Gray Wolf Population
2011-2012

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Abstract

The Wisconsin gray wolf (*Canis lupus)* population in late winter 2012 was 815 to 880 wolves including wolves in 213 packs and at least 20 loners. A total of 774+ wolves occurred outside of Indian reservations, thus the population exceeded its management goal of 350 wolves outside of Indian reservations by 424+ wolves. The wolf population increased 4% above the 2011 count of 782+ wolves. Wolf packs occurred in 34 or 35 Wisconsin counties and wolves were reported for 59 counties in the state. The wolf population in Wisconsin was federally delisted as part of a Western Great Lakes Wolf population on January 27, 2012. Gray wolves have been state delisted since 2004, and were designated as a game species on April 2, 2012.

Introduction

Gray wolves recolonized Wisconsin in the mid-1970's and WDNR has monitored populations annually since 1979. In 1975 the Wisconsin DNR listed the gray wolf as a state endangered species and downlisted them to threatened status in 1999. On August 1, 2004 wolves were removed from the state list of threatened species and classified as protected wild animals.

The U.S. Fish and Wildlife Service (USFWS) listed gray wolves in the eastern U.S. as endangered in 1967 and again in 1974. The USFWS downlisted wolves to a federally threatened species on April 1, 2003, as part of the Eastern Gray Wolf Distinct Population Segment, but because of a federal district court decision, on January 31, 2005 wolves were relisted as endangered in Wisconsin and other locations. Special Section 10 permits were granted by the USFWS in both 2005 and 2006 to allow limited take of depredating wolves, but permits were lost both years due to lawsuits. Wolves were designated as delisted in the Western Great Lakes Distinct Population Segment on March 12, 2007, but were relisted again on September 29, 2008, delisted again on May 3, 2009, and again relisted on July 1, 2009. A third delisting effort for the Western Great Lakes DPS of wolves was completed on January 27, 2012, returning management authority to states and tribes in the region.

The Wisconsin legislature passed bills to authorize the hunting and trapping of wolves, and these were signed into law on April 2, 2012 by Governor Walker as part of Wisconsin Act 169. This resulted in the wolf being designated a game species, with the first season to be conducted from October 15, 2012 through February 28, 2013.

Intense population surveys will be required for the next five years following federal delisting, and thus similar surveys will be conducted as has been done since winter 1979-1980. With the designation of wolves as a game species, some of the details of the population surveys will change, and types of information reported will be more similar to other game species.

Method

Wolf numbers were determined by live-trapping/ radio tracking (Mech 1974, Fuller and Snow 1988), howl surveys (Harrington and Mech 1982), and winter track surveys (Thiel and Welch 1981, Wydeven et al. 1996, Wydeven et al. 2009). Track surveys were conducted in blocks of suitable habitat (Mladenoff et al. 1995, 2009), or areas where wolves had been reported.

Additional information on wolf abundance was determined from wolves reported by agency personnel or general public through "Rare Mammal Observation Cards" (Wydeven 1992). See Wydeven et al. (2009) for more details on the methods.

Results and Discussion

A minimum count of 815-880 wolves was obtained in Wisconsin in late winter 2011-2012 (Table 1). Average size of 162 northern packs (zone 1) was 3.7 to 4.0 wolves, 32 Central Forest packs (zone 2) was 3.7 to 4.2 wolves, and 19 west and central Wisconsin packs (zone 3) was 3.6 to 4.1 wolves per pack (Table 1). A total of 20 wolves were identified as lone wolves, but the total number of lone wolves across the state was probably underestimated.

The wolf population estimation for 2009-2010 was 782-824 wolves (Wydeven and Wiedenhoeft 2011). Thus the 2012 wolf population may have increased by 4 %. Between 1990 and 2000, the Wisconsin wolf population increased at an average annual increase of 22%, but between 2000 and 2007 had slowed to an annual growth rate of 12% (Wydeven et al. 2009). The current low rate of increase may indicate the population is beginning to stabilize, but could also reflect poorer tracking conditions in 2012, or reduced efforts by volunteer trackers. The current wolf population exceeded recent estimates of carrying capacity at 650-700 wolves (Van Deelen 2009). Active management with delisting will start to reduce the population to more socially accepted levels.

At least 213 packs were located in 34 -35 Wisconsin counties (Figure 1, Table 1).
Average year-round territory area per collared wolf was 48.5 square miles in zone 1 (n=37), 33.8 square miles in zone 2 (n=6), and 17.3 square miles in zone 3 (n=2) (Table 2). We used 49 square miles for zone 1 territorial wolves and 27 square miles for zone 2 and 3 territorial wolves to assess amount of occupied wolf range. The year-round area occupied by territorial wolves would be estimated at about 9,761 square miles in northern and central Wisconsin in 2011-2012, and if we included an interstitial area of 37% (see Fuller 1989), wolf range would cover 13,373 square miles. Among 805-870 wolves that appeared to occupy regular territory areas, average density would be about 1 wolf per 11-12 square miles. Wolf territories were focused on heavily forested areas of public and industrial forest land in those regions of the state, but more wolves were beginning to move into more mixed forest/agricultural areas in northwest and central Wisconsin.

Figure 2 illustrates the changes in the Wisconsin wolf population over the last 33 years. Although population growth rate averaged 22% annually during the 1990s, it declined to an average of 10% between 2000 and 2012. Between 2003 and 2006 when limited controls were in place, a mean of 5.5 % of the winter wolf population was removed by lethal control activities of depredating wolves, but the population still grew at an annual rate of 13% (2003 to 2007). In 2007 and 2008, about 7% and 8% of wolves were removed, and the population seemed to be stabilizing at about 550 wolves. Between 2009 and 2011, only limited authority existing for lethal controls, and the population grew at annual rate of 12%. The wolf population will be expected to decline in the next few years.

A total of 80 wolves and 1 wolf-dog hybrid were found dead in Wisconsin in 2011 (Table 2). A total of 82 radio tagged wolves were monitored by radio-telemetry in Wisconsin in 2011, and 21 (26%) were known to die, and signals were lost on 14 wolves. Among 21 radio-collared wolves actively being monitored that died in the state, mortality included: 8 (38 %) illegal shooting, 1 (5 %) mange and other disease, 2 (10 %) other wolves, 6 (29 %) vehicle collisions, 2 (10%) euthanized for human safety, 1 (5%) artillery fire on a military base, and 1 (5%) capture related. The overall rate of

illegal kill (38%) was similar to rate in 2010 (44%), but less than 62 % detected in 2009. The recent illegal kill was higher than the 1990s, and when wolves were delisted in 2007 and 2008, when it normally was about 20% of mortality among collared wolves dying

For the overall sample of 80 dead wolves (71 were $\geq$ 1 year old) in the state in 2011, mortality included: 24 (30 %) illegal shooting, 4 (5 %) euthanized in human safety concerns, 42 (52 %) vehicle collisions, 1 (1%) artillery fire, 1 (1%) capture related, 1 (1%) disease (mange), 3 (4 %) other wolves, and 4 (5 %) unknown mortalities. Among the overall sample of 80 dead wolves, at least 90 % died from human caused mortality, compared to 86 % of the radio collared sample. Most years the radio collared sample has much lower rates of human caused mortality than the overall sample. The radio-collared sample is probably a less biased assessment of overall mortality affecting wolves, but mainly reflects mortality among adults, and may not be as representative of dispersers living in more marginal habitat across the state. During 2011 both sample sets indicated humans were the main cause of mortality for wolves in Wisconsin. The 24 illegally killed wolves was the highest illegal kill detected in the state, and compared to 15 illegal kills in 2010, and 21 in 2009, the previous high. Dead wolves were detected in 31 Wisconsin counties including 14 counties in zone 1, 7 counties in zone 2, 13 counties in zone 3 (some counties occurred in more than 1 zone). Dead wolves were detected in 22 Wisconsin Counties in 2009 (Wydeven and Wiedenhoeft 2011).

Reports of wolf observations that were classified as “probable” or “possible” were received from 59 counties in the state, although only single observations were received from 14 counties (Table 3). These reports, from citizens and agency personnel, supplement other wolf survey work, provide early reconnaissance of new wolf occurrence, and provide information on general distribution of wolves across the state, especially lone dispersers. These reports do probably also contain some misidentifications of coyotes, wolf-dog hybrids, and dogs as wolves. The 536 reports of wolf observations in 2011 was the highest number of wolves every reported and compares to 2010, with 365 reports, and 2009 with 373 reports, the previous record high. A major reason for increase in wolf reports in 2011, were results of wolf observations on trail cams in Central Wisconsin in a bobcat study by graduate student John Clare of UW-Stevens Point. The highest report rates for wolf observations by counties were Juneau (111), Marathon (34), Bayfield (27), Oneida (26), and Wood (25). The high wolf observation rates for the central Wisconsin counties, reflects high reporting rates of the UW-SP bobcat study.

The wolf count in 2011-2012 included 774-838 wolves outside Indian reservations in Wisconsin. The state long-term population goal was to maintain 350 wolves in the state outside Indian reservations (Wisconsin DNR 1999), thus the current count represents 424+ wolves above the population goal. With federal delisting, aggressive controls are being applied to problem wolves and wolf packs, and a wolf harvest will begin in the fall. The wolf plan will be updated in the near future and the existing management goal will be reexamined.

The federal delisting goal for Wisconsin and Michigan was a population of 100 or more wolves for a period of 5 or more years (U. S. Fish and Wildlife Service1992). The wolf population currently is about 1500 wolves for both states, and has been at 100 or more since 1994. After two previous delisting attempts in 2007 and 2009, that were later reversed, wolf delisting was finally accomplished on January 27, 2012.
http://www.fws.gov/midwest/wolf/delisting/index.htm

Shortly after the delisting was completed, the Wisconsin Assembly and Senate developed bills for public hunting season on wolves that was signed into law as Wisconsin Act169 on April 2, 2012.
https://docs.legis.wisconsin.gov/2011/related/acts/169.pdf

The Wisconsin Natural Resource Board approved rules for the wolf harvest on July 17, 2012. http://dnr.wi.gov/about/nrb/2012/July/07-12-3A.pdf

The public harvest would run from October 15, 2012 to February 28, 2013,and would include both the hunting and trapping of wolves. Six quota zones are established that allow different levels of harvest based on land use and habitat conditions. A total harvest of 201 wolves will be planned for the harvest, but the Chippewa tribes in ceded territories will be able to claim up to 85 wolves from the harvest for tribal members.

Acknowledgments

Wolf population monitoring was funded by USFWS PR funds; U.S. Forest Service; Wisconsin Endangered Resources fund; Defenders of Wildlife; Timber Wolf Alliance, Ho-Chunk Nation, Menominee Tribe, Munsee-Stockbridge Tribe, Bad River Band Chippewa, Lac Courtes Oreilles Chippewa, and private donations. Major assistance on wolf monitoring was received from Ron Schultz, Sarah Boles, Davin Lopez, Dave MacFarland, Ken Jonas, Greg Kessler, Todd Naas, Nancy Christel, Gary Dunsmoor, Bob Hanson, Tim Babros, Aaron Buchholz, Dave Halfmann, Mike Zeckmeister, John Olson, Nancy Businga, Lindsey Long Bob Willging, Chip Lovell, Dave Ruid, Ed Zydzik, Jim Rollman, Eric Fromm, Chad Alberg, Phil Peterson, Jeremy Irish, DeWayne Snobl, Barry Benson, Steve Krueger, Mark Kerr, Aaron Freund, Karen Karash, Lacey Hill, Paul Christel, Don Reiter, Randall Wollenhaup, Tim Wilder, Phil Miller, Joe Sprenger, Mike Weinfurter, Dan Cardinal, Beverly Paulan, Leo Bunderson, Shawn Rossler, Dan Eklund, Tom Matthiae, Scott Anderson, Mike Peczynski, Erik Olson, Jen Stenglein, Tim Van Deelen, Adrian Treves, Northland College wolf research team, and about 150 volunteer trackers

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Table 1. *Pack and lone wolf summaries for Wisconsin in winter 2011-2012.*

Zone		# of Packs	# of Wolves in Packs	Loners	Total # of Wolves	# of radio monitored Wolves	Average pack territory[a] (mi^2)
1	Off Reservations	*154*	*573-612*	*12*	*585-624*	*34*	
	On Reservations	8	34-35	1	35-36	5	
	Total	162	607-647	13	620-660	39	48.5 N=37
2	Off Reservations	*32*	*119-135*	*0*	*119-135*	*6*	
	On Reservations	0	0	0	0	0	
	Total	32	119-135	0	119-135	6	33.8 N=6
3	*Off Reservations*	*18*	*64-73*	*5*	*69-78*	*2*	
	On Reservations	1	5	1	6	1	
	Total	19	69-78	6	75-84	3	17.3 N=2
4	Off Reservations	0	0	1	1	0	
	On Reservations	0	0	0	0	0	
	Total	0	0	1	1	0	-
Statewide	Off Reservations	***204***	***756-820***	***18***	***774-838***	42	
	On Reservations	9	39-40	2	41-42	6	
	Total	213	795-860	20	815-880	48	45.2 N=45
Outside WI		1	3	1	4	0	-

[a] Pack territory size is only calculated for packs with ≥20 radiolocations for the period 15 April 2011 to 14 April 2012

Table 2. *Wolf mortality in Wisconsin in 2011. Complete necropsies are pending for some wolves.*

Zone 1	Adult		Yearling		Pup		Unknown	**TOTAL**
	Male	Female	Male	Female	Male	Female		
Legal control action								**0**
Legally killed		2						**2**[a]
Illegally killed	6	3	1	2		1		**13**[b]
Vehicle Collision	7	4	1		3	2	5	**22**[c]
Capture related		1						**1**[d]
Unknown human caused								**0**
Total Human Caused								***38***
Disease/ Injury	1							**1**[d]
Inter-specific strife							1	**1**
Unknown natural cause								**0**
Total Natural Caused								***2***
Unknown cause							2	**2**
ZONE 1 TOTALS	**14**	**10**	**2**	**2**	**3**	**3**	**8**	**42**
Zone 2								
Legal control action								**0**
Legally killed	1	1						**2**
Illegally killed	1	3						**4**[a]
Vehicle Collision	1	1		1			3	**6**[d]
Capture related								**0**
Unknown human caused								**0**
Total Human Caused								***12***
Disease/ Injury								**0**
Inter-specific strife		1						**1**[d]
Unknown natural cause								**0**
Total Natural Caused								***1***
Unknown							2	**2**
ZONE 2 TOTALS	**3**	**6**	**0**	**1**	**0**	**0**	**5**	**15**
Zone 3								
Legal control action								**0**
Legally killed	1							**1**[d]
Illegally killed	1	2	1			1	2	**7**[a]
Vehicle Collision	5	2	3	2			2	**14**
Capture related								**0**
Unknown human caused								**0**
Total Human Caused	*7*	*4*	*4*	*2*	*0*	*1*	*4*	***22***
Disease/ Injury								**0**
Inter-specific strife	1							**1**[d]
Unknown natural cause								**0**
Total Natural Caused	*1*	*0*	*0*	*0*	*0*	*0*	*0*	***1***
Unknown								**0**

Table 2. *Continued.*

	Adult		Yearling		Pup		Unknown	**TOTAL**
	Male	Female	Male	Female	Male	Female		
ZONE 3 TOTALS	**8**	**4**	**4**	**2**	**0**	**1**	**4**	**23**
Zone 4								
Legal control action								**0**
Legally killed	1[e]							**1**
Illegally killed								**0**
Vehicle Collision								**0**
Capture related								**0**
Unknown human caused								**0**
Total Human Caused	*1*	*0*	*0*	*0*	*0*	*0*	*0*	***1***
Disease/ Injury								**0**
Inter-specific strife								**0**
Unknown natural cause								**0**
Total Natural Caused	*0*	*0*	*0*	*0*	*0*	*0*	*0*	***0***
Unknown								**0**
ZONE 4 TOTALS	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**1**
STATEWIDE TOTAL	**26**	**20**	**6**	**5**	**3**	**4**	**17**	**81**
Legal control action								**0**
Legally killed								**6**
Illegally killed								**24**
Vehicle Collision								**42**
Capture related								**1**
Unknown human caused								**0**
Total Human Caused								***73***
Disease/ Injury								**1**
Inter-specific strife								**3**
Unknown natural cause								**0**
Total Natural Caused								***4***
Unknown								**4**

[a]Includes 2 radio collared wolves
[b]Includes 6 radio collared wolves (5 being actively monitored)
[c]Includes 6 radio collared wolves
[d]Includes 1 radio collared wolf
[e]Hybrid

Table 3. *Probable and possible wolf observations reported by natural resource agency personnel and private citizens in Wisconsin, 2011.*

County	Number of Sightings	Wolves Seen	Track or Sign Observations	Total Wolf Observations
Adams*	7	14	3	10
Ashland*	8	15	4	12
Barron	1	1	0	1
Bayfield*	17	28	10	27
Brown	4	4	0	4
Burnett*	2	2	2	4
Chippewa*	2	2	0	2
Clark*	5	11	2	7
Columbia	4	5	0	4
Crawford	1	1	0	1
Dane	9	9	0	9
Dodge	2	3	0	2
Douglas*	9	18	6	15
Dunn*	2	5	1	3
Eau Claire*	1	1	1	2
Florence*	6	20	1	7
Fond du Lac	2	2	0	2
Forest*	5	8	8	13
Grant	1	1	0	1
Iron*	10	18	4	14
Jackson*	6	11	0	6
Jefferson	2	2	0	2
Juneau*	108[a]	213	3	111
Kenosha	2	2	0	2
LaCrosse	4	4	0	4
Langlade*	4	10	0	4
Lincoln*	11	23	7	18
Manitowoc	1	1	0	1
Marathon*	32[a]	48	2	34
Marinette*	5	11	4	9
Marquette	4	4	1	5
Milwaukee	1	1	0	1
Monroe*	7	20	14	21
Oconto*	8	12	2	10
Oneida*	20	34	6	26
Outagamie	4	6	0	4
Ozaukee	2	2	0	2
Pepin	1	1	0	1
Polk*	0	0	1	1
Portage*	8[a]	10	0	8
Price*	7	12	2	9
Racine	1	1	0	1
Richland	0	0	1	1
Rock	3	3	0	3

Table 3. *Continued.*

County	Number of Sightings	Wolves Seen	Track or Sign Observations	Total Wolf Observations
Rusk*	7	16	1	8
Sauk	4	4	0	4
Sawyer*	13	41	11	24
Shawano*	5	8	3	8
Sheboygan	2	2	0	2
St. Croix	1	1	0	1
Trempealeau	1	2	0	1
Vernon	1	2	0	1
Vilas*	15	30	2	17
Walworth	1	1	0	1
Washburn*	9	12	2	11
Waukesha	3	3	0	3
Waupaca*	1	3	0	1
Waushara*	2	2	0	2
Wood*	23[a]	33	2	25
Total	**430**	**762**	**106**	**536**

*Counties believed to have packs with breeding activity in 2011. No observations were reported from Menominee & Taylor counties where breeding packs are known to exist.

[a] Many observation reports from this county were due to a graduate student research project using trail cameras.

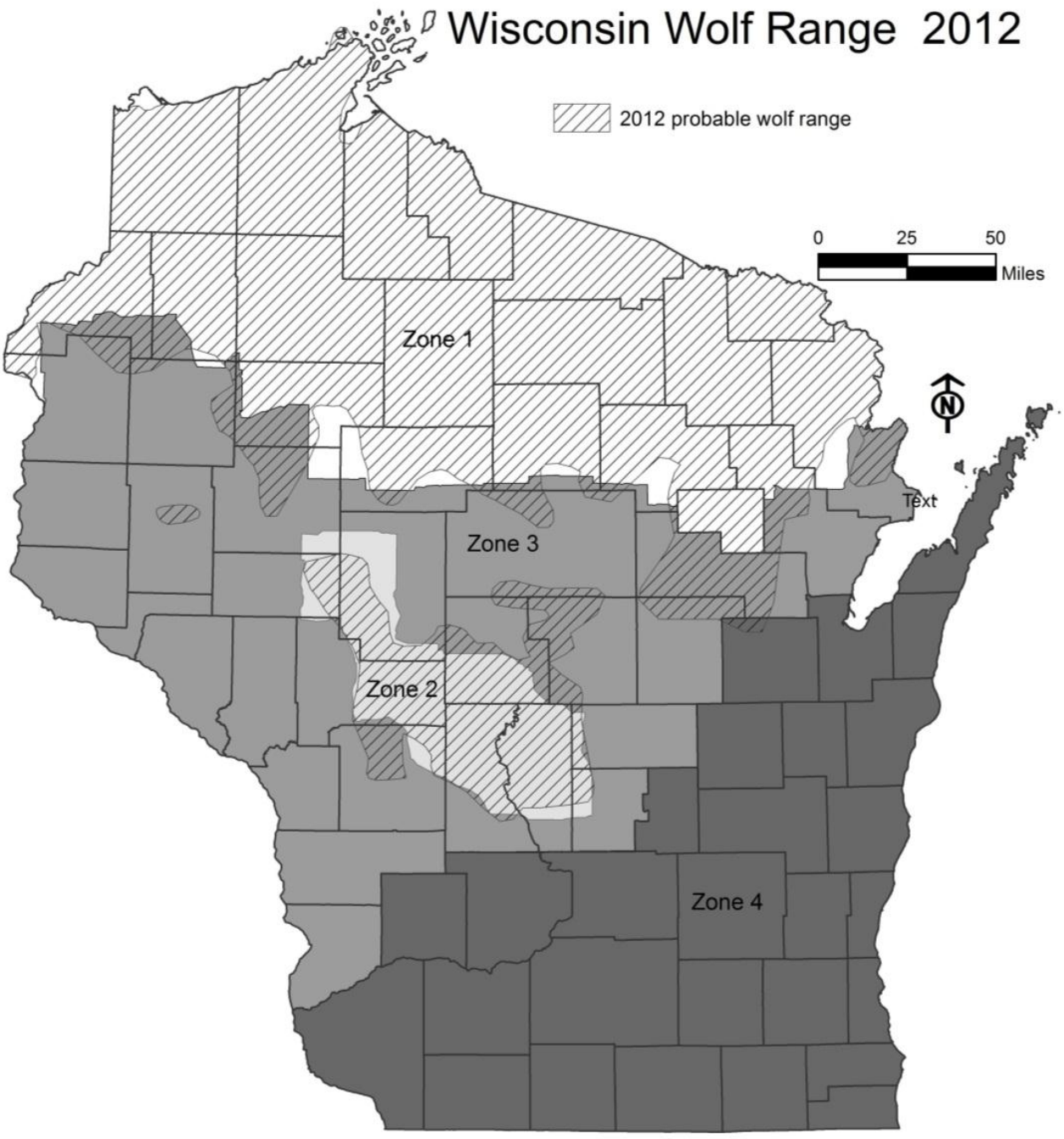

Figure 1. *Gray Wolf Distribution in Wisconsin: Winter 2011-2012.*

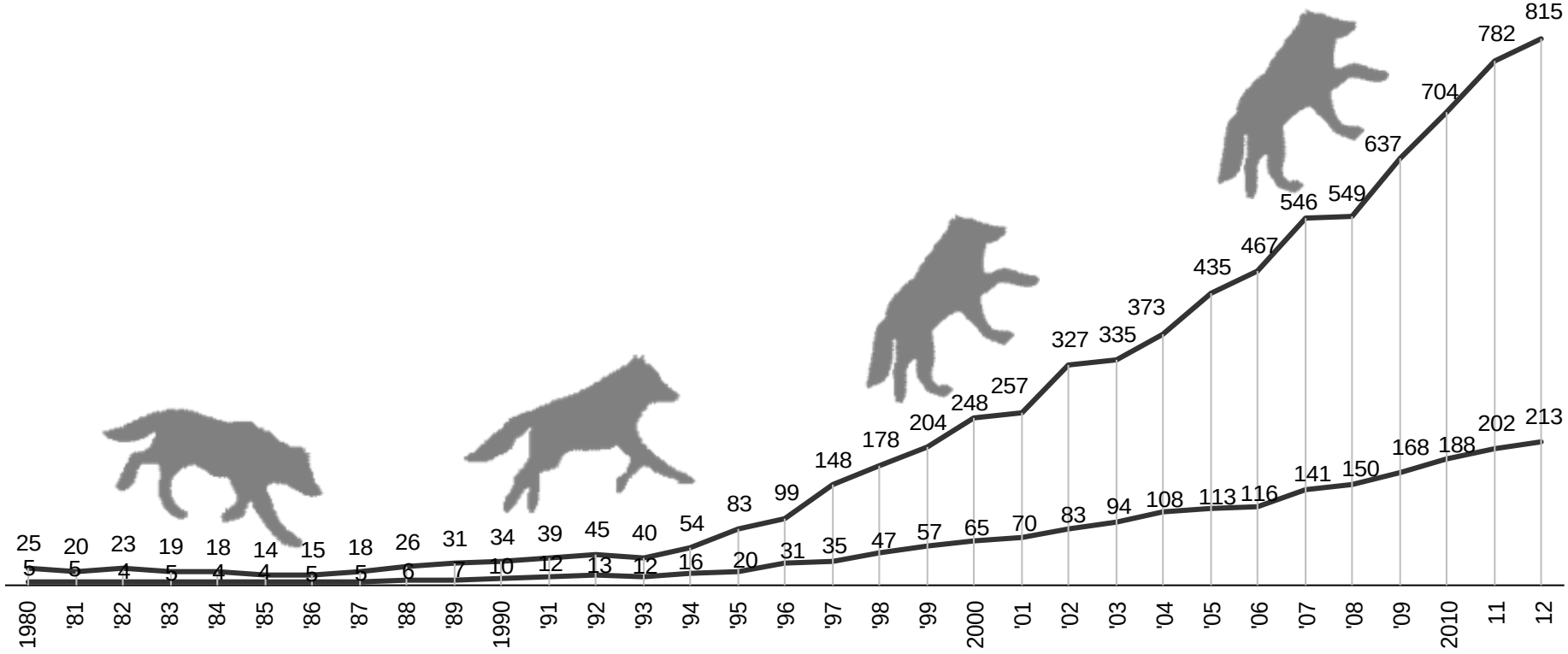

Figure 2. *Changes in Wisconsin Gray Wolf Population: 1980-2012.*