
Urban Deer Biology and Management Options

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Why Engage in Deer Management?



Lyme Disease

- Inverse relationship between Lyme disease and small mammal predators (Levi et al 2012)
- Human cases declined with reduction in deer density (Kilpatrick et al 2014)

Tick-borne disease life cycle

1. Adult tick bites and infects deer, dog or raccoon

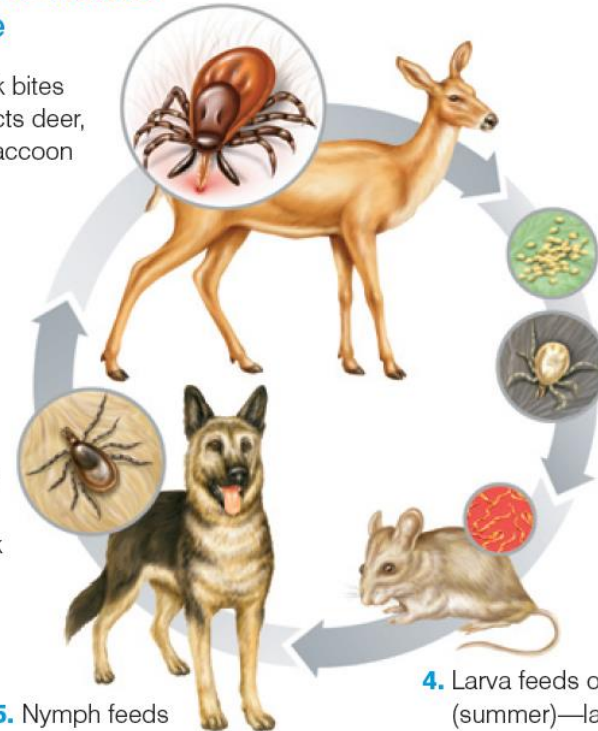
6. Nymph leaves host and molts to adult tick

5. Nymph feeds on dog and transfers infection

4. Larva feeds on small mammal (summer)—larva leaves host and molts to nymph (spring)

2. Adult tick lays eggs (autumn)

3. Egg hatches to larva



Deer ticks can become infected during the larval and nymph phase by feeding on small mammals that harbor bacteria that cause Lyme disease or anaplasmosis.

Pittsboro Animal Hospital



Hemorrhagic Disease



- Virus transmitted by biting midges
- Not transmissible from deer to deer
- Not density dependent
- Currently being experienced in Oakland and other SE MI counties



Characteristics of Urban Deer

■ Reproduction

□ Increased in Urban Areas

- Reported as high as 1.8 fawns/adult doe
- No reproductive senescence

■ Survival

□ Higher rates

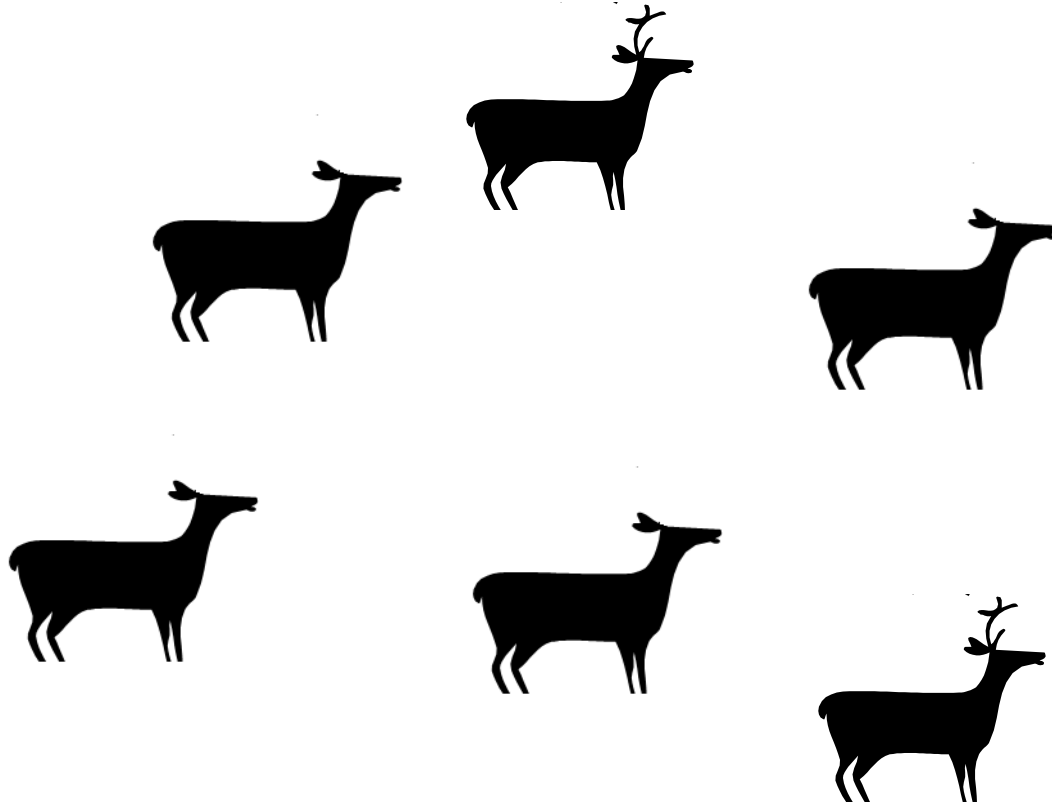
- Reported as high as 87%

■ Home Range Size

□ Typically smaller



The George Reserve, Michigan: Year 1



The George Reserve, Michigan: Year 7

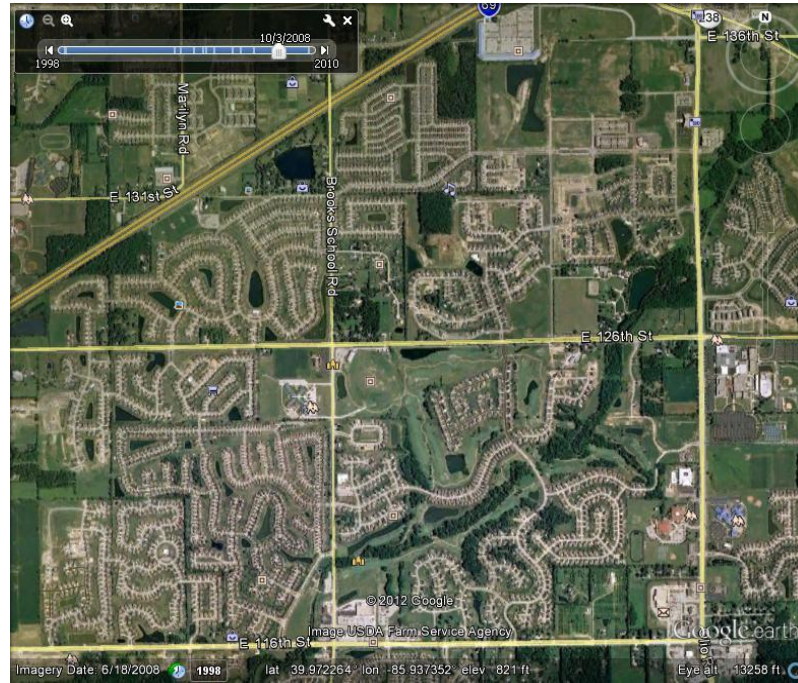


Historical Value of Hunting

- With many states, management has shifted from one of protection and distribution to mitigating impacts



Changes on the landscape



1999

2008



Carrying Capacity

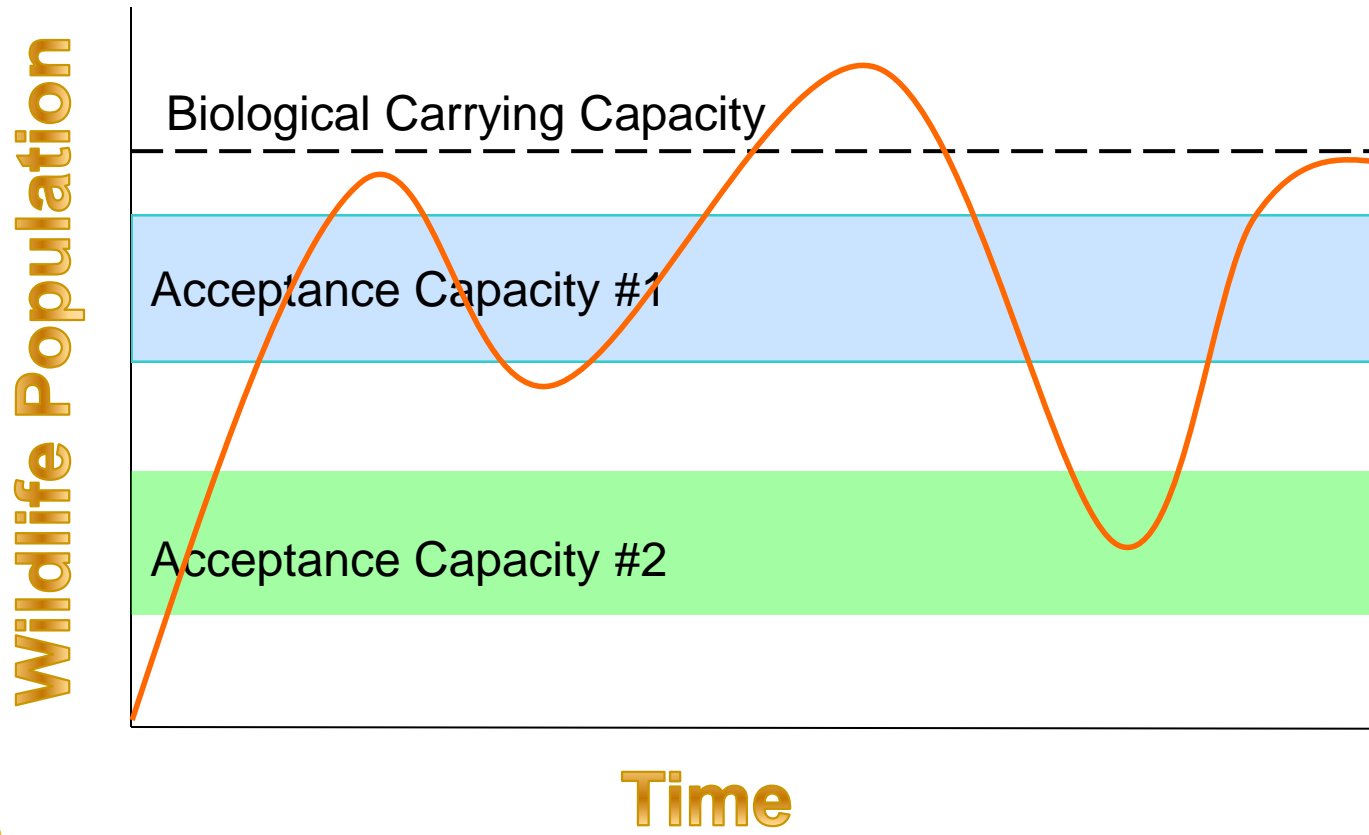
■ Biological



■ Social



Measures of Capacity for Wildlife Populations



Management Options



Management Options

■ No Action or Response

□ Pros

- A compromise?
- Inexpensive

□ Cons

- Some will view as “inaction”
- Continued degradation of habitat and conflicts



Management Options

■ Hunting

□ Pros

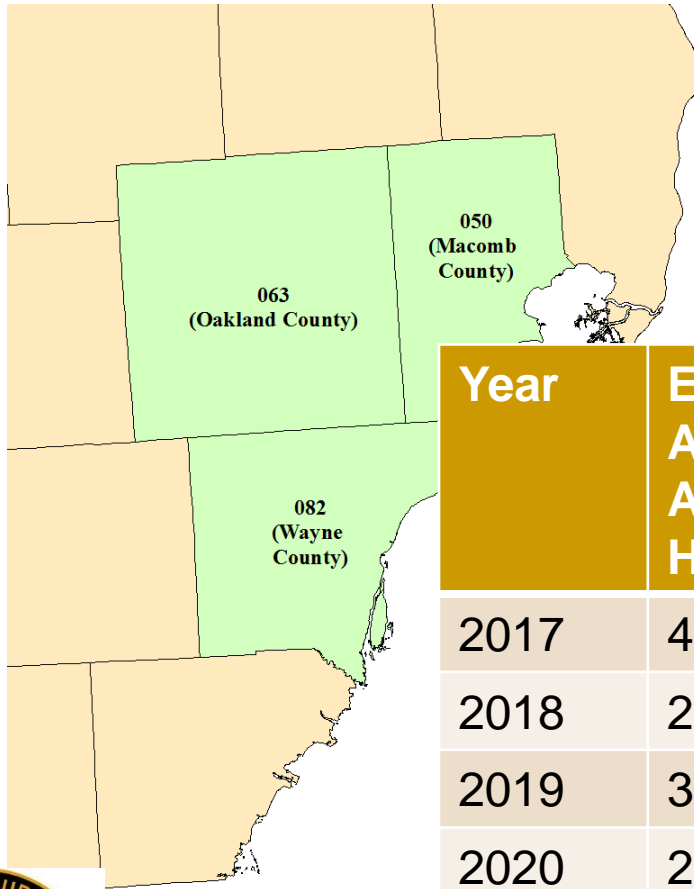
- Inexpensive to communities
- Can provide economic stimulus
- Supported by many

□ Cons

- Some types of hunting (i.e. trophy) not appealing to many
- Local concerns regarding hunting in a community
- Access issues



Expanded Archery Season (Jan 2-31)



Year	Expanded Antlerless Archery Harvest	Regular Season Antlerless Archery Harvest	Total Antlerless Harvest
2017	477	1,451	3,064
2018	295	1,429	2,781
2019	384	1,088	2,896
2020	201	N/A	3,024



Management Options

■ Sharpshooting

□ Pros

- Reduces deer population quickly
- Safe

□ Cons

- Expensive
- Controversial



Management Options

■ Trap and Relocate/Remove

□ Pros

- No projectile
- Removes deer from difficult areas

□ Cons

- High stress to deer
- Expensive
- Relocation not allowed in Michigan



Management Options

■ Contraception

□ Pros

- Doesn't fire lethal projectile
- Prevents future fawns from being born

□ Cons

- Expensive
- Doesn't remove deer which may be the problem
- Difficult (impossible?) to achieve results in free-ranging deer herds



Management Options-GonaCon

- ❑ Hand injection required
- ❑ Multi-year efficacy requires a booster administered within one year
- ❑ Not registered for use in Michigan (MDARD)

United States
Environmental Protection Agency
Office of Prevention, Pesticides and Toxic Substances
(7505P)

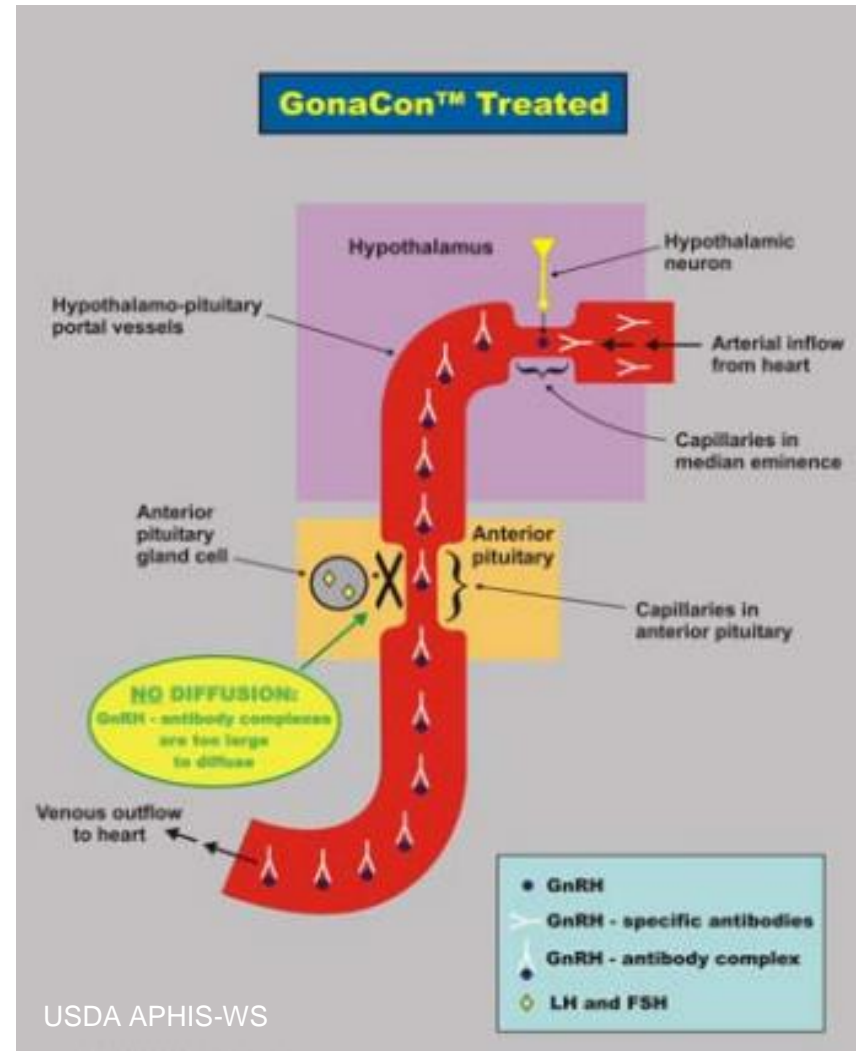


Pesticide Fact Sheet

Name of Chemical: Mammalian Gonadotropin Releasing Hormone (GnRH)
Reason for Issuance: New Chemical Nonfood Use
Date Issued: September 2009

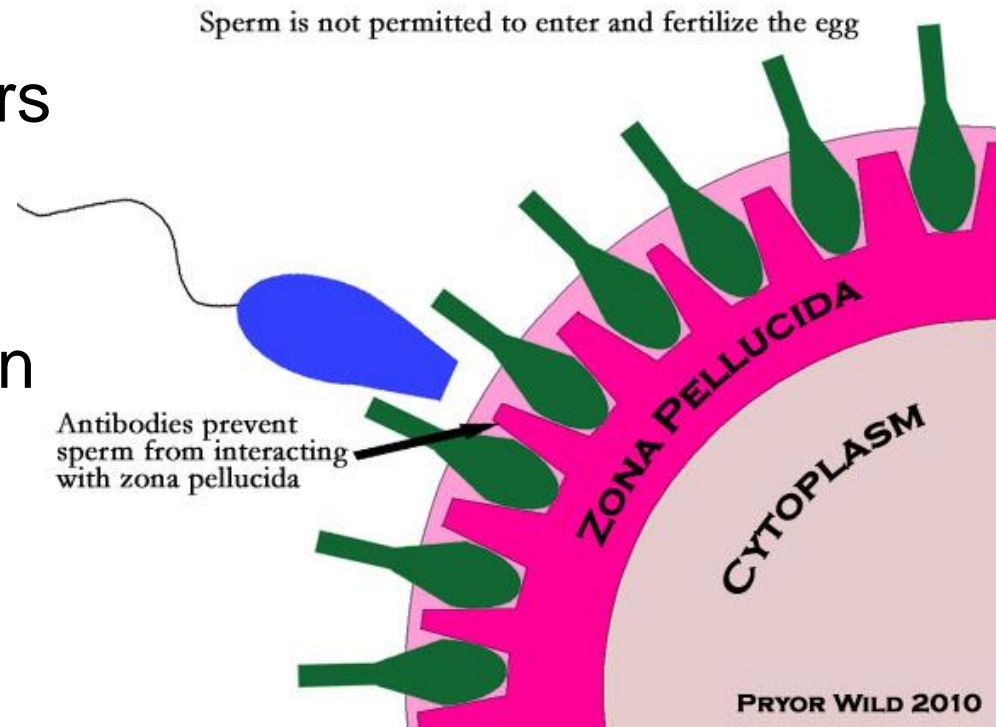
1. Description of Chemical

Peptide Chain: pyro[Glu1-His2-Trp3-Ser4-Tyr5-Gly6-Lu7-Arg8-Phe9-Gly10NH2] (GnRH)
Common Name: Mammalian Gonadotropin Releasing Hormone (GnRH)
EPA PC Code: 116800
Chemical Abstracts Service (CAS) Number: 9034-40-6
Chemical Class: Sterilant/Hormone
Registration Status: New Chemical, nonfood use
Pesticide Type: Mammalian Contraceptive
U.S. Producer: U.S. Department of Agriculture, APHIS, Pocatello Supply Depot
238 East Dilon Street
Pocatello, ID 83201



Management Options-Zonastat

- ❑ Hand, jab-stick, or remote dart delivery
- ❑ Recommended boosters at 2-weeks and each year
- ❑ Not registered for use in Michigan (MDARD)



RESTRICTED USE PESTICIDE

For retail sale to and use only by Certified Applicators or persons under their direct supervision of the following organizations and their designated wildlife management personnel and only for those uses covered by the Certified Applicator's certification:

- Department of Interior and all its designated agents
- National Park Service, US Fish & Wildlife Service, Bureau of Land Management
- USDA and all its designated agents (i.e., U.S. Forest Service, Animal and Plant Health Inspection Service)
- State Agencies for agriculture/livestock & wildlife
- Federally recognized Indian Tribes
- Department of Defense
- Humane Society of the United States

Each Responsible Authority for deer intended to be treated with Zonastat-D must sign a certification of use prior to the administration of the vaccine to any animals. The certification statement is attached to this label.

Sublabel B

ZONASTAT-D

Zonastat-D is a porcine zona pellucida immunosuppressive vaccine indicated for use in limiting the populations of white tailed deer (*Odocoileus virginianus*) and other members of the family Cervidae.

Active Ingredients:	
Porcine zona pellucida (ZP)(0.1%)	0.071%
Porcine zona pellucida (ZP1, ZP2, ZP4)(0.1%)	0.029%
Other Ingredients	99.900%
Total	100.000%

This product contains 100 µg of PZP per 0.04 oz (0.5 mL).

EPA Reg. No. 86833-x
EPA Est. No. 090192-MT-001

Net Contents: 0.5 mL.

Humane Society of the United States
700 Professional Drive
Gaithersburg, MD 20879

Expiration date: xx-xx-xxxx

0811 11/08/2013



Management Options

■ Sterilization

□ Pros

- Doesn't fire a lethal projectile
- Prevents fawns from being born permanently

□ Cons

- Expensive
- Doesn't remove deer which may be problem
- Difficult to achieve results



Ann Arbor Sterilization Program



YEAR FOUR SUMMARY REPORT

2019-20 Deer Research Program

Ann Arbor, Michigan

26 May 2020

Submitted by

Dr. Anthony J. DeNicola
White Buffalo Inc.

- ❑ Sterilization of game prohibited under PA 390 (2018) until April 1, 2022



Melanie Maxwell, The Ann Arbor News



Management Options

■ Reintroduce Predators

□ Pros

- Opportunity to return historical species

□ Cons

- Socially unacceptable
- Expensive
- Complicated interactions requires study



Management Options

■ Fencing and Repellants

□ Pros

- Can exclude deer from problem areas
- Relatively inexpensive

□ Cons

- Requires maintenance
- No guarantees
- Does not solve community wide problem





The Process of Community-Based Deer Management & Decision Making

Adapted From:
Emily Pomeranz
Human Dimensions Research Specialist, Michigan DNR

Phase 1:
Problem
Definition

Phase 2:
Decision
Making

Phase 3:
Implementation

Phase 4:
Evaluation and
Adaptation



Essential Elements to CBDM

- ❑ A structured process for making community decisions that includes multiple perspectives
- ❑ Shared understandings about goals and a desire for achieving acceptable solutions
- ❑ An understanding that this will be an ongoing process
- ❑ A commitment to evaluating
 - ❑ the decision-making process
 - ❑ the subsequent management program



Phase 1:
Problem
Definition

Phase 2:
Decision
Making

Phase 3:
Implementation

Phase 4:
Evaluation and
Adaptation



Do we have a problem?

Gather information, assess, define the problem

What problems are occurring? Where, when, who, severity?

How are you going to gather the data you need?

- Questionnaire of residents
- Tracking of tick-borne illnesses
- DVC (deer-vehicle crashes, struck deer calls)
- Agricultural and horticultural losses
- Monitoring deer browse to assess forest health (sentinel seedlings)



Phase 1:
Problem
Definition

Phase 2:
Decision
Making

Phase 3:
Implementation

Phase 4:
Evaluation and
Adaptation



Develop Your Goals, Consider Alternatives, Make a Choice

- Goals: general outcomes or desired future conditions
- Objectives: Specific, measureable outcomes needed to achieve goals
- Match your actions to your objectives
- Deer committee may consider and weigh actions to achieve objectives



Example: Hopewell Valley, NJ

“...success should be measured by stated impact reduction goals and not based upon measured deer population size” (p. 24).

Goal: Reduce deer vehicle collisions

There has been an average of 567 deer-vehicle collisions from 2007-2009. The task force recommends a 25% reduction goal by 2013 (425 collisions) and a 75% reduction goal by 2019 (142 collisions).

Data linking deer herd reduction with reduced deer collisions is sparse. However, Princeton township experienced a 75% reduction following a six-year deer management program that resulted in a 72% reduction of the deer population (DeNicola & Williams 2008)

<http://hopewelltp.org/DocumentCenter/Home/View/501>

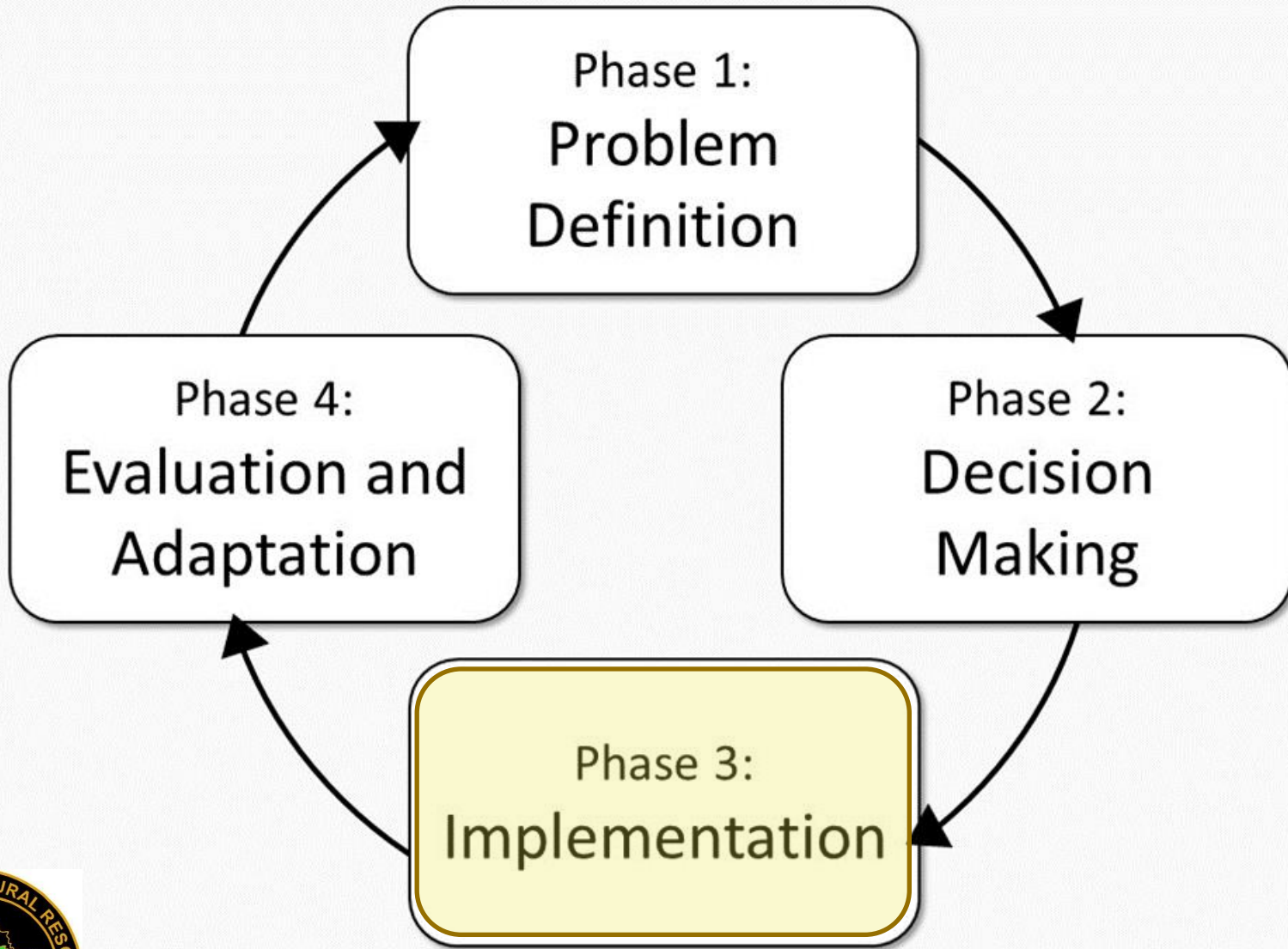


Evaluate and select the right tools for your community



- Legality
- Effectiveness
- Cost
- Social acceptability
- Capacity to implement
- Time





Creating a Deer Plan

- Plan summary and background
- Problem definition
- Goals
- Measurable objectives
- Management actions recommended
- Management actions considered
- Plan for monitoring
- Plan for engagement
- Budget
- Timetable
- Responsibilities
- Supporting Documents
- References



Implementing Your Selected Management Action

Challenges:

- Public safety
- Legal and regulatory
- Evaluation
- Resources limits

Task force seeks public's ideas on deer levels

By MARTHA GOLD
Journal Staff

A task force charged with recommending deer population levels for Tompkins, Tioga and Schuyler counties is looking for public input on how large those numbers should be.

Initiated by the New York State Department of Environmental Conservation, the Citizen Task Force will determine whether there are too many, too few or enough deer in "7R," a newly designated 740-square-mile management unit that includes portions of the three counties.

The group will then make a recommendation to the DEC on how many doe permits should be issued to manage the population.

"White-tailed deer are a problem to some and a benefit to others," said Brian Caldwell, extension educator for the Tioga County branch of Cornell Cooperative Extension and the group's facilitator. "The whole process is to try and balance the two."

There are two hunters, two farmers, one rural landowner, a commercial hunting lodge owner, a forester, an environmentalist and Mark Dresser, senior criminal investigator from the Tompkins County Sheriff's Department.

"Hotel owners, people into deer hunting, equipment salesmen want lots of deer," Caldwell said. "But they also have a negative impact on farmers,

motorists and homeowners with gardens and ornamental plantings. They all have different needs and opinions."

One population segment of the management area not directly represented in the task force is suburban residents, plagued with high deer populations.

"Heavily populated areas present a special problem because hunting isn't allowed in them," Caldwell said.

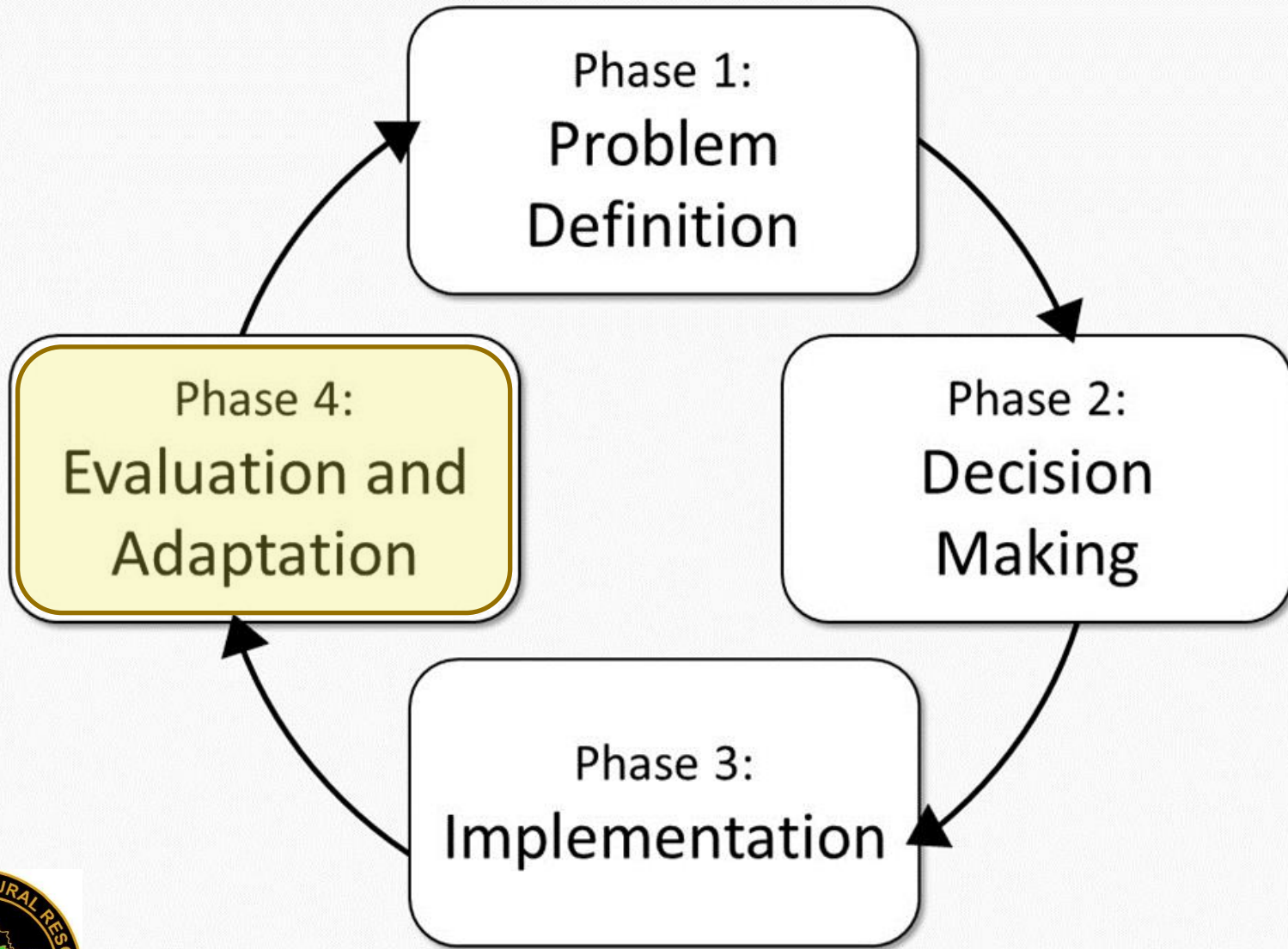
The Tompkins County Sheriff's Department receives a lot of complaints from these areas, particularly from Cayuga Heights and the Village of Lansing, Dresser said.

David Riehlman, a senior wildlife biologist for the DEC in Cortland, said suburban residents need to talk to their town or village governing board and urge them to contact the DEC.

"We give information on control methods, and if they want to move ahead, we make ourselves available as advisers," said Riehlman. "Then we recommend that the community form an advisory group which represents a broad section of the population to get together and discuss these issues."

For their next meeting on March 17, task force members must bring 10 or more opinions from other professionals in their field and nearby residents on whether deer are a problem for them and if the levels should be lowered or raised.





What to Monitor?

- ❑ Deer harvested: straightforward
 - ❑ directly monitoring important impacts
- ❑ Deer population: can be costly & difficult
 - ❑ not directly linked to impacts (e.g. aerial counts, camera traps, pellet counts, spotlight surveys)



What to Monitor?

- Complaints to city
- Readily-available data (tick-borne illness rates, deer vehicle collisions, road-killed deer)
- Tracking deer browse (e.g., sentinel seedlings—browse on planted trees; density of native understory cover)
- Tracking system for complaints
- Resident surveys—perceptions of program and impacts experienced
 - Crop damage
 - Landscape effects
 - Cost/benefit assessments



Monitoring: Are you achieving your goals?

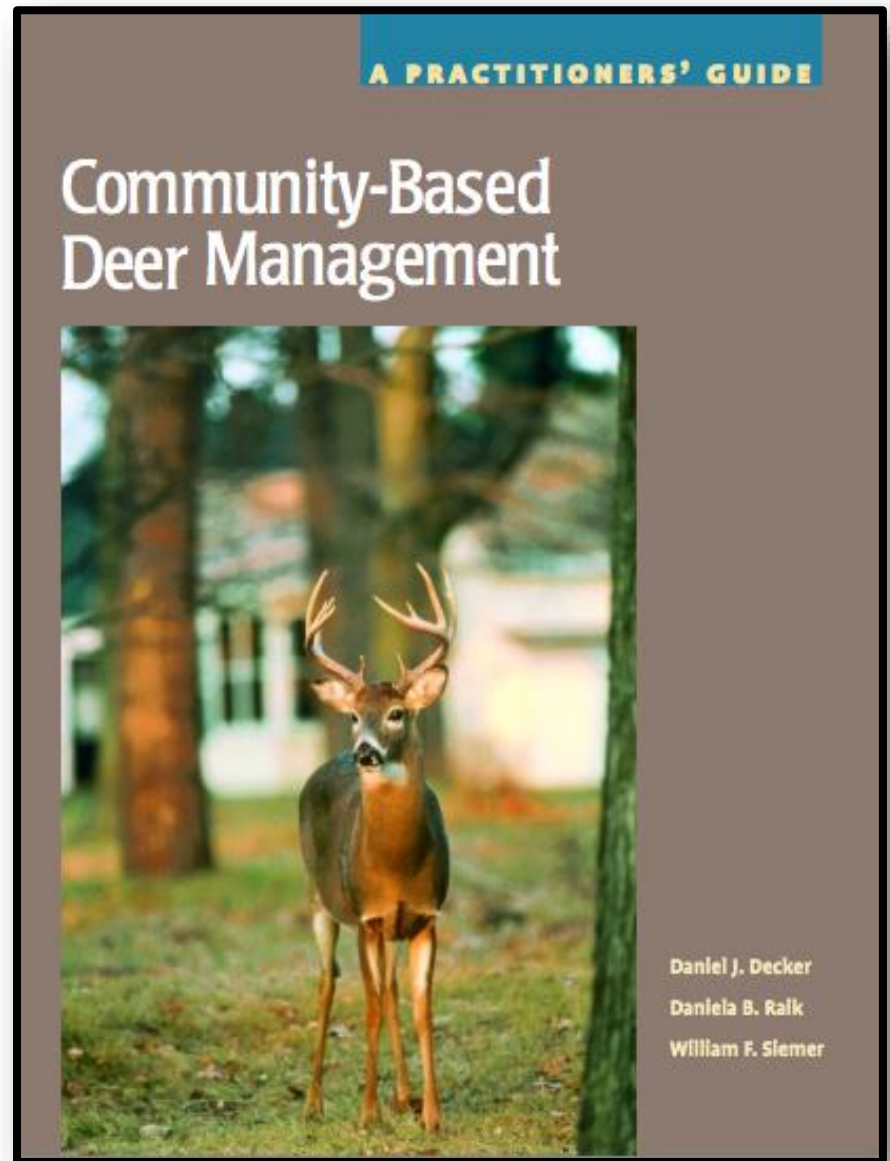
Do you have a process in place if you don't see the response you need?

What will you do when you achieve your objectives—how will you maintain impact or population levels?



Resources

- ❑ Deeradvisor.org
- ❑ Aviddeer.com
- ❑ Other communities & their deer management plans
- ❑ Canvas course: Creating a Community-Based Deer Management Plan



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