



**Salida Deer Advisory Committee
Final Report and Recommendations
October 15, 2013**

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Mission

In response to continuing debate regarding the deer herd within the city limits of Salida, the Salida City Council chartered the formation of a Deer Herd Advisory Committee. The Council requested that, within the next 6 months, the task force present them with 3 - 4 alternatives addressing the growing urban deer population. They requested that the alternatives include discussion of pros and cons of each idea as well as a cost for implementation. They did not provide specific direction on how to research and create the alternatives. One of the alternatives should be 'do nothing' along with some discussion of pros, cons and cost of that lack of action.

Knowing that it will be impossible to please everyone on this issue, the Council requested that the advisory committee provide a spectrum of solutions. The elected officials could then decide which to pursue and not place that responsibility on the task force.

Meeting History

Since July 2013, the advisory committee has been meeting on a regular basis to gather information, discuss the urban deer herd and work to generate a list of options. With the help of Jim Aragon (Colorado Parks and Wildlife) the advisory committee was able to better understand the habits of the deer herd, dynamics of deer herd control and policies of Colorado Parks and Wildlife regarding the deer herd.

With our increased understanding, we reached consensus that education and awareness needed to be addressed first, and we placed it at the top of the list of recommendations. It was also apparent that not all committee members thought the urban deer population was a problem. In fact, some felt that the in-town deer have created an attraction for tourists. With our varying perspectives, it was clear that we needed to recommend that some deer count and resident opinion data be collected before the City proceeds with the recommendations we propose.

While the opinions of the group varied greatly as to what needed to be done (or not done) regarding the urban deer herd, it was found that eventually the group was able to distill what they felt were the citizens' concerns regarding the urban deer herd and reasonable recommendations. One particularly interesting fact learned during the meetings is that the deer are the responsibility of the Colorado Parks and Wildlife. *Many of the actions considered by the task force regarding the urban deer herd would have to be approved by Colorado Parks and Wildlife (CPW) before proceeding.*

Urban Deer Herd Concerns

The perceived issues with the urban deer herd were eventually broken down to 3 main categories

1 – Landscape destruction due to deer grazing

Depending on the time of year and vegetation conditions, the deer herd was known to browse on landscape bushes and plants. Deer were found to become so bold as to wander onto decks and patios to feast on potted plants. Depending on their hunger level, the deer have been known to eat deer-resistant plants, shrubs and low tree branches.

2 – Growing frustration regarding deer droppings

With the perception of a growing deer herd population, some homeowners were finding an increasing amount of deer droppings in their yard. Although CPW and research does not show an increase in disease related to deer droppings, increasing fecal presence in yards causes concern for the homeowner regarding the well-being and safety of themselves and their children.

3 – Safety concerns regarding the deer herd health and human interactions

During mating season and after giving birth to fawns, deer are found to exhibit less tolerant behavior towards citizens of the City. There have been reported cases of injuries to humans in past years in Salida, particularly when fawns are present. Does can use their hooves to “paw” at anyone they perceive is threatening their young. While no deer encounters resulting in injury have been reported in the past couple of years, the potential for this behavior is causing concern.

Recommendations

After much discussion, the Urban Deer Herd Advisory Committee has compiled a list of recommendations along with the pro's/con's and cost. While a number of options did not make the list of recommendations, they have been documented along with the rationale for not bringing them forward to the city council.

RECOMMENDATIONS

Recommendation 1 **Public Education & Awareness**

Recommendations:

- Mountain Mail column provided by a volunteer or Colorado Parks and Wildlife (CPW) jointly with the City to address urban deer herd awareness.
- Pamphlet sent to City households (currently, 2931), around town, in Chamber, motels, real estate offices.
- Increase of deer signage on trails and areas of heavy herd traffic.

Co-Existing With Wildlife

Safety and Behavior

Wild animals are often displaced by development whereas other species are able to live in nearby open spaces, parks, undeveloped parcels of land, river bottoms, and on or near bodies of water. Others have adapted well to urban living, seem to thrive in and near cities.

In most situations, people and wildlife can coexist. The key is to respect the wildness of wildlife. "Wildlife" is just that—wild. Most dangerous and potentially harmful encounters occur because people fail to leave the animals alone.

Wildlife should not be harassed, captured, domesticated or—in most cases—fed. Intentional or inadvertent feeding is the major cause of most wildlife issues, and it is illegal to feed deer, bighorn sheep, mountain goats, pronghorn, and elk in Colorado.

There should be heightened awareness during the fall breeding season, as well as cautioning people to avoid areas with a doe and her fawns, not to get too close or in between them.

Elevate your deer awareness at locations with deer crossing signs. Be especially aware during mornings and afternoons. Deer tend to be more active during the early morning hours and late afternoon hours year round. They are moving between evening feeding areas and daytime bedding sites.

Related Diseases

Colorado Tick Fever:

By far the most common tick-transmitted disease of the region. Despite its name, Rocky Mountain spotted fever is quite rare here.

Lyme Disease:

No human cases of Lyme disease have originated in Colorado. (www.ext.colostate.edu)

- *Lyme Disease U.S. Maps and Statistics*, American Lyme Disease Foundation, Inc., 2004-2008.

Chronic Wasting Disease:

Chronic wasting disease occurs in free-ranging and captive cervids (members of the “deer” family) in several places in North America, including Colorado.

To date, ongoing investigations by state and federal public health officials have shown no causal relationship between chronic wasting disease and human health problems.

Pro's

- Education would increase human awareness, decrease enticing habitat and change human behavior to avoid dangerous confrontations
- No negative political feedback
- Good community building
- Allied with Colorado Parks and Wildlife awareness/education efforts

Con's

- None

Cost

- Brochure and mailing: **\$3,000** – sent to Salida’s approximately 3,000 households, posted on or in existing media; we recommend that it be sent by the City and tailored to the issues that City residents face.
- Signage (estimates based on cost of heritage signs made for highways and in town outdoor displays): Graphic design and content - \$2,500 per sign; outdoor durable free-standing signs - \$160 per 18” x 24” panel, \$240 per 24” x 36” panel to construct. For 5 one-panel signs, approximate cost would be a total of **\$13,000** or less depending on size and content.

Fencing Options

Allowable Residential Fences

Interpretation of City of Salida Code

As of 8-19-13

Fences up to 4 feet high can be erected from the face of a residence to and along the front property line.

Alongside or in the rear of a residence, a 6 foot fence can be erected along or inside the property line.

Double Fencing

- Erect second single-strand fence inside perimeter fence and deer will be hesitant to jump such a large barrier.
- Erect a solid fence so deer cannot see inside and will be afraid to jump.
- See attached *Green Mountain Gardener* and *Ravalli Republic* articles for details.

Deer Resistant Plants and Repellants

Every effort should be made to consult local nurseries and read articles such as those attached and then “deer-proof” one’s yard with appropriate plants, ground cover, and/or the use of repellents to minimize attracting the deer.

- *Yards Prime Habitat for Deer*, by Salida nature writer Susan Tweit, *The Mountain Guide*, 7/24/2002.
- *Preventing Deer Damage*, Colorado State University Extension, No. 650, 2013.
- *Deer and Rabbit Resistant Plants*, Arizona Cooperative Extension, 2001.
- *Deer Repellant*, eHow.

Recommendation 2

Support Colorado Parks and Wildlife's Current Deer Management Strategies in Areas Surrounding the City of Salida

Issues Addressed:

- Deer are eating residents' shrubs and flowers
- Deer are pooping everywhere
- Actual or perceived safety issues

Summary:

During the past 2 years the Colorado Department of Parks and Wildlife has begun to issue an increased number of hunting permits for areas around Buena Vista and Salida in an effort to control the number of deer migrating into the cities. Based on Colorado Parks and Wildlife data, the program appears to be meeting its objectives. Part of the success is due to a high level of cooperation between CPW and private land owners who allow hunting on their properties.

Pros:

- CPW already has a program in place to curb deer migration into the city.
- Potential reduction of deer herd due to urban deer wandering out into hunting zones

Cons:

- None

Cost to implement

- None

Recommendation 3 **Deer Count/Community Survey**

Summary:

For the City to proceed with some of the recommendations of the Committee, Council should consider collecting more information about residents' opinions on whether or not they are bothered by the number of deer, and the City should consider conducting a survey to determine about how many and where the deer reside.

Issue Addressed by Solution:

- Not enough input from residents.
- Not enough knowledge about the size of the City deer herd.

Deer Count Methodology

- Divide the City into routes; assign volunteers to each route.
- At a certain time on a specified date, conduct the count.
- Identify deer by sex and by age (fawns, yearlings, adults).
- This would give us a minimum deer population count.

Pros:

- A survey costs money, although the questions could be few and straight-forward and could be mailed to all households (2,931 when the City surveyed last year), answered online and obtained in key locales around the City.
- Colorado Parks and Wildlife in Salida is interested in helping coordinate a deer count and we would benefit greatly from their expertise.
- A deer count could involve many citizens (take place on one day like a bird count) and raise public awareness.
- We would know if deer over-population is located in only certain areas and then migration into and out of those areas could be examined.
- All of this information could help the City determine which, if any, solutions they want to pursue.

Cons:

- There would be a modest expenditure of City funds to consider.
- Someone/organization would have to coordinate the deer count.
- Some citizens might complain about an expense for a survey.

Cost:

- Survey – **\$4,000** - printing and mailing costs (including return envelope paid by the City). The City would probably absorb the cost of administering it as they have done with other surveys .
- Deer count – **minimal cost** - some advertising cost to recruit volunteers. The City could tally the results and publish. CPW will have to estimate what its personnel costs would be and if they could absorb this cost. Perhaps college or high school students could help.

When:

- Late January/early February (after fawns are born and prior to the rut and the influx of bucks)
- This would give us a minimum deer count in the City

Recommendation 4 **Birth Control for Urban Does**

Summary: Communities across the nation are facing the issue of over population of urban deer. While there is a general consensus that it would be beneficial to reduce the size of the deer herds, there is no easy and simple solution. Because many communities, (presumably including Salida), are against in-town harvesting of deer, much study and research has gone into reducing the herds by more humane methods. The most promising of these is administering birth control to the does. There are two primary drugs that have been developed toward this end: PZP (porcine zone pellucida) and GonaCon.

PZP was developed at Tufts University by Dr. Allen Rutberg, and is safe for deer, scavengers and any humans who happen to consume venison from a treated deer. The deer are captured, tagged, and inoculated with the vaccine. This vaccine has been used effectively to reduce the white-tailed deer at Fire Island National Seashore in NY. (We must note Salida's deer are mule deer and are not in a "closed" environment such as Fire Island.) Hastings-on-Hudson, NY, with the help of Dr. Rutberg, is about to begin a multi-year program of birth control of white-tailed deer using PZP. The program is estimated to cost \$30,000 the first two years.

A second drug, GonaCon, was developed at the National Wildlife Research Center in Ft. Collins, (under the US Dept. of Agriculture Wildlife Services) by a team currently led by Dr. Douglas Eckery. Again, GonaCon has proved to be a safe drug. GonaCon has some advantages over PZP, in that it not only prevents deer from producing offspring, but it also prevents mating behavior. In addition, it claims to be a multi-year, single injection contraception. It has been approved by the EPA, and it was successfully field tested in Silver Springs, MD. Bald Head Island, NC is beginning a six year project testing GonaCon's effectiveness. Again, the drug is administered after the doe is captured and tagged. Funding for some of these early projects has been aided by donations from groups such as citizen conservancy groups and the Humane Society.

Recommendation: We recommend that Salida investigate the possibility of a deer birth control project. Because tests have never been done on mule deer, and have seldom been done on "open" environments, it is possible that Salida could be chosen as a prime test site. The fact that GonaCon was developed in Ft. Collins also is promising -- it would be easy and not too expensive for Solidans to visit the center there, or for the scientists to visit Salida.

Before a GonaCon project can be initiated, cooperation and approval would have to be secured from Colorado Parks and Wildlife and from the State Wildlife Commission. This is a long term project, and not a "quick fix." It will require study and extensive communication with experts in the field. It might be a possible project for staff, interns, or a citizens committee.

Pro's:

- Humane and effective reduction of the urban deer population over time.
- Vaccinated does tend to keep other deer out of their "territory."
- This is a communal, not an individual solution.
- The committee talked to the GonaCon project leader at the Department of Agriculture National Wildlife Research Center in Ft. Collins, and they are interested in doing a pilot study in Salida.
- The National Wildlife Research Center would apply for a grant to fund the project.

Con's:

- It will require study, and extensive work to develop and implement such a plan.
- Using this contraception must be approved by CPW and the State Wildlife Commission, so it will possibly add several months before initiation.

Costs:

- Short term - **\$5,000** for GonaCon consultation and related expenses.
- Long term - to be determined, but not out of the question.

References:

See attached articles from *Wildlife Services* and *Deer Friendly* websites on newly developed contraceptive GonaCon.

- *Questions and Answers: GonaCon—Birth Control for Deer*, USDA, Wildlife Services, May 2010.
- www.deerfriendly.com
- *New York Village Trying Birth Control to Trim Deer Herd*, Jim Fitzgerald, The Pueblo Chieftain, 8/4/13.

Possible Solutions Considered, But Not Recommended

1. "Do Nothing."

Summary: literally, do nothing.

Pro's:

- Easy to implement
- Possible short term solution until we have community consensus on other options.

Con's:

- Will do nothing to address what is believed to be a growing community issue.
- The longer we wait to implement solutions, the bigger the issue is likely to become.
- Public outcry that the city is unwilling or unable to find solutions.

2. In-town Harvesting.

Summary: Professional or licensed sharp shooters (or bow hunters) contracted by the city to cull the urban herd.

Pro's:

- Short term, the herd would be reduced.
- Meat from harvested animals could be distributed.

Con's:

- Inhumane treatment of animals.
- Huge public outcry.
- Safety and legal issues associated with use of weapons in town.
- Studies in other places indicate lack of success in long-term reduction of herd numbers.

3. Dog Herding.

Summary: Trained dogs would be used to herd the deer out of town.

Pro's: Possible short term herd reduction without killing.

Con's:

- This method is designed for rural, not urban areas.
- Little indication that deer would not return soon.
- Difficulty in finding or training the dogs.
- It is illegal in the City to allow dogs to chase deer.

4. Eliminating the Dog Leash Law.

Summary: Eliminate current leash laws, and let the dogs chase the deer away.

Pro's: Effective way of running the deer out of town, and thus, reducing the urban deer herd.

Con's:

- Safety issues and serious danger of injury to deer, dogs, and people.
- Danger of having bands of dogs roaming the city.
- Currently illegal.

5. Sterilization

Summary: Perform ovariectomy (remove ovaries) of does. Requires darting (tranquilizing) does and performing brief surgery in a mobile unit. Probably a multi-year program before almost all does are treated.

Issues Addressed by Solution:

- Too many deer in the City.
- Too much vegetation being destroyed by deer.
- Risk of injury to humans

Pros:

- It's permanent and only has to be performed once.
- It's been conducted over a 3 year period in at least 2 eastern communities with almost complete coverage of the doe population.
- Method is compatible with humane society goals – spaying.

Cons:

- Requires qualified vets/vet techs to perform surgeries (not currently being done in Colorado).
- Some risk of death to the deer because it's an intensive hands-on process.
- Logistics are complicated because it takes lots of people helping.
- Would take community education to be acceptable.
- Would require State Wildlife Commission approval.

Cost:

- In the Baltimore area, in the 3 year operation mentioned above, costs were \$1200-1300 per doe, then dropped to \$500/doe when more volunteers were trained to help.

6. Trap and Transplant

Summary: A number of communities throughout the country have employed a "trap and relocate" approach to urban deer. This method involves trapping deer in over-populated areas and moving them somewhere else.

Pro's:

- High availability of release sites outside of Salida.
- Colorado Parks and Wildlife already has a program in place to curb deer migration back into the City.

Con's:

- High Mortality
 - Studies have shown that approximately 4% of the deer die in transport.
 - As much as 25% of translocated deer die within the first two months of trapping and translocation.
 - More than 85% of deer may not survive longer than one year.
 - There is a high return rate of deer into the City.
 - "Reproduction rebound" occurs – the remaining deer have a higher birth rate.

Cost:

- \$400 per deer

Reference

- *Deer Translocation*, Chad Bishop, Colorado Dept. of Wildlife Ungulate Research.

**City of Salida Deer Advisory Committee
Final Report**

**Reference Articles
And
Websites**



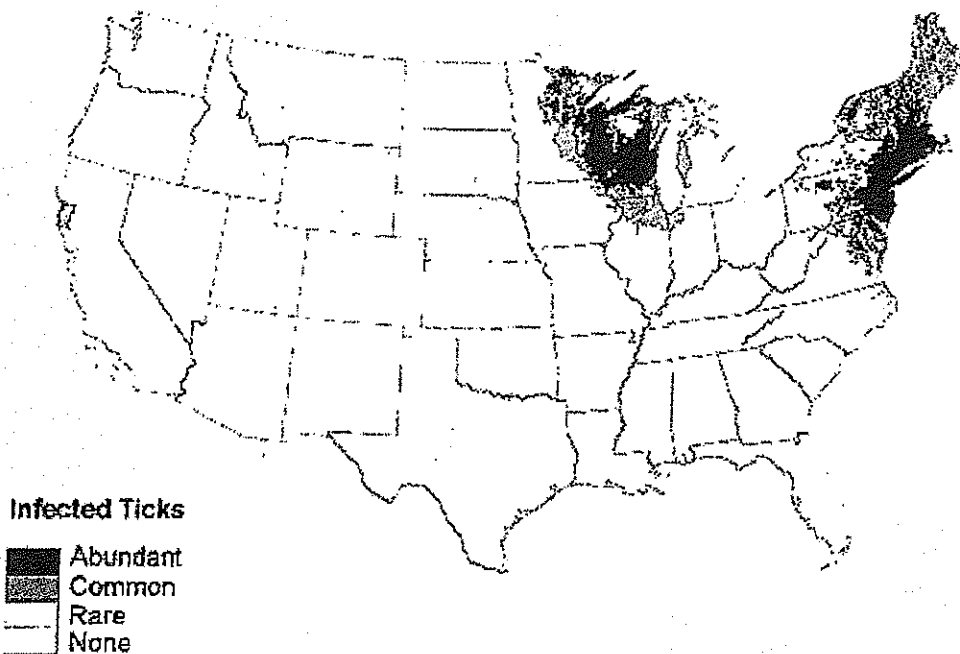
American Lyme Disease Foundation, Inc.
P.O. Box 466, Lyme, CT 06371

[Home](#)

U.S. Maps and Statistics

Infected Tick Areas

Please Choose a State...



Risk Classification:

Abundant: High density of host-seeking nymphal *I. scapularis* ticks.

Common: Medium density of host-seeking nymphal *I. scapularis* ticks or where at least 2% of *I. pacificus* ticks have been shown to be infected with *B. burgdorferi*.

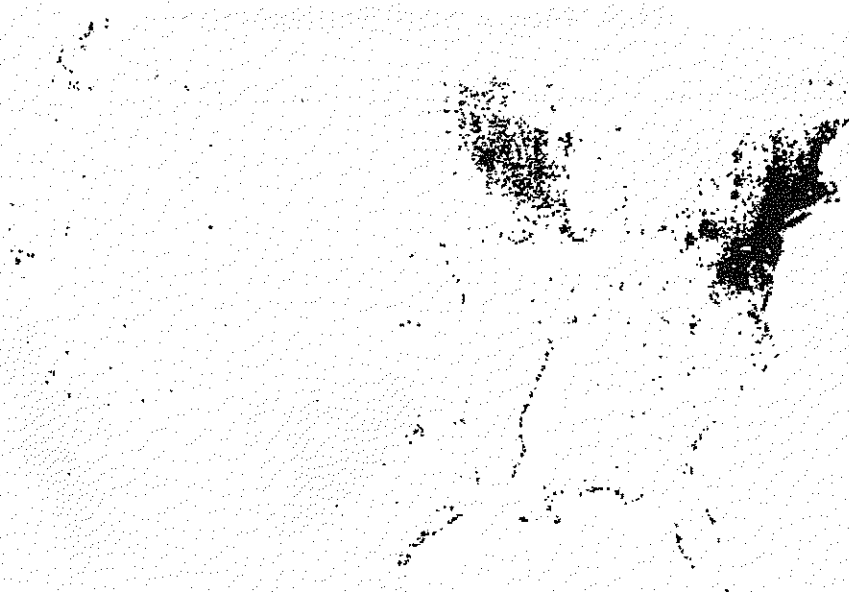
Rare: Areas where *I. scapularis* or *I. pacificus* ticks have been reported, but host-seeking nymphs are extremely rare (*I. scapularis*) or infection prevalence is low (*I. pacificus*).

None: No reports of *I. scapularis* or *I. pacificus* ticks.

Data Sources:

Diuk-Wasser, M.A., Gatewood, A.G., et al., 2006. (Click [here](http://www3.interscience.wiley.com/journal/123341253/abstract) (<http://www3.interscience.wiley.com/journal/123341253/abstract>) for abstract.)

Reported Cases of Lyme Disease -- United States, 2008



- 1 dot placed randomly within county of residence for each reported case.

Source

CDC Division of Vector-Borne Infectious Diseases.
(http://www.cdc.gov/ncidod/dvbid/lyme/ld_Incidence.htm)

Number of Reported Cases of Lyme Disease per State, 2004-2008
([Lyme Disease Reported Cases byState 2004 2008.pdf](#))

Footnote: These data are provided by the Centers for Disease Control and Prevention from annual morbidity and mortality reports.

Lyme Disease Incidence Rates by State, 2004-2008*

State	2004	2005	2006	2007	2008
Alabama	0.1	0.1	0.2	0.3	0.1
Alaska	0.5	0.6	0.4	1.5	0.9
Arizona	0.2	0.2	0.2	0	0
Arkansas	0	0	0	0	0
California	0.1	0.3	0.2	0.2	0.2
Colorado	0	0	0	0	0
Connecticut	38.5	51.7	51	87.3	78.2
Delaware	40.8	76.7	56.5	82.7	88.4
District of Columbia	2.9	1.7	10.7	19.7	12
Florida	0.3	0.3	0.2	0.2	0.4
Georgia	0.1	0.1	0.1	0.1	0.4
Hawaii	0	0	0	0	0
Idaho	0.4	0.1	0.5	0.6	0.3
Illinois	0.7	1	0.9	1.2	0.8
Indiana	0.5	0.5	0.4	0.9	0.7
Iowa	1.7	3	3.3	4.1	2.8
Kansas	0.1	0.1	0.1	0.3	0.6
Kentucky	0.4	0.1	0.2	0.1	0.1
Louisiana	0	0.1	0	0	0.1
Maine	17.1	18.7	25.6	40.2	59.2
Maryland	16	22.1	22.2	45.8	31
Massachusetts	23.9	36.3	22.2	46.3	60.9
Michigan	0.3	0.6	0.5	0.5	0.8
Minnesota	20.1	17.9	17.7	23.8	20
Mississippi	0	0	0.1	0	0
Missouri	0.4	0.3	0.1	0.2	0.1
Montana	0	0	0.1	0.4	0.6
Nebraska	0.1	0.1	0.6	0.4	0.4
Nevada	0	0.1	0.2	0.6	0.3
New Hampshire	17.4	20.3	46.9	68.1	92
New Jersey	31	38.6	27.9	36.1	37
New Mexico	0.1	0.2	0.2	0.3	0.2
New York	26.5	28.8	23.1	21.6	29.5
North Carolina	1.4	0.6	0.4	0.6	0.2
North Dakota	0	0.5	1.1	1.9	1.2
Ohio	0.4	0.5	0.4	0.3	0.3
Oklahoma	0.1	0	0	0	0
Oregon	0.3	0.1	0.2	0.2	0.5
Pennsylvania	32.1	34.6	26.1	32.1	30.7
Rhode Island	23	3.6	28.8	16.7	17.7
South Carolina	0.5	0.4	0.5	0.7	0.3
South Dakota	0.1	0.3	0.1	0	0.4
Tennessee	0.3	0.1	0.2	0.5	0.1
Texas	0.4	0.3	0.1	0.4	0.4
Utah	0	0.1	0.2	0.3	0.1
Vermont	8	8.7	16.8	22.2	53.1
Virginia	2.9	3.6	4.7	12.4	11.4
Washington	0.2	0.2	0.1	0.2	0.3
West Virginia	2.1	3.4	1.5	4.6	6.6
Wisconsin	20.8	26.4	26.4	32.4	26.5
Wyoming	0.8	0.6	0.2	0.6	0.2

*Incidence=confirmed cases per 100,000 persons, calculated using July 1st population estimates for each year.

University of Vermont Extension
Department of Plant and Soil Science



Anytime News Article

EFFECTIVE DEER FENCES

Dr. Leonard Perry, Extension Professor
University of Vermont

If you've tried various forms of sight, sound, taste, and touch repellents for deer, yet still have them feeding on your choice garden plants, perhaps it's time to consider a fence. Just because you have a fence doesn't mean it will be effective at keeping out deer. There are several facts you need to keep in mind when installing such a fence.

Height, or width, is probably the most important factor with deer fences, especially if high deer pressure. White-tailed deer can jump almost eight feet high, so effective upright fences against them should be this high. Deer may be able to jump high, but not both high and over a distance. So a fence may not be as high, perhaps six feet, but slanted outward. The deer will try walking under the fence and meet resistance. Such a slanted fence should be at a 45-degree angle, and may consist of fencing with a few strands of additional wire on top for extra height.

A variation can be used to convert a shorter upright fence. Merely add additional height to posts, and string more fencing or additional strands of wire between them. If the fence is about five feet high, you may also add additions to the posts parallel to the ground and on the outside of the fence. Add strands of wire between these to achieve the same effect as a slanted fence.

If you have a standard fence about four or five feet high, you can add a similar and additional one about four feet away. While not high, with this width deer usually won't like to try and clear both and perhaps get caught between or on them.

Out of sight, out of mind, applies to deer with solid wooden fences, or ones with overlapping slats they can't see through. Such privacy fences are quite effective, as deer can't tell what is on the other side. Even if they can smell what is on the other side, and it's attractive to them, they can't be sure that danger isn't lurking there as well.

One less expensive variation on the high fence is to use a commercial heavy-weight deer netting if the deer pressure is low to moderate. These products are quite popular for home gardens as they are easier to work with than wire mesh, are less expensive, and blend into the landscape. Another inexpensive solution is stringing single strands of monofilament twine (such as deep sea fishing twine) between posts, about six inches apart. If deer pressure is really low, you might even get by with a single strand about two feet off the ground. Deer bump into this, are surprised at something they didn't or can't see, so may flee.

Keep in mind deer can't see well (poor depth perception), so many advocate hanging streamers on the lower strands or netting so deer can see them and don't just try running through. Some recommend not putting such ribbon streamers on the top as this tells the deer the fence height. Some have even

suggested adding streamers on extensions above the fence, to make deer think it is even taller and so even harder to jump. Some advocate using white streamers to mimic the white tail signal that deer use to warn of danger.

There are many variations of electric fences. You may begin with a single strand, about 30 inches off the ground. Some make this more visible to deer by using bright flagging tape, or conductive polytape. This also helps people avoid these fences by mistake. Make this single strand even more effective and attractive to deer by smearing peanut butter on aluminum foil. One taste wont kill deer, but it will surely discourage them from returning. Studies have shown, though, that using odor repellents in combination with an electric wire may be more effective than using the peanut butter bait.

Single strands of electric wire may work if low populations, but if more deer pressure you may need to add multiple strands. You may add these in various configurations as for mesh and strand fences, with the electric wires about a foot apart along the post supports. With any electric fence, use them only if children wont have a chance of getting injured. Some residential areas may even prohibit them, so check local ordinances first.

If you have just an isolated tree or few plants to protect, consider building a cage around them. You may drive stakes into the ground, stretching wire mesh or deer netting between them. Or you can make a portable frame of scrap lumber or PVC pipe, attaching netting to these. If portable, make sure such frames are anchored so deer wont push them over. Make sure such mesh has small openings, or is far enough from the plants, to keep deer from reaching the plants through the mesh.

Rhonda Massingham Hart, in her revised book on *Deerproofing Your Yard and Garden*, gives many more details on deer fences and installing them, plus some additional tips.

* As with other controls, it is best to use them before you have a problem. Train deer first, before they find your plants, or even before you plant.

* Fences must be tight, can't have gaps, and should be checked often. Deer almost always will find the openings.

* With this last point in mind, installing fences over uneven terrain can be difficult, leaving openings large enough for deer.

[Return to Perry's Perennial Pages, Articles](http://pss.uvm.edu/ppp/articles/deerfences.html)





Use a pair of fences to keep out deer

15 HOURS AGO • BY MOLLY HACKETT - FOR THE RAVALLI REPUBLIC

Q: Is there anything besides a six-foot fence I can use to protect my plants from deer? We live where covenants prohibit fences higher than three feet.

A: There is a very easy answer to your problem: two three-foot fences. Deer are afraid of tripping or crashing into objects when they jump. They want to see a five-foot clearing for a landing pad before they go over a fence. If you build two fences, slightly less than five feet apart, deer will be afraid to jump. The space between is not wide enough for them to land and take off again, but it is wide enough that they cannot clear both fences with one jump.

You can make the outer fence a very simple one, with one or two wires, and the inner fence a decorative one. There are local gardeners successfully using this system to keep deer away from their plants.

Keeping weeds at bay

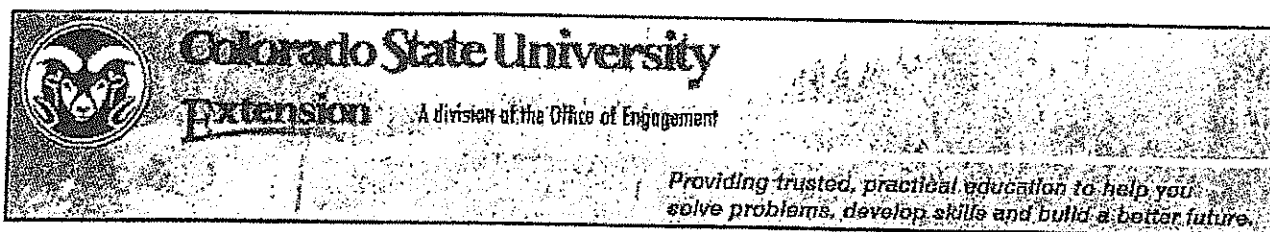
Q: There are dense weed patches coming up around my young fruit trees. I have learned not to lay down landscape cloth. Could I surround the trees with a three-inch layer of commercial mulch, so that weeds could not grow through it?

A: That would not be a good idea. Brawny weed types would be slowed down only briefly by three inches of mulch. They would pick up a fresh supply of nutrients from the mulch and grow more strongly than ever. I am thinking of quackgrass as an example. Furthermore, three inches of mulch is enough to decrease the oxygen supply to the fruit tree roots, slowing down the trees' growth. It is better to use only an inch or two of mulch, adding a fresh supply when the old mulch has decayed into soil.

Instead of deep mulch, try combining a biodegradable weed barrier with mulch. Any plant product which keeps the weeds in the dark will kill them over the course of a growing season. Well, mostly. Sometimes it takes two seasons to kill all the quackgrass.

As long as the weed barrier itself breaks down into soil, it will not produce a long-term problem as landscape cloth does. If weeds begin to return after the barrier decays, simply add a new barrier. One good choice is newspaper. Eight or 10 sheets will make a layer thick enough to create darkness below. An inch of mulch on top will hide the newspaper and keep it from blowing away. One sheet of corrugated cardboard is thick enough to equal the newspaper layer, if you are blessed with an abundance of cardboard.

This may all sound like work, at this time of year when no gardener needs more work. But once done it lasts for a year or more. There will be no weeds this summer in the mulched areas. Weeding them all summer would mean a lot more work, spread out over the next four months.



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no. 6.520

Preventing Deer Damage

by C.E. Swift and M.K. Gross ¹ (4/08)

Quick Facts...

- It is difficult to move deer out of areas where they are not wanted.
- A hungry deer will find almost any plant palatable, so no plant is "deer proof."
- The two types of deer repellents are contact repellents and area repellents.
- Netting can reduce deer damage to small trees.
- Adequate fencing to exclude deer is the only sure way to control deer damage.

Although browsing deer are charming to watch, they can cause extensive damage by feeding on plants and rubbing antlers against trees. In urban areas, home landscapes may become the major source of food. Deer can pose a serious aesthetic and economic threat. Damage is most commonly noticed in spring on new, succulent growth. Because deer lack upper incisors, browsed twigs and stems show a rough, shredded surface. Damage caused by rabbits, on the other hand, has a neat, sharp 45-degree cut. Rodents leave narrow teeth marks when feeding on branches. Deer strip the bark and leave no teeth marks.

Management Strategies

It is difficult to move deer out of areas where they are not wanted. Not all strategies are practical for every homeowner. Frightening deer with gas exploders, strobe lights, pyrotechnics or tethered dogs typically provides only temporary relief. More practical management strategies include selecting plants unattractive to deer, treating plants with deer repellents, netting and tubing, and fencing.

Placement and Selection of Plants

The placement of plants in part determines the extent of damage. Plant more susceptible species near the home, in a fenced area, or inside a protective ring of less-preferred species. Table 1 lists plants and their susceptibility to deer damage. A hungry deer will find almost any plant palatable, so no plant is "deer proof." Also, a plant species may be damaged rarely in one area but damaged severely in another.

Repellents

The two types of deer repellents are contact repellents and area repellents. Contact repellents are applied directly to plants, causing them to taste bad. Area repellents are placed in a problem area and repel by their foul odor. Repellents are generally more effective on less preferred plants.

Preventing Deer Damage

Apply repellents on a dry day with temperatures above freezing. Treat young trees completely. Older trees may be treated only on their new growth. Treat to a height 6 feet above the maximum expected snow depth. Deer browse from the top down. Hang or apply repellents at the bud or new growth level of the plants you wish to protect.

A spray of 20 percent whole eggs and 80 percent water is one of the most effective repellents. To prevent the sprayer from clogging, remove the chalaza or white membrane attached to the yolk before mixing the eggs. The egg mixture is weather resistant but must be reapplied in about 30 days. See Table 2 for a list of commercially available repellents and their ratings against deer and elk browsing in Colorado.

Home-remedy repellents are questionable at best. These include small, fine-mesh bags of human hair (about two handfuls) and bar soap hung from branches of trees. Replace both soap and hair bags monthly. Deer have been reported to eat the soap bars. Materials that work in one area or for one person may not work at all in an area more highly frequented by deer.

Netting and Tubing

Tubes of Vexar netting around individual seedlings are an effective method to reduce deer damage to small trees. The material degrades in sunlight and breaks down in three to five years. These tubes can protect just the growing terminals or can completely enclose small trees. Attach tubes to a support stake to keep them upright. Another option is flexible, sunlight-degradable netting that expands to slip over seedlings. Both products are available from Colorado State Forest Service offices.

Paper or Reemay budcaps form a protective cylinder around the terminal leader and bud. They may help reduce browse damage. Budcaps are rectangular pieces of material folded lengthwise and stapled around the terminal leader.

Tubes placed around the trunks of larger trees will help prevent trunk damage. Tubes may not, however, protect trunks from damage when bucks use the trees to scrape the velvet off their antlers. Fencing may be required.

Fencing

Adequate fencing to exclude deer is the only sure way to control deer damage. The conventional deer-proof fence is 8 feet high and made of woven wire. Electric fences also can be used. Electric fences should be of triple-galvanized, high-tensile, 13.5-gauge wire carrying a current of 35 milliamps and 3,000 to 4,500 volts. Several configurations of electric fences are used: vertical five-, seven-, or nine-wire; slanted seven-wire; single strand; and others. When using a single strand electric fence it helps the deer to 'notice' that the wire is there if it is marked with cloth strips, reflective tape or something similar. Otherwise, the deer may not see it in time and go right through it.

Additional options include invisible mesh barriers, slanting deer fences, and single-wire, electric fences baited with peanut butter. The invisible mesh barriers are polypropylene fences of various mesh sizes, typically 8 feet high with a high tensile strength, that blend in with the surroundings. The baited fences attract deer to the fence instead of what's inside the fence. They administer a safe correction that trains the deer to stay away. They are effective for small Gardens, nurseries and orchards (up to 3 to 4 acres) that are subject to moderate deer pressure. Deer are attracted by the peanut butter and encouraged to make nose-to-fence contact. Deer, like many wild animals, seem to respect and respond better to electric fencing after they become familiar with the fenced area. Additional information on fences and their construction can be found in *Deer* (Craven and Hygnstrom), available from Colorado State University Extension offices. (See references.)

Often browsed	Sometimes browsed	Rarely browsed
Flowers		
Geranium, wild (<i>Geranium fremontii</i>)	Lupine, silver (<i>Lupinus argenteus</i>)	Black-eyed susan (<i>Rudbeckia</i> sp.)
Low sunflower (<i>Helianthus pumilus</i>)	Pasque flower (<i>Pulsatilla patens</i>)	California fuchsia (<i>Zauschneria</i> sp.)
Nodding onion (<i>Allium cernuum</i>)	Prairie coneflower (<i>Ratibida columnifera</i>)	Daffodils (<i>Narcissus</i> sp.)
Penstemon, low (<i>Penstemon virans</i>)	Salvia (<i>Salvia reflexa</i>)	Gaillardia/blanketflower (<i>Gaillardia aristata</i>)
Phlox, common (<i>Phlox multiflora</i>)	Scarlet gilia (<i>Ipomopsis aggregata</i>)	Gayflower (<i>Liatris punctata</i>)

Pussytoes, rose (<i>Antennaria rosea</i>)	Tall coneflower (<i>Rudbeckia lacinata</i>)	Grape hyacinth (<i>Cynoglossum officinale</i>)
Strawberry (<i>Fragaria</i> sp.)	Western wallflower (<i>Erysimum asperus</i>)	Larkspur (<i>Delphinium nelsonii</i>)
Tulips (<i>Tulipa</i> sp.)	Wild iris (<i>Iris missouriensis</i>)	Lavender (<i>Ravandula</i> sp.)
		Mariposa lily (<i>Calochortus gummisonii</i>)
		Mountain harebell (<i>Campanula rotundifolia</i>)
		Pearly everlasting (<i>Anaphalis margaritacea</i>)
		Purple coneflower (<i>Echinacea purpurea</i>)
		Russian sage (<i>Perovskia atriplicifolia</i>)
		Thyme (<i>Thymus</i> sp.)
		Yarrow (<i>Achillea</i> sp.)
Vines		
Grapes (<i>Vitis</i> spp.)	English ivy (<i>Hedera helix</i> var.)	Virginia creeper (<i>Parthenocissus quinquefolia</i>)
Trees and shrubs		
Apples (<i>Malus</i> sp.)	Alder (<i>Alnus tenuifolia</i>)	Apache plume (<i>Fallugia paradoxa</i>)
Aspen (<i>Populus tremuloides</i>)	Golden currant (<i>Ribes aureum</i>)	Blue mist spirea (<i>Caryopteris x clandonensis</i>)
Mugo pine (<i>Pinus mugo mughus</i>)	Mountain maple (<i>Acer glabrum</i>)	Common juniper (<i>Juniperus communis</i>)
Rocky Mountain juniper (<i>Juniperus copulorus</i>)	Ninebark (<i>Physocarpus monogynus</i>)	Douglas-fir (<i>Pseudotsuga menziesii</i>)
Roses (most) (<i>Rosea</i> spp.)	Oregon grape (<i>Mahonia repens</i>)	Hawthorn (<i>Crataegus</i> sp.)
Wild red raspberry (<i>Rubus idaeus</i>)	Wild plum (<i>Prunus americana</i>)	Mountain mahogany (<i>Cercocarpus montanus</i>)
		Oregon grape (<i>Mahonia repens</i>)
		Pinon pine (<i>Pinus edulis</i>)
		Potentilla/cinquefoil (<i>Potentilla</i> spp.)
		Rabbit brush (<i>Chrysothamnus</i> sp.)

Table 2. Relative effectiveness of repellents tested on hungry, captive mule deer and elk in Colorado during 1989, 1991 and 1992. (Compiled by W.F. Andelt et al.)

Material	Deer	Elk
Hot Sauce® 6.2% hot sauce	High	Very High
Hot Sauce® 0.62% hot sauce	Medium	Medium
Hot Sauce® .062% hot sauce	Low - failure	Failure
Deer Away - same as Big Game Repellent	High	High
Chicken eggs (20% eggs, 80% water)	High	Medium
Coyote urine (100% urine)	High	High
Habanero peppers (8% pepper, 92% water)	Medium	Not reported
Tabasco sauce (50% Tabasco, 50% water)	Medium	Not reported
Thiram (labeled concentration)	Medium	Medium
Hinder (labeled concentration)	Medium	Medium
Soap (Lifebuoy)	Low-medium	Not reported
Ro-pel® (denatonium benzoate)	Failure	Failure
Ani-spray (denatonium benzoate, 3 x label) ^a	Failure	Not reported

^a Products should not be used at rates above the labeled concentration.

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¹ C.E. Swift, Colorado State University Extension horticulture agent, Tri River Area, and M.K. Gross, former CSU Extension horticulture and natural resources agent, Eagle County. 12/01. Reviewed 4/08.

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DEER AND RABBIT RESISTANT PLANTS

Jeff Schalaus

Although deer and rabbits are entertaining to watch, they can also do considerable damage to landscape and garden plants. Diets of these animals will change with wild food availability and yearly rainfall and temperature variations. Certain plants are sometimes more desirable when they are young and/or well fertilized. It is difficult to predict what deer and rabbits may find attractive from year to year, but this list suggests some plant species which seem to be

less palatable. This list was compiled from observations made by gardeners, landscapers, and nursery personnel in North Central Arizona. There are some products and home remedies that purport to repel and/or discourage these herbivores, but the surest solution to prevent herbivory is to exclude wildlife from your garden using properly designed fences.

Trees

Common Name	Botanical Name
Fir.....	<i>Abies</i> spp.
Vine Apple.....	<i>Acer circinatum</i>
Japanese Maple.....	<i>Acer palmatum</i>
Albizia.....	<i>Albizia</i> spp.
Cedar.....	<i>Cedrus</i> spp.
Hackberry.....	<i>Celtis</i> spp.
Redbud.....	<i>Cercis</i> spp.
Hawthorn.....	<i>Crataegus</i> spp.
Cypress.....	<i>Cupressus</i> spp.
Ash.....	<i>Fraxinus</i> spp.
Maidenhair Tree.....	<i>Ginkgo biloba</i>
Magnolia.....	<i>Magnolia</i> spp.
Spruce.....	<i>Picea</i> spp.
Pine.....	<i>Pinus</i> spp.
Douglas Fir.....	<i>Pseudotsuga menziesii</i>
Oak.....	<i>Quercus</i> spp.
Texas Mountain Laurel.....	<i>Sophora secundiflora</i>

Ground Covers & Vines

Common Name	Botanical Name
Carpet Bugle.....	<i>Ajuga</i> spp.
Dwarf Plumbago.....	<i>Ceratostigma plumbaginoides</i>
English Ivy.....	<i>Hedera helix</i>
Japanese Spurge.....	<i>Pachysandra terminalis</i>
Virginia Creeper.....	<i>Parthenocissus</i> spp.
Periwinkle.....	<i>Vinca</i> spp.
Wisteria.....	<i>Wisteria</i> spp.

Shrubs

Common Name	Botanical Name
Glossy Abelia.....	<i>Abelia grandiflora</i>
Manzanita.....	<i>Arctostaphylos</i> spp.
Bamboo.....	Many Species
Barberry.....	<i>Berberis</i> spp.
Butterfly Bush.....	<i>Buddleia</i> spp.
Boxwood.....	<i>Buxus</i> spp.
Fairy Duster.....	<i>Calliandra</i> spp.
Flowering Quince.....	<i>Chaenomeles</i> spp.
Littleleaf Cordia.....	<i>Cordia parvifolia</i>
Cotoneaster.....	<i>Cotoneaster</i> spp.
Dalea.....	<i>Dalea</i> spp.
Daphne.....	<i>Daphne</i> spp.
Brittlebush.....	<i>Encelia farinosa</i>
Turpentine Bush.....	<i>Ericarmeria laricifolia</i>
Buckwheat.....	<i>Eriogonum</i> spp.
Holly.....	<i>Ilex</i> spp.
Joboba.....	<i>Sinmondia chinensis</i>
Juniper.....	<i>Juniperus</i> spp.
Chuparosa.....	<i>Justicia californica</i>
Kerria Japonica.....	<i>Kerria japonica</i>
Lantana.....	<i>Lantana</i> spp.
Lavender.....	<i>Lavandula</i> spp.
Leucophyllum.....	<i>Leucophyllum</i> spp.
Oregon Grape.....	<i>Mahonia</i> spp.
Heavenly Bamboo.....	<i>Nandina domestica</i>
Cinquefoil.....	<i>Potentilla</i> spp.
Firethorn.....	<i>Pyracantha</i> spp.
Sumac.....	<i>Rhus</i> spp.
Currant, Gooseberry.....	<i>Ribes</i> spp.
Rosemary.....	<i>Rosmarinus officinalis</i>
Sage.....	<i>Salvia</i> spp.
Lilac.....	<i>Syringa</i> spp.
Viburnum.....	<i>Viburnum</i> spp.

Perennials, Bulbs, & Annuals

Common Name	Botanical Name	Herbs (except Basil)	Many Species
Yarrow.....	<i>Achillea</i> spp.	Candytuft	<i>Iberis</i> spp.
Agave.....	<i>Agave</i> spp.	Iris.....	<i>Iris</i> spp.
Naked Lady.....	<i>Amaryllis belladonna</i>	Red-Hot Poker	<i>Kniphofia uvaria</i>
Columbine.....	<i>Aquilegia</i> spp.	Dead Nettle	<i>Lamium maculatum</i>
Pink Sea Thrift	<i>Armeria</i> spp.	Lupine.....	<i>Lupinus</i> spp.
Artemisia (Sage)	<i>Artemisia</i> spp.	Crown-Pink.....	<i>Lychnis coronaria</i>
Aster	<i>Aster</i> spp.	Blackfoot Daisy.....	<i>Melampodium leucanthum</i>
False Spiraea	<i>Astilbe</i> spp.	Bee Balm	<i>Monarda</i> spp.
Balsam.....	<i>Impatiens</i> spp.	Forget-Me-Not.....	<i>Myosotis scorpioides</i>
Begonia	<i>Begonia</i> spp.	Daffodil.....	<i>Narcissus hybrids</i>
Swan River Daisy	<i>Brachycome iberidifolia</i>	Catnip.....	<i>Nepeta</i> spp.
Serbian Bellflower	<i>Campanula</i> spp.	Oregano	<i>Origanum</i> spp.
Centaurea	<i>Centaurea</i> spp.	Oriental Poppy	<i>Papaver</i> spp.
Snow-in-Summer	<i>Cerastium tomentosum</i>	Beard Tongue.....	<i>Penstemon</i> spp.
Coreopsis.....	<i>Coreopsis</i> spp.	Moss Pink.....	<i>Phlox subulata</i>
Crocus.....	<i>Crocus</i> spp.	Gloriosa Daisy	<i>Rudbeckia hirta</i>
Dahlia.....	<i>Dahlia hybrids</i>	Santolina.....	<i>Santolina</i> spp.
Bleeding Heart.....	<i>Dicentra</i> spp.	Saxifrage.....	<i>Saxifraga</i> spp.
Fleabane.....	<i>Erigeron</i> spp.	Pincushion Flower	<i>Scabiosa</i> spp.
California Poppy	<i>Eschscholzia californica</i>	Squill (Bluebell)	<i>Scilla</i> spp.
Euphorbia.....	<i>Euphorbia</i> spp.	Lamb's Ears	<i>Stachys byzantina</i>
Ferns.....	Many Species	Feather Grass	<i>Stipa</i> spp.
Blue Fescue.....	<i>Festuca ovina</i> 'Glauca'	Thyme	<i>Thymus</i> spp.
Blanket Flower.....	<i>Gaillardia grandiflora</i>	Verbena	<i>Verbena</i> spp.
Cranesbill	<i>Geranium</i> spp.	Speedwell.....	<i>Veronica</i> spp.
Straw Flower.....	<i>Helichrysum bracteatum</i>	Sweet Violet.....	<i>Viola odorata</i>
Daylily.....	<i>Hemerocallis</i> spp.	California Fuchsia	<i>Zauschneria californica</i>



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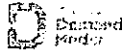
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Factsheet

May 2010

**Questions and Answers:
GonaCon™—Birth Control for Deer**



Wildlife Services (WS), a program within the U.S. Department of Agriculture's (USDA) Animal and Plant Health Inspection Service (APHIS), provides Federal leadership and expertise to resolve wildlife conflicts that threaten the Nation's agricultural and natural resources, human health and safety, and property.

Q. What is GonaCon™?

A. GonaCon™ is a new gonadotropin-releasing hormone (GnRH) immunocontraceptive vaccine developed by scientists at the U.S. Department of Agriculture's (USDA) Wildlife Services' (WS) National Wildlife Research Center (NWRC). It is registered by the U.S. Environmental Protection Agency (EPA) for use with female white-tailed deer 1 year of age or older.

Q. How does GonaCon™ work?

A. The single-shot, multiyear vaccine stimulates the production of antibodies that bind to GnRH, a hormone in an animal's body that signals the production of sex hormones (e.g., estrogen, progesterone, and testosterone). By binding to GnRH, the antibodies reduce GnRH's ability to stimulate the release of these sex hormones. All sexual activity is decreased, and animals remain in a nonreproductive state as long as a sufficient level of antibody activity is present.

Q. How does GonaCon™ stimulate the production of antibodies?

A. GonaCon™ causes an animal's body to make antibodies against its own GnRH. To do this, WS scientists synthesize and hook GnRH to a foreign protein. This material looks like a large, new molecule that the animal's immune system has never encountered. As a result, when it is injected into the animal's body, the body's immune response neutralizes the hormone's function, resulting in infertility.

Q. What are the health effects associated with GonaCon™?

A. The health effects associated with GonaCon™ are minimal. Vaccinated animals showed a decrease in sexual activity and breeding behavior. In field and pen studies, animals showed little to no visual evidence of

Wildlife Services biologists tag a doe after administering an injection of GonaCon™.

Field and pen studies have shown reductions in pregnancy rates among vaccinated animals.



inflammation at injection sites, and blood chemistry was similar among treatment and control groups. In some necropsied animals, granulomas (e.g., thickened tissue filled with fluid) were present at injection sites. However, this observation is not uncommon in other livestock vaccines.

Q. Are there any dangers or secondary hazards to humans or other animals that eat meat from vaccinated deer?

A. There is no known danger associated to humans or wildlife from eating deer that have been vaccinated with GonaCon™. In 2009, the EPA determined there is little likelihood of dietary exposure or impacts to humans who consume meat from a treated doe. As with other vaccines, such as those used with livestock, both the vaccine and the antibodies produced are proteins. Once ingested, they are broken down by stomach acids and enzymes. Similar injectable hormone-altering products are used routinely in livestock applications.

Q. How long does GonaCon™ last?

A. It depends upon the individual animal and its response to the vaccine. Long-term field efficacy data currently does not exist. However, in field studies in New Jersey and Maryland using free-ranging deer in semi-enclosed urban settings, a single shot of GonaCon™ prevented pregnancy in 67-88 percent of the deer in the first year and in 47-48 percent the second year. In pen studies, the vaccine successfully kept 4 out of 5 female deer infertile for 5 years. A second shot given the same year or in subsequent years can increase effectiveness, potentially rendering deer infertile for life.

Q. Can GonaCon™ be used with other wildlife species?

A. GonaCon™ is registered for use in female white-tailed deer 1 year of age and older. In addition to deer, GonaCon™ has proven effective for use with other

wildlife species, including California ground squirrels, prairie dogs, Norway rats, feral cats and dogs, wild horses, and elk. Future research will likely be directed toward registering GonaCon™ for use with other wildlife species.

Q. What are the benefits of GonaCon™?

A. Because it is a single-shot, multiyear vaccine, GonaCon™ may be a practical management tool. Deer may need to be injected only once to become infertile for up to 5 years. A boost injection could increase effectiveness to almost 100 percent and increase longevity of the contraceptive effect. The vaccine can be used in urban and residential areas, where other management methods, such as hunting, are not an option.

Q. What are the limitations of GonaCon™?

A. GonaCon™ must be injected by hand into the muscle or tissue of each animal. WS scientists are working to produce an oral GnRH vaccine. Once an oral vaccine is developed, other technologies, such as baits that are attractive to deer but not other animals and/or exclusion devices, will also be needed. These technologies are currently not available but would be needed because orally delivered GonaCon™ could potentially affect non-target wildlife species if ingested.

Q. How much does GonaCon™ cost?

A. The vaccine itself costs very little per dose. The main cost of using GonaCon™ is associated with the time and money required to capture and vaccinate the deer. This cost can be several hundred dollars per deer depending upon many factors, such as how many deer need to be captured and whether the deer are easy or difficult to catch.

Q. How does GonaCon™ differ from porcine zona pellucida (PZP)?

A. PZP, another immunocontraceptive vaccine, has been used to sterilize dogs, coyotes, burros, wild

There is no known danger associated to humans or wildlife from eating deer that have been vaccinated with GonaCon™.

horses, and white-tailed deer temporarily. The PZP vaccine, also known as SpayVac®, causes multiple estrus cycles in female deer. GonaCon™, however, prevents female deer from entering estrus.

Q. Is GonaCon™ currently available to Federal, State, and local wildlife management agencies?

A. Yes. GonaCon™ is registered with the EPA. However, in order for GonaCon™ to be used in any given State, it must also be registered with the State and approved for use by the State fish and game/natural resource agency. GonaCon™ is available through WS or its licensed manufacturer to authorized organizations.

Q. Who is allowed to use GonaCon™?

A. Only USDA–WS or State wildlife management agency personnel or individuals working under their authority can use it.

Q. Does GonaCon™ eliminate the need for hunting to control deer overpopulation?

A. No. Contraception alone cannot reduce overabundant deer populations to healthy levels. GonaCon™ is a tool to be used in conjunction with other wildlife management methods.

Q. What future studies are planned with GonaCon™?

A. Future NWRC research with GonaCon™ will likely involve studies to support expanded registration to other species, develop oral delivery systems, and prevent transmission of wildlife diseases. Potential

research areas include the following:

- Development of new formulations and delivery methods, including automated vaccine delivery systems for administering the injectable form of the GonaCon™ vaccine, as well as oral and nasal delivery systems.
- Prevention of the spread of brucellosis in bison. Brucellosis is a bacterial disease that causes infertility, abortions, and lowered milk production in cattle and bison. The disease is transmitted through contact with bodily fluids, such as milk and after-birth tissues, of infected individuals. GonaCon™ could potentially break the cycle of this disease and reduce transmission by preventing reproduction in infected animals.
- Combined rabies and GonaCon™ vaccine for reducing stray dog populations and rabies in developing countries.

Q. What is the NWRC mission?

A. The NWRC is the research arm of USDA's WS program, a nonregulatory program that provides Federal leadership in managing conflicts with wildlife. NWRC applies scientific expertise to the development of practical methods to resolve human-wildlife conflicts and maintain the quality of the environments shared with wildlife.

Q. How do I obtain more information on this subject?

A. For more information on GonaCon™ and WS' NWRC, please go to http://www.aphis.usda.gov/wildlife_damage/nwrc/ on the Web.



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SUBURBAN LIFE

New York village trying birth control

The Pueblo Chieftain ■ Pueblo, Colorado

to trim deer herd

Residents say approach is more humane than shooting them

BY JIM FITZGERALD
THE ASSOCIATED PRESS

HASTINGS-ON-HUDSON, N.Y. — This suburban village overlooking the Hudson River is a mere 2 square miles, home to a hip downtown, neighborhoods of neatly kept homes and an ever-growing population of deer that overrun woods, chew through gardens and cause more than a dozen car crashes a year.

Grasping for a way to control the deer without hunting the animals, leaders of this village of 7,900 have proposed an ambitious compromise to shoot them up — not with bullets but with birth control.

Scientists and humane

groups hope the program, which seeks to capture and inject female white-tailed deer with a contraceptive made from pigs' ovaries, can become a model for other places that are too congested or compassionate to consider killing.

"We're hearing all about 'Don't kill Bambi' and all the jokes about deer condoms," Mayor Peter Swiderski said. "People are having their little chuckles. But deer have a pretty big negative effect on the community."

Under the plan, which will begin this winter if approved by the state Department of Environmental Conservation, as many as 90 percent of

the does in Hastings will be tranquilized, inoculated with the contraceptive, then tagged and released. The deer population is estimated at up to 120, a density of 60 per square mile. That's three times the deer density that some studies have tied to a decline in plant and animal species.

The goal is a 35 to 40 percent reduction in five years.

Stephanie Boyles Griffin, a senior director at the Humane Society of the United States, said, "There are thousands of communities in the U.S. that are looking for alternative ways to manage the deer populations." If successful, she

said, "Hastings would be the first open suburb in the U.S. to manage deer exclusively through the use of immunocontraception."

Swiderski said he had heard about such experiments and approached expert Allen Rutberg, director of the Center for Animals and Public Policy at Tufts University.

Rutberg went for a walk in Hastings, saw plenty of deer and deer damage, and figured the village would make an interesting experiment.

"For me the idea is to intervene in the lives of the deer as little as possible, to allow them to mingle with us but

not to the level where they become a nuisance," Rutberg said. The protein, called zona pellucida, is obtained from pork in-

dustry slaughterhouses. It creates antibodies in deer — and elephants and horses — that prevent fertilization.

APPENDIX A - Deer Translocation
Prepared by Chad Bishop, DOW Ungulate Research

A number of studies have reported survival rates and movements of translocated deer. In most cases, whether decades ago or recently, the purpose of translocation was to remove overabundant deer from urban or suburban settings. Studies indicate that controlled hunting and/or professional culling is more effective and economical than translocating deer. However, deer translocations have been used periodically over time when publics in the impacted areas are strongly opposed to lethal control techniques.

All of the available literature I could find indicates that survival of translocated deer is significantly lower than survival of indigenous deer at the release location. In a recent example, Beringer et al. (2002) reported on the translocation of 80 radio-collared white-tailed deer in Missouri. The deer were translocated approximately 160 km in response to an urban deer problem. Estimated survival was 0.30 (SE = 0.05) for translocated deer and 0.69 (SE = 0.05) for resident deer in the release location. They concluded it was not a viable strategy given costs and low survival upon relocation. Jones et al. (1997) evaluated translocation of white-tailed deer social groups to determine if survival increased when social structure remained intact. They found no benefit of translocating deer in social groups and found that translocated deer had lower survival than resident deer at the release location. Jones and Witham (1990) evaluated translocation of white-tailed deer from Chicago to rural areas. The effort was prompted by public opposition to lethal control. Survival rates of translocated adults and fawns during December-March were 0.56 and 0.58, respectively, compared to 0.9 of residents. Annual survival rates of adults were 0.34 for translocated deer and 0.73 for resident deer. Similarly, yet decades earlier, Hawkins and Montgomery (1969) found that translocated white-tailed deer had lower survival than indigenous deer.

The examples I have listed to this point have all pertained to white-tailed deer. However, the available information on mule and black-tailed deer is consistent with the white-tailed deer literature. O'Bryan and McCullough (1985) evaluated survival of black-tailed deer following relocation in California. More than 200 deer were translocated ~150 km in response to an overabundant deer problem where the public was opposed to culling. The release/translocation site was selected because the deer population was considered to be below carrying capacity and local landowners were supportive. Survival of translocated deer was 0.15. Previously, others estimated annual survival at 0.72 for indigenous deer in the release area. In their Discussion, O'Bryan and McCullough (1985) describe a translocation of desert mule deer in New Mexico where survival of translocated deer was 0.45 whereas survival of indigenous deer at the release site was 0.85 (L. J. Temple and W. Evans, unpublished report, New Mexico Fish and Game, Sante Fe, 1981).

Collectively, the set of articles documenting translocations indicate deer rarely attempt to go back to their original home ranges and those that do have low survival. Many translocations occur over a large distance, and thus, it is not surprising deer rarely return or they die attempting to do so. It seems safe to assume that those in charge of these various translocations intentionally moved deer well beyond their current home ranges to prevent likely return. In one example, however, 9 white-tailed deer were translocated a shorter distance than typically reported (i.e., 10-22 km) (Nelson 1994). Four of the deer attempted a return and two made it.

I found only one study that documented a successful translocation effort, which pertained to the endangered Florida key deer (Parker et al. 2008). Here, the objective was species conservation and the authors held the deer in pens for 3-6 months at the new location to allow for acclimation (i.e., soft release). Of note, managers had previously tried to translocate key deer in the 1980s and 2000s with hard releases (i.e., no waiting period in pens) and had little success.

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