Wildlife Response, Innovations & Services

THE HUMANE SOCIETY
OF THE UNITED STATES

Use of Fertility Control to Manage Urban White-Tailed Deer Populations

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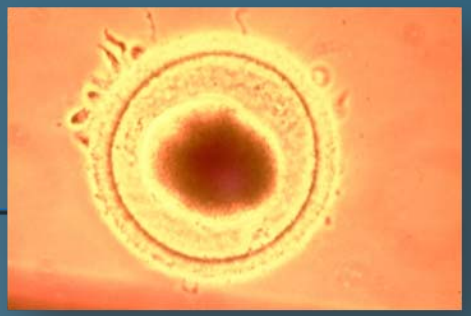
Fertility Control Methods

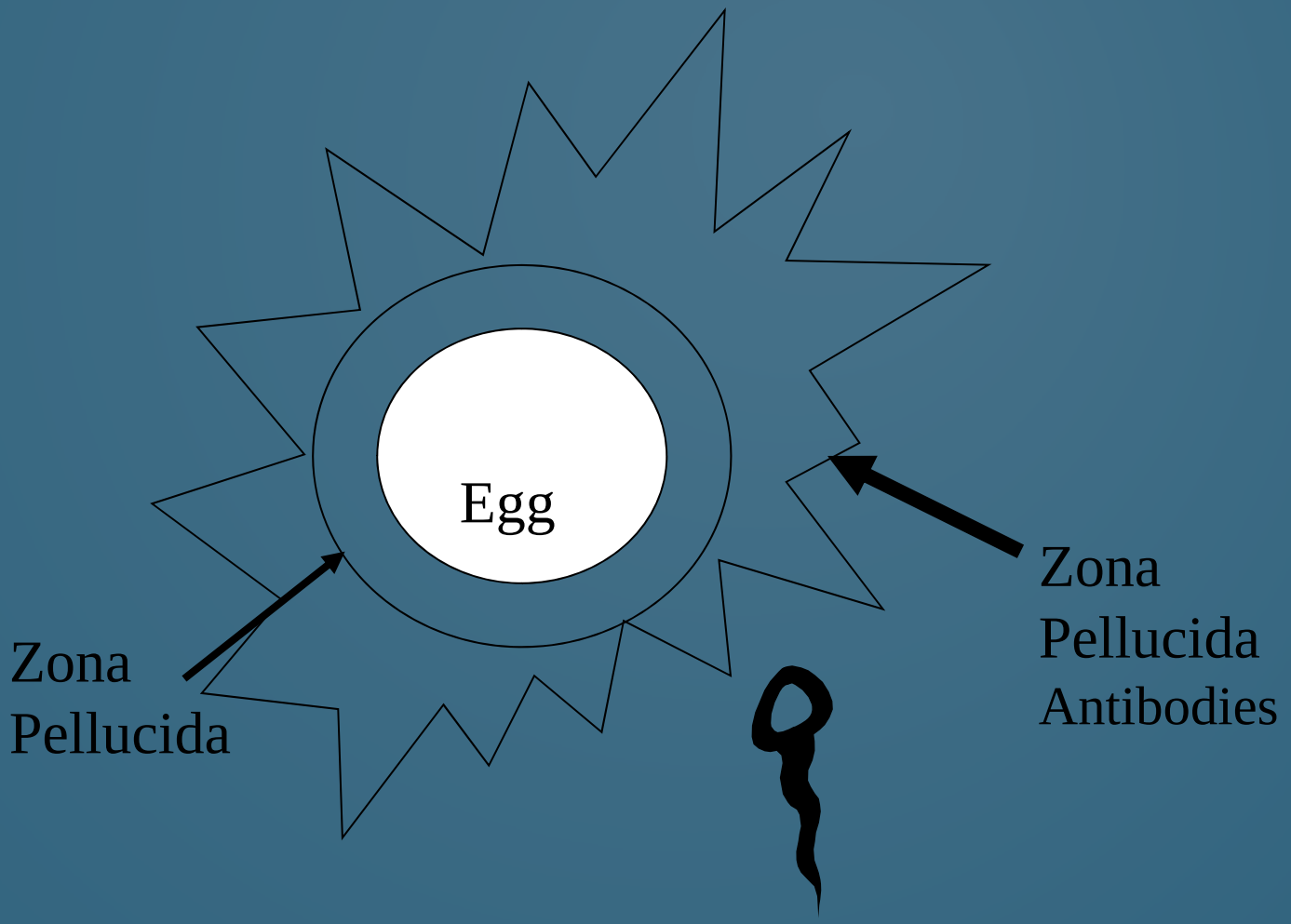
- Immunocontraception
- Surgical Sterilization

What is the PZP vaccine?



- PZP (porcine zona pellucida) is a protein extracted from pig ovaries.
- Vaccination of female deer with PZP yields antibodies that block fertilization.
- Feeding PZP to animals (or people) does not work. If eaten, it is digested.

How PZP works?



Where has PZP been used?

- White-tailed deer
- Wild horses
- African elephants
- Bison and elk
- Zoos

How is PZP delivered?

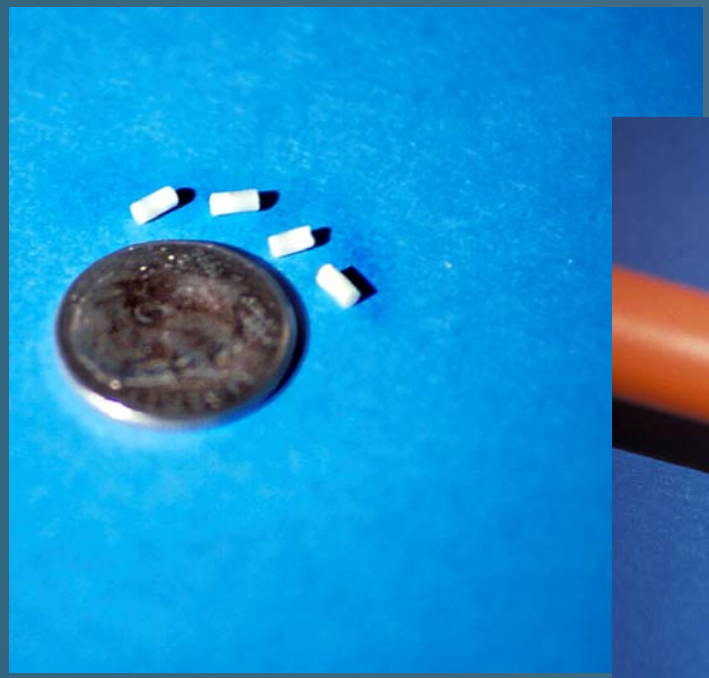
- "Native PZP" emulsion vaccine requires annual boosters
  - ~$25/dose
- "Timed-release" PZP vaccine administered once every 2-3 years
  - $230/dose

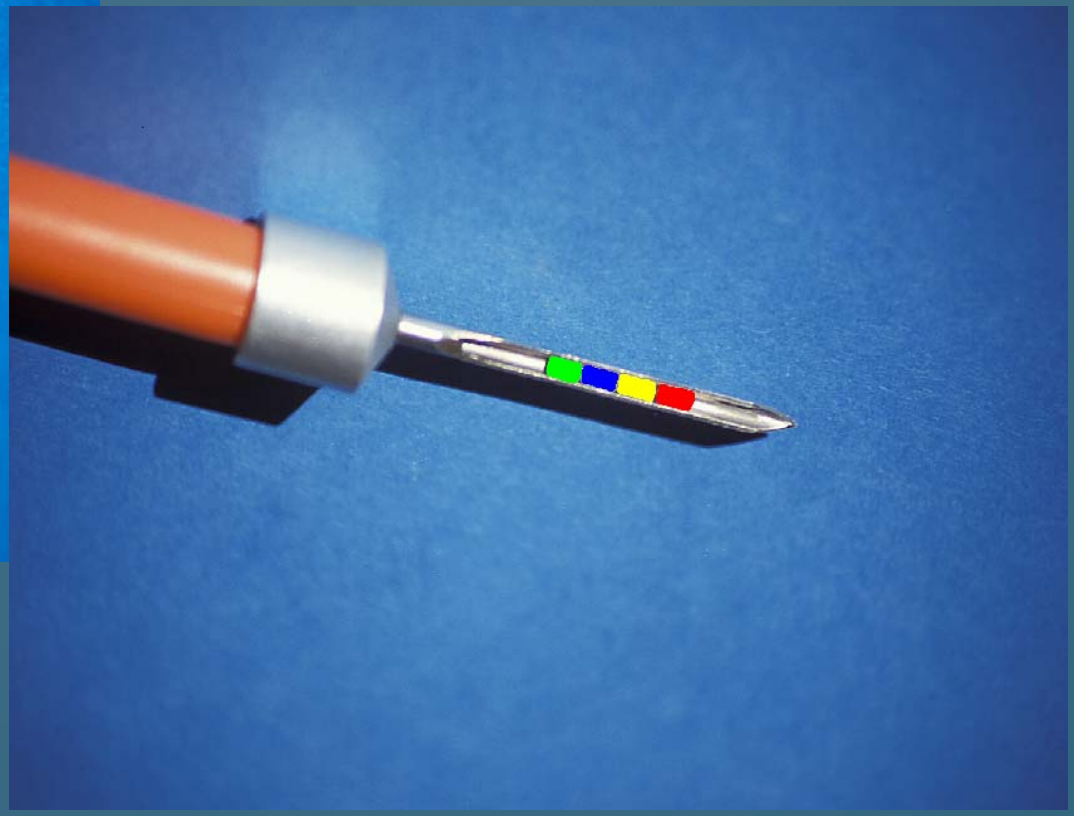
How is PZP delivered?

For opportunistic remote delivery, a custom-designed dart was created to inject the liquid primer/time-release pellets and then eject from the targeted animal's body

How is PZP delivered?

PZP vaccine consists of liquid primer and several time-release pellet doses





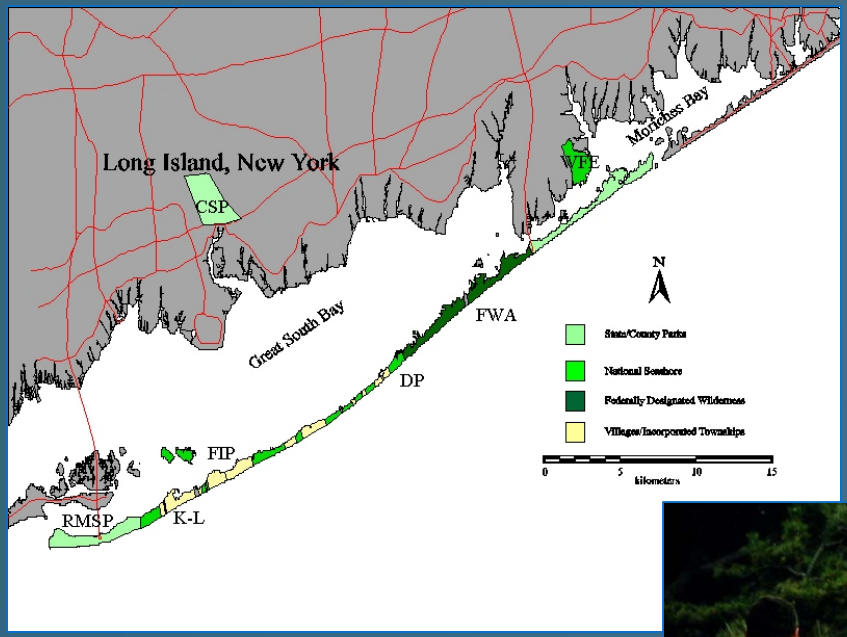
Benefits of PZP?

- Not passed through the food chain
- Does not affect unborn fawns or their future fertility
- Improves the overall health of the doe
- It is reversible
- PZP has been proven effective over 90%

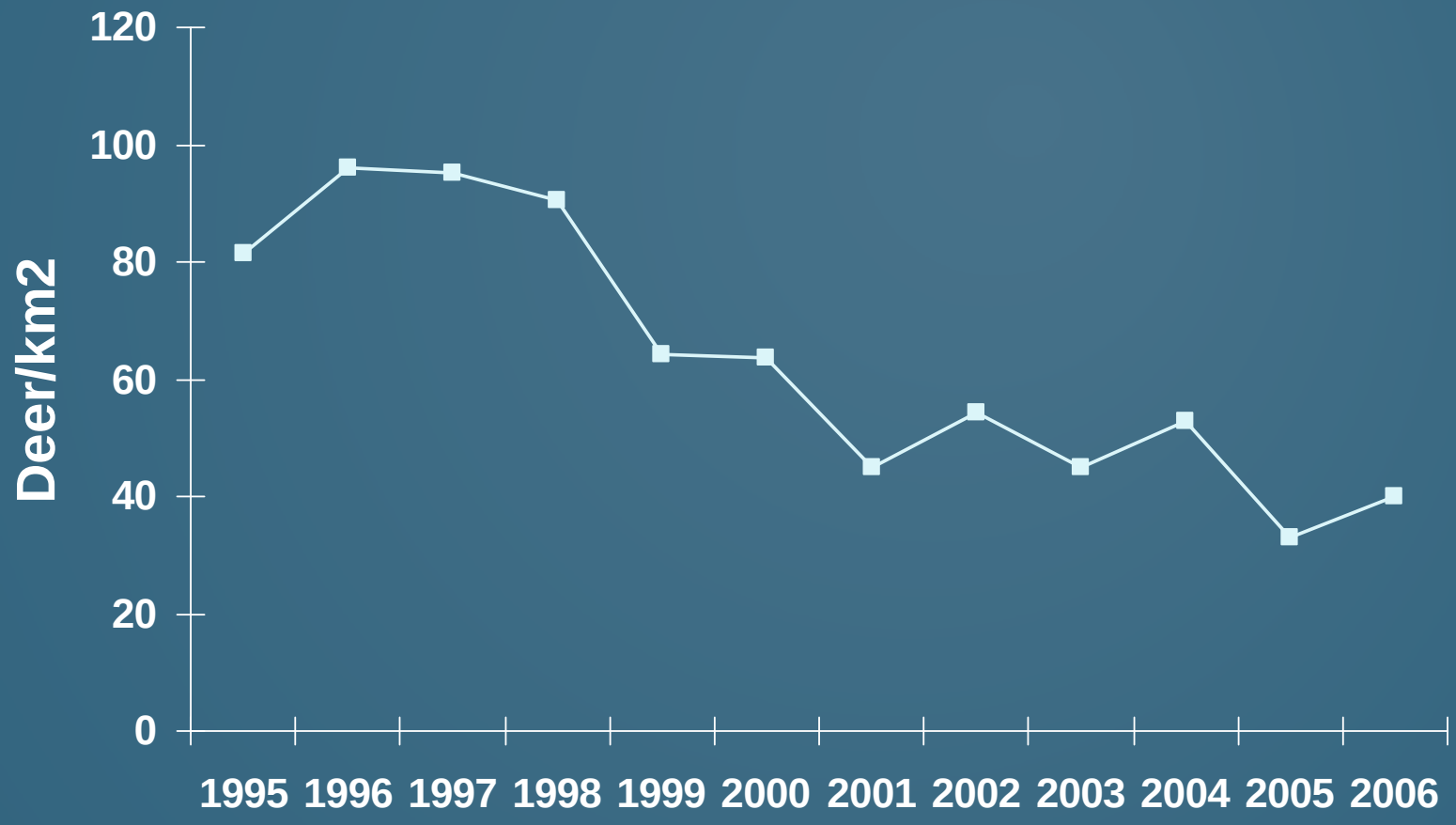
How well does PZP work on deer?

- **On individual females**
  - Native PZP with annual boosters yields annual fawning rates of **5-10%**
  - Timed-release PZP yields pregnancy rates of **~5% in first year** and **~25% in second year**

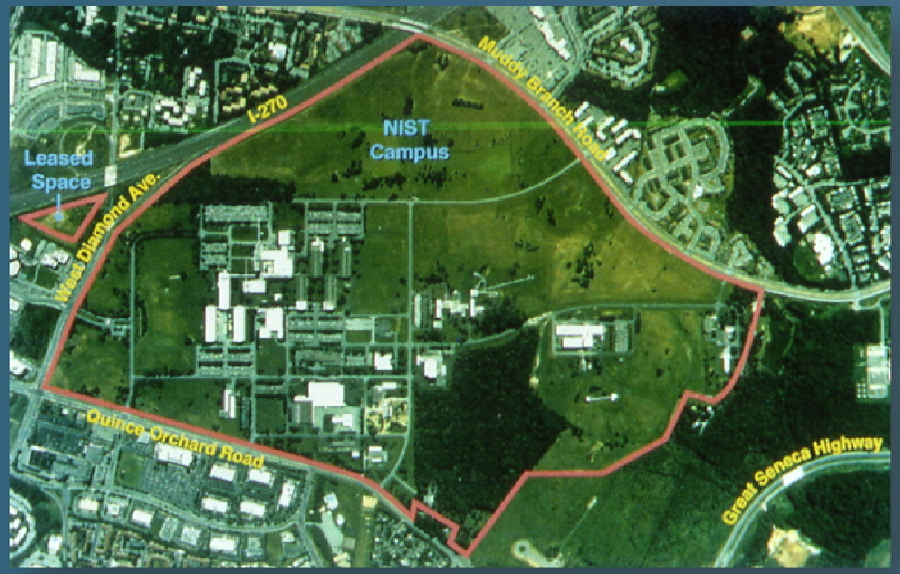
Fire Island National Seashore, NY



Population Changes at Fire Island (Kismet-Lonelyville)



National Institute of Standards and Technology (NIST), Gaithersburg, MD



- 1 mi^2
- Surrounded by dense suburbs

NIST Deer Study

- Efficacy testing vs. studying population effects
- 748 deer captured and tagged, 1994-2006
- ~1,500 PZP treatments delivered

Fripp Island, South Carolina

- ~4 miles^2
- Residential & retirement community

Hunting Island Control Site

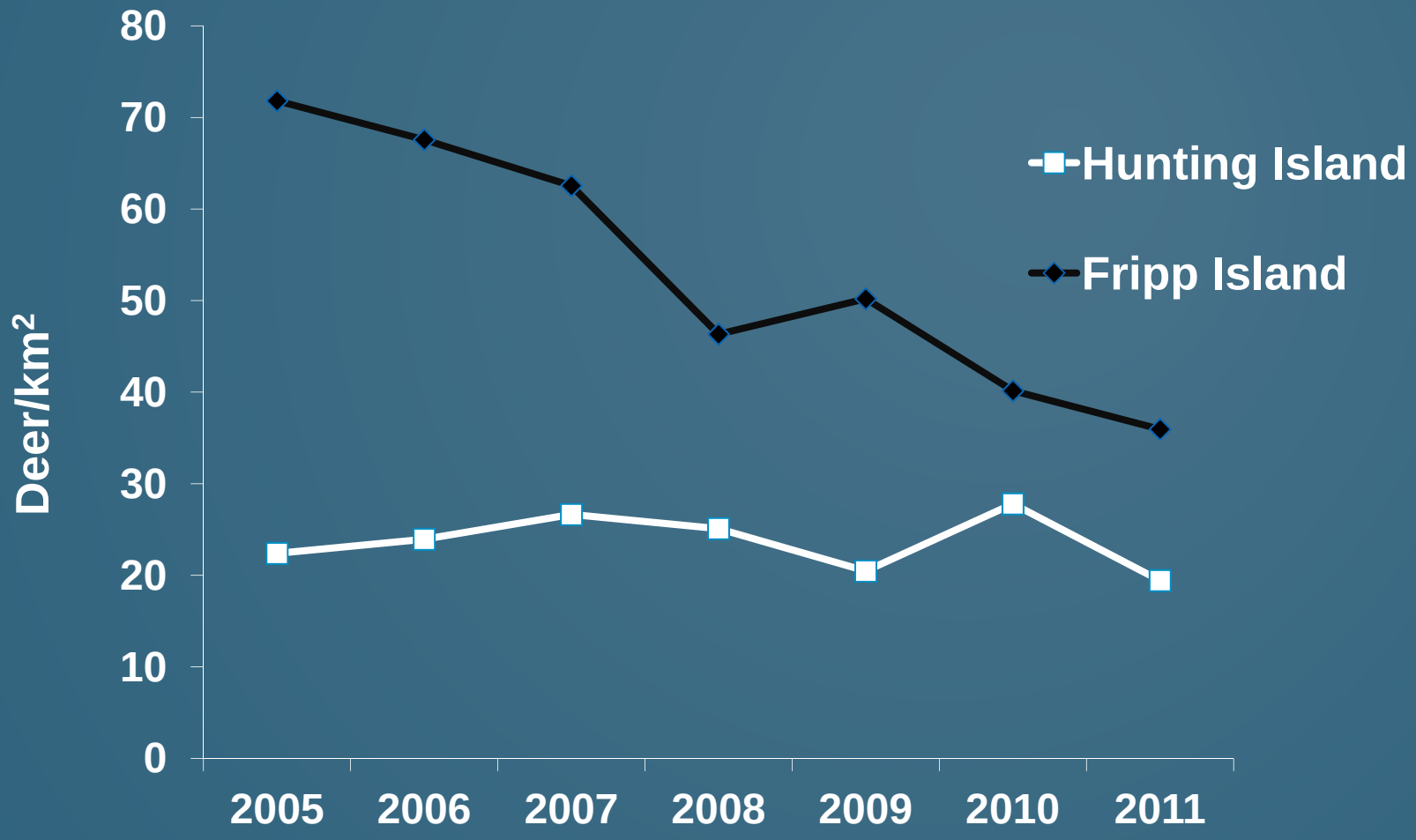
- 6 mi^2 state park
- 0.5 miles across inlet from Fripp Island
- No hunting or other active management

Capture & Treatment: 2005-2010

- 258 females captured, tagged & vaccinated with one of several one-shot PZP test vaccines
- Some females received dart-delivered boosters beginning in 2006

Population Fawn/Doe Ratios, Fripp Island 2006-2011

Deer Population Densities, Fripp and Hunting Islands, 2005-2011



Fewer Deer, Healthier Deer?

2007

2010

- Decreased visibility of deer during daylight hours
- Increased community tolerance for deer

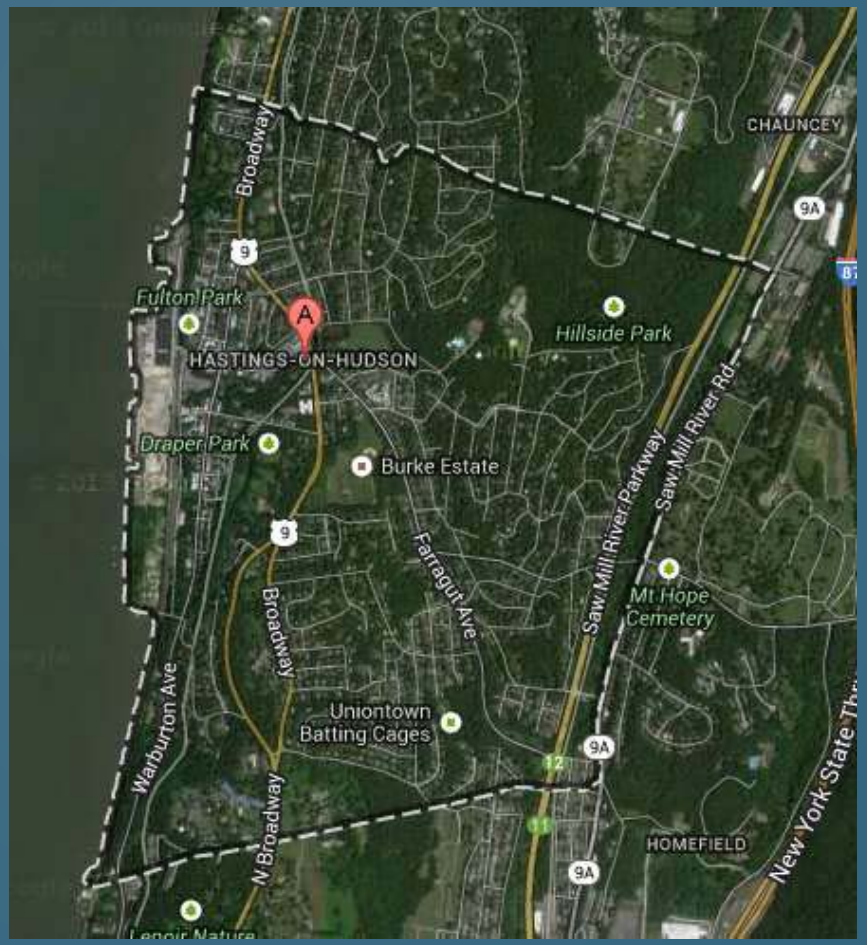
Causes of Rapid Decline on Fripp

- Without need to boost every year, field effort focused on untreated animals.
- ~20% annual adult mortality combined with very low fawning rates
- Little immigration from outside

Hastings-On-Hudson, NY

Can multi-year vaccine be delivered remotely?

Can contraception control deer populations on "nonislands?"



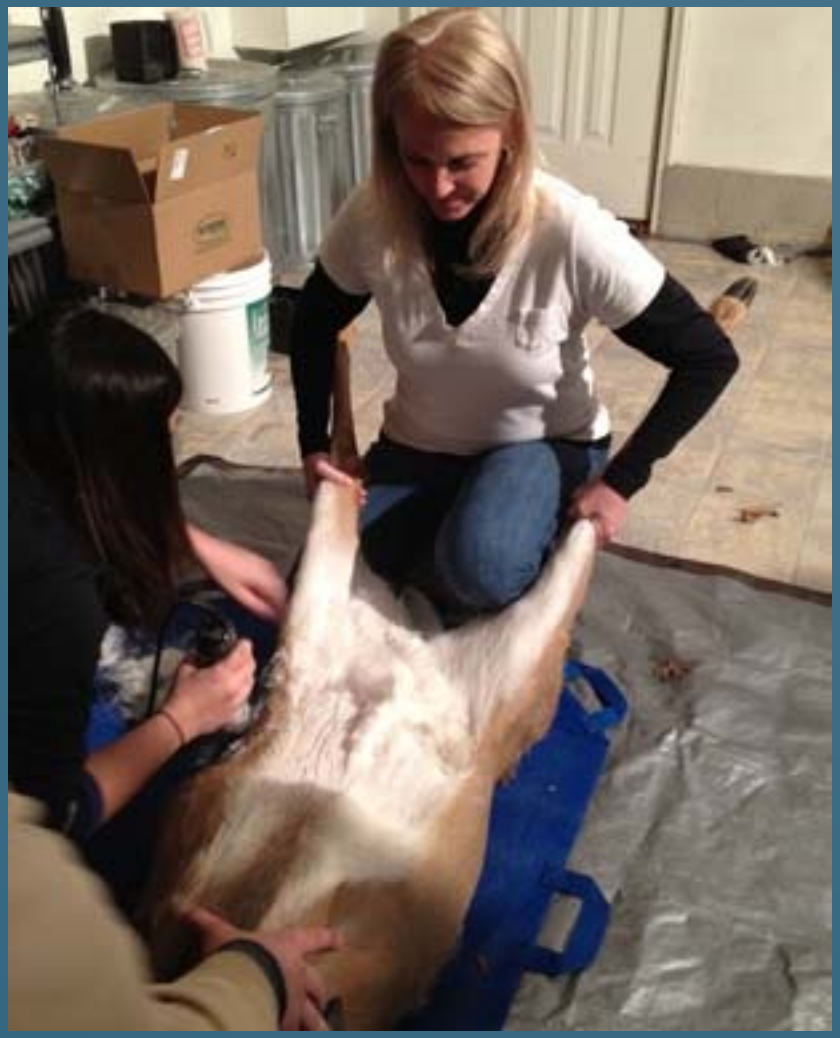
Surgical Sterilization via Ovariectomies

- This technique removes the deer's ovaries and is similar to, but less invasive than a cat or dog spay.
- The animal is typically in and out of surgery in less than 20 minutes, and the mortality rate is less than 1%.
- The technique begins with deer capture via tranquilizer dart. The deer is then transported to a surgical bay.
- The surgical prep and surgery take approximately 20 minutes.
- After surgery, the deer is returned to the field, a reversal agent is administered and the animal is observed from a distance to ensure all is well.

Mobile Surgical Theater

Tranquilized Deer Carried to Mobile Surgical Theater

Deer Shaved for Surgery



Deer in Surgery

Deer on Stretcher Post-Op

Vet Administering Reversal Drug

Mask Covers Eyes for Final Step

Collared/Tagged Deer Months Following Surgery

Surgical Sterilization

Pros

- Only handle the animal once
- Can use a variety of volunteers to reduce costs
- 100% effective for all animals

- Removal of the ovaries reduces movement in landscape due to breeding behavior

- Very low mortality rates.

Cons

- Delayed population reduction as deer persist in the landscape

-Cost is higher than other methods

- This is not a permitted management option in most States, it is still only permitted as research.

Surgical Sterilization

Villages Cayuga Heights, NY

- - 1.8 miles2 open suburban community
- - ~95% sterilized in Year 1 (2012)
- - All remaining females sterilized in Year 2 (149 total)
- - ~30% decline after one year
- - Immigration 3 females/year
- - Surgical mortality <1%

Surgical Sterilization

Villages in San Jose, CA

- - 700 acres fenced (only 6-7 ft high) with open front gate
- - ~90% sterilized in Year 1 (started in 2013)
- - All remaining females sterilized in Year 2 (115 total – October 2013)
- - 30 deer "relocated" outside the fence with 55% returned
- - ~20% decline after one year
- - Immigration 2 females/year
- - Surgical mortality 1%

Surgical Sterilization

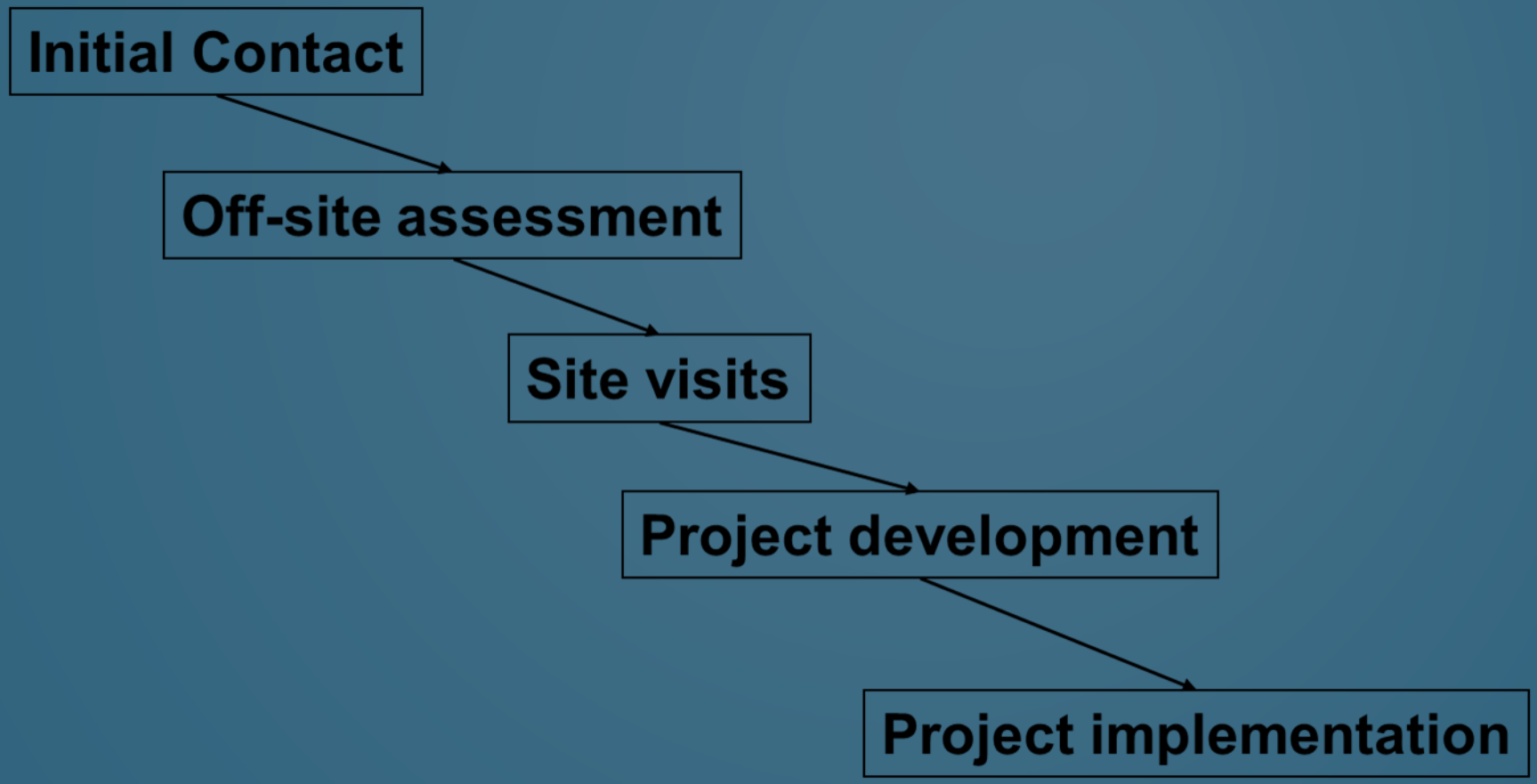
- **Phoenix, MD**
- - Single point of access on 14 acres
- - ~50% sterilized in Year 1 (33 total - started in 2011)
- - ~75% sterilized in Year 2 (50 total)
- - ~80% sterilized in Year 3 (59 total)
- - ~90% sterilized in Year 4 (69 total)
- - Annual mortality ~10%
- - Immigration 3-4 females/year
- - Population stable
- - Surgical mortality 0%

Surgical Sterilization

- **City of Fairfax, VA**

- – 5 miles2 open suburban community
- - ~40% sterilized in Year 1 (18 total - started in 2014)
- - Immigration unknown
- - Surgical mortality 0%

Starting New Deer Projects



Initial Contact/Off-Site Evaluation

- **Contact local official in authority**
- **Preliminary investigation (remote)**
  - **Site characteristics, number of deer, closed, open or semi-open system, deer accessibility, etc.**
  - **Stage of decision making, public interest and support, state agency involvement**

Site Evaluation

Biological/logistical project feasibility

- **Is the deer population accessible?**
- **Can they be captured/darted safely?**
- **Can we get land access?**
- **How are adjacent lands being managed?**

Political & fiscal feasibility

- **Public talks**
- **Meetings with community leaders**
- **Initial contact with state agency**

Building the Project

- **Design the project**
- **Identify and train field personnel and other collaborators**
- **Write proposals**
- **Apply for State/federal agency research permits**
- **Institutional Animal Care & Use Committee (AWA compliance)**
- **Federal regulatory compliance (EPA experimental use permit)**

Implementing the Project

- **Secure permits and permissions**
- **Purchase equipment, supplies, and vaccine**
- **Schedule field work, including lodging and vehicles (if needed)**
- **Conduct additional field training of new personnel**

Example: Hastings-On-Hudson, New York

- Winter 2013 – HOH meets with New York Department of Environmental Conservation (NYSDEC)
- Spring 2013 – HOH prepares and submits proposal to NYSDEC
- Summer 2013 – HOH revises proposal according to NYSDEC comments and recommendations
- Winter 2013 – NYSDEC grants research permit to HOH
- Winter 2014 – HOH, Tufts University and HSUS launch public/private deer fertility control project

Questions?