

**Wisconsin Department of Natural Resources
Natural Resources Board Agenda Item**

Item No. 3.B.2.

SUBJECT: Request approval of a wolf harvest quota and establish the number of licenses to issue for the 2014 - 2015 wolf hunting and trapping season.

FOR: June 2014 Board meeting

TO BE PRESENTED BY: David MacFarland, Carnivore Staff Specialist

SUMMARY:

Annually the department proposes wolf harvest quotas and establishes the number of harvest licenses to issue. For 2014 we are requesting your approval of a 2014-15 wolf season quota of 156 and permit number 10 times the state-licensed quota following adjustment in response to tribal declaration. The zone specific quotas are recommended as follows:

Zone 1 - 33
Zone 2 - 16
Zone 3 - 41
Zone 4 - 9
Zone 5 - 21
Zone 6 - 36

We anticipate this quota will continue to reduce the wolf population, but at a slower rate than last year.

Quota recommendations were made by the Wolf Advisory Committee in consideration of the following factors: observed mortality rates in 2012-13 and 2013-14, projected 2014-15 non-harvest mortality, population impacts of the last 2 harvest seasons, the current management plan and the current plan writing process, legal challenges to delisting, the diverse views of Wisconsin citizens, our early and somewhat limited understanding of how harvest affects the state's wolf population, and projected 2014-15 quota impacts.

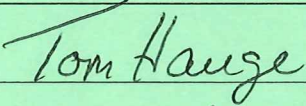
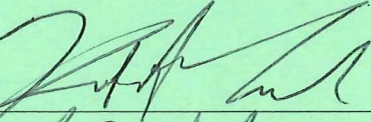

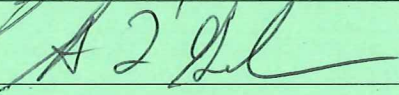
Wolves were delisted as a federally protected species on January 27, 2012. The legislature passed 2011 Wisconsin Act 169 to authorize the hunting and trapping of wolves. Act 169 required the adoption of emergency rules to implement the first season in 2012, with the emergency rule to remain in effect until a permanent rule is promulgated. In December 2012, the Natural Resources Board approved taking a permanent rule to hearings. These hearings will be held later this year in anticipation of Board action in February, 2015. At that time, the department plans to bring the permanent rule language and an updated wolf management plan to the Board for approval.

RECOMMENDATION: Approval of a wolf harvest quota and number of licenses to issue for the 2014 - 2015 wolf hunting and trapping season.

LIST OF ATTACHED MATERIALS (check all that are applicable):

☒ Background memo
☐ NA

☐ NA
☐ NA

Approved by	Signature	Date
Tom Hauge, Bureau Director		6/12/14
Kurt Thiede, Administrator		6/12/14
 Cathy Stepp, Secretary		6-13-14

DATE: June 13, 2014

TO: Natural Resources Board

FROM: Cathy Stepp, Secretary

SUBJECT: Wolf Quota and License Number Recommendations

I am asking for your approval of a 2014-15 wolf season quota of 156 and permit number 10 times the state-licensed quota following adjustment in response to tribal declaration. This quota represents a statewide off-reservation minimum count midpoint harvest rate of 24.1%. The zone specific quotas and proportion of the 2013-14 winter off-reservation minimum count midpoints are recommended as follows: Zone 1 - 33 (12.0%); Zone 2 - 16 (11.5%); Zone 3 - 41 (50.0%); Zone 4 - 9 (48.6%); Zone 5 - 21 (19.8%); and Zone 6 - 36 (128.6%). We anticipate this quota will continue to reduce the wolf population, but at a slower rate than last year.

Background:

Legislation and Rules: Wolves were delisted as a federally protected species on January 27, 2012. The legislature passed 2011 Wisconsin Act 169 to authorize the hunting and trapping of wolves. Act 169 required the adoption of emergency rules to implement the first season in 2012, with the emergency rule to remain in effect until a permanent rule is promulgated. In December 2012, the Natural Resources Board approved taking a permanent rule to hearings. These hearings will be held later this year in anticipation of Board action in February, 2015. At that time, the department plans to bring the permanent rule language and an updated wolf management plan to the Board for approval.

2013-14 Quota and Licenses: The Board approved the department's request for a 2013-14 quota and license numbers of 275 and 10 times the state quota, respectively. The state-licensed quota was reduced by 10% within the ceded territory (24) to prevent total harvest from exceeding the approved quota should Chippewa Tribes exercise their right to harvest. The objectives of the first two seasons were to first halt the continued growth of the population and second to begin to reduce the population in accordance with the current management plan, address conflicts, provide opportunities for hunting and trapping, and collect data to inform future management decisions. The minimum winter wolf population count at the time of delisting was 815, which was 2.3 times the population goal of 350, and 8 times the Federal delisting goal of 100 wolves.

The DNR received 16,672 applications for 2013-14 wolf permits, 12,108 requested a harvest permit with the remainder requesting a preference point only. Of these, 2,510 (20.7%) received authorization to purchase a permit. A total of 1,879 permits were sold. License and application revenues amounted to \$268,919.05, which is first used to pay damage claims (\$151,333.36) and then other wolf management costs including the contract with USDA Wildlife Services for depredation control assistance. A USFWS livestock demonstration grant was used to offset \$50,000 of the damage claims, reducing claims paid from license and application revenues to \$101,333.36.

Reduction in agricultural conflicts has been a priority objective since the state received management authority in 2012. In 2011 (the final year of Federal listing), 40 farms experienced verified wolf losses compared to 28 in 2013 (-30%). Similarly, verified cattle depredation has declined from 71 animals in 2011 to 38 animals in 2013 (-46.5%).

Population Monitoring: Mortality of wolves is monitored through harvest registration, reported observations, and monitoring of animals fitted with radio-telemetry devices. Known human-caused wolf

mortality from April 15th, 2013 – April 14th, 2014 (a wolf monitoring year) fell into expected ranges and included: 257 harvested by hunters and trappers, 65 removed in depredation control actions, 21 killed in vehicle collisions, 11 shot illegally, and 6 of unknown causes. The Chippewa Tribes did not harvest any wolves in 2013-14. The total known human-caused wolf mortality in the 2013-14 monitoring year was 360 or 44.5% of the 2012-13 minimum winter count.

Wisconsin uses a territory mapping with telemetry technique to annually monitor gray wolf populations. We have been using this technique to monitor wolves since 1979. This is a standard wolf monitoring technique used by the majority of states with wolf populations. The technique relies upon multiple data sources to identify the existence of wolf packs, delineate their territories and enumerate the number of individuals in each pack. Pack estimates and detections of lone wolves are aggregated into a state-wide population estimate. The methodology produces a count of the minimum known wolf population in winter. The population roughly doubles when pups are born in the spring and declines throughout the year thus the population at the beginning of the hunting and trapping season is larger than that estimated by winter count. Winter track survey data is a primary component of our population monitoring program. In the winter of 2013-14 over 15,000 miles of track surveys were conducted by volunteers and DNR staff, a record for the program.

The late winter minimum population count in 2013-14 is 660-689 in 197 packs compared to 809-834 in 214 packs in 2012-13 (table 1). This represents a reduction of 18.4% in the minimum count (figure 1). Population models developed by Jennifer Stenglein (UW-Madison), and used in the 2013-14 quota setting process, predicted the total quota of 275 would result in a population reduction of 12.7% (range 3.4-22.6%). Mean pack size has declined following the first 2 harvest seasons from 3.7 in 2011-12 and 2012-13 to 3.2 in 2013-14. The number of packs declined from 214 in 2012-13 to 197 in 2013-14.

Population Impacts: The scientific literature suggests human-caused mortality of 22-29% of winter population estimates is sustainable in established wolf populations, with higher mortality rates resulting in population decline (Adams et al. 2008, Fuller et al. 2003). This is consistent with our observations during the first two wolf harvest seasons. The 2012-13 human-caused mortality rate of 28.1% resulted in population stabilization (815 in 2011-12 vs. 809 in 2012-13). The mortality rate increased by 16.4% in 2013-14 and resulted in an 18.4% population reduction. While we have only 2 years of data, these results suggest Wisconsin's population is responding to human-caused mortality in a similar manner to the populations studied by Adams et. al (2008) and Fuller et. al (2003) (figures 2 and 3).

The 2013-14 wolf season resulted in the harvest of 134 males and 123 females. Of the 257 wolves harvested in the 2013-14 wolf season, 251 were submitted for aging analysis of which 244 were successfully aged. The sample consisted of 55.3% young of the year, 21.7% yearlings with the remainder adult animals (figure 4). Harvest age structure was similar to that observed in 2012 when 50% were young of the year and 25% yearlings. Age structure was similar for male and female animals. Of the 123 female wolves harvested in 2013, the reproductive tracts of 103 animals were analyzed for placental scarring which indicates reproduction in the prior year. Scarring was identified in 21 (19.4%) females. Placental scars occurred at the highest rate in females ≥ 2 years of age (table 2).

2013-14 Wolf Season: The number of licensees and their hunting and trapping success was sufficient to reach quotas in all 6 zones. All zones opened to wolf harvest on October 15th. The first zone closure (zone 2) occurred on October, 23rd, the final zone (zone 3) closed on December 23rd (table 3). The 2012-13 season also closed on December 23rd, however the rate of harvest early in the 2013-14 season was greater (figure 5). Of the 257 wolves harvested, trapping with foothold traps accounted for 180 (70.0%), 77 (30.0%) wolves were harvested by hunters. Of the 77 wolves harvested by hunters, 35 (13.6%) were hunted with the aid of dogs. At the Board's request, I directed staff to assess the carcasses harvested with the aid of dogs. Our wildlife, law enforcement and wildlife health staff inspected a majority of the

carcasses and confirmed all wolves had gunshot wounds, but additional information such as dog wolf interactions was very limited. One wolf was harvested with archery equipment; firearm was the method of harvest for all other animals (table 4). No wolves were harvested with the use of cable restraints. Harvest was distributed across the state according to zone specific quotas (figure 6).

Approach to 2014-15 quotas

Quota recommendations were made by the Wolf Advisory Committee in consideration of the following factors: observed mortality rates in 2012-13 and 2013-14, projected 2014-15 non-harvest mortality, population impacts of the last 2 harvest seasons, the current management plan and the current plan writing process, legal challenges to delisting, the diverse views of Wisconsin citizens, our early and somewhat limited understanding of how harvest affects the state's wolf population, and projected 2014-15 quota impacts.

The Department supports the continuation of the zone specific approach used in 2012-13 and 2013-14, with lower harvest rates in heavily forested regions (zones 1, 2, and 5), higher rates in transitional regions (zones 3 and 4), and the highest rate in regions with higher intensity human land use (zone 6). This approach is intended to sustain a wolf population in Wisconsin but reduce the total number of animals in accordance with the wolf management plan, while attempting to reduce agricultural conflicts.

The recommended quotas are as follows:

Zone 1: 33 = 12.0% of the off-reservation minimum winter count midpoint.

Zone 2: 16 = 11.5% of the off-reservation minimum winter count midpoint.

Zone 3: 41 = 50.0% of the minimum winter count midpoint.

Zone 4: 9 = 48.6% of the minimum winter count midpoint.

Zone 5: 21 = 19.8% of the minimum winter count midpoint.

Zone 6: 36 = 128.6% of the minimum winter count midpoint.

Total: 156 = 24.1% of the off-reservation minimum winter count midpoint.

It is important to note harvest rates are calculated as the percentage of the late winter population count. Rates are calculated in this manner because virtually all wolf scientific literature uses winter population estimates as the basis for evaluation of population impacts; our methods are consistent with other wolf management agencies and researchers and provide direct comparison with results reported by others. As described above, the population is larger in the fall. This makes it possible to have harvest rates > 100% of the late winter population. The high harvest rate in zone 6 is consistent with the Department objective to significantly limit the distribution and abundance of wolves in an area of the state with limited wolf habitat and higher intensity human land use.

Central to the committee's discussion and the Department's recommendation was consideration of projected 2014-15 quota impacts. In 2012 and 2013, quota decisions were based on a model developed by researchers at UW-Madison. This model was originally built to investigate patterns of wolf recovery in Wisconsin and later repurposed to evaluate harvest impacts. Models of this nature have a starting point near which they are most accurate. In this case the starting point was the first harvest season in 2012. As the model moves further from its starting point projections become less reliable. We knew this tool would only be useful for a short time before these issues made projections less precise, meaning that confidence intervals have become too large. While the model was a useful tool for decision making in the State's first 2 wolf seasons, it is no longer providing accurate information. It was necessary to develop new tools to investigate the likely impacts of the 2014-15 harvest.

We anticipate a non-harvest human-caused mortality rate of 14%. With a harvest rate of 24.1% total human-caused mortality rate is projected to be approximately 38%. Two published studies of human-

caused mortality impacts on wolf populations (Adams et. al 2008, Fuller et. al 2003) were used to predict the outcomes of 2014-15 management decisions. The Adams study has provided the basis for quota decisions in Minnesota and Michigan and both studies have predicted the impacts of Wisconsin's 2012-13 and 2013-14 management actions well (figures 2 and 3). Accurately estimating 2014-15 wolf quota impacts requires estimates of 2014-15 non-harvest human-caused mortality rates. The best information available to estimate 2014-15 rates is those observed in 2012-13 and 2013-14 when total non-harvest human-caused mortality was 14.6% and 13.6% of the off-reservation minimum population count respectively. We base our projections on a continued estimated non-harvest human-caused mortality rate of approximately 14%. This assumes the rate of human-caused mortality will be reduced in proportion to the observed population decline; the true rate of non-harvest mortality could be higher or lower than anticipated. Based on these assumptions, the recommended quota of 156 is predicted to result in a population change of -4.6% (80% prediction interval 13.0 to -22.1%) according to the relationship identified by Adams et al., and -19.6% (80% prediction interval 3.5 to -42.8%) according to the relationship identified by Fuller et al.

Based on 2013-14 off-reservation minimum winter counts, the following represents the portion of the quota within the ceded territory: zone 1 - 33; zone 2 -15; zone 3 - 41; zone 4 - 8; zone 5 - 2; and zone 6 - 27 for a total of 129.

License Numbers

The recommended ratio of wolf hunting and trapping licenses to state quota is 10:1. The recommended number of licenses is an attempt to balance the objectives of reaching quotas, allowing for effective zone closure, and providing hunting and trapping opportunity. This ratio was used in both 2012 and 2013 and resulted in quotas being met in all zones while allowing for effective zone closures.

Process for Recommendation Development and Public Input

The Department Wolf Advisory Committee met to review data, discuss quota scenarios with Department Research Scientists, consider impacts of the first 2 seasons, and debate and develop recommended harvest quotas and license numbers for the 2014-15 season. The committee is comprised of 10 department staff and representatives from the following agencies and organizations: the Great Lakes Indian Fish & Wildlife Commission on behalf of Wisconsin's six Chippewa tribes, US Forest Service, US Fish and Wildlife Service, USDA Wildlife Services, WI County Forest Association, WI Conservation Congress, Timber Wolf Alliance, WI Cattlemen's Association, WI Bear Hunters Association, WI Bowhunters Association, WI Trappers Association, Safari Club International, and the WI Wildlife Federation. This recommendation represents a balance of the diverse views held on the committee. Not all committee members support this recommendation with some members advocating for a higher quota, and some for a lower quota. The committee's recommendations were reviewed by the department Wildlife Policy Team. The department has adopted the Wolf Advisory Committee recommendations, and I am asking for approval by the Board.

Works Cited:

- Adams, L. G., Stephenson, R. O., Dale, B. W., Ahgook, R. T., & Demma, D. J. (2008). Population dynamics and harvest characteristics of wolves in the Central Brooks Range, Alaska. *Wildlife Monographs*(170), 1-25. doi: 10.2193/2008-012
- Fuller, T. K., Mech, L. D., & Cochrane, J. F. (2003). Wolf Population Dynamics. In L. D. Mech & L. Boitani (Eds.), *Wolves: Behavior, Ecology and Conservation* (pp. 161-191). Chicago, IL: University of Chicago Press.

Tables and Figures:

Table 1: 2012-13 and 2013-14 late winter minimum wolf count

Zone	2012-13				2013-14			
	Off Reservation	On Res.	Total	Packs	Off Reservation	On Res.	Total	Packs
1	326-341	15	341-356	87	270-280	11	281-291	81
2	153-154	15	168-169	44	135-143	15	150-158	42
3	104-107	0	104-107	31	80-84	0	80-84	28
4	25	0	25	7	18-19	0	18-19	7
5	138-144	0	138-144	35	103-109	0	103-109	32
6	33	0	33	10	28	0	28	7
Total	779-804	30	809-834	214	634-663	26	660-689	197

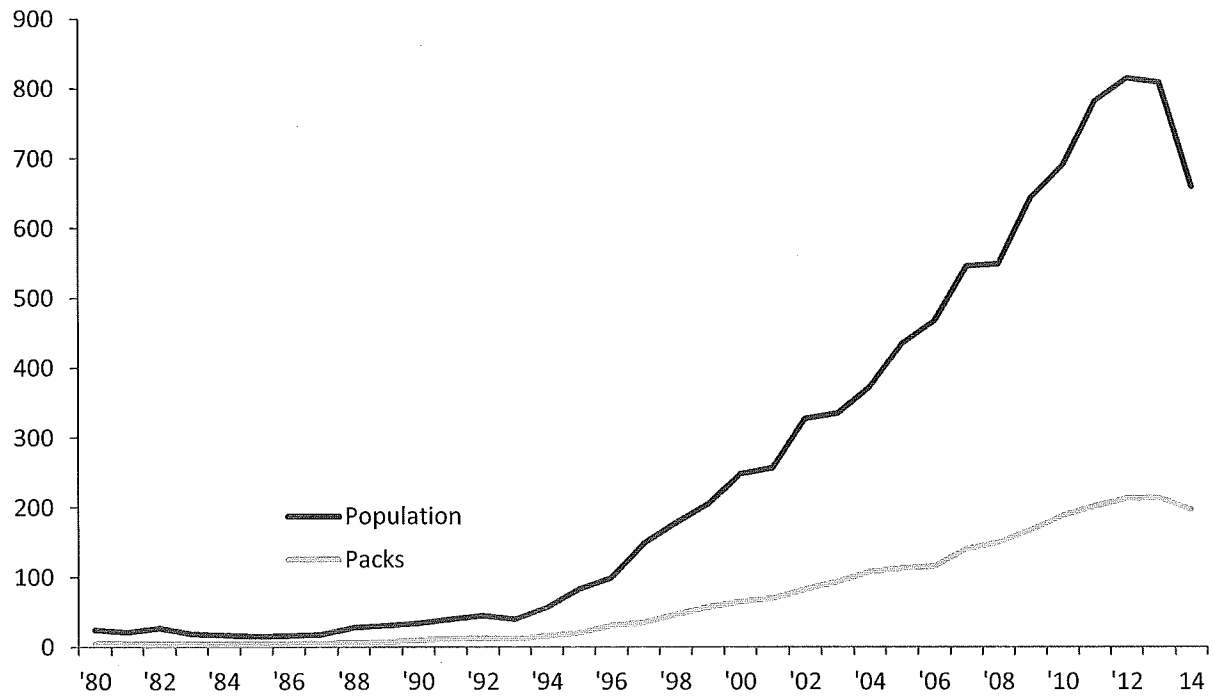


Figure 1: Minimum winter wolf population and number of packs 1980-2014

Plot from Adams et al. 2008

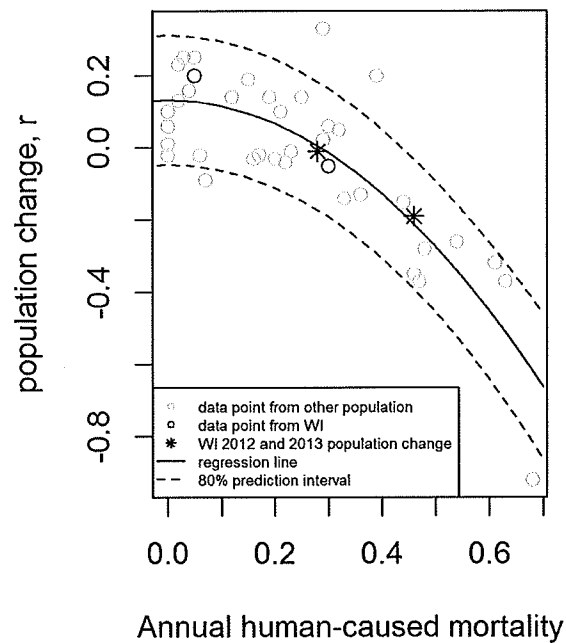


Figure 2. Line and 80% prediction interval fit to 38 data points of population change versus annual human-caused mortality from North American wolf populations. Data and relationship from Adams et al. (2008).

Plot from Fuller et al. 2003

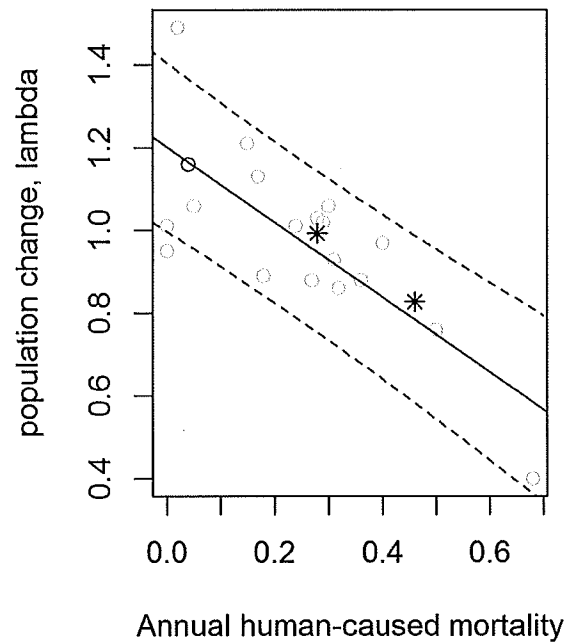


Figure 3. Quadratic and 80% prediction interval fit to 19 data points of population change versus annual human-caused mortality from North American wolf populations. Data and relationship from Fuller et al. (2003).

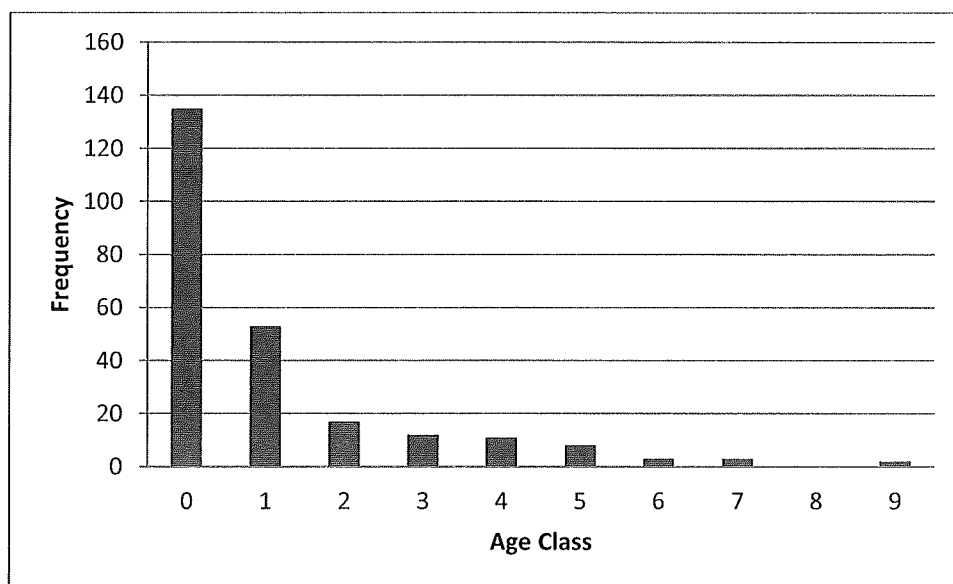


Figure 4: Age distribution of combined male and female wolves

Table 2: Proportion of female wolves with evidence of placental scarring by age class

Age Class	Number analyzed	Scarred	Proportion w/ scarring
0	52	1	0.019
1	24	3	0.125
2	7	3	0.429
3	5	3	0.600
4	6	3	0.500
5	3	3	1.000
6	3	3	1.000
7	1	0	0.000
8	0	0	
9	2	1	0.500

Table 3: Wolf quota, harvest and closure date by management zone.

Zone	Total quota	State-licensed quota	Harvest	Harvest Rate as % of off res. midpoint	Closure date
1	84	76	77	23.1	10/30/13
2	31	28	29	18.8	10/23/13
3	79	71	75	71.4	12/23/13
4	13	12	12	48.0	11/5/13
5	35	34	35	24.8	10/30/13
6	33	30	29	87.9	11/7/13
Total	275	251	257	32.4	12/23/13

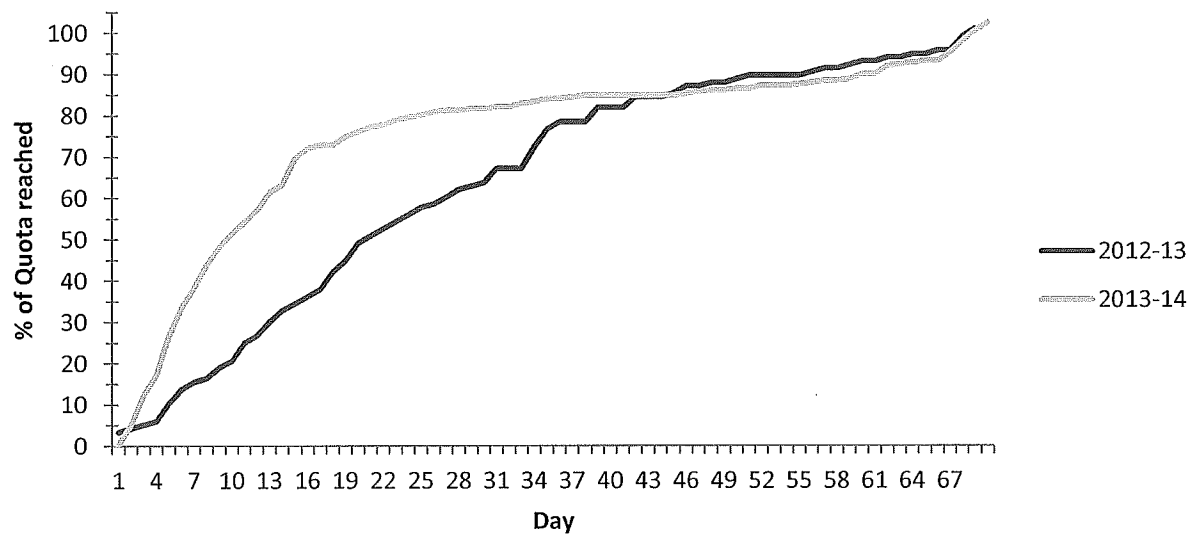


Figure 5: Rate of harvest in the 2012-13 and 2013-14 wolf seasons

Table 4: Method of harvest by management zone.

Unit	Gun	Bow	Foothold Trap	With the aid of Dogs	Total
1	12		65		77
2	5		24		29
3	13	1	26	35	75
4	1		11		12
5	5		30		35
6	5		24		29
Total	41	1	180	35	257

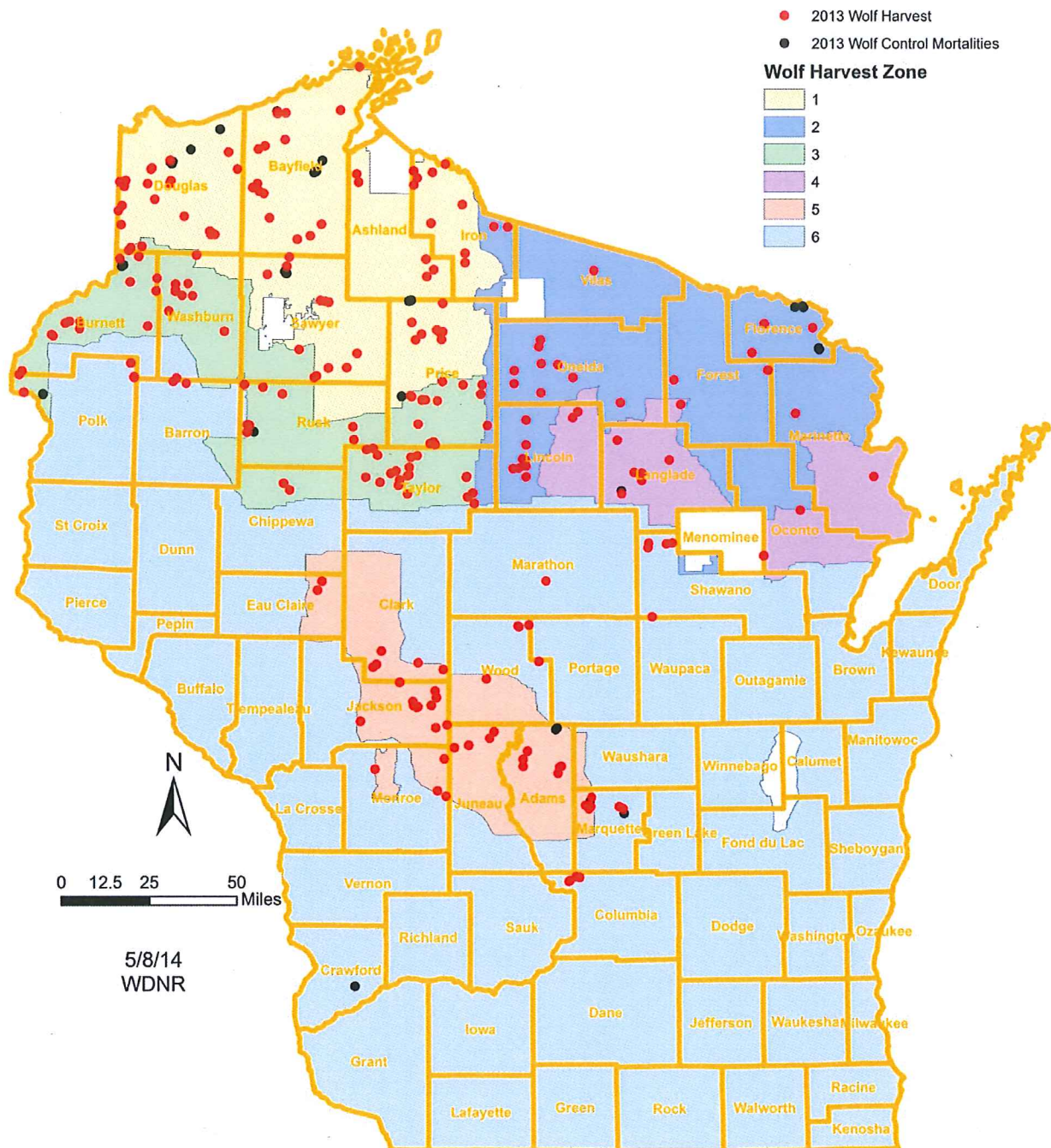


Figure 6: Location of 2013 wolf harvest and control mortalities.