

**WISCONSIN GRAY WOLF MONITORING REPORT
15 APRIL 2015 THROUGH 14 APRIL 2016**

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Introduction

This report describes wolf management and monitoring activities conducted in Wisconsin during the wolf monitoring year, April 15th, 2015 to April 14th, 2016. Gray wolves (*Canis lupus*) reverted to federally endangered status in the Western Great Lakes region as a result of a federal court decision in December 2014. They have been in this status for the entire monitoring period.

Wolf Population Monitoring

Wolf population monitoring was conducted using a territory mapping with telemetry technique, summer howl surveys, winter snow track surveys, recovery of dead wolves, depredation investigations, and collection of public observation reports. A full description of methods is provided by Wydeven et al. (2009). Data are reported by wolf management units (WMU's) established in 2012 (Figure 1). Wolf monitoring methods were similar to the previous year.

Observation reports were collected from the public and agency staff. A total of 279 reports of wolf or wolf sign observations were recorded. This is 16% fewer than the 334 reports recorded the previous year (Wiedenhoeft et al. 2015). Additional reports were received but lacked sufficient information on date, location, or circumstances for recording. Forty-eight reports (17%) were verified as wolves by submitted photos. One hundred six reports (38%) were considered to be "probable" wolves. Photos were submitted for 17 of these reports and were inconclusive but considered to be probable wolves. Photos were requested, but not received, for an additional 3 reports. Descriptions provided for the remainder of these reports supported a designation of probable wolf. Eighty-one reports (29%) lacked adequate evidence or descriptions to determine species and were designated as possible wolves. Some reports were likely mis-identifications. Photos were submitted for 7 of these reports, but were inconclusive. Photos were requested, but not received, for an additional 2 of these reports. Forty-four reports (16%) were considered to be "not likely" wolves. Photos were submitted for 17 of these reports. Species found included coyotes (12 photos), coyote tracks (1 photo) domestic dogs (2 photos), domestic dog tracks (1 photo), and tracks including dog, coyote, and bobcat (1 photo). Photos were requested, but not received, for 1 additional report. A field check was conducted for 1 report which found evidence of coyotes and a coyote den. Twenty-five additional reports were considered not likely wolf based on the descriptions provided. Verified, probable, and possible wolf observations are shown in Table 1 and Figure 1. Reports of packs outside known occupied pack range were forwarded to the biologist responsible for the geographic area for further monitoring to attempt to verify pack presence. Reports from outside the winter count period were used to help direct winter tracking effort. Consistent with our historic methodology, confirmed and probable reports within the winter count period were incorporated into count data.

During summer 2015, 131 howl surveys were conducted with 54 packs detected (Table 2). Pups were detected in 65% of the detected packs. This compares with a pup detection rate of 73% of 52 packs responding during howl surveys in summer 2014 (Wiedenhoeft et al. 2015). A more thorough analysis of wolf howl data is in process.

During winter 2015-16, a total of 17,759 miles of track surveys were conducted by WDNR and volunteers, with 162 of 167 survey blocks tracked (Figures 2 & 3). Tribes tracked an additional 2 survey blocks; 3 blocks that were considered inactive were not tracked. A total of 222 packs were detected in Wisconsin (Figure 4, Table 3). One wolf from a pack considered to be primarily in Michigan and 1 radio collared wolf being monitored in Minnesota were also detected (Figure 4). Of

the 208 packs detected in winter 2014-15, 21 (10%) were not detected at all and 7 (3%) were detected as loners in winter 2015-16. Forty of the 222 packs detected in winter 2015-16 had not been detected the previous winter. Of these packs, 12 (5%) had been detected previous to winter 2014-2015, 15 (7%) had been detected as loners in 2014-15, and 13 (6%) had not been previously detected. An average of 3.4 surveys were conducted per pack or area surveyed.

During the 2015-2016 monitoring period 60 wolves were monitored by telemetry (Table 3). Average pack territory size was 61.3 mi² for 37 packs with ≥20 telemetry locations. This included 20 territories determined from satellite and VHF locations (avg. = 71.7 mi²) and 17 territories with only VHF locations (avg. = 49.1 mi²). Average territory size was largest in WMU 1 (67.6 mi² n=18) and WMU 5 (60.5 mi² n=8). The large average territory size in WMU 5 was likely due to the high percentage (88%) of territories determined from satellite and VHF locations. Research trapping resulted in capture of 22 wolves and telemetry collars were placed on all of them. Three wolves were trapped and removed from captive cervid facilities. Telemetry collars were placed on 2 of them before release. Recreational trappers reported an additional 10 wolves incidentally captured that DNR personnel were also able to place collars on before release. Telemetry collars were deployed on a total of 34 of 35 wolves captured during the monitoring period (Table 4), including 12 adult, 6 yearling, and 2 pup females, and 10 adult, 3 yearling, and 1 pup males.

In April, 2016 the statewide minimum wolf population count was 866-897 wolves, an increase of 16.1% from the previous year (Table 3 & Figure 5). This included increases in 4 of the 6 management units and decreases in 2 units, ranging from -19.4% in WMU 5 to +67.7% in WMU 4. Some of the decrease in unit 5 was likely due to better knowledge of pack boundaries in several packs with GPS collared wolves. The count included 838-869 wolves living in 222 packs, or an average of 3.8 wolves per pack, which is back to the level packs had stabilized at prior to delisting in 2012. An additional 28 non-pack associated wolves were detected. State wolf management is based on the minimum count off Native American reservations. The off reservation minimum count in April 2016 was 829-860 wolves. More detailed information on the 2015-2016 wolf count can be found on the Wisconsin DNR website, http://dnr.wi.gov/topic/wildlifehabitat/documents/Carn_Track_Blocks_Results.pdf.

Statewide Wolf Distribution

Contiguous wolf pack range was estimated to be 20,500 mi². The main range encompassed 20,374 mi² and included northern and central forested regions of Wisconsin (Figure 1). A 126 mi² area in Dunn County comprised the remainder of probable wolf pack range. A single wolf was detected during winter surveys in the Dunn County area, but the area has a history of pack habitation so was included in the probable pack range calculation. Using the 2016 minimum population count of 866-897 wolves, wolf density is estimated to be 1 wolf per 22.9 to 23.7 mi² of contiguous wolf range, calculated by dividing contiguous wolf range by the minimum population count range.

Wolf Mortality

Mortality was monitored through field observation and mandatory reporting of control mortalities. Cause of death for wolves reported dead in the field was determined through field investigation or by necropsy when illegal activity was suspected or where cause of death was not evident during field investigation. A total of 38 wolf mortalities were detected during the monitoring period (Table 5,

Figure 1). Detected mortalities represented 5% of the minimum 2014-2015 late winter count of 746-771 wolves (Wiedenhoeft et al. 2015).

Vehicle collisions (45%) and illegal kills (34%) were the leading causes of death for detected mortalities. One wolf (3%) was trapped and euthanized in a human health and safety concern case. Human caused mortality represented 82% of known cause detected mortalities overall.

The sole cause of mortality detected due to natural causes was intra-specific aggression (5%). No mortalities due to disease were detected. Mortalities due to natural causes are difficult to detect unless the animal is wearing an active telemetry collar.

Cause of mortality could not be determined for 5 (13%) of the cases.

Twelve collared wolves died during the monitoring period, 11 of which were being actively monitored at the time of death (Table 5). Of those being actively monitored, cause of death could not be determined for 3 collared wolves. For the 8 where cause of death could be determined, 4 (50%) were illegally killed, 2 (25%) were killed by vehicle collision, and 2 (25%) died from intra-specific aggression. For an analysis of estimated rates of undetected mortality in Wisconsin wolves see Stenglein et al. 2015.

Disease / Parasite Occurrence in Wolves & Body Condition

General body condition was reported for 33 wolves that were captured and collared for monitoring (Table 4). Thirty-one (94%) were reported to be in good or excellent body condition, 1 (3%) was reported to be in fair body condition, and 1 pup trapped in a cervid enclosure (3%) was reported to be emaciated and in poor condition. Average weight of 8 live-captured adult males was 85 lbs. (range 72 to 106 lbs.), and average weight of 11 adult females was 69 lbs. (range 60 to 77lbs.). Monitoring for mange was conducted by inspection of 35 wolves live-captured for research monitoring, and inspection of 38 wolf mortalities (Table 4). Symptoms consistent with mange were noted in 1 dead wolf (14%) and none of the live captures. Ticks were monitored by inspection of live-captured wolves. Ticks were noted on 21 (60%) of captured wolves.

Wolf Depredation Management

Wolf depredation incidents were investigated by United States Department of Agriculture – Wildlife Services. During the monitoring period, Wildlife Services investigated 160 wolf complaints and 1 complaint was investigated by DNR wardens. Fifty-two incidents of wolf depredation to livestock and 6 incidents of wolf threat to livestock were confirmed on 34 different farms during the monitoring period (Table 6). This included 11 of 38 farms classified as chronic wolf depredation farms (29%). Livestock depredations included 49 cattle killed and 1 injured, 2 guard animals killed, 1 horse killed, 12 domestic fowl killed, and 2 captive white-tailed deer killed. The number of farms affected increased 6.2% from 2014-15 when 32 farms were affected. This follows a decrease of 26% from 2012-13 when 43 farms were affected (MacFarland & Wiedenhoeft 2013) to 2014-2015.

Twenty-five incidents of non-livestock depredation and 7 incidents of non-livestock threats were confirmed during the monitoring period. This included 18 dogs killed while actively engaged in hunting activities, and 6 dogs killed and 3 injured outside of hunting situations. One wolf was

ethanized by USDA-WS in response to a verified human health and safety threat during the monitoring period.

Regulatory Changes Affecting Wolf Management

There were no significant regulatory changes during the reporting period.

Law Enforcement

Population monitoring and law enforcement efforts detected 13 wolves illegally killed within the monitoring period. Law enforcement staff conducted 5 investigations and issued 1 citation during the reporting period (Table 7).

Information on Wolf Prey Species

White-tailed deer are the primary prey species for wolves in Wisconsin. Units used for monitoring Wisconsin deer are counties, or in some cases, partial counties. Counties were assigned to the wolf harvest zone that the majority of the county falls in to compare deer density changes in the wolf management units (Table 8). White-tailed deer density estimates increased 8% statewide from the previous year estimate (Rolley 2015, Rolley 2016). Recommendations from the County Deer Advisory Council and approved by the Natural Resources Board are to increase deer populations in counties in wolf management units 1 through 5 and maintain the deer population density in most counties in unit 6. There is no indication that prey density is negatively impacting the wolf population.

Literature Cited

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Table 1. Verified, probable and possible wolf observations reported by natural resource agency personnel and private citizens in Wisconsin, 15 April 2015 to 14 April 2016.

Wolf Mgmt. Unit	Number of Sightings	Wolves Seen	Track or Sign Observations	Total Wolf Observations
1	24	40	35	59
2	23	39	22	45
3	9	13	3	12
4	6	6	2	8
5	14	42	11	25
6	64	69	22	86
Statewide	140	209	95	235

Table 2. 2015 Wisconsin wolf howl survey data.

Wolf Mgmt. Unit	Howl Surveys	Packs Detected	Detected Packs with Pups	% Detected Packs with Pups
UNIT 1	42	17	13	76
UNIT 2	41	17	10	59
UNIT 3	13	2	1	50
UNIT 4	4	1	1	100
UNIT 5	19	12	8	67
UNIT 6	12	5	2	40
TOTAL	131	54	35	65

Table 3. Pack and lone wolf summaries for Wisconsin in winter 2015-2016.

Wolf Mgmt. Unit		# of Packs	# of Wolves in Packs	Loners	Total # of Wolves	Change from 2014-2015	# of Telemetry Monitored Wolves ^a	Average Annual Pack Territory ^b (mi ²)
1	Off Reservations	83	317-328	7	324-335		28	
	On Reservations	3	12	3	15		3	
	Total	86	329-340	10	339-350	9.7%	31	67.6 (n=18)
2	Off Reservations	51	216-225	5	221-230		12	
	On Reservations	5	22	0	22		1	
	Total	56	238-247	5	243-252	50.9%	13	52.5 (n=7)
3	Off Reservations	29	93-97	3	96-100		3	
	On Reservations	0	0	0	0		0	
	Total	29	93-97	3	96-100	17.1%	3	48.2 (n=3)
4	Off Reservations	13	50	2	52		0	
	On Reservations	0	0	0	0		0	
	Total	13	50	2	52	67.7%	0	55.1 (n=1)
5	Off Reservations	29	103-109	1	104-110		11	
	On Reservations	0	0	0	0		0	
	Total	29	103-109	1	104-110	-19.4%	11	60.5 (n=8)
6	Off Reservations	9	25-26	7	32-33		2	
	On Reservations	0	0	0	0		0	
	Total	9	25-26	7	32-33	-5.9%	2	-
Statewide	Off Reservations	214	804-835	25	829-860		56	
	On Reservations	8	34	3	37		4	
	Total	222	838-869	28	866-897	16.1%	60	61.3 (n=37)
Outside WI				2	2		1	

^aWolves are counted in the primary WMU they were monitored in, though they may have been monitored in multiple WMUs.

^b Pack territory size is only calculated for packs with ≥ 20 radiolocations for the period 15 April 2015 to 14 April 2016.

Table 4. Research capture summary, body condition, and detection of ectoparasites in captured wolves and mortalities in Wisconsin from 15 April 2015 to 14 April 2016.

	n	Body Condition			# (%) w/Mange	# (%) w/Ticks
		Good	Fair	Poor		
Unit 1						
Research Captures	18	16 (89%)	1 (6%)		0	14 (78%)
Mortalities	7				1 (14%)	
Unit 2						
Research Captures	7	5 (83%)		1 (17%)	0	2 (29%)
Mortalities	11				0	
Unit 3						
Research Captures	1	1 (100%)			0	1 (100%)
Mortalities	3				0	
Unit 4						
Research Captures	0				0	0
Mortalities	3				0	
Unit 5						
Research Captures	7	7 (100%)			0	4 (57%)
Mortalities	6				0	
Unit 6						
Research Captures	2	2 (100%)			0	0
Mortalities	8				0	
STATEWIDE AVERAGES						
Research Captures	35	31 (94%)	1 (3%)	1 (3%)	0	21 (60%)
Mortalities	38				1 (14%)	

Table 5. Detected wolf mortality in Wisconsin 15 April 2015 to 14 April 2016.

Cause of Death	Wolf Management Unit						State Total	% of Total
	1	2	3	4	5	6		
Human Caused Mortality								
Agency Control	1						1	3%
Vehicle Collision	1	6 ^b	2	2	4	2	17	45%
Illegally Killed	4 ^a	2 ^a	1	1 ^a		5 ^a	13	34%
Capture Related							0	
Unknown Human Caused							0	
<i>Total Human Caused</i>	6	8	3	3	4	7	31	82%
Natural Mortality								
Disease / Injury							0	
Intra-specific Aggression		1 ^a				1 ^a	2	5%
Euthanized (non-control)							0	
Unknown Natural Causes							0	
<i>Total Natural Causes</i>	0	1	0	0	1	0	2	5%
<i>Unknown Causes</i>	1 ^a	2 ^a	0	0	1 ^a	1 ^c	5	13%
Total Detected Mortality	7	11	3	3	6	8	38	

^aIncludes 1 radio collared wolf^bIncludes 2 radio collared wolves^cRadio collared wolf unmonitored at time of death

12 radio collared wolf mortalities, including 1 unmonitored at time of death

Table 6. Wolf depredation management in Wisconsin, 15 April 2015 to 14 April 2016.

	Wolf Management Unit						State Total
	1	2	3	4	5	6	
Livestock Cases							
Depredation	20	3	23	1	0	5	52
Threat	4	1	0	0	0	1	6
Chronic Farms Affected	7	2	2	0	0	0	11 of 38 (29%)
Total Farms Affected	15	2	10	1	0	6	34
Cattle Killed	17	3	24	1		4	49
Cattle Injured			1				1
Horses Killed	1						1
Guard Animals Killed	2						2
Captive Deer Killed		2					2
Poultry Killed						12	12
Non-Livestock Cases							
Depredation	14	3	2	0	4	2	25
Threat	4	1	0	0	2	0	7
Dogs Killed While Actively Engaged in Hunting Activities	12	1	2		3		18
Dogs Injured While Actively Engaged in Hunting Activities							0
Dogs Killed While Not Engaged in Hunting Activities	3	2				1	6
Dogs Injured While Not Engaged in Hunting Activities	1				1	1	3
Control Actions							
Wolves Euthanized for Control	1	0	0	0	0	0	1

Table 7. Summary of law enforcement activity during the reporting period.

Wolf Related Complaints Received	3
Wolf Related Investigations Conducted	5
Citations Issued	1
Verbal Warnings Issued	0
Illegally Harvested Wolves Recovered	2
Unknown Cause of Death Wolves Found	0
Other Dead/Injured Wolves Recovered	8
Total Wolves Recovered	10

Table 8. White-tailed deer density estimate in wolf management units in 2014 & 2015.

Wolf Mgmt. Unit	# of Deer Mgmt. Zones	Deer Range (mi ²)	2014 Post-Hunt Deer Density (Deer/mi ²)	2015 Post-Hunt Deer Density (Deer/mi ²)	% Change	2015-17 Deer Population Objective
1	6	6,516	12.0	13.1	+8%	Increase
2	6	4,573	16.0	16.2	+1%	Increase
3	4	3,141	23.0	25.6	+12%	Increase
4	4	2,305	27.0	24.8	-8%	Increase
5	7	2,315	24.0	28.1	+17%	Increase
6	53	16995	44.0	48.3	+9%	Maintain
TOTAL	80	35,845	30.5	33.0	+8%	

Deer range and post-hunt deer estimates based on Robert Rolley, 2016, Final 2015 Deer Population Estimates for Wisconsin Deer Management Units, WDNR unpublished data.

Deer population objectives from County Deer Advisory Council Final 2015 – 2017 Deer Population Objectives Approved by the Natural Resources Board, <http://dnr.wi.gov/topic/hunt/cdac.html>.

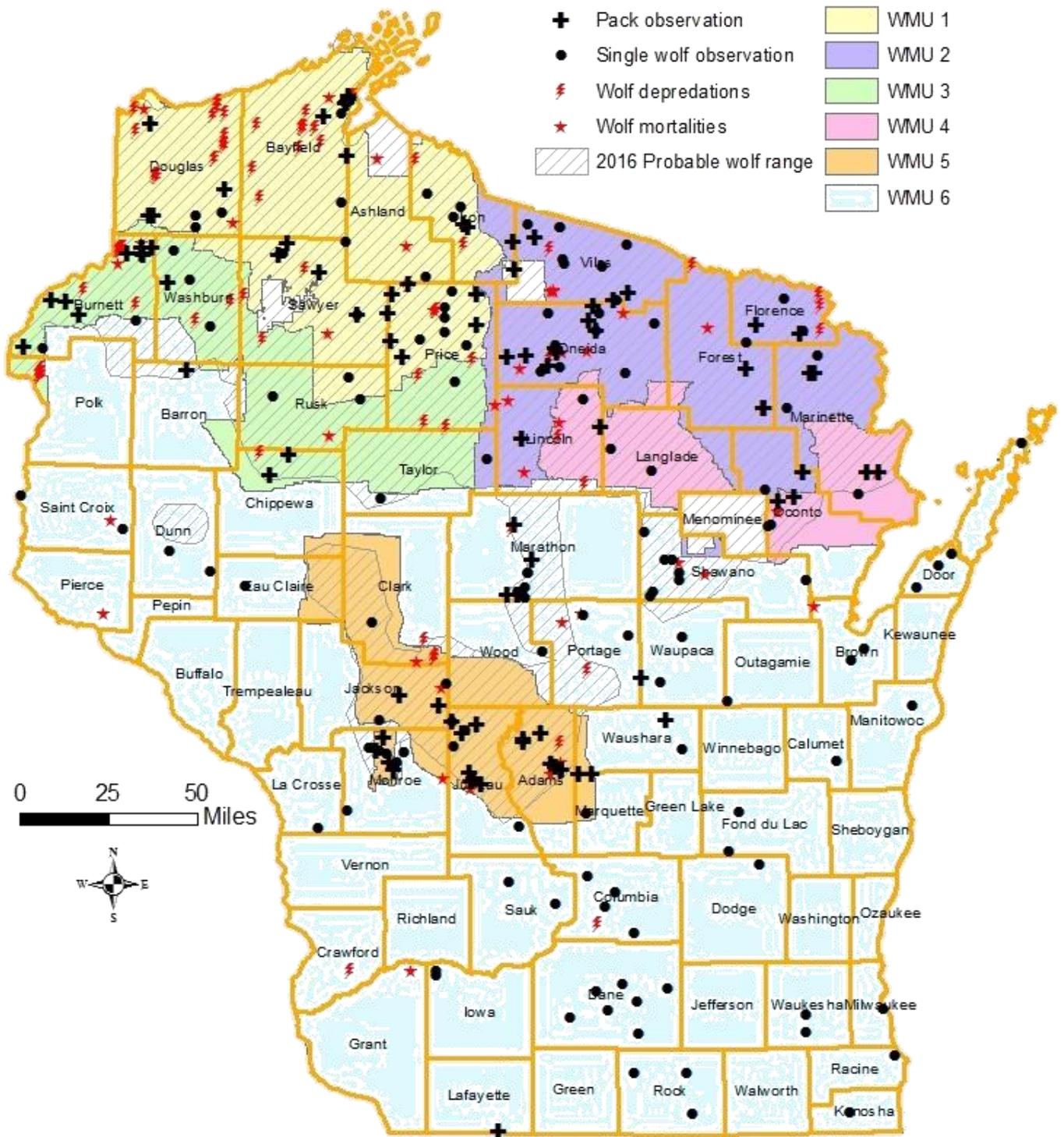


Figure 1. Probable wolf pack range, wolf mortalities, verified and probable wolf depredations, and verified, probable and possible wolf observation reports in Wisconsin 15 April 2015 to 14 April 2016.

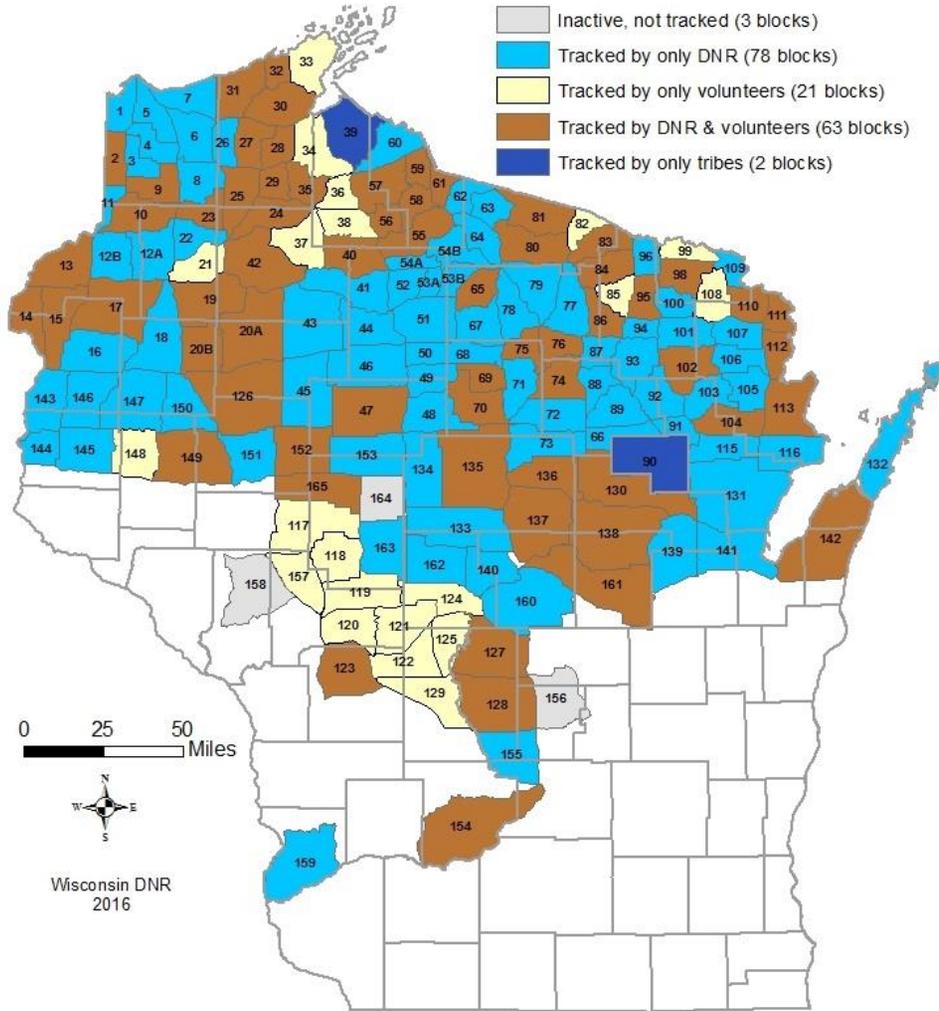


Figure 2. Wisconsin carnivore survey blocks tracked: winter 2015-2016.

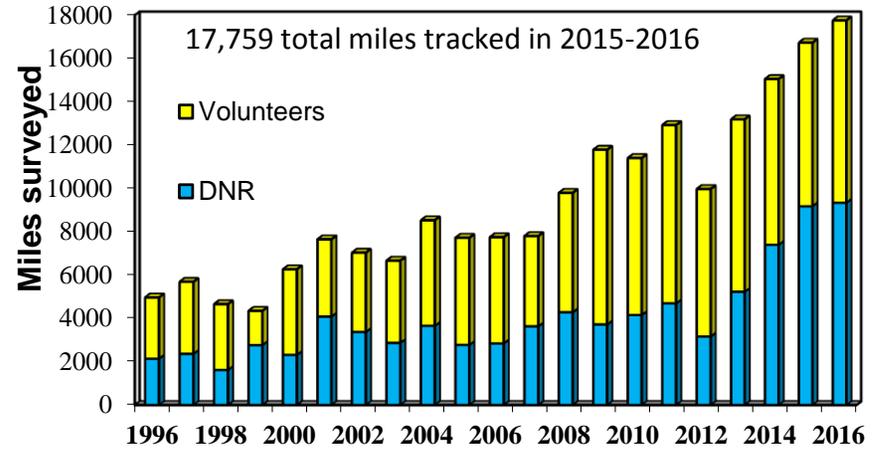


Figure 3. Carnivore track surveys in Wisconsin by WDNR & volunteers 1996-2016

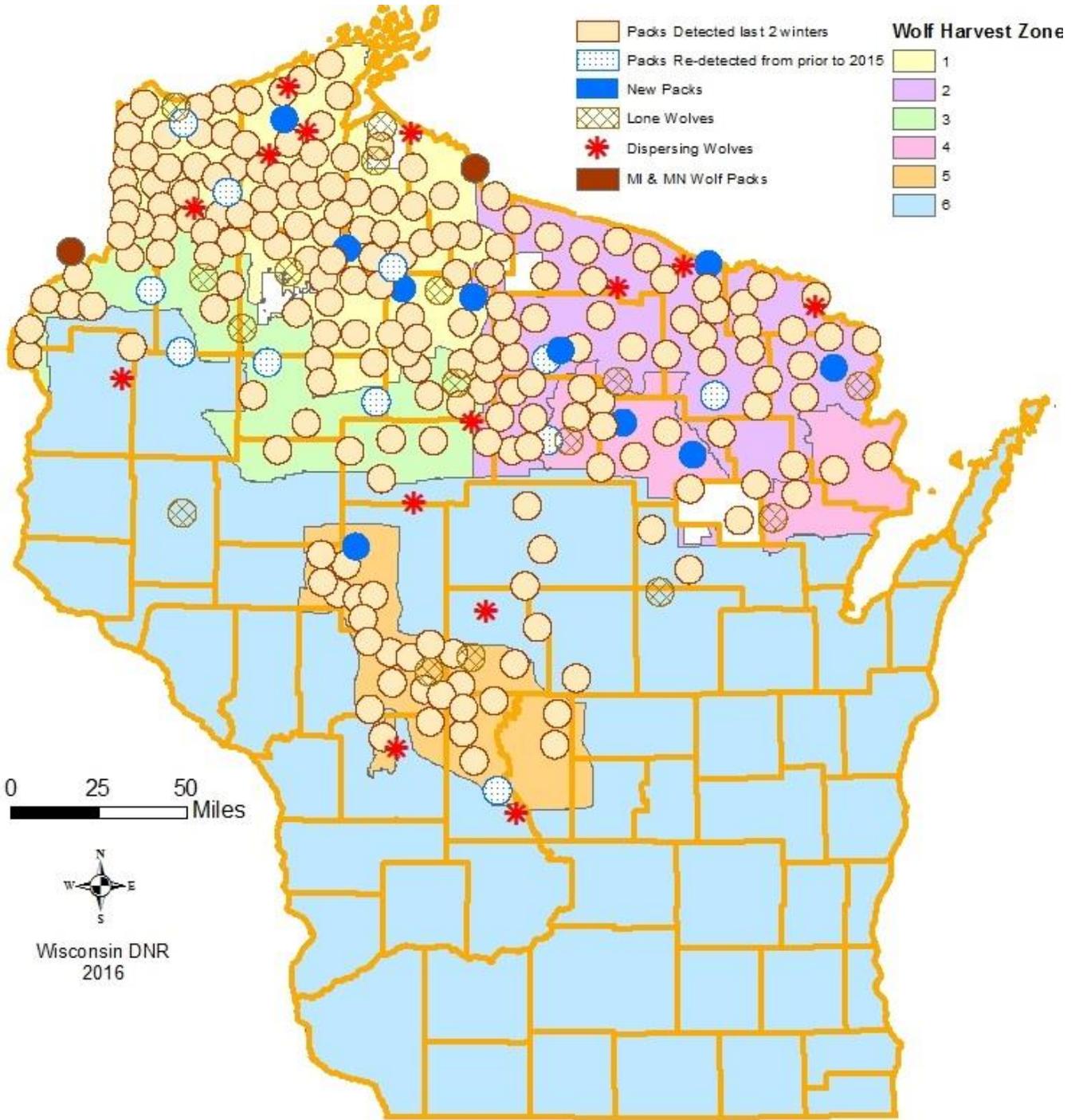


Figure 4. Wolves detected in Wisconsin in winter 2015-2016.

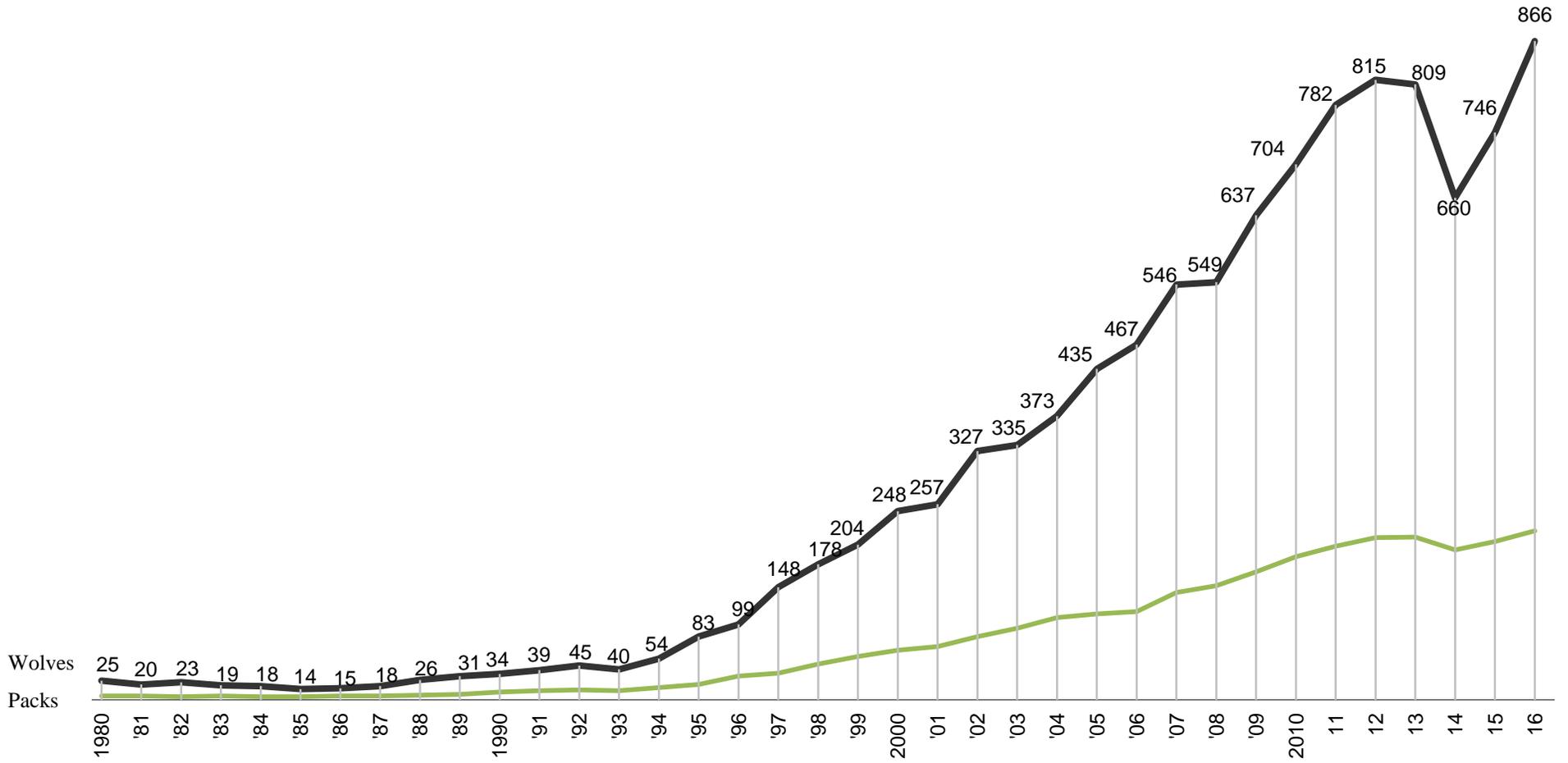


Figure 5. Changes in Wisconsin Gray Wolf Population: 1980-2016.