

STATEMENT OF DAVID K. PERSON
REGARDING THE BIG THORNE PROJECT,
PRINCE OF WALES ISLAND

I, DAVID K. PERSON, state as follows:

1. I am a wildlife scientist with 22 years of experience studying Alexander Archipelago wolves (*Canis lupus ligoni*) and Sitka black-tailed deer (*Odocoileus hemionus sitkensis*) in Southeast Alaska. My references to “wolves” and “deer” throughout this statement relate to these species. I began wolf research on Prince of Wales Island as a Ph.D. student at the University of Alaska Fairbanks in 1991.

2. Prior to beginning wolf research in Alaska, I worked as a statistician for the Vermont Department of Health, studied coyotes for my Masters degree at the University of Vermont, and worked as a deer management biologist for the New Jersey Department of Fish, Game, and Wildlife.

3. I received my doctorate degree in wildlife biology in 2001. By then, I was employed by the Alaska Department of Fish and Game (ADFG) to research wolf-deer predator-prey dynamics in Southeast Alaska. I worked for ADFG from 1998 to 2013, leaving the agency in May 2013. All told, I have more than 30 years of experience as a professional wildlife biologist.

4. During my time in Alaska, I authored or co-authored more than 20 peer-reviewed papers on deer and wolves that were published in scientific journals, three book chapters, and many agency reports and publications. In addition, I am well trained in forestry, forest ecology, and silviculture, and am very knowledgeable about the forest ecology of Pacific Northwest temperate rainforests, including those of the Tongass National Forest.

5. During 1996-1997, I worked closely with the U.S. Forest Service (Forest Service), ADFG, and U.S. Fish and Wildlife Service (USFWS) scientists tasked with developing the wildlife conservation strategy that was ultimately adopted by the 1997 Tongass Land

Management Plan (TLMP). Indeed, I was the senior author on the wolf conservation assessment (Person et al. 1996) the purpose of which was to guide the forest plan revision with respect to the conservation of wolves. I also assessed the population viability of the wolves on Prince of Wales Island as part of the analyses USFWS staff conducted when they were considering a petition to list wolves in Southeast Alaska as threatened under the Endangered Species Act. That assessment constituted a major focus of my Ph.D. dissertation.

6. In 1996-1997, I was the principal resource expert for wolves and a resource expert for deer, advising expert panels of scientists convened by the Forest Service during development of the wildlife conservation strategy for the 1997 TLMP.

7. Following adoption of the 1997 TLMP, I, with three other authors, two of whom were coauthors of the wolf conservation assessment (Person et al. 1996), wrote the Forest Service to point out several serious errors in the Forest Service's interpretation the conservation assessment (Letter to Beth Pendleton 1997). In particular, we objected to how the Forest Service developed the wolf standard and guideline in the forest plan. The agency assumed that deer habitat capability was equivalent to actual deer density. Habitat capability represents the carrying capacity of winter range during an average snow year, not the actual density of deer. Essentially, it represents the potential of the habitat to support deer. In our letter, we demonstrated that deer density can never be at the level of habitat capability when additive predation from wolves, bears, and hunters acts on the population. In that case, actual density will always be well below habitat capability. We stated that a minimum density of 13 deer/ mi² is important to reduce the risk of unstable predator-prey dynamics and provide for predators and subsistence hunters. The Forest Service uses deer habitat capability because they have no cost-effective way to monitor actual deer density. Using deer habitat capability is a very poor

substitute for actual deer density. Subsequently, the Forest Service corrected TLMP's deer habitat capability standard for wolves, increasing it from 13 to 17 deer/ mi² in 1998 (Powell 1998) and to 18 deer/ mi² in 2005 (Puchlerz 2002).

8. In 2006, I was the principal expert for wolves at the Forest Service's Tongass Conservation Strategy Workshop. I presented analyses based on my research that indicated several deficiencies in the TLMP conservation strategy with respect to wolves. Most notably, the large old-growth forest reserves (OGRs) are too small to encompass a single wolf pack home range. My analyses indicated that when about 40% of a pack's total home range is logged and roaded, there is a very high risk that mortality (mostly from hunting and trapping) will exceed reproduction and the pack area becomes a population sink. Indeed, even when as little as 25% of a pack's home range is logged, the ratio of reproduction to mortality is very close to one. Sinks are only maintained by immigration of wolves from other areas, which, as explained below, is not likely to happen on Prince of Wales Island given the population's isolation and small numbers.

9. For the past 22 years, I studied wolves in Game Management Unit (GMU) 2 which includes the Big Thorne project area. Prince of Wales Island and the surrounding islands and GMU2 are essentially the same area with regard to wolves. I studied the predator-prey relationship in the area and tracked wolf populations to the extent that the work was funded. I participated in the Big Thorne environmental review process, including the review of the project's Draft Environmental Impact Statement (DEIS), in my capacity as a biologist for ADFG. I participated in numerous meetings and discussions regarding Big Thorne. Among other meetings, I participated in an April 9, 2013 meeting with Forest Service officials, including Tongass Supervisor Forrest Cole, and representatives from USFWS. The objective of that

meeting was to discuss road closures and other mitigation measures that would reduce the effect of the Big Thorne timber sale on wolves. At the meeting, I showed the group maps of recent GPS locations of radio-collared wolves within the Big Thorne project area. Those locations clearly demonstrated that closing a few spur roads here and there would have a negligible effect on mortality because there were simply too many existing roads in the project area. Moreover, the data showed how vulnerable packs are to access via roads, even for the pack occupying the Honker Divide OGR because that OGR is simply too small to encompass their home range. The only road mitigation that would work would be to close down many of the major arterial roads, which is unlikely to happen. I urged the group to focus more on preserving deer habitat, meeting TLMP's provided guidelines, and recommending ways to treat second-growth forest to improve the quality of deer range. The Forest Service did not indicate any serious effort to go forward with any specific recommendations.

10. Additionally, I communicated directly with Forest Service personnel, including Brian Logan, a Forest Wildlife Biologist, through email and phone conversations. I explained during these informal discussions that the Big Thorne and Log Jam timber projects will have a serious impact on wolves and deer, and consequently wolf viability. They will remove the last high quality winter range for deer in the central portion of Prince of Wales Island and the cumulative effects of the Big Thorne and Log Jam timber projects along with previous logging over 60 years, has and will erode the resilience of deer to severe winter, predation, and hunting. In addition, land transfers to Sealaska Corporation and Alaska Mental Health Trust Authority, will reduce more deer habitat on other parts of the island such that the level of habitat loss within Big Thorne and Log Jam has been and will be duplicated in most of the Prince of Wales

Archipelago. Sealaska Corporation and Alaska Mental Health Trust lands are logged under state of Alaska regulations, which have no meaningful protections for wildlife whatsoever.

11. The combined effects of Big Thorne and the other logging on wolves within the Prince of Wales Archipelago likely will be the collapse of a sustainable and resilient predator-prey ecological community. That community includes deer, wolves, black bears, and people. Because of pressures to sustain subsistence deer hunting as habitat is lost, there will be immense public and political pressure to kill wolves and bears.

12. Because of my many years of research and related professional assignments, I am the most experienced and knowledgeable scientist in the United States with respect to wolves and the wolf-deer predator-prey ecological communities in Southeast Alaska. Over the past decade, I was one of the principal deer researchers on the Tongass. In addition, I am recognized by federal and state agencies as an expert on the effects of forest management on deer, wolves, and predator-prey dynamics. I am particularly qualified to address the effects of the Big Thorne timber sale on wolves and deer because so much of my research on those species during the last 22 years was conducted within the project area.

13. I wrote this statement because I have concluded that the Big Thorne timber sale, if implemented, represents the final straw that will break the back of a sustainable wolf-deer predator-prey ecological community on Prince of Wales Island, and consequently, the viability of the wolf population on the island may be jeopardized. I received no compensation for this statement. Copies of the studies and documents I cite in this statement are provided as exhibits at the end of the statement. My opinion is summarized as follows:

- a. Wolf populations in the Big Thorne project area have declined rapidly in recent years as a result of old-growth logging, which degrades deer winter habitat, road

building, which provides access for hunters and trappers, and high levels of wolf mortality (because roads increase human access) from legal and illegal hunting utilizing both open and closed roads;

- b. The Big Thorne project will harvest much of the best remaining mid and low elevation deer winter habitat in this part of Prince of Wales Island, which will most likely, over time, result in further declines in deer and wolf populations. On Prince of Wales Island, more than 50% of the island is already at or approaching levels of logging that will strongly increase the risk that the island will only be capable of supporting wolf packs that function as population sinks. To prevent this outcome the remaining mid and low elevation deer habitat on Prince of Wales Island needs to be protected and the number and size of OGRs need to be increased to increase the likelihood that more wolf packs are protected from unsustainable mortality from hunting and trapping. As explained below, the Big Thorne project puts the viability of the wolf population on the Prince of Wales and the surrounding islands (the Prince of Wales Archipelago) in doubt.
- c. Because so much winter range for deer has been logged, deer are not resilient to effects of both predation and severe winters. As a result, a bad winter could cause a significant decline in deer and the population remains low owing to predation and hunting (Person and Brinkman 2013). The Big Thorne project area is heavily used by subsistence hunters because it is close to all of the major towns on Prince of Wales Island. The project will cause immeasurable and permanent harm to those hunters and create an intractable management dilemma of trying to sustain deer in the face of dwindling habitat quality, predation, and human demands.

- d. The wildlife conservation strategy in the 2008 TLMP is inadequate to deal with these issues both at the project level and at the biogeographic province. The cumulative effects of 60 years of clear-cut logging plus the Big Thorne project could result in the ecological collapse of the predator-prey system and result in wolf numbers well below minimum viability both demographically and genetically, which would eventually result in their extirpation or extinction within the Prince of Wales Archipelago. The Prince of Wales Archipelago makes up a large percentage of wolves in Southeast Alaska, perhaps as much as 30% (Person et al. 1996). They are a genetically and morphologically distinct group within the Tongass (Weckworth et al. 2005). As a result of these considerations, wolves on the Prince of Wales Island and the Prince of Wales Archipelago are an important part of the overall wolf population in the Tongass.
- e. Other areas of Southeast Alaska where wolves historically were abundant have conditions similar to the Prince of Wales Archipelago. Extensive logging and road construction have similarly changed conditions for deer and wolves on Kuiu, Kupreanof, Mitkof, Zarembo, Revillagigedo, and Wrangell islands. In conjunction with the Prince of Wales Archipelago, those islands sustain most of the wolf population in Southeast Alaska (Person et al. 1996). Decay in sustainable predator-prey communities will occur throughout the most productive areas for deer and wolves in Southeast Alaska because those areas are correlated with the most productive forest stands selected for timber harvest.

Status of Wolves on Prince of Wales

14. Genetic and telemetry data indicate that the wolf population on the Prince of Wales Archipelago is an isolated population from other wolves throughout the Tongass (Person 2001; Weckworth et al. 2005; Person and Russell 2008), which complicates management of the population because it is not buffered by immigration and has limited genetic diversity. The wolf population on Prince of Wales Island is composed of resident pack members and nonresident wolves that are dispersing or are floating between several packs (Person 2001; Person and Russell 2008). Wolves primarily prey on deer, annually consuming an estimated 18 to 32 deer per wolf (Person et al. 1996).

15. The population of wolves on Prince of Wales Island has declined substantially since the middle of the 1990s, especially within the north-central portion of Prince of Wales Island. I estimated the wolf population on the Prince of Wales Archipelago during autumn 1995 to be approximately 300-350 animals (Person et al. 1996; Person and Russell 2008). That estimate was an extrapolation from my study areas on the Prince of Wales Archipelago and was based on aerial counts of wolves in packs containing radio-collared animals plus an estimate of the number of potential nonresident wolves in the population derived from rates of dispersal of radio-collared wolves. During 2000-2004, I estimated 250-300 wolves, again based on aerial counts within my study area on the Prince of Wales Archipelago. No formal wolf population estimations have been conducted since 2004. The Final Environmental Impact Statement (FEIS) for Big Thorne says that during a 2010 Alaska Board of Game meeting in Ketchikan, “ADF&G reported that anecdotal observations by state and Federal biologists, trappers, and hunting outfitters/guides suggested the wolf population had declined to as few as 150 wolves in GMU 2,”

which would mean that wolf numbers were down by roughly 50% compared with the previous decade.

16. Since 2009 the Forest Service and ADFG have cooperated to fund a study to develop a method to estimate abundance of wolves in Southeast Alaska. The project, funded primarily by the Forest Service, collected wolf scats (feces) for Deoxyribonucleic acid (DNA) genotyping from which I hope to derive a population estimate (Person 2009-2012). I was the lead researcher on the study and we have provided regular progress reports to Forest Service and ADFG. Our study area was essentially coterminous with the Big Thorne project area. As part of this effort during 2009 and 2010, I searched roads and trails for fresh scats and located only 36 feces. During 1993-1994, a graduate student from the University of Alaska Fairbanks and I collected more than 150 scats from the exact same area with much less effort (Kohira and Rexstad 1997). In 2010, eleven known, previously used dens of five wolf packs were checked, and no denning activity was found. Also there was no indication of use on wolf trails that previously had been used regularly, and some were starting to grow over. We drove road transects within the study area (north-central Prince of Wales from Whale Pass south to 12-mile Arm, and from Thorne Bay west to Winter Harbor) and found very few signs of wolves.

17. I estimate that in the mid-1990s, at the time the TLMP conservation strategy and viability assessment were being developed, the Big Thorne project area had the habitat to support 45-50 wolves, making up approximately 3 separate packs and a portion of a fourth pack.

18. In the Fall of 2012, we determined through DNA hair trapping and radio-collaring work that there were approximately 29 wolves in the Big Thorne project area and only two remaining packs in the area. Changes in pack structure are a reflection of turmoil and disturbance (Ballard et al. 1997). One of the packs is large; the other is so small it that it appears

to be struggling to raise a successful litter of pups. The large group had two breeding females and covered an area that used to encompass the Honker Divide and Ratz Harbor wolf packs. Both females were killed last year; one was trapped legally and the other trapped illegally.

19. In 2013, we continued our study based on work conducted between January and May and provided the Forest Service our progress report (Person and Larson 2013). In the Spring of 2013, based on our field work we could only account for six to seven wolves left in the Big Thorne project area. During the 2012 hunting season, trappers killed at least fifteen wolves in the Big Thorne project area, but that only accounts for legal, reported take. A few of these wolves could have been dispersing wolves (i.e., wolves travelling through the area and not a part of the resident packs), but the vast majority are likely to have been resident wolves. Some wolves we counted in autumn 2012 also could have dispersed out of the area.

Logging, Deer, Wolves, and Hunters

20. Sitka black-tailed deer and the Alexander Archipelago wolf are endemic to coastal temperate rainforests in Southeast Alaska and northern, coastal British Columbia. This deer species serves as the primary food source for the wolf and is also an important subsistence resource for residents of rural southeast Alaska. Deer, wolf, and humans in this region therefore exist in predator-prey relationship that depends in large part on the habitat provided by the Tongass National Forest.

21. Deer rely on old-growth forest habitats in the Tongass for their survival because these forests provide important winter habitat (Wallmo and Schoen 1980). Less snow accumulates in these old-growth forests, and deer can still find forage during the winter months. Low elevation, high volume old-growth forests provide the best winter habitat for deer (Schoen and Kirchhoff 1990). The logging of old-growth forest can therefore result in declines of deer

populations, because with fewer acres of high quality winter habitat, fewer deer can survive the winter. Deer is also the most important terrestrial subsistence species in rural, Southeast Alaska.

22. In 2011, Brinkman et al. published a study in which they estimated a mean deer density decline in three watersheds in north-central Prince of Wales Island of 32% over a three-year period, from 13.1 deer/km² in 2006 to 8.9 deer/km² in 2008, which the authors attributed to severe winters (Brinkman et al. 2011). Deer populations in unlogged areas (12 deer/km²) were substantially higher than in recently logged areas (10 deer/km²) and areas that were logged more than 30 year ago (7 deer/km²). This study was conducted in the same area that would be affected by the Big Thorne project.

23. Wolf populations are closely tied to populations of deer. Wolves depend on deer for up to 90% of their diet during the winter months. (Person et al. 1996). In 1996, we estimated the number of deer per wolf required to maintain equilibrium between deer and wolves. Our work demonstrated that a ratio of deer to wolf of 170-180 deer to one wolf is needed for a 95% probability of equilibrium between the populations. (Person et al. 1996). If deer populations decline substantially, wolf populations are very likely to decline eventually because of a reduced prey base. Wolves and subsistence hunters both compete for available deer. As deer numbers inevitably decline on Prince of Wales Island as a consequence of on-going logging and the still-pending succession debt of past logging (Person and Brinkman 2013), subsistence and recreational hunters increasingly will perceive competition from wolves for deer. Legal and illegal take of wolves can be predicted to increase as a result, particularly in areas accessible by roads or boats (Person et al. 1996; Person 2001). My experience indicates that regulations designed to sustainably manage wolf populations will then be ineffective, because of unreported and illegal take of wolves (Person and Russell 2008).

24. The construction of roads associated with logging projects also increases the risk of wolf mortality by legal and illegal harvesting. Roads offer convenient pathways for wolves through logged watersheds, but they also provide access to humans, increasing risk of death of wolves from hunting and trapping.

25. The current decline in wolves on Prince of Wales Island, including the Big Thorne project area, is caused primarily unsustainable hunting and trapping, which are facilitated by access provided by road development. From 1990 through 1999, wolf harvest reached unsustainable levels. Wolves can sustain about 35-38% total annual mortality (Person and Russell 2008). Natural mortality is about 5% (Person 2001; Person and Russell 2008), therefore, harvest mortality cannot exceed 30-33% without compromising sustainability. Risk of unsustainable harvest is particularly high within roaded watersheds (Person and Russell 2008; Person and Logan 2013). In 1996, the Alaska Board of Game passed a guideline harvest level for wolves in GMU 2. They did so because the USFWS was actively reviewing a petition to list wolves as threatened under the Endangered Species Act. The guideline was to be implemented in 1997. Knowing that, trappers and hunters on the Prince of Wales Archipelago intentionally made a strong effort in 1996 to kill as many wolves as possible. During that year they killed a record 136 wolves, roughly 45-50% of the population at the time. In 1999, the harvest reached the guideline level resulting in early closure of the trapping season (Person and Russell 2008). Subsequently, reported harvest declined dramatically after 1999. Person and Russell participated in a study that demonstrated a strong positive linear relation ($r = 0.89$) between road density less than or equal to 0.9 km/km^2 (1.5 miles/mile^2) and wolf harvest rates (Person and Russell 2008). We determined that densities greater than 0.9 km/km^2 likely resulted in unsustainable losses of wolves.

26. We also reported that 87% of mortality of wolves on Prince of Wales Island was from hunting and trapping (Person and Russell 2008). We concluded that annually, about 50 to 95 wolves are legally taken (including required reporting of the kill), but that illegal take may at times equal the legal harvest on Prince of Wales (Person and Russell 2008).

27. Person and Logan (2012) concluded that after road closures in GMU 2 prescribed in the Forest Service's Access and Travel Management plan approximately 71% of roaded landscapes will still be accessible to hunters and trappers. That includes the Big Thorne project area. This research was premised on the conservative assumption that hunters or trappers will walk one kilometer from a road to hunt or place traps. However, a study by Todd Brinkman for which he surveyed Prince of Wales hunters and trappers, reported that the median hunter is willing to travel on foot a distance of two kilometers away from the road to hunt deer, and some reported a willingness to walk as much as four kilometers (Brinkman 2006). That is, 50% of hunters are willing to walk-in at least two kilometers. As a result, Person and Logan 2012 significantly underestimates the amount of the project area that is already accessible to hunting and trapping activities. More plausibly, the percent of the project area readily accessible to hunters and trappers actually exceeds 80%.

28. Wolf harvest in the Prince of Wales Archipelago declined dramatically after 2000 (Person and Russell 2008; Person and Logan 2012; Person and Brinkman 2013) and ADFG, Alaska Board of Game, and Federal Subsistence Board took no action to respond to the decline. Indeed, the Federal Subsistence Board responded by lengthening the hunting season for wolves. By 2010, there was evidence that the wolf population had greatly declined at least within the north-central portion of Prince of Wales Island (Person 2009-2012), which includes the Big

Thorne project area, and the Alaska Board of Game lowered the harvest guideline quota but to a level still above the reported annual harvest.

29. I have modeled the viability of an insular wolf population and wolf-deer predator-prey dynamics on the Prince of Wales Archipelago (Person 1997; Person 2001; Person and Brinkman 2013). I concluded that under the TLMP wildlife conservation strategy the deer population would decline substantially and predator-prey dynamics would become much less stable. I also concluded that persistently low deer numbers or even the perception of low numbers would increase the risk of unsustainable take of wolves by hunters and trappers attempting to boost deer populations, an activity facilitated by easy access to shorelines by boat and to island interiors by vehicles using roads. If this occurs on widespread areas on the Prince of Wales Archipelago, the viability of wolves would be at risk.

30. During the Tongass Conservation Strategy Review Workshop in 2006 (part of the process leading to the 2008 TLMP amendment), I presented an analysis based on empirical survival and reproductive data from telemetered wolves. This analysis indicated that when more than approximately 40% of a wolf pack home range on Prince of Wales Island is comprised of logging and roads that allow access for hunting and trapping, the area likely becomes a population sink in which mortality exceeds reproduction. The analysis showed that the ratio of reproduction to mortality for wolf packs was perilously close to one to one when as little as 25% of the home ranges were logged and/or provide road access.

Consequences of the Big Thorne Timber Sale

31. Based on the impacts to wolf and deer habitat and populations described above, Prince of Wales Island, including the Big Thorne project area, is at a tipping point with regard to a viable predator-prey dynamic between wolves and deer. The wolf populations on Prince Wales

have been declining precipitously, and wolves are already facing the possibility of extinction on Prince of Wales Island. Big Thorne logging, if it goes forward, will remove the most important remaining deer winter habitat in many of the affected watersheds, which will further reduce the abundance of deer in the project area (especially following severe winters), perhaps for decades to come. As a result, the predator-prey relationship between wolves and deer on Prince of Wales is likely to collapse.

32. In 2011, I raised these issues inside ADF&G. In particular, I set forth my opinion that the Big Thorne timber sale will likely threaten the ability of the watersheds involved to sustain wolves and deer over the long term. I provided maps demonstrating that the Big Thorne sale would result in the logging of the most important remaining winter habitat for deer in the Thorne watershed and in Steelhead Creek, among others. Several of the emails I sent to ADF&G staff are included in the Big Thorne record. The maps, however, do not appear to be included in the record, so I am including them as exhibits to this statement (Person ADF&G emails and maps). The third map shows the consequence of logging the whole unit pool rather than just the units included in the final Big Thorne decision, but although it therefore somewhat overstates the impact, it gives some indication of what is at stake. The Forest Service has not provided maps like these in the Big Thorne FEIS to show the sequence of loss of deer winter range over time, culminating with this project's actual effects and alternatives.

33. As I described above, it is not enough to maintain a sufficient deer population for wolves because hunters rely on those deer as well, and they can be expected to kill wolves legally or illegally to protect that resource. The situation is further compounded by the extensive road network already in existence, as well as the new roads into previously remote areas approved under the Big Thorne decision. This road system greatly facilitates human access and

eliminates refuge for wolves. The final complication is that the wolf population is genetically distinct and isolated from other wolves in the Tongass and, as a result, if wolves on Prince of Wales Island are extirpated or reduced to a small population, rescue or recolonization by dispersing wolves from the mainland is unlikely.

Comments Concerning TLMP as the Guiding Document for the Conservation of Wolves and Deer

34. TLMP, as amended in 2008, is the umbrella document guiding the conservation provisions incorporated in the Big Thorne timber sale. Because it is flawed, conservation measures derived from it and used in the Big Thorne project are also flawed. Prior to signing the predecessor 1997 Record of Decision for TLMP, the Forest Service convened several species-specific science panels to review the wildlife conservation strategy and seek professional opinion relative to its adequacy. The process involved creating a panel for each species of concern that consisted of a local resource advisor and three to four species experts from outside Southeast Alaska. I served as the local resource advisor for the wolf panel. I believe, based on that experience, my continuing research, and other published science since then, that there are major deficiencies in TLMP's conservation strategy and its implementation with respect to wolves and deer, particularly on Prince of Wales and neighboring archipelago of islands (Prince of Wales Archipelago). Some of these major deficiencies, many of which I pointed out at the 2006 Tongass Conservation Strategy Workshop, are:

- a. Wolves in Southeast Alaska are genetically related to those in north coastal British Columbia, Canada.
- b. Wolves in the Prince of Wales Archipelago are isolated from all other wolves in Southeast Alaska and coastal British Columbia.

- c. The deer density guideline specific to wolves should be applied at the scale of a wolf pack home range (300 km²).
- d. Roads strongly influence wolf mortality by facilitating legal and illegal harvest.
- e. Road density guideline of 0.7 mi/ mi² needed to be changed such that it includes all roads rather than just “open” roads.
- f. Road density guideline should be applied at the scale of a single wolf pack (300 km/km²).
- g. Lower wolf and deer populations are likely in the future under the current forest plan.
- h. OGRs are the only lands that may serve as population sources for wolves, but they are too small.
- i. High quality habitat for deer must be maintained within and outside the OGRs.
- j. Social and economic factors will complicate wolf conservation because declining deer numbers due to loss of habitat from logging will motivate subsistence harvesters to demand predator control for wolves.
- k. Illegal killing of wolves will make it difficult to regulate harvests, and roads will exacerbate that problem because they provide easy access to wolves.
- l. OGRs are not sufficiently large to encompass wolf pack home ranges (Person and Brinkman 2013). The average home range of wolf packs on the Prince of Wales Archipelago is 300 km² (115 mi², [Person and Logan 2012]) or 73,800 acres. The largest contiguous OGR in the Prince of Wales Archipelago is 45,000 acres. Consequently, no OGRs completely protect any wolf pack within the Prince of Wales Archipelago. The Big Thorne DEIS refers to a >200,000 acre Honker-

Sarkar lakes complex, implying a very large single reserve. This is no longer accurate because an identified connecting link between the Honker and Sarkar Lakes OGRs has been extensively clear-cut logged, most recently under the Logjam timber sale, and it is bisected by a major paved highway. Wolves frequently are killed by hunters and trappers within that connecting link. Individually, neither the Honker nor Sarkar OGRs encompass full wolf home ranges.

- m. The term “old-growth” reserve is misleading since reserves may contain as little as 50% productive old growth (POG). The liberal criteria used to define POG assure that much of it is of little value to deer during a snowy winter. Moreover, because of the extensive fragmentation and logging of most of the highest volume old-growth forest on the Prince of Wales Archipelago and in some cases the gerrymandering of OGR boundaries or locations that has occurred in individual logging projects, lands aggregated into OGRs do not necessarily contain the best or even adequate winter habitat for deer and hence wolves. They may be some of the better lands left after the past 60 years of industrial logging but still be inadequate. Indeed, only 36% of the historic (before industrial logging) habitat capability for deer (winter carrying capacity during an average snow year) is protected within OGRs and other lands deferred from logging (Albert and Schoen 2007). In addition, a recent analysis of the amount of landscape-scale high-volume old growth on northern Prince of Wales Island has documented that this unique forest community (which is important as deer winter range in deep snow winters) was reduced by 93.8% from 1954 to 2004 (Albert and Schoen 2013).

- n. Additional flaws in the TLMP wildlife conservation strategy stem from limitations in the Forest Service's deer habitat capability model, which represents carrying capacity for deer during an average snow winter. Yet, a single severe winter or succession of such winters may determine deer population dynamics for many decades after the event, particularly if deer numbers drop very low and predation is high. The slow recovery of deer on Mitkof, Kupreanof, and Kuiu islands due to extreme winter events in the 1970s and the middle of the last decade illustrates this point. Decades after the severe winter snows, deer populations are still at levels far below carrying capacity. (Kirchhoff 1994; Lowell 2013 (presentation at the January 2013 Board of Game meeting)). To calculate the habitat needed for all predictable conditions, the deer model should assume deep snow winters instead of average winters.
- o. The TLMP guideline of deer habitat capability ≥ 18 deer/mi² is based on a calculation for the Prince of Wales Archipelago that assumed an average annual wolf population of 250 animals (Person et al 1996; Person et al. 1997). From a biological perspective, the deer guideline is a minimum value relative to maintaining resilience of the predator-prey system and, in the case of the Prince of Wales Archipelago, the potential to sustain a viable wolf population. If a timber sale project results in deer habitat capability below 18 deer/mi², the likelihood is that predator-prey dynamics will become more erratic and the resilience of deer to predation, hunting, and winter weather is reduced. In addition, conflict between hunters and wolves for deer may increase, resulting in demands by deer hunters for predator control and also a heightened illegal take. Indeed, an incremental

reduction in deer habitat capability likely will result in a much larger effect on the predator-prey system owing to the nonlinear dynamics that characterize predator-prey-habitat interactions (Person et al. 2001; Person 2001; Bowyer et al. 2005; Person and Brinkman 2013).

- p. Additionally, during the 2006 conservation strategy review, I specifically advised the Forest Service that the deer guideline should be applied at the scale of a wolf pack home range (300 km²) and not at larger scales such as a biogeographic province. This means running the deer model at a scale of one or two wildlife analysis areas (WAAs) to best approximate an area the size of a wolf pack's home range.

35. The Forest Service also failed to account for the degree to which the Prince of Wales Archipelago WAAs are highly connected for deer hunter access by the extensive network of roads and marine waterways. Hunting effort by individuals from throughout the Prince of Wales Archipelago is easily transferable from one area to others as one becomes more depleted than others, likely causing a deer deficit in one area to have a far ranging indirect effect, weakening the predator-prey system the Prince of Wales Archipelago-wide. Forest Service projections that deer and wolf populations will not unduly suffer from major logging projects like Big Thorne are further undermined by the lack of accurate information regarding the actual state of the road system on Prince of Wales Island, including the Big Thorne project area. Roads, for example, can be closed on paper only, without the Forest Service (or other property owners) taking any action on the ground to prevent access. In other instances, the physical barriers are easily avoided and vehicles, including off-highway vehicles, can continue using the road despite the fact it has been listed as "closed". The lack of information regarding the road

system (i.e., what roads are open, what is the length of the road and its spurs, what is closed, how was it closed, is the closure being maintained, etc.), makes it impossible to fully assess the adverse consequences of hunting and trapping access throughout Prince of Wales Island, including the Big Thorne project area.

36. To summarize the effect of TLMP on conservation of wolves, several factors have materialized since its adoption in 1997 that were not addressed in the 2008 amendment to the plan. These factors invalidate several of the assumptions and inputs relied upon by experts on the mid-90s TLMP wolf science panel (and consequently by Forest Service decision makers). Nonetheless, the Forest Service continues to rely on outdated outcomes of the wolf panel to justify ecologically destructive projects such as Big Thorne and Logjam. These factors were discussed above, but briefly they are: (1) the precipitous declines in the numbers of wolves on Prince of Wales, (2) new information regarding the levels of illegal take as compared to legal take, (3) lack of an accurate road closure inventory, with reported closures often not effective at preventing access, and not providing the actual mitigation and/or protections that the Forest Service assumed they would when it adopted TLMP, and (4) the scientific knowledge that the OGRs simply are not large enough or adequately composed for a viable wolf population.

This statement is true and accurate to the best of my scientific expertise and knowledge.

Dated this 15th day of August, 2013.



David K. Person, Ph.D

DOCUMENTS CITED IN THE STATEMENT OF DAVID K. PERSON

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