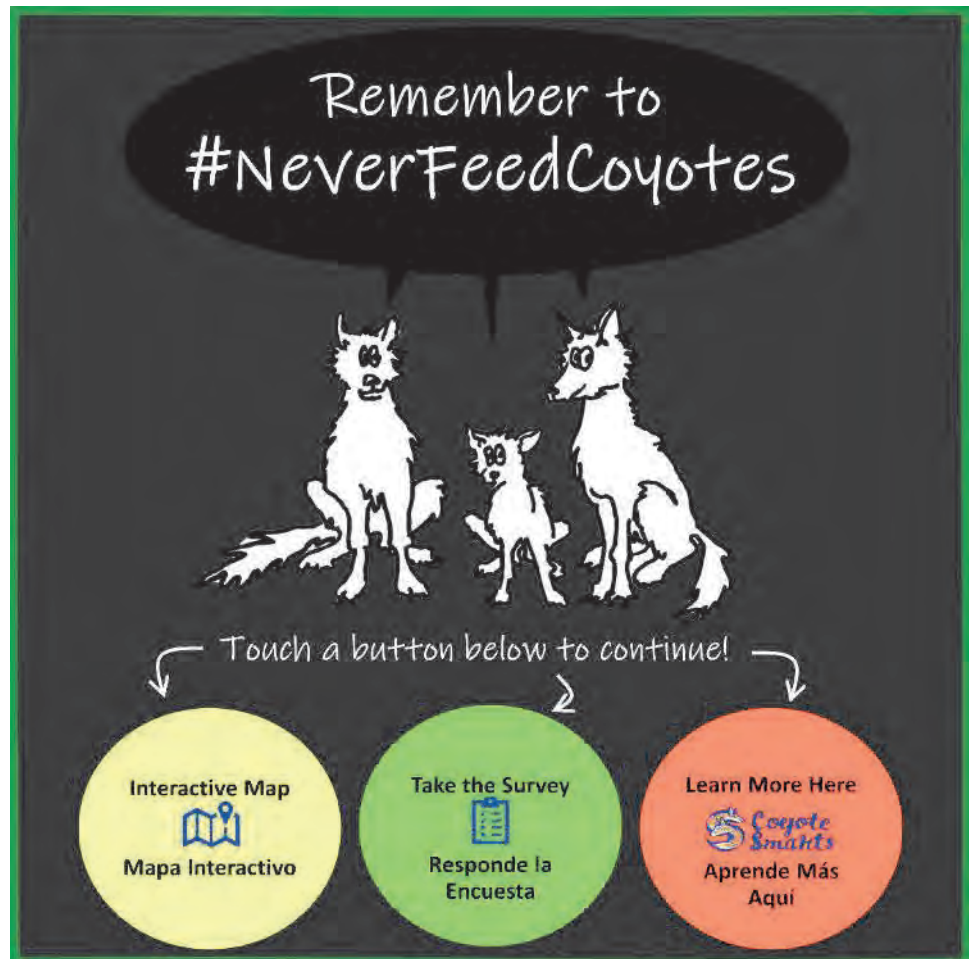
From panel 3, visitors likely move to panel 4 along the back wall of the exhibit.

## Panel 4

Panel 4 is unique because it is an interactive touchscreen rather than the printed vinyl and wood of the other panels. Panel 4 includes an image of Scratch and two other cartoon coyotes (Scratch’s pack), the phrase “Remember to #NeverFeedCoyotes” and the prompt for visitors to engage with three interactive options: the interactive map, the post-visit survey, and the Coyote Smarts website. The interactive map is part of NBCS’ participatory research (referenced on Panel 7, too). The survey is an important part of engagement and exhibit assessment. The Coyote Smarts website encourages visitors to learn more about the study and find answers to questions they may have. The interactive text is presented in English and Spanish.

Panel 4 is part of the coyote science theme by engaging visitors to actively participate in one of the goals of the study—to change behavior among people to not feed wildlife like coyotes. The interactive elements encourage visitors to take action. The panel will require electric power via a connection through the Zoo Lab building wall. An internet connection will also be required. A touchscreen such as the AbraxSys Model SRD-CM-215 21.5” Rugged Sunlight Readable Open-Frame True High-Definition LCD Monitor is appropriate.

From panel 4, visitors can either leave the exhibit to the right or continue to the left along the back wall to panel 5.

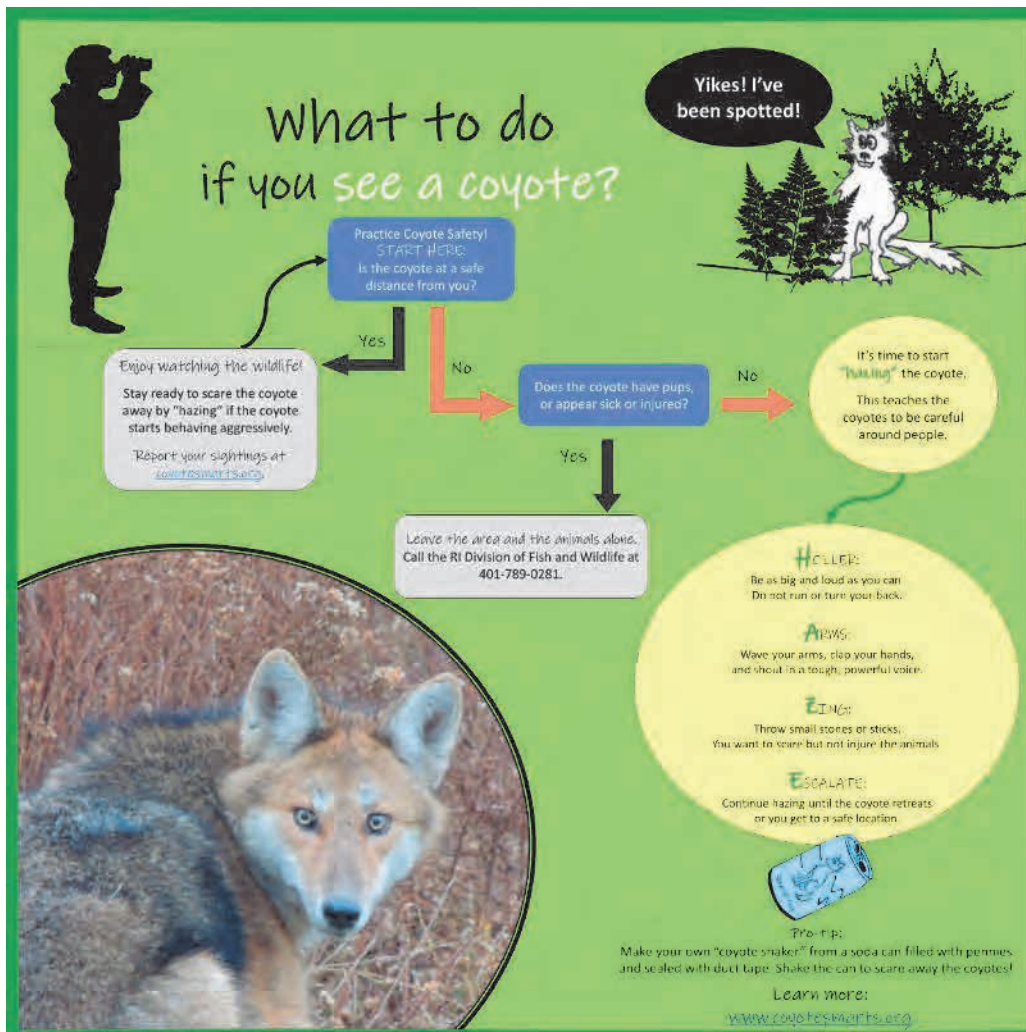


Panel 5

Panel 5 returns to the coyote safety theme with a green background and the title “What to do if you see a coyote?” A silhouetted man with binoculars looks across the panel at Scratch the cartoon coyote among some silhouetted vegetation. A large photograph of a coyote from Dr. Mitchell’s study facing into the camera invites visitors toward this panel at the center rear of the exhibit.

The colorful flowchart guides readers through some appropriate actions when they see a coyote, including an explanation of the “hazing” technique that discourages coyotes from habituating to humans and becoming more dangerous to people, pets, and livestock. The panel instructs readers in making their own “coyote shaker” from a soda can and pennies. The combination of actionable steps and information is intended to address visitors’ likely questions about coexisting with coyotes, assuage fears and promote curiosity and confidence.

From panel 5, visitors continue moving left toward panel 6.



Panel 6

Panel 6 is the first in the coyote ecology theme, signaled by the orange background. The panel is acoustically interactive with a mixed media layout using a combination of sound, photos, cartoon images and text to engage audiences in the “Howl Like a Coyote” topic. As with Panel 4, Panel 6 requires electric power via the Zoo Lab building. A directional speaker such as the Single Localizer from Brown Innovations will direct sound solely into the corner of the exhibit immediately next to this panel, engaging visitors through a multisensory experience while limiting the bleed-over of the sound to other visitors and zoo animals.

Two buttons direct visitors to play a recording of coyote howls or the “Never Feed Coyotes” song sung by Dr. Mitchell. Lyrics to the song’s chorus are provided on the panel. The invitation to “remix your own version” encourages visitors to learn the song and iterate other styles to carry the message about the exhibit goal: to never feed coyotes! Additional fun facts about coyote communications and an image of a mother coyote and pup add to the informative and fun quality of this “corner” in Conservation Corner.

After viewing Panel 6, visitors are expected to turn around out of the exhibit corner and view Panel 7.





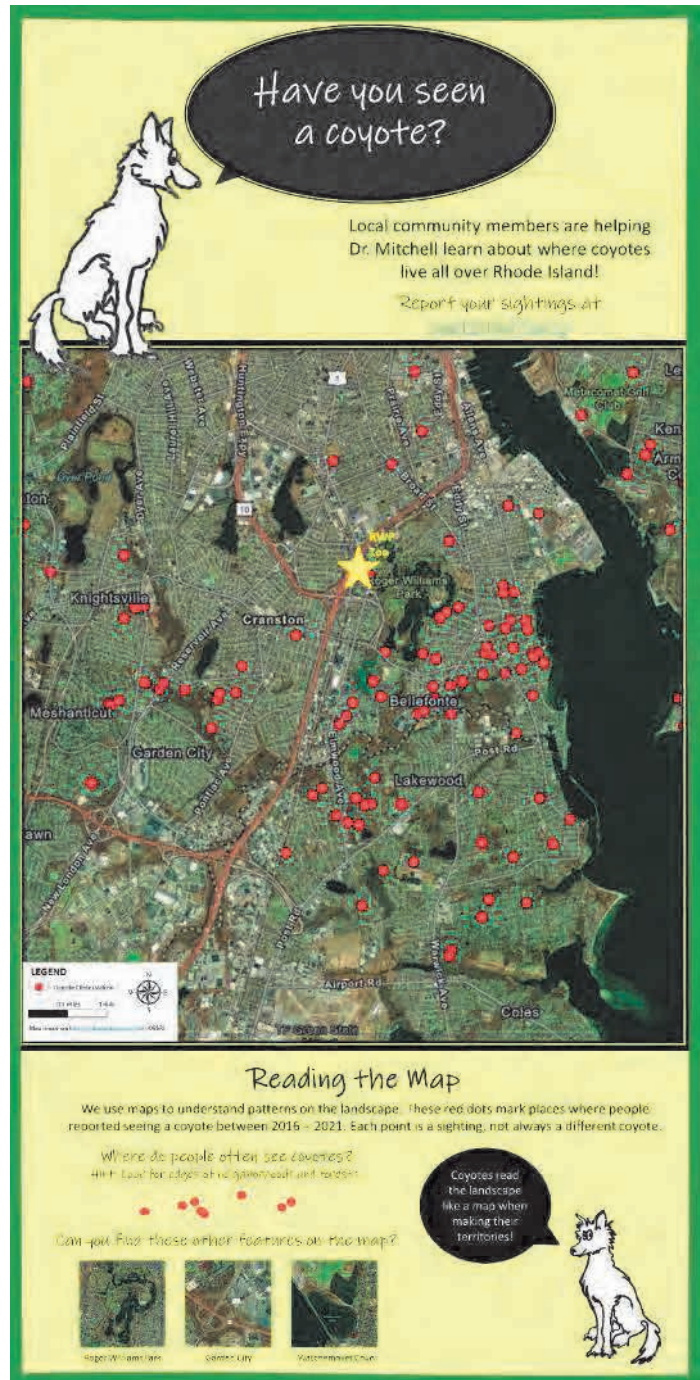
Panel 7

Panel 7 returns to the coyote science theme with a focus on mapping: “Reading the Map,” as signaled by the yellow background color. Scratch orients visitors to the context of the map regarding coyote sightings. In the top right, visitors are invited to participate in the science by reporting their coyote sightings on coyotesmarts.org.

The map depicts locations in neighborhoods surrounding Roger Williams Park Zoo in Providence and Cranston where coyote sightings have been reported in the NBCS. A legend provides further details about the scale, direction, and contents of the map. A yellow star shows where visitors are currently at the RWP Zoo.

In the bottom third, in an area especially intended to engage children, the panel invites viewers to engage in the map by gamifying certain map locations and patterns. The purpose of these gamified interactions is to encourage scientific skills like interpreting information on maps and using critical thinking. Scratch provides the connection to coyotes and their spatial movements in making territory.

From Panel 7, visitors are expected to continue through the space along the Zoo Lab door and windows moving northwest en route to complete their trip through the exhibit.



## Panel 8

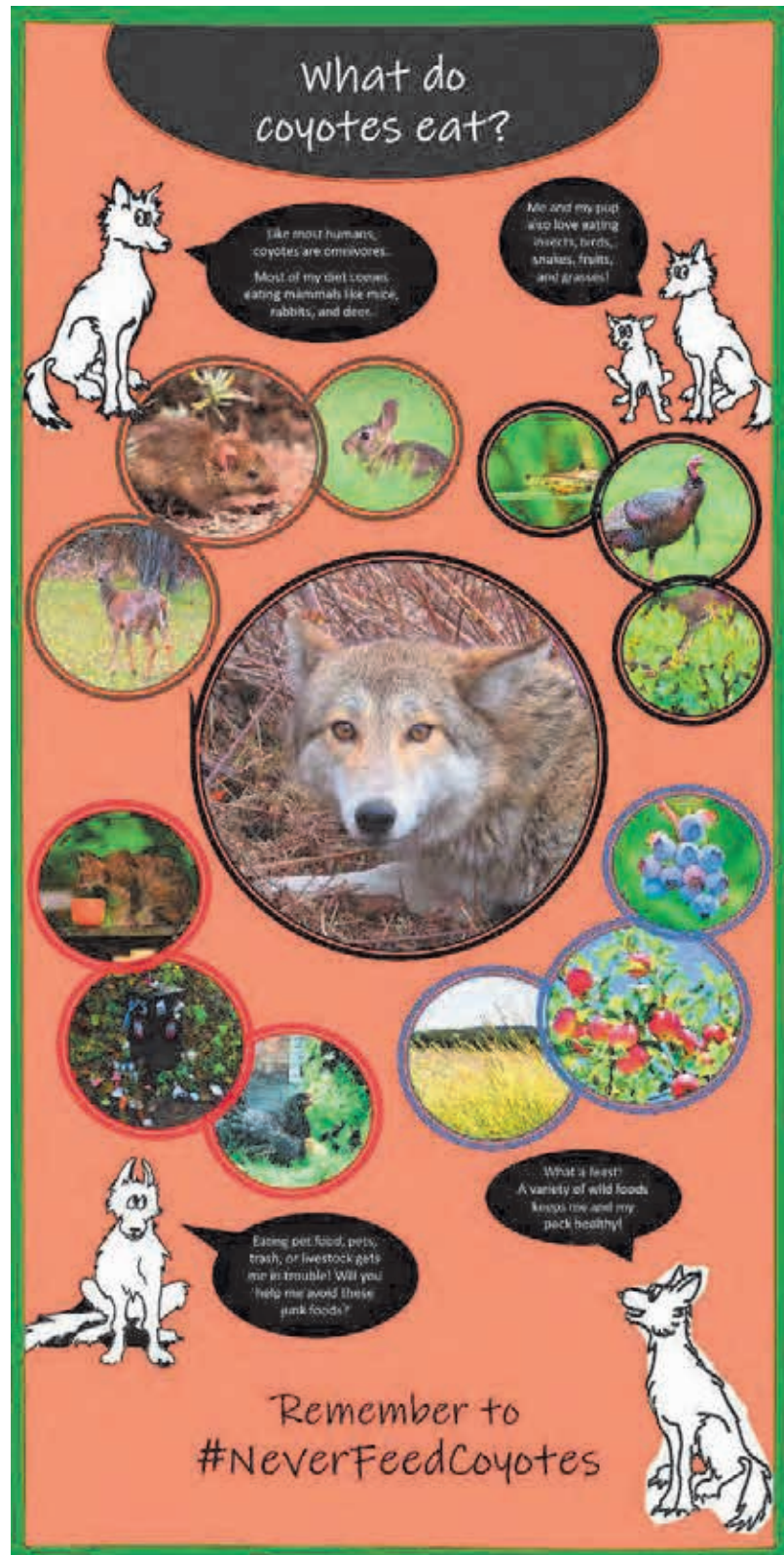
Panel 8 returns to the coyote ecology theme with a focus on "What do coyotes eat?" Most of the information on this panel is communicated via images of animals, plants, and objects that coyotes regularly consume.

The photographs of the food items encircle a large photo of one of the coyotes in Dr. Mitchell's study. The photos are grouped thematically (with color coded borders) as mammals, other animals (insects, birds, reptiles), plants, and domestic animals plus trash. Each grouping is accompanied by Scratch giving some context about those food items.

By the anthropogenic sources of food, Scratch expresses that these "foods that get me in trouble!" Here, Scratch is depicted with a more forlorn demeanor, rather than the plucky depictions in the rest of the panel. The combination of realistic and cartoon images aims to capture the attention of multiple audiences.

The hashtag #NeverFeedCoyotes is repeated at the bottom of the panel to remind viewers of the connection to the broader message and goal of the exhibit.

From Panel 8, visitors are expected to travel to Panel 9 near the intended end of the exhibit.



Panel 9

Panel 9 continues the coyote ecology theme with a variety of "Coyote Fun Facts." Again, the combination of cartoon coyotes, text and photographs create a range of engagement and visual interest. These fun facts are intended to be information that visitors can easily remember and share, building the feelings of science efficacy and confidence for visitors when thinking about coyotes and conservation science.

Life-size tracks of a gray wolf and eastern coyote are depicted with explanations of identifying features in anticipation of the frequent question and confusion on how to differentiate these two canids.

The joke at the bottom between the real and cartoon coyotes leans into the power of humor in learning and having fun at the zoo. At the bottom of the panel, visitors are reminded of the coyotesmarts.org website as a source for additional information on the themes of the exhibit.

After viewing Panel 9, visitors have come full circle back to the entrance of the exhibit. From here, they are may exit along the pathway between Conservation Corner and the Education Center, perhaps making a pitstop for a photo next to the coyote cutout described with Panel 10 and 11.

**Coyote Fun Facts**  
Test Your Knowledge!

*The Latin name *Canis latrans* translates to "barking dog." Coyotes are also called "song dogs."*

*Coyotes are mostly nocturnal hunting alone or in pairs between dusk and dawn.*

*Coyotes tend to be monogamous. They mate in winter, then give birth to litters of 4 - 7 pups in spring.*

**Is this a wolf or a coyote?**

**Gray Wolf**

**Eastern Coyote**

*These tracks are from a...*

*What's the difference between a coyote and a flea?*

*One: howls on the prairie—the other prowls on the hairy!*

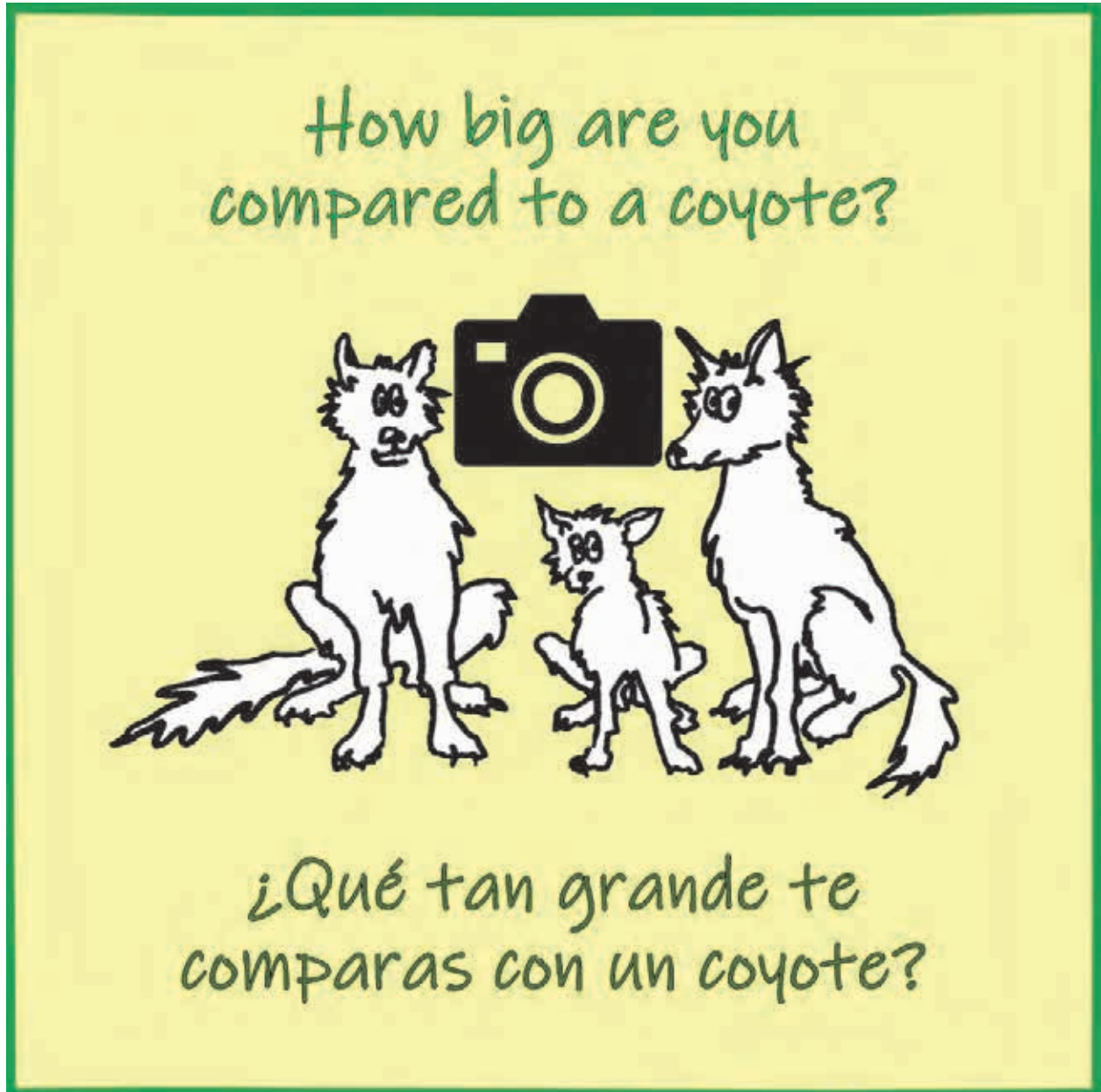
*Grovet joke...*

**Coyote Smarts**

Learn more about coyote safety, science and ecology at [www.coyotesmarts.org](http://www.coyotesmarts.org)

Panel 10

Unlike the previous nine panels, panel 10 is smaller (12 by 12 inches) and invites visitors to compare their size to a life size cutout of a coyote (see Panel 11). The yellow background suggests the coyote science theme, relating the idea of comparing and measuring sizes as part of common scientific practices. The cartoon coyote and photo icon suggest the fun interactive element, and the memory-forming moment of taking a picture one can revisit when reflecting on their trip to the zoo. The text inquiring about the size comparison is provided in English and Spanish to attract visitors representing the two main primary languages spoken by locals in the Greater Providence area. Ideally, this segment of the exhibit engages those that pass through the whole Conservation Corner exhibit or merely pass by.

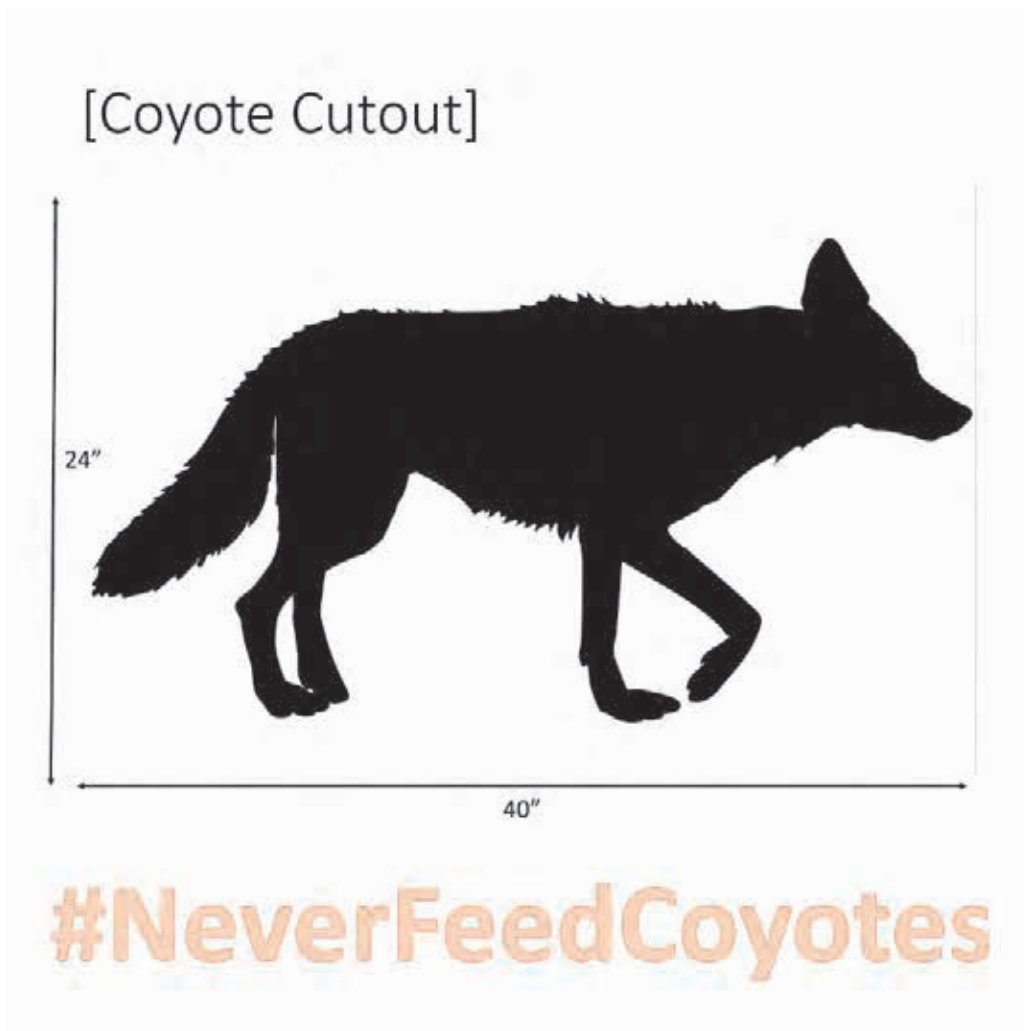


Panel 11

Panel 11 is not truly a panel at all. Once the exhibit is built, this life-size steel laser-cut or wooden silhouette of a coyote will be mounted in the substrate at the edge of the pathway between Conservation Corner and the Education Center. The cutout will be durable, touchable, and weather tolerant, with minimal maintenance needed. Behind the cutout, wooden weatherproof block letters spelling out #NeverFeedCoyotes will be placed in the grassy slope along the Education Center.

This hashtag and the Education Center provide a backdrop for a photo opportunity for visitors of all ages to see the true size of this wildlife species without any of the risks of engaging with a live animal. This interactive moment is reminiscent of the photo frame areas in the Faces of the Rainforest exhibit and the "How far can you jump" station near the snow leopard and takin enclosures.

After interacting with the coyote cutout, visitors will have completed their visit to the Coexisting with Coyotes exhibit in Conservation Corner.



### Additional Exhibit Elements

#### Companion Panel at Red Wolf Enclosure

The companion panel at the Red Wolf enclosure helps draw the thematic connection of coyotes and wolves and encourages visitors to engage with the conservation stories at both the live-animal exhibit at the Red Wolves and the educational exhibit at Conservation Corner. On the panel, Scratch the cartoon coyote provides a fun fact about canids and invites visitors to check out Conservation Corner. A subset of the RWP Zoo map highlights where the Red Wolf enclosure is located in relation to Conservation Corner. Like Panel 10, this signage is 12 by 12 inches and uses the yellow coyote science theme color to connect the concepts across the different parts of the zoo.



### #NeverFeedCoyotes Stickers

These stickers serve multiple options, either as an item for purchase at the gift shop, or as a giveaway incentive upon completion of a post-visit survey interview with a zoo interpretive staff member. The different colors reinforce the color-coded themes of the exhibit and provide an exciting choice for visitors, including multiple members of a family or a group of visitors. The stickers could also be distributed during Zoo Camp activities, or other RWP Zoo events as swag. By including the two important messages of “Keep Wildlife Wild” and “#NeverFeedCoyotes,” the sticker helps the main takeaway for visitors “stick” beyond the moment of interaction at the zoo exhibit.



### Assessment

Assessment is a critical component of any science communication project or educational material. There is no way to know whether we’ve met our project goals and objectives unless we have some kind of assessment of our visitors’ experiences. Assessment will occur a variety of ways for this exhibit.

This brief survey, designed using Google Forms, is intended to function either 1) as an interactive moment during the visitor’s experience with the exhibit (at Panel 4), 2) as a post-visit interview by zoo interpretive staff with zoo visitors, or 3) as a survey taken by guests online after their visit. The survey is built using both English and Spanish text in order to engage speakers of the two most commonly spoken languages in the Greater Providence Area.

Use of the hashtag #NeverFeedCoyotes will also be monitored online to understand patterns in how visitors interpret and iterate on the themes and content of the exhibit. By tracking this usage, we can evaluate the ways in which we met or didn’t meet our goals and objectives and might recalibrate for future versions of the exhibit. Social media through project partners at the RWP Zoo, NBCS, and RINHS will be used to disseminate other information about the exhibit, garner more responses for the post-visit survey and deepen visitor engagement by connecting to ongoing parts of the coyote research in Rhode Island.

Post-Visit Survey

**Post-Visit Survey - Conservation Corner**

Please answer the following five questions about your visit to the Coexisting with Coyotes exhibit at the Roger Williams Park Zoo. This survey is anonymous. Thank you for your participation!

Responda las siguientes cinco preguntas sobre su visita a la exhibición Coexistiendo con Coyotes en el Zoológico Roger Williams Park. Esta encuesta es anónima. ¡Gracias por su participación!

**\* Required**

**Question 1: \***

1. What was your main takeaway from the Coexisting with Coyotes exhibit?  
1. ¿Cuál fue su principal conclusión de la exhibición Coexistiendo con Coyotes?

Your answer: \_\_\_\_\_

**Question 2: \***

2. Are you planning to change any habits to never feed coyotes?  
Examples: not leaving pets or pet food outside, securing trash cans.  
2. ¿Está planeando cambiar algún hábito para nunca alimentar a los coyotes?  
Ejemplos: no dejar mascotas o comida para mascotas afuera, asegurar botes de basura.

Yes (Si)  
 No (No)  
 Maybe (Quizás)  
 N/A (NA)

**Question 3: \***

3. Do you think it's important for scientists to study coyotes in Rhode Island?  
3. ¿Crees que es importante que los científicos estudien a los coyotes en Rhode Island?

Important (Importante)  
 Somewhat important (Algo importante)  
 Not important (No importante)  
 Not sure (No seguro)

**Question 4: \***











4. How did the exhibit make you feel?  
Examples: curious, surprised, scared, excited, bored, happy...  
4. ¿Cómo te hizo sentir la exhibición?  
Ejemplos: curioso, sorprendido, asustado, emocionado, aburrido, feliz...

Your answer: \_\_\_\_\_



Question 5: \*

5. Which was your favorite exhibit panel?  
5. ¿Cuál fue su panel de exhibición favorito?

	
<input type="radio"/> Welcome to Conservation Corner	<input type="radio"/> Coyote Safety
	
<input type="radio"/> Coyote Science	<input type="radio"/> #NeverFeedCoyotes Touchscreen
	
<input type="radio"/> What to Do if You See a Coyote	<input type="radio"/> Howl Like a Coyote
	
<input type="radio"/> Reading the Map	<input type="radio"/> What Do Coyotes Eat
	
<input type="radio"/> Coyote Fun Facts	<input type="radio"/> Coyote Cutout

### Desired Outcomes from Post-Visit Survey:

The following statements reflect what kinds of responses we aim to achieve in the post-visit survey. If answers differ from these desired outcomes, we can learn how to improve the exhibit to better achieve our goals.

#### Question 1) Intended main takeaways:

- *Safety Theme:*
  - I will never feed coyotes. I will secure my trash, pet food, pets, and livestock to help make my home and neighborhood safer for people and animals.
- *Science Theme:*
  - Scientists are doing interesting work to understand more about coyotes in RI.
- *Ecology Theme:*
  - Coyotes are native wildlife that play a role in the environment. I learned (example fact) about coyotes.

#### Question 2) Intended behavior change:

- We want people to intend “yes” to change habits about feeding wildlife by not leaving pets or pet food outside, securing trash bins, and otherwise not leaving out food attractants.

#### Question 3) Intended perception about the importance of conservation science:

- We want people to feel it is “important” to use science to address problems such as understanding more about coyotes in Rhode Island.

#### Question 4) Intended feelings:

- We want people to feel curious, inspired, informed, and excited. As a short answer write-in, this question allows open interpretation.

#### Question 5) Favorite panel

- This question has no direct intended response but is important for assessing which messages were preferred by visitors or considered more engaging.

By offering the last option: “Is there anything else you want to share?” we invite the visitors to offer feedback we did not specifically ask about in the survey. Responses are collected automatically and anonymously via Google Forms submissions, allowing for later analysis of the survey responses.

## Additional Resources and References

Belcher, 1991

Dudo & Besley, 2016

Phillips et al, 2018

**ADD REFERENCE INFO**

## Coyote Exhibit at Norman Bird Sanctuary



Coyote Exhibit at Roger Williams Park Zoo



Welcome  
& Bienvenidos  
to Conservation Corner:  
Coexisting with  
Coyotes!

Join me, Scratch,  
to learn about  
coyote safety,  
science, and ecology!



Have you  
seen me?



🐾 Eastern coyotes (*Canis latrans*) are New England's largest wild canine. Most adults are 30-50 lbs and 48-60 inches nose-to-tail, similar in size to a border collie.

🐾 Scientists are working to understand where coyotes live in Rhode Island. This research helps people and coyotes to coexist more safely.

🐾 Do you leave food out for coyotes? Feeding wildlife can make them sick and behave dangerously around people and pets.

Remember to  
keep wildlife wild!

#NeverFeedCoyotes

The "Scratch" character and the coyote family ©2022 Numi Mitchell



# Coyote Safety



You can help keep your neighborhood safe for people, pets, and wildlife.

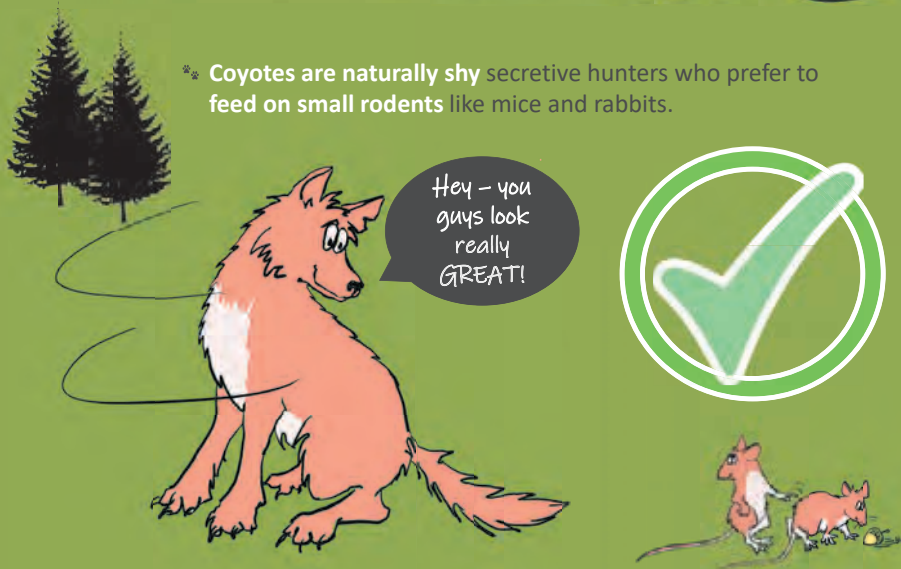
Just remember this good advice:

## Never Feed Coyotes!

\* Eating trash and pet food makes coyotes lose their fear of people and become more dangerous to people and pets.



\* Coyotes are naturally shy secretive hunters who prefer to feed on small rodents like mice and rabbits.



The "Scratch" character, the coyote family, and prey items ©2022 Numi Mitchell

### Feeding Wildlife is for the Birds!

Watching birds at backyard hanging birdfeeders can be great fun but feeding other wildlife can be harmful.

You can help keep wildlife like coyotes wild by securing outdoor trash bins, feeding all pets indoors, and sharing the #NeverFeedCoyotes message!



# Coyote Science

This is my friend Dr. Mitchell (left) and her assistant Mr. Hess (right), scientists from the Narragansett Bay Coyote Study (NBCS).



By safely putting a GPS collar on my cousin "Whinny," scientists learn about where coyotes live!



## Q & A with Dr. Mitchell

Q: What is your research goal?

A: We want to help keep families, pets, and communities safe through effective coyote management.

Q: What is the best part of being a scientist?

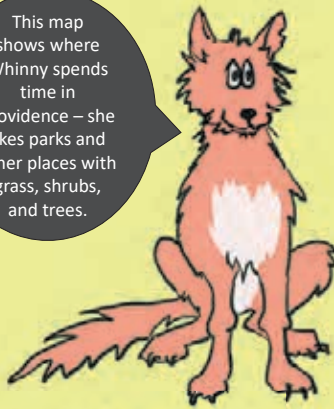
A: I love spending time in the outdoors learning about wild animals and how people and animals can coexist.

Q: Why should people care about coyotes?

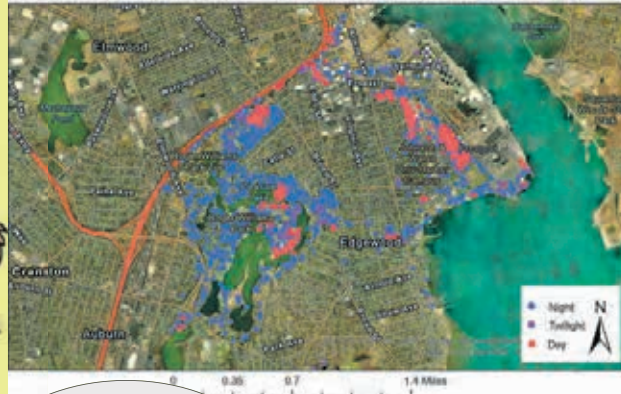
A: Coyotes are a natural part of the environment. As top predators, they help control pests like rodents, deer, and geese.



This map shows where Whinny spends time in Providence – she likes parks and other places with grass, shrubs, and trees.



GPS locations for one female coyote "Whinny," in Providence, Rhode Island (4024 points!)



Hey Scratch!  
Do you like my new necklace?

Dr. Mitchell says I can wear it for a whole year!



Looks great!  
Good job being a part of coyote science!







Have you seen any coyotes?

Local community members are helping Dr. Mitchell learn about where coyotes live all over Rhode Island!

Report your coyote sightings at [coyotesmarts.org](http://coyotesmarts.org)



### Reading the Map

We use maps to understand patterns on the landscape. These red dots mark places where people reported seeing a coyote between 2016 – 2021. Each point is one sighting, not always a different coyote.

Where do people often see coyotes?  
 Hint: Look for edges of neighborhoods and forests.

Can you find these other features on the map?



Roger Williams Park



Garden City



Watchemoket Cove

Coyote families have a territory which they patrol every night. Can you find the edges?



Exhibit supported by the Rhode Island Foundation Program for Animal Welfare; Designed by Carolyn Pralle.

# What do coyotes eat?

We also love eating insects, birds, snakes, fruits, and woodchucks!



Like most humans, coyotes are omnivores – we eat many different things.

My family's favorites include mice, rabbits, and deer!



Eating pet food, pets, trash, or livestock can be unhealthy and gets us in trouble with people!

What a feast!  
A variety of wild foods keeps me and my pack healthy!

My tummy hurts



## Remember to #NeverFeedCoyotes

# Coyote Fun Facts

Test Your Knowledge!



**Coyotes live in families called "packs."**

They mate in winter, then give birth to litters of 4 - 7 pups in spring.



**The Latin name *Canis latrans* translates to "barking dog."**  
Coyotes are also called "song dogs."



**Coyotes are mostly nocturnal;** they usually hunt between dusk and dawn.

Is that a wolf or a coyote?



These tracks are life-size!



Eastern Coyote

Oh brother...



Knock knock...  
Who's there?  
Howl.  
Howl who?  
How'll you know unless you open the door?



Learn more about coyote safety, science, and ecology at [www.coyotesmarts.org](http://www.coyotesmarts.org)

# Howl Like a Coyote!



- 🐾 **Coyotes are communicators!** Coyotes make a variety of vocalizations to tell others about food resources, territory boundaries, and relationships.
- 🐾 **Coyotes can play tricks** with their voices. An alpha female and male work together to sound like a bigger group to other packs or to 'transient' coyotes, saying 'this is our turf—keep out!'
- 🐾 **Coyotes are social animals** with their own personalities. Parents and pups have special communications for playing, teaching, feeding, and more!



Press this button for coyote howls!

🎵 Sing the  
**Never Feed  
Coyotes Song!**



🎵 Never feed coyotes in suburbs or in town.  
Please clean up all food scraps  
and we'll never hang around.  
If there's no easy pickings,  
we'll go and catch some mice – Yay!  
"Never feed coyotes!" is really good advice. 🎵



Press this button for the whole song!



# What to do if you see a coyote?

Yikes! I've been spotted!



Practice Coyote Safety!  
START HERE:  
Do you feel you are a safe distance from the coyote?

Enjoy watching the wildlife!  
Stay ready to scare the coyote away by "hazing" if the coyote starts behaving aggressively.  
Report your sightings at [coyotesmarts.org](http://coyotesmarts.org)

Yes

No

Does the coyote have pups, or appear sick or injured?

No

Yes

It's time to start "hazing" the coyote.  
This teaches the coyotes to be careful around people.

Leave the animals alone.  
Call the RI Division of Fish and Wildlife at 401-789-0281.



- HOLLER:**  
Be as big and loud as you can. Do not run or turn your back.
- ARMS:**  
Wave your arms, clap your hands, and shout in a tough, powerful voice.
- ZING:**  
Throw small stones or sticks. You want to scare but not injure the animals.
- ESCALATE:**  
Continue hazing until the coyote retreats or you get to a safe location.

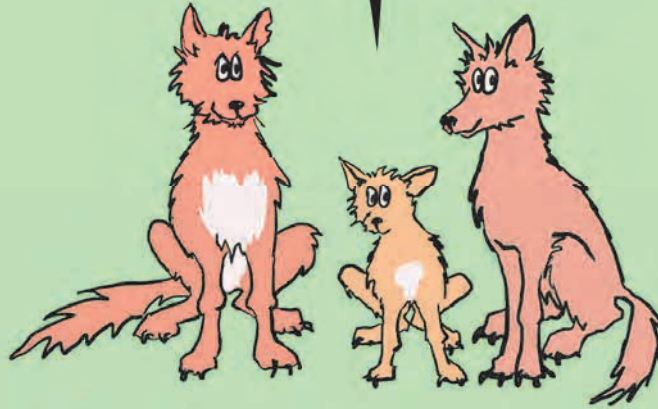


**Pro-tip:**  
Make your own "coyote shaker" from a soda can filled with pennies and sealed with duct tape. Shake the can to scare away the coyotes!

Learn more:  
[www.coyotesmarts.org](http://www.coyotesmarts.org)



The "Scuzz" character and the coyote family ©2012 Naomi Mitchell

Remember to  
#NeverFeedCoyotes



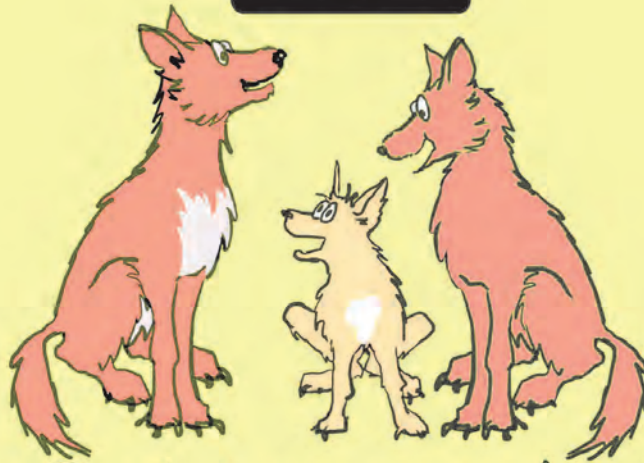
Touch a button below to continue!

  
Interactive Map  
  
Mapa Interactivo

  
Take the Survey  
  
Responde la Encuesta

  
Learn More Here  
  
Aprende Más Aquí

How big are you  
compared to a coyote?



¿Qué tan grande te  
comparas con un coyote?

## **Coyote Study Volunteer and Fellowship Programs**

Volunteer programs and academic internships are exceptional strategies for engaging the public and students in scientific research. This form of citizen science can provide substantial aid with day-to-day tasks like field work, equipment maintenance, and data entry. To this end, NBCS staff created the Coyote Study Volunteer Program in 2018 and the Coyote Fellowship Program in 2019.

Recruitment for the volunteer program involved outreach to volunteers from previous projects and connecting with students and staff at Rhode Island universities. In December of 2018, NBCS staff held an informational presentation for 18 potential volunteers and by January 2019, 11 volunteers were trained on scat collection protocols and actively surveying study sites.

In September 2019, in collaboration with the University of Rhode Island, NBCS created the Coyote Fellowship Program. This initiative was undertaken to build on the success of the volunteer program while adding greater potential investment by participants. The program flyer was distributed by URI professors to students enrolled in the Environmental Science and Management (ESM) and Wildlife and Conservation Biology (WCB) undergraduate degree programs. Successful candidates were expected to work 6-10 hours per week and would earn up to three credits per semester. After receiving an enthusiastic response from students, NBCS staff interviewed select candidates and chose six outstanding Coyote Fellows.

Participants in both programs were required to fill out approved liability waivers and timesheets.

Although the Coyote Fellowship Program was intended to include students in scat collection, scat analysis, hotspot surveys, and much more, the COVID-19 pandemic drastically affected the ability of staff and volunteers to work closely together. Further, the lockdown beginning in mid-March 2020, made it nearly impossible to run the fellowship program as originally intended. Once the State's stay-at-home order was lifted, NBCS staff revised protocols to allow its flexible and conscientious cohort of fellows to focus on scat collection while observing appropriate personal protective measures. The Fellows surveyed sites statewide and collected an impressive total of 114 samples.



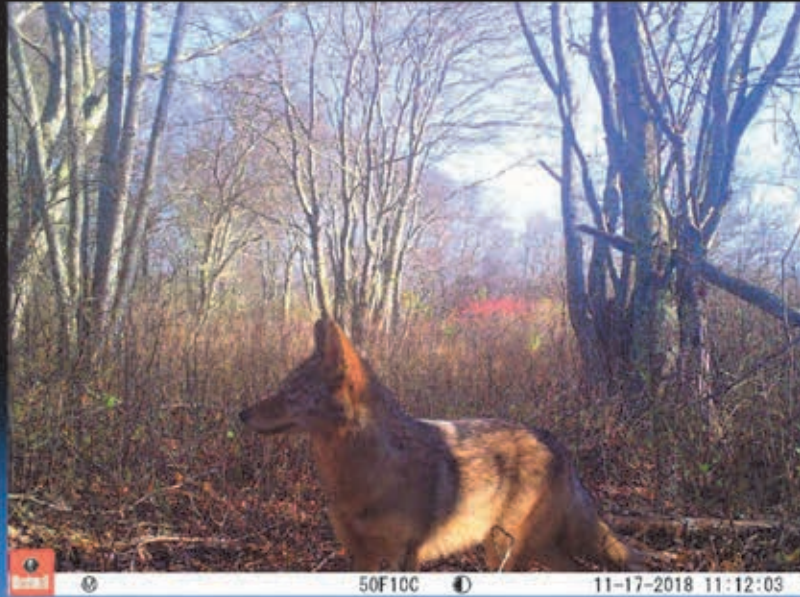
## COYOTE SCAT COLLECTION AND ANALYSIS



### Primary Volunteer Opportunities

- Collection of scat samples in the field
- Dietary analysis of scat samples in the lab

# Identifying Survey Sites



# Site Assignments



# SAFETY

- Wear bright colors (blaze orange is best and critical during hunting season).
- Do field work with a partner.
- Never take unnecessary risks.



## Coyote Scat Collection Protocol

Bags and tubes should contain scat from an individual coyote. Multiple scats cannot be combined.

**Supplies and Equipment:** Scat sample bags, 1 liter tubes with silica gel preservative, 30ml tube of ethanol, cotton swabs, scrape-depressor, gloves, permanent marker, crating blades, scab (brush), seal bag.

Once you have located a coyote scat, follow these steps to collect the sample for dietary analysis:

1. Open Collector  on your smart phone and select the map, "Scat Data Collector".
2. Confirm that the map is showing your current location.
3. Select the "C" at the top of the screen and choose the location of the scat (or find intersection, on land near, etc...).
4. Select the camera icon from the top of the screen and then select "Add" and "Take Photo or Video".
5. Place a stick inside the scat and take a photo.
6. Click "Add" and "Take Photo or Video" a second time.
7. Standing beside the sample and facing N, record a video while slowly rotating clockwise until you return to starting position.
8. Roll the scab strip on the Collector app using the drop-down list. The scab ID Number will be your initials and a unique number (e.g. KH1, KH2, KH3...).
9. Select "Submit" to save your location.

Only if the sample is fresh, continue to step 11 for DNA collection. If sample is not fresh, continue to step 16 to complete collection for dietary analysis.

10. Wear a new pair of nitrile gloves.
11. Push a portion of the sample with the unscrubbed portion of the scab strip (silica gel) and no clear fat or other materials.
12. Dip a cotton swab in ethanol and rub the swab over that portion of the scat sample.
13. Place swab in a clean 1.5ml tube and label the tube with your initials and number (e.g. KH1).
14. Cut a small piece of the scat using a new crating blade from your Scat Kit.
15. Place the small cut piece in a vial with the remaining silica. Use all necessary precautions to prevent the cross-contamination of samples.
16. Take a plastic bag inside me and collect an amount of the scat as possible.
17. Using the permanent marker provided, label the scat bag and DNA tube with your initials and number (e.g. KH1).
18. Seal the bag completely. If you have a DNA sample, bag the tube and scat bag in an enclosing Ziploc and label with your initials and number.

Keep the fecal samples away from high temperatures and store the silica samples at room temperature for at least 1 hour to allow the silica to absorb any water on the pellets. If you are not returning directly to the lab to drop off your samples, store the tubes in your lunch cooler. DNA samples must always be cold. Use a cooler with ice packs to transport.

Deliver all fecal samples to the Wildlife Natural History Service within 24 hours of collecting the samples. Please call (401-441-8245) or email [dlawrence@dnr.state.nh.us](mailto:dlawrence@dnr.state.nh.us) Kyle to arrange a time for drop-off.



Created (2018) by K.K.Hill

Adapted from Coltrane's Field  
Collection Protocol, T.J. McGarvey, Ph.D.

## Lab Work



## Other Opportunities

- Maintaining field cameras
- Checking traps
- Baiting
- Return coyote line phone calls
- And for exceptional volunteers...



QUESTIONS?





## Are you studying wildlife biology and looking for real-world experience for your resume?



The Coyote Fellowship Program provides undergraduate students the opportunity to assist Dr. Numi Mitchell and the Narragansett Bay Coyote Study in ongoing research of eastern coyote (*Canis latrans*) populations throughout Rhode Island.

The successful candidates will work 6-10 hours/week (unpaid but earning up to 3 credits per semester under NRS 397: Internship in NRS) under the supervision of NBCS staff, gaining hands-on experience in wildlife research and resource management. The fellowship term runs throughout the fall 2019 and spring 2020 semesters.

### Responsibilities include:

- Scat collection and analysis
- Trail camera management and maintenance
- Data entry
- Trap maintenance and baiting
- Social media updates



To apply, please email cover letter, resume, and references to [dgregg@rinhs.org](mailto:dgregg@rinhs.org)

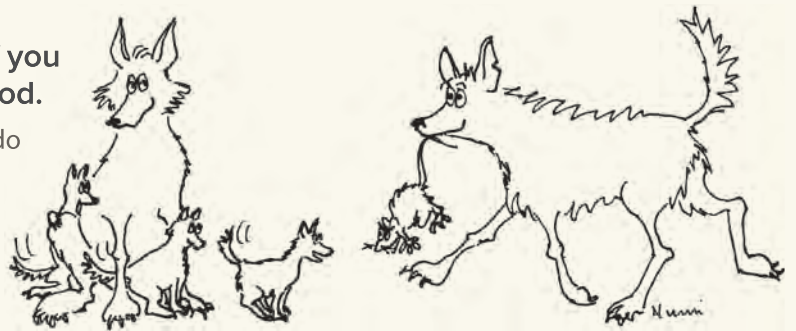


# PLEASE DON'T FEED OR APPROACH COYOTES.

POR FAVOR NO SE ACERQUE NI LES DÉ DE COMER A LOS COYOTES.

A coyote family is raising young pups nearby. If you see coyotes do not call to them or give them food.

Hay una familia de coyotes que está amamantando y criándo a sus cachorros en los alrededores. Si usted viera algún coyote, por favor no llame su atención ni le dé alimentos.



Left alone, coyotes are naturally shy and stay away from people. But giving coyotes food teaches them to connect food with humans, and that is unsafe for you and other residents...and the coyotes, if they become too bold.

Los coyotes son muy tímidos por naturaleza y suelen permanecer alejados de los humanos. Desafortunadamente, el darles comida, les enseña a relacionar, comida con humanos, lo cuál es peligroso para usted y sus vecinos...y en consecuencia para los coyotes demasiado atrevidos.

Curious about coyotes in RI? Visit [www.coyotesmarts.org](http://www.coyotesmarts.org).

Si tiene curiosidad sobre los coyotes en Rhode Island, visite [www.coyotesmarts.org](http://www.coyotesmarts.org)



# COYOTES LIVE HERE

Feeding them is against the law.

Please remove or dispose of all edible waste, including picnic foods, fruit and other snacks, and all remains from baiting or cleaning fish.

Food waste increases coyote traffic and the chances of interaction with people and pets. It also attracts other scavengers such as raccoons and skunks.

Help us keep our wildlife wild!



Equitable Shared  
Department of  
Environmental  
Management

 **Coyote  
Smacks**  
CoyoteSmacks.com





# FEEDING COYOTES CAUSES PROBLEMS



- **Feeding coyotes is not safe.** Attacks on people are rare, but they do sometimes bite the hands that feed them.
- **Feeding coyotes is not smart.** When coyotes associate food with people, they lose their natural fear and may become bold or aggressive.
- **Feeding coyotes is not a kindness.** Aggressive coyotes may have to be shot.

**HELP KEEP THE NEIGHBORHOODS SAFE**

**PLEASE DON'T FEED OR APPROACH COYOTES**

**Feeding coyotes or other wildlife is illegal in Rhode Island**

For more information about coyotes in Rhode Island: [www.coyotesmarts.org](http://www.coyotesmarts.org)



# ALIMENTAR A LOS COYOTES CAUSA PROBLEMAS



- **Alimentar a los coyotes no es seguro.** Los ataques a las personas son raros, pero a veces muerden las manos que les dan de comer.
- **Alimentar a los coyotes no es inteligente.** Cuando los coyotes asocian la comida con las personas, pierden su miedo natural y pueden volverse audaces o agresivos.
- **Alimentar a los coyotes no es un acto de bondad.** Es posible que haya que disparar a los coyotes agresivos.

## AYUDE A MANTENER LOS VECINDARIOS SEGUROS

## POR FAVOR NO ALIMENTE NI SE ACERQUE A LOS COYOTES

Alimentar coyotes u otros animales salvajes es ilegal en Rhode Island

Para obtener más información sobre los coyotes en Rhode Island: [www.coyotesmarts.org](http://www.coyotesmarts.org)



# COYOTES ARE EVERYONE'S BUSINESS

## WHAT CHAMBER MEMBERS CAN DO TO HELP



### ASK EMPLOYEES NOT TO FEED THEM...

- **Feeding coyotes is not safe.** Attacks on people are rare, but they sometimes bite the hands that feed them.
- **Feeding coyotes is not smart.** When coyotes associate food with people, they lose their natural fear and may become bold or aggressive.
- **Feeding coyotes is not a kindness.** Aggressive coyotes may have to be shot.

### ...AND BE SURE TO SECURE ALL DUMPSTERS AND TRASH

## MAKE YOUR BUSINESS "COYOTE SMART" AND HELP KEEP OUR NEIGHBORHOODS SAFE

For more information about coyotes in Rhode Island: [www.coyotesmarts.org](http://www.coyotesmarts.org)



# COYOTE MANAGEMENT TOOLKIT

## FOR RHODE ISLAND MUNICIPALITIES



Compiled by:



A public information initiative of a group of Rhode Island organizations that have come together to address the growing presence of coyotes on Aquidneck Island and in other communities throughout the state.

For additional information: <https://www.coyotesmarts.org/>



# Contents

Introduction.....	1
Basic Tools:	
• <i>Coyote Best Management Practices</i> .....	3
Developed by the Narragansett Bay Coyote Study (NBCS) and adopted by Middletown, Portsmouth, Newport and Jamestown.	
• <i>Sample Wildlife No-feeding Ordinance</i> .....	10
As adopted by Middletown. Similar ordinances have been adopted by Portsmouth, Newport and Jamestown.	
• <i>Sample Coyote Response Protocol</i> .....	12
As adopted by Middletown. Newport has a similar protocol.	
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## Introduction

Coyotes first appeared in Rhode Island in the 1960's and are now found in all parts of the state except Block Island. As coyotes become more abundant in suburban and urban areas, conflicts with people and domestic animals are increasing. Unlike wolves, coyotes have never been successfully eradicated, so other means must be found to keep their numbers under control.

Since 2004, the coyotes of Aquidneck and Conanicut Islands have been the subject of ongoing research by Dr. Numi Mitchell, lead scientist for the Narragansett Bay Coyote Study (NBCS). Using state-of-the-art GPS tracking technology, her work has helped document the effect of human-provided food sources on coyote behavior and population dynamics. Now, thanks to a grant by RIDEM's Division of Fish & Wildlife through the U.S. Fish & Wildlife Service's Wildlife & Sport Fish Restoration Program, she has expanded her research statewide.

In 2013, NBCS joined forces with several other organizations to launch CoyoteSmarts, a public information initiative whose partners now include the Potter League for Animals, Aquidneck Land Trust, Aquidneck Island Planning Commission, Norman Bird Sanctuary, The Conservation Agency, RI Natural History Survey, and the Eastern RI Conservation District.

CoyoteSmarts' mission is threefold: to raise public awareness, promote public and pet safety, and encourage best management practices. To this end, we have compiled a small collection of documents and other materials to assist municipalities in managing their coyote populations. With the exception of the Warwick Coyote Commission Report, they are drawn primarily from the communities of Aquidneck Island and Jamestown. If other communities have documents or materials they would like to add to the collection, **please forward them** to the email address below.

Living alongside wildlife is both a privilege and a challenge. Fortunately, it is a challenge we can meet if we all agree to work together.

Jo Yellis  
Project Coordinator



[info@coyotesmarts.org](mailto:info@coyotesmarts.org)

# COYOTE MANAGEMENT TOOLKIT

## Part 1: BASIC TOOLS

- *Coyote Best Management Practices*.....3  
Developed by the Narragansett Bay Coyote Study (NBCS) and adopted by Middletown, Portsmouth, Newport and Jamestown.
- *Sample Wildlife No-feeding Ordinance*.....10  
As adopted by Middletown. Similar ordinances have been adopted by Portsmouth, Newport and Jamestown.
- *Sample Coyote Response Protocol*.....12  
As adopted by Middletown. Newport has a similar protocol.
- *Trifold Public Safety Brochure*.....18  
While directed at Newport County, the advice is relevant to all communities.

# *The Conservation Agency*

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## **Best Management Practices for Coexistence with Coyotes on Aquidneck and Conanicut Islands**

Prepared by Numi Mitchell, Ph.D., Lead Scientist, Narragansett Bay Coyote Study with the endorsement of the Rhode Island DEM and the Potter League for Animals, January 5, 2010, as revised February 27, 2017.

The following practices are based primarily on data collected by the Narragansett Bay Coyote Study (NBCS) between 2005 and 2009. This work was undertaken to address increased coyote abundance and boldness on the Narragansett Bay Islands.

GPS tracking collars definitively revealed that coyotes on our islands were being heavily subsidized by foods that humans directly and indirectly provided to them (anthropogenic food subsidies). Coyotes respond to more food by increasing their numbers and to less food by decreasing their numbers. It follows that we can passively manage coyotes—get them to reduce their own numbers—if we aggressively manage ourselves and decrease the food subsidies we are providing them.

In order for Coyote Best Management Practices (CBMPs) to be successful, the three Aquidneck Island municipalities need to work as a unit, because there is no such thing as Portsmouth coyotes or Newport coyotes. NBCS research has shown individual coyotes can range over the whole island. Coyotes born in Portsmouth flow into any voids in Newport and vice versa, thus requiring Newport, Middletown and Portsmouth to use one set of CBMPs for Aquidneck Island coyotes. This study also showed that Jamestown could also benefit from using CBMPs as well. A successful plan will require direct collaboration with state agencies (DEM and DOT) or collaboration with state agencies through partnership with NBCS.

Below we explain the critical issues and recommend Best Management Practices for coexistence with and management of coyotes on Aquidneck and Conanicut Islands:

### **1. Issue:** Road-killed deer and other animals:

Currently, there is no effective plan for disposal of inedible road-kills on Aquidneck Island, Jamestown, or elsewhere in RI. Some are buried or trucked to landfills, but most deer killed on roads are dumped somewhere along roads where coyotes find and eat them. There are well over 1,000 deer killed on roads each year in Rhode Island. In recent annual reports, DEM has reported between 25-30 deer road-killed on each of Aquidneck and Conanicut Islands. If they are not disposed of, at 100-150 lbs. each, the carcasses can provide thousands of pounds of food subsidies to coyotes. This poses a significant problem as abundant food is linked to increased litter sizes in coyotes.

*The NBCS is a joint project of The Conservation Agency ([www.theconservationagency.org](http://www.theconservationagency.org)), The Rhode Island Natural History Survey ([www.rinhs.org](http://www.rinhs.org)) and the Potter League for Animals ([www.potterleague.org](http://www.potterleague.org))*



**Recommendation:** The municipalities assist with proper disposal (burial, cremation, rendering, or composting) of large carcasses (>30 lbs.). DEM and DOT employees responding to a roadkill currently have no close-by options for secure disposal. Many deer hit are pushed out of view and dumped in the woods or brush. It is in the joint interest of each municipality that road-killed carcasses are inaccessible to coyotes.

In 2011, NBCS conducted a Pilot Study on livestock and deer carcass disposal for farms and communities under a Natural Resources Conservation Service (NRCS) Conservation Innovation Grant. For one week, the NBCS team collected all reported road-killed deer and dead livestock in Rhode Island and demonstrated the efficacy of an alkaline hydrolysis digester as a bio-secure method of carcass disposal. Approximately 30,000 lbs. of carcasses were processed on Chase Farm in Portsmouth. The process, dubbed “Safe Cycle,” creates sterile, nutrient rich compost in 24 hours that can readily be utilized by local farmers as fertilizer. The Pilot Study showed that one stationary “Safe Cycle” depot, or one mobile alkaline hydrolysis unit, could service all Aquidneck Island and Jamestown. NRCS, a federal agency dealing with soil and water resources, may contribute to the purchase of this device under certain conditions.

Each town would need to arrange the pickup and transfer of road-killed deer within their municipal boundaries to the nearest disposal facility by the Department of Public Works if the DEM or DOT cannot pick up the carcass within 8 hours. The DEM agrees that communities with high coyote populations could benefit from the creation of locally available disposal facilities for road-killed deer that are unfit for human consumption. DEM and DOT should partner in the coyote management effort by transporting island carcasses they pick up to the nearest facility.

2. **Issue:** Link between deer abundance and coyote population numbers.

**Recommendation:** Deer populations are increasing in the suburban-rural landscapes of Aquidneck and Conanicut Islands. This makes for increased food opportunities for coyotes. DEM biologists have recommended that some current local hunting ordinances be amended in an effort to allow more hunting and thus reduce the number of deer on the islands. Examples of town ordinances that could possibly be amended are: Newport—there is currently no hunting allowed at all; Middletown—there is currently no Sunday hunting, no muzzleloader hunting, and daily written permission of the police chief is required; and Portsmouth—there is currently no Sunday hunting permitted.

Coyotes do hunt and kill deer, especially in the winter season. In a functional environment—with appropriate numbers of deer—both coyotes and hunters provide a service by keeping the deer population stable and healthy.

3. **Issue:** Farm livestock carcasses:

Coyotes commonly feed on the carcasses of dead farm livestock on Aquidneck Island and Jamestown. Often livestock, like cattle or sheep, die in the winter when holes cannot easily be dug to bury them. This winter timing coincides with coyote breeding season. Again, if coyotes are in good condition in breeding season, they have larger litters. Carcasses available may be contributing to coyote fitness and therefore increased reproductive output.

Also, NBCS data show that abundant food in an area causes coyote packs to decrease their territory size. Coyote packs cluster around reliable food sources and defend a smaller land area. Smaller territories created by point-sources of food may create room for the establishment of new packs (data from NBCS indicates this occurs). In short, livestock carcass availability may be contributing to coyote population increases. An associated problem for farmers is that coyotes that eat dead livestock are more likely to prey on the same live animals.

The presence of livestock carcasses on farms affects everyone by providing food for coyotes and potentially increasing their population size. It is of paramount importance that municipalities with farms within their boundaries ensure, for the good of the community, that carcasses are disposed of where they cannot be reached by coyotes.

**Recommendation:** Implement a dead livestock disposal strategy for farmers along the lines suggested in item 1 (Road-killed deer and other animals). Alert all farms that a town pickup service is available if farmers are, for any reason, unable to bury carcasses under at least three feet of material. We recommend that the towns endorse the development of secured carcass composting facilities planned by the NBCS and partners, and provide livestock carcass transport from the farms to the secure facilities by the municipal DPW if they cannot be disposed of in a similar fashion by DOT or DEM.

4. **Issue:** Intentional and unintentional feeding by residents:

Coyotes eat fruit, meat, vegetables, pet food, loose seed, grains, garbage, animals, and carrion. They tend to center their territories on places with abundant food. Many people do not understand the consequences of feeding coyotes. In fact, many people do not realize they are feeding coyotes. People need to better understand what items constitute attractants to coyotes and take measures to stop or avoid providing them. If coyotes become dependent on humans for food, they can become a public safety risk. It is important to educate the public about coexisting safely with coyotes.

**Recommendation:** Educate, and reinforce, that the public not leave food, food waste, or any other edible substance that attracts coyotes to land or premises because it feeds them and creates dangerous behavior. This includes any domestic animal food left outside where it is accessible to coyotes. Commercial dumpsters should be secured with a clip on side doors and hatches to prevent coyote entry; all garbage and recycling bins should have secure lids that cannot be removed by coyotes. NBCS GPS collars can help with initial public education as they identify specific areas where coyotes are obtaining food.

NBCS has been developing and conducting an Education and Outreach Program since its outset in 2005. The study has a lively website designed to reduce concern while teaching about safe coexistence with coyotes ([theconservationagency.org/coyote](http://theconservationagency.org/coyote)) or google "coyote study". In 2005-6, NBCS had 15 local schools involved with the study on Aquidneck Island, Jamestown, and the adjacent coast. In 2007, the program was redesigned to allow any school with a web browser participate. Because of coyote feeding that occurred at the Park Holm community in 2006-7, Newport and Middletown were targeted for school visits during that period. In addition to the efforts of NBCS, the Potter League for Animals brings NBCS education and safety materials to more than 1,000 students in Aquidneck Island classrooms each year (2006-2009). DEM provides brochures and additional information about coyotes online at <http://www.dem.ri.gov/programs/bnatres/fishwild/pdf/coyotes.pdf>.

The regional scientific information and recommendations provided by NBCS have proven to reassure people and increase understanding. NBCS explains that people are both unintentionally and intentionally creating the “coyote problem.” Further, that it is within our abilities to reverse the trend. If the human population makes reasonable changes in behaviors and local policies that decrease anthropogenic food subsidies to coyotes, the coyote population will respond by lowering their numbers to levels sustainable by the natural environment. And, for those people who love feeding wildlife, a reminder that “A fed coyote is a dead coyote” will probably make sense.

In 2013, NBCS joined forces with the Potter League for Animals, the Norman Bird Sanctuary, the Aquidneck Land Trust, and the Rhode Island Natural History Survey to launch CoyoteSmarts, a public information initiative whose mission is to raise public awareness of coyotes, promote public and pet safety, and encourage best coyote management practices through a website ([coyotesmarts.org](http://coyotesmarts.org)), a brochure (“Living Safely with Coyotes”) and various outreach activities.

To date, all Aquidneck Island municipalities have established links to the CoyoteSmarts website from their municipal websites and are welcome to download and distribute the CoyoteSmarts brochure.

In addition, all Aquidneck Island municipalities, plus Jamestown, have adopted wildlife no-feeding ordinances, and one Portsmouth resident has been successfully prosecuted for intentional feeding.

**The State of Rhode Island prohibits the intentional feeding of coyotes at all times with the exception of baiting coyotes to hunt on private land (14.13 of RI DEM Hunting and Trapping Regulations).**

5. **Issue:** The feeding of free-roaming, outdoor, and feral cats provides food to coyotes:

Coyotes are attracted to and eat primarily the cat food left out for cats and secondarily the cats themselves. On Aquidneck and Conanicut Islands there is an undetermined number of pet owners who allow their cats to roam freely outdoors as well as a very active program to trap/neuter/return feral cats (defined as any wild, unsocialized or untamed cat, RIGL 4-22-2 (c)) to managed colonies. Feeding these populations on our back porches or at feeding stations for feral colonies serves as a magnet for coyotes, teaches coyotes to associate people with food, and teaches coyotes to eat cats (not a natural prey item). This is extremely unsafe for cats and many pet owners have reported their animals killed by coyotes. These common cat practices allow the coyote population to thrive and develop the undesirable habit of hunting domesticated cats wherever they live, including neighborhoods.

DEM biologists have also noted that non-native feral cat colonies impact native wildlife through predation and disease transmission and support the idea of increased regulation and control, or reduction of feral cat colonies. The State of RI defines cat ownership in Title 4-22-2 (f) (1) as “any person who keeps, has permanent custody, owns, maintains, harbors, provides care or sustenance for, has control or charge of or responsibility for a cat, or who permits a cat to habitually be or remain on or be lodged or fed within such person’s property or premises.”

Cat “guardians” (4-22-2 (h)) have the same responsibilities as “owners.” The state requires identifying marks on owned cats (4-22-3) and that cat owners spay or neuter them by six months of age (4-24-3). Owners of free-roaming, outdoor, and feral cats need to understand the secondary impacts of feeding cats outdoors. Feeding stations on the ground increase coyote density in the area where feeding occurs. Coyotes receiving food subsidies lose their natural fear as they associate people with food delivery. This is particularly inadvisable if it occurs in residential areas because it creates dangerous behavior and is a threat to public safety (see item 6 below). Coyotes receiving food in residential areas are frequently active during the day. This is particularly risky for children and small pets.

**Recommendation:** Owners of free-roaming, outdoor, and feral cats should be educated about the wider impacts of feeding cats outdoors. If cats must be fed outdoors, the owners should: 1) feed during daylight hours on elevated platforms inaccessible to coyotes (6 feet high, no climbable supports), and 2) ensure food remains on the platform no longer than 20 minutes per day.

6. **Issue:** Policies for normal vs. problem coyotes:

In general, “normal” coyotes are not a problem if communities understand how to live with them. “Normal” coyotes are sustained almost entirely by natural resources (mice, voles, rabbits, woodchucks, geese, deer, etc.) and do not rely on humans for food. They are generally afraid of people.

As long as these coyotes are not aggressive towards humans or preying on livestock, it is advisable to leave them alone. If they are removed or killed, they will be replaced by other coyotes that could either be normal or problem coyotes.

Some background biological information will help explain why this occurs. Coyotes regularly roam an area of about 3-6 square miles or whatever it takes to get enough food for the pack members. As of April 2007, there were 6 coyote packs on Aquidneck Island and 3-4 on Conanicut Island. As of 2017, NBCS data suggest the packs have subdivided on Aquidneck Island into at least 10 separate packs. Normally, each pack is a territorial family group that varies in number from 3 to 10 individuals. A portion of the area the pack inhabits is the pack’s territory, which they defend from other coyotes. The number of mature coyotes in the pack is linked to the amount of food resources in the territory. The pack system keeps coyotes from getting too numerous because the packs defend the area they need to survive. A coyote pack usually has one breeding (or alpha) female. This female produces many more puppies than are ultimately wanted in the pack. All but one or two of the young are forced to leave the pack at about 9-11 months of age. These coyotes become transients. Other types of transients include older individuals that can no longer defend their role as upper level pack members and leave the pack. Transients move all over the islands in narrow undefended zones that exist between pack territories searching for an open habitat to occupy or group to join. They often die before they succeed (many are hit by cars). It is largely because of these transients, that wholesale coyote eradication plans are unsuccessful. Removing a group of territorial coyotes will create an undefended area into which the transient coyotes will flow. At all times of the year, numbers of transients are immediately available on Aquidneck and Conanicut Islands to replenish any voids created by killing the resident coyotes.

In some cases, individual coyotes become bold, in general because people have fed them. Feeding causes coyotes to lose their natural fear of humans and they become “problem” animals. Again, the extensive NBCS GPS habitat-use data clearly show that coyotes prefer rural habitat and avoid contact with human—unless people are (intentionally or unintentionally) feeding them.

**Recommendation:** The Coexisting with Coyotes program based in Vancouver, British Columbia, provides a good model for urban coyote coexistence strategies which the NBCS supports. Aquidneck Island could use aspects of their accepted and effective program as a template that municipal officers here can point to as best practices. The Vancouver program has shown that most coyotes can be discouraged from lounging on lawns, and patrolling neighborhoods, by people acting “big, mean, and loud.” They have designed loud shakers and also recommend relentlessly throwing things or charging with brooms. Coyotes should be made to feel unwelcome at all times. If the coyotes remain in the area they are probably being fed. Regardless, coexistence with individual coyotes that are aggressive or threatening is not an option. Aversive Coyote Training (ACT)—deterrence methods such as bean-bagging bold animals—should be attempted. If the police deem that the ACT is unsuccessful, problem individuals can be destroyed by the Police, trained personnel designated by the Police, or the DEM Division of Law Enforcement (401-222-3070). DEM has an existing policy for dealing with problem coyotes: refer to DEM Management & Response Protocols for Incidents Involving Coyotes (<http://www.dem.ri.gov/programs/bnatres/fishwild/pdf/coyotpol.pdf>) drafted March 13, 2006.

While the removal of individual coyotes is sometimes called for, large-scale culling has not proven to be an effective management strategy. Middletown’s taking of over 40 coyotes in 2011 provided only temporary relief since coyote numbers and complaints gradually rebounded, thanks in large part to continued availability of human-provided food subsidies.

7. **Issue:** How to best reduce the number of coyote related complaints from residents to municipalities with the most cost-effective and sustainable long-term strategy for coexistence with coyotes.

**Recommendation:** Endorse and implement the CBMPs. Facilitate continued data collection by NBCS to monitor the effectiveness of CBMPs and make investments as necessary.

To date, Middletown, Portsmouth and Jamestown have adopted the CBMPs.

The coyote food subsidies revealed to NBCS by GPS-collared coyotes led to the science-based management initiatives in the CBMPs. NBCS plans to continue data collection on Aquidneck and Conanicut Islands as long as funding permits. During this time, NBCS GPS collars will identify remaining problem areas where coyotes receive food subsidies.

NBCS uses the number of packs, or family groups, each island supports as an index to overall coyote population size. If coyotes have abundant anthropogenic food, they can defend smaller territories. As a result, more coyote families can fit on each island. If the CBMP recommendations are followed, future NBCS data should show coyote pack territories

increasing in average size as the coyote families begin relying on natural foods. At the same time, the islands should support fewer coyote families and the overall coyote population should decrease.

The CBMP is minimal-cost but not no-cost to towns. Municipal expenditures may include staff time and equipment for carcass pickup and provision of educational materials such as pamphlets, and staff time to visit and educate people providing food or attractants to coyotes. NBCS and CoyoteSmarts will continue to provide educational material and programs as long as funding permits. During this period, we encourage stakeholders to endorse and support the research effort where possible.

Prior to the NBCS, it was not understood why coyote numbers seemed to be expanding on the Narragansett Bay islands. We now have a very good understanding of the reasons behind the coyote population increases and the clinical data necessary to implement the CBMPs and monitor the response of the coyotes.

**ORDINANCE OF THE  
TOWN OF MIDDLETOWN, RHODE ISLAND**

**AN ORDINANCE AMENDING THE TOWN CODE OF THE  
TOWN OF MIDDLETOWN**

**TITLE IX: GENERAL REGULATIONS**

**NOW THEREFORE BE IT ORDAINED AS FOLLOWS:**

*FIRST: The following new chapter is inserted into Title IX: General Regulations:*

**CHAPTER 90A: FEEDING NON-DOMESTICATED ANIMALS**

Section

- 90A.01 Generally
- 90A.02 Definitions
- 90A.03 Prohibitions
- 90A.04 Exceptions
- 90A.05 Enforcement

**§ 90A.01 PURPOSE**

The purpose of this ordinance is to protect the health and safety of residents in the Town of Middletown with respect to dangers associated with coyotes and other non-domesticated animals by minimizing opportunities for such animals to obtain food from sources controlled or controllable by humans..

**§ 90A.02 DEFINITIONS**

- A. "Attractant" means any substance which could reasonably be expected to attract or does attract coyotes or other non-domesticated animals, including but not limited to, garbage, food products, pet food, carcasses, feed, grain.
- B. "Feeding" means the leaving of food of any kind where it is accessible to coyotes or other non-domesticated animals.
- C. "Food" means all substances consumed by humans or animals for nourishment except grass and other vegetation, growing crops, and food that is canned or stored in sealed or closable containers.

### § 90A.03 PROHIBITIONS

A. No person shall feed or in any manner provide an attractant to coyotes or other non-domesticated animals; provided that domestic pets are not attractants, and feeding pets outdoors does not create an attractant if the pet eats all the food immediately, or the remaining food is removed as soon as the pet stops eating, or the pet is fed in a secure cage or other enclosure.

B. No person shall leave, store, or maintain any food or attractant in a manner, area, or location accessible to coyotes or other non-domesticated animals.

### § 90A.04 EXCEPTIONS

A. Food for birds or squirrels that is in a feeder located within 100 feet of a residence and elevated to be inaccessible to coyotes.

B. Outdoor feeding of farm animals, provided (1) animal food, when not being fed to animals, is stored in a building or a closed container; (2) excessive amounts of food, based on the animals' eating history, are not provided to the animals; (3) injured, old, feeble, or prey-sized animals are not left outside unattended; and (4) all other reasonable efforts are made to reduce attractants to coyotes and other non-domesticated animals.

### § 90A.05 ENFORCEMENT

Violations of this ordinance are punishable by a civil penalty of from one hundred (\$100) to five hundred (\$500) dollars for each day of violation.

*SECOND: This ordinance shall take effect upon adoption and its provisions shall supersede any inconsistent or contrary provision in any other ordinance.*



# *Middletown Police Department*

ORDER	EFFECTIVE DATE	NUMBER	ISSUING DATE
GENERAL	SEPTEMBER 12, 2011	380.02	SEPTEMBER 12, 2011
SUBJECT TITLE		SUBJECT AREA	
COYOTE PROTOCOLS		ANIMAL CONTROL	
CALEA REFERENCE		PREVIOUSLY ISSUED DATES	
DISTRIBUTION	REEVALUATION DATE	PAGES	
ALL	AS NECESSARY	5	

## COYOTE PROTOCOLS

### I. PURPOSE

The purpose of this policy is to provide protocols for the Animal Control Officer, (ACO), regular police officers and their respective supervisors to use when dealing with coyotes. Coyotes have established themselves in Rhode Island since the 1960s. Coyotes are intelligent and adaptable and will thrive anywhere there is enough food to maintain them.

### II. POLICY

It is the policy of the Middletown Policy Department to evaluate the complaints and concerns of residents who interact with coyotes on a case-by-case basis. The list of procedures below has been developed to provide members of the MPD with a response guide to effectively deal with coyotes.

### III. DEFINITIONS

- A. Attractant: Coyotes are opportunists when it comes to food. They will eat carrion, wild or cultivated fruit, com, food left outside for domestic pets and uncovered trash. An attractant is defined as any substance which could reasonably be expected to attract, or does attract coyotes or other non-domesticated animals, including, but not limited to garbage, food products, pet food, carcasses , feed and grain.
- B. Feeding: The leaving of food of any kind where it is accessible to coyotes or other non-domesticated animals.

- C. GPS Collar: Several coyotes on Aquidneck Island have been captured and released with a Global Position Satellite (GPS) collar. These collared coyotes tracked and the information used to locate areas where coyotes are finding food,
- D. NBCS: Narragansett Bay Coyote Study uses OPS tracking to follow the movements of coyotes. The organization continues to study area coyotes and recommends strategies to humanely control their population. The NBCS Coyote Information line is (401) 213-9663.
- E. Problem Coyote: A coyote that has lost its fear of humans (also known as "habituated"), Because the coyote has no fear it will approach people expecting to be fed. It may also attack and kill dogs and cats in fenced in yards or while the animal is in sight of its owner. Problem coyotes also pose a danger to humans.
- F. GPS-Collared Coyote: A coyote fitted with a GPS collar by the NBCS. If a dead coyote is found wearing a collar the NBCS should be notified immediately.

#### IV. PROCEDURES

##### A. Coyote Activity Reported:

##### 1. A coyote is sighted crossing a yard or street, or coyotes are heard howling

###### a. Appropriate Initial Response:

- i. Officers should remind residents this is not unusual. Coyotes have inhabited Middletown for the past 15 years and always cross yards or streets. Coyotes howl to communicate.

###### b. Recommended Immediate Action:

- i. Residents should ignore the activity and MPD officers should make sure the resident, or neighbors, are not leaving out food attractants for the coyotes.

###### c. Recommended Follow-up Action:

- i. A call number should be generated using dispatch reason "coyote control." The ACO will review daily logs for appropriate follow-up.
- ii. If, in review, a residential area or business district has persistent coyote activity the town may coordinate with NBCS to deploy a OPS-collared coyote to find and remove attractants in the area
- iii. If attractants are the problem the responding officer will attempt to locate the source of the attractant and document the location for follow-up by the ACO. If residents are intentionally or unintentionally leaving attractants for coyotes they are violating Town Ordinances 90A.01 - 90A.05 and subject to fines.

##### B. Coyote Activity Reported:

##### 1. Following or taking unsupervised or unaccompanied pets. This Includes

**animals greater than ten (10) feet from owner, within inadequate fencing or tied animals.**

- a. Appropriate Initial Response:
  - i. It is the owner's responsibility to protect vulnerable pets.
- b. Recommended Immediate Action:
  - i. Do not leave vulnerable (small or old) animals unsupervised,
- c. Recommended Follow-up Action:
  - i. A call number should be generated using dispatch reason "coyote control." The ACO will review daily logs for appropriate follow-up.
  - ii. If, in review, a residential area or business district has persistent coyote activity the town may coordinate with NBCS to deploy a OPS-collared coyote to find and remove attractants in the area.
  - iii. If attractants are the problem the responding officer will attempt to locate the source of the attractant and document the location for follow-up by the ACO. If residents are intentionally or unintentionally leaving attractants for coyotes they are violating Town Ordinances 90A.01 - 90A.05 and subject to fines.

**C. Coyote Activity Reported:**

**1. Approaching or following People:**

- a. Appropriate Initial Response:
  - i. This is cause for concern. In Middletown some residents permit coyotes to lie in their yards and even feed them. The coyotes have lost their natural fear of people and may think the resident is going to feed them. A diseased coyote may also approach residents when sick.
- b. Recommended Immediate Action:
  - i. Whenever coyotes are seen, residents should take some or all of the following actions: yell, clap hands, throw handy objects, shake and throw a can filled with pebbles, aggressively walk towards the coyote *if* the coyote starts to leave.
  - ii. If the coyote does not leave the area, residents should document with photographs showing the animal's behavior and markings. This will help determine the number of problem animas and identify individual coyotes involved.
- c. Recommended Follow-up Action:
  - i. An officer will be dispatched and a call number should be generated using dispatch reason "coyote control." The ACO will review daily

logs for appropriate follow-up.

- ii. If, in review, a residential area or business district has persistent coyote activity the town may coordinate with NBCS to deploy a GPS-collared coyote to find and remove attractants in the area.
- iii. If attractants are the problem the responding officer will attempt to locate the source of the attractant and document the location for follow-up by the ACO. If residents are intentionally or unintentionally leaving attractants for coyotes they are violating Town Ordinances 90A.01 - 90A.05 and subject to fines.

#### D. Coyote Activity Reported:

##### 1. **Approaching or following People and appears unafraid:**

###### a. Appropriate Initial Response:

- I. This is cause for concern. In Middletown some residents permit coyotes to lie in their yards and even feed them. The coyotes have lost their natural fear of people and may think the resident is going to feed them. A diseased coyote may also approach residents when sick.

###### b. Recommended Immediate Action:

- i. Whenever coyotes are seen residents should take some or all of the following actions: yell, clap hands, throw handy objects, shake and throwing a can filled with pebbles, aggressively walk towards the coyote *if* the coyote starts to leave.
- ii. If the coyote does not leave residents should document with photographs showing the animal's behavior and markings. This will help determine the number of problem animals and identify individual coyotes involved.

###### c. Recommended Follow-up Action:

- i. An officer will be dispatched and a call number should be generated using dispatch reason "coyote control." The ACO will review daily logs for appropriate follow-up.
- ii. If, in review, a residential area or business district has persistent coyote activity the town may coordinate with NBCS to deploy a GPS-collared coyote to find and remove attractants in the area.
- iii. If attractants are the problem the responding officer will attempt to locate the source of the attractant and document the location for follow-up by the ACO. If residents are intentionally or unintentionally leaving attractants for coyotes they are violating Town Ordinances 90A.01 - 90A.05 and subject to fines.

#### E. Coyote Activity Reported:

**1. Approaching or attacking a person or a leashed pet or a pet within ten (1,0) feet of owner:**

a. Recommended Immediate Action:

- i. Residents should document with photographs showing behavior and markings. This will help determine the number of habituated coyotes and identify individual coyotes involved.

b. Recommended Follow-up Action:

- i. An officer will be dispatched and a call number will be generated using dispatch reason "coyote control". The ACO will follow-up the complaint.
- ii. If neighborhood has a persistent problem or multiple coyotes, coordinate with NBCS to trap and OPS-Collar a coyote to find and remove coyote attractants.
- iii. If attractants are the problem the responding officer will attempt to locate the source of the attractant and document the location for follow-up by the ACO. If residents are intentionally or unintentionally leaving attractants for coyotes they are violating Town Ordinances 90A.01 - 90A.05 and subject to fines.
- iv. Lethal control may be appropriate for individual problem coyotes that do not respond to removal of attractants and persist in dangerous behaviors such as closely approaching people or leashed pets despite harassment attempts (throwing objects, yelling, etc.). The **MPD** will review existing law and determine whether hunting or trapping may be more appropriate.
- v. If lethal control is employed NBCS will be notified and the carcass will be held for necropsy.

F. Feeding Non-Domesticated Animals (coyotes)

1. The Town of Middletown ordinance 90A.01 - 90A.05 prohibits the feeding of any non-domesticated animals including coyotes, feral cats or feral dogs.
2. The purpose of the ordinance is to protect the health and safety of residents in the Town of Middletown with respect to the dangers associated with coyotes and other non-domesticated animals by minimizing opportunities for such animals to obtain food from sources controlled or controllable by humans.
3. The ordinance states, "No person shall feed or in any manner provide an attractant • to coyotes or other non-domesticated animals."
4. Violations of the ordinance are punishable by a civil penalty of from one hundred (\$100.00) to five hundred (\$500.00) dollars for each day of violation.

## Appendix H No-Feed Ordinance Template

### Chapter 6.12. - FEEDING OF NON- DOMESTICATED ANIMALS.

#### 6.12.010 - Purpose.

The purpose of this chapter is to protect the health and safety of residents in the city of Newport with respect to dangers associated with coyotes and other non-domesticated animals by minimizing opportunities for such animals to obtain food from sources controlled or controllable by humans.

(Ord. No. 2013-003, § 1, 6-12-2013)

#### 6.12.020 - Definitions.

For purposes of this chapter the following definitions shall apply unless the context clearly indicates or requires a different meaning:

"Attractant" means any substance which could reasonably be expected to attract or does attract coyotes or other non-domesticated animals, including but not limited to, garbage, food products, pet food, carcasses, feed, grain.

"Feeding" means the leaving of food of any kind where it is accessible to coyotes or other non-domesticated animals.

"Food" means all substances consumed by humans or animals for nourishment except grass and other vegetation, growing crops, and food that is canned or stored in sealed or closable containers.

(Ord. No. 2013-003, § 1, 6-12-2013)

#### 6.12.030 - Prohibitions.

- A. No person shall feed or in any manner provide an attractant to coyotes or other non-domesticated animals; provided that domestic pets are not attractants, and feeding pets outdoors does not create an attractant if the pet eats all the food immediately, or the remaining food is removed as soon as the pet stops eating, or the pet is fed in a secure cage or other enclosure.
- B. No person shall leave, store, or maintain any food or attractant in a manner, area, or location accessible to coyotes or other non-domesticated animals.

(Ord. No. 2013-003, § 1, 6-12-2013)

#### 6.12.040 - Exceptions.

- A. Food for birds or squirrels that is in a feeder located within one hundred (100) feet of a residence and elevated to be inaccessible to coyotes.
- B. Outdoor feeding of farm animals, provided:
  - 1. Animal food, when not being fed to animals, is stored in a building or a closed container;
  - 2. Excessive amounts of food, based on the animals' eating history, are not provided to the animals;
  - 3. Injured, old, feeble, or prey-sized animals are not left outside unattended; and
  - 4. All other reasonable efforts are made to reduce attractants to coyotes and other non-domesticated animals.

(Ord. No. 2013-003, § 1, 6-12-2013)

6.12.050 - Enforcement.

Violations of this chapter are punishable by a fine of from one hundred dollars (\$100.00) to five hundred dollars (\$500.00) for each day of violation.












(Ord. No. 2013-003, § 1, 6-12-2013)

**Coyote Protocol: recommended decision tree for coyote complaints. Feb 6 2013**

Coyote Activity Reported	Appropriate Initial Response	Recommended Immediate Action	Recommended follow-up Action
1. In yard or crossing yard or street or howling	No lethal control. Coyotes have inhabited Middletown for 15 years, always cross yards. They howl to communicate →	Ignore. Make sure resident and neighbors are not leaving out food attractants for coyotes.	NA
2. Following or taking unsupervised or unaccompanied pets (this includes animals greater than 10 feet from owner, within inadequate fencing, or tied animals)	No lethal control: owner's responsibility to protect vulnerable pets →	Do not leave vulnerable (small or old) animals unsupervised.	NA
3. Approaching people	Concern. In Middletown some residents permit coyotes to lie in their yards and even feed them. They may have lost their natural fear of people, think resident is going to feed them, or coyote may be diseased. →	1. Whenever coyotes are seen: yelling, clapping hands, throwing handy objects, shaking and throwing a can filled with pebbles, and aggressively walking towards coyote <i>if</i> it starts to leave. If the coyote does not leave →	Site visit should be conducted and any information/evidence reviewed.  Options:  1. If neighborhood has a persistent problem, or multiple coyotes, work with NBCS to GPS-collar a coyote to find and remove coyote attractants.  2. If attractants are not the problem, lethal control may be appropriate for problem individuals. Public safety and existing laws should determine whether hunting or trapping may be more appropriate.
4. Following people		2. When possible document with photographs showing behavior and markings. This will help determine number of problem animals and identify individual coyotes involved.	
5. Unafraid: does not run when approached or when something is thrown			
6. Approaching or attacking leashed pet or pet within 10 feet of owner.			
7. Other →	Call NBCS Coyote Information Line: (401) 300-4695 (HOWL)		



## Living Safely with Coyotes

-  Never feed coyotes or leave out food that might attract them. Don't feed their puppies.
-  Secure trash. Coyotes eat everything: fruit, cereals, meats, small animals, and garbage.
-  Never feed pets outside.
-  Bring your small pets inside at night or accompany them in heavily used coyote areas.
-  Any pet spaniel size or smaller, or tied, is at risk.
-  A safe cat is an indoor cat. Outdoor cats or cat colonies are a magnet for coyotes.
-  If coyotes are staring at you, or following you, they probably think you are going to feed them.
-  Remember many coyotes are trained to expect food from people.
-  If you are uncomfortable with coyotes near you, act big, mean, and loud. A soda can full of pennies makes a good noisy shaker and should scare them away. If noise alone does not work throw something. Coyotes are very nervous animals and should leave especially if it looks like you are going to approach them.
-  If you feed them you are part of the "coyote problem." Remember: fat coyotes are fertile coyotes. They have plenty of natural foods here - including mice, rats, woodchucks, rabbits, geese and deer - they don't need more.
-  Habituated coyotes can be dangerous because they are apt to approach people and may become aggressive. Problem individuals may need to be removed and euthanized. You are not doing a coyote any favor by feeding it: a fed coyote is a dead coyote.

## Working Together

The Narragansett Bay Coyote Study (NBCS) is working with local and state government and the public to develop viable management and coexistence strategies for the eastern coyote in RI. We are addressing the issue of coyote subsidization and population growth by creating Best Management Practices to reduce coyote numbers to a level sustainable by the natural environment.

NBCS is a collaborative project committed to cutting edge research on coyote populations in Rhode Island and sharing its findings and recommendations with local communities. Study details can be found at [www.theconservationagency.org/coyote](http://www.theconservationagency.org/coyote).

For information on coyotes, public and pet safety, and how to report sightings, you can visit [CoyoteSmarts](http://CoyoteSmarts.org) at [www.coyotesmarts.org](http://www.coyotesmarts.org). For rules and regulations, pertaining to coyotes in Rhode Island visit [www.dem.ri.gov](http://www.dem.ri.gov).



Potter League  
*Enriching Lives*

Aquidneck Land Trust

RHODE ISLAND  
NATURAL HISTORY SURVEY  
*Preserving Animals, Ecology and Landscapes*

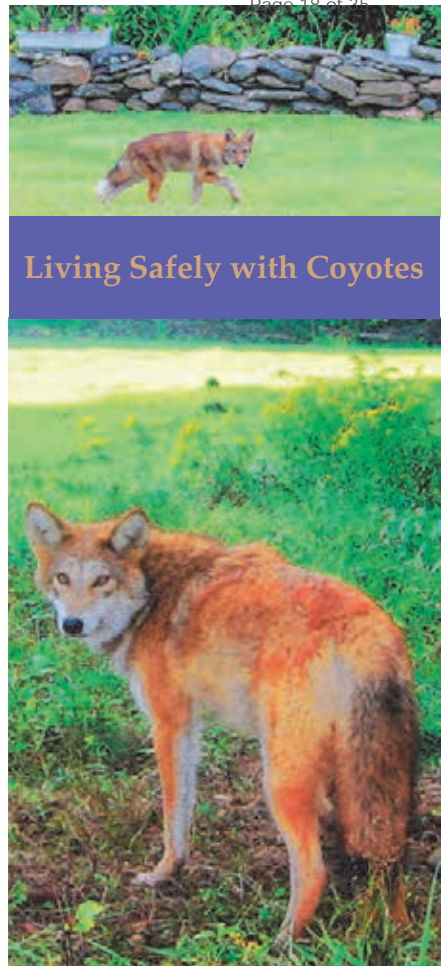
Aquidneck Island  
PLANNING COMMISSION

CoyoteSmarts™

www.CoyoteSmarts.org | info@CoyoteSmarts.org

The Conservation Agency

FOXMAN BIRD SANCTUARY



Prepared by  
The Narragansett Bay Coyote Study  
for  
 CoyoteSmarts™






## CoyoteSmarts

First seen in Rhode Island in the 1960s, coyotes can now be found in every part of the state except Block Island. They arrived on Aquidneck and Conanicut Islands in the mid-1990s, making their way from the mainland by swimming or crossing one of the islands' three bridges. By 2005, coyotes became a regular sight even during the day as they expanded their territories from farmlands and open spaces into suburban and urban areas.

The Narragansett Bay Coyote Study (NBCS) was initiated that same year to attempt to determine what was responsible for the apparent increases in coyote numbers. Since 2005, NBCS research has shown that throughout the islands the increasing coyote presence has a lot to do with food. The NBCS is currently working in Newport County to develop regionally tailored management and coexistence strategies.

Through its parent organization, The Conservation Agency, NBCS joined forces in 2013 with the Potter League for Animals, Rhode Island Natural History Survey, Aquidneck Land Trust, and Norman Bird Sanctuary to launch *CoyoteSmarts*, a major public information initiative. In 2019, the Aquidneck Island Planning Commission joined the group. With funding from the Prince Charitable Trusts and the RI Foundation, the initiative will help raise public awareness of coyotes, promote public and pet safety, and encourage best coyote management practices.

## Coyote Biology Relates to Management

-  Coyotes are different from deer, which depend on predators to control their population size.
-  Since coyotes are top predators they have to control their own numbers – nothing eats them to bring their numbers down.
-  Coyote litter size can be related to food abundance and availability. More food resources mean more puppies and higher survival rates.
-  Coyote population density can increase in areas with abundant food resources.
-  With less food both coyote numbers and population density decrease.



It follows that if we can identify and control the availability of food resources the coyotes are using, coyote numbers will decrease. NBCS calls this "Passive Coyote Management."

## Why Not Shoot Them?

Lethal control programs are costly, time consuming, and rarely effective. In suburban and urban areas lethal control options may be hindered by legal constraints and concerns for safety of people and domestic animals. Trying to get rid of coyotes by killing them is a logistically impossible task since most of them are discrete, shy, and virtually invisible. Inevitably, the ones that are missed sense the increase in available food, produce more pups, and rapidly restore the population to former levels.

In extreme cases where habituation has occurred and the coyotes are exhibiting aggressive behavior, removal by lethal means may be the best short-term solution for problem individuals. Since shooting, trapping, and poisoning, can be unsafe or illegal in closely built neighborhoods, NBCS recommends being proactive about coyote management to make sure habituation does not occur.

## People Cause Coyote Problems

Using GPS tracking, NBCS has found humans directly and indirectly provide thousands of pounds of food to coyotes each year. Excessive coyote reproduction occurs wherever people are subsidizing coyotes significantly. Coyotes can produce many more offspring than they need to replace pack members. The young spread out and fill any available habitat on the island. For that reason there is no such thing as an isolated coyote problem on Aquidneck Island. Portsmouth's problem is Newport's problem and visa versa.

We can manage coyotes - get them to drop their own numbers - if we aggressively manage ourselves. If the island municipalities decrease the food subsidies we are collectively providing to coyotes - their populations will stabilize at lower levels. To avoid bold coyotes foraging in residential areas make sure no one ever

feeds them or they will learn to associate people, and your neighborhood, with food. Be a good neighbor and don't feed coyotes.

## Easy Pickings: Human Handouts



### Intentional and unintentional coyote subsidies:

- Road-killed animals, especially deer, are dumped or not properly disposed of
- Unsecured food, garbage, or compost
- Dead farm-livestock dumping
- People feeding feral cats or wildlife
- People intentionally feeding coyotes



### Problem:

- Fat coyotes are fertile coyotes
- Coyotes respond to abundant food resources by producing more offspring
- Coyote populations increase
- Coyotes get habituated when they associate people with food – they may get bold and aggressive

## Solutions

The NBCS has prepared a set of guidelines for the Newport County municipalities: "Best Management Practices for Coexistence with Coyotes on Aquidneck and Conanicut islands." Encourage your local and state government to adopt and implement these guidelines for a safer community and a sustainable relationship with coyotes.



**Narragansett Bay Coyote Study**  
[www.theconservationagency.org/coyote](http://www.theconservationagency.org/coyote)

## COYOTE MANAGEMENT TOOLKIT

### Part 2: Ancillary Materials

- *Report of the Warwick Coyote Commission*.....21  
Issued in 2005, presents findings **from the first municipal commission to address the coyote problem in Rhode Island.**
- *Report on the NBCS Forensic Tracking Program*.....27  
Identifies coyote food resources provided by humans with recommendations for action.
- *Early Findings from NBCS Coyote Food Removal Study*.....33  
Presents "before and after" data on coyote traffic in a Portsmouth neighborhood when human-provided food resources were removed.

*City of Warwick  
Coyote Commission  
Report & Recommendations*

*Councilman John A. DelGiudice Chairman*

*Robert McVay Vice-Chairman*

*September 30, 2005*

*To: The Honorable Mayor Scott Avedisian  
3275 Post Road  
Warwick, Rhode Island 02886*

*City of Warwick Rhode Island  
Coyote Commission  
Final Report*

**September 30, 2005**

**Executive Summary:**

This report of the Warwick Coyote Commission, formed by Mayor Scott Avedisian on January 26, 2005, is based upon 8 months of data collection, interviews with experts in the field, and a series of public meetings to hear complaints and experiences of residents regarding their interaction with the Warwick coyote population. Initially, the great majority of sightings reported were from Warwick Neck, where the large open spaces of Rocky Point, Aldrich mansion, numerous undeveloped areas of fresh water wetlands, and two golf courses present ideal habitat for coyotes; however, as a result of press articles and public meetings, many more sightings have now been reported in adjoining areas such as Oakland Beach, Buttonwoods, City Park, Greenwood and others – a clear indication that the population either already existed in many areas, or was moving into other parts of the city.

Initially the Commission sought to find ways to count the number of animals by locating dens, trapping and placing transmitters on some animals to enable monitoring their locations during the day, or tracking them – however, based upon reports of experts (see below) this would be an extremely time consuming and expensive task, taking months or perhaps years and costing tax payers well over \$100,000.00. Furthermore the coyote is a self-regulating species, which, on the one hand, will not overpopulate the food supply, and on the other, if efforts are made to reduce the population by eradicating them, will only result in the entry into the vacated area by new groups from adjoining areas. DEM Biologists estimate that on average a coyote territory (approximately five square miles) will support a pack of from 4 to 6 animals, which vigorously defend their territory against other coyotes moving in. As a result of these findings, it was decided it would not be fiscally responsible or necessary at this time to try to count the coyote population in Warwick. However, coyotes being a statewide issue further research into coyote behavior and movement should be considered at a state level.

Not surprisingly, the Commission found that educating the public about the behavior and feeding patterns of the coyote is the most effective way of both controlling the population of animals and at the same time reducing the fears of people who suddenly are encountering coyotes on a more frequent basis. Well meaning people who place food out for coyotes on a regular basis, believing they are helping the animals survive, are in fact changing the feeding patterns of the animals, expanding the food supply, and resulting in an increase in the coyote sightings. Such feeding can also change the patterns of movement by the animals, increase their risk of road kills, reduce their natural fear of humans, and result in more frightening encounters by people and their pets, whom the coyotes see either as a food source, or as a competitor for the limited food supply.

## Findings

Based upon the testimony by experts and the residents interviewed by the commission, the following observations and conclusions were reached:

- The Eastern coyote is a self-regulating species:
  - Average pack size is 4-6 animals;
  - Pups are born in the spring, and will stay with the pack for about 1 year, after which they will be driven out of the territory by the adults, becoming transients, seeking their own territory, sometimes traveling many miles before finding and defending their own territory;
  - When their numbers are reduced, females start breeding at a younger age and have larger litters; when the territory becomes overpopulated, the opposite occurs;
- Coyotes will feed on insects, berries, small mammals such as mice, rats, skunks, rabbits, squirrels, as well as domestic cats and small dogs. As long as there is an ample supply of these food sources, it has been suggested that the coyotes will continue to occupy this area regardless of our best efforts to remove them.
  - It was reported that in Texas, the government destroyed 2500 coyotes in 1998, 2800 in 2000, and 3300 in 2002, at a tremendous cost to taxpayers. In 2004, they report no significant drop in the population of coyotes.
- Typically they feed at night and are seldom seen. The coyote does not appear to be susceptible to rabies (as, for example raccoons are) and there have been very few cases of coyote rabies ever reported. A case of a person being bitten by a coyote occurred when the person was trying to feed the coyote by hand. Other cases of confrontations with coyotes occur when the person is trying to protect a pet from a coyote.
- Coyotes are of significant concern to humans (especially infants) and domestic pets. The coyote is the largest predator to occupy this area in some 200 years. Since the extinction of the grey wolf and the bobcat, from this area, the coyote has no natural predators and will most likely be with us for some time. This lack of danger reduces the coyote's fear and leads to more brazen confrontations between coyotes and humans, which can be frightening to people especially if a child, pet dog or cat is involved.
- Unsecured garbage cans can also become a food source for coyotes. The new system of collecting garbage in Warwick may be effective in eliminating this source.
  - Interestingly, the number of reported sightings in Warwick Neck, the first neighborhood to receive the new receptacles, has dropped significantly.

- Coyotes are very social animals. They mate for life and packs remain close-knit
- It has been suggested by trappers that trapping the animals may help coyotes become “wilder”, leading them to revert to their practice of hunting only at night and avoiding contact with humans. The potential risk of trapping other animals, domestic and wild can be controlled by the use of today's leg-hold traps which have been approved by RIDEM, and which can be adjusted for both the weight and size of the animal. Therefore only animals of similar weight and size would be at risk. This approach should be considered with caution. Further research is recommended by using a controlled experiment or by researching this approach to see if it has been used in other communities and what were the end results. This will help to determine the true effectiveness of this practice. This approach would not in anyway decrease the numbers of coyotes, as this report has previously stated. Trapping would have to be done year after year to have any long term effect, and if considered, should only be done by professional trappers licensed by D.E.M .

### **Conclusions and Recommendations:**

1. Develop an on-going educational program for the citizens; utilize newspaper articles and reports, the City of Warwick website. Expand the current Coyote section by adding a “Frequently Asked Questions” section.
2. Utilize trained specialist to conduct classroom training for our children. Distribute information published by DEM, the Conservation Agency, and other knowledgeable sources in public places, City Hall, schools and churches to create a more informed public.
3. Bring in coyote experts to work with our Animal Control and Police Officers on Best Management Practices regarding coyotes.
4. Modify the current Police Department policy of only responding to citizen complaints about domestic pet problems, in order to improve police response to coyote complaints.
5. Train our Animal Control and Police Force on the best way to remove a problem animal. This does not mean a coyote walking through someone’s yard, but a coyote acting aggressively towards people without provocation.
6. Educate owners of domestic animals on how to best protect their pets. Educate people about the problems created by people feeding wildlife such as coyotes, turkeys, feral cats and other wild animals, through community meetings, informational material distribution, as indicated above.

7. Establish a permanent commission to follow the future impact of the coyote population in our city. Continue to follow the ongoing scientific research studies on controlling the population i.e. sterilization.

**Sources of Information:**

DEM Biologists Charlie Brown and Mike Lapisky  
Dr. Jonathan Way Eastern Coyote Research Project. Based on Cape Cod  
John Maguranis Animal Control Officer Belmont, Massachusetts  
Coyote Web Page, Warwickri.com, reported sightings  
Spencer Tripp Professional Trapper  
Texas Sheep Herders Association  
Lowell Miller U.S. Dept. of Agriculture Wildlife Research Center Ft. Collins,  
Colorado

**Submitted By:**

**The Warwick, R.I. Coyote Commission:**

**Chairman:** Councilman John A. DelGiudice

**Vice-Chairman:** Robert McVay

**Members:** Senator William Walaska  
Representative Peter Ginaitt  
Sargeant Robert Palumbo, W.P.D.  
Kim Casci, Defenders of Animals  
Kate Stark, President, Warwick Neck Improvement  
Association  
Mike Lapisky, RI Department of Environmental Management  
Joanne Cournoyer, Secretary (non-voting)



**Councilman John A. DelGiudice** \_\_\_\_\_.

**Robert McVay** \_\_\_\_\_.

**Senator William Walaska** \_\_\_\_\_.

**Representative Peter Ginaitt** \_\_\_\_\_.

**Sergeant Robert Palumbo** \_\_\_\_\_.

**Kim Casci** \_\_\_\_\_.

**Kate Stark** \_\_\_\_\_.

**Michael Lipisky** \_\_\_\_\_.

# The Conservation Agency

Branch Office: 67 Howland Avenue, Jamestown, Rhode Island, 02835 USA • Telephone: (401) 423-0866

## Summary Report on the Results of Narragansett Bay Coyote Study Forensic Tracking Program

Prepared by Numi Mitchell, Ph.D., Lead Scientist, Narragansett Bay Coyote Study, a project of The Conservation Agency, Jamestown, RI

Submitted to: Town Councils and Administrators of Newport, Middletown, Portsmouth, and Jamestown, Newport County, RI

October 6, 2017

### Background

Since the inception of the Narragansett Bay Coyote Study (NBCS) in 2005, we have used GPS tracking of coyotes to understand the biology and resource use of coyotes on Aquidneck and Conanicut Islands. Our goal is to develop and test effective science-based strategies for coexisting with coyotes and managing their populations.

From existing research two things are clear about coyote management. First, lethal control does not work except in the very short term because coyotes rapidly repopulate any vacated territory. Second, control of food resources should work because food availability is known to determine the reproductive rate of coyotes and thereby the upper limits of coyote density. For these reasons we focused our research on identifying important regional food resources and determining if it would be possible to control them. We hypothesized that reducing food resources on the islands would lower the ceiling for coyote population. This, in turn, would reduce human coyote interactions.

### Initial results

We rapidly determined, from GPS tracking, a large part of the coyote food resources were anthropogenic (from humans). We found two major coyote issues created by food subsidies:

1. **A numbers problem** – Root causes are large reliable resources such as unsecured commercial dumpsters, outdoor livestock feeding, livestock carcass dumps, commercial compost piles, free range poultry farms, feral cat colonies, or fruit orchards and vineyards. Abundance is key; more food creates higher coyote population density.
2. **A behavior problem** – Root causes are small or occasional food resources present in populated communities, such as dumpsters with open doors/lids, uncovered or unsecure garbage or recycling bins, accessible home composting bins, pet or feral cat feeding outdoors, individual fruit trees, or coyote feeding. Foods provided near human activity generate coyotes habituated to people. Habituated coyotes can be bold and approach people for food (including small pets).

We concluded that these coyote food subsidies are controllable if communities, cities, towns, and states committed to stop residents from providing them.

### **Initial recommendations to municipalities**

Based on early data, we promulgated the “Best Management Practices for Coexistence and Management of Coyotes on Aquidneck and Conanicut Islands” and a recommendation for a companion “No-Feeding Ordinance” that prohibited the placing of food attractants for coyotes and other wildlife. As of this date, Newport, Middletown, Portsmouth, and Jamestown have adopted both.

### **Forensic Tracking Program**

In 2013, NBCS joined forces with the Potter League for Animals, the Norman Bird Sanctuary, the Aquidneck Land Trust, and the Rhode Island Natural History Survey to launch **CoyoteSmarts**, a public information initiative whose purpose is to raise public awareness of coyotes, promote public and pet safety, and encourage best coyote management practices through a website—[www.coyotesmarts.org](http://www.coyotesmarts.org)—and various outreach activities.

Following a rise in coyote complaints in the latter half of 2014, NBCS and the CoyoteSmarts partners agreed to deploy three collared coyotes—one in each Aquidneck Island community—in an effort to determine the source of the problems, which were strongly suspected to be food-related. State-of-the-art collars capable of transmitting location data at 15-minute intervals were acquired for this purpose, along with a software app that presents tracking data as a visually compelling series of connected dots. To help identify the best locations for collar deployment, the NBCS sightings databank was consulted and input was sought from the communities and the local police departments.

As tracking data became available, it was shared with the individuals or operations shown to be causing the problems, which in most cases were corrected voluntarily. When necessary, the information was also provided to the local police departments and the RI Department of Environmental Management (DEM). Thanks to our tracking data, a Portsmouth resident who was feeding coyotes was successfully prosecuted for the offense, and DEM agreed to place wildlife “no-feeding” signage at the state parks and boat ramps in Newport and Jamestown.

NBCS continues to conduct the Forensic Tracking Program to identify food resources or issues contributing to increased coyote traffic. Any time problems are identified, NBCS provides data from the tracking program to municipal administrators and/or police. In turn, some communities have donated collars to NBCS to assist with program expenses.

## Current findings specific to municipalities and municipal action recommended

### Findings:

Data from the Forensic Tracking Program confirm our earlier findings (see **Initial results**) regarding food sources that contribute to coyote numbers and behavior.

The attached **Summary Table** lists all the coyote food subsidies identified by our tracking, including residential, commercial, agricultural and other sources (road kill, carrion, livestock carcass dumps, free-range and other unprotected animals, and feral cat colonies). These resources are categorized by **municipality** (Newport, Middletown, Portsmouth and Jamestown) and **problem type** (numbers, behavior or both).

While almost all food resources are present in every community, there are a few logical exceptions with agriculture, livestock and roadkill, which are less prevalent in urban areas. What the Table clearly illustrates is the coyote's omnivorous diet, which includes everything from garbage and compost to fish remains, fruit, and some vegetables, such as corn.

### Recommendations:

In general, we recommend a two-pronged approach that begins with **education** and is followed, when appropriate, by **enforcement** of the local no-feeding ordinances.

For **residential** food sources (fruit trees, vegetable gardens, small pets and other animals), we recommend

1. An educational visit from the Animal Control Officer.
2. Citations and fines to follow if the problem is not corrected. This process was followed in the case of a Portsmouth resident known to be feeding coyotes, who was subsequently prosecuted for the offense.

For **agricultural** food sources (fruit and other produce, chickens and other small animals, and livestock), we acknowledge that

1. Farmers have found ways to deal with coyote predation through hazing, shooting, and making use of guard animals such as llamas and donkeys.
2. Municipal action is not usually warranted unless the farmer is unable to control coyote traffic and it becomes a problem for neighboring communities.
3. If problems persist, an educational visit to evaluate and troubleshoot issues (such as insufficient fencing, free ranging and unprotected livestock, free choice grain feeding of poultry or livestock, carcass dumping, edible compost) may be needed.
4. Municipal assistance may be required in burying or removing large livestock carcasses when the ground is frozen or the farmer lacks the resources.

Since **carrion**, especially road-killed deer, is a major food source for coyotes, we recommend that

1. DEM be asked to pick up and dispose of road-killed deer, or town equipment be made available for this purpose.

2. Since fish remains have also been identified as a coyote attractant, the towns place wildlife no-feeding signage at boat ramps as DEM has done.

**Feral cat colonies and outdoor cat feeding stations** offer a double bill for coyotes: they eat both cat food and cats. Placing and leaving cat food where it will attract coyotes is, a) a violation of the No-Feeding Ordinance, and b) sets up the cats for coyote predation. Coyotes learn the feeding schedule, just as the cats do, and intense coyote activity is focused on them. NBCS data show coyotes rest and forage near colonies to maximize their opportunity to exploit the food provided as well as the visiting cats. Feeding cats in a way that increases mortality cannot be justified as kind or humane. Since cat colonies also increase the chance of human and pet coyote interactions in surrounding or adjacent neighborhoods we recommend

1. An educational visit from the Animal Control Officer.
2. Feral cat feeding should only occur when the feeder is present. All food attractants must be removed when feeder not present.
3. Feeding cats on tables or elevated platforms to reduce cat mortality.

**Non- Migratory Canada goose flocks:** Canada geese, once entirely migratory, have become resident in Rhode Island. They gather in large flocks in agricultural fields but also on lawns around ponds, reservoirs, and on shorelines. Non-migratory geese are a valuable food source for coyotes, which regularly visit areas where geese congregate to prey on them. We recommend that

1. In or adjacent to residential areas, Canada goose flocks should be discouraged from settling and feeding to reduce coyote traffic in these neighborhoods.
2. Goose feeding should be prohibited in urban public areas.
3. Tactics to prevent geese from landing and foraging on lawns and shorelines, such as goose-dog services, goose canons, and goose guns, all used to startle geese and prevent settling of the flock, should be used.
4. Goose hunters should be encouraged to take their limit in agricultural and rural areas where it is safe to hunt.

Since proper **waste disposal** is a major issue, we recommend that the towns

1. Modify waste-hauler contracts to include use of wildlife-resistant garbage and recycling containers and clips on dumpster doors.
2. Require modification of residential and commercial garbage and recycling bins to include lids secured with clips or “bungee cords,” or subsidize purchase of commercial wildlife-resistant waste and recycling bins.
3. Require residential and commercial dumpsters lids and doors be secured by clips or locks.
4. Require wildlife-resistant composting bins.

**We also recommend that the towns**

1. Place wildlife no-feeding signage at public parks and other locations where food may be available.
2. Distribute public information (brochures, leaflets) at municipal offices, contribute to the cost of public service announcements, sponsor public information presentations.
3. Enforce leash laws and discourage free-range backyard poultry.
4. Purchase forensic tracking collars to troubleshoot persistent issues.

**Final Comments:**

It is much easier and safer to be proactive about enforcing the No-Feeding Ordinances and limiting food subsidies to coyotes than it is to correct coyote issues after they occur. This is particularly true with habituated coyotes in urban and suburban areas where hunting and trapping may be precluded by public and pet safety risks. We recommend that municipalities stringently enforce the ordinances and policies adopted and do not tolerate scoff-laws. Removing the root of the problem – food subsidies – will generate long term coyote control results better than lethal control efforts, which are dangerous and temporary solutions at best.

Reducing food subsidies that attract coyotes and generate coyote traffic through residential areas will reduce the potential for human and pet coyote encounters. The strategy and goal of these recommendations is to make residential areas worthless to coyotes as foraging areas. If no food is available, coyotes will choose to occupy natural habitats (meadows, shrublands, forests) for foraging instead. At this point, each of our municipalities has demonstrated, with repeated attempts at lethal control, what reams of scientific literature have long-since proven: killing coyotes to manage population size does not work. Alternatively, the science-based recommendations provided by NBCS are both logical and practical, and will be effective if adhered to by community residents and authorities.

For additional findings and recommendations, please consult the “Best Management Practices for Coexistence and Management of Coyotes on Aquidneck and Conanicut Islands” (<http://theconservationagency.org/wp-content/uploads/Best-Management-Practices-for-Coexistence-with-and-Management-of-Coyotes-current-vers.pdf>).

**Summary Table.** Important anthropogenic food subsidies for coyotes in Newport, Middletown, Portsmouth, and Jamestown, identified by the Narragansett Bay Coyote study using GPS tracking 2005-2017.

P = food resource present (confirmed by forensic tracking)

E = food resource expected (likely occurs)

N = large reliable resources supporting coyote population growth

B = resources likely to cause behavioral problems such as habituation and increased urban/suburban coyote presence

Food Subsidy	Newport	Middletown	Portsmouth	Jamestown	Problem caused
<b>Residential fruit</b>					
apples, pears, peaches, plums	P	P	E	P	B
grapes	P	E	E	P	B
<b>Farm produce</b>					
corn		E	P	E	N
strawberries		P	P	E	N
apples, pears, peaches plums	P	P	E	P	N
grapes		P	P	P	N
<b>Carrion</b>					
fish remains (shore, dock, boat ramps)	P	P	P	P	N & B
deer (roadkill or scavenged from hunter)	P	P	P	P	N
<b>Carcass disposal</b>					
Deer carcass dumps		P	P	P	N
Livestock carcass dumps		E	P	P	N & B
<b>Farm livestock vulnerability</b>					
Livestock birthing in fields		P	P	P	N & B
Unprotected small livestock < 40 lbs	P	P	P	P	N & B
<b>Small free-range animals (common)</b>					
chickens	P	P	P	P	N & B
dogs	P	P	P	P	B
cats	P	P	P	P	B
<b>Outdoor pet feeding (grains or meat-based)</b>					
residential	P	P	P	P	N & B
farm	P	P	P	P	N & B
<b>Non-migratory Canada goose gathering areas</b>	P	P	P	P	N & B
<b>Feral cat colonies or outdoor cat feeding stations</b>	P	P	P	P	N & B
<b>Compost (containing fruit, vegetables, meat, fish, etc.)</b>					
residential	E	P	E	P	B
commercial		P	P		N & B
farm	E	P	P	P	N
<b>Dumpsters</b>					
overflowing	P	P	P	P	N & B
unsecured side door	P	P	P	P	N & B
unsecured top	P	P	P	P	N & B
<b>Unsecured residential garbage and recycling bins</b>	P	P	P	P	N & B

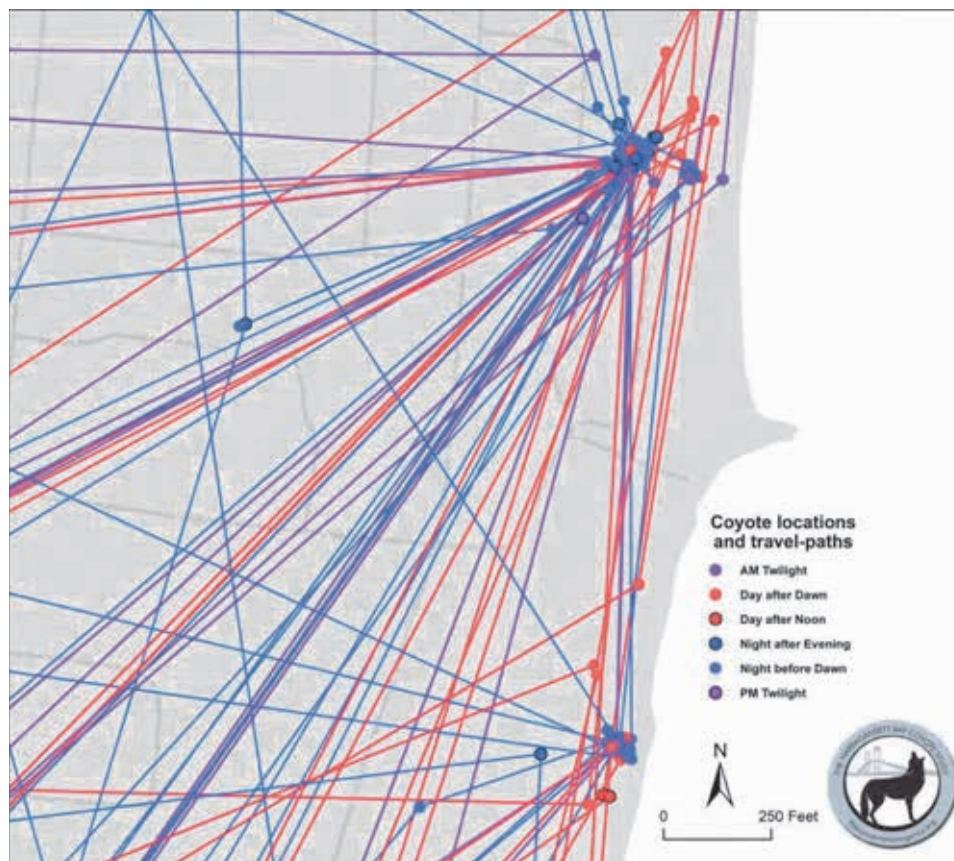


FOR IMMEDIATE RELEASE

July 11, 2019

## Coyote food removal study meets with early success

As shown in a striking set of before-and-after pictures, a Portsmouth, RI, neighborhood has experienced a significant drop in coyote traffic thanks to the removal of two food sources provided by community residents. Two months after being fitted with a GPS collar, a coyote named “Hanks” led researchers from the Narragansett Bay Coyote Study (NBCS) to two residential sites in Portsmouth where tracking data clearly indicated that feeding was taking place. In the first picture, clusters of GPS locations (dots) and travel vectors (lines) reveal the location of two suspected feeding sites. The blue lines and dots show activity at night, purple at twilight (dawn and dusk), and red during the day.



**BEFORE:** Two residential coyote-feeding sites in Portsmouth, RI, revealed by location points and travel vectors of a GPS-collared coyote. Tracking period: April 4 – May 17, 2019. (N. Mitchell, NBCS, The Conservation Agency)



NBCS sent a report to the Portsmouth Police Department and a warning was issued to those at the northern feeding site. NBCS staff, conducting weekly coyote-hotspot surveys, asked the owner of the southern site about possible reasons for coyote action there. The second photo, taken 3-5 weeks after the residents were put on notice, shows no coyote activity at either site or in the surrounding neighborhoods. According to Dr. Numi Mitchell, lead scientist for NBCS, “the collared animal, and likely his pack members, quickly figured out there is no longer a food reward when going to either residence. Coyote traffic has dropped and the risk of people or pets encountering a coyote has been greatly reduced by removing the food subsidies.”



**AFTER:** The same neighborhood after coyote feeding is stopped. Coyote travel drops out across entire neighborhood. Tracking period is from June 5 – 20, 2019, 3-5 weeks after warnings were issued. (N. Mitchell, NBCS, The Conservation Agency)

After many years of accumulating anecdotal evidence, the Narragansett Bay Coyote Study is now, with federal funding and in partnership with the RI Department of Environmental Management (RIDEM), conducting food subsidy removal experiments with cooperating communities such as Portsmouth. “It is our job,” says Mitchell, “to provide scientific data that show (if we prevail) that coyote populations and coyote behavior can be controlled by managing human-generated food

subsidies. This was our first experiment with stopping residential feeding – and the results so far are pretty dramatic.”

Since NBCS can’t track everywhere, Mitchell encourages communities with coyote traffic like the Portsmouth neighborhood above to take the lead from her findings. Residents are advised to keep an eye out for food subsidies such as open compost piles, pet feeding outdoors, free range chickens, feral cat feeding, or even intentional coyote feeding. As she says, “you will know there are easy pickings being offered when coyotes start hanging around.”

Providing food attractants for coyotes is illegal under state regulations and RIDEM will issue fines to offenders. It is also prohibited under some local ordinances like the one Portsmouth and the other Aquidneck Island communities have adopted. Enforcement is often simply a matter of an educational visit, although a citation or town assistance with farm issues such as livestock carcass removal may sometimes be required.

For more information about the coyote research project, please visit the NBCS website at [theconservationagency.org/coyote](http://theconservationagency.org/coyote) or the Coyote Research page at [coyotesmarts.org](http://coyotesmarts.org).

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*CoyoteSmarts is a public information initiative of the Potter League for Animals, Aquidneck Land Trust, Aquidneck Island Planning Commission, Norman Bird Sanctuary, The Conservation Agency, and the RI Natural History Survey—a group of Rhode Island organizations that have come together to address the growing presence of coyotes on Aquidneck Island and throughout the state.*

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