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Deer Management Plan

Mount Lebanon Township, Pennsylvania

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Contents

Introduction & History:

The white-tailed deer is a highly adaptable animal that has successfully adjusted to living in the suburban habitats also occupied by large numbers of people. In this situation, they often create negative interactions with the people by browsing on landscape and garden plants and the over-browsing of native habitats, through collisions with automobiles (deer-vehicle collisions - DVCs), and by possibly supporting the increasing incidence of Lyme disease. In 2005, many residents approached the Mt. Lebanon Municipal Commission (Commission) with complaints about the effects of the growing deer population in their community. The Municipality of Mount Lebanon (Mt. Lebanon) has, as a result, decided to take steps to mitigate this issue.

Mt. Lebanon has been managing the white-tailed deer population within its boundaries for the past several years. Through consultation with the USDA Wildlife Services (Wildlife Services) staff, deer density surveys were conducted from May through June of 2006. A Deer Management Plan was completed for the municipality. Mt. Lebanon entered into two Cooperative Service Agreements with Wildlife Services since 2006, and a Pennsylvania Game Commission (PGC) Political Subdivision Permit to shoot deer was issued. Wildlife Services culled 69 and 146 deer in the 2006-7 and 2007-8 seasons, respectively. There appeared to be a reduction in the number of roadkilled deer following the larger number of deer culled in the 2007-8 season (62 roadkilled deer in 2006, 64 in 2007, and 48 in 2008). It is likely that the 69 deer culled in 2006-7 was only enough to offset growth of the herd through reproduction, whereas the 146 deer taken in 2007-8 actually reduced the population significantly.

On June 25, 2012, the Commission instituted a ban on the feeding of deer within Mt. Lebanon. This ban is an important practical step taken by the Commission to keep deer from concentrating in certain areas at high densities, and also reduces the effects of supplemental nutrition at times of the year when limited forage availability can help to reduce overall productivity in the population.

501 – Feeding of deer prohibited.

501.1 – No person shall knowingly, purposely or intentionally feed deer, cause deer to be fed or provide food to deer in Mt. Lebanon on any public or private property. This prohibition includes, but is not limited to, disbursement of food on the ground, at a feeding station, in a feeding device, or in a container of any form; providing a salt or mineral lick/block; or any other means which serves to provide feed to any deer in Mt. Lebanon.

501.2 – A person shall be deemed to have knowingly, purposely or intentionally fed deer, caused deer to be fed, or provided food to deer if the person places, or allows to be placed, wheat, pelleted livestock food, corn in any form, fruit, vegetables, hay or alfalfa, human food scraps, any form of commercially sold wildlife feed, birdseed or livestock feed, or any other edible matter that deer will consume on the ground or within the reach of deer. This prohibition shall include allowing residue that deer will consume to remain underneath a birdfeeder. This prohibition shall not include live vegetation such as ornamental

landscaping, flowers, trees, vines, vegetable gardens, edible matter located either in an enclosed building or stored in a securely sealed package, or unmodified commercially purchased bird feeders or their equivalent when placed out of the reach of deer.

502 – Notice of violation. Any person that violates this Ordinance shall, immediately and permanently upon notification from Mt. Lebanon, remove feed and feeding devices utilized to feed deer, and discontinue the activity for which the notification was given. If a person promptly complies with such notification, no penalties will be sought as outlined in §503. The notification under this 502 is not mandatory, and penalties under 503 may be sought whether such notification was sent or received.

503 – Penalty. In addition to the remedies under §502, the Enforcement Provisions of Chapter I, §104.3 of the Mt. Lebanon Code shall apply to violations of this Ordinance.

Citation: http://mtlebanonpd.org/animal-ordinances/

The Commission indicated that they would like another, third party, deer density survey to be completed before authorizing Wildlife Services to proceed with further deer culling within the municipality. They hired Vision Air Research to complete a FLIR (forward looking infrared) aerial survey, which was flown in February 2013, and again in February 2014. A total of 342 deer were counted in 2013, and 193 in 2014. These surveys are understood to represent an underestimate (often significantly so) of the actual deer population for an area. It is unlikely that the population declined significantly during this time, so these numbers probably reflect the variability inherent to this technique. This variability is a result of impediments to sightability of deer from overhead cover, which is more expressed during time periods of low deer activity. These surveys were conducted with single pass sampling, which can yield highly variable results. A more reliable estimate can be derived by conducting multiple survey passes (3 to 5) on separate days, then using the sampling that generated the highest count of deer.

Deer-vehicle collisions are the most critical variable to describe the problem of deer overabundance in Mt. Lebanon. There are two primary sources of data available to track this variable, the calls to Animal Control to remove dead deer from roadsides and the Mt. Lebanon Police reports of vehicle crashes attributable to deer. Table 1 below provides the numbers of these incidents by year.

Table 1. Animal Control and Mt. Lebanon Police numbers of DVCs.

Year	2000	01	02	03	04	05	06	07	08	09	10	11	12	13
Animal Control	34	40	39	59	49	61	62	64	48	50	79	71	99	90
Police Reports												23	49	43

These numbers indicate a generally increasing problem, until 2007, where there was a slight reduction, then gradually rising over time since then. Currently, we do not have an accurate estimate of the population of white-tailed deer in Mt. Lebanon Township. We do, however, have information which clearly indicates a severe and growing problem that is of great concern to both the managers and residents of the township.

On June 10, 2014, the Commission hosted a Deer Forum panel discussion to educate the public on the specifics of the deer overabundance issue. Panelists included District Magistrate Blaise Larotonda (Moderator), Dr. Anthony DiNicola (White Buffalo), Jeannine Fleegle (PA Game Commission), Laura Simon (Humane Society of the United States), Tom Kelley (Mt. Lebanon Public Works), Sandy Feather (Penn State Cooperative Extension), Todd Kravits (Penn DOT), and Lt. Aaron Lauth (Mt. Lebanon Police Dept.). Panelists were asked and answered a series of specific questions to illuminate the issue. The list of questions and video documentation of this meeting are available at this link: http://mtlebanon.granicus.com/MediaPlayer.php?view_id=&clip_id=147&meta_id=4772

Project Goal:

The stated goal of the Municipal Commission of Mount Lebanon is to reduce deer vehicle collisions (DVCs) within the Township by 50% over a three to five year period. This target was decided at the January 14, 2014 meeting of the Commission.

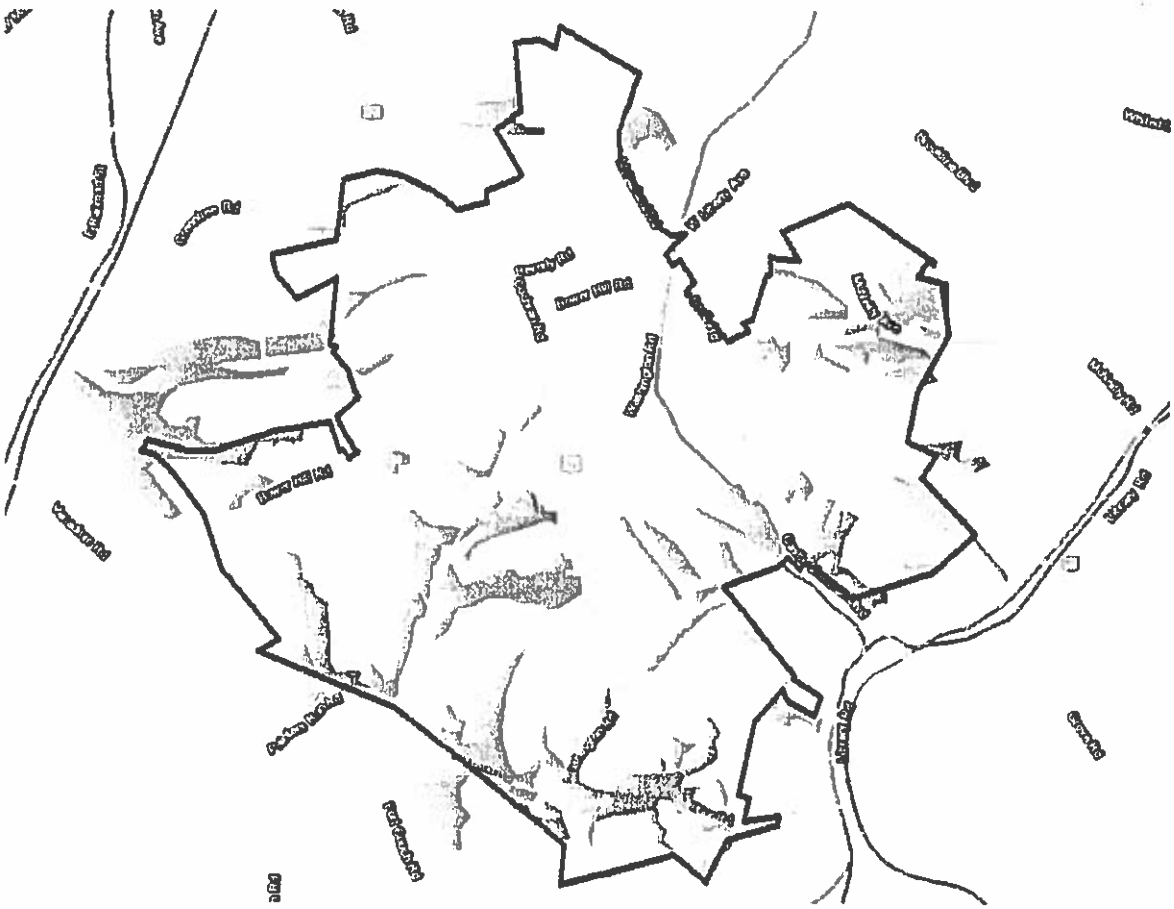
The current annual DVC average is 45, as reported by the Mt. Lebanon Chief of Police. This report will list and describe options to reach the goal. Furthermore, it will indicate if each option is currently allowed by the Game Commission or other regulatory agencies, the estimated cost over the next five years to reach the 22 DVC per year threshold (cost/year), the steps required to implement each option, and possible barriers to implementation. Wildlife Specialists, LLC (Wildlife Specialists) was contracted by Mt. Lebanon to prepare this evaluation and to prepare a Deer Management Plan to guide them as they work to accomplish this goal.

Project Area:

Mt. Lebanon is more than six square miles (about 3,890 acres) of suburban community located six miles southwest of the City of Pittsburgh. Of the six square miles of land area, 63% or 3.8 square miles are classified as residential; the remaining 37% is comprised of commercial, recreational, community facilities, transportation or vacant land. According to the 2010 census, the community is made up of 14,089 housing units with a population of 33,137 people. Throughout much of Mt. Lebanon, houses are separated by strips of forest or brush-land (Figure 1). The municipality has almost 200 acres of parks in 15 parks and numerous parklets ranging from 51 acres down, plus a 95 acre municipal golf course. Mt.

Lebanon has several commercial areas including the central business district, two smaller business districts, some unique commercial pockets and a specialty mall.

Figure 1. Forested Open Space within Mt. Lebanon Township



Evaluation of Potential Methods:

Non-lethal Management Options. The options described below will have varying effectiveness at reducing DVCs in Mt. Lebanon, and most will depend on maintaining a stable deer population within the township. Table 2 summarizes the non-lethal options.

1) Ban Deer Feeding. This option has already been enacted by Mt. Lebanon (approved 6/25/2012). Over time, this tool will reduce dangerous hotspots of DVCs where deer concentrate around an artificial food source. Eliminating deer feeding reduces the effects of supplemental nutrition at times of the year when limited forage availability can help to reduce overall productivity in the population. The impact of this option is difficult to measure, but most likely will account for an annual reduction of 2-5 DVCs. This option is free of cost for Mt. Lebanon, except for law enforcement action when a complaint is filed.

2) Repellents. Deer repellents are used most often to protect individual plants or groups of plants (orchards) by reducing the attractiveness and/or palatability of treated plants. This option is effective on individual properties if applied repeatedly, and if other browse is available for deer to eat. Most commercially-available repellents must be re-applied every two weeks and after every rain event. It is costly, only reduces site-specific plant damage, and is ineffective with high deer density. It will not reduce deer densities at a community-wide level. This option will not aid in reaching the goal of reductions in deer/vehicle collisions (DVCs).

3) Landscaping alternatives. Changing ornamental plants from ones that deer prefer to ones that they do not may save some plants, but the list of these non-preferred ornamentals is short. This option does not work in areas of high deer feeding pressure, displaces deer to neighboring areas, and may negatively impact desirable wildlife species. On the scale of a township, this option will do little to reduce DVCs. The only way to positively use this option to reach Mt. Lebanon's goal is for roadside plantings. It would be important to work with those planting ornamental plants along roadsides to discourage the use of preferred browsing species. This will likely account for a very small (perhaps unmeasurable) impact on the number of DVCs in Mt. Lebanon.

4) Roadside Habitat Modification. Natural and planted habitats can be altered in a way that will influence DVCs. Removing habitat features that either attract deer or provide cover for them, particularly in areas where deer prefer to cross roads, would decrease use of these areas by deer, increase the visibility of deer to motorists, and decrease the number of DVCs. This also would be helpful in areas of low visibility, such as on sharp curves. This option is potentially costly to maintain and is not always desirable for human landscape preferences. Issues of

right-of-way certainly would need to be considered, and coordination with Penn DOT would be necessary on State Highways. Many of these areas occur on private properties. These could be addressed through a process of identifying the highest priority areas and working with the landowners. Perhaps an incentive could be offered to encourage those targeted private properties to participate. This option could potentially have a significant impact on the number of DVCs in Mt. Lebanon (5-10 DVCs per year). Likely costs would range from $20,000 to $50,000, depending on the level of use, although there is potential for cost-sharing with Penn DOT. A more refined estimate of effectiveness and cost would require on-site visits to survey potential implementation sites.

5) Roadside Fencing and Signage. In areas where habitat clearing might not be possible, fencing could be used to channel deer to areas of greater visibility where they could cross with fewer DVCs. This option should be used as a backup plan where habitat modification is not possible. It is expensive to erect and maintain fencing, and would need to be coordinated with landowners, but it is effective. Penn DOT and other highway agencies use this technique to reduce DVCs on a much larger scale. Costs would depend, of course, on the amount of fencing that is used. As with Roadside Habitat Modification, potential exists for cost-sharing, and on-site visits to survey potential implementation sites is required. Signage should be added at both ends of such fencing.

6) Wildlife Underpasses/Bridges. This is an expensive alternative, and is best used in conjunction with fencing to allow wildlife passage across highways. It has been used effectively, however, in a variety of situations and with numerous species (several deer and antelope species in North America). A wildlife underpass may be an appropriate tool if there is one area or a few areas exhibiting particularly high DVCs. This is a highly expensive option, but potential exists for cost-sharing with Penn DOT, particularly as a pilot project in Pennsylvania. Onsite visits are required to determine if potential sites within the township are feasible for this type of project. This could be more cost effective when with fencing deer could be directed into existing bridge locations.

7) Hazing or Frightening. Hazing is a short term solution that uses sensory cues to frighten deer from a specific area, often with loud noises or flashing lights. Deer become accustomed to this form of interruption, or change their movement patterns. This is also likely to disturb the human residents of the area, and unlikely to affect an ongoing reduction in DVCs.

8) Trap and Relocate. This technique has many disadvantages. This is very expensive (between $500 and $2,100 per deer), causes stress (often death) for deer, may spread disease, and contributes to deer-related problems in the areas where the captured deer are released. Currently, this technique is not permitted by

the Pennsylvania Game Commission (personal communication with PGC Permitting Division, August 7, 2014).

9) Fertility Control Agents. This requires that 70-90% of female deer to be treated to stop or reduce population growth. The average cost/deer per application (deer must be retreated every 18 months) is $500-1300, with a high proportion of the cost coming from the capture of deer. The capture and handling of deer to administer the injections greatly stresses them, often leading to additional mortality. These drugs are currently in the experimental classification (not approved for general use), and may alter the health and behavior of the deer. Treated deer must be clearly marked with warning tags against consumption. The fertility control agents do not reduce populations, but control new reproduction while other mortality factors reduce the population over time. Any deer immigration into the population, though it may be a low proportion, would begin to negate fertility control efforts by adding new, fertile reproducers into the population. Population reduction may not be noticed for a decade or more of continued application. These methods should not be attempted until the population is at the target level, then fertility control may be effective in maintaining the level of damage at an acceptable point. This method is generally considered humane.

More information is available at these links:

http://www.marylandqdma.com/files/Download/GONACON.pdf

https://bloomington.in.gov/documents/viewDocument.php?document_id=5717

10) Surgical Sterilization. This method of deer management is currently not permitted by the Pennsylvania Game Commission (personal communication with PGC Permitting Division, August 7, 2014). Sterilization costs between $800-$1,000/doe, plus ongoing maintenance within the population. This method is generally considered humane.

More information is available at this link:

https://bloomington.in.gov/documents/viewDocument.php?document_id=5718

Table 2. Summary of Non-lethal options to reduce DVCs in Mt. Lebanon Township.

Non-lethal Technique	Effectiveness	Estimated Costs	Estimated Reduction in DVCs	Currently Allowed by PGC
Ban Deer Feeding	moderate, localized impacts	$0	2-5	yes
Repellents	not feasible to reduce DVCs	N/A	0	yes
Landscaping Alternatives	minimal impact	$0 - simple replacement of species planted	0-2	yes
Roadside Habitat Modification	high, focused on problem areas	$20,000-$50,000 first year, less thereafter	5-10	yes
Roadside Fencing	high, focused on problem areas	unknown, dependent on extent of implementation	unknown, dependent on extent of implementation	yes
Wildlife Underpasses/Bridges	high, focused on problem areas	unknown, dependent on extent of implementation	unknown, dependent on extent of implementation	yes
Hazing or Frightening	low	labor intensive	0-2	yes, with Permit
Trap and Relocate	high, focused on problem areas	$500-$1,000 per deer	possible to achieve 50% reduction, dependent on extent of implementation	no
Fertility Control Agents	moderate	$500-$1,300 per deer	no immediate reduction in DVCs, over time as population declines	no (at this point - may become an option in future)
Surgical Sterilization	moderate	$800-$1,000 per deer	no immediate reduction in DVCs, over time as population declines	no (at this point - may become an option in future)

Lethal Management Options. These options range from ineffective to highly effective, however with increasing effectiveness comes increasing cost. Table 3 summarizes the lethal options.

1) Statewide Hunting Regulations. This option can be effective and costs nothing. However, hunters must have access to public or private land, which requires a 150 yard safety zone for gun hunters and a 50 yard safety zone for archery hunters without landowner permission. Some of the public will be opposed to this option and there is very limited hunter access around the township. Baiting for hunting purposes increases the effectiveness of this option, but is currently not allowed in this part of Pennsylvania. It is unlikely that this method would be effective enough to stabilize or reduce the deer population in Mt. Lebanon, given the distribution of human residences on the landscape.

2) Community Managed Hunts. A good option IF enough land (public or private) is available for hunting, but requires very close supervision from community organizers. Typically hunters are assigned specific stand locations that have been preselected for safety, and the hunt occurs in a limited time window, which makes it possible to close down other activities in areas like parks during the time of the hunt. Mt. Lebanon does not have enough areas open to hunting for this to be a meaningful contributor to reducing DVCs. Also, this option could generate significant opposition in a highly-populated suburban area like Mt. Lebanon. One study showed this to cost slightly over $100/deer.

3) Deer Control Permits/Sharpshooters. A good option, especially for suburban areas where hunting is impossible, and deer become nocturnal. Safety is primary, and only areas with a safe backstop are considered. Fragmenting bullets are used to reduce any possible ricocheting of bullets. Professional shooters use silenced rifles, night vision scopes, and pre-baited shooting sites. Most shooting occurs at night to maximize deer encounters and minimize public concern. Head or upper neck shots will be used to reduce any possible bullet fragments from entering edible meat, and to produce nearly instantaneous and painless death of the deer. Cost may be high, but population reduction is immediate, meat is donated to food banks, and this is the most humane way to reduce populations compared to non-lethal methods. Some of the public will oppose this or any lethal means, and this will require an ongoing commitment to maintain a stable deer density. Costs range from $200-500/deer. It is hard to calculate price/deer until the operation is complete, so we suggest a weekly rate for sharpshooting operations. Dates should be arranged based on weather forecasts to maximize deer movements during the sharpshooting operation. This option is currently permitted through a Deer Control permit from the PGC.

4) Trap and Euthanize. This option of deer culling would involve enticing deer into one of several types of traps or drop nets. We would recommend the use of a baited corral-style fence with remotely-controlled gates. When the desired number of deer enter the fence, the doors are closed and animals can be quickly culled. This technique of deer management is currently not permitted by the Pennsylvania Game Commission (personal communication with PGC Permitting Division, August 7, 2014). It has, however, been used in Mt. Lebanon previously by USDA Wildlife Services under the Deer Control Permit of 2006-2008. This fact would suggest that this technique may indeed be available to Mt. Lebanon in the future.

Table 3. Summary of Lethal Management Options to reduce DVCs in Mt. Lebanon Township.

Lethal Technique	Effectiveness	Estimated Costs	Estimated Reduction in DVCs	Currently Allowed by PGC ?
Statewide Hunting Regulations	moderate, Safety Zone issues make it unfeasible	$0	N/A	yes, Safety Zone issues make it unfeasible
Community Managed Hunts	high, Safety Zone issues make it unfeasible	$100 per deer	N/A	yes, Safety Zone issues make it unfeasible
Deer Control Permits/Sharpshooters	high	$200-$500 per deer	possible to achieve 50% reduction, dependent on extent of implementation	yes
Trap and Euthanize	high	$300-$600 per deer	possible to achieve 50% reduction, dependent on extent of implementation	no (at this point - may become an option in the future)

Methods to Accomplish the Goal:

Wildlife Specialists recognizes the magnitude of effort that will be required for Mt. Lebanon to reach their stated goal of a 50% reduction in deer vehicle collisions within a five-year timeframe. To reach this goal, a suite of different methods will need to be used in conjunction with each other, each addressing different variables involved in deer vehicle collisions. Furthermore, we recommend using an Adaptive Management approach, where potential methods are evaluated, an educated decision is made, actions are initiated, monitoring indicators are evaluated, and adjustments are made throughout the project in response to those evaluations. These indicators should reflect not only the ultimate goal (reduction of deer-vehicle collisions) but various human dimensions factors as well (participation in programs, acceptance of techniques, etc.).

Wildlife science seldom deals in absolutes. Measuring variables like deer density or deer populations are nearly always accompanied by a high degree of variability, rendering such statistics weak. Therefore, to move forward, it is prudent to recap what we do know and decide upon the apparent "best" course of action at this point.

Current Situation:

- Residents have complained about overabundant deer
- Deer-vehicle collisions are at an all-time high and continue on an upward trend
- Two years of sharpshooting via a PGC Deer Control Permit at differing intensities either stabilized or reduced DVCs
- Several possible deer management tools are currently not allowed by the PGC, but may become available in the future and seeking approval for these methods should be considered.
- Several other management techniques are available which could assist with reducing DVCs, particularly if the population was stabilized or reduced.

To monitor progress towards the goal, we must monitor the response variable, deer-vehicle collisions. In doing this, we can fine-tune the management tools by collecting some additional data from each incident. In addition, an unstated goal is to improve the satisfaction of the human residents of Mt. Lebanon that the problems of overabundant deer are being reduced, so this, too, should be monitored.

Monitoring Indicators:

- Deer-vehicle collisions: continue the current monitoring of both Reported Crashes by the Mt. Lebanon Police and the Road-killed Deer Calls to Animal Control. In both cases, however, request that additional information be collected. The date, time, and exact location via a GPS

unit would aid in targeting other potential management, like Roadside Fencing, Roadside Habitat Manipulation, or Wildlife Underpasses/Bridges and Signs. It may also be useful in the enforcement of the feeding ban within the township.

- Human dimensions monitoring: conduct an annual, standardized survey of a sampling of the Mt. Lebanon residents to track changes in attitudes regarding deer overabundance in the township.

- Deer health indicators: as the population is reduced, and despite the fact that nutrition does not yet appear to be a limiting factor, the population age structure, overall body weights in age classes, and other factors should respond the the reductions. Data should be recorded from each deer culled through professional sharpshooting to track these changes and validate the effectiveness of management. The primary goal of a deer reduction program is to reduce the reproduction from adult does in the population.

Project Strategies:

- Inform the residents of Mt. Lebanon about the Plan

- Institute increased monitoring of DVCs

- Apply for and secure a Deer Control Permit from the PGC

- Initiate deer reductions via sharpshooting in a phased approach, with a short-term (2-3 year) goal of reduction of the population to create a corresponding reduction in DVCs to 22/year

- Continue deer control efforts via either sharpshooting, capture and euthanize (if allowed) or non-lethal methods (fertility control agents or surgical sterilization, should these options become available), with a long-term goal of maintaining the population's stability and keeping DVCs below the level of 22/year.

- Assess the potential to use other management techniques to reduce DVCs, particularly Roadside Fencing, Roadside Habitat Manipulation, or Wildlife Underpasses/Bridges. Use monitoring data to target specific problem areas for management, implement and evaluate the effectiveness of these techniques for more widespread use.

Recommended Timeline and Objectives:

October 2014: Present draft Deer Management Plan to Mt. Lebanon Municipal Commission for comment, modification, and approval

October 2014: Initiate expanded monitoring of DVCs

November 2014: Apply for Municipal Deer Control Permit from Pennsylvania Game Commission

November 2014: Decide upon Human Dimensions Monitoring strategy and develop standardized survey tool

January 2015: Initiate deer control efforts via sharpshooting

May 2015: Survey township for potential for use of other management options

Deer Control Plan:

Assume starting population of 500 deer.

Deer Population Reduction Phase - Years 1-3: Remove 200 deer per year at $40,000 - $80,000 per year. If monitoring of DVCs indicates that the goal has been reached, assume reductions are sufficient and move into long-term stabilization and maintenance phase

Deer Population Stabilization and Maintenance Phase: Remove 100 deer per year at approximately $20,000 - $40,000 per year.

Throughout the project, monitor response variables (DVCs, human dimensions) and adjust as necessary.