

**WISCONSIN ENDANGERED RESOURCES REPORT #119
STATUS OF THE TIMBER WOLF IN WISCONSIN
PERFORMANCE REPORT 1 JULY 1999 THROUGH 30 JUNE 2000
By Adrian P. Wydeven and Jane E. Wiedenhoeft**

SUMMARY

This report covers activities conducted from 1 July 1999 through 30 June 2000. The Wisconsin wolf population was at its reclassification goal of 80+ wolves for the last six years and was reclassified to threatened on 1 October 1999. A new wolf management plan for the State was passed by the Natural Resources Board on 27 October 1999.

Nineteen wolves from 16 different packs were live-captured and radio-collared in 1999. Forty-two radio-collared wolves were monitored during the study period. Winter territories of 17 adult wolves averaged 39 square miles. The minimum count for the wolf population in winter 1999-2000 was 248-259 wolves in 66 packs, including 239-249 wolves occurring outside Indian reservations. Territorial wolves occupied an area of 3600 square miles at a density of 1 wolf per 15 square miles. Seven radio collared wolves were found dead including 4 by intraspecific strife, 1 mange, 1 shooting, and 1 unknown. Wolf observations were reported from 30 Wisconsin counties. Wolf disease tests for 1998-1999 were 11 of 28 positive serum samples for parvovirus, 8 of 27 positive for infectious canine hepatitis, 6 of 28 positive for canine distemper virus, and 1 of 18 samples positive for heartworm. Five of twenty wolves captured in 1999 showed some evidence of sarcoptic mange, 2 of 16 wolves found dead had died from mange. Thirteen cases of wolf depredation occurred during the period and involved 10 calves (4 killed), 3 deer (deer farm), 6 dogs (4 killed), and 44 chickens. Other strategies to implement the new wolf plan were also conducted during the period.

**BUREAU OF ENDANGERED RESOURCES
Wisconsin Department of Natural Resources
PO Box 7921
Madison, WI 53707**

**Wisconsin Department of Natural Resources
Box 7921
Madison, Wisconsin 53707**

**RECOVERY OF THE TIMBER WOLF
PERFORMANCE REPORT**

1 July 1999-30 June 2000

Prepared by Adrian P. Wydeven and Jane E. Wiedenhoeft

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 - 106.2 Population Monitoring and Management
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Background: Timber wolves (*Canis lupus*) in the Great Lakes region were originally placed on the first list of Federal Endangered Species in 1967, and were again placed on the Endangered Species list with the enactment of the Endangered Species Act of 1973 (U.S. Fish and Wildlife Service 1992). The State of Wisconsin listed the wolf as an endangered species in 1975, but reclassified it to a threatened species on 1 October 1999 after the population had remained above 80 wolves for 5 years. The Wisconsin Department of Natural Resources (DNR) has monitored the state wolf population since 1979. A Wolf Recovery Plan approved by the DNR in 1989 set a state reclassification goal (endangered to threatened) of 80 wolves for at least 3 consecutive years (Wisconsin DNR 1989). The wolf population has remained at 80+ wolves since 1995 and in 2000, 248-259 wolves occurred in the state. On 27 October 1999 the Wisconsin Natural Resources Board approved a new wolf Management Plan for the state (Wisconsin DNR 1999). The plan set a state delisting goal of 250 wolves outside of Indian reservations, and set a management goal of 350 wolves outside of Indian reservations. At the management goal, proactive population control activities may be conducted by government trappers, and public

harvest of wolves may be considered. The plan included 14 management strategies that represent the general outline of this report. Work done under each category is listed below.

The 1992 Federal Recovery Plan set a goal of reclassifying wolves in Wisconsin and Michigan after 80 or more wolves were maintained in Wisconsin for 3 years. The plan allowed for delisting to be considered if the Michigan and Wisconsin population remained at 100 wolves for 5 or more years while wolf numbers in Minnesota remained at or above 1251 to 1400. The federal delisting level was initially achieved in 1994 with 114 wolves, and has remained above this level for the last 6 years. Currently (2000) the two states contain nearly 470 wolves. Because approved wolf management plans have not been completed for all three states, the U.S. Fish and Wildlife Service is only beginning the reclassification process to threatened status for Wisconsin and Michigan (as well as other states) in the summer of 2000. Minnesota was reclassified to threatened in 1978. Wolf conservation work completed in Wisconsin under the 1999 Wolf Management Plan is listed below for the period 1 July 1999 through 30 June 2000.

Personnel and funding: Funding for wolf conservation activity in Wisconsin was from the Federal Aid in Wildlife Restoration Project W-154-R; U.S. Fish and Wildlife Service, Endangered Species Grants; funds from the Nicolet-Chequamegon National Forest; Wisconsin Endangered Species Fund; Timber Wolf Alliance (TWA) Adopt-A-Wolf-Pack Program; Timber Wolf Information Network; Wisconsin Department of Transportation (WDOT), and private donations. Adrian Wydeven was the ecologist in charge of the project, with extensive assistance from project wolf technician Ron Schultz, and other technicians Sarah Boles, Jane Wiedenhoeft and Paul Keenlance. Research ecologist Bruce Kohn assisted with some field research and continued analysis on the Highway 53 wolf study. DNR pilots surveying wolves included Phil Miller, Paul Anderson, Joe Sprenger, John Bronson, Mike Weinfurter, and John Jorgenson. Dick Thiel, wildlife educator, coordinated wolf surveys in central Wisconsin with the help of biologist Wayne Hall. Numerous wildlife management personnel assisted in many areas of wolf conservation work. Kerry Beheler coordinated wolf health monitoring, and Dr. Nancy Thomas of the National Wildlife Health Lab in Madison performed necropsies on dead wolves. Bob Willging, Kelly Thiel, Ed Zyzdik, Buck Follis, Jim Rollman and other personnel of the USDA-APHIS-Wildlife Services conducted Wolf depredation control activities. Over 80 people assisted on volunteer carnivore surveys across northern and central Wisconsin.

JOB 106.1 WOLF MANAGEMENT ZONES

Four wolf management zones were created in the 1999 Wolf Management Plan. Wolf populations and management activity in each zone is listed below.

Zone 1 represents the northern forest wolf range in Wisconsin and in winter 1999-2000, contained 203 to 207 wolves. Part of 21 counties occurred within the zone and wolf packs occurred in at least 10 of these counties, and wolf sightings were reported from 17 of these counties. Verified depredation by wolves occurred on livestock or poultry on 6 different farms in the zone. Two free roaming dogs and two dogs near home sites were killed by wolves in this zone. Wolf depredation occurred on 3 deer in a deer farm and 2 wolves were live-captured and relocated to other portions of the zone.

Zone 2 represents the central forest wolf range and contained 44 to 52 wolves in winter 1999-2000. Portions of 10 counties occurred within this zone, but the zone only contained very small portions of Waushara, Marquette and Chippewa Counties. Wolf packs occurred in 6 of the counties in this zone. Wolf observations were also reported from all 6 counties containing packs. No wolf depredations were reported for this zone during the study period.

Zone 2 differed from Zone 1 in not having a closure on coyote hunting during the firearm deer season. No wolves had been known to have been shot in Zone 2 during the firearm deer season since the wolves colonized the zone in about 1992. In November, 1999 a wolf shooting did occur during the firearm deer season on the Necedah Wildlife Refuge. The Refuge itself was actually closed to coyote hunting, but surrounding areas were open to coyote hunting. If wolf shootings start to become more prevalent, the coyote closure may need to be revisited in the future.

Zone 3 represents the dispersal habitat that occurs between zones 1 and 2. No packs were known to occur in zone 3 during the study period. Portions of 33 counties occur within zone 3. Wolf observations were reported for 19 of these counties, but 14 of these counties also contained portions of zone 1 or 2.

A satellite collared wolf from Minnesota (monitored by Dave Mech and Sam Merrill) traveled extensively through zone 3 in the spring of 1999, and went through at least 25 or 26 of these counties. The wolf also traveled along the southern edge of zone 1 and extensively on the eastern portions of zone 2. This wolf illustrated that it could readily disperse between zone 1 and 2 traveling across zone 3. The wolf did not settle in Wisconsin, and eventually returned to Minnesota.

Two wolves are known to have been killed in zone 3 during the study period. An adult male was killed by a vehicle collision outside of Eau Claire on 28 December 1999. A female pup that had dispersed from Michigan was shot in southwest Marathon County on 15 January 2000.

Wolf depredation occurred on one farm in zone 3 and one dog was injured by wolves in the zone. In both cases, the possibility existed that the depredations were by large dogs or wolf-dog hybrids.

Zone 4 represents portions of southern and eastern Wisconsin with very little potential for wolves. No packs were detected in the 28 counties in zone 4, and wolf observations were reported for only one of these counties (Columbia). The satellite collared wolf described above also visited the very northern portion of Columbia County where the southern border of zone 3 occurred.

JOB 106.2 POPULATION MONITORING AND MANAGEMENT

Twenty wolves were live captured in 1999, and 19 were radio collared (Table 1). Two wolves were captured at depredation sites, and one was euthanized at the site while a second was shot and killed 2 weeks after being relocated (313M). Captured wolves were from 16 different packs. Wolves captured included 10 captured as part of the Highway 53 wolf study (290M, 291M, 292M, 293F, 294M, 295F, 296M, 297M, 298M and 299M), 2 wolves were caught by USDA-

Wildlife Services at depredation sites (AF on 31 May, 313M), 2 wolves were caught in traps set for coyotes (309F, 316F), and 6 wolves were caught in the general wolf monitoring program (269M, 303M, 307M, 314M, 315F and 724F). Wolf captures included 7 adult males (avg. wt of 6=78.3 lbs), 4 adult females (avg. wt=79.0 lbs), 4 yearling males (avg. wt of 3=79.0 lbs), 1 yearling female (74 lbs), 2 male pups (avg. wt 54.5 lbs), and 2 female pups (avg. wt=41.5 lbs). A total of 889 trap nights were used by DNR to trap 5 wolves outside the Highway 53 wolf study.

Sixty-six wolf territories were identified in Wisconsin in winter 1999-2000 (Figure 1). Fifty-six packs occurred in northern Wisconsin in zone 1 and 10 packs occurred in the central forest in zone 2. Two territories were again located in northeast Wisconsin in Vilas and Forest Counties.

A total of 42 wolves were monitored in 36 different packs during the study period (Table 2). At least 7 wolves were dispersers during part of the study period, and two wolves were depredating wolves that were translocated. Sex-age composition of monitored wolves included 13 adult males, 17 adult females, 4 yearling males, 3 yearling females, 3 pup males, and 2 pup females (age during the majority of study period or age at capture for wolves live-trapped in 2000).

Mean winter home range was 37 square miles for 23 wolves detected 20 or more times over winter. Average home range for 17 territorial adults located 20 or more times during winter was 39 square miles. The largest winter home range was 70 square miles for the Frog Creek Pack and the smallest home range was 9 square miles for the Chase Brook Pack and 12 square miles for the Ranger Island Pack.

Dispersing Wolves

Wolf 240 (adult female) had traveled from the Torch River Pack in Ashland County to the Pine Lake Pack 24 miles to the east in Iron County. She appeared to be associating with this pack, but was apparently killed by other wolves on 19 July 2000.

Wolf 002F (adult female) seemed to split off from the Wildcat Mound Pack in Jackson County during the winter 1999-2000 and began to spend time north of Highway 54. She was observed near Pray with 2 other wolves in winter. It was not clear if she had completely severed her ties with the Wildcat Mound Pack.

Wolf 229F (adult female) was the original founder alpha female of the Augustine Lake Pack in Ashland/Iron Counties in 1994. In January 2000 she moved north of the pack. By February she had apparently joined the West Fire Lane Pack in the Bad River Indian Reservation, after that pack had lost its alpha female. The territory was about 12 miles north of her original territory. In mid March 2000, 229F abandoned the West Fire Lane Pack and rejoined the Augustine Lake Pack. She remained only until late March when she moved west of the Augustine Lake Pack. She spent the remainder of spring in a small home range south of Mellen, along the Penokee Range and south of Highway 77. It was not clear if she occupied this home range by herself or if she had another with her.

Wolf 280M (adult male) had occupied the Riverside territory in northern Burnett County in winter, spring and summer 1999. In November, he began several movements 20 or more miles to the west in Minnesota. By April 2000, he had established or joined a territory 33 miles to the northwest near Sturgeon Lake in the Andrews State Forest in Minnesota. He remained in that area for the remainder of the period.

Wolf 290M (adult male) had been caught in the Shoberg Lake Pack of eastern Douglas County in May 1999. In July, he traveled east of his territory into western Bayfield County. He returned to his territory in Late July. In mid September he moved to the Rainbow Lake Pack area about 15 miles to the east. Over the next 1 1/2 months he traveled back and forth at least twice between the two packs, but his signal was lost after 4 November 1999. Perhaps he dispersed out of range.

Wolf 294M (adult male) was caught in the Frog Creek Pack in northeast Washburn County in May 1999. In early February he suddenly dispersed 17 miles to the west to join up with Female 295F from the Stuntz Brook Pack. The two wolves formed a new pack in the Totagatic River area, and settled down into the area formerly known as the Riverside Pack.

Wolf 295M (Yearling female) was caught in the Stuntz Brook Pack of western Washburn County. She left the pack in early December 1999 and began moving to the north and the west. In early February 2000, she joined up with wolf 294 and appeared to establish a new territory, 6 miles northwest of the Stuntz Brook area.

Wolf 309F was caught in the Beaver Creek Pack in the Necedah Wildlife Refuge in November 1999. She remained in this pack in the northern portions of the refuge and state land to the northwest until early February 2000 when the wolf moved eastward. Wolf 309F moved 6-9 miles east of the refuge into northeast Juneau County. Her signal was lost from 28 March to 2 May, and was rediscovered near Highway 54 northwest of last location in March. From there she moved northwest into Clark County and some locations as far as eastern Eau Claire County. On 6 June she was 56 miles northwest of her original capture site. She roamed an area from Rock Dam to Highway 10 in late spring and may have joined the Rock Dam Pack.

Wolf 316F was caught as an adult female in a coyote trap in October 1999. She initially roamed a wide area from just east of Park Falls/ Fifiel to southwest Vilas County, 20 miles to the east. Toward mid winter she began to concentrate activity near Wintergreen Lake, and was seen with one other wolf. Wolf 316F was initially thought to belong to the Hoffman Lake Pack, but she may have originated from some other pack.

Wolf 309F was caught in the Wilson Flowage Pack on 23 May 2000, on the same day that the alpha male of that pack (334M) was caught a mile to the west. She stopped associating with this territory in late May when she moved 11 miles north. She remained near Block House Lake before going southeastward on 12 June. By mid June she was located just south of the Willow Flowage, and possibly had joined the Little Rice River Pack. On 30 June she was within 1 mile of Highway 51 near the Tomahawk River, and 25 miles southeast of the Wilson Flowage territory.

Wolf 017F was a female pup caught and monitored by Michigan DNR southeast of Ironwood. She was lost in her home territory after late November 1999. On 15 January 2000, wolf 017F was shot to death near Spencer in Marathon County, Wisconsin and 108 miles south of her natal territory.

Wolf Count Summary

Through radio telemetry monitoring of collared packs and snow tracking of non collared packs, a total statewide count was made of 248-259 wolves in winter 1999-2000 (Table 3). Wolves occurred in 66 packs and included at least 13 lone wolves. The wolf count included 239-249 wolves outside of Indian reservations. Using a modified count of 205 wolves for 1999 (some additional packs found after winter survey), the wolf population increased at 21%, close to the average increase of 20% that has occurred since 1985 (Figure 2). Average size of wolf packs was 3.6 wolves (range 2 to 11 wolves). Wolf territories and interstitial areas covered 3591 square miles at a density of 1 wolf/15 square miles. Wolf counts were based on 466 radio locations of 22 packs and 3 loners/dispersers, and involved observations of 97 different wolves. Additionally, DNR wolf trackers surveyed 2318 miles of snow covered roads for wolves in non collared packs, and packs using heavy cover. Volunteer carnivore trackers also surveyed another 3942 miles of snow covered roads.

Wolf Mortality

Seven collared wolves died during the study period (Table 4). Four of the mortalities were apparently caused by other wolves, one was shot, one died from mange and one died from unknown causes. No human caused mortality was detected among collared wolves, although wolf 299M was suspected, but was too decomposed to adequately necropsy. The crude survival rate for 42 collared wolves was 88%.

Overall 15 or 16 (one may be a wolf-dog hybrid) dead wolves were found during the study period (Table 4). Causes of mortality included 44% human caused (7), 50% natural (8) and 1 unknown. Human caused mortality included 4 shootings and 3 vehicle collisions. Natural mortality included 5 killed by other wolves, 2 mange related mortality and 1 died from an accident (became wedged between two branches of a forked tree). The overall mortalities are more biased toward human causes, but does illustrate that intraspecific strife is becoming a more common form of mortality. As an unexploited wolf population approaches its carrying capacity, mortalities caused by other wolves are likely to increase.

Mortality of collared wolves monitored by the Wisconsin DNR from 1979 through June 2000 is illustrated in Table 5. Human caused mortality accounted for 58% of the mortality during the 21 year period. Illegal shootings seemed to have declined somewhat but continue to occur. Disease and intraspecific strife are nearly equal as natural forms of mortality. Disease losses were more prevalent during the parvovirus outbreak in the early 1980's and sarcoptic mange outbreak in the mid 1990's.

Statewide Wolf Distribution

Reports of 174 wolf observations from private citizen and agency personnel were collected from 30 Wisconsin counties (Table 1). Only observations judged to be "probable" or "possible" were reported, although some may include coyotes, wolf-dog hybrids, or large dogs mistaken for wolves. Observations during the study period were higher than the study period 1998-1999 (150), but less than study period 1997-1998 (224). Observation rates seemed to have declined or reached a plateau in recent years as wolves have become more abundant. Those observations are useful for determining extent of wolf distribution. Wolf observations were reported for all counties with breeding populations and highest rates were reported for Iron (22), Ashland (15) and Sawyer (12) Counties.

JOB 106.3 WOLF HEALTH MONITORING

Disease testing was conducted on 13 wolves in 1998 and 15 wolves in 1999 (Table 7). Exposure to canine parvovirus was detected in 5 of 13 serum samples in 1998, and 6 of 15 serum samples in 1999; fecal samples for the two years were positive for 3 of 6 samples. These disease tests indicate adequate exposure for antibody responses, yet not extensive outbreak of parvovirus. Disease testing for infectious canine hepatitis was positive for 2 of 12 samples in 1998 and 6 of 15 in 1999. Canine distemper virus showed 3 of 13 positive in 1998 and 3 of 15 positive in 1999. Only 1 wolf of 18 tested during the 2 years was positive for heartworm - only the second positive response in the last 9 years.

In 1999, 5 of 16 captured wolves showed some evidence of mange. Mange was the cause of death of 2 of 16 wolves found dead during the study period (Table 4), and mange was prevalent on a third wolf that was killed by other wolves. Sarcoptic mange apparently persists in the Wisconsin wolf population, but apparently is not slowing the growth of the wolf population.

JOB 106.4 HABITAT MANAGEMENT

Comments were made on Forest Service management plans and proposed timber sales during the study period. Also the project ecologist attended population and habitat viability assessment for wolves and other mammals on Forest Service lands on 19-21 January 2000 in Duluth, and the project ecologist attended meetings on the Forest Service Roadless Initiatives. Habitat management guidelines were developed for the wolf management plan and approved by the Natural Resources Board in October 1999. A master planning meeting was attended on 28 April 2000 for the Flambeau Forest, and comments were also made on master planning for the Willow Flowage. Wolf potential habitat maps were developed by Ted Sickley of the University of Wisconsin GIS Lab, and were sent to the Nicolet-Chequamegon National Forest and the Northern Highland/American Legion State Forest. The project ecologist met with Forest Service personnel on 10 February to identify potential corridor habitat connecting the Nicolet and Chequamegon National Forests to other blocks of public land. The project ecologist worked with graduate student Beth Sutherland from the University of Wisconsin-Madison on a study to identify potential travel corridors for dispersing wolves across the state.

JOB 106.5 WOLF DEPREDAATION MANAGEMENT

Thirteen cases of wolf depredation involving 10 calves (8 killed), 44 chickens, 3 deer, and 6 dogs (4 killed) occurred during the study period (Table 8). Depredations on livestock and poultry occurred on 7 farms in 6 counties. Two dogs were killed in training situations in August 1999

and 2 dogs were killed near homes in winter 1999. Nine of 66 packs in the state were involved in depredations, but only 6 packs were involved in depredations on livestock or poultry. Two of the depredation cases may have been due to wolf-dog hybrids because no wolves were known to occur nearby.

A landowner illegally shot a wolf at a depredation site in Taylor County on 24 July 1999. The landowner mistook the wolf for a dog in the dark; no charges were filed.

Two wolves were removed from a deer farm near Hazelhurst in Oneida County in late April and early May 2000. The wolves had gotten into the fenced area and killed at least 3 deer over winter. Wolf 289F (adult female) was caught on 26 April 2000 and was relocated 59 miles to the east on 2 May 2000 in Florence County. The second wolf 332F (yearling female) was caught on 10 May 2000 and released 51 miles to the east on 29 May 2000. Neither wolf returned to the deer farm. Wolf 289F roamed a large area from western Vilas County, Wisconsin to Delta County, Michigan. Wolf 332F traveled to the southwest through Forest County and roamed southern Oneida and western Langlade Counties.

The project ecologist cooperated with University of Wisconsin researchers Lisa Naughton and Adrian Treves studying wolf depredations in Wisconsin and Minnesota. The researchers hope to develop GIS maps illustrating wolf depredation potentials across Wisconsin and adjacent states of Michigan and Minnesota. Graduate students Rob Rose and Karen Archibald conducted interviews of farmers with previous depredations during spring and summer 2000.

JOB 106.5 WOLF EDUCATION PROGRAMS

During the study period the project ecologist gave 23 talks on wolves to 1311 people. Additional wolf talks were also given by Ron Schultz, Dick Thiel, Sheri Buller, Sarah Boles and other DNR personnel. The project ecologist and technician provided training for 16 people at a Timber Wolf Alliance (TWA) workshop in August 1999, and attended 3 TWA Board meetings. DNR cooperated with TWA to sponsor Wolf Awareness Week in October 1999, and distributed over 10,000 educational wolf posters within the state. A pamphlet called "Wolves in Farm Country in Wisconsin" was developed with USDA Wildlife Services to guide farmers in wolf country.

The project ecologist had 101 interviews and media contacts during the study period including 40 newspapers, 33 radio, 14 television, 8 magazines, 3 independent writers, 3 government media specialists, and 1 book author. Most of the media contacts were on the development of the new wolf management plan, but contacts were also on wolf population growth, wolf surveys, depredation problems, and illegal shooting of wolves.

JOB 106.7 LAW ENFORCEMENT

Project personnel assisted DNR wardens and Federal Special Agents in 3 wolf shootings. News releases were developed for wolf shootings in Juneau County in November, and Marathon County in January. A person who shot a translocated wolf in Oneida County in May 1999, was found guilty and fined \$1079 in March 2000.

JOB 106.8 INTERAGENCY COOPERATION AND COORDINATION

The Wisconsin Wolf Technical Committee consisting of WDNR, Forest Service, GLFWC, U.S. Fish & Wildlife Services, USDA Wildlife Services, County Forests, University of Wisconsin-Stevens Point and Wisconsin Conservation Congress met on 1 September 1999 and 17 May 2000. Many committee members were in attendance when the wolf management plan was presented to the Natural Resources Board on 25 August and 27 October. Coordinating meetings with other groups include 9 July 1999 meeting with National Wildlife Federation, Milwaukee Zoo 12 July 1999, USDA-Wildlife Services and cattlemen 27 July 1999, Native American Wildlife Conference 14-15 September 1999, Wolf Population Monitoring 12 October 1999, Forest Service Concerns 19-21 January 2000, International Wolf Conference in Duluth 23-26 February 2000, Wolf Health Monitoring 24 March 2000, Wolf Population Monitoring 14 April 2000 and Wolf Stakeholders meeting 15 April 2000. The project ecologist served on the Federal Recovery Team for Eastern Gray Wolves, and held one conference call meeting during the study period.

JOB 106.9 PROGRAM GUIDANCE AND OVERSIGHT

The first meeting of a Wolf Stakeholders Group was held on 15 April 2000 to discuss and review status of wolf plan. The DNR Wolf Technical Committee met on 17 May 2000 to address concerns expressed by the Wolf Stakeholders Group and assess status of the wolf management plan. Both committees agreed to wait at least another year before beginning state delisting (250 or more wolves outside of Indian Reservations). A pamphlet for farmers in dealing with wolf depredation was developed as a result of these meetings.

JOB 106.10 VOLUNTEER PROGRAMS

Sixteen volunteers were trained at a Timber Wolf Alliance workshop on 14 August 1999. Volunteer carnivore trackers were coordinated during the winter and training was provided for 120 people on 1 December 1999. Over 80 people conducted winter track surveys on 54 survey blocks covering 3942 miles. A volunteer recognition night was held on 14 April 2000 in Wausau.

JOB 106.11 WOLF RESEARCH

Bruce Kohn had finished regular field work on the Highway 53 wolf study in northwest Wisconsin in June 1999, but continued some limited field work while analyzing and writing up of results. Bruce will examine the impact of highway development on wolves in northwest Wisconsin, as well as assessing wolf crossings of major highways.

Paul Keenlance, Ph.D candidate at Michigan State is conducting follow-up research, and attempting to refine assessment of suitable wolf habitat.

Lisa Naughton and Adrian Treves from the University of Wisconsin-Madison have begun research on wolf depredation in Wisconsin, along with graduate students Rob Rose and Karen Archabald. The UW researchers will examine depredations and will attempt to use GIS and landscape features to predict future risks of wolf depredations in the Great Lakes region.

Beth Sutherland, graduate student University of Wisconsin-Madison, is examining habitat used by dispersing wolves in Wisconsin, and will attempt to determine whether specific corridor habitat for wolves exists across the state.

Reports completed on Wisconsin wolf monitoring included Wolf Population 1999-2000 for Wisconsin Wildlife Survey, 4 quarterly progress reports, 5 presentations at International Wolf Center Conference in Duluth in February 2000, completion and distribution of "Wisconsin Wolf Management Plan, 1999" (Publ-ER-099 99), and publication of "Wolves in Farm Country in Wisconsin" (Publ-ER-103-00).

JOB 106.12 WOLF-DOG HYBRIDS AND CAPTIVE WOLVES

Provisions for DNR regulation of captive wolves and wolf-dog hybrids were included in the 1999 Wolf Management Plan. The plan also included provisions for control of free-roaming wolf-dog hybrids by DNR wardens and wildlife biologists. Representative DuWayne Johnsrud had submitted a bill on Captive Wildlife Regulations in spring that would have authorized DNR to regulate wolf-dog hybrids, but the bill did not pass both houses of the state legislature.

During the study period, the DNR and USDA-Wildlife Services was involved with at least 15 cases of problems with free-roaming wolf-dog hybrids (Table 9). Cases suspected as wolf-dog hybrids were based on descriptions of behavior of canids, physical appearance, and juxtaposition to known packs or known wolf-dog hybrids in captivity. Unless carcasses were collected, it was not possible to verify whether the animals involved were actually wolf or wolf-dog hybrids. These cases amplify depredation concerns about wolves, and complicate attempts to adequately monitor wolf numbers in the state.

JOB 106.13 WOLF SPECIMEN MANAGEMENT

Sixteen wolf carcasses were handled during the study period, although one of these may have been a wolf-dog hybrid (Table 4). The DNR policy as a state endangered species had been that all dead wolf specimens be turned over to scientific collections. With the reclassification of wolves from endangered to threatened on 1 October 1999, such specimens can now also be made available for educational use and Native American cultural and religious purposes. Regional wildlife experts will become responsible for coordinating shipment, necropsies and final designation of wolf specimens. Wolf specimens handled included 12 in the DNR Northern Region and 4 in the DNR West Central Region. Specimens continued to be mainly sent to the University of Wisconsin-Zoology Museum.

JOB 106.14 ECOTOURISM

DNR participated in talks/field trips for Timber Wolf Alliance in August 1999, Animal Lab Workers September 1999, Nicolet College January 2000 and International Wolf Center February 2000. These activities brought people to Wisconsin wolf range while also using the facilities and business in the local area.

Programs on wolves were also presented at Treehaven near Tomahawk and Trees for Tomorrow at Eagle River. The wolf exhibit at the northern Great Lakes Visitor Center was a major attraction for many people visiting the Ashland area. No detrimental affects of ecotourism on wolves were detected during the study period.

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Table 1. Capture data on wolves caught in Wisconsin in 1999.

Date	Weight (lb.)	Sex	Age^a	Wolf #	Pack/Area	County
31 May 99 ^b	84	F	A	----	Loner	Oneida
17 Sep 99	55	M	P	269	Dead Creek	Jackson
13 May 99	74	M	A	290	Shoberg Lake	Douglas
27 Jun 99	80	M	A	291	Chain Lakes	Douglas
21 May 99	76	M	Y	292	Tranus Lake	Washburn
23 May 99	70	F	A	293	Frog Creek	Washburn
23 May 99	~80	M	A	294	Frog Creek	Washburn
25 May 99	74	F	Y	295	Stuntz Brook	Washburn
28 May 99	~75	M	Y	296	Crotte Creek	Douglas
2 Jun 99	82	M	A	297	South Empire	Douglas
8 Jun 99	74	M	Y	298	North Empire	Douglas
30 Jun 99	72	M	A	299	Buckley Creek	Douglas
19 Sep 99	87	M	Y	303	Bear Bluff	Jackson
23 Sep 99	54	M	P	307	Dead Creek	Jackson
15 Nov 99	57	F	P	309	Beaver Creek	Juneau
28 Apr 99 ^c	82	M	A	313	Little Rice River?	Oneida
30 Jul 99	80	M	A	314	Bootjack Lake	Oneida
4 Sep 99	26	F	P	315	Averill Creek	Lincoln
20 Oct 99	84	F	A	316	Wintergreen	Price
26 Apr 99 ^d	78	F	A	724	Chase Brook	Burnett

^a At time of capture assuming birth date of 1 May (P=Pup, Y=Yearling, A=Adult)

^b Captured by Wildlife Services on game farm, euthanized

^c Captured by Wildlife Services on game farm, relocated to Forest County 3 May 99

^d Recapture; initial capture 28 May 97 Douglas County

Table 2. Radio telemetry data on wolves monitored from July 1, 1999 – June 30, 2000 in Wisconsin.

Wolf # & Sex	Age^a	Pack^b	Date Captured	Last Date	# of Locations^c	Winter Territory Size (mi²)	# of Wolves in Territory^d
002F	Y	Wildcat Mound/Pray	10 May 98	Ongoing	111	37 ^e	3
155M	A	Moose Road	6 May 97	Ongoing	263	40	2
210F	A	Moose Lake	31 May 96	6 Nov 99 ^{**}	313	NE ^f	4
229F	A	Augustine Lake/Disperser	17 Jul 98 ^g	Ongoing	346	15 ^h	5-6
237F	Y	Price Creek	20 Oct 95 ⁱ	1 Sep 99 [*]	233	NE	7
240F	Y	Disperser/Pine Lake	21 Jun 97	21 Jul 99 ^{**}	100	NE	-
241F	P	Ghost Lake	20 Nov 97 ^j	Ongoing	125	51	2
244F	A	North Willow	23 Jul 97	Ongoing	141	41	11
245F	P	Hoffman Lake	30 Jul 97	Ongoing	153	40	5
248M	A	Torch River	28 Jun 00	Ongoing	1	NE	4-5
266F	Y	Bird Sanctuary	7 Aug 96	Ongoing	333	19	6
267M	A	North Empire	28 Aug 96	Ongoing	323	28	3
268M	Y	Truck Trail	11 Jun 97 ^k	Ongoing	252	43	3
269M	P	Dead Creek	17 Sep 99	Ongoing	43	43	8
280M	Y	Riverside/MN pack	13 May 98	Ongoing	144	NE	-
282F	Y	Little Rice River	10 May 98	Ongoing	117	57	5
285F	A	Ranger Island	24 Aug 98	Ongoing	95	12	3
286F	Y	Brunet River	5 Sep 98	Ongoing	90	45	2
289F	A	Relocated	26 Apr 00 ^l	Ongoing	39	NE	-
290M	A	Shoberg Lake/Disperser	13 May 99	4 Nov 99 [*]	36	NE	3
291M	A	Chain Lakes	27 Jun 99	Ongoing	58	14	5-6
292M	Y	Tranus Lake	21 May 99	Ongoing	68	18	3
293F	A	Frog Creek	23 May 99	Ongoing	67	70	10
294M	A	Frog Creek/Totagatic River	23 May 99	Ongoing	66	10 ^m	2 ^m
295F	Y	Stuntz Brook/Totagatic River	25 May 99	Ongoing	67	17 ⁿ	4 ⁿ
296M	Y	Crotte Creek	28 May 99	Ongoing	66	31	4
297M	A	South Empire	2 Jun 99	Ongoing	66	60	5
298M	Y	North Empire	8 Jun 99	Ongoing	62	37	3
299M	A	Buckley Creek	30 Jun 99	19 Aug 99 ^{**}	11	NE	3-4
303M	Y	Bear Bluff	19 Sep 99	15 Nov 99 [*]	9	NE	4-5
307M	P	Dead Creek	23 Sep 99	28 Mar 00 [*]	29	37	8
309F	P	Beaver Creek/Disperser	15 Nov 99	Ongoing	44	16 ^h	5-7
310M	P	Brush Creek	2 Nov 97 ^o	Ongoing	68	37	4

Table 2. (Cont.)

Wolf # & Sex	Age^a	Pack^b	Date Captured	Last Date	# of Locations^c	Winter Territory Size (mi²)	# of Wolves in Territory^d
314M	A	Bootjack Lake	30 Jul 99	13 Nov 99 [*]	14	NE	6
315F	P	Averill Creek	4 Sep 99	19 Apr 00 ^{**}	37	13	3
316F	A	Wintergreen	20 Oct 99	Ongoing	45	61	2
318F	Y	Nineweb Lake	11 May 00	Ongoing	16	NE	3
332F	A	Relocated	10 May 00	Ongoing	17	NE	-
333F	Y	Wilson Flowage/Disperser	23 May 00	Ongoing	15	NE	-
334M	A	Wilson Flowage	23 May 00	Ongoing	11	NE	5
351M	A	Chippewa River	17 Jun 00	Ongoing	5	NE	4
724F	A	Chase Brook	26 April 99 ^p	Ongoing	259	9	3

^a Age at time of capture (P = Pup, Y = Yearling, A = Adult)

^b Pack during winter of the study period

^c Total locations from the time of capture

^d Number of wolves in pack during midwinter

^e Transitional territory

^f No estimate

^g Recaptured wolf; first captured as a yearling in Sawyer County on 9 July 1993

^h Before dispersal

ⁱ Recaptured wolf; first captured 4 May 1995

^j Recaptured wolf; first captured in Ashland County on 23 Jun 1997, 19 lb pup too small to collar

^k Recaptured wolf; first captured as a pup in Douglas County on 28 Aug 1996

^l Recaptured wolf, first captured in Douglas County on 5 Jun 1998

^m Totagatic River territory

ⁿ Stuntz Brook territory

^o Initial capture in Houghton County, Michigan; locations listed for Wisconsin only

^p Recaptured wolf; first captured in Douglas County 28 May 1997

^{*} Lost signal

^{**} Died

Table 3. Minimum estimation of Wisconsin's timber wolf population in winter 1999-2000.

Pack/Area/Wolf	Counties	No. of Wolves	Evidence^a
Augustine Lake*	Iron/Ashland	5-6	T
Averill Creek	Lincoln	3	R/T
Bear Bluff*	Jackson	4-5	T
Beaver Creek	Juneau	5-7	T/R
Bird Sanctuary*	Douglas	6	R
Black Lake*	Ashland/Sawyer	2	T
Bootjack Lake*	Price/Oneida	6	T
Brunet River*	Sawyer/Ashland	2	R/T
Brush Creek*	Ashland	4	R/T
Buckley Creek	Douglas/Washburn	3-4	T
Chain Lakes	Douglas	5-6	T
Chase Brook	Burnett/Douglas	3	R
Chippewa River*	Iron/Ashland	4	T
Clifford*	Oneida/Price	2	T
Crex Meadow	Burnett	2	T
Crotte Creek*	Douglas	4	R
Dead Creek*	Jackson/Monroe/Juneau	8	R
Ding Dong Creek*	Ashland	3	T
Eastside Firelane*	Ashland	2	T
Flagg River	Bayfield	2	T/O
Frog Creek	Washburn/Douglas	10	R
Ghost Lake	Bayfield/Sawyer	2	R/T
Giant Pine*	Forest	2	T
Haystack Corner*	Sawyer/Rusk	3	T
Hellhole Creek*	Bayfield/Ashland	4	T
Hoffman Lake*	Price/Ashland/Iron	5	R
Kidrick Swamp*	Taylor	2	T
Little Rice River*	Oneida	5	R
Log Creek*	Sawyer/Ashland/Price	4	T
Miles Lake	Price/Ashland/Vilas	2	T
Moose Lake	Douglas	4	T
Moose Road*	Douglas/Pine	2	R
Nineweb Lake*	Vilas	3	T
Noch Hanai*	Jackson	3-4	T
North Empire*	Douglas	3	R
North Willow*	Oneida	11	R
O'Brien Lake*	Iron	2	T
Orienta Falls	Douglas/Bayfield	2	T
Pine Lake*	Iron	3	T
Porcupine Lake*	Bayfield	3	T
Pray	Jackson	3	R
Price Creek*	Price/Sawyer	7	T
Rainbow Lake*	Bayfield	4	T
Ranger Island*	Lincoln	3	R
Rock Dam	Eau Claire/Clark	2-3	T
Scotchman Lake*	Oneida	2	T

Table 3. (Cont.)

Pack/Area/Wolf	Counties	No. of Wolves	Evidence^a
Shanagolden*	Ashland	2	T
Shoberg Lake*	Douglas	3	T
Smoky Hill*	Bayfield/Sawyer	5	T
Somo River*	Lincoln	2	T
South Empire*	Douglas	5	R
Springbrook	Washburn	2-3	T
Stuntz Brook*	Washburn	4	R
Suk-Cerney*	Juneau	7	T
Thornapple River*	Sawyer	2	T
Torch River*	Ashland	4-5	T
Totagatic River	Burnett/Washburn/Douglas	2	R
Tranus Lake	Washburn	3	R
Truck Trail*	Douglas/Pine	3	R
Tupper Creek*	Sawyer	2	T
Two Korner	Jackson/Clark	1-2	T
West Firelane	Iron	2	T
Wildcat Mound*	Jackson	6	T
Wilson Flowage*	Price	5	T
Wintergreen Lake*	Price	2	R
Yellow River*	Juneau	2	T
Total Pack Members		235-246	
66 Packs = 3.6 – 3.7 wolves/pack			
Dispersers & Loners			
W229	Ashland/Iron	1	R
W309	Juneau	1	R
Bibbon Swamp	Bayfield	1	T
Chippewa Flowage	Sawyer	1+	T
Dunbar	Marinette	1	T
Ft. McCoy	Monroe/Jackson	1	T
Johnson Creek	Oneida	1	T
Lake Nabagamom	Douglas	1	T/O
Lost Lake	Florence	1	T
Morrison Creek	Iron/Ashland	1	T
Sandhill loner	Wood	1	T
South Bluff	Wood/Juneau	1+	T
Sterling Barrens	Polk/Burnett	1	T/O
Total Loners		13	
^a Evidence: R = radio-telemetry surveys		Grand Total All Wolves	248-259
T = track and sign surveys		Indian Reservation Wolves	9-10
O = observations		Wolves Outside Reservations	239-249
*Pack with breeding activity			

Table 4. Wolves dying in Wisconsin from 1 July 1999 to 30 June 2000.

Wolf # & Sex	Age^a	Date Captured	Date Died	County Died	Cause of Death
240F	A	21 Jun 97	21 Jul 99	Iron	Other wolves?
----F	A	-----	27 Jul 99	Taylor	Shooting
299M	A	30 Jun 99	19 Aug 99	Douglas	Unknown
210F	A	31 May 96	6 Nov 99	Douglas	Other wolves
----F	A	-----	24 Nov 99	Juneau	Shooting
----M	A	-----	28 Dec 99	Eau Claire	Vehicle Collision
017F	P	2 Aug 99	15 Jan 00	Marathon	Shooting
199M	A	11 Jun 95	20 Jan 00	Washburn	Other wolves/mange
----M	A	-----	21 Jan 00	Florence	Mange
----F	P	-----	26 Jan 00	Lincoln	Vehicle Collision
BR2F	A	17 Aug 99	27 Jan 00	Ashland	Mange
----M	P	-----	31 Mar 00	Douglas	Other wolves
*--M	A	-----	3 Apr 00	Marathon	Shooting
----?	?	-----	<10 Apr 00	Taylor	Accidental
315F	Y	4 Sep 99	19 Apr 00	Lincoln	Other wolves/ Radiocollar restriction
----M	A	-----	16 May 00	Bayfield	Vehicle Collision

^a Age at time of death

*May be wolf-dog hybrid

Table 5. Mortality summary of radio-collared wolves in Wisconsin and adjacent areas of Minnesota from October 1979 – June 2000.

	Cause of Death	Number	% Known Mortality
Human Causes	Capture Related	2	3%
	Shot Wound*	19	31%
	Trapped	3	5%
	Vehicle Collision	8	13%
	<u>Unknown Human Causes</u>	<u>4</u>	<u>6%</u>
	<i>Total Human Causes</i>	<i>36</i>	<i>58%</i>
Natural Causes	Birth Complications	1	2%
	Disease	12	19%
	Killed by Other Wolves	10	16%
	<u>Unknown Natural Causes</u>	<u>3</u>	<u>5%</u>
	<i>Total Natural Causes</i>	<i>26</i>	<i>42%</i>
Totals	<i>Known Mortality</i>	<i>62</i>	<i>100%</i>
	<u><i>Unknown Mortality</i></u>	<u><i>7</i></u>	
	Total Mortality	69	

* 18 wolves shot by firearm; 1 wolf by bow and arrow

Table 6. Wolf observations reported by natural resource agency personnel and private citizens in Wisconsin in July 1999 – June 2000.

County	Sightings	Wolves Seen	Track or Sign Observations	Total Observations
Ashland*	7	10	8	15
Barron	1	1	1	2
Bayfield*	7	13	4	11
Burnett*	2	2	0	2
Clark*	0	0	1	1
Columbia	1	1	0	1
Douglas*	3	4	8	11
Eau Claire*	1	1	1	2
Florence	4	11	0	4
Forest*	3	3	8	11
Iron*	16	35	6	22
Jackson*	1	1	5	6
Juneau*	3	3	1	4
Langlade	5	8	1	6
Lincoln*	7	15	3	10
Marathon	3	4	1	4
Marinette	1	1	2	3
Monroe*	0	0	2	2
Oconto	2	2	0	2
Oneida*	8	10	6	14
Pierce	1	1	0	1
Portage	2	2	0	2
Price*	9	13	2	11
Rusk*	0	0	1	1
Sawyer*	11	20	1	12
Shawano	1	1	1	2
Taylor*	1	1	0	1
Vilas*	3	5	1	4
Washburn*	3	3	3	6
Wood*	0	0	1	1
Totals	106	171	68	174

* Counties with known breeding packs during winter of this study period.

Table 7. Disease testing of wolves captured in Wisconsin in 1998 and 1999.

Wolf # & Sex	Age	Date	Serum CPV	Fecal CPV	ICH	CDV	HW
004 M	P	7/16/98	1:80	-----	1:20	1:5	Neg.
006M	P	8/13/98	1:80	-----	1:40	1:5	Neg.
229F	A	7/17/98	1:160	-----	<1:5	1:20	Neg.
246M	A	4/11/98	1:80	-----	1:5	1:20	-----
279F	Y	5/3/98	1:80	1:128	1:5	1:5	Neg.
281M	Y	4/12/98	1:40	-----	1:5	1:5	Neg.
282F	Y	5/10/98	1:160	-----	1:5	1:5	-----
284M	A	8/23/98	1:80	1:32	<1:5	<1:5	Neg.
285F	A	8/24/98	1:80	1:128	1:5	1:5	Neg.
286F	Y	9/5/98	1:320	-----	1:5	1:5	-----
287M	A	10/27/98	1:160	-----	1:5	1:5	-----
288F	Y	5/22/98	1:80	-----	-----	1:20	Neg.
289F	A	6/5/98	1:160	-----	1:5	<1:5	Neg.
269M	P	9/17/99	1:320	-----	1:20	1:10	Neg.
290M	A	5/13/99	1:20	-----	1:5	<1:5	Neg.
291M	A	6/27/99	-----	-----	-----	-----	-----
292M	Y	5/21/99	1:320	-----	1:20	1:5	-----
293F	A	5/23/99	-----	-----	-----	-----	-----
294M	A	5/23/99	-----	-----	-----	-----	-----
295F	Y	5/25/99	1:640	-----	1:20	1:5	Neg.
296M	Y	5/28/99	1:320	-----	1:5	1:5	Neg.
297M	A	6/2/99	1:80	-----	1:5	1:5	-----
298M	A	6/8/99	1:160	Neg.	1:5	<1:5	Neg.
299M	A	6/30/99	1:80	1:64	1:10	1:5	Neg.
303M	Y	9/19/99	1:80	-----	<1:5	1:5	-----
307M	P	9/23/99	1:80	-----	1:20	1:5	Neg.
309F	P	11/15/99	-----	-----	-----	-----	-----
313M	A	4/28/99	1:80	-----	<1:5	1:40	Pos.
314M	A	7/30/99	1:40	-----	<1:5	1:5	-----
315F	P	9/4/99	1:80	-----	1:5	1:5	-----
316F	A	10/20/99	1:160	-----	1:5	1:5	-----
724F	A	4/26/99	1:80	1:4096	1:10	1:20	Neg.
Positive Tests		1998	5/13	2/3	2/12	3/13	0/9
/Total		1999	6/15	1/3	6/15	3/15	1/9

Disease Tests - Serum CPV = Serum Canine Parvovirus: positive \geq 1:160
Fecal CPV = Fecal Canine Parvovirus: positive \geq 1:128
ICH = Infectious Canine Hepatitis: positive \geq 1:10
CDV = Canine Distemper Virus: positive \geq 1:10
HW = Heartworm: Neg. = Negative, Pos. = Positive
(Disease tests conducted by Kerry Beheler, WDNR Wildlife Diagnostic Lab.)

Table 8. Wolf depredation cases on livestock and pets in Wisconsin, July 1999 through June 2000.

Date	Animal Lost	Pack Involved	County	Payments	Other Actions
1 Jul 99	1 dog injured	Wolf-dog hybrid?	Taylor	\$162	None
23 Jul 99	44 chickens	Averill Creek	Taylor	\$220	Attempted livetrapped wolf shot illegally
7 Aug 99	1 dog (Bear Hound) 1 dog injured	Kidrick Swamp	Taylor	\$1201.65	None
20 Aug 99	1 dog (Bear Hound)	Chain Lake	Douglas	\$2500	None
28 Aug 99	1 calf 1 calf injured	Stuntz Brook	Washburn	\$550	None
18 Nov 99	2 calves	Wolf-dog hybrid?	Barron	\$600	None
17 Jan 00	1 dog	Chase Brook?	Burnett	\$500	None
18 Jan 00	3 deer*	Little Rice River?	Oneida	Pending	2 trapped & reloc. ^a
15 Mar 00	1 dog (Husky)	Loner?	Price	\$250	None
12 Apr 00	1 calf	Chase Brook	Burnett	Pending	None
2 May 00	1 calf	Tupper Creek	Sawyer	\$500	None
8 May 00	1 calf	Pine Lake	Iron	Pending	None
20 May 00	1 calf missing	Tranus Lake	Washburn	Pending	None
	11 calves (8 killed) 3 deer killed 6 dogs (4 killed) 44 chickens	9 packs 1 loner/disperser 2 possible hybrids			2 Trapped & reloc. > 40 mi. 1 Attempted trap
13 cases			9 counties	\$6483.65	

* Liscensed deer farm

^a 2 Wolves were livetrapped and relocated to NE Wisconsin

Table 9. Suspected wolf-dog hybrid incidents and problems in Wisconsin, 1 July 1999 – 31 June 2000.

Date	County	No. of wolf-dogs Sex/Age	Problem	Outcome
7/10/99	Chippewa	Unknown	Killed duck	Unknown
7/11/99	Barron	Unknown	Killed cow & calf	Owner attempt to kill
7/24/99	Forest	Unknown	4 pigs killed	Hybrids disappeared
10/14/99	Marathon	1, sex & age?	Killed calf	Unknown
10/15/99	Shawano	1, sex & age?	Approaching people	Hybrid disappeared?
11/07/99	Oneida	1, sex & age?	Approaching people	Killed by local people
11/15/99	Marathon	1, sex & age?	Challenging people	Unknown
11/18/99	Juneau	Male pup	Roaming refuge	Live capture & placed in captivity
11/18/99	Barron	Unknown	Killed calf	Owner attempt to kill
12/03/99	Lincoln	Unknown	Injured horse	Attempt capture by DNR
3/09/00	Sawyer	Unknown	Frequenting roadsides	Unknown
3/23/00	Marathon	Male adult	Found shot	Verified as a hybrid
4/03/00	Marathon	Male adult	Found shot	Suspected hybrid
4/13/00	Marathon	Unknown	1 dead & 2 missing calves	Canid seen in fields
5/26/00	Oneida	1, sex & age?	Roaming residential area	Unknown

Figure 1. Gray Wolf Distribution in Wisconsin: Winter 1999 - 2000

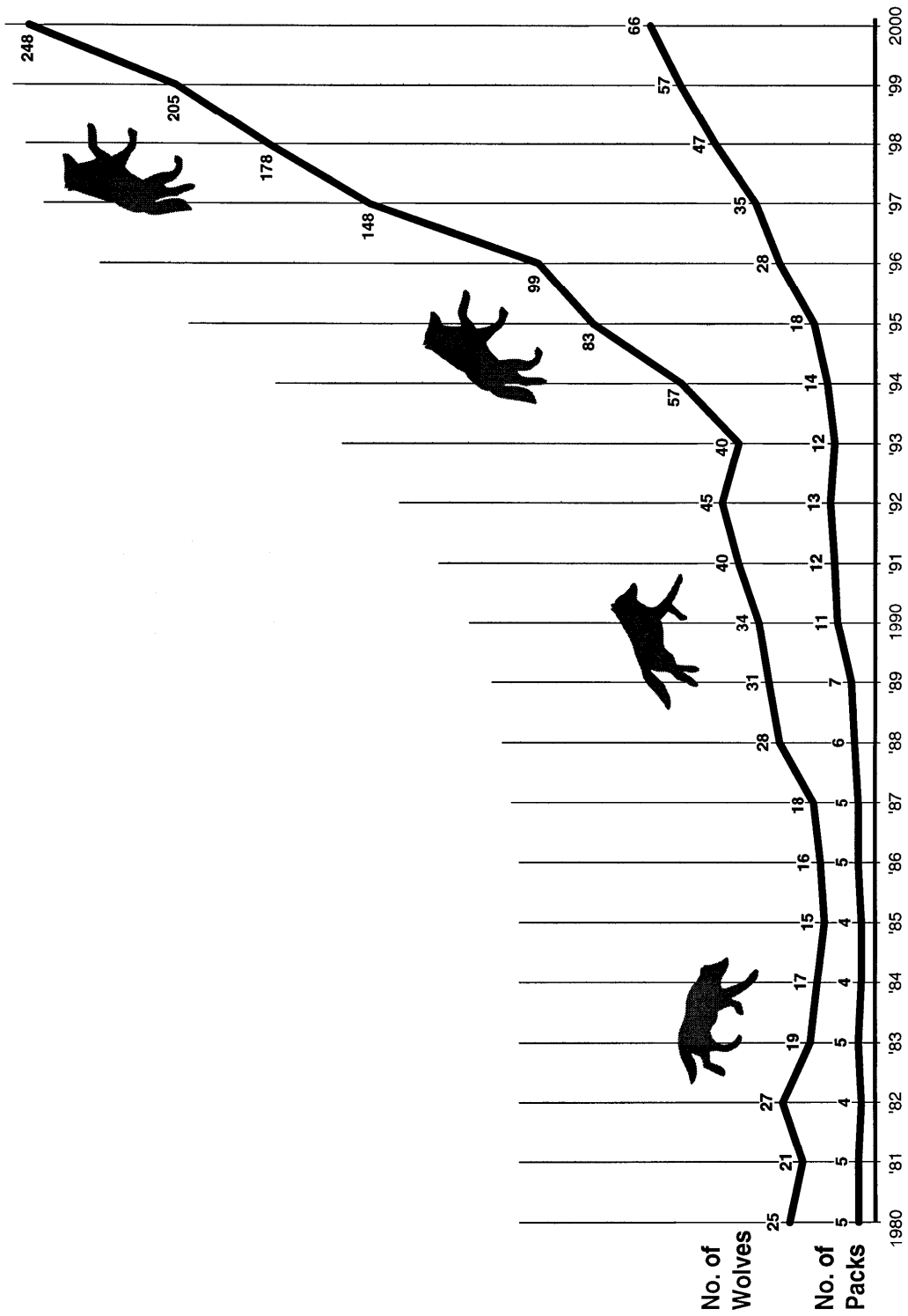


Figure 2. Changes in Wisconsin Gray Wolf Population: 1980-2000