

Ecology and management of white-tailed deer in Ann Arbor



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Talk outline

- Impacts of deer overabundance
 - Social vs Biological Carrying Capacity
 - Lessons from the UM's ES George Reserve
- A2 Deer deer management program overview
- Was the A2 cull a success?
 - Results from deer cull and sterilization program
 - Results from A2 browse studies
- Lessons from other communities

History of deer in SE Michigan

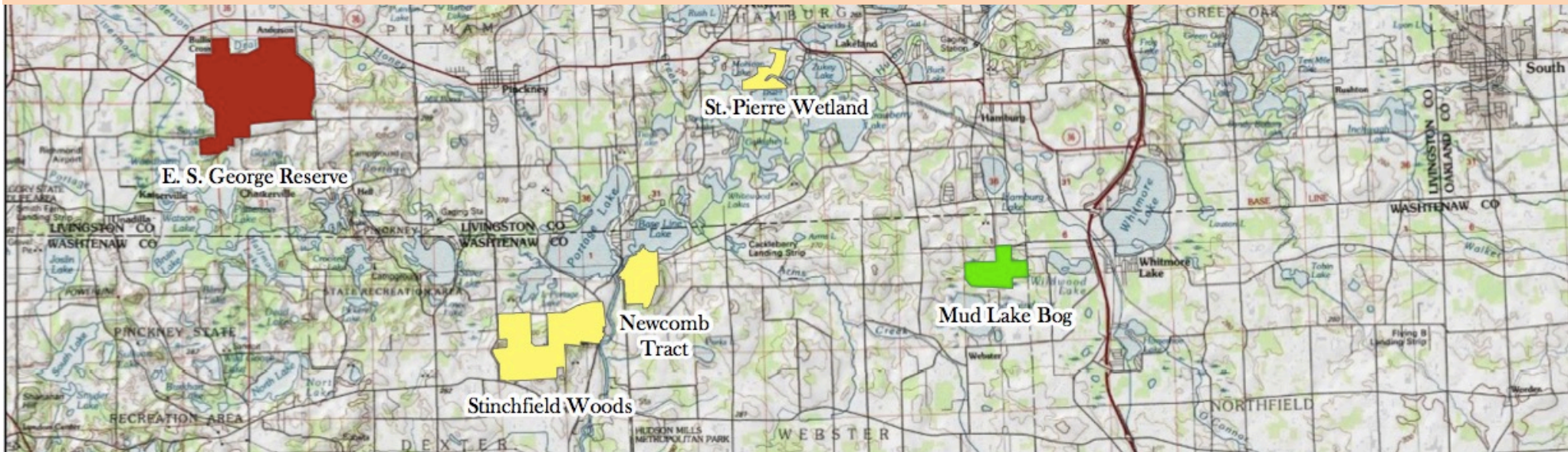
- 1900s deer extirpated in SE Michigan
- 1920s deer are reintroduced or migrate to SE Michigan, hunting laws enacted
- 1940s deer populations crash in some areas due to overabundance and starvation
- 1990s historically high deer densities
- 2000s overabundance in urban areas

Current numbers believed to be higher than pre-European settlement in MI and throughout US

General causes of high deer abundance

- Improved forage from agriculture
- Loss of major predators (cougars, wolves)
- Increase in favorable edge habitat
- Warm winters
- Fewer hunters; reduced access to hunting locations; anti-hunting sentiment in urban and suburban areas

Deer management at ES George Reserve

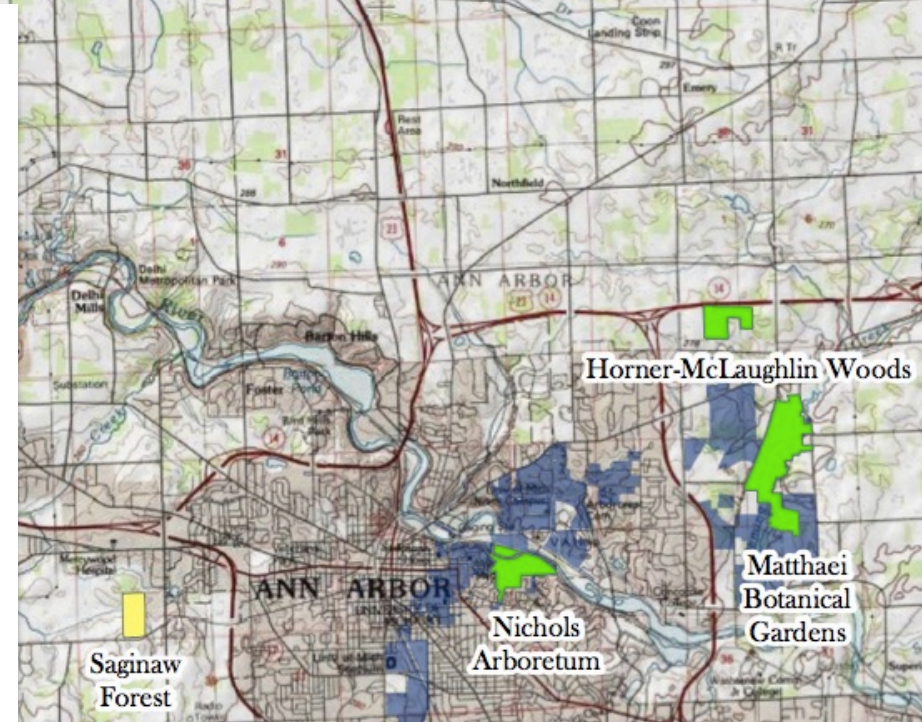


1300 acres (550 hectares) fenced reserve
Site of UM Research since 1930

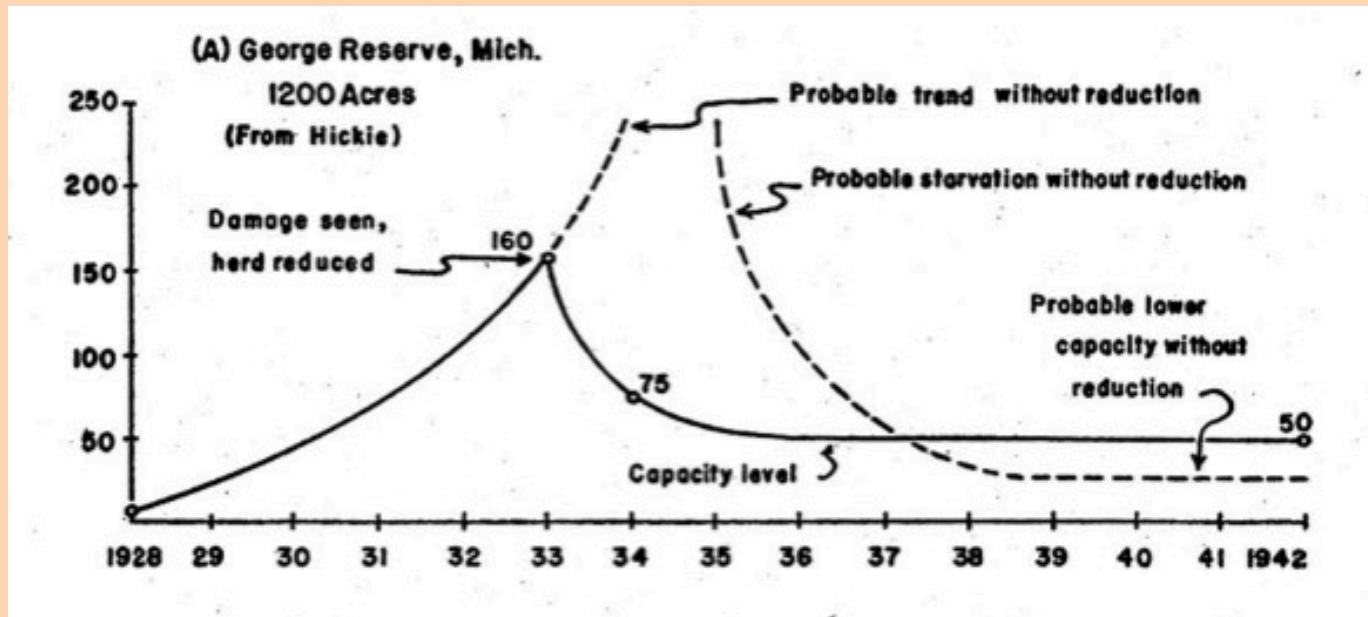
4 does and 2 bucks were introduced in 1928

6 years later there were 160 deer. Understory
vegetation destroyed

Culls implemented in 1940s leading to the
return to diverse understory vegetation



Healthy herds, diverse forests



ES George deer cull produced healthier herd and an environment able to sustain higher deer numbers than if deer left to die from starvation. It became an important case study in wildlife management

Aldo Leopold (1947) *Deer Irruptions Wisconsin Academy of Sciences*

ES George Reserve today



Oak and hickory seedlings, ESGR, June 2021

Culls performed when deer density seems high, often skipping years

ES George has an ecologically diverse forest with dense forest regeneration

Carrying Capacity

Biological Carrying Capacity – is the maximum number of deer that an environment can sustain before the numbers dwindle due to starvation (deer perspective)

Social Carrying Capacity* – the number of deer that is acceptable to a community, considering vehicle collisions, disease, property damage, and impacts to natural areas (people perspective)

Biodiversity Carrying Capacity – the maximum number of deer that an ecosystem can sustain before seriously degrading natural areas (ecological perspective)

*Indiana DNR Urban Deer: Technical Guide

Some ecological consequences of urban deer overabundance

- Inhibited forest regeneration
- Increase in unpalatable invasive plant species (garlic mustard, Japanese barberry, etc)
- Increase in soil erosion and sediment runoff
- Reduced habitat for understory birds, small mammals, and insect pollinators
- Increased incidence of deer diseases and ticks

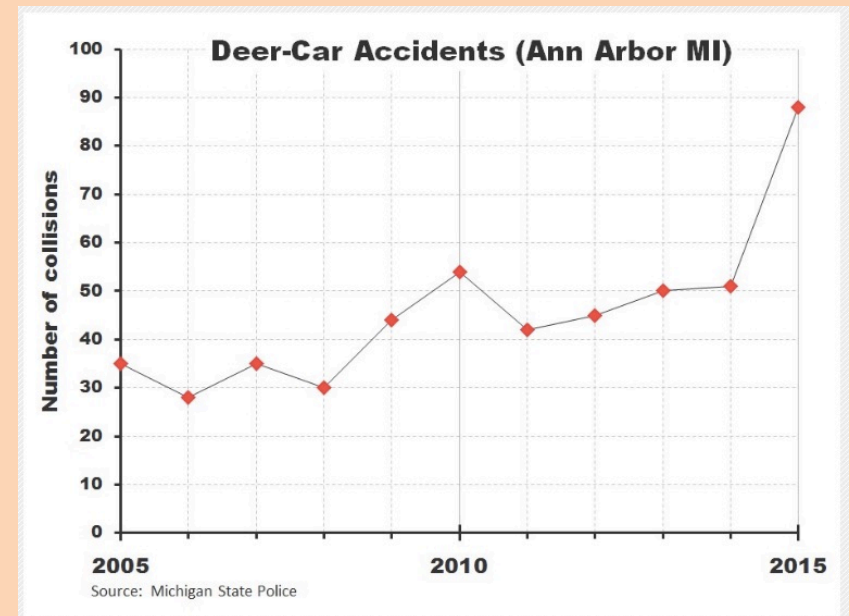


Browse line (Minnesota)

Too many deer in A2?

Concerns in 2015

- Increase in deer-vehicle collisions
- Lyme disease potential
- Impact on parks and natural areas
- Damage to landscapes and gardens



A2 deer management program

In 2015 Ann Arbor City Council approved a deer management program. In 2016 A2 contracted USDA sharpshooters. In 2017-20 A2 worked with White Buffalo Inc., a private deer management company that does deer research, deer culls and sterilizations

White Buffalo advocated an integrated approach consisting of lethal (culls) and non-lethal (female sterilization) methods in areas where lethal methods weren't possible.

The goal was to address the two main concerns of the City:

- (1) restore ecological balance to city natural areas
- (2) reduce deer-vehicle collisions

The city contracted with an independent ecologist, Jacqueline Courteau, to monitor impacts of deer browsing.

Other aspects of the program are described in A2 city web pages

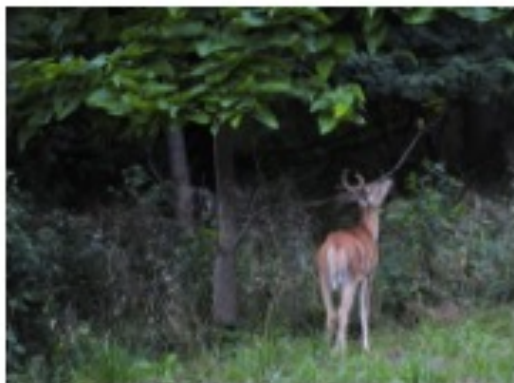


Ann Arbor deer cull controversy becomes election issue in 2nd Ward

With Ann Arbor officials making plans to hire sharpshooters to kill 100 deer this winter, "stop the shoot" has become the official battle cry of animal rights activists. "Stop the shoot" yard signs, which are being distributed by the Humane Society of Huron Valley, are starting to pop up around town. And joining the HSHV in the fight against the... [Full story »](#)

Protesters urge Ann Arbor officials to call off 'deer massacre'

"Stop the shoot! Save the deer!" That was the message chanted by protesters outside Ann Arbor's city hall Friday night in opposition to the city's plan to hire sharpshooters to kill 100 deer this winter. They carried signs with messages such as "No deer massacre in Ann Arbor," "Stop the deer slaughter," and "No snipers in our parks!" Another protester... [Full story »](#)



Ann Arbor marijuana advocate worried people smoking pot in parks could be shot during deer cull

A longtime drug policy reform advocate in Ann Arbor is worried people smoking marijuana in city parks at night could be shot during an upcoming deer cull. "People smoke weed in Ann Arbor," said Charmie Gholson, founder of Michigan Moms United to End the War on Drugs and sometimes organizer of the annual Hash Bash marijuana rally in Ann Arbor.... [Full story »](#)



Ann Arbor council member facing recall threat for vote on deer cull

After voting in favor of hiring sharpshooters to kill 100 deer in city parks this winter, an Ann Arbor City Council member is facing a potential recall. Sabra Sanzotta, a 2nd Ward resident and leader of a local group called Save the Deer Ann Arbor, filed recall petition paperwork with the county clerk on Monday in hopes of getting approval... [Full story »](#)

53 | 11 months ago | By Ryan Stanton | ryanstanton@mlive.com



Ann Arbor council members not bending to requests to call off deer cull

The controversy over the Ann Arbor City Council's decision to hire sharpshooters to kill 100 deer in city parks this winter continued to play out inside city hall Monday night. Members of a group called FAWN, standing for Friends of Ann Arbor Wildlife in Nature, showed up to the City Council's meeting to protest the planned cull, which was approved... [Full story »](#)



Group files lawsuit against Ann Arbor in attempt to stop deer shoot

Residents hoping to stop the shooting of deer in Ann Arbor parks are taking their fight to federal court. [Full story »](#)

236 | 10 months ago | By Ryan Stanton | ryanstanton@mlive.com



Ann Arbor deer cull helping Food Gatherers feed the hungry

As the shooting of deer continues in Ann Arbor's parks and nature areas, some fresh venison is going to feed the hungry. [Full story »](#)

230 | 8 months ago | By Ryan Stanton | ryanstanton@mlive.com



Peaceful memorial rally in Ann Arbor honors lives of 63 deer killed

Four dozen peace activists gathered Saturday afternoon in downtown Ann Arbor for a memorial honoring the lives of 63 deer recently killed. [Full story »](#)

846 | 8 months ago | By Ryan Stanton | ryanstanton@mlive.com



U-M biologist says Ann Arbor deer cull is 'positive step toward ecological sustainability'

As an associate professor in the Department of Ecology and Evolutionary Biology at the University of Michigan, Dick also serves as the director of the university's 1,300-acre E.S. George Reserve northwest of Ann Arbor. [Full story »](#)

182 | 9 months ago | By Jeremy Allen | jallen42@mlive.com

Demographic surveys

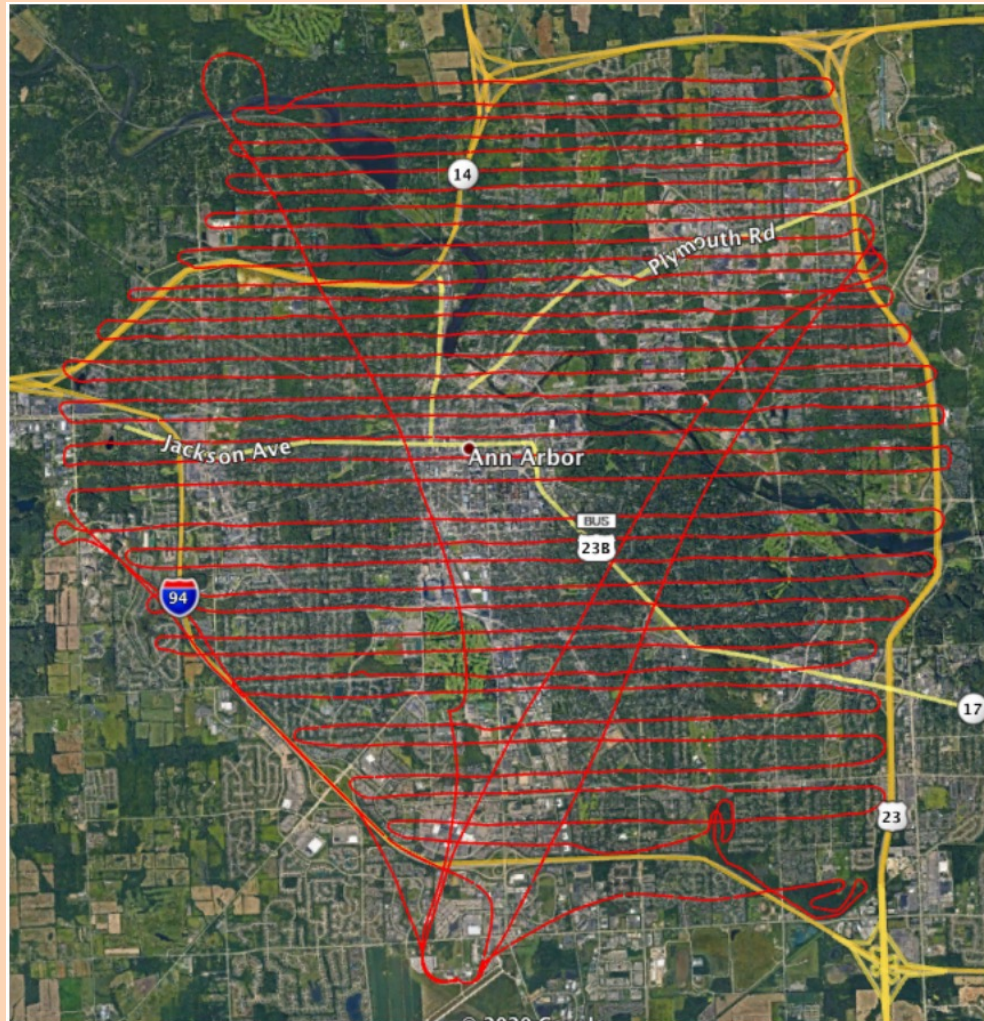


Fig. 3 from DeNicola (2020) showing helicopter transects used in deer survey in 2020. White Buffalo also used camera traps to estimate herd numbers.

Sharpshooting locations

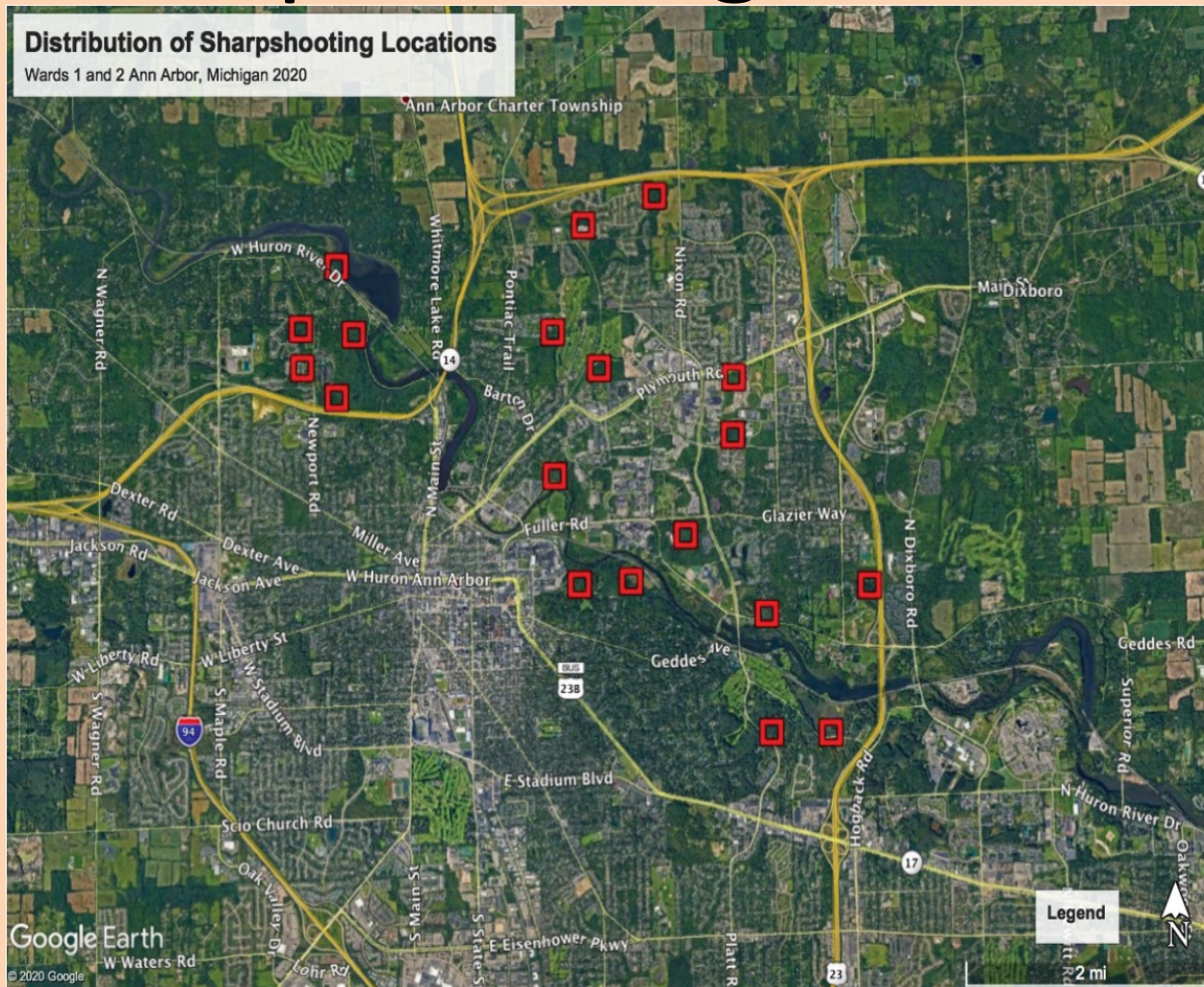


Fig. 1 from DeNicola (2020) showing distribution of sharpshooting locations in Wards 1 and 2 in Ann Arbor.

Female sterilization

- Cost 2-3x per deer more than sharpshooting
- May be only option in densely populated areas
- Sterilized females live longer (e.g. 17 years at Cornell)
- Females w tubal ligations in constant estrus/ buck bait
- Sterilized females tagged and monitored
- Likely death from vehicle collisions



Sterilization sites

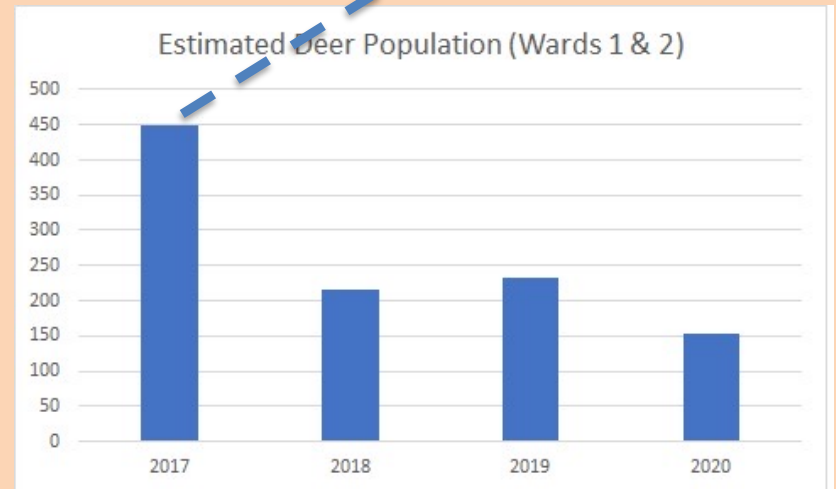


Fig. 2 from DeNicola (2020) showing surgical sterilization study areas (North, East and South Study Areas). Sterilization was used where cull was not possible.

White Buffalo summary

- 53% population reduction from yr 1 (289 deer) to yr 4 (137 deer) within city limits
- Stabilized population within the surgical sterilization zones*

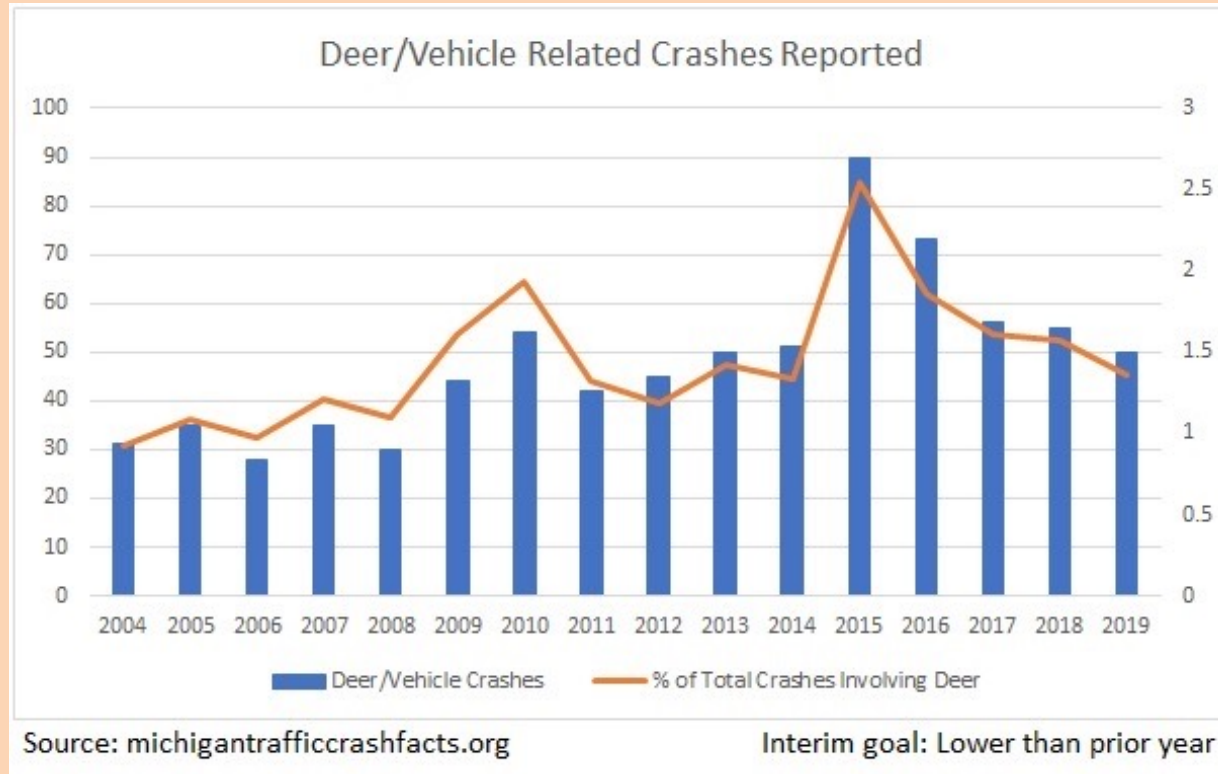
Potential growth averted



Source: White Buffalo Yearly Research Summaries
Pre-2017 population estimates utilized different a different methodology. Figures above are estimates only, based on the best available information.

*Deer sterilization banned in MI until 2022

White Buffalo summary



55% decrease in deer-vehicle collisions

average DVC cost of \$2600 (Cornell Study)

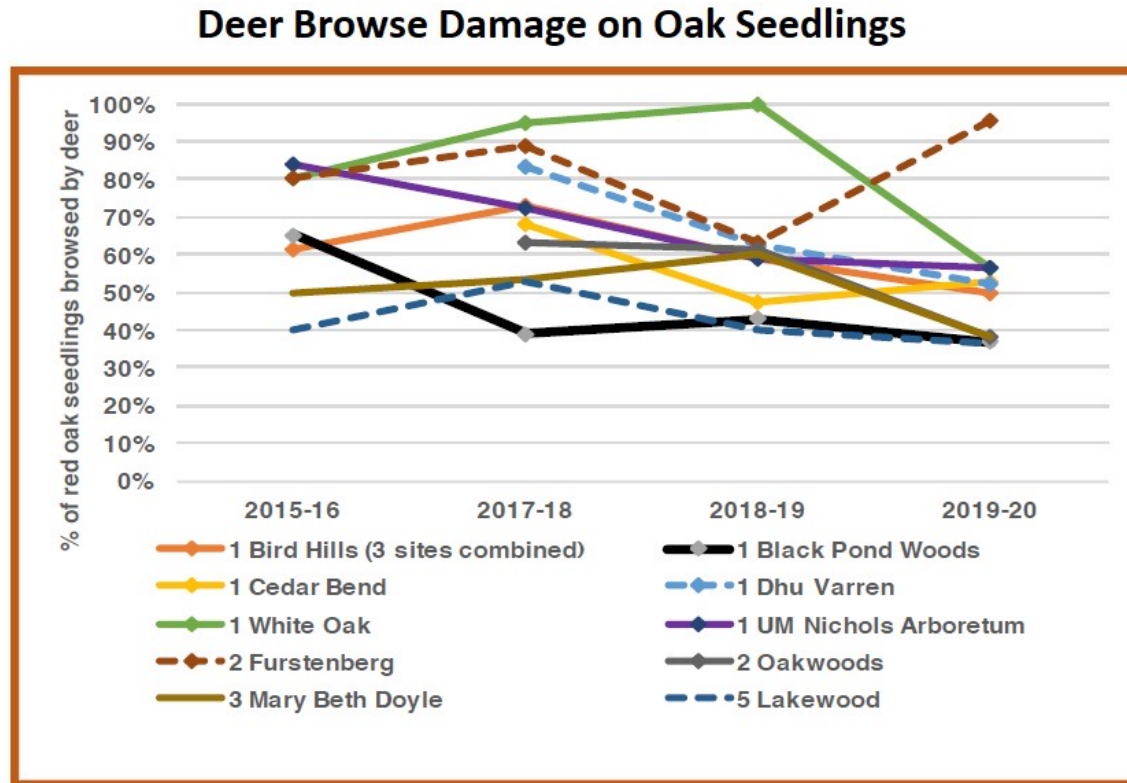
Courteau oak study

>400 red oak (*Quercus rubra*) seedlings (paired open and protected) planted in city natural areas to monitor browse damage.

Because red oaks are of intermediate browse preference, they are a conservative indicator of impacts on more highly preferred plant species.

>15% seedling damage per year is considered too high to permit forest regeneration (Boulanger et al. 2014)

Browsing rates show decline but are still too high for forest regeneration



Trends in Ann Arbor deer impacts, 2016–20. Nature Areas shown with solid lines are sites where oak seedlings were planted within the effective distance (3/8 mile) of deer management; dashed lines indicate that seedlings are >3/8 mile from deer management areas.

Source: Deer Impacts on Oak Seedlings in Ann Arbor Natural Areas Summary, 2020 by Dr. Jacqueline Courteau

Goal: 15%

How can A2 attain carbon neutrality if forests aren't permitted to regenerate?

Deer management program has broad support

Assessment of Deer Management Program Overall, by Ward

Ward	% "Acceptable"	95% Confidence Interval	<i>n</i>	Comparison (2017)
1	70.9%	(65.8% - 75.5%)	340	72.4%
2	72.7%	(67.0% - 77.8%)	264	72.5%
3	67.0%	(61.1% - 72.5%)	264	65.6%
4	72.1%	(66.4% - 77.2%)	265	77.1%
5	75.8%	(70.2% - 80.6%)	264	79.0%
Overall	71.7%	(69.2% - 74.0%)	1,397	73.3%

Source: June 2018 Citizen Survey by MSU.

Goal: 75% Each Ward

Despite vocal opposition, A2 deer management program has broad public support. Support could be increased through better communication.

Recommendations from Cornell study

- Develop a deer study committee
 - Combine University and City resources
 - Evaluate local problems and solutions
- Build trust through effective communication
 - Workshops
 - Outreach activities
- Plan to use lethal methods
 - It is the only method that will work in open forests
- Prepare for political polarization, but in other communities anti-cull sentiment has faded
 - We may be seeing that already in A2

Readings

Indiana Division of Fish and Wildlife (no date) Urban Deer Technical Guide

Courteau, J. (2019) Deer Impacts on Vegetation in Ann Arbor Natural Areas: Key Monitoring Metrics for 2018–2019. Report to City of Ann Arbor.

DeNicola, A. J. (2020) Year four summary report: 2019-2020 deer research program. Ann Arbor, MI. White Buffalo, Inc.

Boulanger, J. R., P. D. Curtis, B. Blossey (2014) An integrated approach for managing white-tailed deer in suburban environments: The Cornell University Study.

Ann Arbor Deer Management Program Website

<https://www.a2gov.org/departments/community-services/Pages/Deer-Management-Metrics-.aspx>