MEMORANDUM

TO: Mayor and City Council

FROM: Howard S. Lazarus, City Administrator

DATE: June 18, 2018

SUBJECT: **Winter 2018 Deer Management Final Report**

REFERENCES:
- 2018 Deer Management Objectives
- Year Two Summary Report - 2018 Deer Research Program, White Buffalo Inc., March 2018
- Deer Impacts on Vegetation in Ann Arbor Park Natural Areas, NatureWrite LLC, April 2018
- Deer Management Program Evaluation, Michigan State University |The Office for Survey Research Institute for Public Policy and Social Research, June 2018

PURPOSE: This memorandum provides City Council and the community the final results from the City's 2018 Deer Management Program. Staff's intent with the development of the deer management 2018 plan was to be inclusive and transparent. Inclusiveness was sought by actively engaging with self-organized citizen groups, both for and against previous programs. Transparency was achieved by maintaining a dedicated page on the City's website (www.a2gov.org/deermanagement) which tracked the development and status of the plan. Full consensus on the plan was not expected and did not occur; however, acceptance of the plan, which contains elements desired by the various parties, was and is desired.

BACKGROUND: The 2018 program was the third year of Council's approved deer management plan. The program operated under a "research" permit from the Michigan Department of Natural Resources (MDNR) and included three primary strategies: lethal removal (culling), non-lethal (sterilization), and an educational component. Without the research permit (to White Buffalo, Inc.), the MDNR would only have permitted lethal culling to reduce the deer population. Because of the research permit, the MDNR is allowing the limited use of sterilization in Ann Arbor. Input into this Plan from the stakeholder's group was instrumental in creating a program which incorporated the various components.

Staff members assigned to this project were: Tom Crawford, Chief Financial Officer, as overall project lead; Derek Delacourt, Community Services Area Administrator; and Dave Borneman, Natural Area Preservation Manager.

GOALS AND OBJECTIVES: Significant progress was made this year to define long-term objectives and measures for the City's Deer Management Plan. These long-term objectives were published on the City's

website at www.a2gov.org/deermanagement (under the Long-Term Objectives heading). 2018 Program specific objectives and measures were also developed. In addition, an on-going process was established to meet with interested stakeholders at least once each year to review and discuss the latest data involving deer impacts in the City and to obtain input on the next year's objectives. It's important to note that the spectrum of opinions and feelings on this topic have not changed and while the stakeholder group will provide input to staff, no group is likely to agree with all of staff's final recommended objectives.

PROGRAMS RESULTS: The information captured during the 2018 program were consistent with the data collection plan approved with the project. These data establish the measures for the program objectives, which are incorporated herein as Attachment 1 – "2018 Deer Management Measures". The first page of the attachment has the problem statement and status of each long-term objective. Page two has the 2018 program-specific results. Additional information about the City's deer program is incorporated in Attachment 2 – "Deer Data Dashboard".

Even though all of the objectives were not met, overall the 2018 program was considered successful by staff for the following reasons:

- The program continued to improve the city's knowledge of the local deer population and its impact in the community.
- The lethal program was implemented without injuries and expanded to incorporate the use of private properties.
- Sterilization rates were high in the primary non-lethal zone and a new (third) sterilization zone was added (where culling is not feasible).
- An educational program was initiated that expanded signage, revised the public website, and launched a Deer Data Tool.

Highlighted below are some of the specific areas of the plan and results from 2018.

Deer Population - The accuracy of the estimates of the deer population continued to improve with another year of data collection. Wards 1 and 2 are estimated to have approximately 216 deer (20 per square mile), including 78 in the sterilization study areas. However, the variation in density across sections of the Wards varied from 6 to 54 per square mile. The largest concentrations were in the southern sterilization study area (39 per square mile) and the western area in the northwest section of the city near Skyline High School (54 per square mile). This suggests the other areas in Wards 1 and 2, not included in a sterilization study area, have population levels near a "maintenance" level.

Browse Damage - For private property, the citizen survey measure of "acceptable" browse damage for Wards 1 and 2 improved in 2018 versus the prior year, but only Wards 3, 4, and 5 were above the 75% objective. The citizen survey was conducted in March and April 2018, so it's a lagging indicator since the impact from the removal of the deer in 2018 will be visible during and after this spring.

For public natural areas, deer browsed 65% of experimental red oak seedlings across 13 natural areas and 70% or more of experimental wildflower plants at 4 sites (50% at a 5th site). The vegetation metrics don't show a reduction in deer impacts, but it takes at least 3 years of data to establish a trend and the city has only completed two years of study to-date.

Lethal Removal (Culling) – 115 deer were lethally removed from the city in 2018. This was substantially below the 250 objective; however, this was due in part to the revised lower deer population estimates.

Aspects of implementing this operation remain challenging, but the addition of private property as a viable and safe option, as well as other lessons learned, support the continued use of this facet of the program.

Sterilization (non-lethal) – 18 deer were sterilized in 2018. This increased sterilization rates to >96% in the southern study area, 70% in the area near Cedar bend, and a yet to be determined rate in the new third zone on the eastern side of Ward 2. There were no mortalities associated with the sterilization program. The city was also successful in achieving MDNR and state legislature agreement to allow Ann Arbor to continue the sterilization program for the duration of the research project. Being able to utilize sterilization to access the deer that would otherwise not be accessible supports the continued use of this study project.

Education Efforts – An education stakeholder's group was utilized to help identify areas in the city where deer warning signage could be improved. Staff installed signage during the fall. The content of the city's website was revamped to improve its educational effectiveness and a new map-based Deer Data Tool was launched. Despite these improvements, managing the variety of perspectives to achieve an agreed-upon outcome was very difficult. The education stakeholder group was ultimately disbanded and going forward staff anticipates utilizing a temporary city staff member to assist with the program.

Data Collection – The data collected for this program continues to help refine and improve the plan. Data collection presently costs approximately $60k per year. However, there is opportunity for staff to reduce the frequency and cost of collection (i.e. survey data) after baselines and trends are established.

Social Equity of Program Input – Few city projects have had the resources available to measure the validity of input by social demographic. Section II and Appendix B of the citizen survey (performed by Michigan State University's Institute for Public Policy and Social Research in the Office for Survey Research) describe how the survey handled demographic variations and ultimately how the survey measures the views of those who know and care most about the deer issues more than those who are less informed or indifferent.

Costs – The 2018 program cost $275k to implement, including allocated city staff time and ancillary costs. This is $94k under budget. Financial details are included in Attachment 3 – "2018 Deer Management Budget" report. Although the 2018 program cost is significant, it reflects a smaller than anticipated program as sections of the city are believed to have reached a "maintenance" outcome. Further reductions in the recurring costs of this project are anticipated as more of the objectives are met.

NEXT STEPS: The Winter 2019 deer management program will be developed, incorporating the lessons learned from 2018, and shared with City Council by the fall of 2018. At this time, no new contracts beyond the multi-year contracts approved last year are anticipated to be required.

COORDINATION AND COMMUNICATION: The primary point of contact for this program is changing from Tom Crawford to Derek Delacourt, who can be reached at 734-794-6110 x43902 or at ddelacourt@a2gov.org. Mr. Delacourt has assigned Dave Borneman as the Project Lead.

3 Attachments

1 – 2018 Deer Management Measures
2 – Deer Data Dashboard
3 – 2018 Deer Management Budget report

2018 Deer Management Measures

PROBLEM:

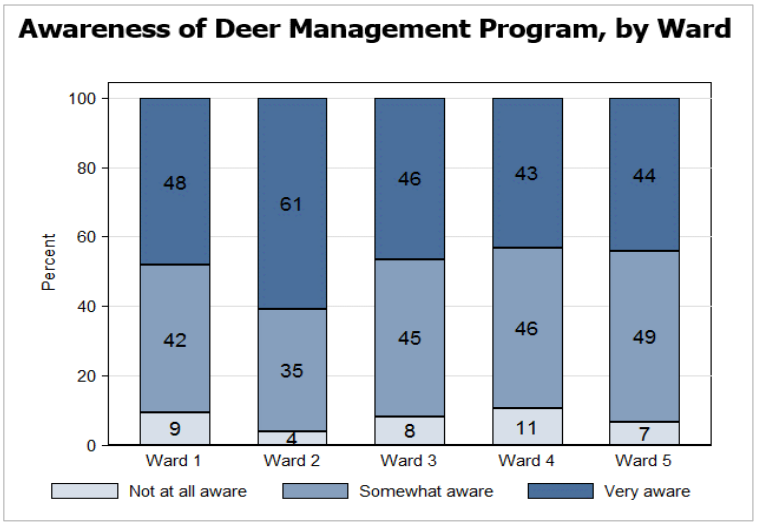
- Deer browsing is adversely impacting beyond the tolerance level of a portion of the City's residents, the bio-diversity and sustainability of plants/animals/insects in the City's natural areas.
- Deer browsing is adversely impacting beyond the tolerance level of a portion of the City's residents, the residential and commercial gardens/ landscaping on private land.
- The number of deer/vehicle accidents averaged 62 over the past five years versus 41 over the five years before that.
- A segment of the City's residents has a higher tolerance for deer, views them in a positive light, and is advocating for a change in the deer management program that includes non-lethal methods, education, and/or no action all.

MEASURES OF SUCCESS	STATUS
Long-term Measures:	
• Number of firearm related injuries associated with the deer management program is 0.	0
• Total number of deer/vehicle crashes reduced to 40 per year, and percent of vehicle crashes involving deer reported in the legal boundaries of the City of Ann Arbor reduced to 1.3%, assuming no major changes in total vehicle crashes.	Not Yet Available
• Reduce deer browse damage in the City's natural areas to a sustainable range of 15% to 30%, as measured by NatureWrite's field study. This measure will be regularly re-visited to reflect the latest information available.	Only 1 Study Area Achieved 30%. At Least One Additional Year Needed to Establish Trend.
• Maintain community-based education program about the role of deer in the local ecology and identify options for residents to manage potential deer impacts on their private property.	Effort Initiated. Temp Employee Being Hired to Support.
• Community acceptance of herd impact - when 75% of surveyed residents in a Ward respond that damage to their landscape or garden plants is at an acceptable level on private lands. Recognizing there will be variability of this measure over time, a trend towards 75% is desired.	Ward 3 was 67%. Wards 1, 2, 4 & 5 were 71% - 76% (statistically indistinguishable from the 75% objective).
• Community acceptance of deer management program - when 75% of surveyed residents in a Ward respond that the City's strategy of managing the deer population is acceptable. Recognizing there will be variability of this measure over time, a trend towards 75% is desired.	Ward 3 was 67%. Wards 1, 2, 4 &5 were 71% - 76

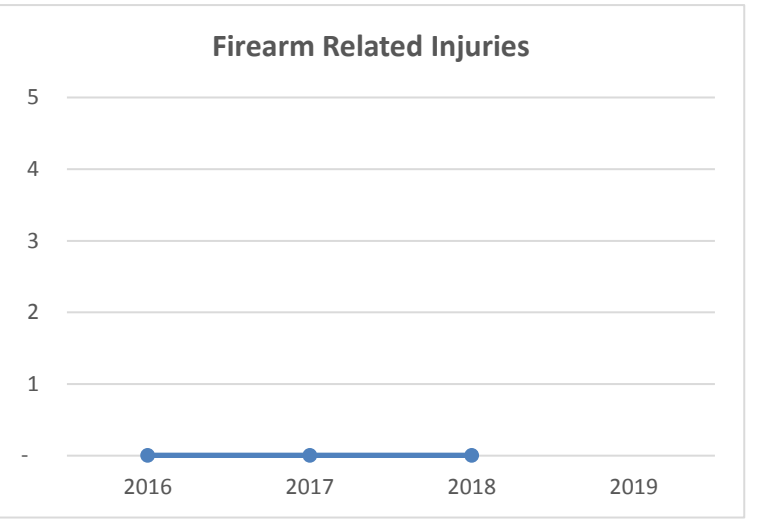
2018 PROGRAM SPECIFIC MEASURES	STATUS
Sterilization Program:	
• Obtain an amended permit from the Michigan Department of Natural Resources (MDNR) for a deer sterilization program.	Obtained
• Sterilization of at least 98% of the female deer in the original research areas 1 and 2.	Area 1: >96% Area 2: 70% (3 does)
• Sterilize at least 95 percent of the female deer in a new third zone, such that the cumulative sterilizations for all three zones are not more than 80.	Area 3: Can't be determined until next year.
• Mortality rate associated with sterilization less than 2 percent.	0%
• Investigate with University of Michigan if there are appropriate locations for sterilization.	None for 2018
• Obtain a written update on the scientific results to-date on the sterilization efforts.	Report Received. Published on City website.
Lethal Program:	
• Number of firearm related injuries associated with cull activities is 0.	0
• Remove 250 deer.	115
• Level of public park closures is acceptable to at least 75 percent of surveyed residents.	All 5 Wards met or exceeded objective.
• Coordinate with University of Michigan to increase the number of available locations for the deer management program.	Achieved
Education:	
• Review the city's "Fencing" ordinance and existing deer signage locations. Recommend and implement changes and improvements.	Phase I (Signs) Completed. Fencing on hold.
• Develop and publish an expanded deer education component to the city's deer management website, including a deer-resistant gardening campaign.	Completed
• Develop an interactive information/mapping tool.	Completed
• Create and hold a public forum designed to address questions related to the city's deer management program.	Deferred, at this time
• Establish an on-going education program.	See above actions.

DEER DATA DASHBOARD

ATTACHMENT 2



Source: June 2018 Citizen Survey by MSU.



Source: White Buffalo. Goal: 0

Deer Browse Damage on Oaks

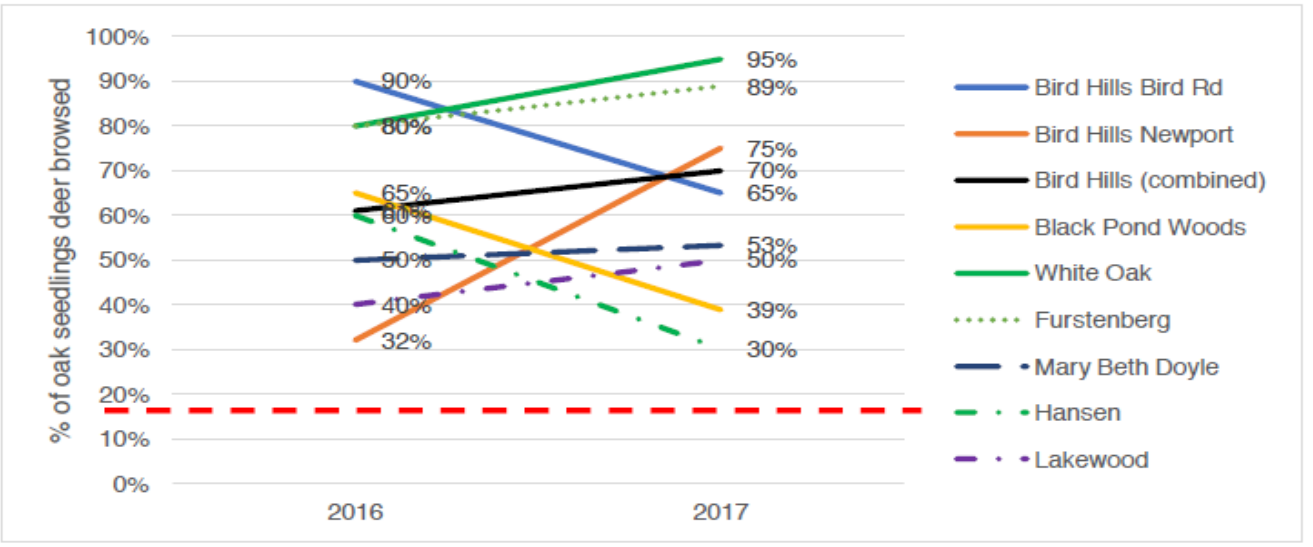


Figure 14. Change in % oaks deer browsed from 2016 to 2017 in Ann Arbor natural areas. Data for sites monitored for two full years. Browse levels at Bird Hills are shown separately for the Bird Road and Newport Road sites; Bird Hills (combined) shows the average for the full site. Natural areas are grouped by wards, which correspond to geographical areas: solid lines indicate natural areas in Ward 1 (north central), dotted lines are Ward 2 (northeast), small dashes and dots are Ward 3 (southeast), and large dashed line indicates Ward 5 (northwest). The red dashed line shows the 15% deer browse level above which oak forest regeneration is unlikely to succeed.

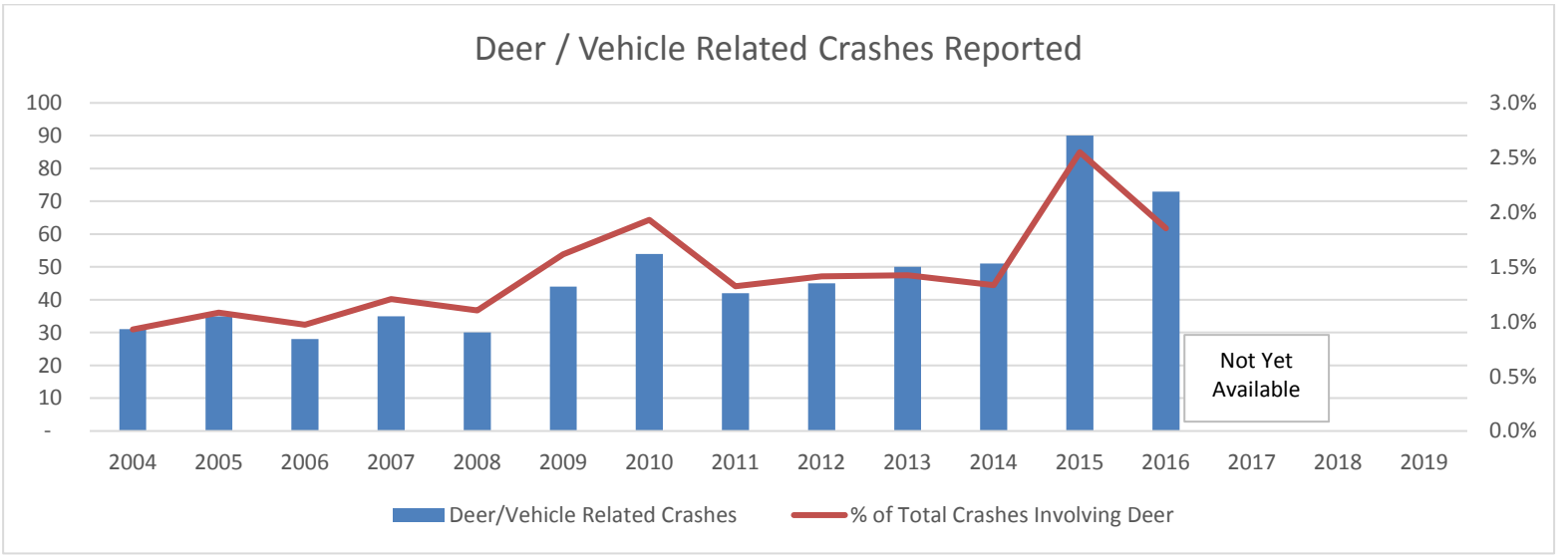
Source: May 2018 Study - Monitoring Deer Impacts on Natural Vegetation by Dr. Courteau. Goal: 15%

Assessment of Amount of Deer Damage Among those with Lawns, by Ward

Ward	% "Acceptable"	95% Confidence Interval	*n*	*N/A (No Lawn)*	*Comparison (2017)*
1	72.0%	(65.9% - 77.3%)	239	102	64.5%
2	51.6%	(45.0% - 58.2%)	219	49	44.0%
3	77.4%	(71.0% - 82.7%)	199	67	84.3%
4	82.3%	(75.7% - 87.4%)	164	101	85.7%
5	83.4%	(77.1% - 88.3%)	175	90	78.5%
Overall	*72.2%*	*(69.3% - 74.9%)*	*775*	*312*	*69.8%*

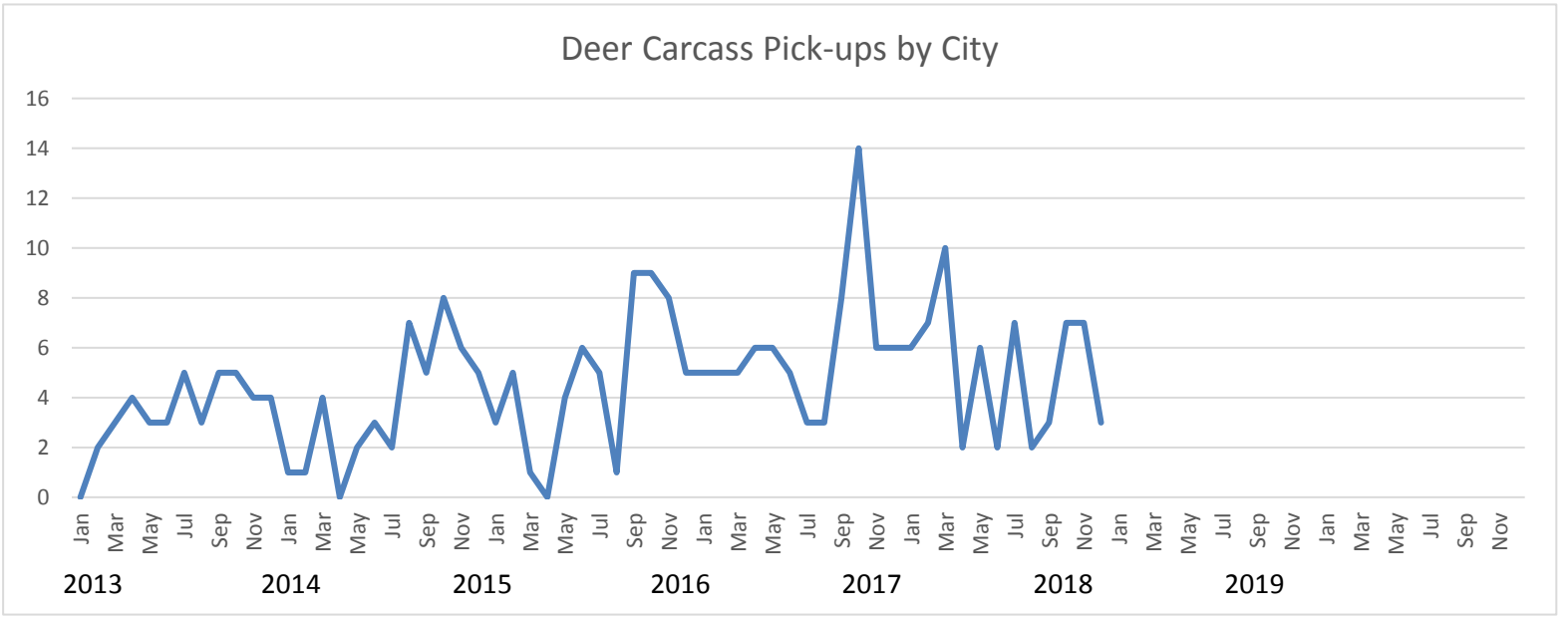
Source: June 2018 Citizen Survey by MSU. Goal: 75% Acceptable

DEER DATA DASHBOARD



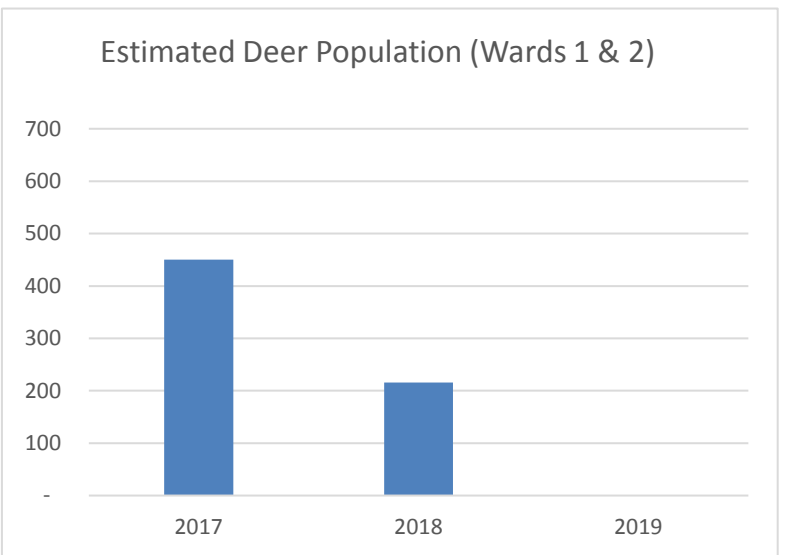
Source: https://www.michigantrafficcrashfacts.org

Interim Goal: Lower than prior year

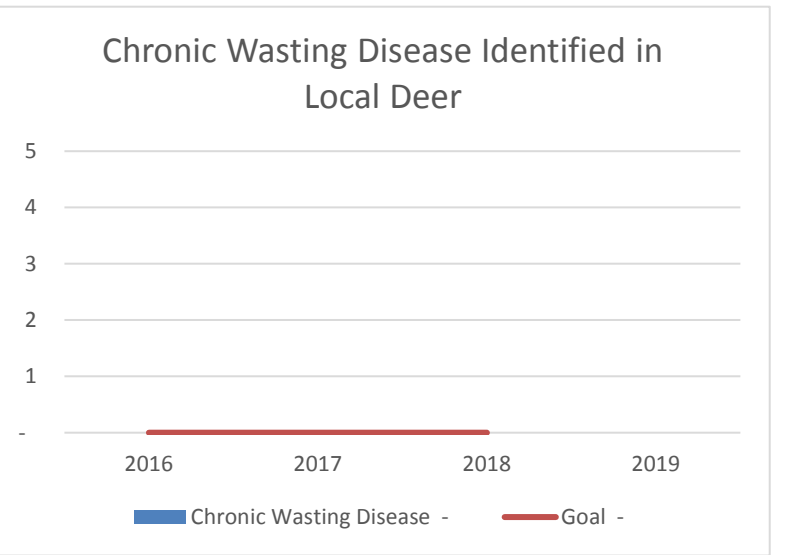


Source: Ann Arbor Police Dept.

Goal: Not Established

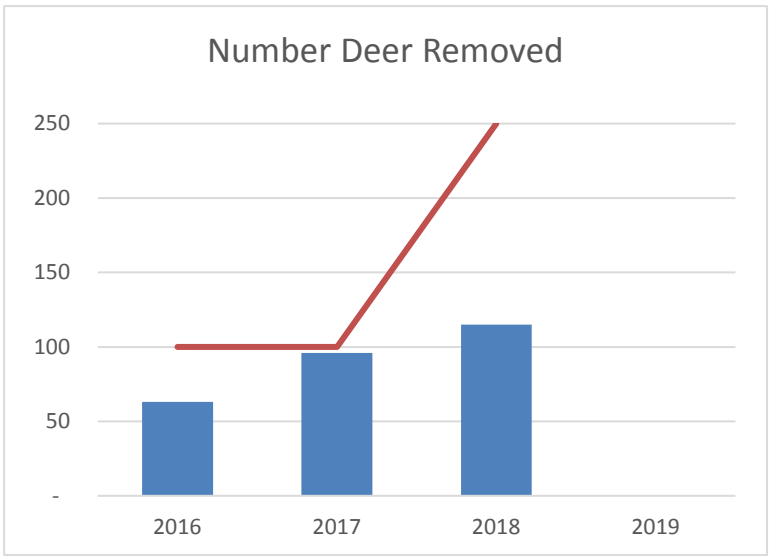


Source: 2018 Deer Research Program by White Buffalo Inc.
Pre-2017 populations estimates utilized different methodology.

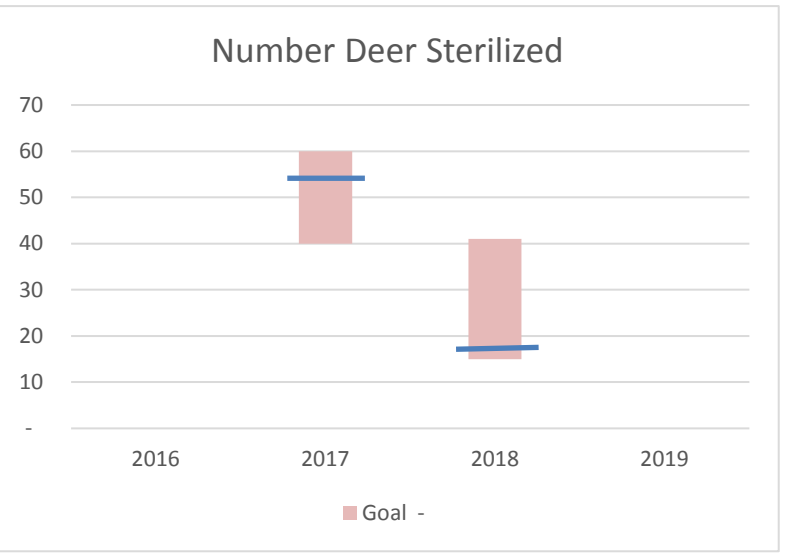


Source: Michigan Dept. of Natural Resources.

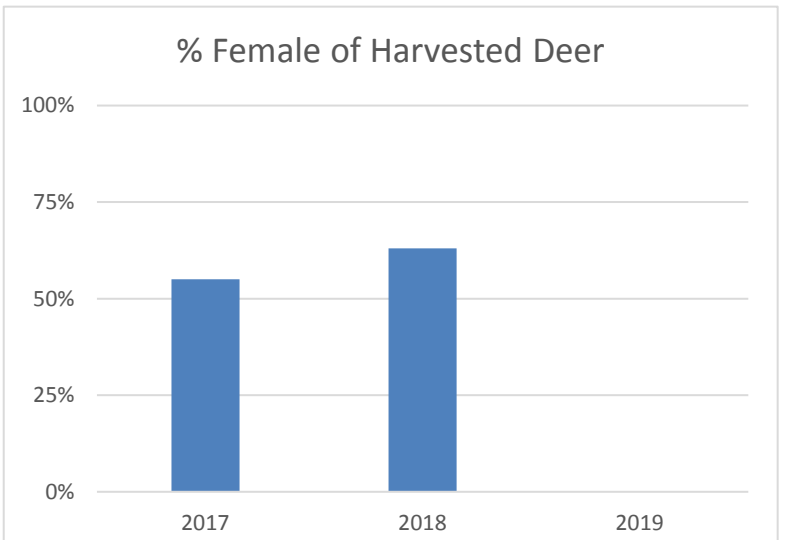
DEER DATA DASHBOARD



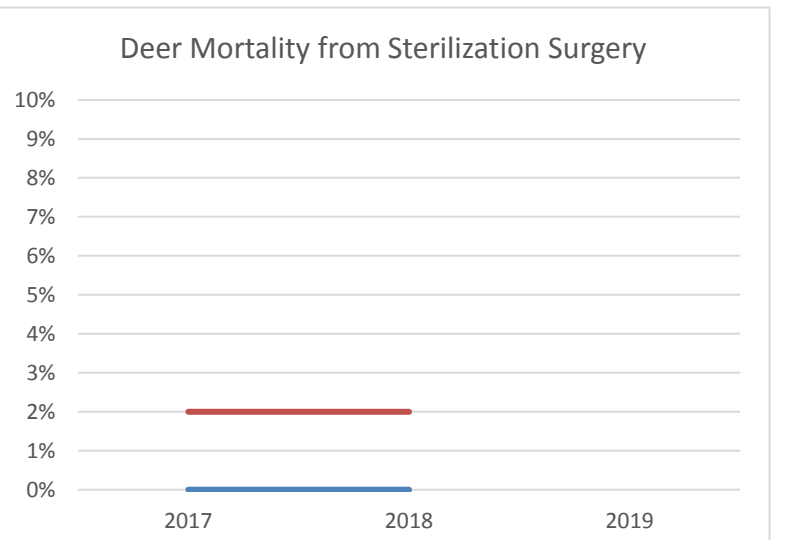
Source: 2018 Deer Research Program by White Buffalo Inc.
Red Line: 2018 Goal was 250.



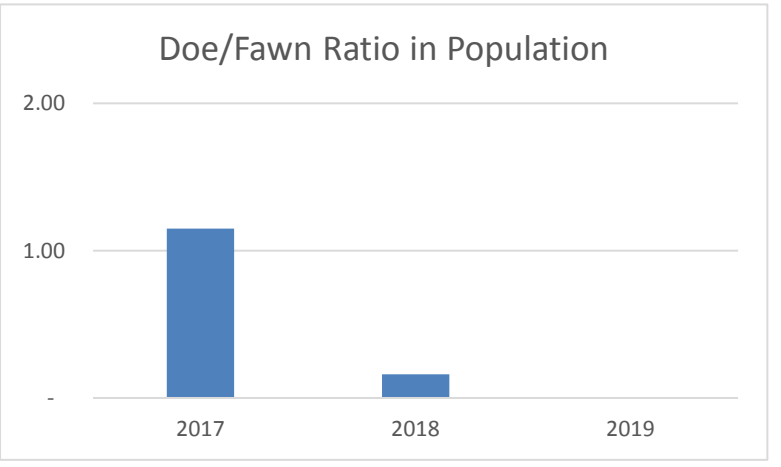
Source: 2018 Deer Research Program by White Buffalo Inc.
Red Area: 2018 Goal 15-26



Source: 2018 Deer Research Program by White Buffalo Inc.
Goal: Not established



Source: 2018 Deer Research Program by White Buffalo Inc.
Actual: 0% Red Line: 2018 was less than 2%.



Source: 2018 Deer Research Program by White Buffalo Inc.
Goal: Not established

Assessment of Deer Management Program Overall, by Ward

Ward	% "Acceptable"	95% Confidence Interval	*n*	*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

ATTACHMENT 3

2018 Deer Management Budget

	2018 Budget	Actual	Forecast	(Over)/ Under Budget
DATA COLLECTION				
Aerial Deer Survey plus equipment	$ 5,000	$ 4,410	$ 4,410	$ 590
Wildlife Monitoring (Vendor costs for tracking/processing data)	8,000	7,315	7,315	685
Citizen Survey	20,000	16,917	20,000	-
Vegetation Impact Study - Oak Seedlings	17,250	-	17,250	-
Vegetation Impact Study - Wildflowers	15,750	-	15,750	-
Subtotal Data Collection	**$ 66,000**	**$ 28,642**	**$ 64,725**	**$ 1,275**
Site Visit, Planning, Permitting (incl. travel)	**15,000**	**13,021**	**13,021**	**1,979**
LETHAL				
Vendor Cost (Prep, sharpshooting, travel, processing)	112,540	79,794	79,794	32,746
City staff time charged - baiting/monitoring	28,000	34,200	34,200	(6,200)
City - location monitoring by contractor	25,000	9,225	9,225	15,775
Materials & Supplies:				
Bait	1,500	2,458	2,458	(958)
Signs/fencing	2,000	2,487	2,487	(487)
Pickup food donation for local Food Bank	750	175	175	575
Processing Deer	-	14,062	14,062	(14,062)
Miscellaneous	1,810	390	390	1,420
Subtotal Lethal	**171,600**	**142,791**	**142,791**	**28,809**
Less: UM financial support			**(27,500)**	**27,500**
Less: Sportsmen for Hunger	**-**	**-**	**(4,655)**	**4,655**
Subtotal - Net Lethal expense	**171,600**	**142,791**	**110,636**	**60,964**
NON-LETHAL				
Vendor - Non-lethal (capture, sterilization, supplies, travel)	70,400	61,516	61,516	8,884
City staff time charged - baiting/monitoring	14,000	14,018	14,018	(18)
City - Police staff riding with non-lethal	8,000	1,719	1,744	6,256
Materials & Supplies	-	7,361	7,361	(7,361)
Subtotal Non-Lethal	**92,400**	**84,614**	**84,639**	**7,761**
Less: UM financial support			**-**	**-**
Less: A2 Non-lethal Deer Management donation			**-**	**-**
Subtotal - Net Non-lethal	**92,400**	**84,614**	**84,639**	**7,761**
EDUCATION				
Signage - permanent	5,000	-	2,500	2,500
Signage - temporary	5,000	806	806	4,194
Other Initiatives	15,000	-	-	15,000
Subtotal Education	**25,000**	**806**	**3,306**	**21,694**
Totals				
Expenses	**370,000**	**269,874**	**308,482**	**61,518**
Donations/Contributions	**-**	**-**	**(32,155)**	**32,155**
Net Expense to City	**$ 370,000**	**$ 269,874**	**$ 276,327**	**$ 93,673**
Number of Deer Removed	250-350		115	
Number of Deer Sterilized	26		18	
Volunteer Hours (estimated)	tbd		tbd	