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SUPERIOR COURT FOR THE STATE OF ALASKA
FIRST JUDICIAL DISTRICT AT SITKA

JOEL FARWELL BENNETT and **ALASKA WILDLIFE ALLIANCE,**
Plaintiffs,

vs.

DOUG VINCENT-LANG, Commissioner, in his official capacity, and the **STATE OF ALASKA,**
Defendants.

Case No. 1JU-20-00879 Civil

AFFIDAVIT OF DAVID KARL PERSON IN SUPPORT OF APPLICATION FOR INJUNCTIVE RELIEF

State of Vermont)
) ss.
Orange County)

1. David Karl Person being first duly sworn and, on my oath, states as follows:

2. I am currently a resident of Braintree, Vermont.

3. The facts and matters I am providing testimony about in this affidavit are based on my personal observations, a review of various documents and professional literature as well as my experience, research, and peer-reviewed publications as a professional research wildlife biologist.

4. A *curriculum vitae* outlining my experience and suitability to offer testimony in this matter is attached [**ATTACHMENT A**].

5. The observations and testimony I am offering in this submittal are true to the best of my knowledge.

6. I am familiar wolf and Sitka black-tailed deer ecology, population dynamics, and predator-prey interactions within Game Management Unit 2 ("GMU 2"). That includes wolf population estimates and methods of population estimation.

7. I was employed by the State of Alaska, Alaska Department of Fish and Game ("ADF&G"), as the predator-prey research wildlife biologist for Region 1 for 15 years, commencing in 1998.

8. I left ADF&G in 2013 and fully retired in 2015.

9. As part of my duties and work for ADF&G, I was the principle investigator assigned to study wolves and predator-prey dynamics in GMU 2.

10. My work in regard to the wolves in GMU 2 began during my PhD. thesis research at the University of Alaska Fairbanks in 1991 and continued during my time with ADF&G until 2013. Consequently, I studied wolves in GMU 2 for 22 years.

11. As part of my research, colleagues and I developed DNA-based methods to estimate deer and wolf populations in temperate rainforest ecosystems. Counting or estimating wildlife populations within the dense forests of SE Alaska is very difficult. Nonetheless, I designed research and instigated the work to develop the methods for estimating wolf population currently used by ADF&G. That work was continued by the current ADF&G region 1 predator-prey biologist after I left in 2013 and one part of that work was published in a peer-reviewed journal (*Roffler et al.* 2019). According to my initial design and plan, population estimates for wolves in GMU 2 were to be based on scientific sampling and statistically sound methods intended to assure reliable estimates of the wolf population.

12. Those methods included 3 independent strategies to obtain population information. The first required individual identification of wolves from DNA extracted from hair follicles obtained from hair traps located systematically within our study area in GMU 2. Mark-recapture procedures were applied to those data to estimate population density of wolves within the study area. The second strategy was to estimate wolf population in the study area by counting wolves observed from the air in packs containing radio collared wolves. This was a method I pioneered and used during the preceding 2 decades to

successfully count wolves within sample portions of GMU 2 and then extrapolate that count to the rest of the unit. We wanted to get away from using that method because it required capture and radio collaring of wolves, and was very expensive and time consuming. However, we used it for the exact same study area in which we collected hair for DNA extraction. The objective was to use the aerial count method to verify if the DNA-based mark-recapture method was reliable. It was hoped both methods would produce similar population estimates and trend in the same direction over the 3-year period of the study. We also employed a third strategy, which was an annual survey of wolf trappers and hunters in GMU 2 to see if their opinions and observations of wolves within our study area coincided with our 2 population estimates. Again, the purpose of the 3 strategies was to determine if DNA-based population estimates corresponded with other independent measures of wolf population and abundance.

13. ADF&G continued on with that work after I left in 2013. The survey of wolf hunters and trappers did not prove very useful as an index of wolf abundance. We were successful the first year (2012), estimating wolves aerially but after I left, ADF&G staff could not capture and radio collar sufficient numbers of wolves to enable aerial estimates of population. Consequently, both methods were abandoned and not used to corroborate DNA-based population estimates.

14. ADF&G adopted the DNA-based method but without any reliable means to test its accuracy and reliability. In addition, they used the method to sample a much larger portion of GMU 2 than our original study area but again never verified the accuracy or reliability of their method. One reliable result from DNA-based sampling should be the number of unique individual wolves identified. There could be some error in those IDs owing to errors sequencing DNA but that should be small. That of course is a minimum number for wolf population but it could be used as a population index tracking the direction of population change year to year if the sampling effort remains the same every year. Theoretically, if you collected hair over a long enough time and covered every location wolves likely travel, you might identify every individual and have a census, not a population estimate. However, that would require an enormous outlay of time and resources and would likely be impossible. Instead the wolf population is sampled for unique individuals over a restricted period of time and area, and those data are incorporated in a mark-recapture model that estimates population based on the sample. That model includes assumptions about the representativeness of the sample relative to the total

population and about the probabilities that hair from a wolf is sampled and later, resampled. All of that leads to uncertainty in the estimation of population such that a single estimate is not produced, rather a range of estimates associated with probabilities. Those probabilities and uncertainties are expressed as confidence intervals. Typically, ±95% confidence intervals are calculated. For example, the 2015 wolf population estimate is 101 wolves with a 95% confidence interval of 65-157 wolves. That means there is a 95% chance that another population estimate given the same data on unique individuals would fall within that range of estimates. It does **not** mean that there is a 95% chance the true population size is within that interval. That would be true only if all the model assumptions hold.

15. In addition to uncertainty associated with mark-recapture modeling of population, those estimates are based on data from a portion of GMU 2 and then extrapolated to the entire GMU. I believe an area about 3,800 km^2 on Prince of Wales Island is typically sampled each year. That represents about 42% of the total GMU (9,024 km^2). Upon extrapolation, more error and uncertainty are introduced because ADF&G assumes the total area functions as a single contiguous land mass rather than the archipelago of big and small islands it is. Using historical data on the presence and absence of wolves, *Person et. al.* (1996), showed that within GMU 2, only Prince of Wales, Kosciusko, and Dall Islands likely were sufficiently large to sustain permanent packs of wolves. The other islands support temporary populations but their dynamics are not the same as on the larger land masses because they have to piece together small territories separated by marine waters. A wolf that just has to trot down a road or across a muskeg to range its territory probably behaves differently than one who has to swim 0.5-2 miles in frigid Alaskan ocean to sustain life. If a wolf pack home range typically is 300 km^2 , you cannot assume a collection of little islands separated by ocean that has the same total land area similarly supports a pack of wolves. So, it is problematic to simply take a wolf population density estimate (wolves/1000km^2) derived from a 3,800 km^2 contiguous portion of Prince of Wales Island and multiply it by 9 to derive a number for GMU 2. The result risks over estimating the population.

16. So where does all this bring us? I am very skeptical of the population estimates provided by ADF&G used to support their policy. Below is a table showing the estimates, 95% confidence intervals, and finite rate of increase (λ). The rate of increase is simply the population estimate from one year divided by the estimate from the previous year.

Year	Reported Kill	Pop Est.	Lower CI	Upper CI	λ
2014	30	89	52	159	
2015	7	101	65	157	1.13
2016	29	231	150	358	2.29
2017	61	225	146	349	0.97
2018	44	170	110	264	0.76
2019	165	316	205	490	1.86

These population estimates are simply not credible. You have to look at them in a time series not by individual years. Between 2015 and 2016 the population in the entire GMU more than doubled ($\lambda = 2.29$)? This increase in estimated population is not credible. No wolf population enumerated over an area the size of GMU 2 has ever increased that much in one year. Individual packs may, under ideal or special circumstances, but not an entire population. But no increase for an entire population could come close to the numbers used by ADF&G. The supposed jump in wolf population between 2018 and 2019 is instructive. ADF&G figures suggest the wolf population basically doubles. The upper CI for 2019 is 490 wolves or a density of 54.4 wolves/ 1000km^2, a value higher than any density of wolves ever recorded other than the isolated wolf population on Isle Royale in Lake Superior which should be regarded as a special situation that existed only for a short time before the wolf population eventually crashed nearly to extinction. It is certainly possible that over 300 wolves exist in GMU 2 but not the population jump from 170 to 316 that included a reported harvest of 25% of the population in between. My conclusion, from a scientific analytical perspective is that the population estimate numbers are not credible. Moreover, ADF&G no longer adjusts reported harvest with unreported and illegal kill, which I estimated from radio collared wolves to be as high as 50% of the reported take (*Person and Russell* 2008). In regard to wolves, it is sometimes suggested that harvest stimulates reproduction in wolves by causing more females to breed and larger litters. However, research shows that does not compensate for population decline from high harvests preventing decline. Look at the increased wolf population numbers used by ADF&G between 2015 and 2016 with a reported harvest of just 7 wolves (7%). Look at 2017 and 2018. Killing 61 out of 225 wolves

(27%) and the next year the population declines to 170 but a kill of 44 from 170 (25%) doesn't prevent the population from almost doubling? Again, a review of the data used by ADF&G illustrates that the wolf population estimates are questionable.

17. My comments are not meant to insinuate that ADF&G staff estimating wolf population in GMU 2 are intentionally biasing results or doing shoddy work. They likely are doing the best they can and I have great respect for the region 1 staff, but estimating wolf populations in SE Alaska is fraught with difficulties and current methods require assumptions that, to my knowledge, are not being tested. Hence, the uncertainty surrounding population estimates and the risk of unreported and illegal take should prompt ADF&G to set seasons and bag limits cautiously. Capping reported take at 30% of the autumn population estimate, a kill which could be as high as 45% when unreported and illegal kill are included, is too risky given the uncertainties about the population estimates. At very least the department should use a population estimate within the lower range of the confidence interval. For example, to be more conservative, rather than using the mean estimate, use the estimated population for which 80% of all other estimates within the confidence interval are greater. Also, assume reported harvest under represents total kill by as much as 50% because of illegal and unreported take.

18. The extremely high reported harvest in 2019, which is a record for the unit, is 52% of the mean population estimate for autumn 2019 and is unsustainable. I recommended a decade ago that a 30% kill from all human causes including reported, unreported harvest, and illegal kill, likely was the limit of sustainability based on mortality data from radio collared wolf packs. Moreover, the percent killed may be higher if the population estimate is inflated by the factors I described previously. This may cause irreparable harm to wolves in the unit because they are an isolated population and have genomic characteristics of inbreeding similar to the wolves on Isle Royale in Michigan (*Zarn* 2019). Over harvesting that reduces population substantially, even for just one year, may force it through a genetic bottleneck further reducing genetic diversity and increasing risks of inbreeding.

19. ADF&G closed wolf trapping seasons early by emergency orders during 2013 and 2014 because harvest approached or reached the guideline limits set for those years. The effects of those closures on total harvest of wolves is unknown because the extent of unreported and illegal kill is also unknown. The effect of those closures on wolf population is also unclear. If population estimates are taken at face value a reported harvest of 57 (26%) wolves in

2013 from a population estimated at 221 may have contributed to a decrease to 89 wolves in 2014. In contrast, a reported harvest of 30 (34%) in 2014 resulted in a population increase to 101 in 2015. Clearly, there is more at play here than is accounted for by reported harvest and questionable population estimates. However, the record kill of 165 in 2019 clearly shows that current ADF&G harvest monitoring is not sufficient to prevent egregiously high and damaging harvests from slipping through the cracks in monitoring. A 30% harvest guideline limit should have been 95 wolves based on the autumn population estimate of 316. Even if the upper confidence limit of 490 wolves is used instead of the mean, the reported harvest is still 34%, a level considered unsustainable. Moreover, the reported harvest does not account for illegal and unreported take. It is possible the actual kill was over 200 wolves. That is wolf control, not sustained yield management.

20. It is also important to understand that ADF&G area management biologists often have to act on very imprecise and sparse data for wolves and other species. In the case of wolves in GMU 2 they have imprecise and questionable population estimates and harvest data that does not include illegal and unreported wolf mortality. In their species management annual reports, area biologists usually construct narratives to explain the numbers but rarely expose those stories to rigorous examination. Any discussions of "tweaking" seasons and bag limits or fine-tuning harvest guidelines is simply creating a veneer of scientific precision over what is largely a creative writing process. Biologists at best have bull-dozers driven through a fog rather than precision scalpels at their command when it comes to managing populations.

21. The wolf trapping season changes proposed by ADF&G rely on the same harvest monitoring procedures that failed in 2019 and strike me as unworkable and ineffective. If wolf hide sealing requirements allow trappers and hunters 30 days to report their take, ADF&G won't have any way to monitor take during the proposed 2-week season. Essentially, a 30-day time requirement for reporting creates a 6-week season because a trapper can leave their gear in the field for 30 days after the end of the season and claim any wolves caught were taken on the last day of the season. Unless sparse law enforcement discovers a trapper's gear after the season closes there is little risk he will be prosecuted. Even if the sealing requirement was reduced to 14 days it would still not work as a means of in season monitoring. ADF&G does not impose a requirement for trappers to check their sets within a specified time period, like 48 hours, so legally, a trapper could set his traps and snares on day one of the season and not check them until the season closes. Consequently, there is no

practical way ADF&G can monitor the proposed season by keeping an accurate running tally of harvest and promptly closing the season if their harvest cap is reached. The only reliable way they have to assure harvest doesn't further damage the wolf population is to close the season completely or require trappers and hunters to report harvest immediately after the kill and trappers must check their gear frequently, perhaps every 72 hours.

22. Alaska constitutional authority requires the state to manage all wildlife using long-term sustained yield principles. ADF&G has a long history of applying those principles selectively, favoring ungulate species such as deer, moose, and caribou and ignoring others such as wolves. Nonetheless, sustained yield management for wolves in GMU 2 requires a conservative and cautious approach because the population is isolated and would not be rescued naturally by dispersal if brought to the brink of extinction or subjected to severe inbreeding. Because the population estimates ADF&G is using are questionable and given the highly problematic harvest monitoring methods employed by the State of Alaska, there is an obvious risk of substantial harm to the wolf population in GMU 2. My conclusion on this point is not only based on what is obviously incomplete data, but also supported by the fact that the wolf population in GMU 2 was severely depleted by over-harvest in 2019. In conclusion, it is unlikely ADF&G can reliably administer the proposed wolf trapping seasons in 2020 to assure no further damage is done to the population. The genetic diversity and population resilience of wolves in GMU 2 is at risk from over harvest and ineffective population and harvest management. That risk and the factors contributing to it increase the likelihood that wolf population in GMU 2 may eventually go extinct. I believe the wolf harvest season in GMU 2 should be closed.

Literature Cited

Zarn, K. E. 2019. Genomic inference of inbreeding in Alexander Archipelago wolves (*Canis lupus ligoni*) on Prince of Wales Island, Southeast Alaska. MSc Thesis, University of Montana.

Roffler, G. H. et al. 2019. Wildlife Society Bulletin 43:31-41.

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Person, D. K. and A. L. Russell. 2008. Correlates of mortality in an exploited wolf population. Journal of Wildlife Management 72: 1540-1549.

Further the affiant sayeth naught.

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David Karl Person

SUBSCRIBED AND SWORN TO before me this _____ day of November, 2020.

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Print Name:_____

Notary Public in and for the State of Vermont

Residing at:_____

My Commission Expires:_____

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David Karl Person

SUBSCRIBED AND SWORN TO before me this 5 day of November, 2020.

Print Name: _____
Notary Public in and for the State of Vermont
Residing at: _____
My Commission Expires: _____