

Otter Population Analyses 2018

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Abstract

Aerial surveys were conducted for river otters during the winter of 2017-18. In the northern management zone 27 transects were surveyed. In the central and southern management zones, 3 and 14 transects were surveyed respectively. Management zones have been consolidated into a northern and southern zone for 2018-2019. Harvest data and indices suggest a robust river otter population dispersed throughout the state. The Wisconsin Department of Natural Resources Furbearer Advisory Committee recommended a harvest goal of 2,000 otters for the 2018-19 trapping season. With changes in the zone structure, a quota consistent with previous years will allow for observation of changes in the distribution of harvest under the new zone structure.

Introduction

River otters are monitored via a collection of data sources including aerial surveys, harvest distribution, harvest success rates, and sex and age distribution of the harvests.

Methods

Wisconsin trappers are required to register their otters with the DNR. The area of kill (county and game management unit), date of kill, sex of the animal, type of trap used, and the name and address of the trapper were recorded for each animal registered.

Trappers were also required to periodically submit the carcass of harvested otters to the Department. Carcass collections were conducted in 1979-82, 1994-95, 1998-99, 2001-02, 2006-07, 2009-10, 2012-13 and 2015-16 seasons. Teeth, including the third premolar and a canine, were sent to Matson's Laboratory, Milltown, MT for processing and aging by counting annuli in the cementum. Ovaries were removed from all female carcasses and stored in 10% formalin until they were firm enough to hand section. The sections were then examined for *corpora lutea* to estimate pregnancy rates and litter size. Prior to 2015, all collected ovaries were examined by DNR staff. For carcasses collected in the 2015-16 season, a sample of 100 ovaries were randomly selected and submitted to Matson's Laboratory, Milltown, MT. The corpora lutea counts obtained by Matson's Laboratory were used to calculate reproductive rates for 2015-16.

An aerial survey to estimate regional otter population trends was developed beginning in 2001. The aerial survey involved recording the presence or absence of otter tracks at stream and river crossings along 30-mile transects within each Otter Management Zone. The transects selected had ≥ 8 stream crossings in each to provide adequate sample sizes, and were located to provide an even distribution within each Management Zone. Permanent transects were established in each Otter Management Zone. Based on analysis of the data collected during 2001-03, the aerial survey was adopted as an operational field survey. Wildlife Management personnel have conducted the survey annually since 2004.

Transects were surveyed from Cessna 172 and 182 aircraft using 1-2 observers plus the pilot. Surveys were conducted between 9am and 3pm on bright, sunny days 1-3 days after a significant (>2") snowfall. The date, days since snow, cloud cover, and observers names were

recorded when each transect was surveyed. At each stream/river crossing, the pilot circled the plane as low as necessary to thoroughly search for otter tracks. Ice conditions and the presence or absence of otter tracks were recorded at each crossing.

Data on harvest size, sex-specific age-structure of the harvest, and reproductive rates were incorporated into the Minnesota Furbearer Population Model to obtain statewide otter population estimates. Trends in otter track sightings from the aerial survey provide and additional index of population trend.

Results

Age structure and reproductive rates

Carcasses were obtained from 1,025 otters (663 males, 361 females, 1 unknown) harvested during the 2015-16 season, and age at harvest was estimated for 658 males and 354 females. Between the 1979-80 and 2015-16 trapping seasons, age data has been obtained from 4,163 male and 2,845 female otters harvested (Tables 1 and 2). Age distributions were similar between sexes. The age structure in the harvest has changed over the 7 collection periods for both sexes. The proportion of juveniles was lower and the proportion of yearlings or 2.5 year old and older otters was higher in the 5 most recent collections than in the 3 prior collections.

Ovaries and uterine horns were collected and examined from 1,349 yearling and adult female otters since 1979 (Table 3). Pregnancy rates (based on *corpora lutea*) averaged 31% for yearling and 74% for adult females. Average litter sizes were 1.7 for yearlings and 2.1 for adults. Adult pregnancy rates have remained relatively stable since otter carcass collections began in 1979. Yearling pregnancy rates may have increased since the mid-1990s. Yearling pregnancy rates of otters collected during 1979-95 were about 10% as compared to pregnancy rates of 30-46% from 1998-2013. Yearling pregnancy rates from the 2015-16 season were lower than in the previous 5 carcass collections, though still higher than they were in the 1980s and early 1990s. Mean litter sizes for both yearling and adult otters have remained relatively stable since 1979, however in 2015-16 estimated litter sizes were larger than had been seen in all previous years for both yearlings and adults.

Aerial Survey

A total of 27 aerial otter survey routes in the northern Zone were completed in 2017-18. However, suitable survey conditions were limited in the central and southern portions of the state. As a consequence, only 3 transects in the central zone, and 14 transects in the southern zone were completed in 2017-18. Analysis of the percentage of stream and river crossings with otter tracks on aerial surveys during 2001-2018 suggest trends in otter populations in northern and central Wisconsin, declining during the 2000s but then stabilizing (Table 4). In southern Wisconsin, aerial survey results suggested a stable population.

Population Estimates

Because of the declining trend in otter tracks observed on the aerial surveys during 2001-08, in 2009 the WDNR Furbearer Advisory Committee decided to reduce the starting population size in the population model to improve the correspondence between the population trend suggested by aerial surveys and the trend simulated by the model. Population estimates calculated by the model suggested that the statewide otter population has fluctuated over time and currently appears stable.

Discussion

The limited recent data from the otter aerial survey, together with the incongruity among 1) trends in track sightings on aerial survey, 2) otter harvest success rates, and 3) opinions of beaver trappers regarding otter population status, results in considerable uncertainty about recent otter population trends in the state. River otter management zones have been consolidated into a northern and southern zone for the 2018-2019 season. The Wisconsin Department of Natural Resources Furbearer Advisory Committee considered data from all of these sources and recommended a statewide harvest goal of 2,000 otters for the 2018-19 trapping season.

Table 1. *Percentage of male otters harvested in Wisconsin in age class, 1979-2016*.*

Age Class	1979-95	1998-99	2001-02	2006-07	2009-10	2012-13	2015-16	Pooled
0.5	47%	47%	42%	40%	33%	34%	30%	40%
1.5	21%	23%	27%	25%	25%	26%	27%	25%
2.5	11%	8%	12%	16%	13%	12%	12%	12%
3.5	8%	7%	7%	4%	9%	9%	11%	8%
4.5	6%	3%	3%	4%	6%	5%	6%	5%
5.5	3%	4%	1%	4%	4%	3%	4%	3%
6.5	2%	3%	3%	3%	2%	3%	3%	3%
7.5	1%	2%	1%	1%	0%	3%	2%	1%
8.5	1%	1%	0%	2%	3%	1%	2%	1%
9.5	1%	0%	1%	0%	3%	1%	2%	1%
10.5+	1%	3%	1%	1%	2%	2%	2%	2%
No. Aged	864	599	643	522	235	642	658	4,163

Table 2. *Percentage of female otters harvested in Wisconsin in age class, 1979-2016*.*

Age Class	1979-95	1998-99	2001-02	2006-07	2009-10	2012-13	2015-16	Pooled
0.5	48%	49%	39%	36%	40%	39%	42%	43%
1.5	15%	21%	25%	24%	24%	26%	20%	22%
2.5	15%	9%	11%	11%	12%	10%	11%	11%
3.5	8%	5%	9%	9%	10%	6%	9%	8%
4.5	6%	3%	5%	6%	3%	6%	6%	5%
5.5	2%	2%	4%	3%	3%	4%	4%	3%
6.5	3%	3%	2%	4%	2%	4%	2%	3%
7.5	1%	3%	1%	3%	3%	2%	2%	2%
8.5	2%	2%	1%	1%	1%	1%	1%	1%
9.5	0%	1%	0%	0%	1%	1%	1%	1%
10.5+	1%	2%	2%	2%	1%	1%	2%	2%
No. Aged	610	465	477	353	172	414	354	2,845

*age data not collected in 2017-2018

Table 3. *Reproductive data from female otters collected in Wisconsin.*

Age Class	1979-95	1998-99	2001-02	2006-07	2009-10 ^a	2012-13 ^a	2015-16 ^a	All Seasons
Yearlings (Age Class 1.5)								
Number examined	103	82	113	67	38	101	24	528
Number pregnant	10	38	48	22	14	30	4	166
Percent pregnant	9.7	46	42	33	37	30	17	31
Mean number of corpora lutea	1.7	2.0	1.7	1.6	2.1	1.7	3.0	1.7
Number with embryos	0	0	2	2				4
Mean number of embryos			2.0	2.0				2.0
Adults (Age Class 2.5+)								
Number examined	211	117	158	111	57	132	35	821
Number pregnant	143	102	120	71	44	97	27	604
Percent pregnant	68	87	76	64	77	73	77	74
Mean number of corpora lutea	2.2	2.3	2.0	2.0	2.2	2.2	2.6	2.1
Number with embryos	14	16	10	6				46
Mean number of embryos	2.4	2.4	2.5	2.0				2.4

^a Embryo counts were not made in 2009-10, 2012-13, 2015-16, or 2016-2017.

Table 4. Results from aerial otter surveys conducted in 2001-2017.

Otter Management Zone	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
North																	
No. Transects Surveyed	18	23	23	23	23	23	23	23	18	7	18	0	0	14	23	16	23
No. Stream/River Crossings	180	257	241	280	241	302	258	285	181	89	193			142	196	132	371
% of Crossings With Otter Tracks	17	25	19	19	23	14	17	12	12	15	14			16	17	16	24
SE (%)	4.2	4.1	3.2	2.7	3.2	2.5	3.7	2.2	1.8	5.4	2.6			3.0	10.2	3.9	3.3
Central																	
No. Transects Surveyed	0	14	23	11	23	19	23	23	17	21	23	0	13	15	2	15	3
No. Stream/River Crossings		152	224	115	210	220	196	198	149	188	203		118	108	16	143	43
% of Crossings With Otter Tracks		29	14	15	15	7	14	8	10	5	6		9	6	0	10	23
SE (%)		4.0	2.5	4.3	3.3	2.2	2.8	2.0	1.8	2	1.7		3.1	3.7	0	3.0	12.6
South																	
No. Transects Surveyed	0	5	23	21	23	13	23	23	10	22	23	0	3	23	1	4	14
No. Stream/River Crossings		73	245	262	267	171	211	214	127	220	258		34	234	9	41	225
% of Crossings With Otter Tracks		4	7	4	5	2	8	6	7	10	8		12	3	0	5	2
SE (%)		2.1	2.1	3.1	2.0	1	3.2	1.5	1.8	3.3	3.0		2.8	2.8	0	2.9	2.7

Table 5. Wisconsin otter population estimates^a and harvests, 1983-2017.

Year	Preharvest population	Harvest	Harvest rate (%)
1983-84	11,800	995	8
1984-85	12,100	1,213	10
1985-86	12,100	960	8
1986-87	12,500	1,588	13
1987-88	12,200	1,724	14
1988-89	11,700	1,140	10
1989-90	11,900	1,294	11
1990-91	12,000	818	7
1991-92	12,600	883	7
1992-93	13,200	1,060	8
1993-94	13,700	1,212	9
1994-95	14,100	1,900	13
1995-96	13,700	1,599	12
1996-97	13,700	2,521	18
1997-98	12,900	2,809	22
1998-99	11,800	1,631	14
1999-00	11,900	2,278	19
2000-01	11,300	1,945	17
2001-02	11,100	2,701	24
2002-03	9,900	2,096	21
2003-04	9,300	1,544	17
2004-05	9,000	1,275	14
2005-06	9,100	1,511	17
2006-07	8,800	1,458	17
2007-08	8,600	990	12
2008-09	8,800	709	8
2009-10	9,400	752	8
2010-11	10,000	913	9
2011-12	10,400	1,487	14
2012-13	10,200	1,445	14
2013-14	10,100	907	9
2014-15	10,600	1,202	11
2015-16	10,800	1,342	12
2016-17	10,800	1,617	15
2017-18	10,700	1,408	13

^a Population estimates are from the furbearer population model.

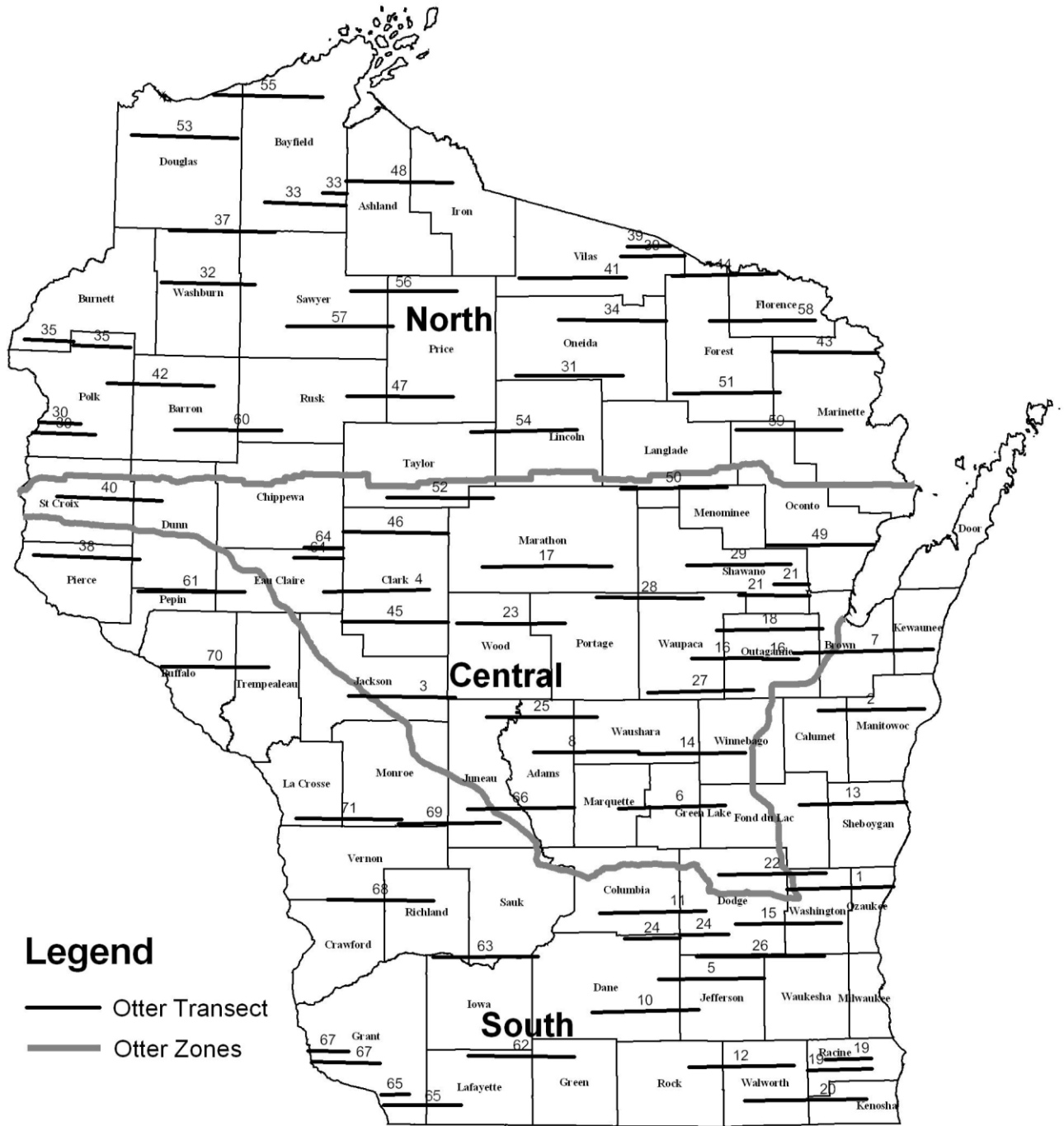


Figure 1. Location of aerial otter transects and boundaries of Otter Management Zones in Wisconsin.