Addendum Testimony of Richard P. Thiel

I submit the following written testimony as a hunter, trapper, and retired wildlife biologist who served the Wisconsin DNR for 33 years working in both the Bureaus of Endangered Resources and Wildlife Management. I have authored or co-authored 22 peer-reviewed publications on Wisconsin's wolves and authored 2 books on the same subject. I am one of 5 people who served on both the DNR's 1989 Wolf Recovery Plan, which I chaired, and the 1999 Wolf Management Plan.

Because conflicts with wolves and dogs are inherently violent and dangerous—it is important that there either be reasonable restrictions imposed on the use of hounds for hunting wolves or a prohibition against such hunting. Due to behaviors specific to the wolf species, the type of comprehensive restrictions and regulations needed for wolf hunting with dogs will be different from the type of restrictions necessary for dogs hunting other species such as birds, bear, or coyote.

The Concept of Territoriality

Gray wolves (*Canis lupus*) are medium-sized carnivores found throughout the Northern Hemisphere. Like most carnivores, wolves occupy landscapes that are organized in discrete territories. The term, territory implies an occupied space or home range that is defended (Ewer 1973). Territories tend to be mutually exclusive or nearly so; they seldom overlap except perhaps along the perimeters.

Most carnivores occupy space as *individuals*. Most carnivores also employ a *polyganous* reproductive system whereby single males mate with many females. Significantly, in this reproductive style males do not contribute to the rearing of offspring. Examples of these types of carnivores in North America that are similar in size to wolves include bears (*Ursus* spp.), and cougars (*Felis concolor*). Species employing polyganous reproductive approaches typically defend their individual space against others of their own *gender*. Males' territories do not overlap with those of fellow males, while females may or may not display territorial overlaps. However, male territories tend to be larger than those of females, and the territories of males overlap the territories of several females (see discussions in Hansen 2007, Logan and Sweanor 2001, and Craighead, Sumner and Mitchell 1995).

Wolves employ a *monogamous* reproductive strategy and the males remain with their mate and assist in rearing offspring. As a consequence wolves do not occupy landscapes on the *individual* level as do bears and cats; they occupy space as *families* called packs. Further, since wolves'maturation is not complete until 22 months of age, and because wolves mate each year, within each pack 2 generations of offspring typically exist: pups (<1 year) and yearlings (1 to 2 years) (Packard 2003). Thus wolves are tied to a familial structure and as a result space is mutually occupied by all members of the pack.

Wolf territories tend to be large and are tied to the *size* of their ungulate prey, and prey densities (Mech and Boitani 2003). In Wisconsin, where prey consist of white-tailed deer,

wolf pack territory size averages 54 mi^2. On Ellesmere Island in the high Arctic, where prey consists of musk oxen, pack territory size is estimated at over 1,000 mi^2 (see Mech and Boitani 2003; page 22, Table 1.3).

Defence of such large territories is difficult because of the terrain and great space involved in patrolling them. Encounters tend to be violent when wolves, who are physiologically adapted to and equipped to prey on animals much larger than themselves, encounter intruders. To reduce injuries or death through territorial clashes wolves have evolved certain behavioral traits to minimize direct conflict and these include both scent-marking and howling both of which serve to "advertise" occupancy. Behavioral queues in response to these activities tend to minimize conflicts (Mech and Boitani 2003).

Interspecific-strife: or combat between wolves

Territoriality likely evolved amongst wolves as a manner of protecting scarce food resources. Lethal encounters between wolves – referred to as *interspecific* strife - usually involve food (i.e. near prey kill-sites) or intentional aggressiveness. This response may be triggered in either case by territorial intrusions where an individual wolf or neighboring pack intrudes within the territory of a resident pack who discovers and repells the invaders (Mech and Boitani 2003, Packard 2003). The scientific literature is replete with instances of wolves killing wolves (summarized by Mech and Boitani 2003, but see also Peterson 1977, Mech 1994, Mech et al. 1998, Meier et al. 1995). Mech (1994) analyzed the deaths of 22 of 443 radio-collared wolves due to interspecific-strife and found that 91 percent were killed within a ±3.2 km strip along the edge of territories. This "kill zone" represented 50 percent of the average pack territory's radius. Sixty percent of victims were alpha wolves. He concluded that most lethal incursions resulting in death occurred within this broad belt along the edges of pack territories.

Most cases of interspecific-strife between wolves occur during the annual breeding cycle which extends from roughly late December through March (Mech and Boitani 2003, Packard 2003).

Protection of Pups

Wolves are also protective of their pups. Pups are generally born in mid April in a protected den. Typically they first emerge from the den around 6 weeks of age. Soon thereafter the den is abandoned, and the pack confines the pups at sites referred to as homesites or rendezvous sites. Homesites are generally occupied from late May into August, September and even October. Each pack usually occupies a series of 2 to 4 homesites of durations ranging from a few days to more than a month each summer at each site(Packard 2003, Unger et al. 2009).

Unger et al. (2009) reviewed the literature regarding the spacial relation of both dens and rendezvous sites to wolf pack territorial boundaries. Previous researchers reported that both dens and homesites were prone to being situated anywhere within the territory. In there own study involving 22 dens from 15 study packs, Unger et al. (2009) found wolves

selected the *inner* core of territories for the placement of dens. By contrast rendezvous sites were more randomly distributed within territories and tended to be affiliated with wetlands and vegetative types supporting locally higher densities of deer (their primary prey in this region). They noted that as pups matured they became more mobile and were more able to avoid danger. This explained differences in site selections between these two phases of pack pup rearing (Unger et al 2009).

Wolves are known to vigorously defend their pups at both dens and homesites against intrusions by other wolves (Murie 1944), and by bears (Murie 1944, Ballard et al. (2003; tables 10.1 & 10.2). Among 25 encounters with grizzlies (*Ursus arctos*) at wolf dens, none resulted in fatalities to either species. Ballard et al. (2003; table 10.3) summarized 8 encounters reported in the literature between black bears (*Ursus americanus*) and wolves at dens. Encounters in one instance each, resulted in the death of a wolf and a bear. Both species of bear are typically larger than wolves.

Coyote (*Canis latrans*) – wolf interactions at wolf dens have seldom been observed. Ballard et al. (2003: page 267: table 10.4) summarized 4 coyote – wolf interactions and at wolf dens. None of these resulted in injuries or deaths.

Intraspecific – strife: combat between wolves and other members of the genus Canis

In his review of intra-canid competition, Peterson (1995) felt that North American canid guilds followed an ecological theory labeled "interference competition". This basically describes a scenario where two or more closely related species (as are wolves, coyotes and dogs) or a suite of species with similar ecological functions compete through direct displacement, "...of competitively subordinate individuals, which are killed, driven away, or choose to avoid dominant predators." (in Peterson 1995, page 315). Ballard et al. (2003) concluded that outcome of wolf – coyote interactions depended on 3 factors: (1) coyotes benefit from scavenging at wolf prey-kill sites, (2) wolves kill coyotes but generally do not consume them, and (3) coyotes tend to alter behaviors, especially spacing and use of landscape, to avoid interactions.

Coyotes

Coyotes are smaller than wolves (viz: 30 pounds vs. 65 to 85 pounds), and where the 2 are sympatric (ranges overlap) wolves typically dominate coyotes at both the individual and population levels (Arjo and Pletscher 1999, Carbyn 1982, Fuller and Keith 1981, Peterson 1995, among others). Switalski's (2003) excellent study noted that resident coyotes learned to forage differently, adjust time-budgets and alter other aspects of their behaviors to survive in the presence of reintroduced Yellowstone wolves. Significantly, he noted that wolves were less aggressive towards coyotes encountered along wolf pack boundaries, surmising that resident wolves engaging in chases or killings ran a risk of drawing the attention of neighboring wolf packs. Thus coyote survival was best in the *interstitial* areas between wolf packs.

Ballard et al. (2003; table 10.4) summarizes outcomes of 149 observed interactions between coyotes and wolves in Yellowstone between 1995 and 2001. These yielded 17 killings of coyotes (11 percent of encounters). Thirteen of the 17 killings occurred at wolf prey kill-sites. In all 17 cases, wolves outnumbered coyotes. In 13 of 18 cases where coyotes outnumbered wolves, wolves still ran off the coyotes (by contrast the coyotes successfully ran off wolves in 3 cases!).

Hunting Hound Dogs

Ruid et al (2009) provides a comprehensive review of wolf depredation on hunting hounds in Wisconsin and Michigan between1986 and 2006. Both the States of Wisconsin and Michigan allow the use of hunting hounds in the pursuit and harvesting of black bears. Wisconsin compensates hunters for losses caused by wolves. Michigan does not. Therefore Ruid et al. (2009) felt that reporting of losses was more accurate in Wisconsin than Michigan due to monetary incentives. Despite this, Ruid et al. (2009) felt Wisconsin hound hunters lost more dogs to wolves because Wisconsin has an earlier start to hound training and more bear hunters. Baiting of sites commences around mid April each year in Wisconsin in contrast to mid August in neighboring Michigan. Dog training begins each year in July in Wisconsin. Hunts begin in mid September and conclude about a month later.

Ruid et al. (2009) compared the percent of hunting hounds killed in Wisconsin to the percent of pet dogs killed that were located at residential properties. Of 103 attacks reported among hunting hounds during Wisconsin's training or hunting period, 89 (72 percent) resulted in death to the hounds. This contrasted with 12 of 32 attacks resulting in death (38 percent) of pet dogs at residences.

Ruid et al. (2009) attributed the substantially higher death rate among hunting hounds to following factors:

(1) training and the early portions of the hunting season coincide with the period when wolf packs inhabit rendezvous sites;
(2) wolf packs vigorously defend these rendezvous sites from intruders;
(3) wolf attacks occurred on public lands with hunters > than 200 m from hunting hounds

Ruid et al. (2009) cited Wydeven et al. (2004) in which it was stated that larger wolf packs were more likely to attack hunting hounds and attack in subsequent years. Only a small percentage of the state's total number of packs were involved in killing hounds each year. One to 11 packs, representing 3 to 15 percent of the state's wolf packs between 1990 and 2006, depredated on hunting hounds (Ruid et al. 2009).

Ruid et al. (2009) concluded that wolf attacks on hunting hounds occurs most often when superior numbers of wolves are present over dog pack numbers, to defend wolf pups, and to defend bait sites or wolf-prey kill sites.

Summary Opinion, based on peer-reviewed literature

Wolves are powerful predators that aggressively resist intrusions into their territories, are defensive of young, and in superior numbers, kill their adversaries.

Personal Experience

Over my 30 + year career I have been involved in trapping and radio-collaring wolves, monitoring radioed wolves, retrieving dead wolves (radioed and non-radioed), , conducting night-time summer howling surveys, and trailing wolf packs in snow. I have handled hundreds of wolves in Wisconsin, but have only assisted in a small number of necropsies.

I have retrieved, at minimum, 3 radioed wolves killed by other wolves. I have encountered 3 coyotes killed by wolves while snow-trailing wolf packs, and I have investigated, in the field, 2 cases where wolves killed hounds during the training season. In addition to this I have received many citizen calls of complaints involving wolves and dogs, referring them to Wildlife Services field investigators. I then reviewed reports and maintained a data file on incidents occurring within Wisconsin's Central Forest region.

Necropsied wolves suffered from extreme subcutaneous hemorrhaging with little or no penetration of the skin. Animals so killed literally looked like they were coated in red jelly over nearly 100 percent of their bodies when their skins were removed. This suggests that individual bites were exceedingly numerous, quick and involved violent shaking of the afflicted area, resulting in massive muscle damage to each individual bite area. Time to death likely was slow (based on number of bites and rate of blood loss beneath the skin).

Coyotes received less bites with bites breaking skin in several areas; bites being delivered to neck, shoulder, hind legs and abdominal regions. Death was probably fairly quick, based on crushing bites smashing through muscle, vertebrae and bone resulting in rapid blood loss, shock and death.

The 2 dogs received few bites; these bites penetrated the skin. Sites involved include the lower back, shoulders and abdomen.

In summary, wolves seem able to quickly dispatch canids smaller than themselves (ie. coyotes and most dog breeds). When confrontations occur between wolves, clashes are prolonged.

I conclude my testimony by sharing two stories, one involving a hunting hound, and the other two bird dogs coursing the woods in sight of their owner/hunter. As I am retired I cannot furnish more accurate data such as dates, names and DNR case numbers as these files did not follow me into retirement. They are public records.

Case # 1
In this case a single hound, weighing approximately 50 pounds, was dropped off on a raccoon track (at least according to the victim's owner, as it was illegal to be using hounds for nearly everything in that part of Wisconsin at that time) wearing a radio-collar so it could be retrieved. Its trainer heard it baying as it ran off. Eventually he heard a yelp, then nothing. At that time he was approximately ¼ mile from what would be the kill site. The owner/hunter left the carcass and got a hold of us so we could inspect the site.

The hound had inadvertently run right into the Bear Bluff pack's rendezvous site (the site was known to us). As it was summer, reading sign would normally have been exceedingly difficult. But the encounter took place on a dry drainage ditch, so its bottom and embankments were full of sand with little vegetation to impede detection of tracks. As it happened the hound was running directly towards a *large* wolf laying prostrate on the far berm. As the hound crested the near berm we surmised the wolf stood up and swiftly moved towards the hound. The hound, meanwhile, realized its predicament and as its paws hit the ditch basin, it immediately turned180 degrees about to retreat. As the hound reached the top of the berm the wolf locked its jaws in the rump of the dog and threw it bodily over the berm in the direction from which it had come. The dog landed 10 to 15 feet away and as it hit the ground the wolf was on it. The dog evidently rolled over to beg quarter and a single bite delivered by the wolf into the inguinal area eviscerated the dog's intestines. In shock, the dog was in death throes with its forelegs thrashing (evident in sand) while the wolf stood over it. The entire engagement took place in an area of about 30 feet. Two bites delivered: dog dead. The wolf's pups were likely a couple of hundred yards off in the neighboring spruce bog. In this case the sign indicated only one wolf was involved and based on the great size of its paws, we felt it was the pack's alpha male.

Case # 2
I received a call from an irate grouse hunter complaining about a close call he had with a pack of 4 wolves while hunting with his 2 bird dogs within a mile of the City Limits of Wisconsin Rapids (this was the Seneca pack). One of his two dogs had coursed out ahead of him while the other was closer towards him in a thicket of pole-sized aspen. The nearer dog suddenly turned about and ran right towards him, cowering. The second dog came running back, and the hunter noticed that right on it's heal was a large wolf. As the dog closed in on the hunter the wolf noticed the hunter and ceased its pursuit of the dog, but did not retreat. With some effort he was able to place leads on his dogs and with difficulty he began retreating towards his vehicle, about a ¼ mile off, escorted by the wolf. Sometime during his retreat he became aware that flanking him were 3 other wolves: 2 to his left and 2 to his right. Once back at the vehicle he was able to crate his 2 dogs and as he got in he noticed a pair of wolves standing behind his vehicle, and 2 standing in front of his vehicle at a distance.

The only difference in these 2 stories is outcome: in the absence of humans (primarily visual because I suspect wolves can smell humans under favorable wind conditions a long way away) wolves *kill* dogs. In the (visual) presence of humans, the outcome is still unpredictable, but attacks on dogs are far less likely.

Professional Opinion

Wolves have only one predator: human beings. Their response to all other creatures depends on whether the creature is considered food, or is considered a threat. Threat to a wolf means either a threat of usurping their territory, a threat to recently killed food, or a threat to either themselves or their offspring. Wolves primarily consider dogs as threats, especially those in pursuit or trespassing onto wolf territory. The Wisconsn DNR has long recognized this fact, as demonstrated by the Wolf Warnings posted by the Department advising citizens of the risks to their dogs in certain portions of the state, particularly at certain times of the year. [*See* "Wolf DNR Wolf Warning Page for Dogs" http://dnr.wi.gov/topic/wildlifehabitat/wolf/dogdeps.html]

Outcome of encounters between wolves and dog is dependent on many variables including:

(a) dominance status of wolf(ves) encountered, with alphas being more aggressive than subordinate pups or some yearlings
(b) terrain that may or may not contain escape routes for wolves
(c) relative numbers of each canid during encounters
(d) size of dog (breed) encountered
(e) presence of food or pups
(f) time of year with pup rearing (May through October) and breeding (late December through mid March) being periods of heightened aggressiveness,
(g) individual personalities of specific wolves and dogs (and among dogs, breed predisposition); and
(h) site of encounter relative to pack territory (viz. edge vs. core).

Traditionally, hound hunters in Wisconsin are not in visual contact with their dog packs while hunting in thick wooded terrain. This contributes to the high rate of mortality observed by Ruid et al (2009), as explained earlier.

In my professional experience, dog packs that will be used to chase a wolf or a pack of wolves will be regarded by the wolves as a *threat*. If the wolves flee (canids do not climb trees as do bears or cats) and are still encroached upon, or if the wolves stand their ground, they will most likely fight the oncoming dog pack.

When defensive behavior is activated, it is exceedingly difficult to get wild wolves to cease as they tend to be very single-minded and focused in their aggressiveness. Dogs so attacked – unless they are breeds that specialize in attack / killing – have little survival chance, especially if they are smaller in both stature and weight, and in equal or fewer numbers than the attacking wolves.

Attacks will be swift and furious. Dogs will be seriously injured and die, and wolves will be injured and die as they both fight by slashing out with their canines and carnassial teeth.

In order to avoid the violent confrontations and animal fighting described in the preceding paragraphs, it is incumbent upon the DNR to impose reasonable restrictions and parameters on the use of dogs as a method for hunting wolves, or otherwise prohibit the use of dogs to hunt wolves (not possible under Act 169). Such restrictions include breed restrictions; lead requirements, harvest zone limitations (i.e. prohibiting hunting and training with dogs in areas with known wolf den and rendezvous areas); and closely regulated dog training and licensing requirements. In my professional opinion, without such restrictions and regulations, the use of dogs to hunt wolves will result in a high risk of direct physical encounters between wolves and dogs, leading to severe bloodshed and grievous injuries on the part of both dogs and wolves.

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