Suburban Deer Management

Jonathan Kays,
Forestry Extension Specialist
jkays@umd.edu
University of Maryland Extension
www.extension.umd.edu/woodland
What We Will Cover

- Problems with overabundant deer populations
- IPM Options for Deer Damage Management
- Implementing community deer management
- Questions
Deer Contribute to our Quality of Life and Provides Many Benefits

- People enjoy watching deer.
- Deer hunting is an essential management tool
  - MD - 129,000 big game licenses.
- Economic impact (2011) for all hunters.
  - MD – 264 million
Suburban Areas Biggest Challenges

- Deer Management Tool Limited
  - Local ordinances
  - Public perceptions
  - Limited land access

- Deer numbers likely* increasing in developed areas
  - Reduced mortality
  - Increased longevity
  - Improved natality (high reproductive success)

* Limited data available
Deer have adapted to rural... and urban habitats.

Photo by: Tom Decker
Adaptive

- Improved survival in suburbs
- Predation reduced/absent
- Human induced mortality reduced or absent
- Most mortality from vehicles
Problems With Overabundant Deer

- Damage to Personal Property – Gardens, Landscaping, Agriculture & Woodlands
- Damage to Forest Health
- Deer - Vehicle Collisions
- Disease Transmission to Humans (Lyme)
- Herd Health
Deer browsing ruins landscapes.

Photo by Rob Gibbs
Agricultural

- Lands removed from production (not economical)
- Horticultural plants
- Fruits & vegetables
Maryland Farmers Losses - 2011

<table>
<thead>
<tr>
<th>Region</th>
<th>Est. Economic loss</th>
<th>% Loss by Deer</th>
<th>Amount spent on prevention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Western</td>
<td>$200,000</td>
<td>70%</td>
<td>$10,000</td>
</tr>
<tr>
<td>North Central</td>
<td>$4,300,000</td>
<td>80%</td>
<td>$175,000</td>
</tr>
<tr>
<td>Southern</td>
<td>$3,400,000</td>
<td>80%</td>
<td>$50,000</td>
</tr>
<tr>
<td>North Eastern Shore</td>
<td>$1,200,000</td>
<td>65%</td>
<td>$125,000</td>
</tr>
<tr>
<td>Southern Eastern Shore</td>
<td>$900,000</td>
<td>80%</td>
<td>$50,000</td>
</tr>
<tr>
<td>Total</td>
<td>$10,000,000</td>
<td>77%</td>
<td>$410,000</td>
</tr>
</tbody>
</table>

Largest losses in North Central & Southern MD.

National Agricultural Statistics Service, Annapolis, MD – April 2012
Damage to Forest Ecosystems & Biodiversity
Impact on human suffering and property from deer-vehicle collisions
## MD Deer Vehicle Collisions

<table>
<thead>
<tr>
<th>Year</th>
<th>Annual estimate # of collisions</th>
<th>Annual $ estimate @ $4,000-$6,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>35,000</td>
<td>$180 million</td>
</tr>
</tbody>
</table>

Source: State Farm Insurance quoted in MyMarylandFarmers.com – Dec. 14, 2017

Likelihood of having vehicle collision with a deer in MD in 2017-18: 1 in 138. Down 7.8%

Source: www.carcrashinsurance.com
Disease Transmission to Humans

Lyme Disease Life Cycle
(Deer are an essential component)

Four Poster Tickicide Device

From: Lyme Disease, by M. Brittingham,
Penn State Ext. Cir. 366
Deer Population Dynamics

- Deer are polygamous
  - One male service multiple female
  - Sterilizing local males ineffective
  - Fertility program target females
- Suburban deer can live 15+ years
- Twinning is most common
- Triplets occur
- Fawn born in summer often bred their first fall
### Deer Population Dynamics

#### Initial Deer Herd (3:1 Ratio)

| 18 does + 6 bucks = | 24 deer |

#### After Hunting Season

| 9 does + 3 bucks = | 12 deer |

#### Each Remaining Doe Produces 1.3 fawns

| 9 x 1.3 = | 12 new fawns |

#### Deer Herd Next Year

| 12 new deer + 12 remaining = | 24 deer total |

---

Need to harvest 30-40% of does to maintain population till next year.
Deer Population Dynamics - Simplified

- Absent significant mortality:
  - Deer numbers increase over time
  - Deer-human conflicts increase
  - Public tolerance becomes reduced
  - Complaints increase
Wildlife Damage Management (WDM) Approach for Deer

- Population Management
- Fencing
- WDM with careful monitoring
- Vegetation Management
- Repellents / Scare Tactics
Decision Considerations for Applying Wildlife Damage Management for Deer

- Non-lethal Options
  - Fencing
  - Repellents
  - Vegetation Management

- Lethal Options
  - Population Management
    - Traditional hunting
    - Managed hunts or sharpshooters
    - Deer contraception not a viable option
Wildlife Damage Management (WDM) Approach for Deer

- Population Management
- Fencing
- Repellents / Scare Tactics
- Vegetation Management

WDM with careful monitoring
Favorite Deer Foods (Trees)

- Japanese maple
- pear
- Leyland cypress
- white pine
- apple
- crabapple
- balsam fir
- Norway maple
- cherry
- plum
- hemlock

Resistance of Ornamentals to Deer Damage (UME fact sheet 655)
Rarely Damaged Trees

- Allegheny serviceberry
- heritage birch
- Japanese falsecypress
- Japanese cedar
- Scotch pine
- Douglas fir
- San Jose / American holly
- Colorado blue spruce
- flowering / Korean dogwood
- honeylocust

Resistance of Ornamental to Deer Damage (UME fact sheet 655)
Forest Stewardship Program

- Combine native habitat with deer harvesting to maintain balance.
- If over 10 acres, contact your DNR state forester
Wildlife Damage Management (WDM) Approach for Deer

- Population Management
- Fencing
- WDM with careful monitoring
- Repellents / Scare Tactics
- Vegetation Management
Commercial Repellents

Use an IPM approach

Need to evaluate effectiveness of repellents by their active ingredient, not the trade name.
Things to Know About Using Repellents...

- They will fail – usually 7 to 13 weeks.
- To stop damage you need an 8-foot fence.
- Work by odor, taste or a combination.
- Apply repellents with before deer change feeding patterns in all and spring.
Things to Know About Using Repellents...

- Different areas – different results.
- Change repellents annually.
- Availability of other foods a factor.
- Deer a long-term problem – repellents short-term
- Targeted to homeowner market
### Repellents NOT for Use on Edible Plants
New growth requires application more often.

<table>
<thead>
<tr>
<th>Mode of Action</th>
<th>Active Ingredient</th>
<th>Longevity</th>
<th>Name brands</th>
</tr>
</thead>
<tbody>
<tr>
<td>Odor Taste</td>
<td>Putrescent egg-based</td>
<td>7 weeks or more</td>
<td>• Deer-away&lt;br&gt;• Deer guard&lt;br&gt;• Liquid Fence</td>
</tr>
<tr>
<td>Taste</td>
<td>Fungicide Thiram-based</td>
<td>7 weeks or more</td>
<td>• Bonide Chew-Not&lt;br&gt;• Deerbuster deer repellent &amp; turf fungicide</td>
</tr>
<tr>
<td>Odor Taste</td>
<td>Edible animal Protein, fish</td>
<td>7 weeks or more</td>
<td>• Plantskydd&lt;br&gt;• Repellex&lt;br&gt;• Bobbex</td>
</tr>
<tr>
<td>Taste</td>
<td>Benzldiethyl Ammonium benzoate BITREX</td>
<td>7 weeks or more</td>
<td>• Tree Guard&lt;br&gt;• Ropel, Repel</td>
</tr>
<tr>
<td>Odor Taste</td>
<td>Combination preparations Egg, garlic, pepper, BITREX, menthol</td>
<td>7 weeks or more</td>
<td>• Deerbuster Deer 1&lt;br&gt;• Deer Out&lt;br&gt;• Deer Off – Havahart</td>
</tr>
</tbody>
</table>
### Cost Per Ounce for Selected Commercial Repellents (2002)

<table>
<thead>
<tr>
<th>Name</th>
<th>Active Ingredient</th>
<th>RTU $ / oz.</th>
<th>Concentrate $ / oz.</th>
</tr>
</thead>
<tbody>
<tr>
<td>DeerAway BGR</td>
<td>Egg-based</td>
<td>0.62</td>
<td>0.15</td>
</tr>
<tr>
<td>Liquid Fence</td>
<td>Egg-based, garlic</td>
<td>0.31</td>
<td>0.06</td>
</tr>
<tr>
<td>Deerbuster Deer I</td>
<td>Egg-based Pepper, garlic</td>
<td>0.62</td>
<td>0.20</td>
</tr>
<tr>
<td>Bobbex</td>
<td>Fish oil &amp; more</td>
<td>0.56</td>
<td>0.13</td>
</tr>
<tr>
<td>Plantskyd</td>
<td>Animal protein</td>
<td>0.72</td>
<td>0.15</td>
</tr>
<tr>
<td>Tree Guard</td>
<td>Bitrex</td>
<td>0.45</td>
<td>-</td>
</tr>
<tr>
<td>Hinder</td>
<td>Ammonium soaps</td>
<td>-</td>
<td>0.13</td>
</tr>
</tbody>
</table>
Repellent study in Montgomery County started in 2000...
Repellent Studies in Montgomery County 2000-present
Effect of Different Repellents on the % Loss of Plant Material from Azaleas from Jan-March 2001
Suburban Homesite

% of Plant Remaining

Weeks Since Application

DEER AWAY  TREE GUARD  REPELLEX  LIQUID FENCE  BOBBEX  CONTROL
Difference in Browse of Treated and Untreated Plants
(Montgomery County 2000-2002)

Year

2000 2001 2002

% of Plant Browsed

Untreated Control Plants
Treated with Repellents

2000: 68%
2001: 53%
2002: 31%

2000: 20%
2001: 31%
2002: 27%

3%
Results of Repellent Studies after 3 years

• Repellents reduced deer browsing during the January-April time.
• 0-12 weeks of control was common.
• Effectiveness after 7 weeks depends on deer pressure, weather, alternative foods, etc.
• Repellents less effective with continuous snow cover - no alternative foods.
• No major differences between odor and taste-based repellents.
Four Poster Deer Treatment
Bait Stand

Before treatment

After permethrin treatment
Deer Bait Station Cost

- Bait station – one gallon permethrin $800
- Corn – 1-1.25 lbs/100 lbs deer
- If average deer 100 lbs, multiple number of deer by 1.25 to get daily usage
- 1.25 lbs * $0.20/lb. = $0.25 per deer/day
- 40 deer * $0.25 = $10 per day or $3,650 per year
- Labor another expense
Noncommercial repellents

- Soap bars
- Sachets of hair & meat waste products
- Home brews

Some can be effective but may have to be spaced closely and replaced often.
Dog in a box activated by motion detector barks louder as animal approaches.

Ultrasonic generator hooked up to motion detector.

Beware of Snake Oil! Research does not support use of these devices!
Deer whistles on vehicles do not work and provide a false sense of security.
Pairs of dogs can protect 20-30 acres

Dogs contained by buried electric fence
The dogs live in the contained area all year-round and have a doghouse, automatic feeders, vet care, and regular contact with humans.
Most systems are installed in high-value agriculture operations such as fruit orchards, vineyards, pick your own farms, and nurseries.
UM Extension Dog Fence Study
Nov 2000- Jan 2002 - After 1.5 years

- 100% survival for protected trees and 0% for unprotected trees.
- Within first year dogs killed approximately 45 groundhogs, 17 raccoons and countless voles.
- Dogs did escape a few times which required a more powerful collar.
Wildlife Damage Management (WDM) Approach for Deer

- Population Management
- Fencing
- Repellents / Scare Tactics
- Vegetation Management
- WDM with careful monitoring
9-10 ft. fence needed for exclusion
Electric Fences largely replaced
Solidlock Fixed-Knot Fencing
Fence of choice by most
Commercial Fencing

Finished fence
270 acres @ $6/linear foot

Annual crop losses - $25-$30,000

Deer guard
$1,000
Cost-Benefit Analysis

270 acre diversified farm

- How much is being lost? $30,000/year
- How much does the control cost? $78,000
- Payback period? 2.6 years
Plastic Fencing

- Light, Low cost
- Easy to install
- Blends in with woods
Black plastic fencing blends in with a wooded backdrop. Flagging tied to fence to alert deer.
Deer will go through fence making holes that are easily fixed by attaching spare pieces.
Electric chargers

- High voltage, low impedance
- Small computers with 45-65 pulses/minute
- Short Duration - 0.003 per second
- AC, DC, battery, solar powered units available
- Always use AC power if possible.

Battery/solar-powered  A/C- powered
Polytape & Polywire

A plastic filament material with strands of wire interwoven that carry an electric charge. Very flexible and easy to use.
Training Deer w/Electric Shock
Baiting Improves Effectiveness
Applications: Gardens & Yards
Applications: Crops
Double Polytape Fence
Achilles’ Heel of polywire fences...

...snow.
**Types of Deer Fencing and Cost per Linear Foot**  
(cost does not include charger)

<table>
<thead>
<tr>
<th>Type of fence</th>
<th>Labor &amp; Material cost (in dollars)</th>
<th>Material cost only (in dollars)</th>
</tr>
</thead>
<tbody>
<tr>
<td>8-foot woven wire</td>
<td>5.00 – 7.00</td>
<td>2.00 – 4.00</td>
</tr>
<tr>
<td>8-foot plastic mesh</td>
<td>1.00 - 1.50</td>
<td>0.75</td>
</tr>
<tr>
<td>Slanted 7-wire</td>
<td>1.75 - 2.25</td>
<td>1.50 - 2.00</td>
</tr>
<tr>
<td>Vertical 7-wire</td>
<td>1.50 - 2.00</td>
<td>0.75 - 1.50</td>
</tr>
<tr>
<td>Spider fence 5-wire</td>
<td>0.70 - 0.80</td>
<td>0.35 - 0.40</td>
</tr>
<tr>
<td>Polywire/polytape</td>
<td>0.35</td>
<td>0.20</td>
</tr>
</tbody>
</table>
Wildlife Damage Management (WDM) Approach for Deer

Population Management

Fencing

WDM with careful monitoring

Repellents / Scare Tactics

Vegetation Management
The most economical and practical method of deer population regulation is...

...hunting.
For Hunters - Ask the Right Questions!

- Instead of trying to keep everyone off the property......
- Ask, ‘Who do I want to allow on my land.”
- Many times this will solve your trespass or access.
- Landowners liability minimized if charge no fee
  - See Maryland Cooperative Extension Bulletin EB357 for more detail. www.extension.umd.edu/woodland
Move to Community-based Deer Management

Provides greater flexibility in the management of deer populations where traditional management methods are not an option.
Community Deer Management

- Requires a community come together to develop consensus on problem and options.
- Public meetings do not lend themselves to good outcomes.
- Best approach is a small group that represents different stakeholders.
- Need to consider non-lethal and lethal options
Time, Planning & Preparation, Resources & Funding . . .

- **Time**
  - Deer populations took decades to grow to current level
  - There is no quick fix

- **Planning & Preparation**
  - Information needed on deer numbers / impacts
  - Community Surveys provide information on deer impacts
  - Public support is essential for community-based deer mgt.
  - Education & Information is key to public
  - Transparency is key to keep public support
Move to Community Based Deer Management

- Research-based information, not decisions based on emotion.
- Good educational programs for homeowners, producers, professionals, etc.
- Resolve and commitment of local political officials.
- On the ground implementation essential for the long term.
Examples of Community-Based Mgt

- Gibson Island
- Loch Raven Reservoir
- Homeowner associations
- Local Government organizations
- Municipalities
- County-based citizen task forces
Citizen Task Forces in Counties
Principles for Success

- Select reasonable individuals to represent key stakeholder groups.
- Different group members educate others
- Allow time for members to get feedback from stakeholder groups
- All members agree to work toward consensus
- Commitment at beginning from local politicians or local authority to implement what is agreed to.
Task Force Progress to Working Group

- Representative stakeholders
- Resolution from local government
- Deer Survey of county residents
- Understanding deer biology, interactions, conflicts, and impacts
- Deer management options & effectiveness, cost, etc
- Summary & recommendations
- Best success if county or municipality proves personnel to implement a long term deer management plan through working group.

Howard County Deer Mgt. Task Force – completed 2000 and followed by deer implementation plan

Baltimore City – Watershed properties being managed

Washington Suburban Sanitary Commission – Watershed properties managed with community involvement

Baltimore County

Anne Arundel County
Online Resources from the University of Maryland Extension:

- Managing Deer Damage in Maryland (EB354).
- Resistance of Ornamentals to Deer Damage (FS655).
- Using Commercial Deer Repellents to Manage Deer Browsing in the Landscape (FS810-A).
- Recreational Access & Landowners Liability in Maryland (EB357).

www.extension.umd.edu/woodland
Deer Management Resources

Managing Whitetail Deer in Suburban Environments

An Evaluation of Deer Management Options

Community-Based Deer Management:
A Practitioner’s Guide

The Cornell University Study:
An Integrated Approach For Managing White-Tailed Deer In Suburban Environments
Questions?

Jonathan Kays
Extension Forestry Specialist
301-432-2767 x323; jkays@umd.edu
www.extension.umd.edu/woodland

George Timko, Urban Deer Biologist
MD DNR Wildlife & Heritage
george.timko@maryland.gov
(301) 478-2314