

**Sault College
St. Joseph Island
White-tailed Deer Check Station: 2018 summary**
February 25, 2019

This document is intended for information purposes only.



Contents

Overview	2
Recommendations	3
Acknowledgements	3
Methods	4
Results and Discussion	6
Literature Cited	15
Appendix A. Hunting effort and deer sightings by Township, WMU 45, 2014 – 2018.	17
Appendix B. Deer harvest data sheet.	18
Appendix C. Deer and other wildlife population status and trends data sheet	19

List of Tables and Figures

Table 1. Snow depth data, 2010-18	6
Table 2. Deer Check Station harvest in WMU 45, 2010-18.....	7
Table 3. Deer Check Station highs (dressed weight, no. of points, antler beam diameter) and lows (dressed weight), 2012-18.	12
Table 4. Wildlife population status questionnaire, 2018: deer and predators	13
Table 5. Wildlife population status questionnaire, 2018: upland game birds	14
Figure 1. Representative lower jaws from deer aged ½ yr to 3½ yrs old	3
Figure 2. Harvest by township in WMU 45, 2010-18	8
Figure 3. Average number of deer seen per hunter, 2014-18	9
Figure 4. Average number of deer seen per hunter-hour, 2014-18	9
Figure 5. Average antler beam diameter of yearling bucks, 2010-18	11
Figure 6. Average fawn dressed weight, 2010-18	11
Figure 7. Average number of points on antlered deer, 2010-18	12

Overview

The voluntary St. Joseph Island White-tailed Deer Check Station is led by 2nd year Sault College Fish & Wildlife Conservation Technician students with the assistance of all Sault College Natural Environment & Outdoor Studies students. Although the focus of the Check Station is **Wildlife Management Unit (WMU) 45** (St. Joseph Island, 376 km²), data is collected from other WMUs as well, notably from the mainland in **WMU 36**. The data is provided to the local Ontario Ministry of Natural Resources & Forestry (MNRF) to support them in making sound, informed decisions regarding the harvest management of the deer herds. As an incentive for hunters to check their deer, hunters are rewarded, as always, with an MNRF Deer Hunter crest. The Check Station hours of operation at Mom's Restaurant on St. Joseph Island in 2018 were: 9:30 a.m. to 7:00 p.m Saturday, November 10 to Friday, November 16 (Firearm Season) and 9:30 a.m. to 2:30 p.m on Saturday, November 17. The Check Station did not operate in 2017.

A total of **155 deer** were processed at the Check Station through to the end of the Firearm Season in **November, 2018: 119 deer** from **WMU 45** (including 8 deer from the early Archery Season) and **34 deer** from **WMU 36**. The average number of deer seen per hunter and deer seen per hunter-hour increased in **WMU 45** from 2016 to 2018. There was, however, a potential effect of winter 2017 - 2018 on deer productivity through the spring of 2018 owing to a decrease in the number of lactating does (2½ yrs and older) in the harvest from 66.7% in 2016 (15 does sampled) to 40.0% in 2018 (15 does sampled). The weight of lactating does decreased negligibly from 126.9 lbs (dressed weight, sd = 18.7) in 2016 to 121.3 lbs (sd = 10.5) in 2018. Although winter 2017-18 was considered mild at the Caufield Lake Snow Station (St. Joseph Island), the decline in lactating does could be an artifact of a small sample size and/or the result of food stress caused by a late green-up (fawn loss at birth), a dry spring/early summer (newborn fawn mortality), and predation. Fawns that entered the winter of 2017-18 appeared to have a high survival rate as the number of yearling bucks in the harvest in 2018 as a percentage of all bucks harvested is consistent with harvests following mild winters. This could also indicate a population with a lower percentage of older deer (e.g., 3½ yrs and older). However, a decline in yearling antler beam diameter (a commonly used index to gauge overall deer herd health) was observed in **WMU 45** and **36** indicating that male fawns making it through the winter of 2017-2018 were likely stressed to some degree, potentially due to a late green-up and/or dry spring/early summer conditions affecting the quality of available forage.

Winter 2018-19 is predicted to be a moderate winter at best on St. Joseph Island which will likely lead to lower fawn survival (Voigt et al. 1997) and a subsequent decline in the number of yearling bucks in the 2019 harvest. Fawn mortality at birth may also be substantial. For example, a "**mild**" winter with a Snow Depth Index (SDI) of <590 may equate to a 0 – 20% fawn loss at birth; a "**moderate**" winter with an SDI of 591 – 760, 20 – 40% fawn loss at birth; and a "**severe**" winter with an SDI of >760, >40% fawn loss at birth (OMNR 1997). The length of winter (residency in deer yards), winter severity (SDI but also temperature and sinking depth), and the number of deer the habitat can support, as determined through the availability of suitable winter browse (i.e., carrying capacity) are all factors that determine how long deer fat reserves last and subsequent survival rates (Mautz 1978, Potvin and Huot 1983).

Recommendations

- Establish a check station on the mainland during the **WMU 36** Firearm Season through one or more depots and/or a manned station operated on specific days
- Emphasize importance of having yearling bucks (antler beam diameter is important), adult does (lactation status), and fawns (weight) be brought through the Check Station
- Encourage more individuals (hunters and the general public) to fill out the “wildlife population status” questionnaire
- Attempt to collect more data from deer harvested during the Archery Season as it was shown in Michigan that the firearm and archery harvest sex and age ratios differed (Mattson and Moritz 2006)
- Stress importance to hunters and the general public the value of identifying, monitoring, maintaining and enhancing deer winter habitat

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Methods

Data collected includes (also see data sheet, **Appendix B**):

- Date and location of harvest
- Number of deer seen, hours actively spent hunting
- Sex and weight (1,000 lb platform scale)
- Age using tooth replacement and wear (see **Fig. 1**)
 - Tooth replacement allows fawns and 1½ year old's (yearlings) to be confidently separated from deer 2½ years of age and older (e.g., Hamlin et al. 2000, Gee et al. 2002)
 - Fawns (½ yrs, 6 months) will have less than 6 cheek teeth present; usually 4 cheek teeth: 3 milk teeth (premolars; 3rd one is tricuspid) and their first molar – **see Fig. 1A**
 - Yearlings (1½ yrs, 18 months) will have 3 premolars and 3 molars
 - Usually replacement of 3 milk teeth has not occurred (confirmed if 3rd cheek tooth is tricuspid – **see Fig. 1B and Fig. 1C, top**)
 - Occasionally a yearling will have 3 newly erupted premolars (the 3rd tooth will be bicuspid and teeth will have minimal staining compared to the molars – **see Fig. 1C, bottom**)
 - Tooth wear patterns allow placement of deer in the following age classes: 2½, 3½, 4½, 5½, and 6½ years and older, however, this method has been shown to be inconsistent thus data should be used with caution (e.g., Hamlin et al. 2000, Gee et al. 2002, Copper et al. 2013, Storm et al. 2014)
 - **Fig. 1** shows examples of deer aged 2½ (**Fig. 1D**) and 3½ yrs (**Fig. 1E**)
- Number of antler points >1 inch (>2.54cm); length exceeding width at 1 inch or more of length
- Antler beam diameter (mm) measured 1 inch above the burr on one antler; two measurements at right angles
- Lactation status of adult (2½ and older) does; only confirmed evidence of lactation or that a doe showed no earlier signs of lactation (confirmed dry) is recorded
- Current population status of deer and other wildlife and perceived changes over the past year (see data sheet, **Appendix C**)
- MNRF was assisted with collecting samples for CWD determination in 2016 but not in 2018 as their CWD monitoring staff rotate annually to other WMUs

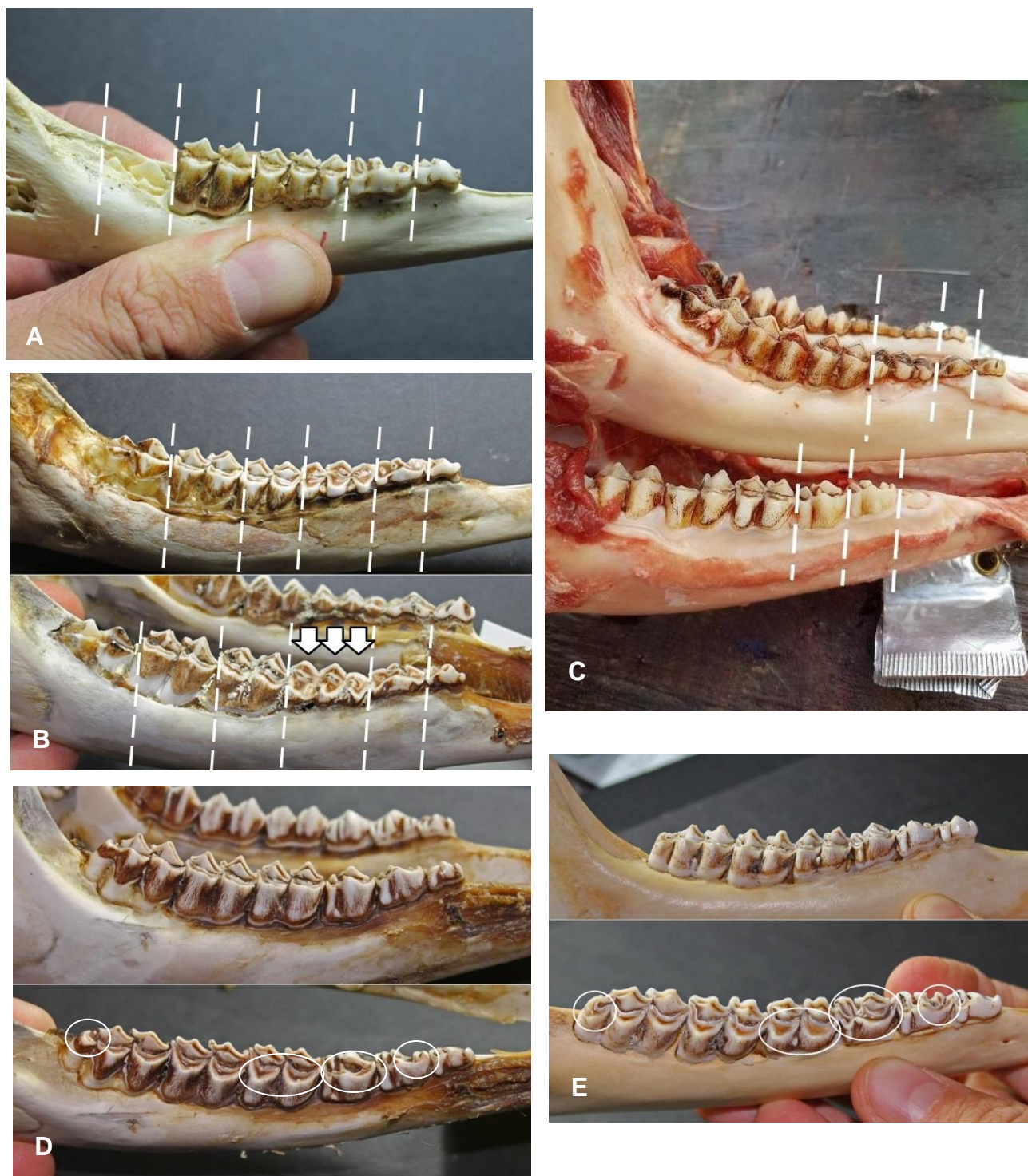


Figure 1. Representative lower white-tailed deer jaws from a (A) fawn ($\frac{1}{2}$ yr) and (B, C) yearlings ($1\frac{1}{2}$ yrs) aged using tooth replacement, and a $2\frac{1}{2}$ yr old (D) and $3\frac{1}{2}$ yr old (E) aged based on tooth wear.

Results and Discussion

Winter 2017-18 was considered mild based on snow depth recorded weekly at the St. Joseph Island Snow Station (southeast corner of Island). The winter was considered moderate on the mainland at the Desbarats Snow Station (**Table 1**). There is anecdotal information available (landowner observations) to suggest that green-up occurred later than normal on St. Joseph Island and the mainland in effect extending the length of winter. Snow Station data is usually collected each Monday and did show that the last day with measurable snow was April 23, 2018 (St. Joseph Island) and April 30 (Desbarats) which is later than normal (**Table 1**). Moving forward it is suggested that data on green-up occurrence should be collected, if possible, as it is very important in determining the stress deer endure through winter until green-up occurs. In reality, winter does not end for a deer until green-up occurs, when grasses and other potential forage begin to grow providing deer with a food source enabling them to recover from substantial weight loss incurred through winter.

Table 1. Snow depth data. Note: as snow depths are usually read each Monday, the last day with measurable snow refers to that date.

Winter	St. Joseph Island ¹			Desbarats ²		
	SDI ³	winter severity ³	last day with measurable snow	SDI	winter severity	last day with measurable snow
2009-2010	205.8	mild	March 08			
2010-2011	240.0	mild	March 21			
2011-2012	209.2	mild	March 19	109.0	mild	March 12
2012-2013	601.8	moderate	April 22	592.6	moderate	April 22
2013-2014	792.0	severe	April 14	694.4	moderate	April 28
2014-2015	347.0	mild	April 13	563.7	mild	April 13
2015-2016	259.2	mild	April 18	289.6	mild	April 18
2016-2017	302.8	mild	March 27	488.2	mild	April 03
2017-2018	453.6	mild	April 23	666.6	moderate	April 30
2018-2019	50% chance of severe conditions by late March based on SDI of 361 (Feb. 11, 2019)			70% chance of severe conditions by late March based on SDI of 415 (Feb. 11, 2019)		

¹ Caufield Lake Snow Station; located at the southeast corner of St. Joseph Island

² Desbarats Lake Snow Station; located 2 km northeast of Desbarats

³ SDI, snow depth index, is the cumulative total of the weekly average snow depth readings (ten readings per station); measurements are usually taken each Monday. A SDI of <590 represents a mild winter; 591-760, moderate; and >760, severe (OMNR 1997).

Yearling buck harvest is typically 40% or greater of all antlered bucks harvested in areas with no antler restrictions and/or healthy deer herds (e.g., MDNR nd, MDNR 2015, QDMA 2018). Yearling bucks as a percentage of all antlered bucks harvested in 2018 (52.6%) was consistent with other harvests in **WMU 45** following mild winters (**Table 2**). Following the moderate to severe winters of 2012-13 and 2013-14, only 33.3% and 27.8% of antlered bucks harvested were yearlings. This is not surprising as reduced fawn survival during moderate to severe winters will produce a smaller crop of yearling bucks for the subsequent fall harvests (MDNR, 2015). For comparison, the average yearling buck harvest between 2005 – 2014 was 43% in the eastern Upper Peninsula of Michigan, (MDNR 2015) and 43 – 47% statewide between 2014 and 2016 (QDMA 2018).

The total number of antlered bucks coming through the Check Station experienced lows in 2013, 2014, and 2015 which likely reflect the decrease in the number of yearling bucks harvested (**Table 2**). This could be due, in part, to reduced fawn survival during the moderate to severe winters of 2012-13 and 2013-14 and fawn losses at birth following both winters (OMNR 1997, Voigt et al. 1997). The low number of antlered bucks in 2015 may be indicative of a population recovery from the two previous challenging winters.

Table 2. Deer Check Station antlered and antlerless harvest in WMU 45 during the Firearm and early Archery Seasons, 2010 – 2018.

Harvest Year	Antlered		Antlerless		Antlerless as % of total harvest	Antlerless tag allocation (WMU 45) ¹	Total harvest (% of MNRF harvest estimate)	MNRF harvest estimate ²
	1½ and older	Yearling (1½) %	1½ and older	Fawn				
2010	100	54.0%	35	17	34.2%	375	152 (44%)	345
2011	105	61.9	29	37	38.6	500	171 (29)	598
2012	93	59.1	24	20	32.1	600	137 (29)	525
2013	48	33.3	40	18	54.7	600	106 (21)	515
2014	54	27.8	27	17	44.9	525	98 (27)	364
2015	45	60.0	31	15	50.5	525	91 (28)	326
2016	84	59.5	29	18	35.9	400	131 (34)	388
2017						425	no data	515
2018	76	52.6	26	17	36.1	525	119 (n/a)	no data

¹ tag allocation retrieved from annual Ontario Hunting Regulations Summaries

² harvest estimate by MNRF for WMU 45 (Firearm and Archery) based on replies received from a sample of hunters. Source: <https://www.ontario.ca/data/white-tailed-deer-hunting-activity-and-harvest> (accessed Feb. 25, 2019)

The percentage of deer coming from each of the three Townships on St. Joseph Island has remained consistent from 2010 through 2018 with nearly half of the harvest consistently coming from the Township of St. Joseph (**Fig. 2**). Although all three townships are similar in size (Hilton, 115.8 km²; Joceyln, 131.5 km²; St. Joseph, 129.1 km²), the township of St. Joseph contains a mixture of agricultural land and mature deciduous forest while the other townships are predominately mature deciduous forest with significant areas of lowland coniferous forest.

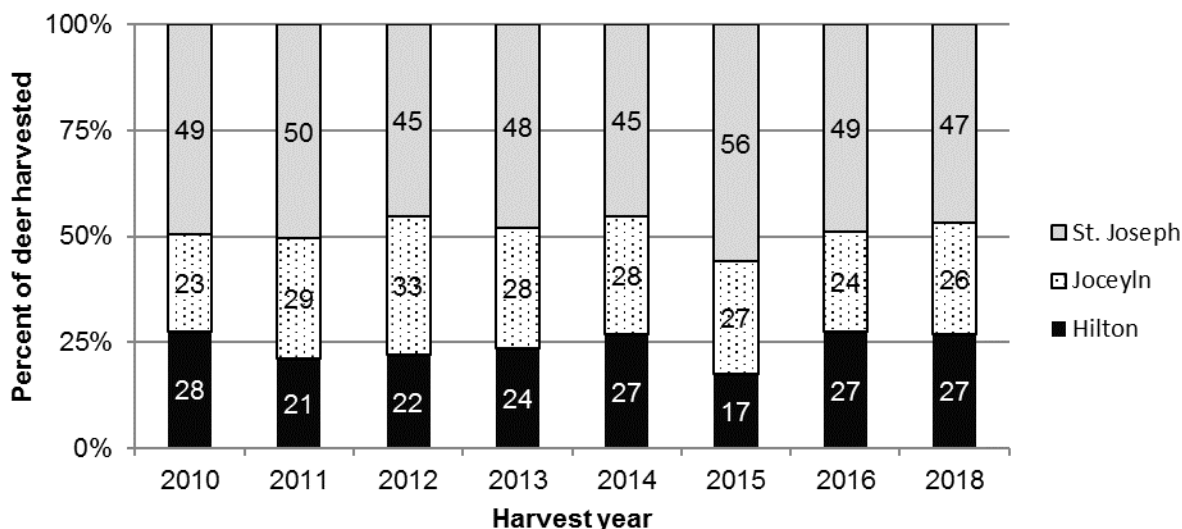


Figure 2. Harvest by township in WMU 45 during the Firearm and early Archery Seasons, 2010 – 2018.

Although there was a small sample size of hunters, the average number of deer seen by a hunter in **WMU 36** increased from 6.8 in 2016 (8 hunters reporting) to 8.0 in 2018 (22 hunters reporting). When taking into account the hours hunted, however, only a negligible increase in deer seen per hunter-hour was observed, from 0.30 to 0.33. The average number of hours hunted was similar in 2016 (22.9 hrs/hunter) and 2018 (24.1 hrs/hunter).

The average number of deer seen per hunter increased in **WMU 45** across all Townships from 2016 to 2018 (**Fig. 3, Appendix A**). This increase was still observed when taking into account the hours hunted (**Fig. 4, Appendix A**). Something not considered here is the effect of temperature and other climate variables on deer and hunter activity and subsequent effect on deer observation rates.

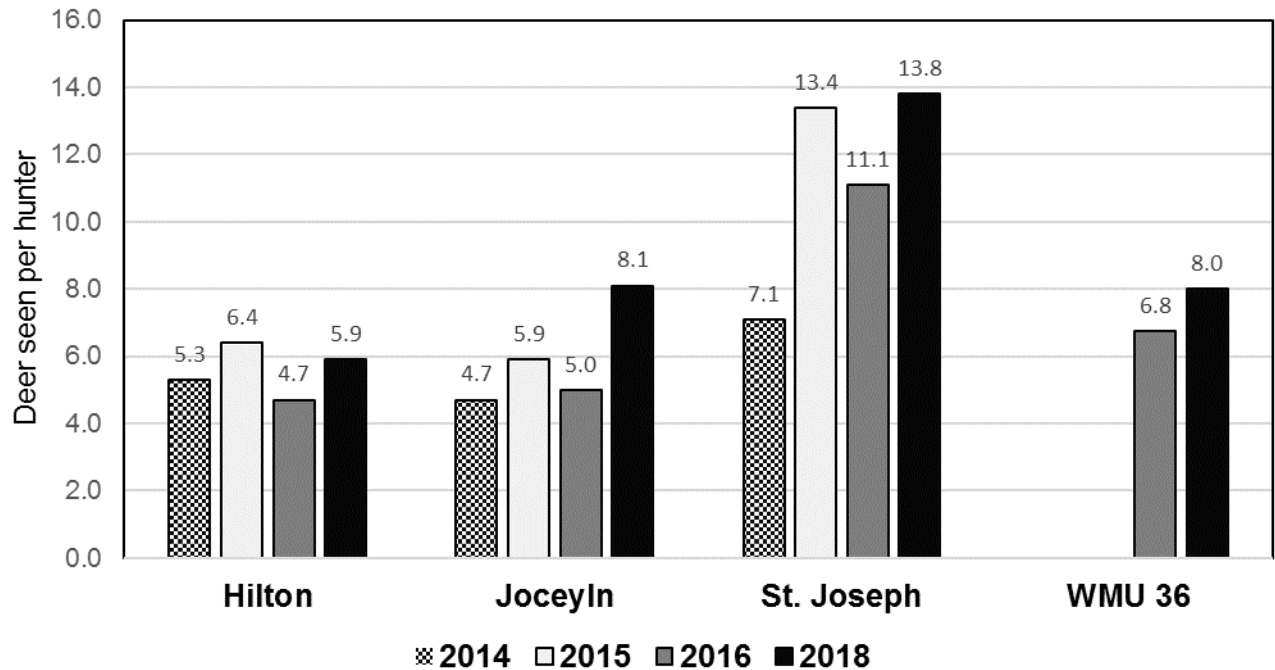


Figure 3. Average number of deer seen per hunter, 2014 – 2018.

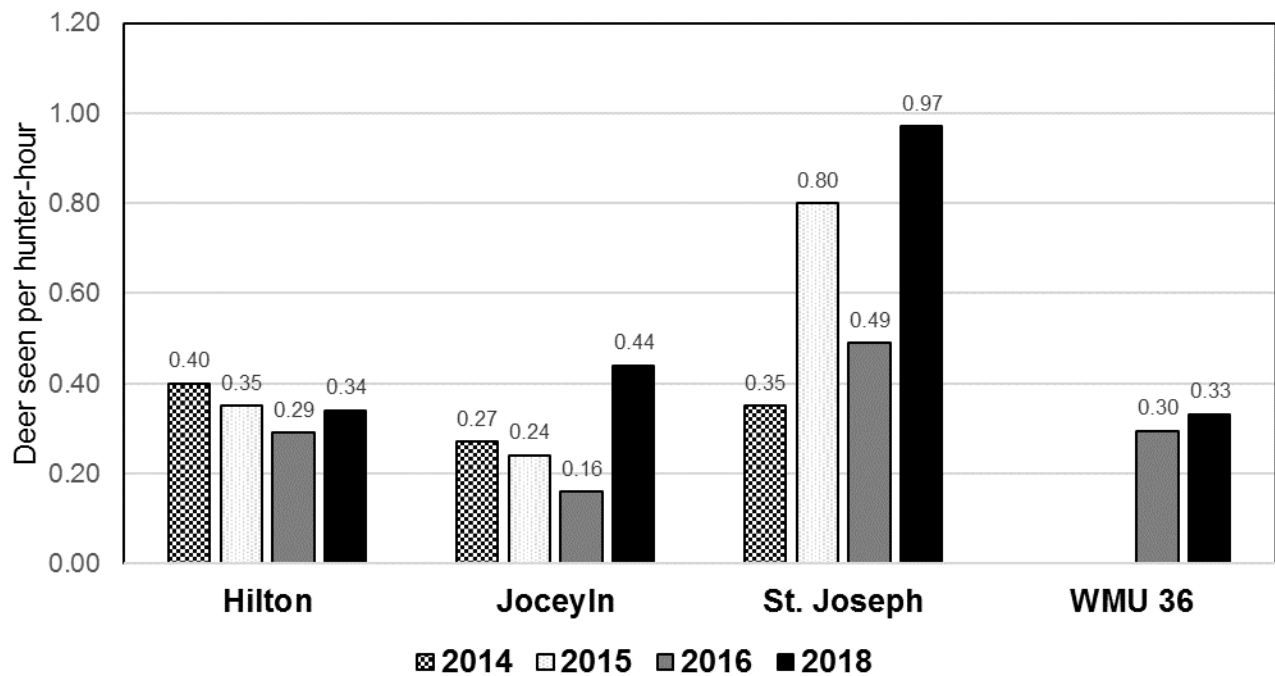


Figure 4. Average number of deer seen per hunter-hour, 2014 – 2018. Number of hunter-hours were not recorded prior to 2014.

Yearling antler beam diameter is often used as an index to overall deer herd physical condition and productivity (MDNR nd, WDNR 2001, MDIFW 2007). Antler beam diameter of yearling bucks harvested during the Firearm Season from **WMU 36** decreased from 19.2 mm (sd = 1.3, 4 deer) in 2016 to 17.3 mm (sd = 2.2, 9 deer) in 2018. This decline mirrors what was observed in **WMU 45** where a decline of 19.6 mm (sd = 3.5, 45 deer) in 2016 to 17.3 mm (sd = 2.9, 27 deer) in 2018 occurred (**Fig. 5**). The antler beam diameters observed in 2018 were approaching those observed following the winters of 2012-13 and 2013-14 (**Fig. 5**) which were considered moderate and severe winters, respectively, based on the St. Joseph Island Snow Station snow depth index (**Table 1**). Winter 2017-2018, however, was considered mild at the St. Joseph Island Snow Station but moderate at the Desbarats Lake Snow Station. This decline in antler beam diameter may indicate that male fawns were stressed through the 2017-2018 winter, potentially due to a late green-up (extended length of winter).

Results from a southern Michigan study of yearling antler sizes between 1980 and 2015 suggest that yearling antler size is negatively affected when fawns endure severe winter conditions (Roloff et al. 2017). A study of penned deer fed diets of varying quality showed that deer which were fed a restricted diet through their first winter, but fed a balanced diet in spring, did not reach the weight nor did antlers get as large as deer in a control group or those that had their diet supplemented (French et al. 1956). Interestingly, by the time a deer reaches 4.5 years of age, there is no difference in antler measurements regardless of the size of their first set of antlers as a yearling (Pennsylvania Game Commission, nd).

The effect of high deer density on yearling antler growth was demonstrated following a major deer population reduction at Long Point, Ontario. Yearling bucks had an antler beam diameter of 11.2 mm prior to, and 21.6 mm following, a population reduction (Ashley et al. 1998). This is not surprising as the carrying capacity of the summer habitat would have increased (less competition for resources) after the population reduction. Interestingly, since yearling antler beam diameter and number of embryos per doe are both related to summer carrying capacity (the number of deer the habitat can support), antler beam diameter can be used to predict the number of embryos per doe (Voigt et al. 1997 and references therein). There is no indication that there is an exceptionally high density of deer on St. Joseph Island thus changes in yearling antler beam diameter are likely in response to environmental stress exerted not by deer density or summer habitat but by winter conditions.

Average fawn dressed weight in 2018 (67.0 lbs) was comparable with 2015 and 2016 fawn weights (71.7 lbs) and much higher than fawn weights observed following the moderate to severe winters of 2012-13 (57.4 lbs) and 2013-14 (57.2 lbs) suggesting the fawns in general were healthy (**Fig. 6**).

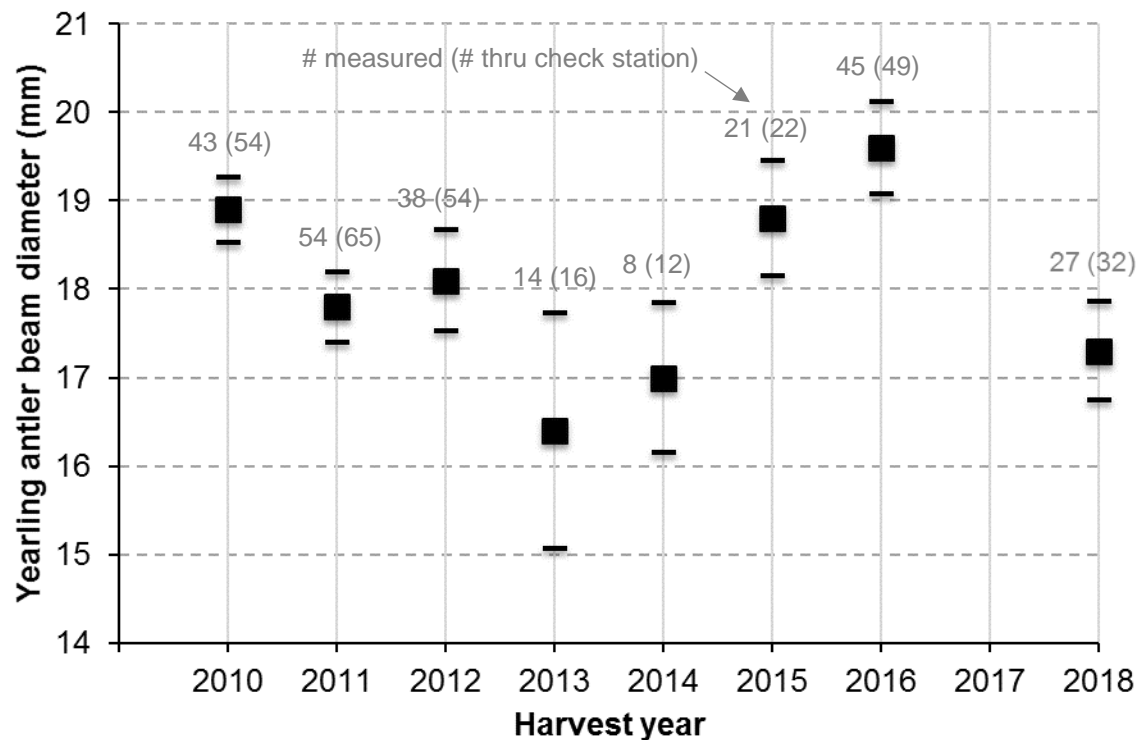


Figure 5. Average antler beam diameter (mm, mean \pm SEM) of yearling bucks during the Firearm Season, 2010 – 2018.

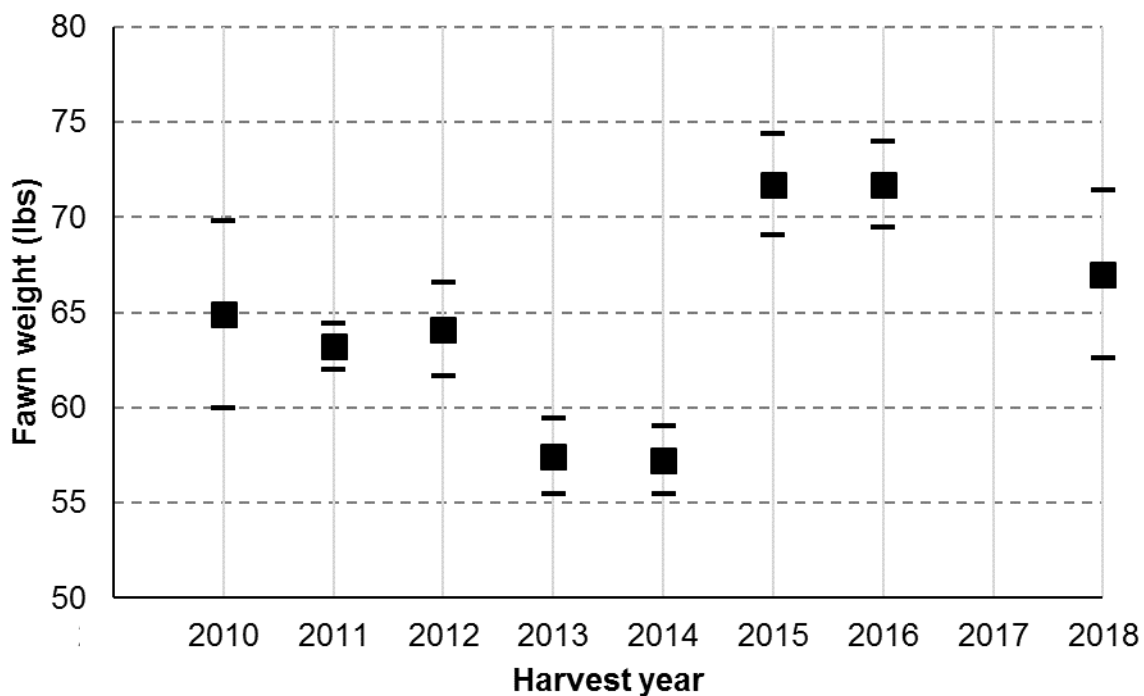


Figure 6. Average fawn dressed weight (lbs, mean \pm SEM), 2010 – 2018. Only fawns harvested during the Firearm Season are included.

The following data shows the largest and smallest dressed weights of fawns (½ yr), antlered (1½ yrs and older) and antlerless (1½ yrs and older) deer through the Check Station from 2012 through 2018 (**Table 3**). **Fig. 7** shows the average number of points on antlered deer from 2010 through 2018.

Table 3. Deer Check Station highs (dressed weight, no. of points, antler beam diameter) and lows (weight), 2012 – 2018. Data from deer harvested during Firearm Season only.

	Antlered					
	2012	2013	2014	2015	2016	2018
Largest Weight (lbs)	198	208	217	241	214	197
Smallest Weight (lbs)	100	109	102	101	94	94
Most Points	10	11	11	13	12	11
Widest Antler Beam (mm)	39	38	44	40	39	41
	Antlerless (adult)					
	2012	2013	2014	2015	2016	2018
Largest Weight (lbs)	127	166	163	152	143	133
Smallest Weight (lbs)	74	73	99	86	102	107
	Antlerless (fawn)					
	2012	2013	2014	2015	2016	2018
Largest Weight (lbs)	85	72	80	81	82	94
Smallest Weight (lbs)	38	52	49	65	62	56

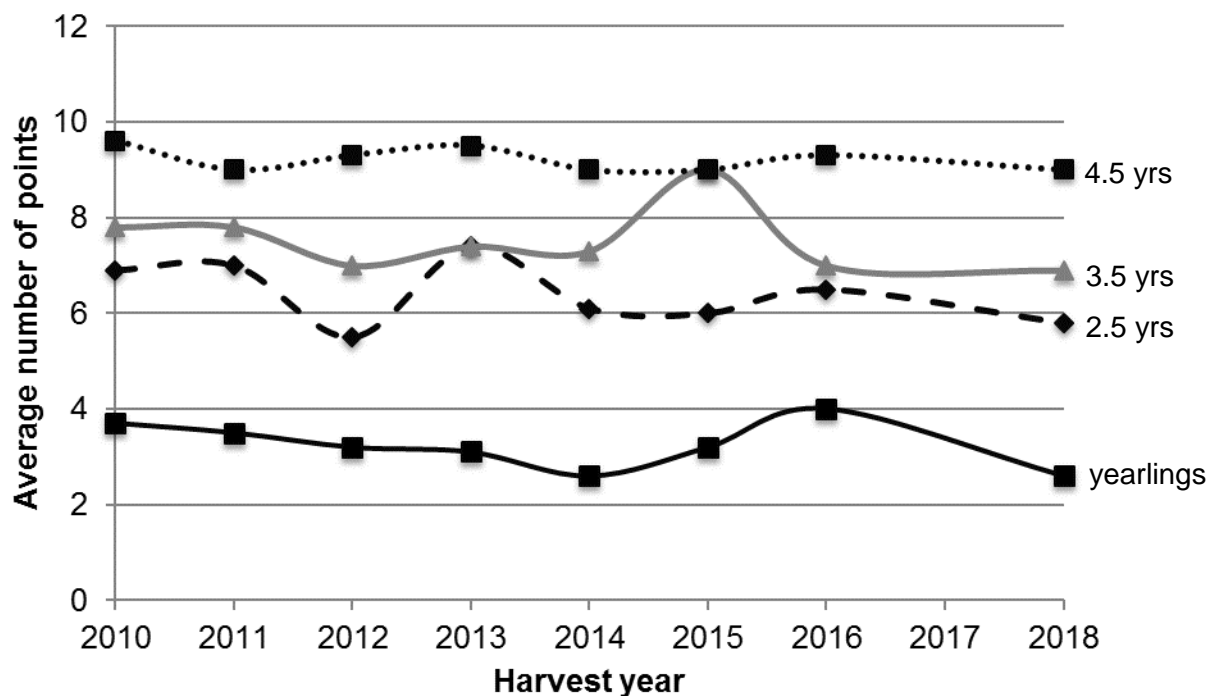


Figure 7. Average number of points on antlered deer, 2010 – 2018.

The 2018 wildlife population status questionnaire (**Appendix C**) was completed by 37 individuals within **WMU 45**. Data for **WMU 36** was obtained from only 7 individuals thus is not included here. The majority of individuals reported that deer were common with no change over the previous year (**Table 4**). Eastern coyote populations were reported most frequently as scarce but split between no change or an increase over the previous year. Although sample size was small, there is no indication that predator numbers are high on St. Joseph Island although data on black bear and bobcat is limited due to bears having entered hibernation by the time the Firearm Season occurred and the elusive nature of bobcats limiting their observations.

Eastern coyotes, wolves and black bears have all been shown to be significant predators of deer fawns through their first 3 – 6 mos followed by bobcats and some instances of predation by domestic dogs (e.g., Kunkel and Mech 1994, Ballard et al. 1999, Vreeland et al. 2004, Carstensen et al. 2006). The major predators of fawns >7 mos are eastern coyotes or wolves, depending on which species is dominant in the area (Ballard et al. 1999). The majority of adult deer mortality can be attributed to predation for females and a combination of legal hunting, and to a lesser extent predation, for males (Van Deelen et al. 1997, Whitlaw et al. 1998). Predation can be attributed to eastern coyotes or wolves, again, depending on which species is present in the area.

Table 4. Wildlife population status questionnaire, 2018: deer and predators. Percentage of respondents reporting are provided. A total 37 surveys were completed.

	Deer	Eastern Coyote	Wolf	Bobcat	Black Bear
Never found here OR Not present this year	0%	18	25	67	50
Scarce	17	41	63	17	0
Common	61	24	0	0	50
Abundant	22	18	13	17	0
respondents	23	17	8	6	6
	Deer	Eastern Coyote	Wolf	Bobcat	Black Bear
More	23	43	17	67	0
No change	55	50	83	33	75
Less	23	7	0	0	25
respondents	22	14	6	3	4

Wild turkey was reported as being common to abundant (31 respondents) with no change over last year (**Table 5**). The sample size was too small too allow for comparison by township.

Table 5. Wildlife population status questionnaire, 2018: upland game birds. Percentage of respondents reporting are provided.

	Wild Turkey	Ruffed Grouse	Sharp-tailed Grouse
Never found here OR Not present this year	6%	13	40
Scarce	13	38	0
Common	32	50	40
Abundant	48	0	20
respondents	31	8	5
	Wild Turkey	Ruffed Grouse	Sharp-tailed Grouse
More	24	14	0
No change	64	86	100
Less	12	0	0
respondents	25	7	3

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Appendix A. Hunting effort and deer sightings by Township, WMU 45, 2014 – 2018.

WMU 45	2014	2015	2016	2018
Total hours hunting	958.0	1147.1	2018.5	1670.2
Average hours hunting	16.5	19.1	22.2	16.2
Total number of deer seen	347	613	713	1044
Average number of deer seen	6.0	10.2	7.8	10.1
Deer seen per hunter-hour	0.36	0.53	0.35	0.63
Number of hunters reporting	58 (2) ¹	60 (3)	91 (0)	103 (5)

¹ number of hunters reporting from early Archery Season

WMU 45 (Township of Hilton)	2014	2015	2016	2018
Total hours hunting	211.5	181.0	476	489.9
Average hours hunting	13.2	18.1	16.4	17.5
Total number of deer seen	84	64	136	165
Average number of deer seen	5.3	6.4	4.7	5.9
Deer seen per hunter-hour	0.40	0.35	0.29	0.34
Number of hunters reporting	16	10	29	28

WMU 45 (Jocelyn Township)	2014	2015	2016	2018
Total hours hunting	266.0	400.0	557.5	499.1
Average hours hunting	17.7	25.0	31.0	18.5
Total number of deer seen	71	95	90	218
Average number of deer seen	4.7	5.9	5.0	8.1
Deer seen per hunter-hour	0.27	0.24	0.16	0.44
Number of hunters reporting	15	16	18	27

WMU 45 (Township of St. Joseph)	2014	2015	2016	2018
Total hours hunting	480.5	566.1	985	681.2
Average hours hunting	17.8	16.7	22.4	14.2
Total number of deer seen	192	454	487	661
Average number of deer seen	7.1	13.4	11.1	13.8
Deer seen per hunter-hour	0.40	0.80	0.49	0.97
Number of hunters reporting	27	34	44	48

18 | Page

[illegible]

Appendix C. Deer and other wildlife population status and trends data sheet.

Other Wildlife Questionnaire 2018		Township or Municipality: _____		Comments? Place on back side of this questionnaire				
		POPULATION LEVELS			POPULATION CHANGES			
Species	Circle the best answer for species you are familiar with:			Compared to last year there are (circle the best answer)				
Deer	Never Found Here	Not Present This Year	Scarce (Low #s)	Common	Abundant	More	Same	Less
Bobcat	Never Found Here	Not Present This Year	Scarce (Low #s)	Common	Abundant	More	Same	Less
Lynx	Never Found Here	Not Present This Year	Scarce (Low #s)	Common	Abundant	More	Same	Less
Eastern Coyote	Never Found Here	Not Present This Year	Scarce (Low #s)	Common	Abundant	More	Same	Less
Wolf	Never Found Here	Not Present This Year	Scarce (Low #s)	Common	Abundant	More	Same	Less
Red Fox	Never Found Here	Not Present This Year	Scarce (Low #s)	Common	Abundant	More	Same	Less
Fisher	Never Found Here	Not Present This Year	Scarce (Low #s)	Common	Abundant	More	Same	Less
Striped Skunk	Never Found Here	Not Present This Year	Scarce (Low #s)	Common	Abundant	More	Same	Less
Raccoon	Never Found Here	Not Present This Year	Scarce (Low #s)	Common	Abundant	More	Same	Less
Wild Turkey	Never Found Here	Not Present This Year	Scarce (Low #s)	Common	Abundant	More	Same	Less
Ruffed Grouse	Never Found Here	Not Present This Year	Scarce (Low #s)	Common	Abundant	More	Same	Less
Sharp-tailed Grouse	Never Found Here	Not Present This Year	Scarce (Low #s)	Common	Abundant	More	Same	Less
Black Bear	Never Found Here	Not Present This Year	Scarce (Low #s)	Common	Abundant	More	Same	Less
Snowshoe Hare	Never Found Here	Not Present This Year	Scarce (Low #s)	Common	Abundant	More	Same	Less
Other: _____	Never Found Here	Not Present This Year	Scarce (Low #s)	Common	Abundant	More	Same	Less
Other: _____	Never Found Here	Not Present This Year	Scarce (Low #s)	Common	Abundant	More	Same	Less