

# *The Conservation Agency*

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

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with the endorsement of the Rhode Island DEM and the Potter League for Animals,  
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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 coyotes 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.