

Wisconsin Timber Wolf Population Monitoring # 113
by Adrian P. Wydeven, Wisconsin DNR

March 31, 1995 - June 31, 1996

For: U.S. Fish and Wildlife Service
Region 3, Endangered Species Grant Program
Section 6

Cooperators: Dr. L.D. Mech, U.S. Biological Survey; Wisconsin
Department of Transportation; U.S. Fish & Wildlife
Service; U.S. Forest Service; U.S. National Park
Service; Great Lakes Indian Fish and Wildlife
Commission; Univ. Wisconsin-Stevens Point;
Minnesota DNR; Michigan DNR; Timber Wolf Alliance

The Eastern timber wolf (Canis lupus lycaon) was listed as an Endangered Species by the U.S. Fish and Wildlife Service in 1967, and the Wisconsin Department of Natural Resources (DNR) listed it as a State Endangered Species in 1975. The revised recovery plan for the Eastern Timber Wolf (U.S. Fish and Wildlife Service, 1992) set a criteria for recovery that included establishment of a second viable population of at least 100 wolves within 100 miles of the Minnesota wolf population, or 200 wolves in an isolated population more than 200 miles from Minnesota. Wisconsin and Michigan with their growing wolf numbers, show the best potential for establishment of this second viable population. Thus high levels of wolf population monitoring are necessary to determine recovery status of wolves in Wisconsin and Michigan.

Primary support for Wisconsin's wolf population monitoring has come from U.S. Fish and Wildlife Service Section 6. Additional funding came from Pittman-Robertson Wildlife Restoration Funds, Chequamegon National Forest, Nicolet National Forest, Timber Wolf Alliance, Wisconsin Endangered Species check-off Funds, Society of Tympanuchus Cupid Pinnatus, Wisconsin Department of Transportation, and private donations.

The major objective of wolf population monitoring was to determine distribution, abundance, breeding status, population changes, habitat use, mortality factors, health status of wolves in Wisconsin.

METHODS

Attempts were made to trap and radio-collar wolves in most functioning wolf packs in northern Wisconsin using methods described by Mech (1974). Radio-collared wolves were flown about once per week across most of the state, but more frequently in an intense

study area of northwest Wisconsin-eastern Minnesota. Attempts were made to locate packs at least 30-35 times for winter territory assessment (Fuller and Snow, 1988).

Packs that were not radio-collared were surveyed using winter tracks surveys (Thiel and Welch 1982). Winter sign surveys were also used to assess breeding status of wolves (Rothman and Mech, 1979). Summer howling surveys (Harrington and Mech, 1982), were used to determine pup production, summer home site utilization, and summer distribution of uncollared wolf packs.

MONITOR STATEWIDE WOLF POPULATION

Sixteen wild wolves and a wolf-like animal (256F) that may have been a wolf-dog hybrid were caught in 1995 in Wisconsin and Pine County, Minnesota. All except wolf 501M were radio collared. Wolf 501M was injured after capture and escaped from captivity into the fenced Sandhill Wildlife Area while recuperating from its injury. Collared wolves represented members of two Minnesota Packs, 11 Wisconsin Packs, and a group of 3 pups (256F and siblings). Wolves 251M, and 252M became loners, dispersing soon after capture.

At least 31 wolf territories were identified in Wisconsin in 1995-1996 and at least 28 of these territories contained evidence of breeding packs (Figure 1). Packs were distributed mainly across northwestern and northcentral Wisconsin, but 3 packs also occurred in central Wisconsin. Wolf territories occurred in at least 13 Wisconsin counties. Only packs with more than half their territories in Wisconsin were tabulated as part of the state wolf population.

Thirty-three collared wolves were monitored during the period (Table 2). Collared wolves included 26 wolves in 19 Wisconsin Packs, 4 wolves in 3 Minnesota Packs, and 4 wolves that were mainly loners. Radio-collared wolves monitored during the study period included 14 adult males, 11 adult females, 2 yearling males, 2 yearling females, 1 pup male, and 3 pup females (age during majority of the study period except wolves captured since May 1996 are listed by age at capture).

Winter home range varied from 8 mi² to 114 mi², and averaged 46 mi² for 27 wolves. Territory size for 14 Wisconsin adults averaged 48 mi².

A summary of wolf activity and monitoring efforts within specific regions and specific packs are listed below.

DOUGLAS COUNTY:

Two wolves were initially monitored in the Truck Trail Pack during the period, including 191M (alpha male), and 187F (subordinate female). By late fall and early winter 187F began to associate with 230M from the Empire Pack. During winter, 187F and 230M occupied a new territory south of the Truck Trail Pack. Wolf 191M continued occupying the Truck Trail Pack over winter 1995-1996 with two other

wolves, including his mate and a pup produced in 1995. The pack occupied an area of 64 mi² over winter, and in spring again showed denning activity.

Two collared wolves initially occupied the Empire Pack including 186M (adult male - alpha?) And 230M (subordinate male). In fall, 186M dispersed westward into Minnesota. Wolf 230M initially dispersed with 186M, but returned eastward to occupy the area near Moose Road with 187F from the Truck Trail Pack. Four non collared wolves continued to occupy the Empire Pack area including a breeding pair and two pups from 1995. Breeding activity was again detected in 1996.

The Crotte Creek Pack occupied about 34 mi² near the St. Croix River. Two adult males were monitored in the pack during the period (194M, 500M). A total of 7 wolves occupied the territory during winter 1995-1996. Apparently 4 pups from spring 1995 had survived over winter. Denning activity was again detected in 1996.

Three collared wolves were monitored in the Moose Lake Pack including 200M (male pup), 209F (female pup), and 210F (adult female). Wolf 200M unfortunately died soon after collaring in September 1995, after his radio-collar became stuck in his mouth. Wolf 209F occupied a home range of 18 mi² in winter 1995-1996. The area was considerably smaller than the 50⁺mi² occupied by adults in this territory in the 1980's. The immature status of this animal or the severe winter may have reduced movements. A total of 5 wolves occurred in the Moose Lake Pack over winter including 2 or 3 pups. Breeding apparently again occurred in winter 1996.

Wolf 209F remained in the territory overwinter, but dispersed northward to the shores of Lake Superior in June 1996. An adult female (210F) was caught on May 31, 1996 in this territory.

The Chase Brook Pack occupied 66mi² in southwest Douglas and portions of northwest Burnett County. Wolf 185F (adult female) occupied this territory with her mate. No pups were produced in 1995, and although breeding activity apparently occurred in winter 1996, denning activity was not detected in spring.

A calf was killed on the south side of the Chase Brook territory in April 1996, but 185F was 10 miles away at the time of depredation. She did travel within at least ½ mile of the depredation site in May while control trapping was occurring, but was not caught.

Wolf 187F (adult female) from the Truck Trail Pack, wolf 230M (adult male) from the Empire Pack, and a third uncollared wolf formed a new territory during winter 1995-1996. The 34 mi² Moose Road Territory was located south of the Truck Trail Territory, southwest of the Empire territory, west of the Crotte Creek territory, and north of the Chase Brook territory. Evidence of breeding was detected in winter, but it was not clear if denning occurred in spring.

BURNETT COUNTY:

Wolves 184M (alpha male) and 195F (subordinate female) were monitored in the Crex Meadow Pack in western Burnett County. Part of this pack territory extended west across the St. Croix River into Minnesota. In fall the pack consisted of 9 wolves, probably including 4-6 pups. Wolf 184M went off the air along the Minnesota border in early November, the start of the Minnesota deer gun hunting season. Yearling male 196M in the adjacent Five Corner's Pack in St. Croix State Park, Minnesota also went off the air at this time. Neither wolf had shown any indication of starting to disperse, and both may have been killed. By January the Crex Meadow Pack was down to 5 wolves including a wolf with a limp. Only 4 wolves were seen in the pack the remainder of winter. The adjacent Five Corner's Pack declined from 4 wolves in the fall to only 2 wolves over mid-winter. With the decline of the Five Corner's Pack, 195F and other members of the Crex Meadow Pack began to spend more time in St. Croix State Park. Wolf 195F occupied a large home range of 114 mi² during winter. The large home range was due to the expansion of Crex Meadow wolves into the Five-Corner's territory, and perhaps also represented home range expansion for 195F prior to dispersal. On May 23, 1995, wolf 195F was only 1½ miles from wolf 221F, the alpha, and perhaps last wolf left of the Five Corner's Pack. Five days later, 221F was found dead within ¼ miles of her previous location. She was probably killed by wolf 195F and possibly other members of the Crex Meadow Pack.

During winter 1995-1996 evidence of breeding was found in the Crex Meadow Pack, but no evidence of denning was found in spring. The Crex Meadow Pack may be shifting its territory to Five Corner's Pack area in St. Croix State Park in Minnesota.

In late fall and winter, 256F (wolf-like female pup) was monitored with 2 other female pups near the Clam River, 2-3 miles west of Webster, Wisconsin. The pups were found abandoned in the wild by a local resident, who fed and cared for the canids in summer and fall 1995. The pups became habituated to people and remained close to their caretakers home until February 1996 when they moved 6 miles to the southwest. The canids were adult size by this point, and became nuisance animals, attacking dogs, mating with a dog, and stealing food scraps. After 4 attacks on dogs and challenging a woman, the two noncollared canids were live captured and placed in captivity. Canid 256F eluded capture and was shot by DNR personnel, after discussion with a federal warden and U.S.D.A. - Animal Damage Control. One of the live captured canids produced 4 hybrid pups in captivity, one of which survived. The specific origin of these 3 canids was not determined, but it appeared they might be wolf-dog hybrids.

WASHBURN COUNTY:

Wolf 199M (adult male) and his mate (probably wolf 207 with a nonfunctioning radio-collar) occupied the Stuntz Brook territory along U.S. Highway 53 in northwest Washburn County. The pack occupied a small territory of only 8 mi². No pups were produced in 1995, but breeding activity was detected in winter 1996 and denning apparently occurred in spring.

BAYFIELD COUNTY:

Wolf pup 254F occupied a 69 mi² home range in the Smoky Hill Pack area of southwest Bayfield County, and also extended into northeast Washburn and northwest Sawyer counties. Four wolves were located in this pack in midwinter including a breeding pair and two pups. Wolf 254F was 19 miles southwest of the Smoky Hill territory on February 29, 1996, and her signal was lost afterwards. It appeared that she dispersed out of the area.

Breeding was detected in the Smoky Hill Pack in winter and pups were again produced in spring 1996.

Three noncollared wolves, including a breeding pair, were monitored in the Flag River area of northern Bayfield County. The Flag River Pack apparently occupied county and national forest land southeast of Port Wing. Breeding activity was detected in winter, but denning was not found in spring 1996.

Wolf 223M (alpha male) and wolf 255F (female pup) were monitored in the Rainbow Lake Pack during the period. The radio signal was lost on 223M in March 1996. Three or four wolves occurred in the 101 mi² territory during winter 1995-1996.

Wolf pup 255F was placed in captivity and medically treated because she had a severe case of mange when captured in early September 1995. She was held in captivity for 53 days before release back into the wild. After two weeks of limited movements, wolf 255F rejoined the pack. She remained with the pack until late winter, when 255F began dispersing westward toward the Gordon area.

The Echo Valley area of northeast Bayfield County was found to have at least one wolf in winter and spring 1996. No evidence of a breeding pair was found.

ASHLAND/IRON/SAWYER COUNTIES:

Five noncollared wolves were monitored in the Hellhole Creek Pack north of Clam Lake in winter 1995-1996. The pack consisted of a breeding pair and probably 2-3 pups. Breeding again occurred last winter and additional pups were produced during spring 1996. Wolf 257M (adult male - probably alpha) was caught in the Hellhole Creek Pack in June 1996. He occupied a territory near Spider Lake in west Ashland and portions of eastern Bayfield Counties.

A breeding pair was detected in the Brush Creek area northeast of Clam Lake. Although denning was not detected in Spring 1996, a vehicle killed pup was found in this territory in June 1996.

Wolf 234M (adult male) had been a member of the Torch River Pack previously, however during the study period the wolf was only loosely associated with this pack. He died in early January 1996 from the affects of mange and porcupine quills.

Four noncollared wolves occupied the Torch River Pack southeast of Clam Lake during winter 1995-1996. The group probably consisted of a breeding pair and two surviving pups from 1995. Pups were again produced in 1996.

Three groups of wolves occurred on the Bad River Indian Reservation in winter 1995-1996. The Morrison Creek Pair existed in the northern part of the reservation, in northern Ashland and northwest corner of Iron Counties. Two wolves occupied southern parts of the reservation in the area of the Bad River, and probably occasionally traveled through Copper Falls State Park. A breeding pair occurred near West Firelane in western portions of the reservation.

Wolf 229F (alpha female), her mate, and one surviving pup from 1995, occupied the 36 mi² Augustine Lake territory southeast of Mellen. The Augustine Lake Pack showed breeding activity in winter 1996 and again produced pups in spring 1996. This represents the second litter for wolf 229F.

In winter 1995 the O'Brien Lake Pack was thought to occupy a large area in central Iron County. The pack may have split into two territories sometime during the last year. There appeared to be at least 2 packs in this area in winter 1995-1996. In June 1995, adult male 252M was caught in the O'Brien Lake Territory, but soon dispersed eastward into Vilas County, Wisconsin and Gogebic County, Michigan. Wolf 252M returned to Ashland / Iron Counties in September and settled into a small area near Augustine Lake southwest of his original capture site. Wolf 252M died near this location on December 20, 1995 from gunshot wounds, and was also impacted by mange.

The O'Brien Lake Pack consisted of a single breeding pair last winter that occupied west central Iron County. No pup production was detected in spring, but additional survey work was planned.

Wolf 253F (adult female - probably alpha) and her mate, occupied the 52 mi² Pine Lake Territory in central Iron County. When 253F was originally caught in June 1995, she was thought to be part of the O'Brien Lake Pack, but she never associated with 252M, nor traveled through areas occupied by this pack. The Pine Lake Pack territory is centered on Moose Lake in Iron County. No evidence of pup production was found in spring 1996.

A new breeding pair of wolves was found at the headwaters areas of the Chippewa River in southeast Ashland, and western Iron Counties. The Chippewa River Pair was not known to produce pups in spring 1996, but additional surveys are needed in the area.

No radio collared wolves occurred in the Log Creek Pack during the study period. As many as 8 wolves occurred in this territory in fall 1994, but only 3 remained by winter 1994-1995. Although at least one pup was produced in this pack in spring 1995, only the breeding pair survived in the pack by winter 1995-1996. Breeding activity was

detected, but pup production has yet to be confirmed.

Wolf 251M (adult male) was initially caught in the Thornapple River Pack in May 1995, but spent only about one half of his time in the territory. By fall the wolf was spending most of his time 20 miles southwest of the territory near Dairyland Flowage. He was found dead near this area on January 24, 1996, and apparently died from exposure due to severe mange.

Although at least 2 pups were present in the Thornapple River Pack in summer 1995, none apparently survived. Only the breeding pair remained in the territory by mid-winter. Breeding again occurred last winter and pups were produced in spring 1996.

PRICE/ONEIDA COUNTIES:

Wolf 237F (yearling female) occupied the 74 mi² Price Creek Pack territory with the breeding pair during winter 1995-1996. Although at least 2 pups were present in summer 1995, none apparently survived to mid-winter. Breeding again occurred in winter 1996, but pups have not been detected.

In November 1995, a two-week old calf was killed in western Price County within the Price Creek territory. Wolf 237F was nearby shortly after the depredation. The cattle were grazing in a back pasture near legume fields planted to attract deer.

Adult male 128M, formerly the alpha male of the Bootjack Lake Pack, paired up with a female to form a new pack around Wilson Flowage in the Park Falls District of the Chequamegon National Forest. The Wilson Flowage Pack bred in winter and produced pups in spring 1996. Wolf 128M had been on the air since July 1991, and his radio-collar finally quit in mid-April 1996. This male is probably 10-12 years old, and was on the "air" the longest of any wolf in Wisconsin.

Wolf 225F (alpha female), her mate and two pups were monitored in the 23 mi² Bootjack Lake Pack throughout the winter. Three pups had been alive until early winter, but only 2 were observed in mid and late winter. The breeding pair again bred in winter and produced pups in spring 1996. This is the second litter for wolf 225F.

Two wolves occupied the Little Rice River territory southeast of the Willow Flowage in Oneida County. The female in this pack did produce some pups last year, but she lost her mate (201M) from a shooting in May 1995 and no pups survived into the fall. Breeding activity was detected in winter 1996, but pup production has yet to be verified.

LINCOLN/TAYLOR COUNTIES:

Wolf 231M had originally been captured in the Averill Creek Pack of western Lincoln County in May 1994. By late summer 1994, 231M was only loosely associated with the Averill Creek Pack, spending much time in eastern Taylor County. During the study

period, wolf 231M spent some limited time in the Averill Creek Pack, but most of the period was spent in Taylor County and a few locations occurred in extreme southwestern Lincoln and northcentral Marathon Counties. He apparently continued to be mainly a lone wolf. The signal for 231M was lost after February 21, 1996; he may have finally dispersed out of the area, or his radio collar battery went dead.

The Averill Creek Pack consisted of 3 wolves in winter 1995-1996. At least 2 pups had been produced the previous year, and one pup apparently survived to mid-winter. Breeding activity occurred in winter 1996 but pups have yet to be detected.

A single lone wolf was tracked in northern portions of Taylor County in the Chequamegon National Forest. No breeding activity was detected with this animal.

NE WISCONSIN:

No wolf sign was found in 336 miles of track surveys in the northern Nicolet Forest. Volunteer trackers reported possible tracks of 2 or 3 wolves in western Florence County, but the observations were not verified by DNR trackers.

JACKSON/WOOD/CLARK COUNTIES:

Wolf 238M was monitored in the Wildcat Mound Pack and occupied a 74 mi² territory. Up to 4 wolves were seen from the air, and track surveys indicated that as many as 6 to 8 wolves existed in this pack. Apparently as many as 4 pups survived in this territory from last year. Wolf pups were again produced in spring 1996.

Three or four noncollared wolves occupied the Bear Bluff Pack in eastern Jackson county. One or two pups had apparently survived from last year, and pup production again occurred in spring 1996.

In May 1996 a Plothound was killed by members of the Bear Bluff Pack. A raccoon hunter was training his dog in the area when the female Plothound had gotten separated from the other dogs. The depredation site may have been close to the packs den area.

A pack of 4-5 wolves was found in winter 1995-1996 in the vicinity of South Bluff in southwestern Wood County. The South Bluff Pack apparently also used portions of northwestern Juneau County. This pack had probably been present for a year or two and had gone undetected. There were probably 2 or 3 pups from 1995 in this pack. Breeding probably again occurred, but pups have not been found.

Wolf 501M (adult male) was injured when caught in May 1995. He escaped into the Sandhill Wildlife Area while recuperating before we had a chance to place a collar on him. The wolf continued occupying the 13 mi² fenced wildlife area throughout the period. He apparently has accepted the area as his territory, and had not displayed any evidence of attempting to escape.

Last year wolf sign was observed in Clark County. Although no sign was detected, observations continued to be reported from the area.

DISPERSING WOLVES:

Thirteen radio-collared wolves displayed dispersal behavior during the study period. Eight animals dispersed as adults, three as yearlings and two as pups.

Wolf 128M (adult male) had been the alpha male of the Bootjack Lake Pack in eastern Price County, but was displaced when his daughter accepted a new male as her mate. He moved west in spring and summer 1995 to form a new territory near Wilson Flowage. The center of the new territory was about 10 miles west of the center of the Bootjack Lake territory.

Wolf 186M (adult male) was thought to be the alpha male of the Empire Pack in Douglas County. He dispersed westward in late October 1995. Three other wolves including 230M (adult male) traveled with him at least 20 miles to the west. The other three came back east, but may not have resettled into the Empire territory. Wolf 186M was last located near Hinekley, Minnesota, 42 miles southwest of his original territory.

Wolf 230M originally moved west with wolf 186M, but returned eastward to settle into the area south of the Truck Trail Territory and southwest of the Empire Pack. Wolf 187F (yearling female) dispersed south from the Truck Trail Pack to join 230M in the new territory along the Moose Road. The center of the territory was about 8 miles southwest of the center of 230M's original territory, and 8 miles south of the center of 187F's original territory.

Wolf 195F had moved as much as 14 miles north of the center of Crex Meadow Pack territory. In her case it was not entirely clear if 195F was dispersing by herself, or if the whole pack had shifted its territory. In spring and summer 1996, wolf 195F was spending much of her time 8-10 miles north of her original territory.

Wolf 198F was originally caught in the Moose Lake territory on May 23, 1996, but she probably was already a dispersing wolf. She traveled through at least 4 other packs during the next 3 weeks. Wolf 198F was last detected on June 14, 19 miles southwest of her original capture site. She probably dispersed out of range after that.

Wolf 209F (yearling female) dispersed north from the Moose Lake Pack to the shores of Lake Superior in late May 1996, shortly after reaching her first birthday. She moved to an area east of Wisconsin Point in Superior and about 18 miles from the center of the Moose Lake territory. From Wisconsin Point, she moved eastward along Lake Superior and in 10 days had traveled 24 miles to the east, near Port Wing. From Port Wing, she returned westward and spent time near the mouth of the Brule River for much of the remainder of the period.

Wolf 231M had originally dispersed out of the Averill Creek Pack in western Lincoln County in late summer 1994. He spent most of his time in eastern Taylor County, but continued to make some trips back to the Averill Creek Pack up to summer 1995. During fall 1995 and winter 1995-1996 he moved as far southwest as 17 miles from the center of the Averill Creek Territory, to within 1½ miles of State Highway 13. His last location on February 21 was about 9 miles south of the center of his original territory.

Wolf 251M was caught in the Thornapple River Pack in May 1995 and began making extensive moves outside of the pack territory in late June. By late summer he was spending most of his time 12 to 18 miles south, and southwest of the Thornapple River territory. He spent most of the fall near Dairyland Flowage, 7 to 10 miles north of Ladysmith. The wolf was found dead near Highway J on January 24, 1996, about 22 miles southwest of the center of his original territory. He apparently had died from exposure due to mange.

Wolf 252M was caught in the O'Brien Lake Pack territory in early June, 1995. He initially remained near Island Lake and O'Brien Lake but by the end of June, he moved eastward into Vilas County, Wisconsin and Gogebic County, Michigan, as much as 28 miles southeast of his original capture site. The full extent of his movements were not known because he was not found during most of July and August. After September 7, wolf 252M settled into an area 14 miles southwest of his original capture site. He remained in this area near Augustine Lake until his death on December 20, 1995. His death site was 15 miles southwest of his original home. He died from gun shot wounds with a severe mange infection.

Wolf 234M had been a member of the Torch River Pack but during the last year spent most of his time on the periphery of the pack territory. He died from mange and imbedded porcupine quills on January 10, 1995. His last location was near Glidden east of the Chequamegon National Forest and about 8 miles from the center of the Torch River territory.

Wolf 254F (female pup) apparently dispersed from the Smoky Hill territory in mid or late January 1996. She was last detected on February 29, 21 miles southwest of the center of her natal territory. Her signal was lost after that and it appeared she dispersed out of range. Its rather unusual for a wolf to disperse at such a young age.

Wolf 255F had been raised in captivity for 53 days in fall 1995, but seemed to have been re-accepted into the Rainbow Lake Pack by mid November 1995. She dispersed westward from the Rainbow Lake Pack in early April 1996, just before her first birthday. She moved as far as the St. Croix Flowage, 28 miles WSW of her original home. During spring, she crossed U.S. Highway 53 at least 4 times. By late June 1996, wolf 255F was spending time northwest of the pack territory, but showed no indications of rejoining the pack.

The results of 13 dispersals of wolves included: 3 successfully found mates and settled

into new areas; 3 died while dispersing; 3 were still moving about; and signals had been lost on 4. Direction of major movements was 9 wolves west and southwest, 1 wolf south, 1 wolf east, and 2 wolves northward.

WINTER WOLF POPULATION:

The minimum estimation of the Wisconsin timber wolf population in winter 1995-1996 was 99-105 wolves (Table 3). Twenty-eight breeding packs averaged 3.2 wolves (range 2-7). Areas occupied by wolf territories and adjacent interstitial areas included about 2400 mi² with an average density of 1 wolf per 24 square miles. The combined population in Michigan and Wisconsin was about 215 wolves.

The 1995-1996 wolf population represented a 19% increase above last year (83-86 wolves). This represents the second year at the population goal of 80+ wolves, and the third year that a population of 100+ wolves have been maintained in Michigan and Wisconsin.

WOLF MORTALITY:

Six radio-collared wolves were found dead during the study period (Table 4). Gross survival rate for 29 adult and yearling wolves was 83% (Micromort analysis will be performed later to more accurately determine survival rate). If 2 wolves that went off the air under suspicious circumstances (184M and 196M), were included as mortality, gross survival rates would be reduced to 76%. Causes of death was due to complications from mange for 3 wolves, 1 wolf shot (also had severe mange), 1 wolf killed by other wolves, and 1 wolf (pup) died from capture related mortality.

Two noncollared wolves were found dead during the period. A yearling male was shot in western Bayfield County in July 1995. A male wolf pup was killed by vehicle collision in June 1996 near Clam Lake in Ashland County.

About 29 pups were thought to be alive in the 1995-1996 winter population. Mean pup survival was estimated at 28% (29 pups/20 females x 5.2 pups per female). Five of 20 packs lost all pups by mid-winter.

A summary of mortality for radio collared wolves in Wisconsin and Pine County, Minnesota since 1979 is shown in table 5. Overall human causes accounted for 60% of the loss. In recent years human caused mortality have declined.

STATEWIDE WOLF DISTRIBUTION:

Wolf observations were obtained from natural resource agency personnel and private citizens from July 1, 1995 through June 30, 1996. All observations were classified as "probable", "possible", and "not likely". A total of 134 probable and possible observations were received (Table 6); this represented a decline of 20% from last year (190 observations). Decline in wolf observations may be partially due to decreased

tendency of people to report sightings as wolves have become more abundant; only 4 reports were received for Douglas County despite the highest concentration of wolves in the state, and the longest history of wolves present (21+ years). Observations were generally highest from counties that had known wolf packs; although no reports were received from Wood and Juneau Counties, where wolf packs have only recently colonized. Wolves were reported from 29 Wisconsin counties, with the majority of reports from northern Wisconsin. Wolf reports in central Wisconsin might include some dispersing wolves, but could include some misidentification, or wolf dog hybrids. A dispersing wolf did occur as far south as Columbia County in August 1994.

Wolf Health Status:

Wolves captured in 1995 were tested for 5 different diseases (Table 7). None of 14 wolves tested were positive for canine parvovirus tested in serum, but 11 were in the suspicious category; this probably indicates past exposure and healthy immune response. Two of 5 wolves did test positive for parvovirus in feces. Moderate to low levels of the disease continued to exist in the population. Other disease testing included: 0 of 14 positive for infectious canine hepatitis, 0 of 14 positive for distemper, 0 of 14 positive for heartworm, and 2 of 14 positive for Lyme Disease. During most years nearly half the wolf population has tested positive for Lyme, but the rate may have declined recently.

Since 1991, only 1 of 50 wolves tested was positive for heartworm (wolf 147F, adult female in 1991). Canid 256F, believed to be a wolf dog hybrid, was shot in March, 1996. Although her serum sample from October 1995 tested negative for heartworm, she was infected with heartworm at the time of death. Also a captive wolf temporarily held by the wolf project also tested positive for heartworm in summer 1995.

Only three wolves captured in 1995 showed signs of mange. Wolves 237F (yearling female) and 251M (adult male) had slight signs of mange, but wolf pup 255F had severe mange and weighed only 10 1/2 pounds in early September when she should have weighed near 30 pounds. Wolf 255F was taken from the wild and raised in captivity for 53 days. She was released back in the wild in late October, and eventually did rejoin her pack. Four adult males died during winter with severe mange including 251M, 252M, 234M, and 188M. Wolf 252M also had been shot, which was the major factor in its death. All wolves had been injected for mange with Ivermectin at the time of capture, but its effectiveness on wild wolves may be limited. In combination with ectoparasite dip and boosters, as well as supplement feeding, as occurred with 255F, Ivermectin may be more effective. All wolves captured in 1994 were also vaccinated with a modified live virus multiple antigen vaccine for canine distemper virus, canine parvovirus, infectious canine hepatitis, and corona virus.

SUMMARY

This report covers activities conducted from March 31, 1995 through June 30, 1996. The Wisconsin wolf population was at its goal of 80 or more wolves for the second year

Table 1. Capture data on wolves^a caught in Wisconsin and adjacent areas of Minnesota in 1995.

| Date | Weight | Sex | Age ^b | Wolf # | Study Area | |
|----------|-----------------------|-----|------------------|-------------------|------------------|----------|
| | | | | | Pack | County |
| 05/04/95 | 76 lbs. | F | Y | W237 | Price Creek | Price |
| 05/04/95 | 85 lbs. | M | A | W184 | Crex Meadows | Burnett |
| 05/09/95 | 65 lbs. | M | Y | W196 | Five Corners | Pine(MN) |
| 05/11/95 | 68 lbs. | F | A | W195 | Crex Meadows | Burnett |
| 05/21/95 | 75 lbs. | F | Y | W238 | Wildcat Mound | Jackson |
| 05/21/95 | 85 lbs. | M | A | W501 ^d | Wildcat Mound | Jackson |
| 05/23/95 | 82 lbs. | M | A | W251 | Thornapple River | Sawyer |
| 06/08/95 | 76 lbs. | M | A | W186 | Empire | Douglas |
| 06/11/95 | 78 lbs. | M | A | W252 | Pine Lake | Iron |
| 06/11/95 | 97 lbs. | M | A | W199 | Stuntz Brook | Washburn |
| 06/12/95 | 52 lbs. | F | A | W253 | O'Brien Lake | Iron |
| 07/28/95 | 68 lbs. | M | A | W197 | Tamarack River | Pine(MN) |
| 08/24/95 | 32 lbs. | F | P | W243 | Smokey Hill | Bayfield |
| 08/29/95 | ≈25 lbs. ^c | F | P | W209 | Moose Lake | Douglas |
| 09/01/95 | 30 lbs. | M | P | W200 | Moose Lake | Douglas |
| 09/03/95 | 11 lbs. | F | P | W255 | Rainbow Lake | Bayfield |
| 10/31/95 | 38 lbs. | F | P | W256 | Unknown | Burnett |

^a Animal 256 may have been a wolf-dog hybrid or captive raised wolf

^b Age: P=pup (<1 yr), Y=yearling (>1 yr & <2 yr), A=adult (≥2 yrs)

^c Not weighed

^d Not radio-collared; escaped while being treated for injury

Table 2. Capture and telemetry data on wolves monitored from July 1, 1995 - Jun 30, 1996 in Wisconsin and eastern Minnesota.

| Wolf # & Sex | Age ^a | Pack ^b | Date Captured | Last Date Located | No. of Locations | Winter Territory Size (mi ²) | Wolf No. in Territory ^c |
|-----------------|------------------|-------------------|------------------|-----------------------|---------------------|---|---------------------------------------|
| 128M | A | Wilson Flowage | 07/23/91 | 04/16/96 ^c | 256 | 52 | 2 |
| 184M | A | Crex Meadows | 05/04/95 | 11/09/95 ^c | 53 | 20 | 4-5 |
| 185F | Y | Chase Brook | 06/23/94 | Ongoing | 206 | 66 | 2 |
| 186M | A | Empire | 06/08/95 | 11/27/95 ^c | 47 | NE | 5 |
| 187F | Y | Moose Road | 07/30/94 | Ongoing | 188 | 34 | 3 |
| 188M | Y | Sand Creek | 05/12/93 | 01/03/96 ^d | 297 | 17 | 3 |
| 191M | A | Truck Trail | 07/29/93 | Ongoing | 319 | 64 | 3 |
| 194M | A | Crotte Creek | 06/16/94 | Ongoing | 209 | 34 | 7 |
| 195F | A | Crex Meadows | 05/11/95 | Ongoing | 114 | 114 | 4-5 |
| 196M | Y | Five Corners | 05/09/95 | 11/02/95 ^c | 51 | 17 | 2 |
| 197M | A | Tamarack River | 07/28/95 | Ongoing | 88 | 52 | 3 |
| 198F | Y | Loner | 05/23/96 | 06/14/96 ^c | 7 | - | 1 |
| 199M | A | Stuntz Brook | 06/11/95 | Ongoing | 108 | 8 | 2 |
| 200M | P | Moose Lake | 09/01/95 | 09/16/95 ^d | 3 | NE | 3 |
| 209F | P | Moose Lake | 08/29/95 | Ongoing | 88 | 12 | 3 |
| 210F | A | Moose Lake | 05/31/96 | Ongoing | 8 | - | 3 |
| 221F | A | Five Corners | 05/07/94 | 05/22/96 ^d | 215 | 89 | 2 |
| 223M | A | Rainbow Lake | 09/09/92 | 03/06/96 ^c | 289 | 101 | 3-4 |
| 225F | Y | Bootjack Lake | 05/25/93 | Ongoing | 130 | 23 | 4 |
| 229F | Y | Augustine Lake | 07/09/93 | Ongoing | 177 | 36 | 3 |
| 230M | P | Empire | 09/05/93 | Ongoing | 302 | 26 | 5 |
| 231M | Y | Loner | 05/13/94 | 02/21/96 ^c | 83 | 41 | 1 |
| 234M | A | Loner | 05/21/94 | 01/10/96 ^d | 95 | 51 | 1 |
| 237F | Y | Price Creek | 05/04/95 | Ongoing | 70 | 74 | 3 |
| 238F | Y | Wildcat Mound | 05/21/95 | Ongoing | 82 | 48 | 6-8 |
| 251M | A | Thornapple River | 05/23/95 | 01/24/96 ^d | 42 | 23 | 2 |
| 252M | A | Loner | 06/11/95 | 12/20/95 ^d | 24 | 9 | 1 |
| 253F | A | Pine Lake | 06/12/95 | Ongoing | 58 | 52 | 2 |
| 254F | P | Smoky Hill | 08/24/95 | 02/29/96 ^c | 34 | 69 | 3 |
| 255F | P | Rainbow Lake | 09/03/95 | Ongoing | 50 | 73 | 3-4 |
| 257M | A | Hellhole Creek | 06/05/96 | Ongoing | 4 | - | 5 |
| 258F | A | Torch River | 06/13/96 | Ongoing | 2 | - | 4 |
| 500M | A | Crotte Creek | 05/14/93 | Ongoing | 332 | 36 | 7 |

^a Age at the time of capture^b Pack during winter of the study period^c Midwinter wolf number^d Wolf died^e Lost radio signal (186M, 198F, and 254F probably dispersed out of range)

in a row, and the combined population of Michigan and Wisconsin were at 100+ for the third year. Reclassification to threatened status could potentially occur by 1997.

Fifteen wild wolves from 13 different packs were captured and radio-collared in 1995. Thirty-three radio-collared wolves were monitored during the period. Winter territories of 14 adult wolves in Wisconsin averaged 46 mi². Wolves occupied 2400 mi² at a density of about 1 wolf per 24 mi². The estimated wolf population in winter 1995-1996 was 99-105 wolves in 28 or more packs. Six radio-collared wolves died during the period including 3 from mange, 1 shooting, 1 intra-specific strife, and 1 capture related. Wolf observations were reported from 29 Wisconsin counties. Wolf serum was tested for 5 canine diseases: 2 of 14 were positive for Lyme disease, and none were positive for canine parvovirus, hepatitis, heartworm, or distemper. Three of 16 captured wolves had some sign of possible mange, including a pup that was severely affected by it.

LITERATURE CITED

- Fuller, T.K., and W.J. Snow. 1988. Estimating winter wolf densities using radio telemetry data. Wildl. Soc. Bull. 16:367-380.
- Harrington, F.H. and L.D. Mech. 1982. An analysis of howling response parameters useful for wolf pack censusing J. Wildl. Manage. 46:686-693.
- Mech, L.D. 1974. Current techniques in the study of elusive wilderness carnivores. Pages 315-322 in proc. XIth Int. Congr. Game Biol. Stockholm, Sweden.
- Rothman, R.J. and L.D. Mech. 1979. Scent marking in lone wolves and newly formed pairs. Anim. Behav. 27:750-760.
- Thiel, R.P. and R.J. Welch. 1981. Evidence of recent breeding activity in Wisconsin Wolves. Am. Midl. Nat. 106:401-402.
- U.S. Fish and Wildlife Service. 1992. Recovery plan for the eastern timber wolf. Twin Cities, Minnesota. 73 pp.

Table 3. Minimum estimation of Wisconsin's timber wolf population in winter 1995-1996.

| Pack/Area/Wolf | County(ies) | No. of Wolves | Evidence ^a |
|---------------------|--------------------|---------------|-----------------------|
| Crex Meadow | Burnett | 4-5* | R |
| Chase Brook | Douglas, Burnett | 2* | R |
| Truck Trail | Douglas | 3* | R |
| Crotte Creek | Douglas | 7* | R |
| Empire | Douglas | 4* | T |
| Moose Lake | Douglas | 5* | R |
| Moose Road | Douglas | 3* | R |
| Stuntz Brook | Washburn | 2* | R |
| Flag River | Bayfield | 3* | R |
| Smoky Hill | Bayfield, Washburn | 3* | R & T |
| Rainbow Lake | Bayfield | 3-4* | R & T |
| Hellhole Creek | Bayfield, Ashland | 5* | T |
| Brush Creek | Ashland | 2* | T |
| Torch River | Ashland | 4* | T |
| Bad River | Ashland | 2 | T |
| West Firelane | Ashland | 2* | T |
| Morrison Creek | Ashland, Iron | 2 | T |
| Echo Valley | Bayfield | 1+ | T |
| Augustine Lake | Ashland, Iron | 3* | R & T |
| Chippewa River | Ashland, Iron | 2* | T |
| O'Brien Lake | Iron | 2* | T |
| Pine Lake | Iron | 2* | R & T |
| Log Creek | Ashland, Sawyer | 2* | T |
| Thornapple River | Sawyer | 2* | T |
| Price Creek | Price | 3* | R & T |
| Wilson Flowage Pair | Price | 2 | R & T |
| Bootjack Lake | Price, Oneida | 4* | R & T |
| Little Rice River | Oneida | 2* | T |
| Averill Creek | Lincoln | 3* | T |
| N. Taylor Co. Loner | Taylor | 1 | T |
| Wolf 231M | Taylor | 1 | R |

Table 3. (continued)

| Pack/Area/Wolf | County(ies) | No. of Wolves | Evidence* |
|----------------|-------------|---------------|-----------|
| Wildcat Mound | Jackson | 6-8* | R & T |
| Bear Bluff | Jackson | 3-4* | T |
| South Bluff | Wood | 4-5* | T |
| TOTAL | | 99-105 | |

* Evidence: R = radio-telemetry surveys
T = track and sign surveys

* Pack with breeding activity

Average pack size (28 packs) = 3.2

Table 4. Mortality during July 1, 1995 - June 31, 1996 of radio-collared wolves.

| Wolf # & Sex | Age ^a | Date Captured | Date Died | Cause of Death |
|-----------------|------------------|---------------|-----------|---------------------------------|
| W188M | Y | 05/12/93 | 01/03/96 | Mange? |
| W200M | P | 09/01/95 | 09/16/95 | Capture related |
| W221F | A | 05/07/94 | 05/22/96 | Other Wolves |
| W234M | A | 05/21/94 | 01/10/96 | Mange / porcupine quills |
| W251M | A | 05/23/95 | 12/28/95 | Mange |
| W252M | A | 06/11/95 | 12/20/95 | Gun Shot wound (also had mange) |

^a Age of wolf at time of capture

Table 5. Mortality summary of radio-collared wolves from Wisconsin and adjacent areas of Minnesota, October 1979 - June 1995.

| Cause of Death | Number | % Known Mortality |
|------------------------------|---------------|--------------------------|
| Shot Wound ^a | 15 | 35% |
| Trapped | 3 | 7% |
| Capture Related | 1 | 2% |
| Vehicle Collision | 4 | 9% |
| Unknown-Human Causes | 3 | 7% |
| Total Human Causes | 26 | 60% |
| Killed by other Wolves | 5 | 12% |
| Disease | 9 | 21% |
| Unknown Natural Causes | 3 | 7% |
| Total Natural Causes | 17 | 40% |
| Total Known Mortality | 43 | 100% |
| Unknown Mortality | 5 | |
| Total Mortality | 48 | |

^a14 wolves shot by firearm; 1 wolf shot by bow and arrow

Table 6. Wolf observations reported by natural resource agency personnel and private citizens in in July 1994 - June 1995.

Wisconsin

| County | Sightings | Wolves Seen | Track or Sign Observations | Total Observations |
|-----------------------|------------|-------------|----------------------------|--------------------|
| Adams | 1 | 1 | - | 1 |
| Ashland ^a | 7 | 11 | 8 | 15 |
| Barron | 1 | 4 | - | 1 |
| Bayfield ^a | 7 | 14 | 8 | 15 |
| Burnett ^a | 4 | 7 | - | 4 |
| Chippewa | - | - | 1 | 1 |
| Clark | 2 | 2 | - | 2 |
| Columbia | 2 | 2 | - | 2 |
| Douglas ^a | 2 | 2 | 2 | 4 |
| Dunn | 1 | 2 | - | 1 |
| Florence | 4 | 4 | - | 4 |
| Forest | 2 | 2 | - | 2 |
| Iron ^a | 10 | 16 | 3 | 13 |
| Jackson ^a | 2 | 4 | 1 | 3 |
| Langlade | 2 | 3 | - | 2 |
| Lincoln ^a | 10 | 14 | 2 | 12 |
| Marathon | 6 | 6 | - | 6 |
| Marinette | 1 | 1 | - | 1 |
| Oneida ^a | 4 | 4 | 1 | 5 |
| Polk | 1 | 1 | - | 1 |
| Price ^a | 8 | 11 | 2 | 10 |
| Richland | 1 | 1 | - | 1 |
| Rusk | 2 | 4 | - | 2 |
| Sauk | 1 | 1 | - | 1 |
| Sawyer ^a | 13 | 15 | 4 | 17 |
| Taylor | - | - | 1 | 1 |
| Vilas | - | - | 1 | 1 |
| Washburn ^a | 5 | 5 | - | 5 |
| Waupaca | 1 | 1 | - | 1 |
| TOTALS | 100 | 138 | 34 | 134 |

^a County with known wolf pack during portions of this study period

Table 7. Disease tests of wolves in Wisconsin and adjacent areas of Minnesota in 1995.

| Wolf # & Sex | Age ^a | Date | Serum CPV | Fecal CPV | ICH | CDV | HW | Lyme |
|-------------------|------------------|----------|--------------|--------------|------|------|------------------|------|
| 184M | A | 05/04/95 | 1:320 | 1:512 | Neg | 1:5 | Neg | Neg |
| 186M | A | 06/08/95 | 1:80 | - | Neg | 1:5 | Neg | Neg |
| 195F | A | 05/11/95 | 1:320 | - | 1:5 | 1:5 | Neg | Neg |
| 196M | Y | 05/09/95 | 1:160 | 1:32 | 1:10 | <1:5 | Neg | Pos |
| 197M | A | 07/28/95 | | | | | | |
| 199M | A | 06/11/95 | 1:160 | - | 1:10 | 1:5 | Neg | Neg |
| 200M | P | 09/01/95 | 1:40 | - | 1:5 | <1:5 | Neg | Neg |
| 209F | P | 08/29/95 | | | | | | |
| 237F | Y | 05/04/95 | 1:80 | - | 1:20 | 1:5 | Neg | Neg |
| 238F | Y | 05/21/95 | 1:160 | - | 1:20 | 1:20 | Neg | Pos |
| 251M | A | 05/23/95 | Neg | 1:512 | Neg | <1:5 | Neg | Neg |
| 252M | A | 06/11/95 | 1:80 | - | 1:5 | 1:5 | Neg | Neg |
| 253F | A | 06/12/95 | 1:80 | - | 1:5 | 1:5 | Neg | Neg |
| 254F | P | 08/24/95 | | | | | | |
| 255M | P | 09/03/95 | 1:160 | Neg | 1:5 | <1:5 | Neg | Neg |
| 256F ^b | P | 10/31/95 | <1:20 | - | 1:5 | 1:5 | Neg ^c | Neg |
| 501M | A | 05/21/95 | 1:320 | 1:256 | 1:5 | <1:5 | Neg | Neg |

^aAge: P = Pup (< 1 yr)
Y = Yearling (> 1 yr & < 2 yr)
A = Adult (≥ 2 yrs)

^bWolf 256F was believed to be a wolf-dog hybrid

^cAlthough serum tested negative, the canid was found positive for heartworm at the time of death in March 1996

Disease Tests:

CPV = Canine Parvovirus Serum: ≤1:40 Negative
80-320 Suspicious
>320 Positive

= Canine Parvovirus Fecal: >256 Positive

ICH = Infectious Canine Hepatitis: <1:20 Negative
1:20 - 1:40 Suspicious
>1:40 Positive

CDV = Canine Distemper Virus ≥1:40 Positive

HW = Heartworm: Neg = Negative; Pos = Positive

Lyme = Lyme Disease: Neg = Negative; Pos = Positive

(Health Testing conducted by Kerry A. Beheler Amass, DNR Wildlife Health Program)

