

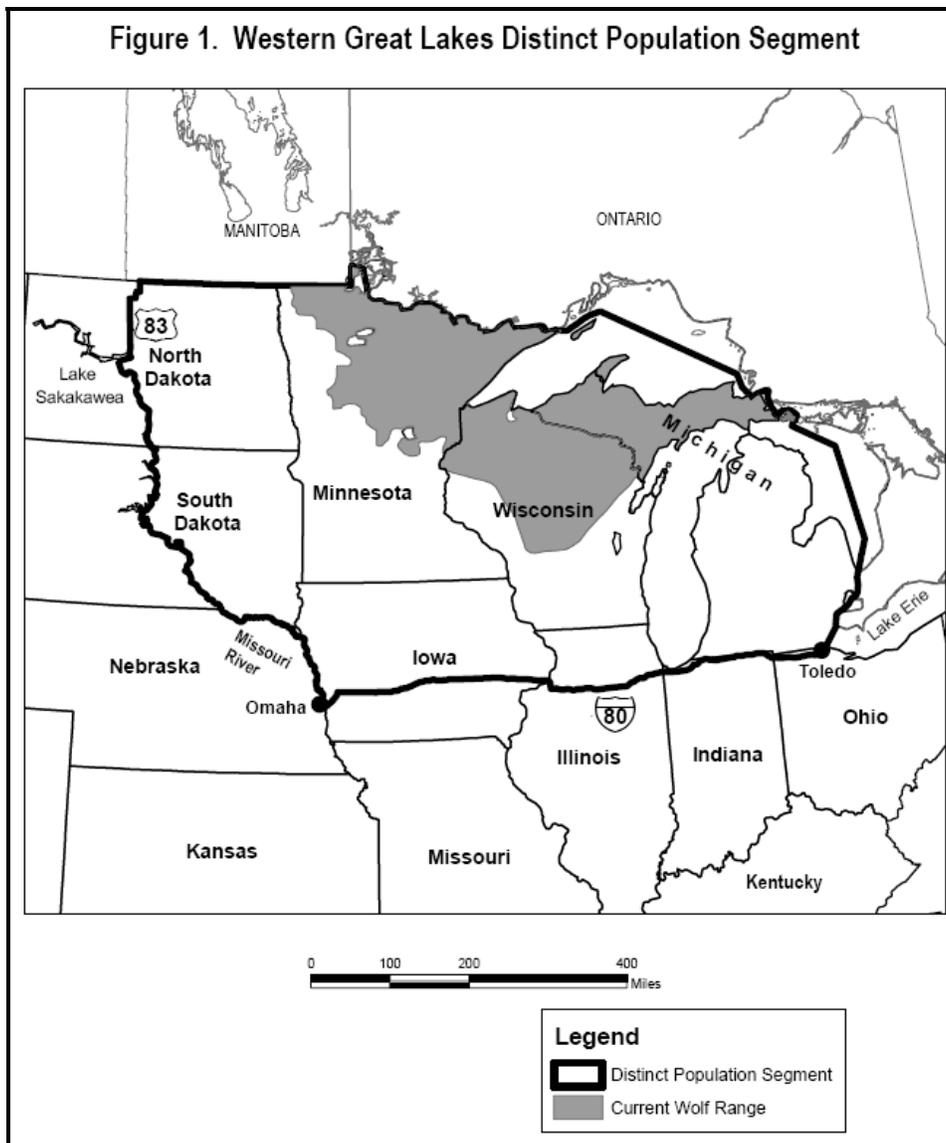
Post-Delisting Monitoring Plan Gray Wolf Western Great Lakes Distinct Population Segment

Overview of Purpose and Focus

Section 4(g) of the Endangered Species Act (Act) requires post-delisting monitoring (PDM) for a minimum of five years after a species is delisted due to its recovery. The post-delisting monitoring shall be used to indicate whether the species should be relisted, or relisted under the emergency listing authority of the Act, to prevent a significant risk to its well being. In order to do this, PDM should focus on reviewing and evaluating (1) population characteristics of the species, (2) threats to the species, and (3) implementation of legal and/or management commitments that have been identified as important in reducing threats to the species or maintaining threats at sufficiently low levels.

For the proposed Gray Wolf Western Great Lakes Distinct Population Segment (WGL DPS) (71 FR 15266; March 27, 2006; Figure 1), focusing PDM on these three aspects is necessary and sufficient to ensure that the DPS does not decrease to the point of again meeting the definitions of threatened or endangered. Demographic data – specifically, winter and late-winter estimates of wolf populations in the northern portions of Minnesota, Wisconsin, and Michigan – are the basis for our determination that wolves in this DPS have surpassed their numerical recovery criteria for a sufficient period. A reduction in threats to the species is the primary cause of the dramatic wolf population increase over the last 25 years and attainment of the numerical recovery criteria. The post-delisting protection of wolves via state and tribal laws and regulations, as well as protections by federal land management agencies, will be critical to maintaining a recovered population of gray wolves in the WGL DPS, because those laws and regulations will become the primary mechanism to protect wolves from their primary former threat – excessive human-caused mortality.

PDM for the WGL DPS will be focused within the borders of Minnesota, Wisconsin, and the Upper Peninsula (UP) of Michigan. These areas constitute the core wolf recovery areas within the DPS, and the numerical recovery criteria specified in the Recovery Plan for the Eastern Timber Wolf (USFWS 1992) have been attained by the wolf populations within this area. Because the delisting of the gray wolf WGL DPS is based on wolf recovery in these states, it is not necessary for the Service to conduct PDM in other parts of the DPS. However, the Service remains interested in receiving additional biological evidence regarding the existence of individual wolves or wolf populations in the other states within the DPS, and especially in the Northern Lower Peninsula (NLP) of Michigan. Additionally, the Service is interested in obtaining disease/parasite data from wolves found in other portions of the DPS that may provide evidence regarding a new or increasing threat that may impact wolves in the core recovery areas of the DPS.



Population Characteristics

The monitoring of wolf populations in Minnesota, Wisconsin, and Michigan has been carried out for several decades primarily by the three State DNRs, with significant assistance from numerous partners, including the U.S. Forest Service, National Park Service, USDA/APHIS-Wildlife Services, tribal natural resource agencies, and the Service. The methods used in this monitoring are summarized below, and are described in detail by Erb and Benson (2004), Wydeven *et al.* (2006), and Potvin *et al.* (2005).

In order to maximize comparability of PDM data with data obtained prior to delisting (Table 1), all three states intend to continue their previous wolf population monitoring methodology with only minor changes. As specified in the Recovery Plan for the Eastern Timber Wolf (USFWS 1992), population monitoring will be conducted during the late winter months when wolf populations are at the low point of their annual cycle, and when snow cover and lack of foliage

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on deciduous trees facilitates tracking and aerial counting.

Table 1. Gray wolf winter populations in Minnesota, Wisconsin, and Michigan (excluding Isle Royale) from 1976 through 2006.

YEAR	Minnesota	Wisconsin	Michigan	WI & MI Total
1976	1,000–1,200	?		
1978–79	1,235	?		
1988–89	1,500 & 1,750	31	3	34
1989-90		34	10	44
1990-91		40	17	57
1991-92		45	21	66
1992-93		40	30	70
1993–94		57	57	114
1994–95		83	80	163
1995–96		99	116	215
1996–97		148	113	261
1997–98	2,445	180	139	319
1998–99		205	169	374
1999–2000		248	216	464
2000–01		257	249	506
2001–02		327	278	604
2002–03		335	321	656
2003–04	3,020	373	360	733
2004–05		435	405	840
2005-06		465	434	899

Minnesota DNR will continue to use a rangewide survey/local intensive study approach, which is suitable for a wolf population of thousands of animals ranging across more than 34,100 sq. mi. (88,325 sq. km). The most recent survey was conducted during the winter of 2003-2004 to provide a population estimate used in making the Service’s delisting decision. However, the Minnesota Wolf Management Plan (MN DNR 2001) specifies that the survey frequency will be increased from the previous 9 or 10-year interval. Statewide wolf population and distribution estimates will be conducted during the first and fifth years following delisting and subsequently at 5-year intervals. In the intervening years the DNR will continue their collection and analysis of scent post data, winter track surveys, and verified wolf depredations on domestic animals. Each of these will furnish independent annual indices of wolf population trends and changes in occupied range, but they will not provide population estimates.

The Minnesota method uses estimates of winter pack territory and pack size that are based on several localized radio-tracking studies in different portions of Minnesota wolf range. The extent of occupied wolf range is separately delineated from extensive surveying of hundreds of natural resource managers, wildlife biologists, conservation officers, and other knowledgeable

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field personnel, and also by using human density and road density data. Wolf density data from the localized radio-tracking studies are applied to the wolf range delineated from the surveys to derive an estimate of pack wolf numbers across the occupied range. This number is adjusted upward to account for a Minnesota wolf population believed to include 15 percent non-pack wolves (based on Fuller *et al.* 1992). This method provides a population point estimate, and the DNR has computed a 90 percent confidence interval for the point estimate (Erb and Benson 2004).

Wisconsin DNR will continue its intensive radio-tracking and annual winter track and sign surveys to provide data directly comparable to those available for recent years. This method is based on weekly aerial radio-tracking of approximately 40 percent of Wisconsin wolf packs from mid- through late winter, supplemented by multiple winter track and sign surveys in all areas suspected of having wolf packs. These complementary methods identify the locations and approximate territorial boundaries of nearly all packs, and they have a high likelihood of detecting most or all members of each pack. Because detection is less than 100 percent, the method is understood to provide something of an underestimate of the late winter pack wolf population in the State.

Due to the intensity of the Wisconsin surveys, very few packs are missed. There have been several years in which packs subsequently have been documented in a location where no packs were identified during the previous late winter survey. When this occurs, WI DNR retroactively adjusts the previous year's population estimate to account for the missed wolves. Although there currently are no data available to derive confidence limits, the DNR's survey method probably underestimates packs and pack wolf numbers by less than 10 percent. Because some of the underestimate is removed by adjustment in the subsequent year, the ultimate underestimate probably averages 5 to 10 percent or less for pack wolves. Winters with less snow cover produce poorer conditions for track surveys and reduced contrast for aerial sightings, likely resulting in larger underestimates in such years.

A second cause of underestimation is the lone wolves that are missed in the survey. Lone wolves are generally believed to constitute about 10-15 percent of a wolf population in winter (Fuller *et al.* 1992, 2003). The WI DNR recorded 2 to 13 percent of the wolf population as loners from 1991-2000, but among radio-collared wolves an average of 8 percent spent the whole winter as loners (range 0 to 15 percent) (Wydeven *et al.* 2000). Wolf reports were received from numerous Wisconsin counties beyond the area surveyed by the DNR. Although many of these are likely misidentifications by the public, some of these reports likely are of dispersing lone wolves not included in the survey tally. Thus, missing lone wolves may lead to an underestimate on the order of 5 to 10 percent of the statewide wolf population in Wisconsin.

Combining the estimated error for missed packs and missed individual pack wolves with the estimated error from missed loners results in an overall underestimate on the order of 10 to 20 percent. At the other extreme, the survey design minimizes the likelihood of double-counting wolves or packs; we do not believe overestimating the statewide wolf population will occur via this survey methodology.

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Wisconsin DNR might test other methods during the PDM period, but the State does not plan to replace its traditional radio tracking/snow tracking surveys during the PDM period (Wydeven in litt. 2006).

Michigan DNR also plans to continue its intensive ground tracking, aerial observation, and radio telemetry-based methods during the PDM period. Michigan's methods are very similar to those used by Wisconsin, including weekly monitoring of radio-collared wolves in about 40 percent of the packs. However, Michigan does not use volunteers to assist with ground tracking. Annually, Michigan DNR, assisted by USDA-Wildlife Services, spends over 2,000 person hours conducting the ground tracking portion of the survey. This effort involves searching over 8,000 miles of roads and trails at least once for wolf sign, with many miles searched multiple times.

Given the increases in wolf numbers and the effort required to count wolves, the Michigan DNR is planning to implement a sampling approach to reduce the cost and increase the efficiency of the survey based on an analysis by Potvin *et al.* (2005). Michigan DNR is planning to stratify the UP into three sampling areas and intensively survey roughly 40 to 50 percent of the wolf habitat area annually. Computer simulations have shown that such a geographically stratified monitoring program will produce unbiased and precise estimates of the total wolf population which can be statistically compared to estimates derived from the previous method to detect changes in the UP wolf population (Beyer in litt. 2006, Lederle in litt. 2006).

The late winter surveys by the Wisconsin and Michigan DNRs produce estimates of their wolf populations at the low points in their annual cycle. By late winter, mortality factors such as starvation and hypothermia exacerbated by mange and other diseases have largely exerted their effect and the annual production of pups has not yet begun. In early spring after pups are born it is likely that the wolf population jumps to approximately double the late-winter population. Therefore, the late-winter population estimates must always be accompanied with this understanding when used to evaluate recovery progress and post-delisting viability – they are minimum estimates of the wolf population made at its annual low point.

Post-Delisting Threats

Post-delisting threats are all the threats that may affect the species after the protections of the Act are removed. These include ongoing threats whose magnitude has been reduced by recovery actions for the species, continuing threats that have not been mitigated by recovery actions over the years since listing, or new threats that are first recognized subsequent to delisting. For gray wolf WGL PDM purposes, we believe the most important threats to monitor are those that have been sufficiently reduced and contained, but not permanently eliminated, during the recovery process. For gray wolves in the WGL DPS, those threats are primarily the various forms of human-caused mortality that have been reduced by the provisions of the Act. Additionally, a variety of known wolf diseases and parasites are of concern. Furthermore, the possibility of new diseases represents a threat that requires vigilance. All these anticipated post-delisting threats are described in detail in **Summary of Factors Affecting the Species** in the preamble of the 2006 proposed delisting rule (75 FR 15277-15302).

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Minnesota, Wisconsin, and Michigan DNRs will continue to compile summaries of incidents of human-caused and natural mortality and to provide this information to us annually. This reporting will include information on: **wolves killed legally and intentionally** for depredation control, threat reduction, research, or other reasons; **known accidental mortalities** (for example, vehicle collisions and incidental trapping mortalities); **natural mortality** (e.g., disease and intraspecific conflict); **illegally killed wolves**, and **mortalities from unknown factors**.

The wolf management plans for Minnesota and Wisconsin commit the respective DNRs to conduct necropsies on dead wolves, carry out disease screening on livetrapped wolves, and analyze wolf scat for disease-causing microorganisms and parasites. The Michigan DNR states that wolf health disease monitoring will receive a high priority for a minimum of five years following Federal delisting. This information will be provided annually for our review.

Generally, American Indian reservation natural resource agencies are not bound to the wolf reporting mechanisms that are contained in state wolf management plans. Thus, there may be reservations within wolf range in Minnesota, Wisconsin, and Michigan which will not annually report their wolf population, mortality, and disease data to the state DNRs. Annually we will contact each of the large reservations within the DPS's known wolf range to directly obtain their population and mortality/disease data, as well as any new information regarding tribal management and protection of wolves in order to have the most comprehensive data available for our annual review.

Similarly, we will annually contact the federal land management agencies with significant wolf populations on their units in Minnesota, Wisconsin, and Michigan to obtain any additional data they may have regarding wolf management/protection, numbers, mortalities, injuries, or disease occurrences.

Implementation of Legal and Management Commitments

The recovered WGL DPS is dependent upon wolves receiving sufficient protection in Minnesota, Wisconsin, and Michigan so as to ensure that a viable wolf population will remain in Minnesota and a second viable population will exist in Wisconsin-Michigan for the foreseeable future. As the Act's protection ended at the time of delisting, the necessary post-delisting protection must come from state, tribal, and local governments, and from several federal land management agencies. Among these, state protections are the most important, because they apply directly to the largest number of WGL DPS wolves.

By delisting the Gray Wolf WGL DPS we have concluded that the wolf management plans of the Minnesota, Wisconsin, and Michigan DNRs and future gray wolf protections by the various tribes and federal land management agencies are sufficient to preserve viable wolf populations in the Midwest. Therefore, post-delisting monitoring will also annually evaluate the implementation and outcomes of these wolf management plans, protections, and related guidelines and procedures.

Monitoring Duration and Methods

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Duration. Unless such situations arise as are described below, the Service and the wolf management agencies will carry out PDM for five years following the delisting of the Gray Wolf WGL DPS. This will allow for five complete Wisconsin-Michigan population estimates after delisting has occurred and non-federal wolf management plans and protections become operational. It will also include population estimates for Minnesota wolves at or near the beginning and end of the five-year period. Given that the Gray Wolf WGL DPS population currently is estimated to be several times greater than the numerical delisting criteria stated in the 1992 Recovery Plan (USFWS 1992), and because at this time we envision no reasonably likely threat or combination of threats sufficient to drive that population rapidly downward, we believe 5 years of PDM is sufficient. Under the circumstances described below we will consider extending the PDM and/or taking action to restore federal protections under the Act.

Data Gathering. We will annually gather available data from Minnesota, Wisconsin, and Michigan DNR's, and from the Native American natural resource agencies and federal land management agencies with large land bases within occupied wolf range in these three states. We will also contact the wildlife management agencies of the other states in the DPS to obtain relevant data that they may have acquired during the previous year.

The Service will contact state and tribal wildlife resource conservation agencies and federal land management and research agencies to establish points of contact to obtain the relevant data annually. Within the Service, the Endangered Species Coordinator at the Service's Twin Cities, Minnesota, Ecological Services Field Office will be the focal point for the data gathering, evaluation, and coordination with the Eastern Gray Wolf Recovery Team and other experts, as appropriate.

Our data gathering will include the following, with the primary data shown in bold type:

- Wolf **population estimates, pack numbers, and estimated occupied area** from Minnesota, Wisconsin, and Michigan DNRs and from larger reservations within the wolf-occupied portions of these three states
- Wolf **mortality data** from the three states and the larger reservations within occupied range in the WGL DPS
- Data on the **occurrence of diseases and parasites** in wolves throughout the WGL DPS
- Information on changes made within the previous year, or changes likely within the next year, to state **regulatory mechanisms that change the previously-provided protections** for gray wolves, gray wolf prey, or gray wolf habitat within the DPS
- Summary data for all **law enforcement investigations** relating to wolves by the three states.
- Summary reports of **wolf depredation incidents** and the resolution of those incidents
- Reports or publications on public attitudes toward WGL DPS wolves
- Reports of wild gray wolves in other states within the WGL DPS
- Wolf research reports or publications dealing with WGL DPS wolves or factors adversely affecting them
- Educational materials, press releases, and other wolf-related public information/education documents distributed by the state, tribal, and federal agencies within the WGL DPS, and

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similar materials distributed within the WGL DPS by non-governmental agencies.

Summary of Annual Data Collection. Letters will be sent annually to the following four categories of agencies, requesting a standard list of data types from all agencies in the category.

Minnesota, Wisconsin, and Michigan Departments of Natural Resources:

- population estimates, pack numbers, occupied area
- mortality data
- disease/parasite occurrence in wolves
- verified or probable depredation incidents and follow-up actions
- changes to regulatory mechanisms affecting the protection or management of the species, its prey, and its habitat
- law enforcement investigations of wolf mortality
- other relevant information

Natural Resource Management Agencies of the large reservations in occupied wolf area – Red Lake, Leech Lake, Fond du Lac, Bois Forte, Grande Portage, Bad River, Lac Courte Oreilles, Menominee, and Lac du Flambeau:

- population estimates and pack numbers
- mortality data

Other States within the WGL DPS – North Dakota, South Dakota, Iowa, Illinois, Indiana, and Ohio:

- verified or probable wolf reports & disposition of any verified or probable wolves
- disease/parasite occurrence in documented wolves

Federal Land Management Agencies with large land bases within occupied wolf range – Chippewa National Forest (NF), Superior NF, Chequamegon-Nicolet NF, Hiawatha NF, Ottawa NF, Voyageurs National Park; and national wildlife refuges with sufficient land base or known wolf presence:

- population estimates and pack numbers
- mortality data
- law enforcement investigations of wolf mortality
- regulatory mechanism changes

Wisconsin and Michigan DNRs currently finalize their annual population estimates in April through June, so we expect to annually gather this information during April through June, for subsequent evaluation in June or July. If state and tribal population estimates are available earlier, the evaluation similarly will occur earlier in the year.

Evaluation. These data will be reviewed and evaluated internally by the Service and provided in entirety or in summary form to the Eastern Gray Wolf Recovery Team for their independent review. The Service may request additional reviews from other wolf experts and independent specialists, as appropriate. These annual reviews will look for indications of increasing or new

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threats to wolf population viability, a decline in wolf population or decrease in occupied range, a change in state/tribal/federal management/protection that might cause a decline, or other factors that might indicate or cause a decline in wolf population viability in the WGL DPS. While the reviews will focus on population trends, mortality data, and protection/enforcement activities, other data will be reviewed when appropriate.

We will post the results of these reviews in summary form on our Web site in a timely manner in order for all interested parties to annually review our PDM and our evaluation of the data.

Events & Factors Indicating a Potential Need for Action:

While it may seem desirable to specify in advance a list of strict quantitative triggers that would automatically result in specified actions by the Service (e.g., PDM expansion or extension, initiating a formal status review, or publication of a relisting proposal), such decisions are rarely clear-cut and often require the consideration of multiple qualitative factors and evaluating interactions of varying complexity. Thus, we are instead identifying five quantitative events and describing several examples of qualitative factors that would lead to our *consideration* of the actions (a) through (f) described below, but *would not necessarily trigger* these actions. Consultation with the Recovery Team, other wolf experts, and/or endangered species biologists within the Service will precede our determination of the appropriate response.

Events that might cause Consideration of Relisting or Emergency Relisting:

Either of these events might be evidence of a serious problem, but by itself would not necessarily trigger Federal regulatory action. The occurrence of any of the following could cause the Service to investigate the cause, the likelihood of continuation, other indications of Midwest wolf population viability, and other relevant factors, to decide if a proposal to relist, an emergency relisting, or other action is warranted.

1. A decline that reduces the combined Wisconsin-Michigan (excluding Isle Royale and the Lower Peninsula) late winter wolf population estimate to 200 or fewer wolves.
2. A decline that brings either the Wisconsin or the Michigan (excluding Isle Royale and the Lower Peninsula) wolf estimate to 100 or fewer wolves.
3. A decline that brings the Minnesota winter wolf population point estimate to 1500 or fewer wolves.

Others factors indicating a potential cause for concern include, but are not limited to, the following:

The occurrence of any of the following factors can direct the Service's attention to an evaluation of its seriousness, but will not necessarily lead to any other follow-up action.

1. A rapid and large decline (for example, 25 percent or more from the previous year) in the late winter wolf population estimate for Wisconsin and/or Michigan.
2. Any wolf population decline in Wisconsin Zones 1 and 2 or the Upper Peninsula of Michigan of three years or more in duration.
3. A substantial and widespread increase in mortality from known or unknown causes.
4. Evidence of a new wolf disease or substantial increase in virulence of a previously known wolf disease, even in the absence of noticeable demographic impacts on the wolf population.

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5. A substantial decline in the wolf prey base across a large portion of the occupied wolf range in the DPS.
6. A significant adverse change in wolf, wolf prey, or wolf habitat, management practices or protection across a substantial portion of the occupied wolf range in the WGL DPS.

In the event that WGL DPS declines are evident following an annual PDM review, the Service may take any or all of the following actions:

- (a) extend the PDM period,
- (b) add new components to the PDM,
- (c) initiate a comprehensive status review of the species within the DPS, and/or
- (d) investigate and/or remedy the cause(s) of the decline.

As part of each annual evaluation the Service will also consider changes to the PDM methodology and data review process. If such changes are found to be necessary to meet the Service's responsibilities under Section 4(g) of the Act they will be promptly implemented, subject to available funding needed for their implementation.

At the end of the PDM period the Service will conduct a final internal review, and may request reviews by the Recovery Team and other independent specialists, as appropriate. The results of these reviews will be posted on the Service's Web site.

Literature Cited

- Beyer, Dean. 2006. E-mail from Beyer, MI DNR Wildlife Research, to Ron Refsnider, USFWS Regional Office, Ft. Snelling, MN, dated 08/10/06. Subject: Potential for "MN-style" wolf monitoring in WI and MI? 2 pp. with 6-page attachment by Drummer.
- Erb, J. and S. Benson. 2004. Distribution and abundance of wolves in Minnesota, 2003-04. Unpublished report by Minnesota Department of Natural Resources, Grand Rapids, MN 13 pp.
- Fuller, T.K., W.E. Berg, G.L. Radde, M.S. Lenarz, and G.B. Joselyn. 1992. A history and current estimate of wolf distribution and numbers in Minnesota. *Wildlife Society Bulletin* 20:42-54.
- Fuller, T.K., L.D. Mech, and J.F. Cochrane. 2003. Wolf population dynamics. Pp. 161-191 In *Wolves: Behavior, Ecology, and Conservation*. eds. L.D. Mech and L. Boitani. Univ. of Chicago Press, Chicago. 448 pp.
- Lederle, P. 2006. E-mail from Lederle, MI DNR Wildlife Research Section Supervisor, to Ron Refsnider, USFWS Regional Office, Ft. Snelling, MN, dated 09/05/06. Subject: Support for the sampling protocols. 1 p.
- Michigan Department of Natural Resources. 1997. Michigan gray wolf recovery and management plan. Lansing, MI 58 pp.
- Minnesota Department of Natural Resources. 2001. Minnesota wolf management plan. Prepared by the Section of Wildlife, dated February 2001. 36 pp. plus 9 appendices.
- Potvin, M.J., T.D. Drummer, J.A. Vucetich, D.E. Beyer, R.O. Peterson, and J.H. Hammill. 2005. Monitoring and habitat analysis for wolves in Upper Michigan. *J. Wildl. Mgmt.* 69:1660-1669.

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- U.S. Fish and Wildlife Service. 1992. Recovery plan for the eastern timber wolf. Twin Cities, MN 73 pp.
- Wiedenhoeft, J.E. 2005 . Summary Report - "Minnesota-type" wolf survey for Wisconsin - GIS analysis. Unpublished report to State Wildlife Grants Program - CWCP. Wisconsin DNR, Park Falls, WI. 14 pp.
- Wydeven, Adrian. 2006. E-mail from Wydeven, WI DNR Mammalian Ecologist, to Ron Refsnider, USFWS Regional Office, Ft. Snelling, MN, dated 08/09/06. Subject: Potential for "MN-style" wolf monitoring in WI and MI. 2 pp. with 14-page attachment [Wiedenhoeft 2005, listed separately above].
- Wydeven, A.P., J.E. Wiedenhoeft, B.E. Kohn, R.P. Thiel, R.N. Schultz, and S.R. Boles. 2000. Progress report of wolf population monitoring in Wisconsin for the period October 1999 - March 2000. Unpublished report by Wisc. Dept. Natural Resources, Park Falls, WI. 31 pp.
- Wydeven, A.P., J.E. Wiedenhoeft, R.N. Schultz, R.P. Thiel, S.R. Boles, and E. Heilhecker. 2006. Progress report of wolf population monitoring for the period October 2005 – March 2006. Unpublished report by WI DNR, Park Falls, WI. 39 pp.

Draft prepared by the Region 3 Division of Endangered Species, U.S. Fish and Wildlife Service, Whipple Federal Building, 1 Federal Drive, Ft. Snelling, Minnesota 55111.