Comments on Webinar on "Best Available Predator Science and the Law", given through the Wolf Conservation Center on December 18, 2018.

January 7, 2019

On December 18, 2018, Dr. Adrian Treves from University of Wisconsin-Madison presented a webinar through the Wolf Conservation Center, titled "Best Available Predator Science and the Law". In his talk, Dr. Treves discussed and criticized science used in setting wolf management policy in Wisconsin. While scientific criticism on wildlife management planning is reasonable, it should be based on factual and objective information and thorough understanding of the management process. Treves makes several factual errors, and confuses the whole management process.

Treves mischaracterizes the 1999 wolf management plan for Wisconsin. He presents the plan as if it was created by some monolithic group that he refers to as "architects", whom he implies wanted to dictate wolf management for the state. The plan was developed by 23 individuals with diverse backgrounds from the Wisconsin Department of Natural Resources, other agencies and University of Wisconsin-Stevens Point (WDNR 1999, p. 7). The plan went through extensive reviews with the public, natural resources specialists, wildlife professionals and scientists, and went through 4 drafts before a final version was developed (WDNR 1999, p. 50-55). Approval of the plan went through the Wisconsin Natural Resources Board, a citizen commission appointed by the governor and approved by the state legislature. Such plans, while based on science, also represent social and political compromises as well as value judgements. The plan receive much more extensive review than most peer-reviewed articles published in scientific journals, and represents much more than just the narrow ideas of a homogenous group of "architects".

Treves incorrectly stated that the architects of the wolf plan dictated that wolves would be hunted. The plan states, "A public harvest can be considered if other control activities do not adequately maintain the population near the 350 goal (p. 21, WDNR 1999)." Thus the plan determined the population level at which public harvest could be considered, but did not dictate that a public harvest would occur. Treves mentioned an Appendix J, about how wolves would be hunted as part of the wolf plan. Such an appendix was requested by the Wisconsin Natural Resources Board when the 3rd draft of the plan was presented to them. Thus Appendix J, which was not an original product of the wolf advisory team, but was a request by the governing board with responsibility for overseeing management, to add to the plan. The addition of that appendix was strongly opposed by many members of the public and was eliminated from the final version of the plan. Thus the public planning worked in rejecting additions to the plan that were not necessary and were premature.

Treves makes incorrect reference to how the 1999 wolf plan presented potential carrying capacity. Treves states that the plan used 500 as the potential carrying capacity for wolves in Wisconsin, but he incorrectly states that it ranged to 662. The wolf plan relied on a publication by Mladenoff et al. (1997) for estimating carrying capacity. That publication used 2 models to estimate carrying capacity, a habitat based one with mean of 380 (324-461 90% confidence intervals), and prey based model with mean of 462 (262-662 90% confidence interval) (p. 49, WDNR 1999). The planning team relied more on the higher prey based model and rounded it to 500 as the provisional estimate of carrying capacity for setting population goals. During the planning process the Wisconsin wolf population was < 200 wolves. In his webinar, Treves stated that the range of wolf carrying capacity was 500 to 662, when in actuality if he is using the 90% confidence interval correctly, it goes from 262-622, and 500 represents the middle ground.

Considering the estimated carrying capacity of about 500 wolves, the delisting goal of 250 was set at about ½ of the potential carrying capacity, and the management goal of 350 was set at about 2/3 of carrying capacity. Population viability analysis was also done for the Wisconsin wolf population that demonstrated that wolf populations of 100 and 200 incurred a risk of going extinct, but populations of 300, 400, and 500 were very secure (p. 41, WDNR 1999). Thus 250 was judged to be a reasonable level at which wolves were no longer endangered or threatened, and 350 was a level at which wolf populations were secure. The 350 level that allowed consideration of harvest was well above levels that were considered maximum sustained yield, which would be about 250 if 500 wolves was the carrying capacity and the growth was logistic-like. The 350 goal was not intended to be the maximum sustained yield, but a level at about 2/3-3/4 of carrying capacity , a level at which large mammals are commonly managed because it is associated with dynamic stability.

A 350 management goal is no longer appropriate for a wolf population that most recently was estimated at 905-944 in winter 2018 (Wiedenhoeft et al. 2018), and more recent estimates a carrying capacity of 1242 wolves (Stenglein et al. 2015). At the time of the 1999 wolf plan when <200 wolves occurred in Wisconsin, the 350 goal did represent a scientifically defensible goal. Although the goal did represent a political compromise, it was based on the latest GIS assessment of suitable habitat (Mladenoff et al. 1997), and fell within population levels considered secure based on population viability assessment of wolf data from Wisconsin at the time (WDNR 1999, p. 41-45).

The lack of changes in the old management goal in Wisconsin was not due to any intentional effort by "architects" of the state wolf plan, but due to political and administrative decisions in the state, beyond control of the wolf advisory team. Several attempts to update the plan and population goals were done between 2009-2014, but planning efforts were canceled by the administration on several occasions, mainly due to lack of state management control. While there were attempts during the previous delisting (2012-2014) to reduce the wolf population by 15-20% to reduce conflicts, there was no attempt to reduce the wolf population anywhere near the 350 goal. After 3 years of public harvest, the wolf population had been reduced only by 8% below the population level before delisting occurred (815 to 746 wolves). Once delisting again occurs, work on a new wolf plan and population goal for the state is expected to again occur.

Treves implied that the logistical growth curve used in the 1999 wolf plan was an arbitrary choice for depicting wolf population growth, and that several other models could have been used. Actually having an estimate of the wolf carrying capacity, and some data on early population growth, the logistical growth as used in the 1999 wolf plan was the most logical model for showing potential population growth. Some version of logistical growth is the way population growth of large mammals such as wolves are typically shown (Miller et al. 2002, Van Deelen 2009, Stenglein et al. 2015, Stenglein and Van Deelen 2016). The alternative of using an exponential growth model as suggested by Treves, has been shown to poorly depict population growth of wolves in Wisconsin and Michigan when evaluated against several common density dependent (logistic-like) growth models (Van Deelen 2009). Exponential growth rates are only useful for short periods of time, because resources, space and competition are limited. Exponential growth models are most useful for organism such as bacteria, insects, and small mammals that go through irruptive population growth followed by major crashes. Variations of logistical models best illustrate population growth for wolves, though the shape of the growth curve can vary, and maximum growth can be stalled for periods of time due to an Allee Effect which commonly occurs in newly colonized wildlife populations at low numbers (Stenglein and Van Deelen 2016).

Treves too readily dismisses density dependence impact on wolf population growth when there is considerable scientific evidence of it impacting wolf populations, including both phenomenological models and mechanistic studies (Miller et al. 2002, Van Deelen 2009, Cubaynes et al. 2014, Stenglein et al. 2015, Stenglein and Van Deelen 2016, Olson et al 2017 [supplementary materials]).

Treves incorrectly stated that changes were made to the Wisconsin wolf survey system in 1995, and 2001, that altered the wolf counting system. While volunteers were included in the counting system in 1995, there were no changes made in how wolves were counted. Wisconsin DNR uses a territory mapping, minimum counting systems for determine the wolf population in late winter, attempting to count all adults, yearlings and surviving pups in each territory (Wydeven et al. 2009). Similar territory mapping and minimum counts have been used in all recovering and reintroduced wolf populations in the US, varying mainly by level of dependence on radio tracking verses field methods such as snow track surveys. The addition of volunteers in 1995 did not drastically increase monitoring efforts because agency tracking efforts declined the first 5 years after starting the volunteer program due to budget limitations (Wydeven et al. 2009, p. 94). Plus volunteers normally did not reach competence levels comparable to agency trackers until on the average they had 3 or more years of experience. Thus for the first few years of the volunteer tracker program, less experienced trackers were mainly replacing the efforts by agency trackers.

Treves incorrectly stated that volunteers were only required to receive special training after 2001, and implied that training altered the wolf counting system. Training was required of all volunteers from the start of the program in 1995. By the early 2000s, there certainly were more experienced volunteers, but no changes were made in the wolf counting system at that time.

The minimum count, territory mapping system as used in Wisconsin and other recovering wolf populations is a conservative population estimation. While the attempts were to obtain a full census of the wolf population, except within small geographic areas or at very low populations, rarely would all wolves be counted. Thus missing some wolves or packs is expected, and likely varies some based on efforts, and tracking conditions that vary from year to year. The minimum count system is appropriate when populations are at critical conservation levels to avoid management actions that may jeopardize the population. In the future with larger wolf population on the landscape, estimates with error measurements or confidence levels will be used to more broadly estimate wolf number, and these will likely reflect higher numbers than current counting systems, but likely will have broad confidence intervals. Well designed and intensely conducted minimum wolf counts will likely fall on the lower portion of such confidence intervals.

Criticisms of wildlife management programs to encourage use of best available science are welcome, and can help improve conservation of wildlife. Such wildlife conservation programs should allow input by all people interested in wildlife whether consumptive users or not. But care needs to be taken that the criticisms are based on factual information and understanding of the management and governance process and objective evaluations of available research. Many of the criticisms of wolf conservation in Wisconsin charged by Treves were based on incorrect information, or dispute over the science, not whether the best available science was used. Wolf management in Wisconsin has been based on sound science. Debates on whether the best science was used are welcome, but debates over the facts are not. The facts are the facts.

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