

WISCONSIN ENDANGERED RESOURCES REPORT # 137
STATUS OF THE TIMBER WOLF IN WISCONSIN
PERFORMANCE REPORT 1 JULY 2007 THROUGH 30 JUNE 2008
By Adrian P. Wydeven and Jane E. Wiedenhoft

SUMMARY

This report covers activities conducted from 1 July 2007 through 30 June 2008 on wolf conservation in Wisconsin. The Wisconsin DNR reclassified wolves from endangered to threatened in 1999 and delisted wolves to protected wild animals on 1 August 2004. The U.S. Fish and Wildlife Service downlisted wolves to threatened on 1 April 2003 but, following a federal district court ruling, relisted them as endangered on 31 January 2005. On 12 March 2007 wolves were removed from the federal list of threatened and endangered species in Wisconsin and other portions of the Western Great Lakes Distinct Population segment. The 1999 Wisconsin Wolf Management Plan and 2007 Wolf Plan Addendum determined wolf management in the state, and this report follows the outline of those plans to describe wolf management activities.

Twenty-four wolves and 1 wolf-dog hybrid were live captured and fitted with radio collars in 2007 in 22 different packs. Seventy-three radio collared wolves and 2 hybrids were monitored during the study period. Mean territory size was 30.5 square miles for adult wolves, and 6499 square miles of the state was estimated to be occupied by territorial wolves. The minimum count for winter 2007-2008 was 537 to 564 wolves in 144 packs and 24 as loners, and included 520 to 545 wolves living outside Indian reservations in the state. Sixteen wolves being actively monitored died during the period and included: 1 shot illegally, 1 vehicle collisions, 2 accidental trapping, 3 euthanized depredators, 1 shot protecting domestic animals, 4 mange and disease, 1 other wolves and 3 unknown mortalities. A total of 92 wolves were found dead in the state and included the following mortality factors: 35 euthanized problem wolves, 3 landowner shooting, 24 vehicle collisions, 11 illegal shootings, 1 shot in trap, 4 accidental trapping, 5 died from mange, 2 died from other wolves, 7 died from unknown mortalities. Twelve of 66 live-captured wolves examined in 2007 had some mange. Reports of wolf observations were received from 50 counties. Fifty-four depredations on domestic animals occurred during the period and included 36 cattle killed, 12 cattle injured, 2 sheep killed, 1 horse killed, 2 horses injured, 12 dogs killed and 11 dogs injured. Thirty-two wolves and 1 wolf-dog hybrid were captured at depredations sites and were euthanized. Nonlethal methods were also used on many farms. Various other strategies for implementing the Wisconsin Wolf Management Plan were also conducted during the period.

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RECOVERY OF THE TIMBER WOLF
PERFORMANCE REPORT

1 July 2007 - 30 June 2008

Prepared by Adrian P. Wydeven and Jane E. Wiedenhoef

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Timber or gray wolves (*Canis lupus*) were listed as Endangered in the Great Lakes region in 1967 and 1974 by the U.S. Fish and Wildlife Service (U.S. Fish and Wildlife Service 1992). The State of Wisconsin listed wolves as Endangered in 1975, reclassified them to Threatened in 1999, and delisted wolves to Protected Wild Animal on 1 August 2004. The Wisconsin Department of Natural Resources (WDNR) has monitored wolves since 1979. A recovery plan with a reclassification goal to Threatened status of 80+ wolves was completed in 1989 (Wisconsin DNR 1989), and a management plan was completed in 1999 (Wisconsin DNR 1999). The management plan sets a state delisting goal of a late winter count of 250 wolves outside of Indian reservations, and a management goal of 350 wolves outside of Indian reservations.

The plan included 14 management strategies that represent the general outline of this report. The Wisconsin wolf plan was updated in 2006 and 2007, although no major changes were made in the plan or in strategies for managing wolves (Wisconsin DNR 2007).

The 1992 Federal Recovery Plan for the eastern timber wolf established reclassification goals of 80+ wolves for 3 years in Wisconsin, and a delisting goal of 100+ wolves for 5 years for Wisconsin and Michigan (U.S. Fish & Wildlife Service 1992). Federal delisting also required a stable population of

1251 to 1400 wolves in Minnesota, and approved management plans for each state. The Minnesota wolf population was 2922 wolves in winter 2008 (Myer 2008). In 2008, Michigan and Wisconsin shared about 1060 wolves, and had exceeded the 100+ threshold for 15 years. On 1 April 2003 the U.S. Fish and Wildlife Service reclassified wolves to Threatened in Wisconsin and Michigan (Minnesota has been listed as Threatened since 1978), and other states in the Eastern Distinct Population Segment (EDP), but on 31 January 2005 a federal district court invalidated the 2003 reclassification process and wolves in Wisconsin and elsewhere (except Minnesota) were re-listed as endangered. On 27 March 2006, the U. S. Fish and Wildlife Service began a process to remove Wisconsin, Michigan and Minnesota wolves from the list of federal endangered and threatened species as part of a Western Great Lakes Distinct Population Segment (DPS), and this process was completed on 12 March 2007, when all wolf management authority was returned to the 3 states, as well as portions of North Dakota, South Dakota, Iowa, Illinois, Indiana, and Ohio (U.S. Fish and Wildlife Service 2007). In 2005 and 2006, while wolves were again listed as endangered, special permits or sub-permits were issued to Wisconsin and Michigan to allow the states to kill depredating wolves, but permits were lost both years due to lawsuits by animal welfare and environmental groups. Since wolves have been removed from the federal list of endangered & threatened species, public harvest of wolves may be considered and government trappers may conduct proactive population control activities as long as the wolf population exceeds the management goal.

The enclosed report describes wolf management activity conducted in Wisconsin between 1 July 2007 through 30 June 2008, and represents the first full year of management as a state managed species since delisting on 12 March 2007.

Personnel and funding

Funding for wolf conservation activity in Wisconsin was received from the following: Federal Aid in Wildlife Restoration Project W-154-R, funds from the Nicolet-Chequamegon National Forest, Wisconsin Endangered Resources Fund (tax check-off and license plate), Timber Wolf Alliance (TWA), Timber Wolf Information Network (TWIN), Defenders of Wildlife, National Wildlife Federation, donations from private individuals, USDA-Wildlife Services federal appropriations were used to fund depredation management and research of calf mortality factors, funds from research grants through University of Wisconsin - Madison supported research by Tim Van Deelen and Elizabeth Berkley..

Adrian Wydeven was the ecologist in charge of the project, and was assisted by project wolf technicians Ron Schultz, Sarah Boles and Jane Wiedenhoef. DNR pilots conducting aerial monitoring of collared wolves included: John Bronson, Joe Sprenger, Mike Weinfurter, Phil Miller, Paul Anderson, and Dan Cardinal. Other DNR personnel that assisted extensively on wolf monitoring included Dick Thiel, Dr. Julie Langenberg, Nancy Businga, Michele Windsor, Randy Jurewicz, Aaron Buchholz, Ken Jonas, Greg Kessler, Todd Naas, Bruce Bacon, Rick Weide, Pat Beringer, Laine Stowell, Nancy Christel, Gary Dunsmoor, Paul Kooiker, Joanne Finnell, Jess Carstens, Aaron McCullough, Kevin Morgan, Randy McDonough, Rick Steffen and Tanya Hoffman. Buck Follis, Dave Ruid, Mark Kerr, Phil Peterson, Eric Fromm and Barry Benson with the USDA-Wildlife Services conducted trapping of wolves for monitoring, and Eric Fromm conducted track surveys during winter. Dead collared wolf specimens and some hybrids were sent to Paula Holahan at University of Wisconsin-Madison, and Paula assisted in identification of possible hybrids. Most dead wolves found in the field were necropsied by the DNR Wildlife Health Team, except euthanized depredators. Toni Piaggio of the USDA National Wildlife Research Center in Fort Collins, CO provided genetic testing of wolf specimens. Wolf surveys were also conducted by Don Reiter, Richard Annamitta and Doug Cox on the Menominee Reservation; Bob Frank on the Stockbridge reservation, Matt O'Clair on the Bad River Ojibwa Reservation; Paul Christel on the

LCO Reservation; and Ho Chunk members, including April Riley and Karen Karash, surveyed portions of central Wisconsin. Dawn Hinebaugh and Dustin Driese maintained the DNR wolf web site. Live trapping and field investigations of wolf depredations were conducted under the supervision of Jason Suckow and district supervisors Bob Willging and Charles Lovell of USDA-APHIS-Wildlife Services, as well as assistant district supervisor, Dave Ruid and the many wildlife specialists. About 127 volunteer trackers assisted with winter track surveys.

Two people that contributed greatly to wolf conservation in Wisconsin died during the study period. David Weitz public affairs manager from Eau Claire died on 9 July 2007. Dave had been on the state wolf advisory committee in the 1990s, and helped edit and write the 1999 wolf management plan. Most WDNR news releases about wolves written in the last 15 years were written by Dave or had major input by him. Pamela Troxell, coordinator of the Timber Wolf Alliance (TWA) in Ashland, died on 9 November 2007. Pam had been the coordinator of TWA since 1994, and had major influences on education efforts about wolves in Wisconsin, Michigan and other areas of the Midwest.

Job 106.1 WOLF MANAGEMENT ZONES

Four wolf management zones were created in the 1999 wolf management plan (Figure 1). Wolf populations and summary of wolf management activities are discussed for each zone below.

Zone 1 (18,384 square miles) represents the northern forest wolf range in Wisconsin, and in winter 2007-2008 consisted of 417-436 wolves in 116 packs and 14 as loners. Packs were detected in portions of all 21 counties in the zone. Public reports of wolf observations were received from 19 of these counties during the study period. Depredations during the study period included 25 cattle killed (mostly calves), 8 cattle injured, 2 sheep killed, 1 horse killed, 2 horses injured, and 1 deer killed (deer farm) on 26 farms by 19 packs and 1 loner. Thirteen wolf packs also killed 12 dogs and injured 10 dogs. During the period, 26 wolves and 1 wolf-dog hybrid were captured at depredation sites and euthanized. Average deer density in late 2007 across the zone was 26 deer per square mile (range 11 to 42 deer per square miles among 44 management units), and was above the average goal of 19 deer per square mile. Wolf packs and territorial lone wolves occupied about 5172 square miles in the zone at a density of about 1 wolf per 12 square miles.

Zone 2 (4,521 square miles) represents the central forest wolf range, and in winter 2007-2008 consisted of 65-72 wolves in 18 packs, and 3 loners. The zone consists of portions of 10 counties, but consists mainly of 7 counties that all contained packs. Public reports of wolf observations were received from 9 counties in the zone. No depredations on domestic animals were detected during the study period. Average deer density in this zone in late 2007 was 41 deer per square mile (range 33 to 48 deer per square mile among 5 management units), and was considerably above the average goal of 27 deer per square mile. Wolf packs occupied about 851 square miles in the zone at a density of about 1 wolf per 12 square miles.

Zone 3 (~18,000 square miles) represents wolf dispersal habitat and marginal wolf habitat in areas of mixed forest/farmland across central and southwest Wisconsin and includes portions of 33 counties. This area was not expected to be important wolf habitat, and was not expected to support many packs. In winter 2007-2008, 31-32 wolves were detected in 10 packs and 5 loners were detected. Reports of wolf observations were received from at least 21 counties. Twelve wolves were found dead in the zone during the period, including 7 killed in control actions. Depredations during the period occurred on 8 farms and included 11 cattle (calves) killed. Depredations were apparently caused by at least 5 packs and 3 appeared due to lone wolves; 2 of the packs causing depredation occurred mainly in zone 1. Wolves also attacked

and injured 1 dog. Wolf packs occupied about 477 square miles in the zone at a density of about 1 wolf per 14 square miles.

Zone 4 (~16,000 square miles) represents portions of southern and eastern Wisconsin, and includes 28 counties in portions of the state that are mostly agricultural and urban areas. No packs were detected in the zone, but 2 loners were reported in the zone during the winter survey period. Reports of wolf observations were received from 14 counties in the zone during the study period. Eight wolves were found dead in 7 different counties in the zone during the study period. No depredations on domestic animals were detected.

JOB 106.2 POPULATION MONITORING AND MANAGEMENT

Thirty wolves and 1 wolf-dog hybrid were live-captured and released back in the wild, and radio collars were placed on 24 wolves and 1 hybrid in 2007 (Table 1). Collars were not placed on smaller pups. Collared wolves were located in 22 different packs. Captured wolves included 6 adult males (mean weight 78 lbs \pm 6.8 SD for 5), 11 adult females (mean weight 68 lbs \pm 9.2 SD), 2 yearling males (mean weight 60 lbs \pm 4.5 SD), 5 yearling females (mean weight 60 lbs \pm 5.9 SD), 3 male pups (12 to 58 lbs), and 3 female pups (30 and 46 lbs.).

A total of 73 wolves and 2 wolf-dog hybrids (461F & 636F) were monitored during the study period (Table 2). Radio collared wolves were monitored in 60 different Wisconsin packs and 1 Minnesota pack (Truck Trail), or 42% of packs detected in winter (144 packs) in Wisconsin. Wolves monitored during the 2007-2008 study period included 25 adult males, 38 adult females, 3 yearling males, 4 yearling females, 1 pup male, 2 pup females, and 2 adult wolf-dog hybrid females (age during most of study period or age at capture for wolves captured in spring 2008). Most collared wolves were monitored in Zone 1 (64 wolves and 2 wolf-dog hybrids) and Zone 2 (7 wolves), and only 2 were monitored in Zone 3.

Mean winter home range area for 28 wolves with \geq 20 radio locations was 29.7 square miles (\pm 16.6 SD), and for 26 adults with \geq 20 location was 30.5 square miles (\pm 16.9 SD)(Table 2). Home range areas were probably larger in northern Wisconsin (Zone 1) where deer densities were lower (Wydeven et al. 1995), but we lacked adequate sample size to determine home range areas in central Wisconsin. Home range area in winter ranged from 5.8 square miles for adult female 627F who had established a small home range area squeezed between other territories in Bayfield County, to 73.2 square miles for adult female wolf M2749 in the Giant Pine pack in Forest County.

Dispersing Wolves

Wolf 556M was captured as an adult male in the Moreland Lake Pack area of northwest Bayfield County on 26 May 2005. His territory gradually shifted westward across Highway 27 into northeast Douglas County, near Lake Nebagamon. On 29 August 2007 he was found north of Highway 2, east of Maple and about 4.7 miles north of his summer home range area. On 10 September he was captured and euthanized on a farm having wolf depredations 7 miles further north and 10.5 miles north of his summer home range area.

Wolf 559F was captured as a yearling female in the South Bluff pack in Wood County on 12 August 2006. In fall and early winter 2007 she remained within the South Bluff area, but by 22 January 2008 she had moved just north of her natal territory to the Turner Creek area, about 5.5 miles north of her original capture site. She remained in the Turner Creek area with another wolf through spring and seemed to have established a new home range.

Wolf 561F was captured as a yearling female in the Flag River Pack in northern Bayfield County on 7 June 2006. Throughout the winter of 2006-2007 she traveled across northern Bayfield County across the Flag River, Siskiwit Lake, and part of Twin

Lakes pack. On 5 April 2007 she was located 13 miles to the southeast of the Flag River territory center, and appeared to be dispersing to the southeast. She was rediscovered in the Siskiwit Lake territory in July 2007. Wolf 561F seemed to have settled into the Siskiwit territory during the summer, but by later October she again began wandering to the south toward the base of the Bayfield Peninsula. Through winter she roamed the Washburn District of the Chequamegon National Forest extensively and by late winter she seemed to have settled into the Ino pack, 17 miles south of the Siskiwit Lack pack and 13 miles southeast of her original home in the Flag River Pack.

Wolf 569F was captured as a yearling female in the Wildcat Mound Pack in eastern Jackson County on 15 June 2006. She remained in her home territory through 8 November 2006, but was lost for 2 months after that until she was rediscovered in the Dandy Creek area, 14 miles southeast of her original capture location on 19 January 2007. She remained in the Dandy Creek area through 20 March 2007, when she began moving to the west. Wolf 569F's last location during the winter study period was on 9 April 9 miles south of her original capture on the south side of Jackson County, east of I-94. She seemed to have established a new territory in the area in summer, and was named the Starlight Pack.

Wolf 570F was captured as an adult in the Rainbow Lake pack area of Bayfield on 13 May 2007. She remained in the Rainbow Lake pack area through fall, but made more use of the northern edges of the territory. By mid January she began using areas along the Brule River in Douglas County on the northern edge of the Casey Creek pack, and 20 miles northwest of her locations on the east side of the Rainbow Lake pack. She did make some short visits back to the Rainbow Lake pack in winter, but spent most of her time on the north edge of the Casey Creek pack. She was last located on 5 May 2008 between the Casey Creek pack and the Rainbow Lake pack, about 11 miles northwest of the center of the latter pack territory.

Wolf 572M was captured as an adult male in the Little Rock Lake Pack in Vilas County on 24 May 2006. He remained in the Little Rock Lake pack territory until late spring 2007. He was last detected in the Little Rock Lake territory on 14 May 2007, and on 21 June 2007 was detected 11 miles to the south in the North Willow area. He spent the summer wandering south, west and north of the Willow Flowage and by 3 October 2007 seemed to have settled in the Little Rice River area, 23 miles south of the center of his original territory. By mid-winter he seemed to have established a home range in the Clifford area along the Price/Oneida County line with 1 or 2 other wolves. The mid-point of his new territory was about 29 miles south of the mid-point of his original territory.

Wolf 573F was captured as a yearling female in the Torch River Pack of Ashland County on 26 June 2006. During winter 2007-2008 she spent much time toward the south end of the Torch River pack and on the western portions of the Hungry Run pack, especially after the death of 477F on 28 January 2008, the previous alpha female of that pack. Wolf 573F may have joined the Hungry Run pack or established a new territory on the west side of this territory.

Wolf 615F was captured as an adult female in the Bearsdale Pack of western Bayfield County on 10 June 2007. In fall she began to travel near the edge of the territory, and by late November 2007, occupied a small wedge of land north of Bearsdale, east of the Rainbow Lake Pack, and west of the Bibon Swamp pack. She was seen with another wolf in this area on 3 and 19 December 2007. She continued to occupy a small home range area near Pigeon Lake with another wolf throughout the rest of winter.

Wolf 620F was captured as a yearling female in the Namakagon Barrens in Burnett County on 27 May 2007 and remained in the pack area during the summer, and was last located 16 August 2008 in the area. She was again located on 3 October 2008, 82 miles to the east in the Chippewa River pack in Iron County. She was lost after that location.

Wolf 621F was captured as an adult female in the Hoffman Lake pack in Iron County on 27 May 2007. She was last located just to the north in the Chippewa River pack area on 19 September 2007, about 7 miles north of the center of the Hoffman Lake pack territory.

Wolf 624F was captured as an adult female somewhat east of the Chain Lake pack area in eastern Douglas County on 1 June 2007, but roamed broadly through the territory over summer. By late October she began traveling outside the Chain Lake area, and by 15 November she had settled into an area north of Minong Flowage to the west. She was found dead on 10 December 2007, 9 miles west of the center of the Chain Lake territory, apparently due to mange.

Wolf 627F was captured as an adult female on 28 June 2007 in the Rainbow Lake Pack of western Bayfield County. She was apparently lactating at the time. Soon after her capture, 627F moved to the eastern edge of the territory, and through the rest of the summer and into fall, occupied a small area north of the Rainbow Lake Wilderness and along the White River. She was seen with one other wolf on 3 December and 27 December 2007. This 6 square mile home range area was wedged between the

Rainbow Pack on the west, Bibon and Mason Pack on the east, and Ino Pack on the north, and remained in the area throughout the winter.

Wolf 633M was captured to the east of the Casey Creek pack on 23 October 2007 in Bayfield County. She remained in the Casey Creek pack along the Bayfield and Douglas County boundary throughout most of the winter. She was last located in the Casey Creek pack area on 10 March 2008, and was last located on 19 March 2008 south of Superior in Douglas County, and 26 miles west of her original capture site.

Wolf 649M was captured in the Whitney Lake pack territory in Vilas County on 31 December 2007. Although he initially remained in the Whitney Lake pack area, by early March he began moving to the southwest, and by late winter was in the Bootjack Lake pack area, 27 miles southwest of his original capture in the Whitney Lake pack. In spring he roamed broadly through eastern Price County in portions of the Bootjack Lake, Wintergreen, Musser Creek packs and other areas.

Wolf 4927M was captured as a male pup in Mackinac County, Michigan on 20 November 2006. He entered northern Marinette County, in northeast Wisconsin, shortly before 28 January 2008, and 118 miles west of his original capture site. He continued to travel to the southwest and by 10 March had traveled to a location halfway between Shawano and Keshena, and 57 miles from his location on 28 January. He was lost after that location, but was shot by a turkey hunter who misidentified him as a coyote on 1 May 2008 in western Crawford County. This location was within 1 mile of the Mississippi River, 330 miles southwest of his original home in Michigan, and 161 miles from his last location near Shawano in Wisconsin.

Wolves 605F, 613F, & 622F, were all captured in spring 2007 in the Ghost Lake, North (or South?) Empire, and Echo Valley packs respectively. All 3 went off the air soon after capture, due either to dispersal or possible collar failure. Reduced flights in summer due to budget limitations may have contributed to loss of the animals.

Shawano County Female, adult was killed on 17 August 2007 along Highway 29 about 9 miles south of the nearest pack on the Stockbridge reservation to the north.

Dane County female yearling was found dead from shooting on 1 October 2007 along a roadway near Mazomanie, and 58 miles south of the wolf packs near Necedah NWR

Trempealeau County Female was shot on 14 October 2007 near Ettrick, about 25 west of the Fort McCoy Pack.

Dodge County Female adult was hit by a vehicle on 19 October 2007 near Waupun, 56 miles southeast of the nearest pack in the Colburn Wildlife Area in Adams County.

Iowa County Male, adult was shot on 20 October 2007 near Avoca, about 62 miles south of the nearest packs on Necedah NWR.

Adams County Male, was trapped and shot on 2 November 2007 north of Wisconsin Dells, and about 18 miles southwest of the Colburn Pack

Sauk County Male, adult was killed by a bow hunter on 10 November 2007 west of Portage along the Wisconsin River. It was killed about 34 miles south of the Colburn Pack, the nearest pack to the north

Clark County male adult was found dead from shooting on 20 November 2007 along a town road south of Neillsville, and about 4 miles southeast of the Wedges Creek Pack. Because the wolf had been shot, it may not have traveled to this location on its own.

Winnebago County male, adult was shot by a bow hunter southwest of Oshkosh on 29 December 2007. On 28 December a wolf was sighted on the southwest side of Oshkosh in a snowstorm that, based on analysis of photos, appeared to be the same animal. The death site was 50 miles to the east of the nearest wolf pack (Colburn Pack).

Douglas Co. yearling female was found dead on the north side of the city of Superior on 29, January 2008. Being found about 4-5 miles north of the nearest pack, the animal was suspected of being a disperser, but possibly the carcass was dropped off at the site.

Grant County wolf, a wolf of unknown sex was found dead in Grant County on 7 May 2008 near Lancaster. Sex and cause of death were not determined, due to advanced decomposition. The location was 78 miles south of the nearest wolf pack in Monroe County (Ft. McCoy pack). It was confirmed genetically to be a gray wolf (Toni Piaggio, pers. comm., 6/18/08).

Wolf Count Summary

Through radio tracking of collared wolf packs, snow tracking of noncollared packs, and public and agency reports of wolf observations, a total statewide population count was obtained of a minimum of 537 to 564 wolves in winter 2007-2008 (Table 3). This included 513-540 wolves in 144 packs or groups of ≥ 2 wolves, and at least 24 loners (Figure 2). The count outside of Indian reservations was 520 to 545, thus the wolf population was at least 170 wolves above the state population goal of 350 wolves outside of Indian reservations. We adjusted the winter count in 2007-2008 from 540-577 with 138 packs, to 546-583 including 141 packs with discovery of 3 packs (pairs) missed in the winter count in 2006-2007 (Amnicon River, Weirgor Lake, and Bradley). Using the lower range of the population ranges, the wolf population declined about 2%, the first time since 1993 that an annual increase was not observed. Annual growth averaged 12% between 2000 and 2007, but was higher between 1990 and 1999 when the rate averaged 22%. The wolf population growth since 1979-1980 is shown in figure 3.

Average pack size was 3.6 to 3.8 wolves across the state, which was slightly less than pack size in 2007 (3.8 to 4.1), 2006 (3.9 to 4.3), or 2005 (3.8 to 4.1) (Wydeven et al. 2007). The area occupied by territorial wolves in winter was estimated to cover 6499 mi², and thus 522 to 549 wolves occurred at densities of 1 wolf per 11.8 mi² to 12.5 mi² within occupied wolf range. DNR pilots detected 134 different wolves at 179 radio locations, and mean pack size of 35 packs observed by pilots was 3.8 wolves per pack (SD \pm 1.80)

An estimated 138 to 216 pups existed in the winter wolf population. Using a midpoint of 177 pups and estimating 132 potential breeding packs, estimated pup survival to late winter 2008 from pups born in the spring of 2007 was 0.26 or 26%. Pup survival was apparently lower than detected in recent years when it was 32% in 2007, 32% in 2006, and 31% in 2005 (Wydeven et al 2007). Pup survival was similar in Zone 1 (26%) and Zone 2 (28%), but low in Zone 3 (19%). No surviving pups were detected in 37 packs or 28% of packs potentially producing pups. The lower pup survival detected in 2008 may have been one of the reasons for lack of population growth.

Ninety-two wolves and 3 apparent wolf-dog hybrids were found dead in the state during the study period (Table 4). The wolf sample included 50 adults, 14 yearlings, 18 pups and 10 wolves of unknown age (probably mainly wolves ≥ 1 year old). Gender of wolves found dead included 52 males, 33 females, and 7 unknown. Among 16 wolves that died while being actively monitored 1 (6%) was shot illegally. 2 (12%) died from wounds sustained from accidental trapping, 1 (6%) vehicle collision, 3 (19%) were euthanized depredators, 1 (6%) shot protecting livestock, 4 (25%) disease and starvation (mostly mange related), 1 (6%) intraspecific strife, and 3 (9%) unknown causes.

Among the overall sample of 92 wolves found dead in the state, mortality included: 35 (38%) euthanized depredators, 3 (3%) shot protecting livestock, 24 (26%) vehicle collisions, 11 (12%) illegal shooting, 1 (1%) illegal trapping, 4 (4%) died from capture related activity in traps set for other animals, 5 (5%) died from mange and other disease, 2 (2%) intraspecific strife, and 7 (8%) unknown causes. Among the overall sample, at least 85% were human caused mortality but among the actively monitored wolves, 50% were human caused mortality. The radio-collared sample is probably less biased as far as assessment of overall mortality rates, because natural mortality is rarely detected among non-collared wolves. Illegal kill represented 54% of all mortality among collared wolves in the same study period in 2006-2007, but

declined to 6% in the current study period. Mange seemed to be a more important mortality factor during the current period.

A total of 147 radio collared wolves actively being monitored were found dead in Wisconsin and adjacent areas of Minnesota between October 1979 and June 2008 (Table 5). Just slightly more than 50% were human caused mortality, and slightly less than 50% were caused by natural factors among known mortalities. The most important mortality factors were: illegal shooting (28%), disease (28%), other wolves (11%), and vehicle collisions (9%). Illegal killing was especially important in the 1980s, but declined drastically in the 1990s. Illegal killing seemed to be increasing in 2006-2007, but in the current study period was back down to low rates detected in the 1990s. Mange seemed to be on the increase in the last year. Euthanization of depredating wolves seems to be becoming a more important mortality factor, although it has only been possible since 2003.



Statewide Wolf Distribution

Reports were received of 327 observations of wolves by private citizens and agency personnel from 50 Wisconsin Counties (Table 6). Only reports classified as “probable” or “possible” were listed although some misidentifications may have occurred. The number of reports was similar to those received in recent years including 2006-2007 (299), 2005-2006 (341), and 2004-2005 (274) (Wydeven and Wiedenhoft 2007). Highest reports were for the following counties: Iron (25), Sawyer (21), Marinette (20), Ashland (19), and Vilas (18) Counties. The distribution of observations by zone was as follows: 210 in Zone 1, 45 in Zone 2, 39 in Zone 3, and 33 in Zone 4. Although some of these observations in Zone 3 and 4 may have included some misidentifications, the number of wolves found dead in both zones indicate regular dispersal of wolves into those zones.

JOB 106.3 WOLF HEALTH MONITORING

No disease testing was conducted on wolves that were live captured in 2007. Most wolves found dead in the field were necropsied by the Wisconsin DNR Wildlife Health team and cause of death was determined. Factors that may have contributed to mortality risk were also assessed.

The crude mortality rate during the study period of 16 wolves found dead of 73 wolves monitored, was 22% mortality among wolves that were mostly ≥ 1 year old. Among these 16 wolves, 4 (25%) died from disease and starvation (mostly mange related). Although sample size was low, mange seemed more prevalent this winter. Mange was detected in 7 (25%) of 28 wolves live-captured in 2007 for monitoring, and 3 had severe cases of mange. Mange was also detected on 5 (13%) of 38 wolves captured at depredation sites in 2007, and 2 were severe. An adult male wolf that died on 15 July 2007 from a vehicle collision, was determined during the fall to have died with Demodectic mange, a disease previously not found in Wisconsin wolves (Tanya Hoffman, DVM, WDNR, Wildlife Health Case # 2007-378). This male died in Washburn County, perhaps as part of the Tranus Lake pack where 446F died from attack by other wolves, but also suffering from mange. Previous mange in Wisconsin was mainly considered Sarcoptic mange, and it is unknown what the effects of this new mange may be on the wolf population. Lack of population growth seen in winter 2007-2008, may be partially due to more extensive mange in the wolf population.

JOB 106.4 HABITAT MANAGEMENT

Wolf program personnel continued to work with public land agencies to encourage maintaining areas of low road density and protecting den sites. The program ecologist attended the a USFS meeting on Travel Management in the Nicolet-Chequamegon National Forest on 15 October 2007 in Cable and provided comments on the proposed rule. The program ecologist also provided input in a FS meeting on Cumulative Effects on wolves and other mammals in the national forest on 11 November 2007.

JOB 106.5 WOLF DEPREDATION MANAGEMENT

Sixty-six cases of wolf depredation problems occurred during the 2007-2008 study period, including 54 cases of wolf depredations causing death or injuries of domestic animals (Tables 7a & 7b). Nine cases of threats or harassment to livestock were recorded and 3 cases of safety concerns occurred where wolves had apparently lost fear of people. Thirty-six cases occurred where wolves depredated on 34 farms, causing the death of 36 cattle (35 calves), injury to 12 cattle, death of 2 sheep, death of 1 horse, injury to 2 horses, and death of 1 deer (deer farm)(Table 7a). Eighteen cases included wolf attacks on dogs resulting in the death of 12 dogs and injury to 11 dogs (Table 7b). Seven dog depredation cases involved dogs attacked near homes, involving 2 dogs killed and 6 dogs injured. Eleven cases involved hunting and training situations involving the death of 10 hounds and injury to 5 hounds. Thirty-three packs (23% of the state total) were involved in depredation; 20 (14%) depredated only on cattle, 9 (6%) depredated only on dogs, and 4 (3%) depredated on both. Lone wolves attacked livestock in 2 or 3 situations and 1 loner attacked a dog.

USDA-Wildlife Services attempted trapping at 30 farms and 1 human safety site, and captured 32 wolves and 1 wolf-dog hybrid at 15 farms, and 2 wolves were removed by landowners. USDA-Wildlife Services also provided technical assistance, and provided non-lethal devices such as flashing lights, fladry, and noise devices, especially on farms with threats and harassment of livestock. DNR provided reimbursements for all verified losses of livestock and dogs. DNR also provided shooting permits to 26 landowners in zone 1, and 8 landowners in zone 3. No landowners with permits shot any wolves during the study period, although 2 landowners with depredations shot wolves in the act of attacks, and 1 landowner prevented an attack by shooting a wolf.

JOB 106.6 WOLF EDUCATION PROGRAMS

During the study period talks about wolves were given by the following WDNR personnel (talks/people): A. Wydeven (17/556), J. Wiedenhoef (6/168), R. Schultz (10/311), R. Thiel (7/577), S. Boles (1/40), Gary Duns Moor (4/90), Kathleen Harris (2/115), Michele Windsor (3/?), Rick Weide (1/20), John Huff (1/12), plus elk talks by Laine Stowell that included information on wolves (35/1352). Persons in USDA-Wildlife Services who gave wolf talks included: Dave Ruid (5/250), Bob Willging (2/49), Chip Lovell (1/25), Ed Zyzdik (1/30), and Eric Fromm (1/50). Volunteers with Timber Wolf Alliance (TWA) who gave wolf talks in Wisconsin included: Alice Droske (1/430), Clay Eklund (1/19), Steve Hoffmeister (1/30), Jody Henseler (6/90), Lisa Lemke (5/112), Doug Moericke (1/18), Mary Nortman (6/257), Dianne Schmitz (5/250), Emily Scheunemann (11/603), and Nancy Warren (2/85). Others giving wolf talks during the period included: Dan Eklund with USFS (1/45), Cully Shelton with Cable Natural History Museum (32/786), Cindy Mueller with Bubolz Nature Center (11/513), and volunteer tracker Linda Nelson (1/15). Talks by DNR Wolf Program Personnel included training 30 volunteers at a wolf ecology

weekend in August 2007, and training of about 100 volunteer trackers at 3 workshops in fall 2007. The Wisconsin DNR, US Forest Service, and other agencies cooperated with TWA to distribute > 6000 educational posters during Wolf Awareness Week in October 2007.

The wolf program ecologist attended 3 meetings with the TWA advisory council to coordinate wolf educational and outreach activities. TWA was formed in 1987 to assist the Wisconsin DNR in wolf recovery efforts (and later assist Michigan DNR as well) by educating people about wolves. During most of the 20-year period, TWA was a program with the Sigurd Olson Environmental Institute at Northland College in Ashland. With the death of TWA coordinator (1994-2007), Pam Troxell, and changing directions at Northland College, a new home was sought for TWA during the study period. Four meetings were held with the Cable Natural History Museum in summer and fall 2007 to explore possibilities of incorporating TWA, but was not considered feasible under current conditions. In winter and spring 2008, 3 formal meetings and many informal meetings were held with the North Lakeland Discovery Center (DC), and TWA to discuss joining TWA to DC. By the end of the study period, TWA had moved over to DC and a formal announcement on the move was made on 7 July 2008.

Media contacts by the project ecologist included 78 contacts including, 33 newspaper (including wire services), 26 radio, 15 television, 3 magazine, and 1 book author interview. Major news stories included: proposal by the Wisconsin Conservation Congress for a public wolf harvest, wolf depredations on dogs, new population count, livestock depredations and control actions. A cougar (*Puma concolor*) detected in southern Wisconsin in January-March 2008, and in northern Illinois March-April, until killed in Chicago on 14 April, created a lot of interest in cougars and other large carnivores, and included 40 additional media contacts. News releases were developed for dog and livestock depredations, coyote season closure during deer season, and new population count. Two progress reports (the previous fall and summer reports were combined into one report) and two annual reports were written and distributed and posted on the DNR wolf web site, <http://dnr.wi.gov/org/land/er/publications/wolfreports/> & <http://dnr.wi.gov/org/land/er/publications/reports/mammals.htm#TimberWolf> and the DNR Wildlife Survey Reports web site, <http://dnr.wi.gov/org/land/wildlife/harvest/reports/07graywolfpop.pdf>. The DNR wolf web site, <http://dnr.wi.gov/org/land/er/mammals/wolf/>, also contained information on wolf depredations on farms, latest updates on depredations on hounds, updated wolf distribution maps, news releases, and information on the Volunteer Carnivore Tracking Program.

JOB 106.7 LAW ENFORCEMENT

Wolf project personnel assisted DNR conservation wardens on the 12 illegally killed wolves that occurred during the study period. In seven cases, persons shooting wolves turned themselves in after mistakenly shooting wolves for coyotes. Seven of the illegal wolf kills occurred in Zones 3 and 4 outside of typical wolf range, and 6 of these people turned themselves in. Only 5 illegal kills were detected in Zones 1 and 2 where most wolves lived. Persons turning themselves in were fined at a minimum level and did not lose any hunting privileges.

The coyote closed area during the firearm deer season was monitored during the hunting season, and a news release was published prior to the deer season to remind hunters of the coyote closed season and the protected status of wolves. Extra flights were flown during the deer season..

JOB 106.8 INTERAGENCY COOPERATION AND COORDINATION

The Wisconsin Wolf Science Committee met on 31 January 2008, and 15 May 2008, to update wolf depredation guidelines, and reviewed depredation controls, proactive control areas, opportunities for shooting wolves attacking domestic animals on public lands, and Wisconsin Conservation Congress proposals for public wolf harvest. The Wisconsin Wolf Science committee, which advises DNR administration, the Wisconsin Wolf Stakeholders, and the Wisconsin Natural Resources Board on scientific management of wolves in the state, consisted of staff from Wisconsin DNR, University of Wisconsin, University of Wisconsin Extension, Wisconsin Department of Agriculture Trade & Consumer Protection, U.S. Forest Service, USDA-Wildlife Services, Great Lakes Indian Fish and Wildlife Commission (GLIFWC), U.S. Fish and Wildlife Service, Wisconsin county forests, and a private veterinarian.

A meeting was held with the Wisconsin Wolf stakeholders on 19 April 2008 to discuss wolf population updates, depredation guidelines, proactive control areas and Conservation Congress proposals. The Wolf Stakeholders consisted of a diverse group of interested parties including hunting groups, environmental groups, animal welfare organizations, farm groups, tribes, educators and private citizens.

The Midwest Wolf Stewards met in Hinckley, Minnesota on 23-24 April 2008. Talks and discussions were held on wolf status and research in Michigan, Wisconsin, Minnesota and southern Ontario. The organizations involved included Wisconsin DNR, Michigan DNR, Minnesota DNR, Ontario Ministry of Natural Resources, USDA-Wildlife Services, U.S. Fish and Wildlife Service, U.S. Forest Service, University of Wisconsin-Madison, Timber Wolf Alliance, Central Michigan University, GLIFWC, International Wolf Center, Wildlife Science Center, and others. The project ecologist is a member of the Eastern Gray Wolf Recovery team, but no meetings were held during the study period.

Other coordination by wolf program personnel included some of the following: presentation on wolf plan updates to the Wisconsin Natural Resource Board in Bayfield on 15 August 2007, Tri-State Furbearer Management meeting at Ashland on 7-8 November 2007, Wisconsin Conservation Congress Wolf Committee in Stevens Point on 7 December 2007, Voight Task Force of Chippewa Tribes in Odanah on 1 May 2008, Bad River Conservation Department in Odanah 21 May 2008, LCO Conservation Department in Hayward 18 June 2008.

JOB 106.9 PROGRAM GUIDANCE AND OVERSIGHT

Depredation guidelines developed in 2007 were used to create 5 proactive control areas where numerous wolf depredations were documented by 6 specific packs. Within these control areas, liberal issuing of wolf shooting permits was done for landowners, and more liberal controls could be applied by USDA-Wildlife Services to reduce problem packs. USDA-Wildlife Services updated its environmental assessment for wolf control in Wisconsin to allow application of proactive controls. During the study period, depredation guidelines were updated and were discussed by the Wolf Science Committee on 31 January 2008 and 15 May 2008, and discussed with the Wolf Stakeholders on 19 April 2008.

http://dnr.wi.gov/org/land/er/mammals/wolf/pdfs/depredation_guidelines.pdf

Meetings were held on 16 October 2007 and 18 April 2008 to plan wolf survey activities. Wolf management was coordinated with the Chippewa tribes by meeting with the Voight Task Force (1 May 2008), and meetings with conservation departments of 2 of the Chippewa Bands (Bad River, LCO). A

presentation on Wisconsin wolf management was given at a Native American Wildlife Conference in Lac du Flambeau on 12 September 2007, and coordination of wolf management activities was also done with Ho-Chunk, Menominee, and Stockbridge at regular wolf monitoring meetings.

JOB 106.10 VOLUNTEER PROGRAMS

Volunteers were again important to wolf conservation activity in Wisconsin including assistance on wolf surveys, assisting with funding including the purchase of radio collars, and providing education and outreach about wolves. Volunteers also served on the Wolf Stakeholders group which met on 19 April 2008, and the Conservation Congress Wolf advisory committee which met on 7 December 2007 to advise DNR on wolf issues. Ten volunteer speakers with the Timber Wolf Alliance gave talks to 1954 people. A total of 100 volunteers attended track training classes, and 127 people completed 5508 miles of track survey in 79 survey blocks. Volunteers averaged 3.6 surveys per block (~ 200 square mile area), and averaged 12.2 hours surveying 70 miles of roads and trails in their blocks. During the deer hunting season, volunteers visited hunting camps across northern Wisconsin to share information on wolves with hunters. Volunteers also assisted with wolf trapping, radio collaring scouting for wolf sign, howl surveys, reporting wolf observations, and manning of education booths at sport shows and other events.

JOB 106.11 WOLF RESEARCH

The Wisconsin DNR wolf workers Adrian Wydeven, Randy Jurewicz, Ronald Schultz, Dick Thiel and Jane Wiedenhoft continued research with DNR Wildlife Health including Julie Langenberg, Nancy Businga, and Tanya Hoffman. Most wolves dying in the state, excluding euthanized depredators, were necropsied.

Research with Paula Holahan (University of Wisconsin), continued research on osteopathology of wolves that have died in Wisconsin. Attempts will be made to correlate pathological conditions on skeletons of wolves with necropsy results and field conditions. Paula Holahan also investigated structural and anatomical differences between wolves and wolf-dog hybrids.

Genetic research on Wisconsin wolves was conducted with graduate student, Tyler Wheeldon of Trent University, Peterborough, Ontario and research scientist Brent Patterson with Trent University and Ontario Ministry of Natural Resources. The research is examining the relationship of Wisconsin gray wolves (*Canis lupus*) to eastern Canadian wolves (*Canis lycaon*). It is suspected that wolves in Wisconsin and the western Great Lakes area may be hybridized with *Canis lycaon* (Kyle et al. 2006). Toni Piaggio, geneticist at the USDA, National Wildlife Research Center, in Fort Collins, Colorado helped with genetically identifying wolves and helped verify some cases of wolf-dog hybrids occurring in Wisconsin. Ongoing sharing of wolf genetic samples also occurred with U.S. Fish and Wildlife Service Forensic Lab in Ashland, Oregon.

Timothy Van Deelen, assistant professor at University of Wisconsin – Madison, began research with graduate student Elizabeth Berkley on use of quantitative fatty acid signatures to determine diet of wolves in Wisconsin (Iverson et al. 2004). Analysis will include examination of fatty acids in huskies in captivity with known diets and examinations of samples from wild wolves.

John Shivik with USDA-Wildlife Services conducted research on cause of death of “missing calves”, and attempted to determine the role of wolves and other predators in the death and disappearance of these animals.

Data from the Wisconsin wolf monitoring program was used in a recent publication that described the loss of breeding wolves on pup survival and persistence of packs (Brainerd et al. 2008).

Research on trophic cascades by wolves on ecosystems in Wisconsin was initiated by 3 graduate students. Graduate students Bryan Murray examined vigilance among deer, and Krystle Bouchard examined impact of wolves on deer browse species with assistant professor Tom Rooney with Wright University in Dayton, Ohio. Ramana Callan began her PhD dissertation research entitled “Describing spatiotemporal variability in trophic level responses to a recolonizing top-predator”, with assistant professor Nate Nibbelink, University of Georgia, Athens, Georgia.

Major work was completed on a book on the successful recovery of wolves in the Great Lakes (Wydeven et al. 2009). Adrian Wydeven, Tim Van Deelen and Ed Heske (editor for Journal of Mammalogy) edited and wrote portions of this volume, which will consist of 21 chapters and include about 50 authors. The book will include an updated model on GIS assessment of potential wolf habitat from work previously done by Mladenoff et al. (1995, 1999). The book will also include a chapter by Tim Van Deelen updating population growth and possible equilibrium population for wolf populations south of Lake Superior. The book manuscript was submitted to Springer Press in New York in July 2008, and is expected to be published early in 2009.

The wolf program produced several other reports during the study period. The Wisconsin Wolf Population in 2006-2007 was published in the Wisconsin Wildlife Surveys (Wydeven and Wiedenhoef 2007). Progress reports on wolf population monitoring were produced for summer-fall surveys, and winter surveys.

JOB 106.12 WOLF-DOG HYBRIDS AND CAPTIVE WOLVES

Eighteen cases of suspected wolf-dog hybrid incidents were reported during the 2007-2008 study period (Table 8). Because WDNR does not regulate wolf-dog hybrids, not all cases of wolf-dog hybrids came to the attention of the wolf program. Some wolf dog hybrid problems were handled by local law enforcement personnel or animal control officers, but most cases listed in table 8 included some response by WDNR. Wolf-dog hybrid problems occurred in 16 Wisconsin counties and occurred throughout the state. Three cases of wolf-dog hybrids included attacks on domestic animals, and 2 involved hybrids being aggressive toward pets. Two wolf-dog hybrids that died had been part of wild wolf packs (461F in North Willow pack, 636F in Skinner Creek pack), and one had been a member of a pack for at least 5 years (461F).

The Wisconsin DNR worked on regulations for Invasive Species Rules, as part of NR 40, <http://dnr.wi.gov/invasives/classification/>, and wolf program personnel worked at trying to include wolf-dog hybrids under this rule. It was not clear by the end of the study period whether wolf-dog hybrids would be regulated under this new rule. The Invasive Species Rules were expected to go out for public review in fall 2008.

JOB 106.13 WOLF SPECIMEN MANAGEMENT

Attempts were made by WDNR Wildlife Health staff to necropsy most wolves that were found dead in the state, if carcasses were not too decomposed. Wolves that were euthanized in depredation situations were not submitted for formal necropsies, but received amended field necropsies. Many of the euthanized depredators were also examined for a study on determination of Best Management Practices for assessing specific traps used for wolf trapping. Most collared wolves that died, and some wolf-dog hybrids, were made into specimens at UW Zoology Museum in Madison. Other wolf specimens were made available to nature centers, DNR offices, tribal offices, tribal spiritual use, and wolf educators. Randy Jurewicz coordinated wolf specimen distributions. Wolf and wolf –dog hybrid specimens handled by WDNR regions included: 75 in the Northern Region, 10 in the West Central Region, 3 Northeast Region, and 7 in the South Central Region.

JOB 106.14 ECOTOURISM

Workshops by the Timber Wolf Alliance, Timber Wolf Information Network, and Sandhill Outdoor Skills Center brought people into communities of Drummond, Tomahawk, and Babcock to explore wolf habitat and supported local businesses. Wolf programs were also given at the Cable Natural History Museum, State Parks and Forests, and National Park Service, and these programs were part of the attractants for people to visit these areas. On 14 July 2007, a Natural Resource Foundation tour was given for 34 people in the Clam Lake area, which included a tour of wolf habitat, dinner at a local supper club, and howl survey in the forest after dark. The Wisconsin DNR continued support and monitoring of ecotourism activities involving wolves in forested portions of the state.

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