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Attorney for Plaintiffs

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF MONTANA
MISSOULA DIVISION

FLATHEAD-LOLO-BITTERROOT CITIZEN TASK FORCE and WILDEARTH GUARDIANS, Plaintiffs, vs. STATE OF MONTANA, LESLEY ROBINSON, and GREG GIANFORTE, Defendants.	)	CV 23-101-M-DWM **PLAINTIFFS' SUPPLEMENTAL EXPERT DISCLOSURE**

Pursuant to FRCP 26(a)(2), Plaintiffs now provide this supplemental expert report with the report of Dr. David Mattson.

DATED this 26th day of May, 2024.

/s/Timothy M. Bechtold

Attorney for Plaintiffs

CERTIFICATE OF SERVICE

I certify that I served a true and accurate copy of the foregoing on May 26, 2024, via email attachment upon the following:

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/s/Timothy M. Bechtold
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Pursuant to 28 U.S.C. § 1746, I, David J. Mattson, declare as follows:

1. I am a scientist and retired wildlife management professional with extensive experience in grizzly bear research and conservation spanning four plus decades.

2. I have been asked to render expert opinions by Timothy Bechtold, attorney for plaintiffs in *Task Force v. Montana*. My opinions are based on my education, training, and experience in the field of wildlife biology, and my review of the documents and materials in this case, as well as relevant research in the field of grizzly bear biology and ecology. See Attachment 1. I have reviewed the case filings and discovery in this case. My rate is $250 per hour for review, and $500 per hour for depositions. In the past four years, I not offered trial testimony and I have been deposed once, in this case. My CV is attached with a listing of my publications. My opinions are expressed to a reasonable degree of scientific certainty.

3. My educational attainments include a B.S. in Forest Resource Management, an M.S. in Plant Ecology, and a Ph.D. in Wildlife Resource Management.

4. My professional positions prior to retirement from the U.S. Geological Survey (USGS) in 2013 included Research Wildlife Biologist, Leader of the Colorado Plateau Research Station, and Acting Center Director for the Southwest Biological Science Center, all with the USGS; Western Field Director of the Massachusetts Institute of Technology-USGS Science Impact Collaborative; Visiting Scholar at the Massachusetts Institute of Technology; and Lecturer and Visiting Senior Scientist at the Yale School of Forestry & Environmental Studies. My CV is attached here.

5. I have been consulted by brown/grizzly bear managers and researchers worldwide, including from Russia, Japan, France, Spain, Greece, Italy, and, most notably, Canada. I have also given numerous public presentations on grizzly bear ecology and conservation, including talks at the Smithsonian (Washington, D.C.) and American Museum of Natural History (New York, New York).

6. I led field investigations for the Interagency Grizzly Bear Study in the Yellowstone Ecosystem during 1983-1993, prior to which I was research technician with this project for three years. During this work, I closely

observed and interacted with grizzly bears on numerous occasions. I also developed and led six projects that investigated mountain lion ecology in the Southwest during 1999-2013.

7. I currently lead the Grizzly Bear Recovery Project, which is an organization devoted to producing materials that educate the public and synthesize research relevant to conservation of grizzly bears in North America.

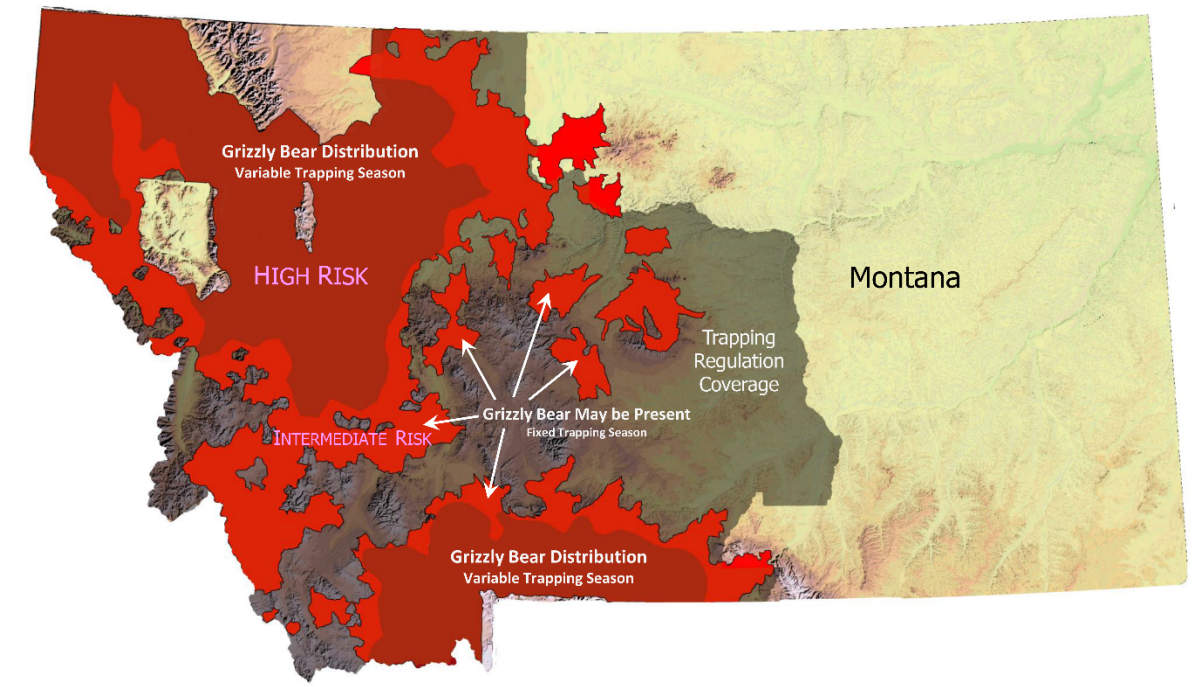
8. I have authored more than 130 scientific articles and reports based on my professional research, many of which address the ecology and behavior of grizzly bears.

9. The current distribution of grizzly bears in Montana overlaps almost entirely with areas covered by regulations that Montana's Fish and Wildlife Commission promulgated to govern trapping of furbearers and wolves during August 2023 (See Figure 1).

10. Much of this overlap corresponds with core distributions of grizzly bears where the beginning of wolf and furbearer trapping can vary from the first Monday after Thanksgiving to December 31st. However, nearly as much area is encompassed by places where the U.S. Fish & Wildlife Service has determined that "grizzly bears may be present." In these areas the trapping season may start the first Monday after Thanksgiving – approximately November 27th.

11. Barring early achievement of harvest quotas for wolves, trapping for wolves is set to end throughout western Montana on March 15th.

Figure 1. Trapping Regulations, Grizzly Bear Distribution, & Spatial Exposure to Risk



This map shows the distribution of grizzly bears in Montana overlain on areas covered by the 2023 Wolf-Furbearer-Trapping Regulations promulgated by Montana's Fish & Wildlife Commission. Areas colored burgundy are within core grizzly bear distribution where there is greatest risk of grizzly bears being harmed by non-target trapping. Areas colored red are where grizzly bears may be present and where non-target trapping injuries could also occur (adapted from U.S. Fish & Wildlife Service map "Species List Area for Grizzly Bears," updated July 19, 2023).

12. Depending on the ecosystem, nearly 40% of grizzly bears in Montana have historically been active outside their dens either after November 27th or before March 15th, with seasonal duration of activity typically greater for male bears (Figure 2; e.g., Haroldson et al. [2002], Kasworm et al. [2021]).

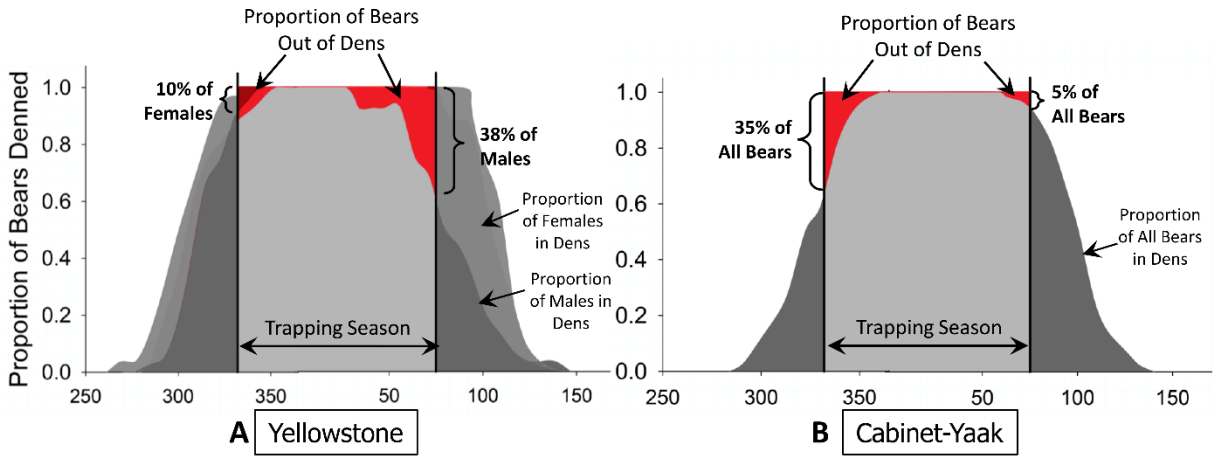
13. The temporal overlap between when grizzly bears are active in the Northern Rockies and current seasons for trapping wolves and furbearers has already increased and will likely continue to increase because of the direct and indirect effects of climate change.

14. There have been numerous anecdotal accounts of winter-active bears in the Northern Rockies, plausibly attributable to both a warming climate and winter availability of meat from wolf kills, late-season kills of ungulates by hunters, and mild winter temperatures (e.g., Zuckerman 2015, Kearse 2019, Heinz 2022, Sherer 2021, Murdock 2023).

15. Grizzly bears in the Northern Rockies will almost certainly enter dens later and exit dens earlier as annual temperatures continue to warm and vegetal foods become available earlier and later in the year. There is ample evidence

worldwide that brown and grizzly bears at lower latitudes spend less time in dens compared to bears in colder climates, with winter activity further promoted by year-round availability of anthropogenic foods and clement winter temperatures (Pigeon et al. 2016, Krofel et al. 2017, Delgado et al. 2018, Johnson et al. 2018, Fowler et al. 2019, Bojarska et al. 2019, González-Bernardo et al. 2020).

Figure 2. Historical Denning Seasons & Temporal Exposure to Risk



These graphs show the cumulative proportions of grizzly bears in dens (from 0 to 1.0; i.e., 0% to 100%) for grizzly bears in the Greater Yellowstone Ecosystem (GYE; A) at left (from Haroldson et al. 2002) and Cabinet-Yaak Ecosystem (CYE; B) at right (from Kasworm et al. 2021). The period during which wolves and fur-bearers can be trapped is delimited by solid horizontal lines in both graphs – in most areas from the first Monday after Thanksgiving until March 15th [Montana Fish, Wildlife & Parks (2023)]. Shades of gray correspond with proportions of bears in dens relative to Julian Date (e.g., 250 = September 7th and 150 = May 30th, with 0 = January 1st). Areas shaded darker gray correspond with proportions of bears *in dens before or after trapping is authorized*; areas shaded red or burgundy correspond with proportions of bears *not in dens during the period when trapping is authorized*. Denning chronology is differentiated for males and females in the GYE but pooled for bears in the CYE. Roughly 38% of male grizzly bears would be exposed to risk of non-target trapping during spring and late winter in the GYE (shaded red); approximately 10% of females would be exposed during fall and early winter (shaded burgundy). Roughly 35% of all bears would be exposed to risk of non-target trapping during fall and early winter in the CYE (shaded red). Differences in chronology between ecosystems and sexes lead to different levels of exposure to potential harm from trapping.

16. The considerable current as well as prospective future spatial and temporal overlap of trapping for furbearers and wolves in Montana with places and times that grizzly bears are also active results in widespread exposure of bears to risks posed by non-target injuries from snares and body-hold traps set to capture other species.

17. This exposure and resulting risks to grizzly bears is magnified by well-documented interactions between wolves and bears that increase the likelihood that grizzly bears will be active in areas frequented by wolves and thus inadvertently targeted by wolf trappers.

18. Wherever ungulates such as elk, deer, and moose are available, wolves and brown/grizzly bears gravitate towards this source of high-quality meat, with grizzly bears often appropriating fresh kills from wolf packs (Hornbeck & Horejsi 1986, Servheen & Knight 1993, Smith et al. 2003, Gunther & Smith 2004, Tallian et al. 2017, Milleret et al. 2018, Ordiz et al. 2020).

19. Although grizzly bears are omnivores, meat comprises a substantial portion of bear diets in the Northern Rockies, with greatest amounts eaten by bears in the GYE and along the East Front of the Northern Continental Divide Ecosystem (NCDE) as well as by male bears in all ecosystems (Kendall 1986, Aune & Kasworm 1989, Mattson et al. 1991, McLellan & Hovey 1995, Mattson 1997, McLellan 2011, Kasworm et al. 2021).

20. Peak consumption of meat by grizzly bears occurs during spring and fall when other foods are scarce. Most consumption is by scavenging carcasses of animals that died from natural and anthropogenic causes (Mattson 1997), including unclaimed remains of animals killed by hunters during September-November and remains of kills made by wolves potentially year-around (e.g., Smith et al. 2023, Kearse 2019, Sherer 2021, Heinz 2022).

21. These dietary patterns predictably lead grizzly bears to associate meat with wolves and humans, especially during periods that potentially overlap with deployment of bait at traps set to capture wolves and furbearers (see Points 18 and 19 above).

22. Grizzly bears have an acute sense of smell, comparable to that of canids such as wolves and smaller carnivores targeted by bait-assisted trapping (Gittleman 1991; Green et al. 2012; Van Valkenburgh et al. 2011, 2014; Bird et al. 2014). Grizzly bears can consequently detect carrion from great distances, including meat used as bait, and can be readily attracted by lures such as fish oil, beaver castor, and rotted blood (Lamb et al. 2016).

23. Because meat and other animal-related scents are so alluring to bears, researchers commonly use these attractants to bait bears into culvert traps and snares – much like those used by trappers to target wolves and furbearers. Black bear hunters also legally use non-game meat and animal scents to lure bears into situations where they can be more readily killed (e.g., Idaho Fish & Game 2022, Wyoming Game & Fish Commission 2023). Grizzly bears are occasionally unintended victims.

24. Wherever baits are available, grizzly bears will predictably be attracted by and motivated to obtain them. This includes using their paws, snouts, and considerable height when erect to exploit lures and edible baits sequestered in small enclosures (or "cubbies") or elevated in a tree (e.g., Lamb et al. 2022).

25. In my professional opinion, because grizzly bears can seasonally range over areas as large as 40-80 square miles, odds that bears will detect even low densities of bait are high, especially where they are shadowing targeted species such as wolves (see Points 17-21 above) and oriented to consuming meat (see Points 19-20 above).

26. These high odds are manifest in documented instances where grizzly bears have been accidentally captured and sometimes severely injured by baited traps that were set to target wolves and furbearers (Figure 3; McKim 2017, Lamb et al. 2022). These injuries predictably included severe damage to paws and amputation of toes.

27. Grizzly bears are amongst the most dexterous of all large carnivores (Iwaniuk et al. 1999, 2000). Grizzly bears consequently use their flexuous front limbs and paws as an integral part of most foraging behaviors, including for catching larger mammals, excavating roots and rodents, exploiting insects, and manipulating limbs of shrubs to eat berries (e.g., French & French 1990; Welch et al. 1997; Mattson 1997b, Mattson 2004).

28. In my professional opinion, any loss of function in paws or limbs caused by trapping injuries has potentially severe consequences for affected bears, including abbreviated lives and increased suffering. I have also personally documented instances where severe injuries such as spiral fractures to front limb bones resulting from attempts to escape snares have been fatal to the involved animals.

Figure 3. Non-Target Injuries from Traps (from Lamb et al. 2022)

These photos adapted from Lamb et al. (2022) are examples of grizzly bears that lost digits because of injuries from non-target capture by leg-hold and body-gripping traps set to capture other species.

29. In addition to physical injury, trapped bears also predictably experience additional harm in the form of stress and exertion associated with attempts to escape. This kind of harm has been well-documented (Cattett et al. 2003, 2008a; Powell 2005), with occasionally fatal consequences (Cattett et al. 2008b). Stress and exertion predictably mount the longer a bear is restrained, which has resulted in common use of radio-transmitters by bear researchers to signal when a snare has been sprung (e.g., Benevides et al. 2008), as well as recommendations that trapped bears be chemically immobilized and released within 1-2 hours of capture (Kaczensky et al. 2002).

30. In my professional opinion, trap-related stress and injury is guaranteed to be even greater for grizzly bears subject to non-target captures compared to those captured during research efforts. Under state regulations, trappers are only required to check wolf traps once every 48 hours (Montana Fish, Wildlife & Parks 2023). Even when a trapper detects a captured grizzly bear, he or she is unlikely to be carrying much less trained in the use of immobilization drugs and equipment. Recreational trappers will consequently need to communicate with a government agent proficient in immobilizing grizzly bears, at which point additional time will predictably transpire before the agent arrives, immobilizes the bear, and releases it.

31. The fact that Montana Fish, Wildlife & Parks had no reports of grizzly bears caught in traps in the NCDE area during 2022-2023 does not lessen the likelihood of future captures or related harm to affected bears.

32. In addition to the harm caused to inadvertently trapped grizzly bears, effects of non-target captures, demographically and to recovery of this species in the contiguous United States, will be proportionately greater in areas outside of the NCDE and GYE Recovery Zones, with repercussions for natural recovery of grizzly bears in the Bitterroot Ecosystem (BE).

33. Currently, grizzly bears outside of established Recovery Zones can only be sustained with immigration of bears from areas where females survive long enough to produce a figurative surplus of emigrants (Merrill & Mattson 2003, Johnson et al. 2004, Haroldson et al. 2006, Schwartz et al. 2006, Schwartz et al. 2010). In my professional opinion, this source-sink population dynamic has likely produced many of the gains in population distribution that promise connectivity among the NCDE, GYE, and CYE, as well as natural colonization of the BE.

34. All the areas recently colonized by grizzly bears outside of Recovery Zones are covered by 2023 regulations governing trapping of wolves and furbearers in Montana (see Points 22-30 above and Figure 1).

35. In my professional opinion, it is highly likely that grizzly bears naturally migrating into the BE and between the NCDE, GYE, and CYE will be attracted to and caught in traps and snares set by recreational trappers.

36. In my professional opinion, this will negatively affect local grizzly bear populations in areas between established grizzly bear Recovery Zones in

Montana, with resulting adverse effects on prospects for connectivity among existing populations and recovery of grizzly bears in the Contiguous United States.

37. Based on my training and experience, the current wolf and furbearer trapping regulations approved by the Montana Fish and Wildlife Commission on August 17, 2023, will result in increased incidences of accidental capture and harm to grizzly bears because these regulations increase the likelihood of traps being set in areas occupied by non-denning grizzly bears.

38. At ¶5 of his declaration, Doc. 19-3, Mr. Kluge states regulated trapping does not cause wildlife to become threatened or endangered and is managed through scientifically-based regulations that are strictly enforced. While this may be Mr. Kluge's opinion, he offers no factual basis for the opinion. Grizzly bears, wolves and other species were systematically shot, trapped and poisoned nearly out of existence in the Lower 48 states. One of the reasons for the listing of the lynx as a threatened species was due to the risk to the species from recreational trapping. and the most recent Species Status Assessment (U.S. Fish & Wildlife Service 2023) for wolverine cites state trapping regulations as a threat to the species.

39. The trap placement regulations Mr. Kluge cites at ¶6 will do nothing to prevent grizzly bears from being attracted to the traps and caught. Grizzly bears have large home ranges and can move several miles in one day. As I stated in my previous declaration, grizzly bears have an acute sense of smell effective at long distances. Fifty to one hundred fifty feet is a trifle to a grizzly bear. The setbacks were established to protect people and their pets around picnic areas, campgrounds, trailheads and fishing access sites and within public rights-of-way adjacent to roads, not for the protection of grizzly bears.

40. At ¶10, Mr. Kluge offers his subjective opinion. The methods described in Mr. McDonald's declaration, Doc. 20 at ¶¶ 6, 8, 9, & 10, are arbitrary and inappropriate as a basis for instituting a "floating" season opening date. The methods are not adequate for determining when "grizzly bears have entered their dens." The method described is dependent on radio telemetry. This is not a reliable method. The current population estimate for the NCDE is 1,136 (Costello and Roberts 2023). Of these, 85 were collared for research and management in 2022. This is just 7.3% of the NCDE population, leaving

approximately 1,051, or 92.7% of grizzly bears that are not monitored. Research trapping effort in the NCDE is concentrated in a couple of areas. Other areas including the South End and parts of the Rocky Mountain Front have no research trapping effort so that there are gaps in the observation data. Without access to telemetry data, managers rely on reports from the public. Trappers are unlikely to report grizzly activity if they believe it would shorten the trapping season. Moreover, each Fish, Wildlife & Parks Bear Manager covers thousands of km^2 and cannot site-specifically monitor all that area. Without telemetry data it comes to an educated guess which lacks the precision required to prevent illegal takings of pre and post-denning grizzly bears.

41. Grizzly bears in lower elevations den later and emerge earlier. For example, grizzly bears in the Yaak portion of the CYE spend an average of three weeks less per winter than grizzly bears in the Cabinet portion of the CYE (Kasworm et al. 2023). Many areas outside of the Recovery Areas are in lower elevations including the Garnet and Sapphire Mountains and the Ninemile Demographic Connectivity Area where grizzly bears are likely to have shorter denning periods. Depending on the ecosystem, nearly 40% of grizzly bears in Montana have historically been active outside their dens either after November 27th or before March 15th, with seasonal duration of activity typically greater for male bears (Figure 2; e.g., Haroldson et al. [2002], Kasworm et al. [2021]). The temporal overlap between when grizzly bears are active in the Northern Rockies and current seasons for trapping wolves and furbearers has already increased and will likely continue to increase because of the direct and indirect effects of climate change. There have been numerous anecdotal accounts of winter-active bears in the Northern Rockies, plausibly attributable to both a warming climate and winter availability of meat from wolf kills, late-season kills of ungulates by hunters, and mild winter temperatures (e.g., Zuckerman 2015, Kearse 2019, Heinz 2022, Sherer 2021, Murdock 2023). The area described as Occupied in 2022 is already out of date. For example, in 2023 there have been multiple reports of several different grizzly bears in and around Potomac, Bonner, Missoula and the Sapphire Mountains and Bitterroot (Jonkel 10/19/23). Jonkel has also confirmed grizzly presence in the Ninemile Demographic Connectivity Area in 2023. The fact that Montana Fish, Wildlife & Parks had no reports of grizzly bears caught in traps in the NCDE area during 2022-2023 does not lessen the likelihood of future captures or related harm to affected bears.

42. Mr. Kluge states at ¶12 that most cases of bears missing toes, feet, or limbs do not have definitive causation. I have observed countless grizzly and black bears in Yellowstone. Based on my professional experience, the types of injuries observed by Timothy Manley (Declaration) and Mike Madel (McDonald Dkt#19-3) and as shown in Lamb et al. (2023) (clean breaks of bone and tissue, slicing type wounds from cables or trap jaws, amputations of toes, feet and arms) are inconsistent with the types of injuries that bears suffer in the wild. The most common source of non-fatal injuries to bears in the wild occur during fights with other bears, injuries suffered when attacking prey and from accidental falls. Fight injuries are most often scars on the nose and face, puncture wounds, torn ears and missing patches of fur.

43. At ¶14 Mr. Kluge states in regards to breakaway devices that "Regardless, both breakaways stand to be broken free by the average-weight grizzly bear in Montana." This is highly arbitrary as any grizzly below "average weight," including females, subadults, yearlings and cubs, would not break free. Moreover, grizzly bears vary by weight depending on their location in Montana. Grizzly bears with more of a meat influence in their diet are larger than grizzly bears with a berry influenced diet.

44. Mr. Kluge states at ¶17 the results of Lamb et al. (2022) are not directly relevant to Montana. However, their study area is in an international population shared by Montana and British Columbia. For example, Montana shares the same population of grizzly bears with Canada in both the NCDE and CYE and grizzly bears frequently move across the border as shown in

the maps below.

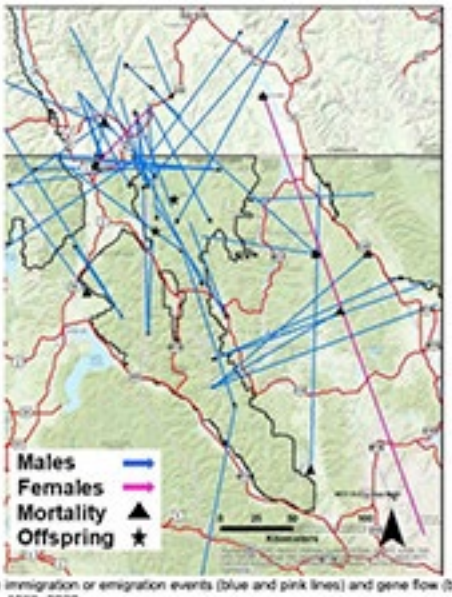


Figure 10. Known immigration or emigration events (blue and pink lines) and gene flow (black stars) in the Cabinet-Yaak, 1988–2020

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Figure 81. Radio locations and minimum convex (shaded) life range of male grizzly bear 722 in the Yaak River, 2011-12.

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45. According to Wayne Kasworm, U.S. Fish & Wildlife Service (pers. comm. from Wayne Kasworm 10/26/23) the grizzly bear killed by mistaken identity in the Moyie River drainage in Idaho that had a neck snare embedded in its neck had an ear tag that came from British Columbia and the FWS gene class model assigned the bear to the Purcell Mountains north of Canada

Highway 3. A grizzly involved in recent incidents in the North Fork of the Flathead was DNA identified to British Columbia. Moreover, all the other grizzly bear populations in Montana share the same populations with Idaho and Wyoming. Based on my own lengthy experience I know that many grizzly bears have home ranges that span the borders of Wyoming, Idaho and Montana as shown in the map below.

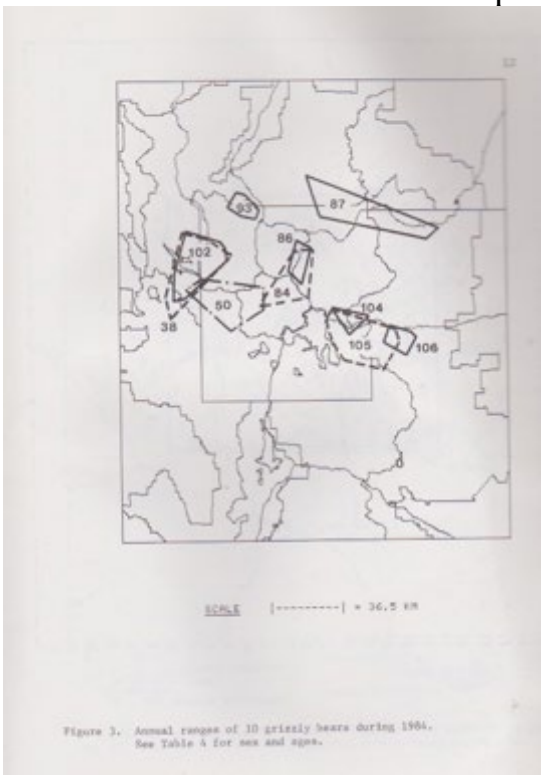


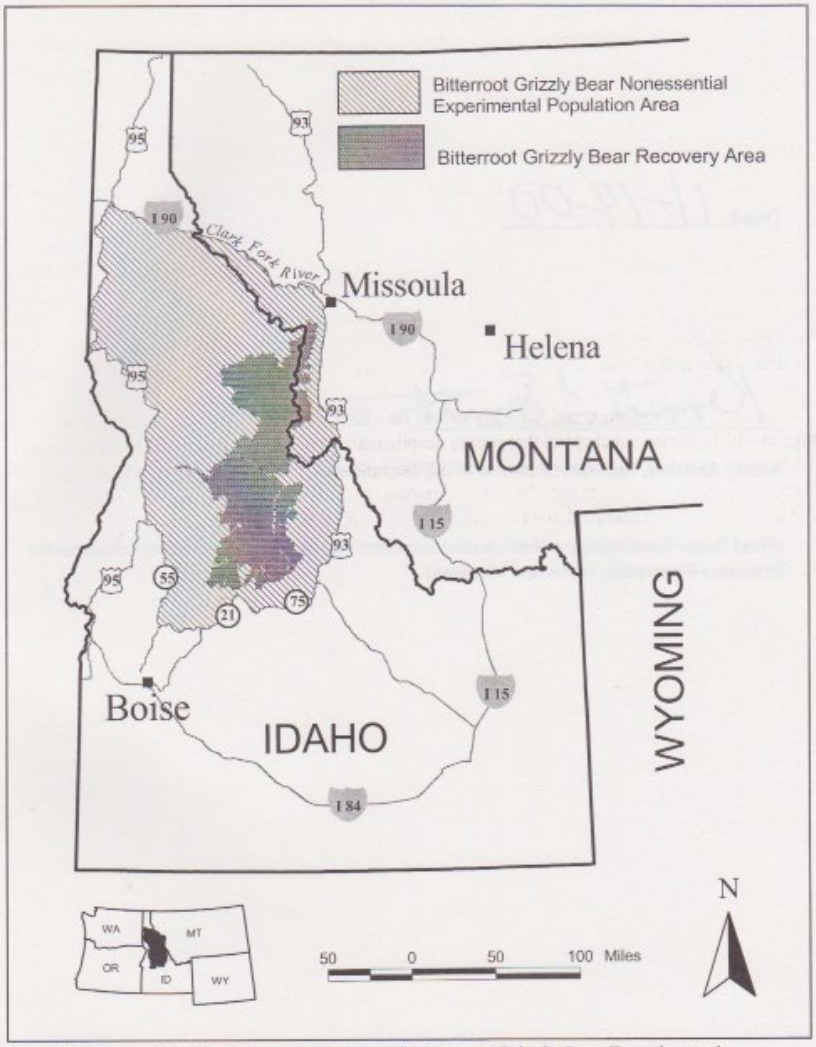
Figure 3. Annual ranges of 10 grizzly bears during 1984. See Table 4 for sex and ages.

Some of the observed injuries of grizzly bears observed in adjacent states and provinces could have occurred in Montana, as many grizzly bears have home ranges that cross borders.

46. Mr. Kluge at ¶18 asserts that Plaintiff's statement that traps kill and maim animals indiscriminately is not true. In my professional opinion, any loss of function in paws or limbs caused by trapping injuries has potentially severe consequences for affected bears, including abbreviated lives and increased suffering. I have also personally documented instances where severe injuries such as spiral fractures to front limb bones resulting from attempts to escape snares have been fatal to the involved animals. In my professional opinion, trap-related stress and injury is guaranteed to be even greater for grizzly bears subject to non-target captures compared to those captured during research efforts. Under state regulations, trappers are only required to check wolf traps once every 48 hours (Montana Fish, Wildlife & Parks 2023). Even when a trapper detects a captured grizzly bear, he or she is unlikely to

be carrying much less trained in the use of immobilization drugs and equipment. Recreational trappers will consequently need to communicate with a government agent proficient in immobilizing grizzly bears, at which point additional time will predictably transpire before the agent arrives, immobilizes the bear, and releases it.

47. The declaration of Ms. Costello, Dkt#19-4 at ¶13 defines the Bitterroot Ecosystem as just the Selway-Bitterroot and Frank Church Wildernesses and states there have been just two verified grizzly bear observations within that area. I and many other scientists, including with the U.S. Fish and Wildlife Service and the Craighead Wildlife-Wildlands Institute, have defined a far broader area as the Bitterroot Ecosystem. Just as the Greater Yellowstone Ecosystem is far larger than the Recovery Area, the Bitterroot Ecosystem is far larger than the Bitterroot Recovery Area. Within this larger area several additional verified grizzly bear observations have occurred, *see Alliance for the Wild Rockies v. Cooley*, ___F.Supp.3d___, 2023 WL 2522945 (D. Mont. Mar. 14, 2023). Additional verified observations include a grizzly bear photographed in the Whitebird area, grizzly tracks verified near the Gospel Hump Wilderness, a grizzly bear killed in the Kelly Creek drainage, a grizzly verified in the North Fork of the Salmon and grizzly bear DNA recovered from a den in the Mallard- Larkins Roadless Area. This map from the 2000 Bitterroot Final Rule shows the ecosystem defined by the U.S. Fish & Wildlife Service that extends beyond the Bitterroot Recovery Area:



The Bitterroot Grizzly Bear Recovery Area and Bitterroot Grizzly Bear Experimental Population Area.

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48. The first grizzly bears verified out of the den each year in Yellowstone National Park from 2014-2023 ranged from February 9 to March 7, according to National Park Service Media Releases.

49. In 2002, researchers determined that males exiting dens earlier in the GYE correlated with higher March temperatures. Haroldson et al. 2002.

50. Grizzly bears are entering their dens later due to lack of accumulating snow pack and available vegetation and exiting earlier, both due to changing climate. Four grizzly bear studies documented at least one individual active all Winter. Researchers found later mean den entrance date for both species in response to apparent increasing food availability during the growing season and denning period, along with later onset and shorter duration of mean snow accumulations to ≥10 cm. Later den entrance date corresponded with increased vegetative forage during the typical bear denning season and later onset of accumulated snow. Fowler et al. 2019.

51. Even in areas of Montana above 5900 feet it is predicted that Snow Water Equivalent (roughly translated as snow depth) will decline by 12%. Whitlock et al. 2017.

52. Extended growing seasons and mild meteorological conditions result in shorter denning periods for grizzly bears. Pigeon et al. 2016.

53. Wildlife poaching is defined as *the intentional or unintentional act of non-compliance with wildlife laws and regulations.* Spencer 2020.

54. Bjornlie, et al. did not intend for their method of estimating grizzly bears to be used as a presence-absence boundary. They stated, "Clearly, not all grizzly bears in the Greater Yellowstone Ecosystem are radio collared or otherwise detected, and this is especially true of lone bears inhabiting the edges of the main distribution. Consequently, our estimate should be considered a minimum known area of occupancy, not an extent of occurrence, because we have many outliers that are not included in the main grizzly bear distribution map. Thus, this map should not be used as a presence–absence boundary**,** because grizzly bears undoubtedly occur outside this line." Bjornlie et al. 2014.

55. Between 1983-2021, at least six Cabinet-Yaak Ecosystem grizzly bears have had home ranges completely within British Columbia, and 45 Cabinet-Yaak Ecosystem grizzly bears have had home ranges that were in both Montana and British Columbia, and some Cabinet-Yaak Ecosystem grizzly bears have had home ranges that were partially in Montana, partially in Idaho, and partially in British Columbia. Kasworm et al. 2022.

56. The Cabinet-Yaak Ecosystem grizzly bear population is composed of two totally separate populations, one population in the Cabinet Mountains and one population in the Yaak River watershed. Kasworm et al. 2022.

57. An isolated population of grizzly bears that numbers between 600-800 individuals is not a viable population. Allendorf et al. 2019.

58. Costello, et al. 2016 estimated a rate of 19% for poaching/malicious killings of grizzly bears. Rates reported for unpermitted killings of grizzly bears in peer-reviewed papers published in scientific journals include 12% (McLellan et al. 2018) and 32% (Lamb et al. 2023). Costello et al. 2016 also found that unreported mortalities accounted for 32% of all grizzly deaths.

59. Documenting illegal killing can be much more difficult even with radiocollared animals. Bears have unique characteristics that make unreported human-caused mortality common. McLellan et al. 2018. In central BC another study reported data that suggest about 90% of bears killed by people for reasons other than permitted hunting were not reported. Ciarniello et al. 2009. Managers and researchers should know that most bears killed by people for non-hunting reasons are unlikely recorded, at least in back-country areas. McLellan et al. 2019.

60. "We knew that grizzly bears could be caught in foothold traps set for wolves given that in recent years several bears had either been killed in, or required release from, wolf traps in southern British Columbia." "We were also aware of multiple reports of grizzly bears being caught in foothold traps set for wolves, and we believe this is another possible source of toe loss…Between 2010 and 2020, at least 5 grizzly bears were caught in wolf foothold traps (with the trap often closing right behind the toes) and had to be released by conservation officers and biologists." "Grizzly bears were accidentally captured by trappers in foothold traps set for wolves on at least 3 occasions during the study in the Selkirk and Purcell Mountains, but no evidence of toe loss due to incidental grizzly bear capture in footholds was reported, likely because bears were either released from the traps or killed." "A similar solution has previously been used in southeast British Columbia to avoid catching and killing bears in neck snares set for wolves, an issue first documented by the Flathead Grizzly Bear Project." Lamb et al. 2022.

61. Researchers have noted that numerous grizzly bears have lost claws, toes and feet after being caught in baited body-gripping conibear traps set for

marten in cubby boxes. In response to this risk, British Columbia requires the opening size on the front of cubbies be limited to no more than 8.9cm (3.5 inches). This is narrower than most bear paws. See, e.g., Lamb et al. 2022.

62. I also offer the opinions I expressed in my deposition of March 7, 2024, which is appended here.

I declare under penalty of perjury that the foregoing is true and correct.

Dated this 24th day of May, 2024.

David J. Mattson

Attachment 1.

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The Grizzly Bear Recovery Project

DAVID MATTSON — SCIENTIFIC RECORD

DATE PREPARED: **15 December 2021**

CURRENT PROFESSIONAL POSITION: **Senior Consultant, Grizzly Bear Recovery Project & Co-Founder, Grizzly Times**

USGS POSITION AT RETIREMENT: **Research Wildlife Biologist, 0486, GS-14**

(1) EDUCATION

Ph.D., 2000, Fish & Wildlife Resources, *Causes and Consequences of Dietary Differences among Yellowstone Grizzly Bears*, University of Idaho (1993-2000)

M.S., 1984, Forest Ecology, *Classification and Environmental Relationships of Wetland Vegetation in Central Yellowstone National Park*, University of Idaho (1980-1984)

B.S., 1979, Forest Resource Management, University of Idaho (1972-1979)

(2) TECHNICAL TRAINING RECEIVED

7. *Leadership 201*, 36 hrs, USGS Leadership Training Program, Sheperdstown, WV, 2007 (Action Learning Scenario Team Leader).

6. *Leadership 101*, 36 hrs, USGS Leadership Training Program, Sheperdstown, WV, 2006.

5. *Leadership Intensive*, 16 hours, USGS Leadership Training Program, Seattle, WA, 2005.

4. *Basics of Working with the News Media*, 16 hours, National Conservation Training Center, 2000.

3. Course on principles and use of geographic information systems, 8 hours, Montana State University, 1991.

2. Course on bear trapping and handling, 20 hours, Yellowstone National Park, 1991.

1. *Buck Brannon Horse Training Clinic*, 18 hours, Yellowstone National Park, 1989.

(3) PROFESSIONAL EXPERIENCE

A. CURRENT PROFESSIONAL POSITION — Grizzly Bear Recovery Project & Grizzly Times

DATES From: 30 September 2013 To: Present

DESCRIPTION OF POSITION — Grizzly Bear Recovery Project & Grizzly Times

My current work focuses on providing technical expertise related to grizzly bear ecology and management for managers, the engaged public, journalists, environmental activists, and litigating attorneys. These efforts take the form of public presentations, presentations to private or by-invitation audiences, *pro bono* services and other professional advice for nongovernmental organizations and private individuals, and paid consultation for organizations of all sorts. I also focus on creating timely technical papers and reports covering topical issues related to grizzly bear ecology and management, complemented by submission of technical comments as part of government decision-making processes related to management of grizzly bears and other natural resources. Another major facet of my current work entails creation of online educational materials hosted by three different websites maintained under auspices of the Grizzly Bear Recovery Project (https://www.mostly naturalgrizzlies.org/ and https://www.allgrizzly.org/) and Grizzly Times (https://www.grizzly times.org/). In addition to these activities related to production of conservation-related content, my position also requires that I write proposals and progress reports for funders as well as engage in strategic planning, and organizational management.

DESCRIPTION & TITLES OF PROJECTS — Grizzly Bear Recovery Project & Grizzly Times

1. **Ecology & Natural History of *Ursus arctos*** — This ambitious project is devoted to assembling, synthesizing and presenting information on the evolution, ecology, anatomy, physiology, and natural history of brown and grizzly bears (*Ursus arctos*). Results of this integrative effort have been and will continue to be presented online as well as in downloadable reports and technical papers. The primary online portals for disseminating this information include *All Grizzly* (https://www.allgrizzly.org/) and *Mostly Natural Grizzlies* (https://www.mostlynaturalgrizzlies.org/). The first covers brown bears worldwide with an emphasis on anatomy, evolution, physiology, and natural history. The second focuses on grizzly bears in the northern U.S. Rocky Mountains, with an emphasis on diets, habitat use, and management issues such as anthropogenic impacts and effects of various management practices (e.g., sport hunting and aversive conditioning). This project aims to provide interested people with a succinct and informative synthesis of an otherwise enormous and inaccessible corpus of current scientific information related to brown and grizzly bears.

2. **Information Relevant to Managing Grizzly Bears** — This project focuses on delivering information to managers, the engaged public, journalists, environmental activists, and litigating attorneys of relevance to specific government policies and decision-making processes governing conservation and management of grizzly bears. This information is conveyed to agency managers informally and formally through comments submitted as part of decision-making processes; to the engaged public through blogs, editorials, online materials, and personal conversations; to journalists through interviews; to environmental activists through briefings, reports, and personal conversations; and to litigating attorneys through materials of direct relevance to contesting specific government decisions and decision document, including comments and declarations submitted as part of judicial proceedings. Government decisions and decision-making processes are often ill-informed, at variance with the best available science, and in contravention of existing law. This project's goal is to provide concerned citizens and other watchdogs of government decision-making with information that improves their orientation to scientific issues broached by specific government decisions of relevance

to grizzly bear conservation and management with the aim of improving public input and legal challenges.

3. **Background Information on Grizzly Bears & Human-Bear Relations** — This project focuses on providing the engaged public, journalists, and those with casual interest in grizzly bears background information on grizzly bears, grizzly bear-human relations, and on-going management issues with the aim of fostering greater appreciation for grizzly bears and better engagement with on-going and emerging grizzly bear management problems. Information is conveyed in many different ways and in many different forms, but with primarily reliance of the web site *Grizzly Times* (https://www.grizzlytimes.org/). This portal provides general information covering a host of topics, blogs pertaining to topical issues, general commentary, and newsletters providing updates on recent news stories and science pertaining to grizzly bears and grizzly bear management.

B. ASSIGNMENT AT TIME OF RETIREMENT — U.S. Geological Survey

DATES From: 28 February 1997 To: 30 September 2013

DESCRIPTION OF POSITION — U.S. Geological Survey

Prior to my retirement in 2013, I investigated the ecology and conservation of large carnivores and other animals, including diet, habitat use, movements, and range, and relations between these factors and demography, effects of climate change, relations with humans, methods for evaluating habitat, and the nature and effectiveness of large-carnivore and other natural resources management. This research occurred throughout the United States, emphasizing the southwestern states of Arizona, New Mexico, Utah, and Nevada, as well as occupied or potential grizzly bear (*Ursus arctos*) habitat in the Rocky Mountains and cougar (*Puma concolor*) habitat elsewhere. For ecological studies I used data from radio-marked animals, transect- and point-based studies, and remote imagery, obtained through use of advanced technology such as GPS-satellite linkages and remote thermally-activated cameras. Analytic methods entailed innovations in model-building and related statistical techniques, including development of state-of-the-art geospatial models and agent-based approaches. I also used grounded theory and methods of the policy sciences to analyze natural resources conservation and management policies. My research provided managers with insights into dynamics of natural resources management, crucial to improving the design of related policy- and decision-making processes in service of democratic outcomes; information about key factors limiting large-carnivore and other animal populations, with relevance to instituting management needed to conserve nationally and internationally important populations; information to minimize risks posed to humans by large carnivores in areas of co-habitation, thereby minimizing harm to humans and increasing prospects for coexistence; and information on the extent and location of areas capable of supporting extant or prospectively repatriated populations of large carnivores important to the survival of valued species. I worked closely with numerous managers and other stakeholders in natural resources management throughout the United States, providing advice and technical input on a multitude of issues germane to maximizing beneficial uses of science in service of durable outcomes.

DESCRIPTION & TITLES OF PROJECTS — U.S. Geological Survey

1. **Cougars of the Colorado Plateau** —This large-scale and logistically and technically complex project focused on the ecology of cougars on and near the southern Colorado Plateau, in northern

Arizona, southern Utah, and southeastern Nevada. The project emphasized behaviors of cougars in wild and human-impacted environments, with the goal of generating insights to foster conservation of regional cougar populations and their prey, while providing for human safety. More specifically, the study documented the effects of highways, railroads, urbanized areas, protected areas, and prey concentrations on the behavior and demography of radio-marked cougars, drawing on data from a wide range of bio-geophysical conditions. More than 70 cougars were radio-collared and tracked by GPS locations downloaded daily via Argos satellites. Locations were visited soon after to build a detailed record of habitat use and predation, including >900 documented kills. Information was incorporated into geospatial models that explained human and other habitat effects and predicted distributions of cougars and related risks to humans. I was responsible for all facets of this long-term project, which began in 2002. The project involved numerous collaborators and was funded by the U.S. National Park Service, U.S. Department of Energy, Grand Canyon National Park Foundation, USGS Southwest Biological Science Center, USGS Fire Program, and several private foundations, among others. Collaborators included the National Park Service (Grand Canyon, Zion, and Capitol Reef National Parks), USGS Western Ecological Research Center, USDA Wildlife Services, Arizona Game & Fish Department, NSTec, Northern Arizona University, and the Grand Canyon Trust.

2. **Trophic Ecology of Predators and Prey on the Colorado Plateau** —This study entailed the analysis of numerous datasets from across the Colorado Plateau to build integrated models of trophic dynamics, involving vegetation, herbivores, and a top predator. The goal was to create state-of-the-art spatial models of time-series data depicting ecosystem dynamics across trophic levels, coupled with ensembles of downscaled global circulation model (GCM) projections to forecast future conditions on and near the Colorado Plateau. Explanatory and predictive models of vegetation used cutting-edge analyses of remotely-sensed imagery. Focal animals included mule deer (*Odocoileus heminous*), elk (*Cervus elaphus*), desert bighorn sheep (*Ovis canadensis nelsoni*), and cougars. Hierarchical Bayesian methods were used to estimate parameters and track uncertainty within and among models, including state-space models of animal movements. I was Principal Investigator and Leader of this project, which involved investigators from the University of Maryland, The Max Planck Institute, The Smithsonian, Duke University, Utah State University, and the USGS Western Ecological Research Center. Collaborators included Colorado Division of Wildlife, Utah Division of Natural Resources, and Arizona Game & Fish Department. The project was supported by a $2 million grant from the NASA ROSES program.

3. **Natural Resources Policy & Conservation** —This challenging project entailed the analysis of natural resources management to foster improved performance of decision-making processes. I analyzed a number of complex cases throughout the West, including grizzly bear conservation in the Rocky Mountains, cougar management in the Southwest, and management of human-origin waters for wildlife, at scales ranging from specific development proposals to regional social processes. These analyses provided participants and academic observers with insights into factors that govern the achievement of policy goals, often by reframing how participants understood their problems, with relevance to improving the design of decision-making processes. Leadership, large-carnivore conservation in North America, and the science-policy-management interface were all a fcous of attention. I collaborated with a number of colleagues from Canada and the United States on this program, including internationally-recognized experts in Q-methodology and the policy sciences. I held primary responsibility for analysis, for conceptualizing approaches, and for teaching, including classes at Yale and MIT. I worked closely with numerous stakeholders from government, academe, and the private sector to foster better-performing natural resources management. This wide-ranging

project was initiated in 1993 and supported by the USGS Southwest Biological Science Center, USGS Forest & Rangeland Ecosystem Science Center, U.S. National Biological Service, Northern Rockies Conservation Cooperative, numerous private foundations, MIT Department of Urban Studies & Planning, and the Yale School of Forestry & Environmental Studies.

4. **Modeling and Projecting Species Ranges** — This thematic project focused on developing geospatial models of ranges and habitat use by avian, reptile, and amphibian species in the southwestern United States that could be used to inform mitigation and restoration management at multiple scales. Most of this work was focused on modeling the current ranges of bird and herp species, and coupling these models with ensembles of downscaled regional GCMs to forecast future distributions under various climate change scenarios. This forecasting project was unique compared to others of its type by relying on conceptual models that encapsulated current ecological knowledge of modeled species, incorporation of static geophysical effects such as terrain and solar insolation, assiduous tracking of conceptual and quantitative uncertainties arising from sampling processes and numerous analytic decisions, and involvement of a stakeholder advisory group to inform all aspects of design. I served as co-Leader of this project, and played a major role in its overall conceptualization and design. A $2 million grant from the USGS National Climate Change and Wildlife Science Center (NCCWSC) supported this work. A related project focused on modeling finer-scale habitat use by yellow-billed cuckoos (*Coccyzus americanus occidentalis*), which are a threatened species being managed for restoration under the Lower Colorado River Multi-Species Conservation Program. I helped design and manage this project, which was supported by a $250 thousand grant from the Bureau of Reclamation.

5. **Ecology of Upland Waters in the Semi-Arid West** — This project addressed the effects of ponded natural and human-origin waters on upland ecosystems of the West. There is a dearth of information about the ecology of upland waters and the impacts of often dramatically human-altered hydrologic regimes on wildlife in uplands, which this project contributed to remedying. Results of this study were important to anticipating the consequences of climate change and judging the impacts of water management outside National Parks on Park resources that cross boundaries. Data on water-focused wildlife activity were collected using remote cameras as well as sign transects. Wildlife activity was explained in terms of habitat features, activity levels of other species, and availability of water as snow, preformed in vegetation, and in natural or artificial basins. Sub-projects conducted in close collaboration with the National Park Service focused on natural and artificial water sources paired along boundaries of National Parks in the southern Colorado Plateau, including Walnut Canyon and Wupatki National Monuments. I supervised all facets of this work beginning in 2003, including a Master's degree project lasting from 2004-2007. Funding and other support were provided by the U.S. National Park Service, Western National Parks Association, and the USGS Southwest Biological Science Center.

6. **Modeling Demography and Habitat Suitability for Grizzly Bears** —This project focused on building robust regional-scale models for assessing the capability of habitat to support large carnivores, with an emphasis on grizzly bears. This endeavor employed coarse-filter analysis and the development of metrics that efficiently denoted human activity. These metrics were developed so as to be robust to the vagaries of data specification and resolution, and to provide a frame of reference that was stable across regions. Analyses of grizzly bear habitat capability were completed for the state of Idaho and for trans-boundary regions including British Columbia, Idaho and Montana. Additional analyses have been undertaken for the Yellowstone-to-Yukon region and for the

southwestern states of Arizona and New Mexico. Research is currently focused on developing robust measures of habitat productivity and related predictors of bear density that are comparable across regions. I have been responsible throughout this project for conceptualizing the approach, statistical analyses, and manuscript preparation. Work began in 1995 and has been funded or otherwise supported by the U.S. National Biological Service, USGS Forest & Rangeland Ecosystem Science Center, USGS Southwest Biological Science Center, Idaho Cooperative Fish & Wildlife Research Unit, Hornocker Wildlife Institute, Yellowstone-to-Yukon Initiative, The Wilderness Society, and The Wilburforce Foundation.

7. **Diet & Behavior of Grizzly Bears** —This project focused on explaining diet and habitat use of Yellowstone's grizzly bears as input to guide conservation of this and other internationally important populations. I elucidated the effects of diet on movements, body size, condition, and fecundity of grizzly bears, with implications for managing to mitigate the impacts of global climate change and invasive non-native species such as blister rust (*Cronartium ribicola*). Data were collected from several-hundred radio-marked animals distributed throughout the Yellowstone ecosystem and during extensive long-duration studies involving transects and random points. Sub-projects were a basis for models that predicted and explained grizzly bear use of individual foods, including spawning cutthroat trout (*Oncorhynchus clarki*), ungulate carrion on winter ranges, whitebark pine (*Pinus albicaulis*) seeds from red squirrel (*Tamiasciurus hudsonicus*) middens, and biscuitroots (*Lomatium cous*). This long-term integrated study, aspects of which began in 1977, generated a data-set for grizzly bears that is unparalleled in the world. I designed and immediately supervised all facets of field work for this study beginning in 1984, and was directly involved with data collection, 1979-1992. Parts of this research constituted three Master's degree projects. Funding was provided by the U.S. National Park Service, U.S. National Biological Service, USGS Forest & Rangeland Ecosystem Science Center, and USGS Southwest Biological Science Center.

C. **PREVIOUS PROFESSIONAL POSITIONS**

Wildlife Biologist, 0486, GS-11, U.S. Department of the Interior, Interagency Grizzly Bear Study Team, University of Idaho Cooperative Park Studies Unit, and USGS Forest & Rangeland Ecosystem Science Center

DATES From: 17 May 1992 To: 10 May 1997

I held primary responsibility for investigating habitat relations of grizzly bears in the Yellowstone ecosystem and investigated grizzly bear demography and conservation.

Wildlife Biologist, 0486, GS-9, U.S. Department of the Interior, Interagency Grizzly Bear Study Team

DATES From: 1 February 1986 To: 16 May 1992

I held primary responsibility for investigating habitat relations of grizzly bears in the Yellowstone ecosystem.

Biological Technician, 0404, GS-7, U.S. Department of the Interior, Interagency Grizzly Bear Study Team

DATES From: 19 May 1984 To: 30 January 1986

I held primary responsibility for fieldwork related to investigations of grizzly bear habitat relations in the Yellowstone ecosystem and collaborated with other team scientists on analysis and reporting of related scientific results.

(4) SIGNIFICANT ACCOMPLISHMENTS — U.S. Geological Survey

A. I successfully fostered and led collaboration among cougar researchers and other scientists to address research and management issues that transcend the inferential scope of single study areas or the limited sample sizes of single studies. These issues include functional responses of cougars to the full spectrum of variation in geomorphology, vegetation, prey availabilities, and human impacts; responses to climate; and variation in vital rates with differences in landscape lethality and productivity. I convened and led 6 workshops during the last 8 years expressly designed to foster collaboration and integration among cougar researchers on and near the Colorado Plateau, including a National Park Service-sponsored workshop to synthesize information relevant to human safety management, a workshop that was part of the *10th Biennial Conference of Research on the Colorado Plateau* in Flagstaff, AZ, and another as part of the *17th Annual Meeting of the Wildlife Society* in Snowbird, UT. These workshops and related efforts bore considerable fruit. Researchers from the National Park Service and two USGS offices formally integrated their cougar field studies in northern Arizona and southeastern Nevada as a result of my efforts. Of greater importance, a team that I led was successful in securing a $2 million grant from NASA to model trophically-defined dynamics of vegetation, herbivores, and top predators on the Colorado Plateau. This project brings modelers, experts in remote sensing, and field researchers together to geospatially analyze numerous datasets for cougars, mule deer, elk, and bighorn sheep from on and near the Colorado Plateau. One product will be the first-ever spatially-explicit model of cougar survival applicable to the entire intermountain West. This product alone will have considerable management relevance.

B. I initiated, designed and found funding for an on-going programmatic study of cougar ecology on the southern Colorado Plateau which has developed into a large-scale regional project. Starting with a widely-recognized but largely unaddressed need to understand the ecology of cougars living near people in predominantly wildlands environments, I grew a diversely-funded research program that currently encompasses both remote and human-impacted study areas around Flagstaff, AZ, Grand Canyon, Zion, and Capital Reef National Parks, the Arizona Strip, and the Nevada National Security Site and Desert Wildlife Range in southeastern Nevada. Working with Telonics Inc, which billed this project "a guinea pig," I pioneered use of GPS/Argos satellite collars on cougars and parlayed the near real-time data available from satellite transmissions into new insights and new hypotheses regarding predatory behaviors of cougars, which are providing new research directions for this and other projects. Initial products included pioneering fine-scale maps of predicted seasonal cougar activity for use in managing human impacts and human safety, and, in collaboration with ESRI, a pioneering application of cougar data to development of a software extension to ArcGIS for agent-based modeling. The project has also entailed working with numerous cooperators from the public and private sector. Like virtually all field studies of large mammals, definitive products await completion of this long-term study. Even so, I delivered 48 talks to public, agency, and academic audiences, 38 of which were invited, to increase public awareness and knowledge of cougars and to expedite dissemination of technical information. I also published four fact sheets, one paper in the *8th Mountain Lion Workshop Proceedings*, and 3 major progress reports that provided peer-reviewed updates on research progress and important findings such as unprecedented predation by cougars on coyotes (*Canis latrans*), rare road crossings controlling for

effects of other habitat features, and different life strategies of sex, age, and reproductive classes. The project is viewed as a ground-breaking effort by managers and other researchers, who have used it as a model for subsequent studies in Arizona, Nevada, and Colorado.

C. I was recognized as one of the foremost practitioners of the policy sciences analytic framework applied to natural resources cases. The policy sciences offer a conceptually comprehensive set of tools for understanding the behaviors of people and organizations involved in complex management cases. Compared to other analytic approaches, these tools offer a more efficient and functional way to orient to policy problems and, from that, gain useful insights into social- and decision-making processes organized around the development and implementation of natural resources policies. The goal is to upgrade policy processes to better serve widely-recognized social values such as human dignity and democratic principles. I was involved in integrating knowledge from ethics, organizational behavior, science studies, and social-psychology under the policy sciences framework in service of this end, with application to cases as diverse as the Glen Canyon Dam Adaptive Management Program, USGS Biological Resources Discipline, management of anthropogenic waters in the Southwest, and management of cougars in the West and polar bears in the arctic. My proficiency with the policy sciences was recognized in many ways, including invitations to instruct seven demanding graduate-level classes (four at Yale, four at MIT, and one at Northern Arizona University), election to the Society for Policy Sciences, prestigious academic appointments at the Yale School of Forestry & Environmental Studies, MIT Department of Urban Studies & Planning, and Northern Arizona University Center for Environmental Sciences & Education, and appointment as Western Field Director for the MIT-USGS Science Impact Collaborative (MUSIC). I gave numerous lectures in professional and academic venues demonstrating policy sciences, 70 all told and 60 since 2000, and published 16 related articles as book chapters or in journals such as *BioScience*, *Policy Sciences*, *Environmental Science & Policy*, and *Journal of Energy, Natural Resources & Environmental Law*.

D. I was at the forefront of developing and applying methods for modeling the geospatial distribution and abundance of a wide range of species, including large carnivores, birds, reptiles, and amphibians. Together with a collaborator, I developed methods for assessing broad-scale habitat suitability and meta-population structure for grizzly bears. The approach emphasized human impacts and the use of coarse-scale qualitative and quantitative information to bring systematic analysis to management-relevant issues. The methods were applied to grizzly bear restoration in Idaho, Montana, and the Southwest, to the appraisal of umbrella effects for carnivores in the Rocky Mountains (as reported on by *Science*), and to the appraisal of unoccupied habitat in the Yellowstone region. This team also investigated historical extirpations of grizzly bears in the contiguous U.S., which was reported in *Conservation Biology* and an associated press release by the journal. This research has had significant effects on the framework for managing grizzly bears throughout their range. More recently, I played a leadership role in teams modeling habitat use and distributions of avi- and herpeto-fauna, funded by major grants from the USGS National Climate Change and Wildlife Science Center and the Bureau of Reclamation. These projects focused on projecting future distributions under climate change, but employing uniquely sophisticated approaches that were largely conceptualized by the scientist. I played a major role in communicating the framework of these projects to stakeholders, including USGS leadership and a project Advisory Team. Results of this body of work have been reported in 11 peer reviewed publications and three technical reports, and were part of 20 presentations in technical or other public venues.

E. More recently I was involved in developing a research program focused on leadership. This program inquired into the context-specific elements of effective leadership, including the expectations of those

being led, and elucidates implications for public order and natural resources governance. This research was relevant to the development of effective leadership in not only natural resources governance, but also in USGS itself. One major result was the identification of multiple narratives regarding "good" or "effective" leadership that are associated with different expectations regarding leader behaviors. These narratives are associated with personality traits and value orientations. Results of this program have been reported in one journal article that studied perspectives of leaders on the challenges of an environmental movement at a key moment in its history (the Yellowstone to Yukon Conservation Initiative), as well as in one conference presentation and four seminars.

F. I developed theoretical models that describe and explain relations among human and biological factors affecting the demography of grizzly bears and other large carnivores, with relevance to conservation of imperiled species and populations throughout the world. These models and related analyses identified factors with primary effects on outcomes of interest to society. This holistic framework provided those interested in large-carnivore management with insights that can improve management and facilitate attainment of policy objectives. This research was reported in 24 talks to scientific societies or in other scientific venues, 29 talks to university classes and seminars, 17 public or other general informational talks, and 14 papers or chapters published in prestigious journals or books. Much of this work was by invitation of organizations such as the Yale School of Forestry & Environmental Studies, University of Michigan, the International Association for Bear Research and Management, the Society for Conservation Biology, Parks Canada, the Royal Zoological Society, the Denver Zoo Conservation Biology Department, the American Museum of Natural History, and the Smithsonian, and has been reported in journals such as *Conservation Biology*, *International Journal of Wilderness*, *Biological Conservation*, *International Conference on Bear Research & Management*, and books such as *Carnivore Conservation*, *Coexisting with Large Carnivores*, and *Predators and People*.

G. Together with a collaborator, I established the importance of behavioral structuring and food availability to explaining death rates of grizzly bears in the Yellowstone region. This was the first time that behavioral differences had been invoked to explain vital rates for bears. This research entailed demographic modeling of messy radio-telemetry data that advanced the state of knowledge and analytical ability in this field. The approach was demonstrated using grizzly bear data, but has application to any species and radio-telemetry data set. I was responsible for a major part of conceptualizing the general approach and applying it to the grizzly bear data set, whereas the collaborator bore equal responsibility for conceptual development and sole responsibility for programming and specifying the mathematical basis of the model. Results of this effort were published in *Ecology*, included in two presentations at scientific meetings, and featured in reports by the Ecological Society of America and *Science*. I also contributed substantially to conceptualizing a mathematically explicit theory that incorporates the effects of habituation into a birth- and death-process model, reported in a talk to the Annual Meeting of the Animal Behavior Society. This model promises to help scientists appreciate the effects of behavior on demography and to better design future demographic research and analysis. I bore sole responsibility for specifying the mathematics of this model.

H. Using data from a long-term integrated study, I described and explained in unprecedented depth and detail the diet, habitat use, and foraging behavior of Yellowstone's internationally significant grizzly bear population. I also elucidated relations of their diet to diets of other brown bear populations, implications of diet to seasonal foraging strategies, and implications of dietary variation to research and habitat management. Of relevance to long-term conservation of grizzly bear habitats and conservation-relevant mitigation of conflicts with humans, I also documented July-September as a critical foraging period, the major foods consumed during this time, and the relative and absolute importance to bears of whitebark pine seeds, ungulates, and army cutworm moths (*Euxoa auxiliaris*). This information not only strongly influences management of grizzly bears in the Yellowstone area, as evidenced by frequent citation in numerous management documents, but also, through general conclusions regarding variability of diet and habitat use, the design of research and management worldwide. The level of detail and scope of analysis in this research are unprecedented for bears. Moreover, this research was the first to analyze, in detail, bear behaviors such as geophagy, rubbing, and the consumption of wasps, earthworms, and fungal

sporocarps. Results of this research were reported in 19 talks at scientific meetings, in 18 peer-reviewed journal articles, four technical reports, and in more than a dozen invited talks to students, managers, and the interested public.

I. I described the effects of humans and human facilities on grizzly bear habitat use and major causes of human-bear conflicts in the Yellowstone ecosystem using a long-term ecosystem data set collected from several-hundred radio-marked bears. I described the degree and nature of impacts, specific to season, type of year, and type of bear. I also addressed, in detail, the roles of whitebark pine seed crop variation, interspecific interactions, and conditioning to humans in human-bear conflicts and related grizzly bear deaths. Information from these papers continues to provide a seminal foundation for managers understanding human-bear conflicts and the effects of humans and their facilities on bear populations, as well as key to appraising management effectiveness and identifying causes amenable to management intervention. This research has had a major effect on the design of grizzly bear management and research in the Yellowstone ecosystem, as evidenced by references in virtually every document germane to establishing management policies and practices for Yellowstone's grizzly bear population. Results of this research have been reported at two scientific meetings, in three peer-reviewed papers, and in more than a dozen talks to students, managers, and the interested public.

J. I completed a long-term study, designed and directed with two collaborators, that described relations among fire, whitebark pine, red squirrels, and grizzly bears. Whitebark pine seeds are one of the most important foods of Yellowstone's grizzly bears. Results of this study continue to be a basis for management of habitats on National Park Service and U.S. Forest Service lands where bears feed on pine seeds, primarily through attention to red squirrel requirements for mixed-species old-growth stands. Given the potential vulnerability of whitebark pine to global climate change, mountain pine beetles (*Dendroctonus ponderosae*), and white pine blister rust (*Cronartium ribicola*), the results of this study are an important basis for anticipating the effects of these agents of change on grizzly bears. This study also clearly demonstrated the nature and degree of human and fire impacts on grizzly bear use of this food, avoiding several of the biases affecting radio-telemetry data. This study additionally demonstrated the benefits of using transect methods to address more refined hypotheses about bear habitat use. Results pertaining to red squirrels and bears were reported in progress reports and five papers presented at scientific meetings, as well as in three peer-reviewed journal articles, three papers in conference proceedings, and one book chapter. Management implications were summarized in a set of recommendations that were solicited by managers in the Yellowstone ecosystem.

K. I, along with two collaborators, completed a long-term study that provided definitive insight into spring availability and bear use of ungulate carcasses on three ungulate winter ranges in Yellowstone National Park. Meat from carrion is the most important spring food of Yellowstone grizzly bears. Winter ranges in this study spanned conditions represented by the Park, and results provided a basis for identifying critical carcass types, foraging times, and foraging areas for bears; for developing explanatory models of carcass use and depletion; and for understanding relations among black bears (*Ursus americanus*), grizzly bears, and humans. This study provided essential information to managers attempting to mitigate for effects on bears of ungulate sport harvests, management of bison for control of brucellosis, and recently reintroduced wolves. This unique study also demonstrated the efficacy of survey-type studies in addressing hypotheses related to bear use of specific foods and habitat complexes. I was fully responsible for design and direction of this study and collaborated on execution, analysis and reporting of this research. Results were presented in progress reports, a workshop proceedings, a technical report related to wolf reintroduction, and a peer-reviewed journal article.

L. A collaborator and I completed a long-term pioneering study of grizzly bear use of cutthroat trout spawning streams in Yellowstone National Park. Trout were at one time the most important early-summer food of grizzly bears in southern and central parts of the Yellowstone ecosystem. The parameters of heavily used streams, the extent of stream influence on bear movements, the relative consumption of trout by bears, time periods when spawning streams were heavily used, and inter- and intraspecific interactions among black bears, grizzly bears and humans were described and explained. This information is important to and has shaped the management of Yellowstone's grizzly bears because of the large number of bears potentially fishing at spawning streams and

because of the increasing effects of drought and non-native lake trout (*Salvelinus namaycush*) on cutthroat trout in Yellowstone Lake. Predation by lake trout has dramatically reduced numbers of cutthroat trout available to Yellowstone grizzly bears. This study established a benchmark for more recent studies attempting to judge impacts of these and other changes in fisheries and habitats. Results were presented at a scientific meeting, in progress reports, and in two peer-reviewed journal articles. I was primarily responsible for design, and collaborated on execution, analysis and reporting of this research.

(5) SCIENTIFIC LEADERSHIP — U.S. Geological Survey

A. I took a significant leadership role in setting strategic science direction for the USGS at the national and Center levels. I was viewed as and routinely sought out to be a leader in this regard on numerous issues within the Southwest Biological Science Center (SBSC). At the national level, I was part of the Science Advisory Group for the USGS Science Strategy Team and Team Leader (Large Mammals & Predators) for the USGS Wildlife Program Five-year Strategic Plan. At the Center level, I twice served as an invited member of the SBSC Strategic Planning Core Team. These seminal planning efforts occurred shortly after creation of the SBSC and during its current fiscal uncertainties, and were instrumental in setting the Center's scientific and science management direction. I was also routinely consulted on an informal basis about strategic science issues and directions by Center leadership.

B. I exercised considerable initiative and leadership in creating venues to foster exchanges among researchers, managers, and traditionally conflicted stakeholders involved with large-carnivore research and management throughout the West, with a focus on grizzly bears and cougars in the Rocky Mountains. For example, these exchanges occurred in venues that I designed to integrate regional research efforts for cougars (six different workshops during an 8-year period), foster civil exchanges of information and perspectives about cougar management (a special session of the *7th Biennial Conference of Research on the Colorado Plateau*; resulting in two papers in a book edited by the scientist), increase knowledge among regional managers about managing for human safety around cougars and black bears (the workshop *Large Carnivores on the Plateau*; resulting in a report to regional managers and scientists during the *6th Biennial Conference of Research on the Colorado Plateau*), and foster discovery of common ground among stakeholders in grizzly bear and cougar management in the Northern U.S. Rocky Mountains (the workshop *Perspectives on Large Carnivore Conservation*; resulting in an article in the journal *Environmental Science & Policy*). These venues served to enhance the role of science in management through fostering the discovery and building of common ground.

C. I demonstrated leadership in pursuing professional directions and undertaking organizational analyses directly relevant to enhancing overall performance of the former USGS Biological Resources Discipline (BRD), typically at my own initiative and often entailing professional risk. For example, I used Science Center venues to critique the practice of peer review within USGS, the agency's approach to climate change science, and the maladies of scientific management. I also undertook appraisals of the high-profile Glen Canyon Dam Adaptive Management Program (GCDAMP) and of the BRD at my own initiative. Both appraisals were subsequently well-received by those authoritatively involved in GCDAMP and BRD, with prospects for contributing to improving the performance of both institutions. In a similar vein, I worked toward developing a different paradigm of practice for biological sciences within USGS, involving the critique of *status quo* conventions and the promotion of collaboration among scientists, managers and other stakeholders. My efforts and innovations resulted in several internal USGS awards (e.g., the *Paradigm Shifter* and *Exploding Head* awards), as well as appointments with the Yale School of Forestry & Environmental Studies and the MIT-USGS Science Impact Collaborative

(MUSIC). I was Western Field Director for MUSIC through 2010, with a focus on fostering integrated collaborative science in the Western Region. These leadership efforts were important to the future direction of USGS, and required that I operate with sophistication and nuance organizationally, exercise considerable vision, and demonstrate a willingness to take professional risks.

D. I effectively led the development of research programs on the Colorado Plateau, framed by a "gap analysis" that I undertook soon after my arrival in this region in 1999. This analysis focused on unaddressed research needs and resulted in the development of programs featuring cougar-human relations, cougar-prey relations, and the ecology of upland waters. A seminal aspect my approach was the rational development of needs-based programs rather than the opportunistic pursuit of funds. This particular demonstration of leadership required effective communication with DOI clients and state-level and private cooperators, the garnering of funds from diverse sources, and the encouragement and inspiration of collaborators and employees to achieve their creative potential and professional vision. Despite an initial dearth of resources, these research programs grew to garner nearly $3 million in support from numerous governmental and private sources. My internal leadership of science programs was evident in exceptionally high marks received from two "360°" appraisals by peers and employees, one each during 2006 and 2007.

E. I took a leadership role as part of the SBSC Colorado Plateau Research Station (CPRS), both by invitation and initiative. Based on demonstrated abilities, I was designated Chair of the Information Resources Management (IRM) Committee at a time when IRM issues and related personality conflicts were particularly contentious. I also took the initiative to develop an alternative management structure for the CPRS at a time of corrosive friction, for which I received a Star Award. Later, I successfully chaired the *Biennial Conference of Research on the Colorado Plateau* at a particularly difficult time when institutional support had waned, and insured that this important regional venue for connecting researchers and managers survived to flourish when institutional support reemerged. I received a Star Award for his efforts with the *Biennial Conference*. In a similar vein, I was able to successfully reenergize Client's Day for the *5th Biennial Conference of Research on the Colorado Plateau* within a few months of arriving at a new duty station, for which I received a Star Award, and on another occasion took the initiative to act as 3rd party to negotiate a settlement for access to sensitive data, for which I received a Special Act Service Award. This history of service to CPRS continued when I took on the duties of Station Leader/Liaison, 2008-2011, during which I dealt with a number of sensitive organizational and personnel issues, including renegotiating a 5-year cooperative agreement with Northern Arizona University. I received two Star Awards for this service as Station Leader.

(6) SCIENTIFIC AND PUBLIC SERVICE

A. MEMBERSHIPS IN PROFESSIONAL SOCIETIES

The American Society of Mammalogists
The Society for Conservation Biology
American Association for the Advancement of Science
The Society for Policy Sciences
Wild Felid Research & Management Association

B. **TECHNICAL PRESENTATIONS**

not including public, classroom, training or information transfer presentations

157. "Reconceiving recovery for grizzly bears," at *College of Natural Resources Seminar Series*, University of Idaho, Moscow, Idaho, April 2019. (INVITED)

156. "Reconceiving recovery for grizzly bears," at *Public Interest Environmental Law Conference*, University of Oregon, Eugene, Oregon, March 2019. (INVITED)

155. "An incidental Holocene history of whitebark pine and grizzly bears," at *10th Annual Whitebark Pine Ecosystem Foundation Science and Management Conference*, Montana State University, Bozeman, Montana, August 2018. (INVITED)

154. "Sex, death, and wildlife management," at *Living Large – Wolves, Bears, Cougars and Humans in North America*, Human Society Institute of Science & Policy, Washington, D.C., October 2015.

153. "Cascading cougars?: The contingencies of cougar effects on prey," at *South East Idaho Environmental Network Seminar*, Idaho State University, Pocatello, ID, April 2014.

152. "Effects of conspecifics on habitat selection by grizzly bears in the southwest Yukon, Canada," 2nd author with R. Maraj, C. Cormack Gates, & R.K. McCann at *20th International Conference on Bear Research & Management*, Ottawa, Canada, July 2011.

151. "Sex matters: Dietary strategies of male and female cougars on the southern Colorado Plateau," 2nd author with B. Holton at *10th WAFWA Mountain Lion Workshop*, Bozeman, MT, June 2011.

150. "The discourses of incidents: Cougars on Mt. Elden and in Sabino Canyon, Arizona," 1st author with S. Clark at *10th WAFWA Mountain Lion Workshop*, Bozeman, MT, June 2011.

149. "An explanation of cougar-related behaviors and behavioral intentions among northern Arizona residents," 2nd author with E.J. Ruther at *10th WAFWA Mountain Lion Workshop*, Bozeman, MT, June 2011.

148. "Two paradigms of climate change science: In service of greenhouse politics and pragmatic adaptation," at *2010 USGS Southwest Biological Science Center All Hands Meeting*, Flagstaff, AZ, December 2010. (INVITED)

147. "The many faces of peer review," at *2010 USGS Southwest Biological Science Center All Hands Meeting*, Flagstaff, AZ, December 2010. (INVITED)

146. "Leadership as social relationship: Perspectives on good leadership and implications for social order," 1st author with S. Clark at *2010 Policy Sciences Annual Institute*, Yale University Law School, New Haven, CT, October 2010.

145. "Scale: Refining the concept in policy sciences," at *2010 Policy Sciences Annual Institute*, Yale University Law School, New Haven, CT, October 2010.

144. "Sex matters: Predatory strategies of male and female cougars," at *Brigham Young University, Wildlife & Wildlands Conservation Seminar*, Provo, UT, October 2010. (INVITED)

143. "**WORKSHOP**: Opportunities for collaborative mountain lion research in the interior western United States," 1st organizer with M. Wolfe at *17th Annual Conference of The Wildlife Society*, Snowbird, UT, October 2010.

142. "Grizzly bears and pine seeds: Complexity and contingency," 1st author with D. Reinhart at *High-Five Symposium: The Future of High-Elevation Five-Needle White Pines in Western North America*, Missoula, MT, June 2010. (INVITED)

141. "Restoring an extirpated species: Grizzly bears in the Southwest?," at *25th Annual Meeting of the Southwest Region Native American Fish & Wildlife Society*, Scottsdale, AZ, July 2010. (INVITED)

140. "The USGS National Climate Change and Wildlife Science Center," 2nd author with K. Kitchell at *25th Annual Meeting of the Southwest Region Native American Fish & Wildlife Society*, Scottsdale, AZ, July 2010. (INVITED)

139. "Development of mountain lion habitat selection models using ArcGIS Model Builder," 2nd author with T.R. Arundel, B. Holton, K. Ironside, & J. Hart on POSTER for 2009 ESRI International User Conference, San Diego, CA, June 2010.

138. "The status of mountain lion research in the southwestern United States," 2nd author with T.R. Arundel, B. Holton, & K. Ironside on POSTER for 2009 ESRI International User Conference, San Diego, CA, June 2010.

137. "Cougar management on the Colorado Plateau," at *2010 Annual Utah Chapter of the Wildlife Society Meeting*, Moab, UT, March 2010. (INVITED PLENARY)

136. "College and university programs as a policy problem: Integrating knowledge, education, and action for a better world," 4th author with S. Clark, M. Auer, & M. Rutherford at *2009 Policy Sciences Annual Institute*, Boulder, CO, October 2009.

135. "Roots of cougar-related human behaviors and behavioral intentions," 1st author with L. Ruther at *Carnivores 2009*, Denver, CO, November 2009.

134. "The discourse of incidents: Cougars and people on Mt. Elden and in Sabino Canyon," 1st author with S. Clark at *Carnivores 2009*, Denver, CO, November 2009.

133. "Factors affecting risk of puma attacks on humans," 1st author with L. Sweanor & K. Logan on POSTER for *Carnivores 2009*, Denver, CO, November 2009.

132. "PANEL: Mountain lions, people, and policy: Improving our prospects for effective conservation of a keystone predator," Panel member with J. Apker, T. Dunbar, R. Hopkins, G. Koehler, & R. Thompson at *Carnivores 2009*, Denver, CO, November 2009.

131. "**WORKSHOP**: Opportunities for collaborative mountain lion research on and near the Colorado

Plateau," at *10th Biennial Conference of Research on the Colorado Plateau*, Flagstaff, AZ, October 2009.

130. "No park is an island: Mountain lions on the southern Colorado Plateau," 1st author with B. Holton at *10th Biennial Conference of Research on the Colorado Plateau*, Flagstaff, AZ, October 2009. (INVITED)

129. "The social-psychology of dominant frames: 'Thresholds' in natural resources management," at *10th Biennial Conference of Research on the Colorado Plateau*, Flagstaff, AZ, October 2009. (INVITED)

128. "We talk about science and traditional knowledge, but are we not really talking about human dignity?," at *10th Biennial Conference of Research on the Colorado Plateau*, Flagstaff, AZ, October 2009. (INVITED)

127. "Effects of simulated mountain lion caching on prey-like carcasses," 2nd author with Z. Bischoff-Mattson on POSTER for *10th Biennial Conference of Research on the Colorado Plateau*, Flagstaff, AZ, October 2009.

126. "Roots of cougar-related human behaviors and behavioral intentions," 1st author with L. Ruther on POSTER for *10th Biennial Conference of Research on the Colorado Plateau*, Flagstaff, AZ, October 2009.

125. "The discourse of incidents: Cougars and people on Mt. Elden and in Sabino Canyon," 1st author with S. Clark on POSTER for *10th Biennial Conference of Research on the Colorado Plateau*, Flagstaff, AZ, October 2009.

124. "Predatory behavior of mountain lions on the southern Colorado Plateau," 1st author with B. Holton at *24th Annual Meeting of the Southwest Region of the Native American Fish & Wildlife Society*, Isleta, NM, July 2009.

123. "'For the good of the resource': Nature as a constructed and contested participant" at *2008 Policy Sciences Annual Institute*, University of Colorado, Boulder, CO, October 2008.

122. "The witch craze: Natural resources parable and policy sciences interpretation" at *2008 Policy Sciences Annual Institute*, University of Colorado, Boulder, CO, October 2008.

121. "The virtues of Q methodology in natural resources planning and decision making," 2nd author with N. Sexton, T. Cheng, & J. Clement, at *14th International Symposium on Society & Natural Resources Management*, Burlington, VT, June 2008.

120. "What is the problem?: Some orientation for the Global Climate Change Collaborative (G3C)" at *Inaugural Meeting of the Global Climate Change Collaborative*, Massachusetts Institute of Technology, Cambridge, MA, March 2008.

119. Mattson, D., "Improving professional practice in resource management agencies: Experiences, patterns and possible insights" at *2007 Policy Sciences Annual Institute*, Claremont-McKenna College, Claremont, CA, October 2007.

118. "Conflict over cougars: A window on natural resources governance" at *2007 Policy Sciences*

Annual Institute, Claremont-McKenna College, Claremont, CA, October 2007.

117. "Managing for human safety in mountain lion range," 1st author with K. Logan & L. Sweanor at *9th Biennial Conference of Research on the Colorado Plateau*, Flagstaff, AZ, October 2007.

116. "PANEL: Future of conservation biology on the Colorado Plateau," 2nd author with E. Grumbine, T. Fleischner, J. Belnap, & E Aumack, at *9th Biennial Conference of Research on the Colorado Plateau*, Flagstaff, AZ, October 2007.

115. "USGS science and the 'scientization' of policy: Thoughts from the East Coast," at *USGS Southwest Biological Science Center Annual All-Hands Meeting*, Flagstaff, AZ, February 2008.

114. "A model of a behaviorally-structured wildlife population," 2nd author with C. Pease for *44th Annual Meeting of the Animal Behavior Society*, Burlington, VT, July 2007.

113. "USGS BRD: A modern organization in a post-modern world," for *Seminar series*, USGS Flagstaff Science Center, Flagstaff, AZ, May 2007. (INVITED)

112. "Polar bear conservation policy: Conservation hunting and climate change," 3rd author with D. Clark, D. Lee, S. Clark & M. Freeman for *ArticNet Annual Science Meeting*, Victoria, BC, Canada, December 2006.

111. "Conservation hunting, climate change, and polar bear policy in Nunavut, Canada," 3rd author with D. Clark & D. Lee for *2006 Policy Science Annual Institute*, sponsored by the Society for Policy Sciences, Yale Law School, New Haven, CT, November 2006.

110. "Knowledge integration: An exploration of psychological frames for understanding personality and perspectives in natural resources cases," for *2006 Policy Science Annual Institute*, sponsored by the Society for Policy Sciences, Yale Law School, New Haven, CT, November 2006.

109. "Whitebark pine, grizzly bears and climate change," 2nd author with K. Kendall for *Carnivores 2006*, sponsored by Defenders of Wildlife, St. Petersburg, FL, November 2006. (INVITED)

108. "Upland free water and wildlife: Past, present and future on the Colorado Plateau," 3rd author with B. Holton & J. Hart for *33rd Natural Areas Conference*, sponsored by the Natural Areas Association, Flagstaff, AZ, September 2006.

107. "Lions on the Plateau: A research program for the Colorado Plateau," 2nd author with J. Hart & T. Arundel for *Learning from the Land 2006 Science Symposium*, sponsored by Grand-Staircase Escalante NM, Cedar City, UT, September 2006.

106. "Upland free water: Past, present and future in Grand Staircase-Escalante NM?," 2nd author with J. Hart & B. Holton for *Learning from the Land 2006 Science Symposium*, sponsored by Grand-Staircase Escalante NM, Cedar City, UT, September 2006.

105. "Conflict over carnivores: A window on natural resources governance," for Symposium on Integrative Problem Solving, *20th Annual Meeting of the Society for Conservation Biology*, San Jose, CA, June 2006. (INVITED)

104. "The importance of gatherings," 1st author with M. Johnson for workshop on *Capacity-Building for SCB Chapters in the 21st century, 20th Annual Meeting of the Society for Conservation Biology*, San Jose, CA, June 2006. (INVITED)

103. "Science and politics in high stakes natural resource decisions," Plenary for *Multidisciplinary Approaches to Recovering Caribou in Mountain Ecosystems*, sponsored by the Columbia Mountains Institute, Revelstoke, BC, May 2006. (INVITED)

102. "Cougars of the Colorado Plateau: A multi-park investigation," for *1st Workshop of the Colorado Plateau Mountain Lion Working Group*, sponsored by USGS Southwest Biological Science Center, Flagstaff, AZ, January 2006.

101. "Cougars of the Flagstaff Uplands: Preliminary results 2003-2005," 1st author with J. Hart and T. Arundel for *1st Workshop of the Colorado Plateau Mountain Lion Working Group*, sponsored by USGS Southwest Biological Science Center, Flagstaff, AZ, January 2006.

100. "Human dimensions of mountain lion management: Value orientations and policy preferences of northern Arizona residents," 3rd author with E.J. Ruther & D.M. Ostergren *8th Biennial Conference of Research on the Colorado Plateau*, sponsored by USGS Southwest Biological Science Center, Flagstaff, AZ, November 2005.

99. "Wildlife water developments and the social construction of conservation conflict," 1st author with N. Chambers *8th Biennial Conference of Research on the Colorado Plateau*, sponsored by USGS Southwest Biological Science Center, Flagstaff, AZ, November 2005.

98. "The ecological effects of artificial water sources in a changing hydrologic regime," 2nd author with P.B. Holton for *8th Biennial Conference of Research on the Colorado Plateau*, sponsored by USGS Southwest Biological Science Center, Flagstaff, AZ, November 2005.

97. "Predation by cougars in the Flagstaff Uplands 2003-2005," 1st author with J. Hart & T. Arundel for *8th Biennial Conference of Research on the Colorado Plateau*, sponsored by USGS Southwest Biological Science Center, Flagstaff, AZ, November 2005. .

96. "Conflict over carnivores: A window on natural resources governance," Plenary for conference on *Governance and Decision-Making in Mountain Areas*, sponsored by Parks Canada and The Banff Centre, Banff, AB, Canada, June 2005. (INVITED)

95. "Cougars of the Flagstaff uplands: Cougar-informed spatial frames for analyzing habitat selection," 1st author with T. Arundel & J. Hart, POSTER for *8th Mountain Lion Workshop*, sponsored by the Washington Department of Fish & Wildlife, Leavenworth, WA, May 2005. .

94. "Cougars of the Flagstaff uplands: Results of 2003-2004 predation studies," 1st author with J. Hart & T. Arundel, for *8th Mountain Lion Workshop*, sponsored by the Washington Department of Fish & Wildlife, Leavenworth, WA, May 2005.

93. "Harvesting lessons of inventorying biological resources: Thoughts on design from the Colorado Plateau," 1st author with C. Drost, E. Nowak, T. Persons, M. Johnson, G. Rink, & J. Holmes, for *2005 George Wright Society Biennial Conference on Parks, Protected Areas and Cultural Sites*, sponsored by the George Wright Society, Philadelphia, PA, March 2005. (INVITED)

92. "A multi-park design for investigating cougar-related risks to humans in the Southwest," 1st author with J. Hart, T. Arundel, E. Garding, H.S. Kim, & E. Leslie, for *2005 George Wright Society Biennial Conference on Parks, Protected Areas and Cultural Sites*, sponsored by the George Wright Society, Philadelphia, PA, March 2005.

91. "The psycho-sociology of integrating conservation science and management," for the conference *A Bright Future for Biodiversity Conservation on the Colorado Plateau*, sponsored by the Colorado Plateau Chapter of the Society for Conservation Biology, Prescott College, Prescott, AZ, March 2005.

90. "Perspectives on wildlife, water, and humans in uplands of the Colorado Plateau," 1st author with B. Holton, T. Arundel, & J. Hart, for the *Wildlife Water Development Workshop*, sponsored by the ASU Law School, BLM, US Fish & Wildlife Service, and Arizona Game & Fish Department, Arizona State University Law School, Phoenix, AZ, November 2004.

89. "The right values at the wrong time?: A functional explanation of factors and participant responses," as part of panel on The Yellowstone to Yukon Conservation Initiative, for *2004 Policy Sciences Annual Institute*, sponsored by Society for Policy Sciences, Yale Law School, New Haven, CT, October 2004.

88. "Implementing impact-assessment models in bear management," for an informal workshop with Japanese bear research and management specialists, sponsored by the Japan Ecosystem Conservation Society, Tokyo, Japan, September 2004. (INVITED)

87. "Using habitat evaluation models for conservation design," Plenary for *The International Symposium on Habitat Evaluation*, sponsored by the Japan Ecosystem Conservation Society, Tokyo, Japan, September 2004. (INVITED)

86. "Seeing the elephant: Holistic intelligence for solving wildlife-related problems," for *Interdisciplinary Research and Management in Mountain Areas* conference, sponsored by Parks Canada and the Banff Centre, Banff, AB, September 2004. (INVITED)

85. "Effects of humans and black bears on the post-Pleistocene invasion of grizzly bears," 1st author with S. Herrero for *2004 Ecological Society of America Annual Meeting*, sponsored by the Ecological Society of America, Portland, OR, August 2004.
http://abstracts.co.allenpress.com/pweb/esa2004/document/35283. (INVITED)

84. "Values, myths and narrative in conservation," for the conference *Views of the Elephant: Lessons Learned form Personal Experiences in Conservation*, sponsored by the Colorado Plateau Chapter for Conservation Biology, Marble Canyon, AZ, April 2004.

83. "Policy-oriented conservation design," for workshop *Policy-Oriented Conservation Design*, sponsored by the Wilburforce Foundation and Y2Y Conservation Initiative, Pender Island, BC, February 2004. (INVITED)

82. "Consumption of voles and vole food caches by Yellowstone grizzly bears: Exploratory analyses," POSTER for *15th International Conference of Bear Research and Management*, sponsored by the International Bear Association, San Diego, CA, February 2004.

81. "Consumption of pondweed roots by Yellowstone grizzly bears," 1st author with S. Podruzy & M. Haroldson POSTER for *15th International Conference of Bear Research and Management*, sponsored by the International Bear Association, San Diego, CA, February 2004.

80. "Natural landscape features, human-related attractants, and conflict hotspots: A spatial analysis of human-grizzly bear conflicts," 3rd author with S. Wilson, M.J. Madel, J.M. Graham, J.A. Burchfield, & J.M. Belsky for *15th International Conference of Bear Research and Management*, sponsored by the International Bear Association, San Diego, CA, February 2004.

79. "Are black bears a factor in the restoration of North American grizzly bear populations?," 1st author with S. Herrero & T. Merrill for *15th International Conference of Bear Research and Management*, sponsored by the International Bear Association, San Diego, CA, February 2004.

78. "Spatial analysis of puma (*Puma concolor*) habitat use relative to topographic roughness in northern Arizona," 3rd author with T.R. Arundel, S.T. Arundel & J Hart POSTER for *7 th Biennial Conference of Research on the Colorado Plateau*, sponsored by the 7th Biennial Conference Committee, Flagstaff, AZ, November 2003.

77. "A conceptual model and appraisal of research related to interactions between humans and pumas," 1st author with J. Hart & P. Beier for *7th Biennial Conference of Research on the Colorado Plateau*, sponsored by the 7th Biennial Conference Committee, Flagstaff, AZ, November 2003.

76. "Clarification of perspectives and pursuit of the community interest: Carnivore conservation in the Northern Rockies," 4th author with S.R. Brown, K.L. Byrd, T.W. Clark, & M. Rutherford for *2003 Policy Sciences Annual Institute*, sponsored by Society for Policy Sciences, Yale Law School, New Haven, CT, October 2003.

75. "Coefficients of productivity for Yellowstone's grizzly bear habitat," for *Workshop on evaluating the Yellowstone grizzly bear cumulative effects model*, sponsored USGS Interagency Grizzly Bear Study Team, Bozeman, MT, September 2003. (INVITED)

74. "Grizzly bear use of whitebark pine habitats," 1st author with D. Reinhart for *Whitebark Pine Committee 2003 Workshop*, sponsored by the Greater Yellowstone Coordinating Committee, Lake Village, Yellowstone National Park, WY, June 2003. (INVITED)

73. "A conceptual model and appraisal of existing research related to interactions between humans and pumas," 1st author with J. Hart, P. Beier, & J. Millen-Johnson for *7th Mountain Lion Workshop*, sponsored by Wyoming Game & Fish Department and The Wildlife Society, Jackson, WY, May 2003.

72. "Bridging scales, bridging to conservation practice: Grizzly bear science in Y2Y," Plenary for *Making Science, Making Change in Y2Y: Four Years of Research and Collaboration on Ecological Connectivity*, sponsored by the Yellowstone-to-Yukon Conservation Initiative and Wilburforce Foundation, Calgary, AB, May 2003. (INVITED)

71. "The Southern Colorado Plateau Network inventory: Where to from here?," for *Southern Colorado Plateau Network Inventory & Monitoring Workshop*, sponsored by the U.S. National Park Service, Southern Colorado Plateau Network, Farmington, NM, April 2003. (INVITED)

70. "How well do different approaches address rare species, biologically and ecologically?," as speaker and panel member for *Innovations in Species Conservation Symposium: Integrative Approaches to Address Rarity & Risk*, sponsored by the U.S. Forest Service, USGS, and etc., Portland, OR, April 2003. (INVITED)

69. "Why grizzly bears?," for *Central Rockies Ecosystem Grizzly Bear Management Workshop*, sponsored by the Central Rockies Ecosystem Interagency Liaison Group, Radium, BC, April 2003. (INVITED)

68. "Promises and pitfalls of models in science and management," for *Central Rockies Ecosystem Grizzly Bear Management Workshop*, sponsored by the Central Rockies Ecosystem Interagency Liaison Group, Radium, BC, April 2003. (INVITED)

67. "Thoughts on transboundary monitoring and management of grizzly bears," for *Kluane National Park and Reserve Grizzly Bear Symposium*, sponsored by Parks Canada Yukon Field Unit, Haines Junction, Yukon Territory, March 2003. (INVITED)

66. "A model-based appraisal of grizzly bear habitat conditions in northwestern Montana," 1st author with T. Merrill for the *Border Bears Workshop*, sponsored by the National Wildlife Federation and U.S. Fish and Wildlife Service, Sandpoint, ID, December 2002. (INVITED)

65. "Perspectives in grizzly bear conservation: Representations from newspaper and magazine articles," 1st author with S. Wilson for *Carnivores 2002*, sponsored by Defenders of Wildlife, Monterey, CA, November 2002.

64. "Conditions of grizzly bear policy implementation: An inside view," 1st author with T. Clark for *2002 Policy Sciences Annual Institute*, Yale Law School, New Haven, CT, October 2002.

63. "Umbrella effects," 2nd author with T. Merrill for *CERI Meeting on Conservation Area Design*, sponsored by the Craighead Environmental Research Institute, B-Bar Ranch, MT, September 2002.

62. "Conservation of mountain carnivores: Living with mountain carnivores?," for *Ecological and Earth Sciences in Mountain Areas* conference, sponsored by Parks Canada and the Banff Centre, Banff, AB, September 2002. (INVITED)

61. "Restoring an extirpated species: Grizzly bears in the Southwest?," for *Second Annual Meeting of the Southwestern Carnivore Committee*, sponsored by U.S. Fish and Wildlife Service and the Tuner Endangered Species Fund, Grand Canyon National Park, AZ, May 2002.

60. "Restoring an extirpated species: Grizzly bears in the Southwest?," POSTER with T. Merrill for *6th Biennial Conference of Research on the Colorado Plateau*, sponsored by USGS Colorado Plateau Field Station, Flagstaff, AZ, November 2001.

59. "Report from a workshop on the biology and management of pumas and black bears in Colorado Plateau National Parks," 1st author with E. Leslie for *6th Biennial Conference of Research on the Colorado Plateau*, sponsored by USGS Colorado Plateau Field Station, Flagstaff, AZ, November 2001. (INVITED)

58. "A conceptual framework for large carnivore conservation: The case of Yellowstone's grizzly bears," for *First Annual Meeting of the Southwestern Carnivore Committee*, sponsored by the Turner Endangered Species Fund and U.S. Fish and Wildlife Service, Albuquerque, NM, June 2001.

57. "Grizzly bears in the southwest: Some biophysical features of their extirpation and current prospects," for *First Annual Meeting of the Southwestern Carnivore Committee*, sponsored by the Turner Endangered Species Fund and U.S. Fish and Wildlife Service, Albuquerque, NM, June 2001.

56. "The effects of fragmentation, edges and habitat loss on wildlife: A perspective for mountain environments," for conference on *Human Use Management in Mountain Areas*, sponsored by Parks Canada and The Banff Centre, Banff, AB, June 2001. (INVITED)

55. "Consumption of earthworms by Yellowstone grizzly bears," 1st author with M. French & S. French, POSTER for *13th International Conference on Bear Research and Management*, sponsored by the International Association for Bear Research and Management, Jackson, WY, May 2001.

54. “Consumption of fungal sporocarps by Yellowstone grizzly bears,” 1st author with S. Podruzny & M. Haroldson, POSTER for *13th International Conference on Bear Research and Management*, sponsored by the International Association for Bear Research and Management, Jackson, WY, May 2001.

53. “Defining habitat suitable for grizzly bears in the Greater Yellowstone Ecosystem,” 2nd author with T. Merrill for *13th International Conference on Bear Research and Management*, sponsored by the International Association for Bear Research and Management, Jackson, WY, May 2001.

52. “Conservation of grizzly bears in the northern U.S. Rockies: An explanatory hypothesis,” 1st author with T. Clark for *13th International Conference on Bear Research and Management*, sponsored by the International Association for Bear Research and Management, Jackson, WY, May 2001.

51. “Rationality or rationalization?: Science in the grizzly bear policy arena,” for *All Hands Meeting*, sponsored by the U.S.G.S. Forest and Rangeland Ecosystem Science Center, Corbett, OR, January 2001. (INVITED)

50. “Social process mapping for large carnivore conservation,” for *Managing Human Activities in Ecosystems in the Face of Large Uncertainties*, sponsored by the Science and Environmental Health Network, Missoula, MT, November 2000. (INVITED)

49. “Comparison of terrestrial and aquatic reserve designs: A northwest Montana pilot study,” 3rd author with T. Merrill & C. Frissell for *Annual Meeting of the Society for Conservation Biology*, sponsored by the Society for Conservation Biology, Missoula, MT, June 2000.

48. “Access management: Managing people not ecosystems,” for *Roads and Zones: Balancing Human Access in Public Lands*, sponsored by the Miistakis Institute for the Rockies, Radium Hot Springs, BC, February 2000.

47. “Use of non-native clover and grass by Yellowstone grizzly bears,” 2nd author with D.P. Reinhart & K.A. Gunther, POSTER for *Exotic Organisms in Yellowstone: Native Biodiversity Under Siege*, sponsored by Yellowstone National Park, Mammoth, WY, October 1999.

46. “The effect of exotic species on Yellowstone’s grizzly bears,” 3rd author with D.P. Reinhart, M. Haroldson, & K.A. Gunther for *Exotic Organisms in Yellowstone: Native Biodiversity Under Siege*, sponsored by Yellowstone National Park, Mammoth, WY, October 1999.

45. "Comprehensive analysis for successful carnivore conservation: A systematic framework for mapping key variables," 2nd author with T. Clark, R. Reading & B. Miller for the *Carnivore Conservation Symposium*, sponsored by the Royal Zoological Society, London, October 1998. (INVITED)

44. "Whitebark pine, red squirrels and grizzly bears," 1st author with K. Kendall & D. Reinhart for the symposium *Restoring Whitebark Pine Ecosystems*, sponsored by the U.S. Forest Service, U.S. Park Service, USGS Biological Resources Division and Society of American Foresters, Missoula, MT, September 1998. (INVITED)

43. "Fire, red squirrels, whitebark pine, and Yellowstone grizzly bears," 3rd author with S. Podruzney & D. Reinhart for *11th International Conference on Bear Research and Management*, Gatlinburg, TN, April 1998.

42. "Use of rub trees by Yellowstone grizzly bears," 2nd author with G. Green & R. Swalley for *11th International Conference on Bear Research and Management*, Gatlinburg, TN, April 1998.

41. "Geophagy by Yellowstone grizzly bears," 1st author with G. Green & R. Swalley, POSTER for *11th International Conference on Bear Research and Management*, Gatlinburg, TN, April 1998.

40. "Landscapes suitable for restoration of grizzly bears in Idaho," for *Annual Meeting of the Idaho Chapter of the Wildlife Society*, Moscow, ID, March 1998. (INVITED)

39. "Grizzly bear conservation in the Greater Yellowstone Ecosystem," for *Workshop on Conservation Problem Solving*, sponsored by the Northern Rockies Conservation Cooperative and U.S. Forest Service, Jackson, WY, September 1997. (INVITED)

38. "Assessing umbrella effects of grizzly bears in Idaho: Applying matrices of habitat sensitivities," 1st author with T. Merrill for *7th Annual Gap Analysis Principal Investigators' Meeting*, Reston, VA, August 1997.

37. "Defining suitable landscapes for reintroduction of grizzly bears in Idaho," 1st author with T. Merrill for *7th Annual Gap Analysis Principal Investigators' Meeting*, Reston, VA, August 1997.

36. "Are grizzly bears an umbrella species for Idaho?," 1st author with T. Merrill, R. Noss, & H. Quigley for *Annual Meeting of the Society for Conservation Biology*, Victoria, BC, June 1997.

35. "Fragmentation and large carnivores: An unconventional view of landscapes," 2nd author with T. Merrill & H. Quigley for the workshop *Landscape Alteration Effects on Fauna in the Americas: Establishing a Basis for Analysis Across Biomes*, sponsored by IAI-AMIGO, Maitencillo, Chile, December 1996. (INVITED)

34. "Extirpations of grizzly bear (*Ursus arctos*) populations: An analysis of historical landscape patterns," 2nd author with T. Merrill for the *Joint Annual Meetings of the Ecological Society of America and the Society for Conservation Biology*, Providence, RI, August 1996.

33. "The Alsek Pass Assessment" and "Interagency grizzly bear management," for *Kluane National Park and Reserve Grizzly Bear Research Project: Project Review and Workshop*, Vancouver, BC, March 1996. (INVITED)

32. "Impacts of the proposed New World Mine on Yellowstone's threatened grizzly bear population," for the World Heritage Committee hearings *Yellowstone National Park: World Heritage Site in Danger Designation*, Mammoth, WY, September 1995. (INVITED)

31. "Demography and behavior of the Yellowstone grizzly bears", 2nd author with C. Pease for *Conference on Greater Yellowstone Predators*, organized by Yellowstone National Park and the Northern Rockies Conservation Cooperative, Mammoth, WY, September 1995.

30. "The strange case of ethics and natural resource agency science," for the Plenary Session *Ethics, Science, and Public Policy*, at the American Institute of Biological Sciences annual meeting, San Diego, CA, August 1995. (INVITED)

29. "Demography and behavior of the Yellowstone grizzly bears," 2nd author with C. Pease for *10th International Conference on Bear Research and Management*, Fairbanks, AK, July 1995.

28. "Diet and morphology of northern bears: Some hypotheses," for *10th International Conference on Bear Research and Management*, Fairbanks, AK, July 1995.

27. "Changing mortality of Yellowstone grizzly bears," for *10th International Conference on Bear Research and Management*, Fairbanks, AK, July 1995.

26. "Assessing cumulative effects of human development on grizzly bears," for *Ecological Outlook Project: Cumulative Effects Assessment and Futures Modelling Workshop*, sponsored by the Banff Bow Valley Study Task Force, Banff, AB, June 1995. (INVITED)

25. "The New World Mine and grizzly bears: A window on ecosystem management," for the symposium *National Parks and Public Land Ecosystems: Meeting the Challenge of Common Boundaries and Conflicting Mandates*, sponsored by the College of Law, University of Utah, Snowbird, UT, April 1995. (INVITED)

24. "Kamchatkan brown bears and *Pinus pumila*," for the workshop *Management of Whitebark Pine Ecosystems — An International and Regional Perspective*, sponsored by the Society of American Foresters, Intermountain Research Station, and Gallatin National Forest, Bozeman, MT, April 1993. (INVITED)

23. "Implementing endangered species policy: Lessons from the Yellowstone grizzly bear recovery effort," for the workshop *Implementing Endangered Species Policy* sponsored by the University of Michigan School of Natural Resources and the Environment, Ann Arbor, MI, January 1993. (INVITED)

22. "Use of road density standards for management of Yellowstone grizzly bear habitat," for a meeting on road density and security area standards for grizzly bear management, sponsored by the Grizzly Bear Recovery Coordinator, Missoula, MT, January 25-26, 1993. (INVITED)

21. "Biology of the Yellowstone grizzly bear," for the symposium *Human-Bear Conflicts*, sponsored by the West Yellowstone Chamber of Commerce, West Yellowstone, MT, October 1992. (INVITED)

20. "Grizzly bear-whitebark pine relationships in North America," for *International Workshop on Stone Pines and their Environment*, sponsored by the Swiss Institute of Forest, Snow & Landscape Research, U.S. Forest Service, and University of Munster, Germany, at St. Moritz, Switzerland, September 1992. (INVITED)

19. "Conservation of the Yellowstone grizzly bear," for the seminar series *Conservation Biology and Public Land Management*, at University of Wyoming, AMK Ranch, Grand Teton National Park, August 1992. (INVITED)

18. "Whitebark pine-grizzly bear associations," for *Whitebark Pine Workshop on New Management Perspectives in the Greater Yellowstone Area*, sponsored by the Gallatin National Forest, U.S. Forest Service Intermountain Research Station, and the Eastern Montana Chapter of the Society of American Foresters, Bozeman, MT, January 1992. (INVITED)

17. "The Yellowstone experience: 'Between a rock and a hard place'," for *Grizzly Bear Management Workshop*, sponsored by the Canadian Parks Service and Friends of Revelstoke National Park, Revelstoke, BC, March 1991. (INVITED)

16. "Sensitivity of grizzly bear population indices to long-term change in habitat support capability," for the symposium *Forever Threatened?*, sponsored by the Wyoming Wildlife Federation, Dubois, WY, June 1990.

15. "Grizzly bears, roads, displacement and mortality: What does the research mean?," for *Grizzly/Wolf Technical Workshop*, sponsored by the National Wildlife Federation, Polebridge, MT, July 1989. (INVITED)

14. "Interactions among red squirrels, grizzly bears, and the whitebark pine cone crop," for the workshop *Review of Research on Whitebark Pine Ecosystems*, sponsored by the U.S. Forest Service, Forest Service Fire Lab, Missoula, MT, March 1989. (INVITED)

13. "Stone pines and bears," 1st author with C. Jonkel for the symposium *Whitebark Pine Ecosystems — Ecology and Management of a High-Mountain Resource*, sponsored by the U.S. Forest Service, National Park Service, Montana State University, and Society of American Foresters, Bozeman, MT, March 1989. (INVITED)

12. "Whitebark pine on the Mount Washburn massif, Yellowstone National Park," 1st author with D. Reinhart for the symposium *Whitebark Pine Ecosystems — Ecology and Management of a High-Mountain Resource*, sponsored by the U.S. Forest Service, National Park Service, Montana State University, and Society of American Foresters, Bozeman, MT, March 1989.

11. "Grizzly bear use of Yellowstone Lake cutthroat trout," 2nd author with D. Reinhart for the *8th International Conference on Bear Research and Management*, sponsored by the International Association for Bear Research and Management, Victoria, BC, February 1989.

10. "Human impacts on bear habitat use," Plenary for the *8th International Conference on Bear Research and Management*, sponsored by the International Association for Bear Research and Management, Victoria, BC, February 1989. (INVITED)

9. "Timbering and roading in grizzly habitat," for *Greater Yellowstone Coalition 1988 Annual Meeting and Scientific Conference*, Lake Lodge, Yellowstone National Park, WY, June 1988. (INVITED)

8. "Dynamics of ungulate carcasses and their use by bears on ungulate winter ranges," 1st author with G. Green & J. Henry for *First Annual Meeting of Research and Monitoring on Yellowstone's Northern Range*, sponsored by the National Park Service, Mammoth, WY, January 1988.

7. "Evaluation of grizzly bear habitat using standard classification systems," 1st author with R. Knight for the symposium *Land Classifications Based on Vegetation — Applications for Resource Management*, sponsored by the University of Idaho, U.S. Forest Service, and State of Idaho, Moscow, ID, February 1987. (INVITED)

6. "Significance of whitebark pine to wildlife," for workshop sponsored by the U.S. Forest Service, Montana State University, Bozeman, MT, February 1987. (INVITED)

5. "Food habits of the Yellowstone grizzly bear," 1st author with B. Blanchard & R. Knight for *7th International Conference on Bear Research and Management*, Williamsburg, VA, February 1986.

4. "The effects of developments and primary roads on grizzly bear habitat use in Yellowstone National Park, Wyoming", 1st author with B. Blanchard & R. Knight for *7th International Conference on Bear Research and Management*, Williamsburg, VA, February 1986.

3. One part of four-part presentation, "A cumulative effects model for grizzly bear management in the Yellowstone ecosystem," for *Grizzly Bear Habitat Symposium*, sponsored by the Interagency Grizzly Bear Committee and University of Montana, Missoula, MT, April-May 1985.

2. "Derivation of habitat component values for the Yellowstone grizzly bear," 1st author with R; Knight and B. Blanchard for *Grizzly Bear Habitat Symposium*, sponsored by the Interagency Grizzly Bear Committee and University of Montana, Missoula, MT, April-May 1985.

1. "Classification and environmental relationships of wetland vegetation in Yellowstone National Park, Wyoming," for *55th Annual Meeting of the Northwest Science Association*, Walla Walla College, College Place, WA, March 1982.

C. **RENDERING SCIENTIFIC JUDGMENT**

External Scientific Review & Consultation since 1992

71. Declaration for "Friend of the Clearwater, Plaintiff, v. Cheryl F. Roberts, in her official capacity as Forest Supervisor of the Nez Perce-Clearwater National Forests; and U.S. Forest Service, Defendants. No. 3:21-cv-189-CWD," October 2021; *topic expert*.

70. Analysis "An Analysis of Claims Made by the Defendants/Appellants Regarding Effects of Whitebark Pine Loss on Yellowstone Grizzly Bears in Appeal from the United States District Court for the District of Montana Nos. 9:17-cv-00089, 9:17-cv-00117, 9:17-cv-00118, 9:17-cv-00119, 9:17-cv-00123, 9:18-cv-00016" for Earthjustice, Bozeman, MT, April 2020; topic expert.

69. Comments on "East Paradise Range Allotment Management Plan and Environmental Assessment, Custer Gallatin National Forest," for Grizzly Bear Recovery Project, December 2020; *topic expert*.

68. Objections to "Black Ram Environmental Assessment & Decision Notice, Kootenai National Forest," for the Grizzly Bear Recovery Project, November 2020; *topic expert*.

67. Declaration for "Yaak Valley Forest Council, Plaintiffs, v. Sonny Perdue, Secretary of Agriculture, U.S. Forest Service, Defendants," for Grizzly Bear Recovery Project, October 2020; *topic expert*.

66. Objections to the "Custer Gallatin Land Management Plan Revision," for the Grizzly Bear Recovery Project, September 2020; *topic expert*.

65. Comments on "South Plateau Area Landscape Treatment (SPLAT) Project Draft Environmental Assessment Custer Gallatin National Forest, Hebgen Lake Ranger District," for the Grizzly Bear Recovery Project, September 2020; *topic expert*.

64. Comments on effects of proposed expansion of the Bull Mountains Mine on grizzly bears, with specific reference to cumulative effects of train strikes and railway infrastructure, for the Grizzly Bear Recovery Project, June 2020; *topic expert*.

63. Declaration for "Western Watersheds Projects, Alliance for the Wild Rockies, and Yellowstone to Uintas Connection, Plaintiffs, v. David Bernhardt, U.S. Department of the Interior, U.S. Fish & Wildlife Service, and U.S. Forest Service, Defendants, Civil Action No. 1:20-cv-860-APM," for Grizzly Bear Recovery Project, March 2020; *topic expert*.

62. Expert input on effects of the proposed Black Ram Project on Yaak grizzly bears, comments on the "Black Ram Environmental Assessment" for the Grizzly Bear Recovery Project, August 2019; *topic expert*.

61. Analysis "GYE grizzly bears killed because of mistaken ID," for Western Environmental Law Center, April 2019; topic expert.

60. "Vision for Recovery of Grizzly Bears & Petition for Revision of the 1993 Recovery Plan." for Grizzly Bear ReVision Project, May 2019.

59. Mattson, D. J., 7 August 2019. Prospectus for action to address grizzly bear conflicts in Park County. The Grizzly Bear Recovery Project.

58. Review and critique of Kasworm et al. (2018) as applied in "Draft Supplemental Environmental Impact Statement Montanore Evaluation Project" for Grizzly Bear Recovery Project, August 2019; *topic expert and expert reviewer*.

57. Testimony for U.S. House of Representatives Subcommittee on Water, Oceans, and Wildlife hearing on "Tribal Heritage and Grizzly Bear Protection Act" (H.R. 2532), May 2019; *topic expert*.

56. Statement of expert opinion on proposal "Mount Backus Wildlife Sanctuary" submitted to the Government of Alberta, November 2018; *topic expert*.

55. Testimony for U.S. Senate Committee on Environment and Public Works hearing "From Yellowstone's Grizzly Bear to the Chesapeake's Delmarva Fox Squirrel—Successful State Conservation, Recovery, and Management of Wildlife," October 2018; *topic expert*.

54. Declaration for "WildEarth Guardians, Plaintiff, vs. Ryan Zinke, as Secretary of the Department of the Interior; U.S. Department of the Interior; Greg Sheehan, as acting director of the U.S. Fish and Wildlife Service; and the U.S. Fish & Wildlife Service, Federal-Defendants" No. 17-cv-00118-DLC, August 2018; *topic expert*.

53. Public comment on "50 CFR Part 17 [Docket No. FWS–R6–ES–2017–0089; FXES11130900000C6–178–FF09E42000] Endangered and Threatened Wildlife and Plants; Possible Effects of Court Decision on Grizzly Bear Recovery in the Conterminous United States" for the Grizzly Bear Recovery Project, January 2018; *topic expert*.

52. Review and critique of "US Fish & Wildlife Service proposal to remove grizzly bears in the Yellowstone ecosystem from the list of endangered and threatened wildlife protected under the US Endangered Species Act (ESA); Federal Register 81(48): 13174-13227" for Wyoming Wildlife Advocates, May 2016; *topic expert and expert reviewer*.

51. Review and critique of the "Final Draft MOA for Allocation of Discretionary Mortality in GYE" published by the US Fish & Wildlife Service, Grizzly Bear Recovery Coordinator, for the Grizzly Bear

Recovery Project, January 2016; *expert reviewer*.

50. Review of USGS white paper published by the Interagency Grizzly Bear Study Team entitled "Response of Yellowstone grizzly bears to changes in food resources: a synthesis" for the Grizzly Bear Recovery Project, December 2013; *expert reviewer*.

49. Second-level USGS review of BLM Sonoran Desert and Colorado Plateau Rapid Ecoregional Assessment processes, for BLM National Operations Center, Denver, CO, 2010-2013; *expert reviewer*.

48. Advice on and review of protocol for managing pocket gophers in grizzly bear habitat, for P. Durkin of SERA Inc., 2010; *topic expert and expert reviewer*.

47. Invited Participant in scoping meeting for USGS response to BLM Rapid Ecological Assessments, Salt Lake City, UT, January 2010; *topic expert*.

46. Invited Participant in *Manhattan Project II Workshop* to scope research needs related to desert bighorn sheep-mountain lion interactions, Armendaris Ranch, Truth or Consequences, NM, April 2010; *topic expert*.

45. Invited Panel Expert for *Human Dimensions of Carnivore Conservation: Experts Workshop* convened to advise the Florida Wildlife Commission and US Fish & Wildlife Service on new approaches to conserving the Florida panther, January 2010; *topic expert*.

44. Invited Participant in problem-solving workshop *Aboriginal People, Polar Bears, and Human Dignity*, Whitehorse, Yukon Territory, January 2009; *topic expert*.

43. Consultant and collaborator on development of ArcGIS Agent Analyst extension with Kevin Johnston, ESRI, 2008-present. This collaboration involved use of cougar data to motivate a seminal application of Agent Analyst used in an instructional book covering this extension: Johnston, K., ed. (2011). *Getting to Know ArcGIS Agent Analyst*. ESRI Press, Redlands, CA. Applications to cougars comprised the bulk of Chapters 5 & 8 entitled *Moving point agents based on multi criteria decision making* and *Adding complexity to moving discrete point agents over continuous surfaces*. The scientist was offered but turned down authorship on these chapters because of complications entailed by the USGS product review process.

42. Review of and reference for research proposal, "Conservation and management of an isolated remnant population of Moroccan Dorcas gazelles north and west of the Atlas Mountains," to People's Trust for Endangered Species, London, UK, for M. Znari, 2008; *expert reviewer & consultant*.

41. Invited Applicant for *Endangered Species Management Kenya*, US Department of Interior International Technical Assistance Program, 2008; Canceled because of political problems in host country

40. Review of research/handling protocol "Pilot study: Ecology of mountain lions in the badlands of southwestern North Dakota" for J. Austin, USGS Northern Prairie Wildlife Research Center, March 2008; *expert reviewer*.

39. Advice on structure and design of MUSIC and of associated curricula and programs in the MIT Department of Urban Studies & Planning, Environmental Policy & Planning Group for H. Karl, MIT-USGS Science Impact Collaborative–entailing numerous meetings, conversations, white papers, and memos, 2007-2008; *expert consultant*.

38. Advice on collaborative approaches to resolving contentious natural resources issues, for Karen Hardigg, Alaska Forest Program Manager, The Wilderness Society, Anchorage, AK, 2007; *expert consultant.*

37. Review of and advice on "Credit trading framework: Conceptual basis for quantifying credits and debits in the sagebrush ecosystem," for J. Hestbeck, USGS Ft. Collins Science Center, 2007; *expert consultant and reviewer.*

36. Review and other input on proposal to the Natural Resources Conservation Service, Washington Office, regarding "Suggested metric for quantifying a positive zone of influence on grizzly bear habitat from non-lethal deterrent practices" for S. Wilson, Yale School of Forestry & Environmental Studies and Blackfoot Challenge, MT, 2006; *expert consultant*

35. Review of *Cougar Management Guidelines for North America,* for the authors and for Wild Futures, Earth Island Institute, Bainbridge Island, WA, 2004; *expert reviewer*.

34. Review of the *Muskwa-Kechika Wildlife Management Plan* for the Muskwa-Kechika Management Area Advisory Board, Fort St. John, BC, 2004; *expert reviewer*.

33. Review of the draft report *Analysis of Scientific Publications Related to the Florida Panther* for U.S. Fish & Wildlife Service and Florida Fish & Wildlife Commission, 2003; *expert reviewer.*

32. Review of web-served synopses of conservation biology literature and methods for Canadian Information System for the Environment, Environment Canada, 2003; *expert reviewer*.

31. Design and analysis for research program to model distribution of pre-historical Palouse Prairie vegetation in the Hangman Restoration Project area for Coeur d'Alene Tribe, Wildlife Program, Plummer, ID, 2002-present; *scientific advisor*.

30. Design of monitoring program for the U.S. National Park Service, Northern Colorado Plateau Network, Moab, UT, 2002; *scientific advisor*.

29. Methods for biological inventory and monitoring for the U.S. National Park Service, Southern Colorado Plateau Network, Inventory and Monitoring Program, Flagstaff, AZ, 2001-2005; *member of scientific advisory committee.*

28. Evaluation of impacts on large terrestrial vertebrates for alternatives regarding vehicular management in the Salt Creek Drainage of Canyon Lands NP, for U.S. National Park Service, Southeast Utah Group, Moab, UT, 2001; *member of the scientific review panel*.

27. Review of grizzly bear research program in and around Banff NP, for Parks Canada, Banff National Park, Banff, AB, 2001; *evaluated past research and proposed future directions for research and monitoring*.

26. Review of restoration plan for grizzly bear habitat in Jasper National Park (*Jasper National Park Three Valley Confluence Recovery Plan*) for Parks Canada, Jasper, AB, 2001; *expert reviewer*.

25. Review of plan for black bear research in Olympic National Park for USGS Forest & Rangeland Ecosystem Science Center, Corvallis, OR, 2001; *expert reviewer*.

24. Review of final report *A Study of New Mexico Black Bear Ecology with Models for Population Dynamics and Habitat Quality* for the New Mexico Fish & Wildlife Research Unit and New Mexico Department of Game and Fish, Santa Fe, NM, 2001; *expert reviewer*.

23. Review of research proposals for Grand Canyon National Park, Flagstaff, AZ, 2000; *expert reviewer*.

22. Review of *Sky Islands Wildlands Network and Conservation Plan* for The Wildlands Project, Tucson, AZ, 2000; *expert reviewer*.

21. Advice on methods for conservation planning and design for Yellowstone-to-Yukon Conservation Initiative, Canmore, AB, 1999-2005; *member of science advisory committee*.

20. Advice and other input on management standards for whitebark pine and relations among bears, red squirrels and whitebark pine, for U.S. Forest Service and U.S. National Park Service, Yellowstone ecosystem, 1999-present; *member of Yellowstone Ecosystem Whitebark Pine Working Group*.

19. Evaluate strategy for scientific research and conservation planning for Yellowstone-to-Yukon Conservation Initiative, Jasper, AB, 1999; *member of Scientific Advisory Forum*.

18. Provide overview of issues in large carnivore conservation for Canadian Ministry on Canadian Heritage Ecological Integrity Panel, 1999; *invited panel expert for Parks Canada*.

17. Advice on decision process and analysis methods related to conservation planning, for The Wildlife Network and Summerlee Foundation, Bainbridge Island, WA, 1998-present; *member of advisory committee for development of methods for bioregional conservation planning*.

16. Advice on development of an education course for hunters to prevent and respond appropriately to grizzly bear encounters, for Grizzly Bear Education Course Team, Wyoming Outfitters & Guides Association, 1998-2002; *member of steering committee*.

15. Advice on development of models and review of methods and products for World Wildlife Fund Canada and Conservation Biology Institute project: Modeling Carnivore Habitat in the Rocky Mountain Region, 1997-2000; *member of scientific advisory committee*.

14. Advice on development of the cumulative effects analysis process, and revision of methods and update of coefficients for mapped habitat types for Interagency Grizzly Bear Committee, Yellowstone subcommittee, 1997-2001; *member of grizzly bear cumulative effects modeling team for the Yellowstone Ecosystem*.

13. Development and review of grizzly bear research program in Kluane National Park, Yukon, for Canadian Parks Service, Western Region, Winnipeg, MB, 1991-2006; *member of the Kluane Grizzly Bear Study Working Group*.

12. Habitat-based population viability analysis for the East Slopes grizzly bear population in Alberta by the IUCN Conservation Biology Specialists Group (CBSG) and the East Slopes Grizzly Bear Project (ESGBP), University of Calgary, 1999; *scientific expert for the CBSG and ESGBP*.

11. Selection of wildlife projects for funding by Seattle City Light, City of Seattle, WA, 1999; *expert reviewer*.

10. Review of species distribution models for Idaho for the Idaho GAP Analysis project, 1998-1999; *scientific expert*.

9. Evaluation of and advice on methods and interpretation of conservation area design for coastal brown bears in British Columbia, for Round River Conservation Studies, Salt Lake City, UT, 1998; *member of scientific review panel*.

8. Evaluation of Tongass Land Management Plan alternatives for probable impacts on brown bears, for U.S. Forest Service, Tongass National Forest, Juneau, AK, 1996-1997; *member of the Brown Bear Panel*.

7. Advice on methods for impacts assessment and review of Environmental Impact Statement and Biological Assessment for the proposed New World Mine near Cooke City, MT, for U.S. Forest Service, Gallatin National Forest, Gardiner, MT, 1995-1998; *member of the scientific review committee*.

6. Development and review of research on current human impacts in the Bow Valley and participation in a futures modeling exercise for the region, for Secretariat of the Banff Bow Valley Task Force, Banff, AB, 1995-1996; *member of the scientific review committee for the Banff-Bow Valley*.

5. Assessment of the status of the Yellowstone National Park World Heritage Site by the World Heritage Committee, 1995; *expert witness for the US National Park Service*.

4. Assessment of proposed access development along the boundary of Kluane National Park, Yukon, 1994-1995; *scientific advisor for Axys Environmental Consultants and the Canadian Parks Service*.

3. Development of a carnivore conservation strategy for the Canadian and northern United States Rocky Mountains by the World Wildlife Fund, Canada, Toronto, ON, 1993; *scientific advisor*.

2. Assessment of the proposed expansion of the Sunshine Ski area in Banff National Park for Parks Canada, Calgary, AB, 1993; *scientific expert*.

1. Assessment of the proposed Westcastle ski development near Waterton National Park, Canada, for the Natural Resources Conservation Board of Alberta, 1993; *scientific expert for Parks Canada*.

Review of Journal or Book Manuscripts since 1998 I reviewed **51 manuscripts** for the following journals since July of 1998. The number of manuscripts reviewed for each venue is given in parentheses in bold.

Ecology (**4**)
Ecological Applications (**1**)
Behaviour (**1**)
Conservation Biology (**8**; **2 as Assigning Editor**)
Ecography (**1**)
Biological Conservation (**1**)
Journal of Mammalogy (**1**)
Journal of Wildlife Management (**9**)
Wildlife Society Bulletin (**4**)
Restoration Ecology (**1**)
Acta Theriologica (**1**)
Canadian Journal of Zoology (**4**)
Ursus (**5**)
Journal of Forest Ecology & Management (**1**)
Western North American Naturalist (**2**)
Northwest Science (**1**)
USFS General Technical Report Series (**1**)
Proceedings of the 5th Biennial Conference of Research on the Colorado Plateau (**1**)
Proceedings of the 8th Biennial Conference of Research on the Colorado Plateau, University of Arizona Press (**2**)
Proceedings of the 9th Biennial Conference of Research on the Colorado Plateau, University of Arizona Press (**1**)
Desert Bighorn Council Transactions (**1**)

I also reviewed **5** papers for scientific quality and compliance with USGS Fundamental Science Practices.

D. LECTURESHIPS AND OTHER ACADEMIC SERVICE

Since 1992 I have instructed **10 semester-long classes or intensives**, 4 at Yale University, 4 at the Massachusetts Institute of Technology, 1 at Northern Arizona University, and 1 at University of Idaho; and given **95 seminars or lectures** in academic venues, primarily graduate classes, but including departmental seminars and undergraduate classes at Yale University, University of Michigan, University

of Idaho, Northern Arizona University, University of Montana, Montana State University, Boise State University, Prescott College, and The Yellowstone Institute.

Semester-Long Seminars & Courses since 1992

10. Instructor, *11.972, Elements of Public Interest Leadership*, 24 hrs of class, MIT Department of Urban Studies & Planning, January 2009.

9. Instructor, *11.941 Elements of Environmental Leadership*, 24 hrs of class, MIT Department of Urban Studies & Planning, Spring 2008.

8. Co-Instructor, *11.375 Workshop on Collaborative Adaptive Management*, 40 hrs of class, MIT Department of Urban Studies & Planning, Spring 2008.

7. Co-instructor, *Foundations of Natural Resources Policy* (F&ES 85036), 42 hrs of class, Yale School of Forestry & Environmental Studies, New Haven, CT, January-May 2007

6. Co-instructor, *Society & Natural Resources* (F&ES 83049), 28 hrs of class, Yale School of Forestry & Environmental Studies, New Haven, CT, January-May 2007

5. Co-instructor, *Large Scale Conservation* (F&ES 83037), 42 hrs of class, Yale School of Forestry & Environmental Studies, New Haven, CT, January-May 2007

4. Co-instructor, *Reforming Natural Resources Governance* (IAP 11.959), 40 hrs of class, MIT Department of Urban Studies & Planning, Cambridge, MA, January 2007

3. Instructor, *Interdisciplinary Approaches to Large Carnivore Conservation* (F&ES 30023a), 39 hrs of class, Yale School of Forestry & Environmental Studies, New Haven, CT, September-December 2006

2. Co-Instructor, *The Policy-Science Interface* (ENV 555), 39 hrs of class, Center for Environmental Sciences & Education, Northern Arizona University, Flagstaff, AZ, August-December 2005

1. Instructor, *Senior Seminar: "What role does biology have in natural resources management?"* (WLF495), 13 hrs of class, Department of Fish and Wildlife Resources, University of Idaho, Moscow, August-December 1993

Lectures since 1992

97. "Conflict without end?: Mountain lions depredation in east-central Arizona," (F&ES 83049b), Yale School of Forestry & Environmental Studies, New Haven, CT, November 2012. (INVITED)

96. "The Blackfoot Challenge." Society & Natural Resources (F&ES 83049b), Yale School of Forestry & Environmental Studies, New Haven, CT, November 2012. (INVITED)

95. "The existential roots of human dignity," *Yale Human Rights and Environment Dialogue*, Yale University, New Haven, CT, January 2011 (INVITED)

94. "Wildlife management in the Southwest: Maladies of scientific management," *Large Scale*

Conservation (F&ES 83037b), Yale School of Forestry & Environmental Studies, New Haven, CT, January 2011 (INVITED)

93. "Existentialism," *Society & Natural Resources: Environmental Psychology* (F&ES 83049b), Yale School of Forestry & Environmental Studies, New Haven, CT, January 2011 (INVITED)

92. "The social-psychology of professional practice," *Western Resources Interest Group*, Yale School of Forestry & Environmental Studies, New Haven, CT, January 2011 (INVITED)

91. "Sex matters: The predatory strategies of male and female cougars," *Brigham Young University, Department of Plant & Wildlife Sciences Seminar*, Provo, UT, October 2010 (INVITED)

90. "Promise and pitfalls of models in science and management," *Biological Techniques: Species Distribution Modeling* (BIO 680), Department of Biology, Northern Arizona University, Flagstaff, AZ, September 2010 (INVITED)

80. "Sustainability, human dignity, and professionalism ," *Society & Natural Resources* (F&ES 83049b), Yale School of Forestry & Environmental Studies, New Haven, CT, February 2010 (INVITED)

79. "Florida panthers: The social construction of a conservation problem," *Species & Ecosystem Conservation* (F&ES 33012b), Yale School of Forestry & Environmental Studies, New Haven, CT, February 2010 (INVITED)

78. "Leadership as relation: The led and their theories about good leadership," *Western Resources Interest Group*, Yale School of Forestry & Environmental Studies, New Haven, CT, February 2010 (INVITED)

77. "Mountain lions in ecosystems: Evidence and speculations about effects," *Species & Ecosystem Conservation* (F&ES 33012b) Field Trip, Yale School of Forestry & Environmental Studies, Flagstaff, AZ, March 2010 (INVITED)

76. "Psycho-, social, and political dynamics of cougar management," *Species & Ecosystem Conservation* (F&ES 33012b) Field Trip, Yale School of Forestry & Environmental Studies, Flagstaff, AZ, March 2010 (INVITED)

75. "Psycho-, social, and political dynamics of cougar management," *Wildlife Management* (BIO478), Northern Arizona University, Flagstaff, AZ, October 2009 (INVITED)

74. "Mountain lions in ecosystems: Evidence and speculations about effects," *Wildlife Management* (BIO478), Northern Arizona University, Flagstaff, AZ, October 2009 (INVITED)

73. "The Witch Craze: Parable and policy sciences interpretation," for F&ES seminar *Professionalism & Human Dignity*, Yale School of Forestry & Environmental Studies, New Haven, CT, January 2009 (INVITED)

72. "Personality and perspectives on leadership," for, *Large Scale Conservation: Integrating Science, Management, and Policy* (F&ES 83037b), Yale School of Forestry & Environmental Studies, New Haven, CT, April 2009 (INVITED)

71. "Sustainability, dignity, and professionalism," for F&ES seminar *Professionalism & Human Dignity*, Yale School of Forestry & Environmental Studies, New Haven, CT, April 2009 (INVITED)

70. "Sustainability, dignity, and professionalism," for F&ES seminar *Professionalism & Human Dignity*, Yale School of Forestry & Environmental Studies, New Haven, CT, April 2009 (INVITED)

69. "Professionalism and human dignity: Foundational notions," to *Seminar on Society & Natural Resources* (F&ES 83049b), Yale School of Forestry and Environmental Studies, New Haven, CT, January 2009 (INVITED)

68. "The Glen Canyon Dam AMP: An appraisal," to *Large Scale Conservation* (F&ES 83037b),Yale School of Forestry and Environmental Studies, New Haven, CT, January 2009 (INVITED)

67. "Psycho-, social, and political dynamics of cougar management," to *Foundations of Natural Resources & Management* (F&ES 85036b),Yale School of Forestry and Environmental Studies, New Haven, CT, November 2008 (INVITED)

66. "Psycho-, social, and political dynamics of cougar management," to *Western Resource Group Luncheon Seminar,* Yale School of Forestry and Environmental Studies, New Haven, CT, November 2008 (INVITED)

65. "The witch craze: Parable and policy sciences interpretation," to *Foundations of Natural Resources & Management* (F&ES 85036b), Yale School of Forestry and Environmental Studies, New Haven, CT, November 2008 (INVITED)

64. "Human dignity and natural resources professionalism," to *Seminar on Human Dignity & Natural Resources Professionalism,* Yale School of Forestry & Environmental Studies, January 2008. (INVITED)

63. "Agitators, Theorists & Y2Y: Potential pitfalls of transformational leadership," to *Combined MIT and Yale Seminars on Elements of Environmental Leadership,* MIT Department of Urban Studies & Planning, Cambridge, MA, March 2008. (INVITED)

62. "The once and future Yellowstone grizzly bears," for *Society for Conservation Biology Spring Lecture Series,* Yale School of Forestry and Environmental Studies, New Haven, CT, February 2007 (INVITED)

61. "An introduction to David Mattson," for *Faculty Lunch Seminar,* Yale School of Forestry & Environmental Studies, New Haven, CT, December 2006 (INVITED)

60. "Y2Y conservation area design," for *Conservation Biology* (E&EB 315a/515a), Yale Department of Ecology & Evolutionary Biology, New Haven, CT, November 2006 (INVITED)

59. "Living with fierce creatures: Cougars on the southern Colorado Plateau," for *Environmental Studies Colloquium,* Prescott College, Prescott, AZ, April 2006 (INVITED)

58. "Psycho-sociology of the science-policy interface," for Joint session of *Natural History and Ecology of the Southwest* and *Behavior and Conservation of Mammals,* Prescott College, Prescott, AZ, April 2006 (INVITED)

57. "A personal perspective on change-oriented leadership," for *Large Scale Conservation: Integrating Science, Management & Policy* (F&ES 909), Yale School of Forestry and Environmental Studies, New Haven, CT, April 2006 (INVITED)

56. "Agitators, theorists and Y2Y: Potential pitfalls of transformational leadership," for *Large Scale Conservation: Integrating Science, Management & Policy* (F&ES 909), Yale School of Forestry and Environmental Studies, New Haven, CT, March 2006 (INVITED)

55. "The grizzly bear policy process: 'Conservation is like warfare'," *Species and Ecosystem Conservation* (F&ES 520b), Yale School of Forestry and Environmental Studies, New Haven, CT, October 2005 (INVITED)

54. "Conflict over cougars: A window on the institution of wildlife management," for *Foundations of Natural Resources and Management* (F&ES 891b), Yale School of Forestry and Environmental Studies, New Haven, CT, October 2005 (INVITED)

53. "Professional practice in natural resources research," for *Luncheon Seminar of the Western Natural Resources Interest Group*, Yale School of Forestry and Environmental Studies, New Haven, CT, October 2005 (INVITED)

52. "Agitators, theorists and Y2Y: Potential pitfalls of transformational leadership," for *Large-Scale Conservation: Integrating Science, Management and Policy* (FES 909b), Yale School of Forestry and Environmental Studies, New Haven, CT, March 2005 (INVITED)

51. "The dogma of conservation area design," for *Seminar on Western Natural Resources*, Western Natural Resources Interest Group, Yale School of Forestry and Environmental Studies, New Haven, CT, October 2004 (INVITED)

50. "The grizzly bear policy process: 'Conservation is like warfare'," for *Species and Ecosystem Conservation* (FES 520a), Yale School of Forestry and Environmental Studies, New Haven, CT, October 2004 (INVITED)

49. "Information ecology in grizzly bear management," for the *Environmental Sciences and Policy Graduate Seminar*, Center for Environmental Sciences and Education, Northern Arizona University, Flagstaff, AZ, September 2004 (INVITED)

48. "Cougars on the edge…of Flagstaff," for the *Forestry Seminar Series*, School of Forestry, Northern Arizona University, Flagstaff, AZ, September 2004 (INVITED)

47. "Y2Y and conservation design: Problematic doctrines and an evolving formula," for the graduate seminar *Large-Scale Conservation: Integrating Science, Management, and Policy* (FES 909b), sponsored by the Yale School of Forestry and Environmental Studies, New Haven, CT, February 2004 (INVITED)

46. "Human dimensions of wildlife management," for undergraduate class Wildlife Management (BIO333), Northern Arizona University, Flagstaff, AZ, October 2003 (INVITED)

45. "The practice of grizzly bear conservation," for the *Western Resources Special Interest Group*, Yale School of Forestry and Environmental Studies, New Haven, CT, February 2003 (INVITED)

44. "Values and perspectives in grizzly bear conservation." for graduate class *Foundations of Natural Resources Policy and Management* (F&ES 891), Yale School of Forestry & Environmental Studies, New Haven, CT, February 2003 (INVITED)

43. "'Conservation is like warfare': Phantom common ground in grizzly bear conservation," for seminar *Society & Natural Resources: Sustaining the Common Interest* (F&ES 746), Yale School of Forestry & Environmental Studies, New Haven, CT, February 2003 (INVITED)

42. "Conditions of grizzly bear policy implementation," for graduate class *Species and Ecosystem Conservation* (F&ES 520), Yale School of Forestry and Environmental Studies, New Haven, CT, October 2002 (INVITED)

41. “The Yellowstone grizzly bear: prospects for the future,” for the *Western Resources Special Interest Group*, Yale School of Forestry and Environmental Studies, New Haven, CT, October 2002 (INVITED)

40. “Conduct, misconduct and the structure of science,” for Dr. Charles van Riper III’s graduate lab seminar, Department of Biology, Northern Arizona University, Flagstaff, AZ, April 2002 (INVITED)

39. “Decision processes in grizzly bear conservation,” for graduate class *Species and Ecosystem Conservation* (F&ES 520), Yale School of Forestry and Environmental Studies, New Haven, CT, October 2001 (INVITED)

38. “Grizzly bear conservation,” for the *Western Resources Special Interest Group*, Yale School of Forestry and Environmental Studies, New Haven, CT, October 2001 (INVITED)

37. “Foraging behavior of Yellowstone grizzly bears,” for *Biological Sciences Departmental Seminar Program*, Department of Biological Sciences, Northern Arizona University, Flagstaff, AZ, February 2001 (INVITED)

36. “Grizzly bears in Yellowstone,” for *Wildlife Management* class, Bozeman High School, Bozeman, MT, October 2000 (INVITED)

35. “Human dimensions of carnivore management,” for *Human Dimensions of Wildlife Management* (WLF520), Department of Fish & Wildlife Resources, University of Idaho, Moscow, ID, March 2000 (INVITED)

34. “Decision processes in grizzly bear conservation,” for graduate class *Species and Ecosystem Conservation* (F&ES 520), Yale School of Forestry and Environmental Studies, New Haven, CT, October 1999 (INVITED)

33. “Conservation of Yellowstone’s grizzly bears,” for graduate/undergraduate class *Conservation Biology*, Department of Biology, Boise State University, Boise, ID, May 1999 (INVITED)

32. “Viability analysis and monitoring techniques for grizzly bears,” for undergraduate class *Fish & Wildlife Ecology, Management, & Conservation* (WLF 290), Department of Fish & Wildlife Resources, University of Idaho, Moscow, ID, May 1999 (INVITED)

31. “Professional practice in the grizzly bear arena,” for undergraduate *Wildlife Seminar* (FISH 495), Department of Fish & Wildlife Resources, University of Idaho, Moscow, ID, March 1999 (INVITED)

30. “Grizzly bear science and management in the Yellowstone ecosystem,” for graduate/undergraduate class *Northwest Environmental Issues* (HIST 404/504), Department of History, University of Idaho, Moscow, ID, March 1999 (INVITED)

29. “Conservation of grizzly bears in Idaho,” for graduate class *Conservation Biology* (WLF 440), Department of Fish & Wildlife Resources, University of Idaho, Moscow, ID, May 1998 (INVITED)

28. "Policy analysis of grizzly bear conservation," for graduate class *Species and Ecosystem Conservation* (F&ES 520), Yale School of Forestry and Environmental Studies, New Haven, CT, March 1998 (INVITED)

27. "Human dimensions of grizzly bear science and management," for graduate class *Human Dimensions of Wildlife Management* (WLF 520), Department of Fish & Wildlife Resource, University of Idaho, Moscow, ID, March 1998 (INVITED)

26. "Conservation of Yellowstone’s grizzly bears," for *Special Topics Senior Honors Seminar* (WLF 404), Department of Fish & Wildlife Resources, University of Idaho, January 1998 (INVITED)

25. "A contextual basis for methods of science," for the *Department of Philosophy Seminar*, sponsored by the University of Idaho Undergraduate Philosophy Organization, Moscow, ID, November 1997 (INVITED)

24. "The behavioral ecology of Yellowstone’s grizzly bears," for undergraduate class *Behavioral Ecology* (WLF 441), Department of Fish & Wildlife Resources, University of Idaho, October 1997 (INVITED)

23. "Grizzly bear habitat relations in the Yellowstone ecosystem," for graduate class *Wildlife Habitat Ecology* (WLF 545), Department of Fish & Wildlife Resources, University of Idaho, September 1997 (INVITED)

22. "Use of demographic indices for monitoring wildlife populations: Grizzly bears as an example," for undergraduate class *Wildlife Management* (WLF 442), Department of Fish & Wildlife Resources, University of Idaho, April 1997 (INVITED)

21. "Policy-relevant science: Grizzly bears in Idaho," for workshop *Interdisciplinary Conservation Science*, sponsored by the Yale Student Chapter of the Society for Conservation Biology, New Haven, CT, April 1997 (INVITED)

20. "Professional practice in endangered species conservation," for graduate class *Natural Resource Policy and Management* (F&ES 891), Yale School of Forestry and Environmental Studies, New Haven, CT, April, 1997 (INVITED)

19. "Human dimensions of grizzly bear science and management," for graduate class *Human Dimensions of Wildlife Management* (WLF 520), Department of Fish & Wildlife Resource, University of Idaho, Moscow, ID, March 1997 (INVITED)

18. "Life histories of North American bears," for graduate class *Large Mammal Ecology* (WLF 544), Department of Fish & Wildlife Resources, University of Idaho, March 1997 (INVITED)

17. "Variation and pattern in the behavior of Yellowstone's grizzly bears," for *Department of Fish & Wildlife Resources Seminar*, University of Idaho, Moscow, ID, January 1997 (INVITED)

16. "The pitfalls of applied research," for undergraduate class *Wildlife Management* (WLF 442), Department of Fish and Wildlife Resources, University of Idaho, Moscow, ID, April 1996 (INVITED)

15. "Professional practice in endangered species conservation," for graduate class *Natural Resource Policy and Management* (F&ES 891), Yale School of Forestry and Environmental Studies, New Haven, CT, March 1996 (INVITED)

14. "Grizzly bear conservation," for graduate class *Species and Ecosystem Conservation* (F&ES 520), Yale School of Forestry and Environmental Studies, New Haven, CT, March 1996 (INVITED)

13. "Grizzly bear conservation," for graduate class *Species and Ecosystem Conservation* (F&ES520), Yale School of Forestry and Environmental Studies, New Haven, CT, March 1995 (INVITED)

12. "Professional practice in endangered species research," for graduate seminar *Society and Natural Resources* (F&ES524), Yale School of Forestry and Environmental Studies, New Haven, CT, March 1995 (INVITED)

11. "Sustaining grizzly bears in the Rocky Mountains," for *Departmental Seminar*, Department of Fish and Wildlife Resources, University of Idaho, Moscow, March 1995 (INVITED)

10. "Grizzly/brown bear ecology," for the graduate class *Large Mammal Ecology* (WLF544), Department of Fish and Wildlife Resources, University of Idaho, Moscow, February 1995 (INVITED)

9. "Calculation of sustainable grizzly bear mortality from unduplicated counts of females with cubs-of-the-year," for the graduate class *Fish and Wildlife Population Analysis* (WLF543), Department of Fish and Wildlife Resources, University of Idaho, Moscow, December 1994 (INVITED)

8. "Natural history of northern bears," for the undergraduate class *Natural History of Mammals* (ZOOL483), Department of Biological Sciences, University of Idaho, Moscow, ID, October 1993 (INVITED)

7. "Conservation of Yellowstone's grizzly bears," for *Conservation Biology Seminar*, Division of Biological Sciences, University of Montana, September 28, 1993 (INVITED)

6. "Grizzly bear habitat selection," for the graduate class *Wildlife Habitat Ecology* (WLF545), Department of Fish and Wildlife Resources, University of Idaho, Moscow, ID, September 20, 1993 (INVITED)

5. "Implementation of the endangered species act: Lessons from the Yellowstone grizzly bear population," for *Graduate Seminar*, Yale School of Forestry and Environmental Studies, New Haven, CT, April 8, 1993 (INVITED)

4. "Biology and management of the Yellowstone grizzly bear," for *Wildlife Forum*, sponsored by the Student Chapter of The Wildlife Society, Montana State University, Bozeman, MT, February 7, 1993 (INVITED)

3. "Lessons for improving endangered species conservation: The Yellowstone grizzly bear population," for the graduate seminar *Lessons for Improving Endangered Species Conservation*, and "Conservation and management of the Yellowstone grizzly," for the School of Natural Resources and Environment, University of Michigan, Ann Arbor, MI, November 1992 (INVITED)

2. "Implementation of grizzly bear research results," for the course *Ecology of Greater Yellowstone*, Yellowstone Institute, Yellowstone National Park, WY, July 1992 (INVITED)

1. "Grizzly bear food habits and habitat use," for the course *Bears: Folklore and Biology*, Yellowstone Institute, Yellowstone National Park, WY, June 1992-93 (2 presentations) (INVITED)

Graduate Student Committees & Interns Since 1990 I have been Committee Member, Faculty Advisor or Preceptor for **24 students** pursuing Ph.D. or M.S. degrees, Certificates or Special Credits.

20. Co-Committee Chair for Kirsten Ironside**,** *Movements and habitat selection by cougars on the Colorado Plateau*, Ph.D. Program, Department of Biology, Northern Arizona University, 2009-2016.

19. Co-Advisor for, Erin Savage, *Mountain lion management in southeastern Arizona: A policy of lethal control*, M.S. Thesis, Yale School of Forestry & Environmental Studies, New Haven, CT, 2008-2010.

18. Advisor for Tanya Rosen, *Social and policy implications of bear reintroductions in Europe: The life and death of brown bear JJ1*, submitted to *Human Dimensions of Wildlife*, Yale School of Forestry & Environmental Studies, New Haven, CT, 2007-2008.

17. Reader for Taijs van Maasakkers, *Environmental restoration in the Atchafalaya Basin: Boundaries and interventions*, Masters of Conservation Planning, MIT Department of Urban Studies & Planning, Cambridge, MA, 2008.

18. Faculty Advisor for Maria Martin Rodriguez-Ovelleiro, Special Credit Project, Yale School of Forestry & Environmental Studies, New Haven, CT, September-December 2006.

17. Faculty Advisor for Avery Anderson, Special Credit Project, Yale School of Forestry & Environmental Studies, New Haven, CT, September-December 2006.

16. Faculty Advisor for Rebecca Watters, Special Credit Project, Yale School of Forestry & Environmental Studies, New Haven, CT, September 2005-December 2006.

15. Co-Chair for Brandon Holton, *Upland free water availability and wildlife*, M.Sc. Thesis, Northern Arizona University, Flagstaff, AZ, 2004-2007.

14. Faculty Advisor for Trevor Streng, *Cougar biology and policy in northern Arizona*, Senior Project, Center for Environmental Sciences and Education, Northern Arizona University, Flagstaff, AZ, 2004-2005.

13. Faculty Advisor for Conservation Ecology Graduate Certificate for Sarah Hartwell, *The African bushmeat crisis: A summary of the problem and its causes*, Conservation Ecology Graduate Certificate Program, Northern Arizona University, Flagstaff, AZ, 2004-2005.

12. Preceptor for Winter Study Project for Margaret Carr and David Allen, *Where the wild things are: A study of cougar response to the presence of humans*, Winter Studies Program (SPEC 99), Williams College, Williamstown, MA, 2004.

11. Committee Member for M.S. program for Suzanne Cardinal, *Home range, movement patterns and habitat use of southwestern willow flycatchers at Roosevelt Lake, Arizona*, Department of Biological Sciences, Northern Arizona University, Flagstaff, AZ, 2003-2005.

10. Committee Member for M.S. program for Mark Weissinger, *Striped skunk (Mephitis mephitis) home range, seasonal and daily movements, and denning ecology in Flagstaff's urban environment*, Department of Biological Sciences, Northern Arizona University, Flagstaff, AZ, 2003-2007.

9. Committee Member for Ph.D. program for Ramona Maraj, *Human land use and grizzlies in southwest Yukon*, Faculty of Environmental Design, University of Calgary, Calgary, AB, 2003-2006. *Two co-authored journal articles in preparation*.

8. Faculty Advisor for Conservation Ecology Graduate Certificate for Matt Clark, *Potential effects of gray wolf reintroduction on the carnivore community of the Grand Canyon ecoregion*, Conservation Ecology Graduate Certificate Program, Northern Arizona University, Flagstaff, AZ, 2003-2004.

7. Faculty Advisor for Conservation Ecology Graduate Certificate for Brandon Holton, *Ecological costs and benefits of artificial water sites, with special emphasis on potential prey traps*, Conservation Ecology Graduate Certificate Program, Northern Arizona University, Flagstaff, AZ, 2003.

6. Committee Member for M.S. program for Elizabeth Ruther, *Conflict & co-habitation: a survey of northern Arizona ponderosa pine ecosystem residents assessing nature views and cougar perceptions*, Environmental Science & Policy, Northern Arizona University, Flagstaff, AZ, 2002-2005. *One co-authored journal article in preparation*.

5. Preceptor for Intern Program for Jesse Millen-Johnson involving field work on a Flagstaff area mountain lion project, Bates College, Lewiston, ME, 2003.

4. *Ex officio* Committee Member for Ph.D. program for Seth Wilson, *Landscape features and attractants that predispose grizzly bears to risk of conflict with humans*, University of Montana, Missoula, MT, 1999-2003. *Two co-authored journal articles*.

3. *Ex officio* Committee Member for Ph.D. program for Kerry Murphy, *Ecology of mountain lions in Yellowstone National Park*, University of Idaho, Moscow, ID, 1993-1997.

2. Principal Agency Advisor for M.S. program for Gerald Green, *Use of spring carrion by bears in Yellowstone National Park*, University of Idaho, Moscow, ID, 1987-1994. *One co-authored journal paper*.

1. Principal Agency Advisor for M.S. program for Daniel Reinhart, *Grizzly bear use on cutthroat trout spawning streams in tributaries of Yellowstone Lake*, Montana State University, Bozeman, MT, 1985-1990. *Two co-authored journal papers*.

Appointments

11. Invited Member of *Large Carnivore Group*, Yale School of Forestry & Environmental Studies, New Haven, CT, 2008-present.

10. Lecturer & Visiting Senior Scientist, *Yale School of Forestry and Environmental Studies*, June 2006-2014.

9. Western Field Director, *MIT-USGS Science Impact Collaborative*, Massachusetts Institute of Technology, April 2007-2010.

8. Adjunct Faculty, *Center for Environmental Sciences and Education* and School *of Earth Sciences and Environmental Sustainability*, Northern Arizona University, 2004-present.

7. Federal Agency Representative, Executive Board, *Colorado Plateau Chapter of the Society for Conservation Biology*, 2003-2013.

6. Adjunct Faculty, *Department of Biology*, Northern Arizona University, 2002-present.

5. Scholar-in-residence, *MIT-USGS Science Impact Collaborative*, MIT Department of Urban Studies and Planning, June 2007-2008.

4. Associate, *Merriam-Powell Center for Environmental Research*, Northern Arizona University, 2002-present.

3. Steering Committee Member, *Center for Sustainable Environments*, Northern Arizona University, 2002-2004.

2. Co-chair, Arizona Chapter, Southwestern Carnivore Committee, 2002-2004.

1. Faculty Participant, Conservation Ecology Graduate Certificate, Center for Environmental Sciences and Education, Northern Arizona University, 2001-2006.

Conference Planning since 1992

15. Co-organizer, with M. Wolfe, of workshop, "Opportunities for collaborative mountain lion research in the interior western United States," *17th Annual Conference of The Wildlife Society*, Snowbird, UT, January 2010-October 2010

14. Organizer of workshop, "Opportunities for collaborative mountain lion research on and near the Colorado Plateau," *10th Biennial Conference of Research on the Colorado Plateau*, Flagstaff, AZ, April 2009-October 2009

13. Program Chair and part of core Planning Committee for *10th Biennial Conference of Research on the Colorado Plateau*, October 2008-October 2009

12. Member of Planning Committee for workshop, *Improving Prospects for Cougar Conservation: Clarifying Goals, Identifying Problems, Seeking Solutions*, Seattle, WA, August-November 2008

11. Member of Planning Committee, *Annual Meeting at Marble Canyon*, sponsored by the Colorado Plateau Chapter of the Society for Conservation Biology, Marble Canyon, AZ, April-August 2006.

10. Member of Interagency Committee for workshop on *Water Developments for Wildlife*, Arizona State University, Tempe, AZ, November 2004, sponsored by numerous stakeholder in the issues of water developments, 2004-2005.

9. Member of Advisory Committee for conference *Governance and Decision-Making in Mountain Areas*, June 2005, Banff, AB, sponsored by The Banff Centre and Parks Canada, 2004-2005.

8. Member of Advisory Committee for workshop on *Faunal Populations and Communities,* Northern Arizona University, Flagstaff, AZ, April 2004, sponsored by NPS Southern Colorado Plateau I&M Network, Flagstaff, AZ, 2004.

7. Member of Conference Committee for *Views of the Elephant: Lessons Learned form Personal Experiences in Conservation*, Marble Canyon, AZ, April 2004, sponsored by the Colorado Plateau Chapter for Conservation Biology, 2004.

6. Advisor for workshop *Policy-Oriented Conservation Design*, Pender Island, BC, February 2004, sponsored by the Wilburforce Foundation and Y2Y Conservation Initiative, 2004.

5. Member of Advisory Committee for workshop *Large-Scale Conservation: Exploring Challenges, Perspectives, and Opportunities in the Y2Y Case*, Yale University, New Haven, CT, April 2004, sponsored by Yale School of Forestry & Environmental Studies, New Haven, CT, and Kent State University, Kent, OH, 2003-2004.

4. Member of Scientific Advisory Committee for *Carnivores 2004* conference, Santa Fe, NM, November 2004, for Defenders of Wildlife, Washington, D.C, 2003-2004.

3. Conference Chair, oversaw all aspects of *7th Biennial Conference of Research on the Colorado Plateau*, Flagstaff, AZ, November 2003, 2002-2003.

2. Program Chair, planned and organized program for *6th Biennial Conference of Research on the Colorado Plateau*, Flagstaff, AZ, November 2001, 2000-2001.

1. Client's Day Chair, developed and organized Client's Day for *5th Biennial Conference of Research on the Colorado Plateau*, Flagstaff, AZ, November 1999, 1999.

E. **TRAINING, BRIEFINGS & INFORMATION TRANSFER** since 1992

52. "Redefining recovery for grizzly bears.," webinar hosted by Sierra Club and Wyoming Wildlife Advocates, May 2020.

51. "Northern Continental Divide grizzly bears: A different view of the science," Briefing for environmental activists, Helena, MT, July 2015.

50. "Northern Continental Divide grizzly bears: A different view of the science," Briefing for Blackfeet Tribal Council, Browning, MT, July 2015. (INVITED)

49. Briefing for the Wilburforce Foundation and the Harder Foundation on planned organizational structure and focus of activities for People & Carnivores, Seattle, WA, April 2014.

48. Briefing for conservation donors on status of the Yellowstone grizzly bear population and associated key management issues, Livingston, MT, September 2013. (INVITED)

47. "Sheep, cougars, water, plants, and disease: Collaborative research on desert bighorn along the middle Colorado River," 1st author with Brandon Holton, Staff Briefing for Canyonlands National Park and Utah Division of Wildlife Resources, May 2012.

46. "Sheep, cougars, water, plants, and disease: Collaborative research on desert bighorn along the middle Colorado River," 1st author with Brandon Holton, Staff Briefing for Zion National Park, Grand Staircase-Escalante National Monument, and Utah Division of Wildlife Resources, April 2012.

45. "Project background and context: Or, what we did and why, and how to interpret and use our

results," for *NCCWSC Forecasting Climate Impacts on Wildlife in the Arid Southwest*, Advisory Team meeting, Flagstaff, AZ, June 2011.

44. "Selection of species, conceptual models, model complexity, and approaches for spatially displayed uncertainty in model outcomes," for *NCCWSC Forecasting Climate Impacts on Wildlife in the Arid Southwest*, Advisory Team meeting, Flagstaff, AZ, September 2010.

43. WORKSHOP convened and led to develop study plan and proposal (*Source-sink dynamics of arid-land mammals: Desert bighorn sheep and their predators in southeastern Nevada*) in response to DoD SERDP rfp, Henderson, NV, February 2010.

42. WORKSHOP convened and led to scope research related to loss of whitebark pine in the northern Rocky Mountains and modeling changes in grizzly bear density under global change, Denver Zoo, Denver, CO, February 2010.

41. "Predatory behavior of mountain lions on the southern Colorado Plateau," 1st author with B. Holton, Staff Briefing for the Coconino National Forest, Peaks RS, Flagstaff, AZ, June 2010. (INVITED)

40. "Climate change effects on plant and animal species in the Southwest," for *Flagstaff Science Center Climate Change Workshop*, USGS Flagstaff Science Center, Flagstaff, AZ, May 2010. (INVITED)

39. "NCCWSC project: Forecasting climate impacts on wildlife in the arid Southwest – Module 3," 1st author with et al., for *NCCWSC Forecasting Climate Impacts on Wildlife in the Arid Southwest*, Stakeholder Advisory Group, Phoenix, AZ, April 2010.

38."Thinking outside the box," for *Human Dimensions of Carnivore Conservation: Experts Workshop*, Florida Wildlife Commission and Florida Defenders of Wildlife, White Oak Plantation, FL, January 2010. (INVITED)

37. "USGS mountain lion studies in the interior Southwest," briefing for Sue Hazeltine and Bruce Jones, University of Arizona, Tucson, AZ, December 2009. (INVITED)

36. "NCCWSC project: Forecasting climate impacts on wildlife in the arid Southwest," 1st author with et al., briefing for Sue Hazeltine and Bruce Jones, University of Arizona, Tucson, AZ, December 2009. (INVITED)

35. "Lion research in the Flagstaff area," for *All Regional Staff Meeting, Region II, Arizona Game & Fish Department*, Flagstaff, AZ, October 2009. (INVITED)

34. "Interdisciplinary problem-solving (IPS) skills-upgrading workshop," WORKSHOP for Banff National Park Grizzly Bear IPS Group, Banff, Alberta, October 2009. (INVITED)

33. "Forecasting effects of climate change on focal wildlife species within Sonoran desert and Colorado Plateau ecosystems," for *NCCWSC Forecasting Climate Impacts on Wildlife in the Arid Southwest*, Advisory Team, Flagstaff, AZ, October 2009. (INVITED)

32. "USGS-National Park Service mountain lion studies on the southern Colorado Plateau," 1st author with B. Holton, T. Arundel, K. Ironside, R.V. Ward, & C. Crow, briefing for DOE & USGS Nevada Test Site personnel, Las Vegas, NV, October 2009.

31. "Upland free water on the Colorado Plateau: Past, present, and future?," for USGS Water Resources Discipline, *National Research Program Research Committee Meeting*, Flagstaff, AZ, May 2009. (INVITED)

30. "Mountain lions of Zion NP: 2006-2008," 1st author with J. Hart, T. Arundel, & B. Holton for Staff of Zion National Park, Springdale, UT, May 2009. (INVITED)

29. "Managing for human safety in mountain lion range," 1st author with K. Logan & L. Sweanor for Staff of Zion National Park, Springdale, UT, May 2009. (INVITED)

28. "Living with large fierce creatures: Cougars and humans on the southern Colorado Plateau," 3rd author with T. Arundel & B. Holton for *2008-2009 Flagstaff Leadership Program*, Flagstaff, AZ, May 2009. (INVITED)

27. "Mountain lions in ecosystems: Evidence and speculations about effects," 1st author with B. Holton for workshop on *Landscape-Scale Management Strategies for Wide-Ranging Mammals*, Grand Canyon NP, AZ, June 2009. (INVITED)

26. "USGS BRD: A modern organization in a post-modern world," for *Seminar Series*, USGS Flagstaff Science Center, Flagstaff, AZ, May 2007. (INVITED)

25. "The Glen Canyon Dam Adaptive Management Program: A preliminary appraisal," briefing for the USGS Southwest Biological Science Center Management Team and Grand Canyon Monitoring & Research Center Program Leaders, Flagstaff, AZ, May 2007. (INVITED)

24. "Why Yale? What at Yale?," for *Brown Bag Seminar*, USGS Colorado Plateau Research Station, Flagstaff, AZ, April 2007. (INVITED)

23. "Monitoring wildlife in wilderness," INSTRUCTOR for *Class on Natural and Cultural Monitoring in Wilderness*, sponsored by Arthur Carhart National Wilderness Training Center, Las Vegas, NV, March 2006. (INVITED)

22. "Cougars of the Flagstaff Uplands: Preliminary results 2003-2005," 1st author with J. Hart & T. Arundel for staff of the Flagstaff Area National Monuments, Flagstaff, AZ, March 2006. (INVITED)

21. "Wildlife, water, and humans in uplands of the Southwest," 1st author with M. Miller, briefing for the USGS Western Regional Executives Team, Seattle, WA, February 2006. (INVITED)

20. "Wildlife water developments and the social construction of conservation conflict," for staff of USGS Grand Canyon Monitoring and Research Center, Flagstaff, AZ, February 2006. (INVITED)

19. "Wildlife water developments and the social construction of conservation conflict," 1st author with N. Chambers for staff of the BLM State Office and BLM Phoenix Field Office, Phoenix, AZ, January 2006. (INVITED)

18. *1st Workshop of the Colorado Plateau Mountain Lion Working Group*, ORGANIZER and CONVENER, sponsored by USGS Southwest Biological Science Center, Flagstaff, AZ, January 2006.

17. "Cougars of the Colorado Plateau: A multi-park investigation," 1st author with J. Hart, T. Arundel, R. Stevens, E. Garding, RV Ward, J. Bradybaugh, & E. Leslie for *USGS Southwest Biological Science Center All Hands Meeting*, Flagstaff, AZ, November 2005. (INVITED)

16. "Safety in Red Rock's lion country," for *Safety Meeting*, USFS Coconino NF, Sedona Ranger District, Sedona, AZ, October 2005. (INVITED)

15. "Perspectives on wildlife water developments: An analysis of documents, quotes, and materials from the November 2004 workshop," for Staff of the BLM Phoenix Field Office, sponsored by the Sonoran Institute and the BLM Phoenix Field Office, Phoenix, AZ, June 2005. (INVITED))

14. “Cougars of the Colorado Plateau: A multi-park investigation, Zion National Park and environs,” 1st author with J. Hart, T. Arundel, & J. Bradybaugh for Zion NP staff, Zion NP Headquarters, UT, December 2005. (INVITED)

13. “Cougars of the Flagstaff Uplands: An introduction and results of the 2003-2004 field season,” 1st author with J. Hart & T. Arundel for *August Staff Meeting, Region 2 Arizona Game & Fish Department*, sponsored by Region 2, Arizona Game & Fish Department, August 2004. (INVITED)

12. “Foraging behavior of Yellowstone’s grizzly bears: Consumption of whitebark pine seeds and ungulates,” for *2004 State Meeting of the Arizona Wildlife Services Program*, sponsored by USDA Wildlife Services, Hawley Lake, AZ, July 2004. (INVITED)

11. “Cougars of the Flagstaff Uplands: An introduction and results of the 2003-2004 field season,” 2nd author with J. Hart & T. Arundel for *2004 State Meeting of the Arizona Wildlife Services Program*, sponsored by USDA Wildlife Services, Hawley Lake, AZ, July 2004. (INVITED)

10. “Y2Y conservation design: A framework for judging the sufficiency of Y2Y science,” for *Y2Y Conservation Science and Planning Meeting*, sponsored by the Yellowstone-to-Yukon Conservation Science and Planning Program, Canmore, AB, January 2002. (INVITED)

9. “People, bear science and decision making,” for *Grizzly Bear Research and Monitoring in Banff and Other Mountain National Parks: Where Do We Go From Here?*, sponsored by Parks Canada, Banff, AB, March 2001. (INVITED)

8. “Large Carnivores on the Plateau: a Workshop on the Biology and Management of Pumas and Black Bears in Colorado Plateau National Parks,” ORGANIZER and CONVENER with E. Leslie for Utah, New Mexico, and Arizona state game and fish agencies and U.S. National Park Service, sponsored by the U.S. National Park Service and USGS, Flagstaff, AZ, March 2001.

7. "Modeling regional habitat suitability for large carnivores," for *Yellowstone-to-Yukon Council Meeting*, sponsored by Y2Y Council, Helena, MT, April 1998. (INVITED)

6. "Cumulative effects model: History, interpretation and future," for Interagency Grizzly Bear Committee Yellowstone Cumulative Effects Modeling Team, Mammoth, WY, June 1997. (INVITED)

5. "Suitability of habitat in the Bitterroot Recovery Area," for *Workshop and Briefing on Grizzly Bear Habitat in the Bitterroot Recovery Area*, sponsored by the Idaho Department of Fish & Wildlife, Boise, ID, May 1997. (INVITED)

4. "Grizzly bear use of ungulates and whitebark pine middens," for *Grizzly Bear Seminar for Yellowstone National Park Staff*, Center for Resources, Mammoth, WY, June 1996. (INVITED)

3. "Grizzly bear science," as part of panel *Journey to Recovery*, for *Summer Meeting of the Interagency Grizzly Bear Committee*, Gardiner, MT, June 1996. (INVITED)

2. "Cumulative effects analysis for the Yellowstone grizzly bear population," for *Cumulative Effects Workshop*, sponsored by Canadian Parks Service, Energy Resources Conservation Board, Natural Resources Conservation Board, Shell Canada Ltd., Alberta Resource Planning Branch, and Environment Council of Alberta, Calgary, AB, March 1993. (INVITED)

1. "Experiences of Yellowstone in Ecosystem Management," for *Kananaskis Workshop for the Ecosystem Management Task Force*, sponsored by Canadian Parks Service, Kananaskis, AB, February 1992. (INVITED)

F. SPECIAL ASSIGNMENTS

15. Member of the *USGS Southwest Biological Science Center Strategic Planning Core Team*, June 2011-2013.

14. Chair of *Hiring Committee for GS-13 Landscape Ecologist*, USGS Southwest Biological Science Center, September-November 2010.

13. Member of *USGS Research Grade Evaluation Panels*, Milwaukee, WI, 2010, and for Sasha Reed, USGS Southwest Biological Science Center, February-March 2010.

12. Principal USGS Agent for renewal of 5-year *Memorandum of Understanding* and *Cooperative Agreement* between USGS and Northern Arizona University governing operations of the Colorado Plateau Research Station at Northern Arizona University, 2008-2009.

11. Station Leader/Liaison for USGS Colorado Plateau Research Station, Southwest Biological Science Center, Flagstaff, AZ, 2009-2011.

10. Acting Center Director for USGS Southwest Biological Science Center, Flagstaff, AZ, as requested, 2003-present; *performed routine duties of Center Director in the absence of official Director.*

9. Member of Steering Committee, *Global Climate Change Collaborative (G3C)*, MIT-USGS Science Impact Collaborative, Cambridge, MA, 2007-2008.

8. Member of the *Science Advisory Group* for the *USGS Science Strategy Team*, February-June 2006.

7. Member of *USGS Research Grade Evaluation Panels*, Reno, NV, 2001, and Columbus, OH, 2006.

6. Member of the *USGS Southwest Biological Science Center Strategic Planning Core Team*, November 2005-February 2006.

5. Reporter for *Workforce Planning Break-Out Group 4, USGS Southwest Biological Science Center All Hands Meeting*, Flagstaff, AZ, November 2005.

4. Team Leader for *Large Mammals and Predators, USGS Wildlife Program Five Year Strategic Plan*, August 2004-January 2005.

3. Acting Station Leader for USGS Colorado Plateau Research Station, Flagstaff, AZ, as needed 2000-2008; *performed routine duties of Field Station Leader in the absence of official Leader.*

2. Committee Chair, USGS Colorado Plateau Field Station Information Resources Management Committee, 2000-2004; *provided oversight for resolution of IRM issues at the Field Station*.

1. Special Project, Interagency Grizzly Bear Study Team, Bozeman, MT, 1982-1983; *developed procedures for and mapped habitat and cover types on 300,000 acres of National Forest lands delineated by the scientist in core grizzly bear range*.

G. **OTHER TECHNICAL ACTIVITIES** since 1998, but earlier accomplishments where appropriate

A. I advised nationally important programs, reviewed nationally important projects, or participated in advanced disciplinary workshops. I was among a few nationally recognized bear scientists to serve on a review panel for the controversial *Tongass National Forest Land Management Plan*. I was also one of three internationally recognized grizzly bear scientists invited by the IUCN Conservation Biology Specialists Group to serve as an advisor and technical specialist for a population viability workshop in Canada. Of additional relevance to Canada, I was engaged to review the controversial and potentially influential *Muskwa-Kechika Wildlife Management Plan*. I was invited as one of the foremost conservation biologists in North America to attend a workshop that reviewed and advanced concepts of regional conservation design and contributed to two chapters of a book that reported the results of this endeavor. I was similarly invited as one the nation's foremost carnivore researchers and conservation biologists to participate in a workshop and serve on an advisory committee for development of a national bioregional conservation planning process. More recently I have been recognized as an authority in the field of cougar research and management, most notably by my engagement to review the authoritative *Cougar Management Guidelines for North America* and the high-profile *Analysis of Scientific Publications for the Florida Panther*, as well as to advise the Florida Panther Recovery Team on methods for public engagement. I also advised key BLM personnel on BLM's Rapid Ecoregional Assessment (REA) program, including reviews of two seminal planning documents for the Colorado Plateau and Sonoran Desert REAs.

B. On the basis of specific requests, 1986-present, I provided substantial technical assistance to numerous Master's and Doctoral-level graduate students in domestic academic institutions such as Yale University, Massachusetts Institute of Technology, Brown University, Northern Arizona University, University of New Mexico, Tufts University, the University of Utah, University of Nevada-Reno, and the University of Georgia, (and more) as well as international universities such as the University of Calgary, Wilfrid Laurier University and the University of Waterloo in Canada, Sinchu University in Japan, the University of León in Spain, and the University of Helsinki in Finland. This assistance was primarily in the form of advice on project design and methods, as well as information about policy analysis and bear and cougar ecology. This assistance served to enhance the quality of academic research programs, built good will between the USGS and academic institutions, and contributed to durable professional relations.

C. On the basis of specific requests, 1992-present, I provided substantial technical assistance to Parks Canada regarding management of grizzly bears in Canada. Some of these grizzly bear populations are of potentially great importance to the future conservation of grizzly bears in the adjacent U.S. This assistance pertained to specific management plans or issues (*e.g*., proposed expansion of the Westcastle development north of Waterton National Park, expansion of the Sunshine Ski Area west of the Townsite of Banff, and construction of roads near Kluane National Park) and to general management issues such as the implementation of ecosystem management or the assessment of current and foreseeable human impacts on large carnivores in the Bow River Valley of Banff National Park and the Greater Kluane ecoregion in the Yukon. More recently this assistance took the form of leading a skills-enhancement workshop during 2009 for a multi-stakeholder Interdisciplinary Problem-Solving (IPS) group involved in management of grizzly bears in Banff National Park. This technical assistance was based on my general knowledge and personal research.

D. On the basis of specific requests, I provided substantial technical assistance to educational media and organizations, including *National Geographic*, *National Geographic Television*, *Audubon* magazine, *Encarta Encyclopedia*, *Earth Notes* radio program, the Canadian Broadcasting Corporation, the British Broadcasting Corporation, Public Broadcasting System, National Public Radio, the Center for Image Processing in Education, ABC, CNN, and the Center for International Environmental Law. This assistance took the form of in-depth interviews, fact checking, verification of bear identification in photos, information on bear and cougar ecology, and provision of data or other teaching aids. My assistance contributed to enhancing the quality of information about bears and cougars reaching the general public through these educational venues. This assistance was based on my personal research.

E. On the basis of specific requests, 1985-present, I advised and educated numerous private individuals and organizations on the ecology of grizzly bears. This advice was to organizations with commodity interests (*e.g*., the Targhee Timber Association), organizations with environmental interests (*e.g*., the Greater Yellowstone Coalition, Sierra Club, Earthjustice, Western Wildlands, Natural Resources Defense Council), non-partisan groups (*e.g*., the Henry's Fork Watershed Council), and industry (*e.g*., Crown Butte Mines). This technical assistance has helped private efforts to conserve bears and cougars or helped to minimize the adverse impacts of human activities on private lands. More importantly, this technical assistance has helped increase the level of scientific knowledge among those in non-governmental capacities who are playing a major role in shaping grizzly bear and cougar management. This technical assistance was based on my personal research.

F. I worked closely with National Park Service biologists, managers, and planners, as needed, 1999-2009, especially on design, execution and appraisal of the National Inventory and Monitoring (I&M) Program. I was intimately involved with the Northern and Southern Colorado Plateau and Mohave Networks. Advice, at times as invited technical papers, pertained to topics ranging from overall strategic direction and philosophy to details of statistical design. I was co-author of an Inventory Plan that was rated by the NPS National I&M Office as 2nd best for the entire country and contributed to the Plan rated 1st. I was also involved in appraisal of I&M efforts, including a talk at the George Wright Society Meeting and plans for peer-reviewed journal papers. In 2000 I also provided expert opinion to managers of Canyonlands National Park regarding the impacts of a controversial road up the Salt Creek drainage. This technical assistance was based on my general knowledge and personal research.

G. I worked closely with US National Park Service and US Forest Service biologists, managers, and planners, as needed, 1985-2008, on issues related to grizzly bear conservation and ecology. I was engaged in development and review of specific plans pertaining to grizzly bear management primarily in the Yellowstone ecosystem (*e.g*., planning and review of Bear Management Areas, Lake Development Concept Plan, Fishing Bridge Campsite Replacement Plan, various plans for road reconstruction, and others). I frequently participated in training programs and advised individual District and Sub-district personnel on grizzly bear ecology and management (*e.g*., regarding specific Bear Management Areas, or bear use of locally important foods such as ungulate carrion). I also assisted in the design of Park Service-sponsored grizzly bear research or monitoring (*e.g*., as along cutthroat trout spawning streams, on ungulate winter ranges, or of whitebark pine cone production) and, up until 2008, was part of the Yellowstone Ecosystem Whitebark Pine Working Group. This technical assistance was based on my personal research.

H. On the basis of specific requests, 1986-present, I have provided substantial technical advice to those involved with management and research of brown bears worldwide. This involved the review of research and the revision of manuscripts concerning brown bear conservation in Norway for Dr. Käre Elgmork, the development of a research program regarding the monitoring of brown bear populations in Kamchatka for Igor Revenko, the development of a program to reintroduce brown bears into two areas of France, for the French Bear Group and Dr. Pascal Wick, the development of research in Kluane National Park, Yukon, for Parks Canada, the status of grizzly bears in Yellowstone National Park for the World Heritage Committee, advice to the Japan Ecosystem Conservation

Society on restoration of black and brown bear in the Japan, the development of community-based grizzly bear conservation for Steve Primm and Dr. Tim Clark of the Northern Rockies Conservation Cooperative, the development of a conservation plan for black and grizzly bears in the Yukon for Dr. Brian Horejsi, the development, implementation and reporting of habitat research for scientists on the Interagency Grizzly Bear Study Team, the status of grizzly bear habitat in Idaho for the Idaho Department of Fish and Game, and the development of approaches to planning and implementing bear conservation for teams working with the IUCN. This technical assistance was based on my general knowledge and personal research.

Reports since 1992

25. Mattson, D.J. (2019). *Vision for recovery of grizzly bears & petition for revision of the 1993 Recovery Plan: Grizzly Bear ReVision Project*. Grizzly Bear Recovery Project, Livingston, MT.

24. Mattson, D.J. (2019). *Prospectus for action to address grizzly bear conflicts in Park County.* Grizzly Bear Recovery Project, Livingston, MT.

23. Mattson, D.J. (2013). *2013 Annual Report of progress/status of activities pertaining to Radio Tracking of Cougars on the Nevada National Security Site*. USGS Southwest Biological Science Center, Flagstaff, AZ. 13 pp.

22. Mattson, D.J. (2012). *2012 Memo of progress/status of activities pertaining to Radio Tracking of Cougars on the Nevada National Security Site*. USGS Southwest Biological Science Center, Flagstaff, AZ. 14 pp.

21. Mattson, D. (2011). *Research needs and opportunities related to cougars and their prey on Grand Staircase-Escalanate NM (GSENM) and the BLM Kanab District. Parts 1 & 2*. USGS Southwest Biological Science Center, Flagstaff, AZ. 10 pp.

20. Mattson, D. (2011). *Comments on BLM Colorado Plateau Rapid Ecoregional Assessment Final Workplan 1-4-a*. USGS Southwest Biological Science Center, Flagstaff, AZ. 5 pp. (**INVITED** technical report)

19. Johnson, M.J., J.R. Hatten, J.A. Holmes, & **D.J. Mattson**. (2011). *Development of a GIS-based Model of Yellow-Billed Cuckoo Breeding Habitat with the Lower Colorado River Multi-Species Conservation Area, San Pedro River and Verde River, AZ: Project Update.* USGS Southwest Biological Science Center, Flagstaff, AZ.

18. Mattson, D., M.J. Matthew, J.R. Hatten, J.A. Holmes, &T. Arundel. (2010). *Development of a GIS-based Model of Yellow-Billed Cuckoo Breeding Habitat with the Lower Colorado River Multi-Species Conservation Area, San Pedro River and Verde River, AZ: Project Update.* USGS Southwest Biological Science Center, Flagstaff, AZ.

17. Mattson, D. (2010). *Comments on the BLM Colorado Plateau and Sonoran Desert REA Identification of Conservation Elements, Change Agents, and Management Questions*. USGS Southwest Biological Science Center, Flagstaff, AZ. 5 pp. (**INVITED** technical report)

16. Mattson, D.J. (2010). *Cougars of Zion and Capitol Reef: 2006-2008 project update*. USGS Southwest Biological Science Center, Flagstaff, AZ. 19 pp.

15. Mattson, D., & L. Sweanor. (2009). *Report on the workshop: Opportunities for collaborative mountain lion research on and near the Colorado Plateau*. Wild Felid Association, Montrose, CO, and USGS Southwest Biological Science Center, Flagstaff, AZ. 5 pp.

14. Mattson, D. (2008). *Parting thoughts about MUSIC's approach to learning*. MIT-USGS Science Impact Collaborative, Cambridge, MA. 3 pp.

13. Mattson, D. (2008). *MUSIC as a boundary-spanning and social movement organization*. MIT-USGS Science Impact Collaborative, Cambridge, MA. 3 pp.

12. Johnson, M., J. Holmes, **D. Mattson**, L. Thomas, & N. Tancreto. (2004). *Summary of faunal populations and communities workshop April 6-7, 2004, Northern Arizona University, Flagstaff, Arizona NPS, Southern Colorado Plateau I&M Network*. U.S. National Park Service, Southern Colorado Plateau I&M Network, Flagstaff , AZ. 10pp. (INVITED technical white paper)

11. **Mattson, D.J.** (2004). *Some thoughts on evaluating the Yellowstone grizzly bear cumulative effects model*. *For* USGS Interagency Grizzly Bear Study Team, Bozeman, MT. USGS Southwest Biological Science Center, Flagstaff, AZ. 3pp. (INVITED technical white paper)

10. **Mattson, D.J.** (2003). *Thoughts on designing a monitoring program for the Southern Colorado Plateau Network (SCPN) National Park units*. *For* US National Park Service Southern Colorado Plateau Network, Flagstaff, AZ. USGS Southwest Biological Science Center, Flagstaff, AZ. 4pp. (INVITED technical white paper)

9. **Mattson, D.J.** (2003). *"Conservation is like warfare:" Phantom common ground in the grizzly bear case*. *For* Yale School of Forestry & Environmental Studies, Seminar on Society & Natural Resources (F&ES 746). 7pp. (INVITED seminar paper)

8. **Mattson, D.J.** (2002). *An approach to selecting vital signs for the Colorado Plateau National Park Service inventory and monitoring program*. *For* US National Park Service Northern Colorado Plateau Network, Moab, UT. USGS Forest & Rangeland Ecosystem Science Center, Colorado Plateau Field Station. 7pp. (INVITED technical white paper)

7. **Mattson, D.J.** (2001). *Comments on ecological effects of the four-wheel-drive route in Salt Creek, Canyonlands National Park, Utah*. *For* Southeast Utah Group National Parks & Monuments, Moab, UT. USGS Forest & Rangeland Ecosystem Science Center, Colorado Plateau Field Station. 14pp. (INVITED technical report)

6. **Mattson, D.J.** (2000). *Managing whitebark pine for grizzly bears: Preliminary recommendations*. *For* Interagency Grizzly Bear Study Team, Bozeman, MT. USGS Forest & Rangeland Ecosystem Science Center, Colorado Plateau Field Station. 3pp. (INVITED technical report)

5. Drost, C., **D.J. Mattson**, M.J. Johnson, A. Cully, M. Bogan, E. Nowak, T. Persons, J. Spence, K. Thomas, & M. Stuart (2000). *Biological inventory of National Park areas on the southern Colorado Plateau*. *For* US National Park Service Southern Colorado Plateau Network. Colorado Plateau Cooperative Ecosystem Studies Unit and USGS Colorado Plateau Field Station, Flagstaff, AZ. 209pp. (INVITED technical plan; *rated second-best inventory plan nationwide*).

4. **Mattson, D.J.** (1998). *Coefficients of productivity for Yellowstone's grizzly bear habitat*. USGS Forest & Rangeland Ecosystem Science Center, Corvallis, OR. 85pp. (Technical report).

3. **Mattson, D.J.** (1998). *Research problem analysis: Yellowstone's grizzly bear research program*. *For* Interagency Grizzly Bear Study Team, Bozeman, MT. USGS Biological Resources Division, Forest & Rangeland Ecosystem Science Center. 10pp. (INVITED technical paper).

2. **Mattson, D.J.** (1993). *Background and Proposed Standards for Managing Grizzly Bear Habitat Security in the Yellowstone Ecosystem*. U.S. National Biological Survey, University of Idaho Cooperative Park Studies Unit, Moscow. 17pp. (Technical report)

1. Reinhart, D.P. & **D.J. Mattson** (1992). *Grizzly Bear and Black Bear Habitat Use in the Cooke City, Montana, Area, 1990-1991*. U.S. National Park Service, Interagency Grizzly Bear Study Team, Bozeman, MT. 31pp. (Technical report)

Other Significant Technical Assistance since 1998 I provided significant technical assistance to individuals on **more than 100 occasions** since 1998, including individuals from Spain, Greece, Italy, Russia, Japan and Canada, pertaining to a wide range of topics, including the design and execution of research, design of conservation efforts, and review of research or management efforts. These instances of technical assistance involved either (i) substantial written or verbal correspondence [generally >3 lengthy e-mail messages or a total of >1-2 hrs of conversation], (ii) significant (several pages) of written products by the scientist, (iii) hands-on analysis of data, (iv) the conveyance of substantive technical products, or (v) otherwise substantively important technical input. I provided lesser technical assistance on many other occasions. Individuals receiving significant technical assistance were from the following organizations (more than one instance is indicated by a trailing bolded number in parentheses):

Yale School of Forestry & Environmental Studies, New Haven, CT (**10**)
Massachusetts Institute of Technology (**5**)
University of Calgary, Calgary, AB (**4**)
National Geographic, Washington, D.C. (**3**)
USGS Colorado Plateau Field Station, Flagstaff, AZ (**3**)
Interagency Grizzly Bear Study Team, Bozeman, MT (**2**)
Tigress Productions, Bristol, UK (**3**)
Brown University
Oregon State University, Corvalis, OR
Nature Conservancy magazine
Audubon magazine
Encarta Encyclopedia
Canadian Broadcasting Corporation, Toronto, ON
Earth Notes Radio Program, Flagstaff, AZ
Universidad de León, León, Spain
Shinshu University, Matsumoto, Japan
University of Helsinki, Helsinki, Finland
University of Waterloo, Ontario, Canada
Wilfrid Laurier University, Waterloo, ON
Yale School of Management, New Haven, CT
New Mexico State University, Las Cruces, NM
University of Utah, Salt Lake City, UT
Washington State University, Pullman, WA
Kent State University, Kent, OH
Marquette University, Milwaukee, WI
Tufts University, Boston, MA
Montana State University, Bozeman, MT
University of Georgia, Athens, GA

University of New Mexico, Albuquerque, NM
Parks Canada, Banff National Park
Grand Canyon National Park
Yellowstone National Park
US National Park Service, Great Basin National Park and Mojave Network, Ely, NV
US National Park Service, Northern Colorado Plateau Network, Moab, UT
USGS Grand Canyon Monitoring & Research Center, Flagstaff, AZ
USFS Targhee National Forest, St. Anthony, ID
USFS Gallatin National Forest, Gardiner, MT
USGS Western Ecological Research Center, Sausalito, CA
U.S. Fish and Wildlife Service, Helena, MT
Idaho Fish & Game Department, Boise, ID
Blackfoot Challenge, Missoula, MT
The Banff Centre, Banff, AB
American Museum of Natural History, New York, NY
Denver Zoo, Conservation Biology Department, Denver, CO
Royal Society, Biological Sciences, London, U.K.
Y2Y Conservation Initiative, Canmore, AB
The Grand Canyon Trust, Flagstaff, AZ
Turner Endangered Species Fund, Bozeman, MT
Sinapu, Boulder, CO
WildFutures / Earth Island Institute
San Juan Citizen's Alliance
Colorado Grizzly Project
Sierra Club Grizzly Bear Ecosystems Project, Bozeman, MT
The Wilderness Society, Anchorage, AK
World Wildlife Fund & Northern Rockies Conservation Cooperative, Ennis, MT
Round River Conservation Studies, Salt Lake City, UT
Center for Image Processing in Education, Tucson, AZ
Center for Environmental Law, Washington, D.C.
Western Wildlife Environments Consulting, Alberta, AB
Great Divide Nature Interpretation, Lake Louise, AB

(7) OUTREACH AND INFORMATION TRANSFER

Technical Information Bulletins or Fact Sheets since 1998

7. Mattson, D.J. (2013). Remarks for the Union of Concerned Scientists: conservation of Yellowstone's grizzly bears. The Grizzly Bear Recovery Project, Livingston, MT. 3 pp. (Briefing document).

6. Mattson, D.J. (2013). *Some of the ways that Yellowstone's grizzly bears are unique globally and in North America*. The Grizzly Bear Recovery Project, Livingston, MT. 5 pp. (Fact sheet).

5. Mattson, D.J. (2013). *Government claims about the ecology and demography of Yellowstone's grizzly bears and the rest of the story*. The Grizzly Bear Recovery Project, Livingston, MT. 8 pp. (Fact sheet).

4. **Mattson, D.**, J. Hart & T. Arundel (2005). *Kills by cougars in the Flagstaff uplands of northern Arizona, July 2003-February 2005*. USGS Southwest Biological Science Center, Flagstaff, AZ. 1 pp. (Fact sheet/Research Briefing)

3. **Mattson, D.**, T. Arundel, & J. Hart (2005). *Preliminary analysis of habitat selection by cougars in the Flagstaff uplands of northern Arizona*. USGS Southwest Biological Science Center, Flagstaff, AZ. 1 pp. (Fact sheet/Research Briefing)

2. **Mattson, D.J.**, J. Hart & T. Arundel (2004). *Kills by cougars in the Flagstaff Uplands of northern Arizona July 2003-May 2004*. USGS Southwest Biological Science Center, Flagstaff, AZ. 1 pp. (Fact sheet/Research Briefing)

1. **Mattson, D.J.**, J. Hart & T. Arundel (2002). *Cougars of the Flagstaff uplands*. USGS Southwest Biological Science Center, Flagstaff, AZ. 2 pp. (Fact sheet/Research Briefing)

Web Sites since 1998

5. Mattson, D.J. (2016-present). *Mostly Natural Grizzlies of the Northern Rocky Mountains*. https://www.mostlynaturalgrizzlies.org/

4. Mattson, D.J. (2013-present). *All Grizzly*. https://www.allgrizzly.org/

3. Willcox, L.L., & **D.J. Mattson** (2013-present). *Grizzly Times*. https://www.grizzlytimes.org/

Grizzly Bear Extirpations
https://www.grizzlytimes.org/grizzly-bear-extirpations
Patterns of Mortality
https://www.grizzlytimes.org/patterns-of-mortality
Trends in Food & Habitat
https://www.grizzlytimes.org/trends-in-habitat
Foods & Demography
https://www.grizzlytimes.org/foods-demography
Landscapes of Conflict
https://www.grizzlytimes.org/landscapes-of-conflict
Potential & Restoration
https://www.grizzlytimes.org/potential-restoration

2. White, L., & **D.J. Mattson** (2001). *Grizzly Bears*.
http://sbsc.wr.usgs.gov/cprs/research/projects/grizzly/grizzly_bears.asp

1. **Mattson, D.J.**, & L. White (2001). *Grizzly Bears in North America*.
http://sbsc.wr.usgs.gov/cprs/research/projects/grizzly/grizzly_na.asp

Public Presentations since 1998

65. "Grizzly bears: Miracles, mysteries, and a bit of history," public presentation, sponsored by the Scoville Public Library, Salisbury, CT, April 2021. (**INVITED**)

64. "The Grizzly Bear Promised Land," online event, sponsored by Grizzly Times, WildEarth Guardians, and Friends of the Clearwater, March 2021.

63. "Grizzly bears for central Idaho: Beyond the Great Divide," public presentation, sponsored by Friends of the Clearwater and Grizzly Times, Moscow, Idaho, April 2019.

62. "Fractures and hubs: Grizzlies in the Cabinets and Yaak," media presentation, sponsored by Yaak Valley Forest Council, Libby, MT, June 2019. (**INVITED**)

61. "A celebration of grizzlies," at *Public Interest Environmental Law Conference*, for Western Environmental Law Center Members Meeting, University of Oregon, Eugene, OR, March 2019. (**INVITED**)

60. "Grizzly bears for the Bitterroot: Beyond the Great Divide," public presentation, sponsored by Friends of the Bitterroot and Grizzly Times, Hamilton, MT, February 2019.

60. "Sex matters: Life strategies and other interesting things about mountain lions," at Gila Community Center, sponsored by Gila Valley Library and Upper Gila Watershed Association, Gila, NM, January 2019. (**INVITED**)

59. "Heart of the Grizzly Bear Nation: Past, present and future?," for conclave of environmental activists at University of Montana, sponsored by Grizzly Times, December 2018. https://www.youtube.com/watch?v=9pfIBnZtjTw

58. "Heart of the Grizzly Bear Nation: Past, present and future?," for Glacier-Two Medicine Alliance Annual Meeting, East Glacier, MT, September 2018. (**INVITED**)

57. "The epic shared journey of bison and grizzly bears," at the *Roxy Theater*, for International Wildlife Film Festival and Grizzly Times, Missoula, MT, August 2018. https://www.youtube.com/watch?v=_8AXACD8byE

56. "Reconceiving recovery: Restoring grizzly bears," for Great Old Broads for Wilderness Annual Meeting, Stanley, ID, June 2018. (**INVITED**)

55. "An epic shared journey of bison and grizzly bears in North America," public presentation at Elk River Books for Sierra Club, Buffalo Field Campaign, and Park County Environmental Council, Livingston, MT, December 2017.

54. "A shared journey: Bison and grizzly bears in North America," presentation for Buffalo Field Campaign Annual Meeting, West Yellowstone, MT, June 2017. (**INVITED**)

53. "A mostly natural history of Yellowstone's grizzly bears," public presentation for the Bozeman Chapter, Audubon Society, Bozeman, MT, October 2016. (**INVITED**)

52. "Northern Continental Divide grizzly bears: A different view of the science," public presentation for the North Fork Protection Association, Polebridge, MT, June 2016. (**INVITED**)

51. "The changing world of Greater Yellowstone's grizzly bears," public presentation at *MSU Billings*, sponsored by The Humane Society, Zoo Montana, and MSU Billings Philosophy, Billings, MT, May 2016.

50. "The changing world of Greater Yellowstone's grizzly bears," public presentation sponsored by the Sierra Club and Park County Environmental Council, Livingston, MT, April 2016.

49. "The changing world of Greater Yellowstone's grizzly bears," public presentation at the *Museum of the Rockies*, sponsored by the Sierra Club, Gallatin Wildlife Association, and Center for Biological Diversity, Jackson, WY, April 2016.

48. "The changing world of Greater Yellowstone's grizzly bears," public presentation at the *Wildlife Art Museum*, sponsored by the Sierra Club, Wyoming Wildlife Advocates, The Cougar Fund, and Center for

Biological Diversity, Jackson, WY, July 2015. https://www.youtube.com/watch?v=VqgRHZr0bNQ

47. "Yellowstone's grizzly bears: Past, present, & future?," *Sierra Club Member's Seminar*, Bozeman, MT, March 2015. (**INVITED**)

46. "Yellowstone's grizzly bears: Past, present, & future?," *Sierra Club Member's Seminar*, Cody, WY, February 2015. (**INVITED**)

45. "Yellowstone's grizzly bears: Past, present, & future?," *Sierra Club Member's Seminar*, Jackson, WY, November 2014. (**INVITED**)

44. "Of grizzly bears and men: An uneasy relationship in a dynamic world," *People & Carnivores Supporter's Seminar*, Missoula, MT, October 2014.

43. "The Pleistocene logic of mountain lions," for *Spring Lecture Series*, Museum of Northern Arizona, April, 2013. (**INVITED**)

42. "Mountain lions in your backyard: Lifeways at the urban-wildland interface," for *Sedona Lecture Series*, sponsored by Sedona Muses and Museum of Northern Arizona, Sedona, AZ, March 2013. (**INVITED**)

41. "Mountain lions in your backyard," for *Muses Lecture Series*, sponsored by Museum of Northern Arizona, Flagstaff, AZ, March 2013. (**INVITED**)

40. "Where's the water?: Elk, lions, bighorn sheep, and big canyons," for *Flagstaff Festival of Science*, Museum of Northern Arizona, September 2012. (**INVITED**)

39. "Sex matters: The life strategies of male and female mountain lions," for *Member's Preview*, Museum of Northern Arizona, September 2012. (**INVITED**)

38. "A brief introduction to behaviors of mountain lions," for *Science Café*, sponsored by Museum of Northern Arizona, Flagstaff, AZ, September 2012. (**INVITED**)

37. "Brother bear, sister bear: Connections between people and bruins," *Lunch Lecture Series*, Arizona State Parks, Riordan Mansion State Park, Flagstaff, AZ, June 2010. (**INVITED**)

36. "Brother bear, sister bear: Cosmic connections between people and bruins," for *2009 Flagstaff Festival of Science*, Flagstaff, AZ, October 2009. (**INVITED**)

35. "Psycho-, social, and political dynamics of cougar management," for *Montana Mountain Lion Workshop*, sponsored by WildEarth Guardians, Bozeman, MT, April 2009. (**INVITED**)

34. "A little about lions and lion habitat in Montana," for *Montana Mountain Lion Workshop*, sponsored by WildEarth Guardians, Bozeman, MT, April 2009. (**INVITED**)

33. "Improving prospects for conserving cougars," for *Workshop on Cougar Conservation*, Dumas Bay Centre, Tacoma, WA, November 2008. (**INVITED**)

32. "Mountain lions of the Flagstaff Uplands," booth for *Science in the Park*, Flagstaff Festival of Science, Flagstaff, AZ, September 2008. (**INVITED**)

31. "State-level wildlife management: With dignity for all," for *2007 Animal Grantmakers' Conference*, Napa, CA, November 2007. (INVITED)

30. “Bears in the backyard: Coexistence and the nature of bruins,” for public event sponsored by Jackson Hole Wildlife Foundation and Patagonia, Teton Science School, Jackson, WY, July 2007. (INVITED)

29. “Lions in the mountains: Coexistence and the nature of pumas,” for *Summer Speakers Series*, Willow Bend Environmental Center, Flagstaff, AZ, July 2006. (INVITED)

28. “Lions in the mountains: Co-existence and the nature of pumas,” for *Summer Speakers Series*, sponsored by Red Rock State Park, Sedona, AZ, June 2006. (INVITED)

27. “Living with large fierce creatures: Cougars and humans on the Southern Colorado Plateau,” for *Flagstaff Leadership Program*, sponsored by USGS Flagstaff Science Center, Flagstaff, AZ, May 2006. (INVITED)

26. “Living with fierce creatures: Cougars on the southern Colorado Plateau,” for *Environmental Studies Colloquium*, Prescott College, Prescott, AZ, April 2006. (INVITED)

25. “Cougars of the Colorado Plateau: A multi-park investigation, Zion National Park and environs,” 1st author with J. Hart, T. Arundel, and J. Bradybaugh for informational public presentation sponsored by Zion NP, Springdale, UT, December 2005. (INVITED)

24. “Cougars of the Flagstaff Uplands,” for *Flagstaff Festival of Science, Speakers Series*, Flagstaff, AZ, October 2005. (INVITED)

23. “Cougars of the Flagstaff Uplands,” 2nd author with J. Hart for *Community Forest Forum*, sponsored by the Greater Flagstaff Forest Partnership, Flagstaff, AZ, October 2004. (INVITED)

22. “Tools for understanding the dynamics and outcomes of complex conservation cases,” for the staff of the Japan Ecosystem Conservation Society, sponsored by the Japan Ecosystem Conservation Society, Tokyo, Japan, September 2004. (INVITED)

21. “Cougars of the Flagstaff Uplands,” 2nd author with J. Hart for *Science in the Park*, sponsored by Flagstaff Festival of Science, Flagstaff, AZ, September 2004. (INVITED)

20. “Cougars of the Flagstaff Uplands: An introduction and results of the 2003-2004 field season,” 1st author with J. Hart & T. Arundel for *2004 Flagstaff Field Center Open House*, sponsored by the USGS Flagstaff Field Center, July 2004. (INVITED)

19. “From bugs to bison: A grizzly bear’s view of the Greater Yellowstone,” for the *2004 Yellowstone Grizzly Bear Writer’s Workshop*, sponsored by the Natural Resources Defense Council, B-Bar Ranch, MT, May 2004. (INVITED)

18. “Rationality and information psycho-sociology in conservation,” for the *Grand Canyon Trust Luncheon Seminar Series*, sponsored by the Grand Canyon Trust, Flagstaff, AZ, March 2004. (INVITED)

17. “Conservation of Yellowstone grizzly bears,” for *Rocky Mountain College Annual Speaker Series*, sponsored by Rocky Mountain College, Billings, MT, January 2004. (INVITED)

16. “Cougars of the Flagstaff Uplands,” 2nd author with J. Hart for *Science in the Park*, sponsored by Flagstaff Festival of Science, Flagstaff, AZ, September 2003. (INVITED)

15. “Grizzly bears of Greater Yellowstone,” for *Greater Yellowstone Coalition 20th Anniversary Annual Meeting*, sponsored by the Greater Yellowstone Coalition, West Yellowstone, MT, June 2003. (INVITED)

14. "Connecting the dots: Bears, numbers, habitat & humans," for the *Natural Resources Defense Council, Grizzly Bear Writer's Workshop*, B-Bar Ranch, MT, May 2003. (INVITED)

13. "Thoughts on transboundary monitoring and management of grizzly bears," for evening public presentation in conjunction with *Kluane National Park and Reserve Grizzly Bear Symposium*, sponsored by Parks Canada, Haines Junction, Yukon Territory, March 2003. (INVITED)

12. "Monitoring cougar movements near the Flagstaff urban interface," POSTER and presentation as 2nd author with J. Hart for *Cougars and Human Safety Trailhead Workshop*, sponsored by the US Forest Service and Arizona Department of Game & Fish, Flagstaff, AZ, December 2002. (INVITED)

11. "Methods for monitoring grizzly bears," for the *Sierra Club Grizzly Bear Ecosystems Project Writer's Workshop*, B-Bar Ranch, MT, May 2002. (INVITED)

10. "Ecology and management of Yellowstone's grizzly bears," for the *Sierra Club Grizzly Bear Ecosystems Project Writer's Workshop*, B-Bar Ranch, MT, May 2002. (INVITED)

9. "From bugs to bison: A grizzly's view of the Greater Yellowstone," for *Jackson Hole Chapter of the Sierra Club Speaker Series*, sponsored by the Jackson Hole Chapter of the Sierra Club, Jackson, WY, May 2001. (INVITED)

8. "Grizzly bears and the beauty of complexity," for the *Predators, People and Places: Finding a Balance*, sponsored by the Predator Conservation Alliance, Mammoth, WY, October 2000. (INVITED)

7. "From bugs to bison: A grizzly's view of the Greater Yellowstone," for the *Mountains and Minds Lecture Series*, sponsored by the Montana State University Big Sky Institute for Science and Natural History, Big Sky, MT, October 2000. (INVITED)

6. "From bugs to bison: A grizzly's view of the Greater Yellowstone," for the *American Museum of Natural History Speaker's Series*, New York, NY, April 2000. (INVITED)

5. "The Conservation of Yellowstone's grizzly bears," for the *Environmental Science and Research Foundation Annual Meeting*, sponsored by the Environmental Science and Research Foundation, Idaho Falls, ID, February 2000. (INVITED)

4. "Yellowstone's grizzly bears," for the *Greater Yellowstone Coalition Annual Meeting*, West Yellowstone, MT, June 1999. (INVITED)

3. "From bugs to bison: A grizzly's view of the Greater Yellowstone," for the *Denver Museum of Natural History Lecture Series*, sponsored by the Denver Zoo and the Sierra Club, Denver, CO, April 1999. (INVITED)

2. "From bugs to bison: A grizzly's view of the Greater Yellowstone," for the *National Zoo Speakers Series*, sponsored by The Smithsonian and the Sierra Club, Washington, D.C., April 1999. (INVITED)

1. "Grizzly bear conservation in the Yellowstone ecosystem," for *Luncheon Seminar*, sponsored by the Endangered Species Coalition and Defender's of Wildlife, Washington, D.C., April 1999. (INVITED)

Videos and recorded interviews since 2013

11. "Foraging behavior of bears," interview by Elisabetta Tosoni and Bruno D'Amicis for *Orso e formica*. https://www.youtube.com/watch?v=YdkzkPp7O4w

10. "Grizzly bear advocacy: Louisa Willcox & David Mattson," interview for Adam Bronstein's *Wilderness Podcast*. https://www.wildernesspodcast.com/grizzly-bear-advocacy

9. "The beast of our time: Climate change and grizzly bears," film by Save the Yellowstone Grizzly. https://www.youtube.com/watch?v=9cfuSIlEIyY

8. "The problem of hunters & grizzly bears," film by Grizzly Times and Reel Kameleon Productions. https://www.youtube.com/watch?v=k6JQ8rH1UBY

7. "Effects of mountain bikers on grizzly bears," film by Grizzly Bear Recovery Project and Reel Kameleon Productions. https://www.youtube.com/watch?v=g66Q5pRJEs0

6. "How people on foot affect grizzly bears," film by Grizzly Bear Recovery Project and Reel Kameleon Productions. https://www.youtube.com/watch?v=zHNZJ7KxwXE

5. "Introduction to David Mattson," film by Grizzly Times and Reel Kameleon Productions. https://www.youtube.com/watch?v=bYuepdZJjOY

4. "Extirpation of bison and grizzly bears," animated Power Point presentation by Grizzly Bear Recovery Project. https://www.youtube.com/watch?v=fDLrZPMhCYY

3. "Extirpations of European and North American brown bears," animated Power Point presentation by Grizzly Bear Recovery Project. https://www.youtube.com/watch?v=VIerzrm1Tjw

2. "Redefining recovery: Coexisting with grizzly bears," film by Morel Media, Grizzly Times, and Wyoming Wildlife Advocates. https://vimeo.com/422863498

1. "Gunning down grizzlies: Scientists speak out," film by Grizzly Times. https://www.youtube.com/watch?v=9AyNIiFgFdY

Media articles and online blogs since 2018

13. Mattson, D. (12 September 2020). Cowboys, ranchers, & hedge fund investors…Oh my! *Counterpunch*.

12. Mattson, D. (28 August 2020). The Sturgis and Standing Rock protests. *Grizzly Times & CounterPunch*.

11. Mattson, D. (21 August 2020). To hunt or not to hunt grizzlies? That may or may not be the question. *Grizzly Times & CounterPunch*.

10. Mattson, D. (26 July 2020). "Man attacks grizzly" and other leading bleeding stories. *Grizzly Times & CounterPunch*.

9. Mattson, D. (23 May 2020). Please, FWP, no more just so stories. *Missoulian* Guest Column.

8. Mattson, D. (27 February 2020). Traveling fast & silent: mountain biking with grizzly bears. *Grizzly Times*.

7. Mattson, D. (25 August 2019). People in the backyard…of grizzlies. *Missoulian* Op-Ed.

6. Mattson, D. (31 July 2019). Grizzly Twister and other games that scientists play. *Grizzly Times & CounterPunch*.

5. Mattson, D. (20 July 2019). Through the climate looking glass and into grizzly Wonderland. *Grizzly Times & CounterPunch*.

4. Mattson, D. (26 June 2019). Felicia's fate: the trials of a grizzly bear mom. *Grizzly Times & CounterPunch*.

3. Mattson, D. (19 June 2019). The Gallatin Forest Partnership and the tyranny of ego. *Grizzly Times & CounterPunch*.

2. Mattson, D. (13 May 2019). Social carrying capacity politspeak bamboozle. *Grizzly Times & CounterPunch*.

1. Mattson, D. (26 April 2019). Grizzly sardine can blues reprise. *Grizzly Times & CounterPunch*.

Media interviews since 1998

Since July of 1998 I have been interviewed on **>100 occasions** by journalists representing **>50 media venues**. Some of the interviews are listed below, starting with feature-length articles, followed by a list of other venues with numbers of interviews for each bolded.

Sielaff, V. (2021). "A league of their own: The unique character of Yellowstone grizzlies". *Outside Bozeman* Spring: 68-73.

Barnes, S. (2020). "A test of our compassion: The plight of grizzly bears". *The Sun* 529: 4-13

Science magazine (**3**)
by Bee Wuerthrich, 2000; *umbrella effects*; "When protecting one species hurts another." *Science* 289: 383, 385.
by Jocelyn Kaiser, 1999; *research reported in an article on grizzly bear demography published by* Ecology.
by Bernice Wuerthrich, 1998; *results of an article in* Biological Conservation *and status of Yellowstone grizzly bear population*.
Ecological Society of America (**1**)
news release on co-authored article about grizzly bear demography in Ecology.
Environmental Review newsletter (**1**)
by Douglas Taylor, 1999; *ecology and management of Yellowstone grizzly bears; featured interview in the August 1999 (Volume **6**[8]) issue*.
Science Times of the New York Times (**3**)
New York Times (**1**)
Los Angeles Times (**5**)
Toronto Globe & Mail (**1**)
The Guardian (**3**)
Washington Post (**2**)
The Denver Post (**2**)
Salt Lake City Tribune (**1**)
Associated Press (**1**)
USA Today (**2**)
High Country News (**2**)
ABC News (**2**)
CNN (**1**)
National Geographic Television (**3**)
Plimsoll Production (UK-based TV)
British Broadcasting Corporation, Natural History Unit (**2**)

Croatian TV
Public Broadcasting Corporation, *Nature* (**1**)
Canadian Broadcasting Corporation (**1**)
Montana Public Radio (**4**)
Public Broadcasting System, *Focus West* (**1**)
The Daily Beast (**1**)
Economist magazine (**1**)
Time magazine (**2**)
National Geographic magazine (**2**)
Audubon magazine (**2**)
Backpacker magazine (**2**)
Outdoor Life magazine (**1**)
Billings Gazette, Billings, MT (**4**)
Casper Star Tribune, Casper, WY (**3**)
Missoulian, MT (**4**)
Missoula Current, MT (**3**)
Montana Free Press, MT (**3**)
Idaho State Journal, Pocatello, ID (**3**)
Arizona Daily Sun, Flagstaff, AZ (**3**)
The Spokesman-Review, Spokane, WA (**1**)
Idaho Statesman, Boise, ID (**2**)
Mountain Living Magazine, Flagstaff, AZ (**1**)
Helena Independent Record, Helena, MT (**1**)
Idaho Falls Post Register, Idaho Falls, ID (**2**)
Bozeman Chronicle, Bozeman, MT (**1**)
Jackson Hole News & Guide, Jackson, WY (**8**)
Ventura County Star, Ventura, CA (**1**)
Wyofile, Jackson, WY (**5**)
Teton Valley Top to Bottom magazine, Jackson, WY (**1**)
Rocky Mountain Outlook, Banff, AB (**1**)
Banff Craig and Canyon, Banff, AB (**1**)
KNAU National Public Radio, Flagstaff, AZ (**1**)
German Public Radio (**1**)
The Animal Show radio show, San Francisco, CA (**1**)
The Saturday Food Chain AM radio show, San Francisco, CA (**1**)
Defenders magazine (**1**)
National Parks & Conservation Association magazine (**1**)
National Wildlife magazine (**1**)
WildFutures/Earth Island Institute, *'On Nature's Terms'* (**1**)
Environmental News Network (**1**)
Wildlife News Archives (**1**)
Greenlines (**1**)
Endangered Species Productions (**1**)
Cascadia Times (**1**)

(8) HONORS, AWARDS, RECOGNITION, ELECTED MEMBERSHIPS

20. *Exploding Head Award* for "the man who has so many ideas it's amazing his head doesn't explode," USGS Southwest Biological Science Center, December 2010.

19. *Star Award* for superior accomplishments as Research Wildlife Biologist and as Station Liaison for the Colorado Plateau Research Station, September 2010.

18. *Star Award* for superior accomplishments as Station Leader for the Colorado Plateau Research Station, September 2009.

17. *Star Award* for superior accomplishments during special assignments at Yale School of Forestry & Environmental Studies and MIT-USGS Science Impact Collaborative, August 2008.

16. *Paradigm Shifter Award*, USGS Southwest Biological Sciences Center, February 2008.

15. *Star Award* in recognition of service as Acting Station Leader for Colorado Plateau Research Station, August 2006.

14. *Star Award*, for sustained superior performance on a variety of projects and activities outside the normal scope of duties, from USGS Colorado Plateau Research Station, August 2004.

13. *Certificate of Appreciation*, for contributions to the 2004 Western Region Center Directors Meeting, from USGS Colorado Plateau Research Station, July 2004.

12. *Star Award*, for outstanding performance as Chair of the 7th Biennial Conference of Research on the Colorado Plateau, from USGS Colorado Plateau Research Station, November 2003.

11. *Certificate of Appreciation*, for activities in support of the 2003 Flagstaff Festival of Science, from USGS Colorado Plateau Field Station, October 2003.

10. *Rick Hutchinson Outstanding Scientific Research Award*, for outstanding scientific contributions to knowledge of grizzly bears in the Yellowstone Ecosystem, from the Greater Yellowstone Coalition, June 2003.

9. Elected to membership in *The Society for Policy Sciences*, 2001-2013.

8. *Star Award*, for development of an alternative management structure for the Colorado Plateau Field Station, from USGS Biological Resources Discipline, 2001.

7. *Star Award*, for outstanding performance as Client's Day Chair for the 5th Biennial Conference of Research on the Colorado Plateau, from USGS Biological Resources Division, 1999.

6. Invitation to participate in "Conversations in the Wild," by The Murie Center, Moose, WY, 1999.

5. *Special Act Service Award*, for acting as 3rd party in negotiations for access to sensitive data to avoid litigation under the FOIA, from USGS Biological Resources Division, 1997.

4. Graduate tuition waived, 1980-1984, University of Idaho.

3. Graduation *summa cum laude*, B.S., 1979, University of Idaho.

2. Undergraduate Teaching Assistantship ($1,200), *General Botany*, 1979, College of Biology, University of Idaho.

1. Dean's List 1972-1979 (for semesters attended), College of Forestry, Wildlife & Range Sciences, University of Idaho.

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8. **Mattson, D.J.**, R.R. Knight & B.M. Blanchard (1987). The effects of developments and primary roads on grizzly bear habitat use in Yellowstone National Park, Wyoming. *International Conference on Bear Research & Management* 7: 259-273.

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3. Brunsfeld, S.J., F.D. Johnson, J. Janish & **D. Mattson** (1985). *Field guide to the willows of east-central Idaho*. University of Idaho, Forest, Wildlife & Range Experiment Station, Bulletin No. 39.

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(10) NOTEWORTHY PUBLICATIONS

8. Mattson, D.J., & S.G. Clark (2011). Human dignity in concept and practice. *Policy Sciences* 44: 303-319.

This paper has become a standard reference for research focused on experiences of dignity in numerous contexts, including health care, end-of-life care, organizational environments, international aid delivery, and community decision-making. The paper offers researchers and practitioners a review of various conceptions applied to individual and collective experiences of dignity, and distils from these various perspectives a useful concept for application to daily human practices. Google Scholar *credits this paper with 113 citations as of 2021.*

7. Mattson, D.J., K.L. Byrd, M.B. Rutherford, S.R. Brown, & T.W. Clark (2006). Finding common ground in large carnivore conservation: Mapping contending perspectives. *Environmental Science and Policy* 9: 392-405.

This paper is noteworthy for several reasons, first, as emblematic of an emerging direction in the scientist's research, and, second, as a definitive and empirical demonstration of common ground among participants conflicted over management of large carnivores in the Northern U.S. Rocky Mountains. It is one of comparatively few examples of Q-methodology applied to natural resources, which is relevant because of recent widespread interest among social scientists in this analytic approach to clarifying human perspectives. Google Scholar *credits this paper with 112 citations as of 2021.*

6. Mattson, D.J., & T. Merrill (2002). Extirpations of grizzly bears in the contiguous United States, 1850–2000. *Conservation Biology* 16: 1123-1136.

This paper has emerged as a seminal work explaining historic regional extirpations of species. It has been singled out as an instructive paper in academe in addition to being instructive regarding key determinants of persistence for modern-day grizzly bear populations. When published, the paper was featured in a press release by Conservation Biology *and has since been included in* eForum on Biodiversity & Conservation. Google Scholar *credits this paper with 188 citations as of 2021.*

5. Pease, C.M. & **D.J. Mattson** (1999). Demography of the Yellowstone grizzly bears. *Ecology* 80: 957-975.

This paper is noteworthy as the only which explicitly accounts for behavioral structuring in the demography of a large-mammal population. It also under-girds emerging understanding of demographic drivers for the symbolically and politically important Yellowstone grizzly bear population. When published, the paper was featured in a press release by Ecology *and in an article by* Science *magazine, and, as of 2021, is credited with 117 citations by* Google Scholar.

4. Mattson, D.J., B.M. Blanchard & R.R. Knight (1992). Yellowstone grizzly bear mortality, human habituation, and whitebark pine seed crops. *Journal of Wildlife Management* 56: 432-442.

This paper was among the first to conclusively document relations between mortality in a bear population and food availability and behavioral tolerance of humans. For this reason it is considered a seminal work on relations of bear demography to bear behavior and, as of 2021, is credited with 307 citations by Google Scholar.

3. Mattson, D.J., B.M. Blanchard & R.R. Knight (1991). Food habits of Yellowstone grizzly bears, 1977-1987. *Canadian Journal of Zoology* 69: 1619-1629.

This paper was among the first to report a detailed long-term record of grizzly bear diet, including annual and seasonal variation and implications for bias and design of dietary studies. It is considered the *seminal paper on bear food habits and, as of 2021, is credited with 284 citations by* Google Scholar.

2. Mattson, D.J. (1990). Human impacts on bear habitat use. *International Conference on Bear Research & Management* 8: 33-56.

This paper was one of the first in which research on the many ways that humans impact bears was summarized and synthesized. It has since become a standard reference for researchers reporting on subsequent research with the same thematic focus and, as of 2021, is credited with 254 citations by Google Scholar.

1. Mattson, D.J., R.R. Knight, & B.M. Blanchard (1987). The effects of developments and primary roads on grizzly bear habitat use in Yellowstone National Park, Wyoming. *International Conference on Bear Research & Management* 7: 259-273.

This paper was the first to publish results using GIS and radio-telemetry locations for the analysis of grizzly bear behavior near highways and other human infrastructure. The paper has since become a standard reference for essentially all subsequent work focused on how roads and highways impact bears and, as of 2021, credited with 229 citations by Google Scholar.

David J. Mattson

Willcox, L., Mattson, D.J., & Rowland, L. (2024). The problem of state wildlife management institutions. Grizzly Bear Recovery Project Report GBRP-2024-1. http://dx.doi.org/10.13140/RG.2.2.10419.85288

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IN THE UNITED STATES DISTRICT COURT

FOR THE DISTRICT OF MONTANA

MISSOULA DIVISION

FLATHEAD-LOLO-BITTERROOT CITIZEN TASK FORCE and WILDEARTH GUARDIANS,

Plaintiffs,

vs.

STATE OF MONTANA, LESLEY ROBINSON, and GREG GIANFORTE,

Defendants.

CV 23-101-M-DWM

DEPOSITION OF DAVID J. MATTSON

Taken at:

Montana Fish, Wildlife and Parks

1400 South 19th Avenue

Bozeman, Montana

March 7, 2024

9:00 a.m.

APPEARANCES OF COUNSEL:

FOR THE PLAINTIFFS (Via Zoom):

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SARAH CLERGET
Chief Legal Counsel
ALEXANDER R. SCOLAVINO, III
Agency Legal Counsel
MONTANA FISH, WILDLIFE and PARKS
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Helena, Montana 59620-0701

ALSO PRESENT:

Christina Bell, Paralegal, FWP
Quentin Kujala, FWP Representative
Mike Bader, FLB Citizen Task Force (Via Zoom)
Lizzy Pennock, WildEarth Guardians (Via Zoom)

I N D E X

E X H I B I T S

DAVID J. MATTSON

THURSDAY, MARCH 7, 2024; BOZEMAN, MONTANA

BE IT REMEMBERED THAT, pursuant to Notice and Subpoena, the Deposition of David J. Mattson was taken at the time and place and with the appearances of counsel hereinbefore noted before Candice L. Nordhagen, Court Reporter - Notary Public for the State of Montana.

It was further stipulated and agreed by and between counsel for the respective parties that this deposition was taken pursuant to the Federal Rules of Civil Procedure.

The following proceedings were had:

DAVID J. MATTSON,
having been called as a witness by the Defendants, being first duly sworn, was examined and testified as follows:

MR. SCOLAVINO: So it is nine o'clock. We are appearing at FWP's Region 3 headquarters at 1400 South 19th Ave. in Bozeman, Montana, conducting the Deposition of Dr. David Mattson.

EXAMINATION
BY MR. SCOLAVINO:
Q. I am pronouncing your name correctly?
A. Correct, yeah.
Q. Okay, perfect. So, Dr. Mattson, as I previously mentioned, my name is Alex Scolavino, and I represent the Defendants: The State of Montana, Lesley Robinson, and Governor Greg Gianforte.
Could you, please, state your name and spell it for the court reporter?
A. David John Mattson; D-A-V-I-D J-O-H-N M-A-T-T-S-O-N.
Q. Okay. I'm going to just make a record of who else is in the room with us right now, and then I'll state on the record whether I'm correct. Is that okay?
A. Sure.
Q. So next to me is Quentin Kujala, Chief of Conservation Policy.
MR. KUJALA: Correct.
Q. (By Mr. Scolavino) He's also our client representative, just so you're aware, Mr. Mattson.
Next to him is Crissy Bell, Montana Fish, Wildlife and Parks, paralegal.
Across the way from me is Sarah Clerget, Chief

Legal Counsel for Montana, Fish, Wildlife and Parks.
And we have the court reporter here as well.
And then appearing on Zoom is Mr. Bechtold.
MR. SCOLAVINO: And I don't know who else is on here, Mr. Bechtold, if you don't mind just mentioning who else is on Zoom.
MR. BECHTOLD: Appearing on Zoom are the client representatives for WildEarth Guardians, Lizzy Pennock; and for the task force, Mike Bader.
Q. (By Mr. Scolavino) Dr. Mattson, I'm going to show you a copy of what the court reporter will mark as Exhibit 19.
(Document marked Deposition Exhibit No. 19 for identification.)
BY MR. SCOLAVINO:
Q. That's just the subpoena to testify at a deposition. Have you seen that before?
A. I have, yes.
Q. And is that a true and accurate copy of the notice you received to be here at this deposition today?
A. As near as I can recall.
Q. Okay.
A. I did not commit it to memory.
Q. And can you tell me, have you ever been to

a deposition before or been deposed?
A. Yes.
Q. Okay. So you know how it works?
A. I need to be reacquainted.
Q. Okay.
A. It's been awhile. I have been on the stand as well, and I'm assuming that's a different kind of venue but similar.
Q. Okay. So I'll just briefly kind of summarize how it's going to work. I'm going to ask you a bunch of questions that relate to this case, and you'll have to answer them under oath. The court reporter is taking everything down and will prepare a written record of everything that is said, which we lawyers call a "transcript."
A. Um-hmm [affirmative].
Q. It is very important that you understand the questions and give accurate answers. If there's anything that you don't understand or anything that you don't know or aren't sure of, just let me know. Is that okay?
A. (Nodding head affirmatively.)
Q. Okay?
A. Which gives you the opportunity to restate or rephrase the question, clarify it?

Q. If you do not understand it, we can have the court reporter either restate the question or, if for any reason you're not understanding that question, I can try and rephrase the question.
A. Okay, good.
Q. So, Dr. Mattson, you understand that you are under oath, correct?
A. I do.
Q. And you know that means you are sworn to tell the truth, correct?
A. The whole truth and nothing but the truth.
Q. And even though we are in an informal setting here in this office, you understand that your answers have the same force and effect as if we were in a courtroom except the judge --
A. Except I don't have a judge looming over me, yeah.
Q. Yeah, that is true.
A. Although you guys are a close approximation, probably.
MS. CLERGET: I would love a robe if somebody could give one to me.
THE WITNESS: Well, if you were in England, you could get a wig.
MS. CLERGET: There you go.

Q. (By Mr. Scolavino) Is there anything that will prevent you from me giving your full attention?
A. Yes.
Q. What would that be?
A. I'm suffering from leukemia and under treatment. So, you know, that may affect my capacity, yeah.
Q. Okay. So if there's ever a moment where you think that you aren't providing your full attention, do you mind telling me so we can take a break?
A. No, not at all.
Q. Okay.
A. Yeah, I was planning on that. I brought snacks.
Q. Good.
MS. CLERGET: So did they.
Q. (By Mr. Scolavino) Yeah, lots of them.
A. I don't know that I need a sugar high.
Q. Are you taking any medications?
A. Yes.
Q. Okay. Will those medications cause any complications?
A. Potentially.
Q. Should we be aware of those medications

you want it shorter?
A. I think that should work, yeah.
Q. That's also to allow a break for the court reporter and for us to have a bathroom break and whatever you may need as well.
A. Okay.
Q. Were you going to say something?
A. Are you done with the prep?
Q. Just one last thing. So it is important that I finish the line of questions and then you answer, and then I will provide the same courtesy for you. So if you're answering a question, I will not start another question or try and rephrase the question.
A. Okay.
Q. So I would just ask that we both be cordial in allowing us to speak to each other.
A. With room for jocularity as appropriate.
Q. Yes.
A. Okay.
Q. So you were going to mention something?
A. So I'm fully aware of my obligations or at least I think I am fully aware of my obligations. What are your obligations?
Q. As far as obligations, again, I'm just

and what could occur?
A. I'm not going to fall on the floor and start quivering, but mental fog, for one.
Q. Okay. Again, I'll just reiterate, if there ever is a moment where you seem to be having mental fog or seem to be losing your attention, just let us know and we'll take a break.
A. I will do it.
Q. If you don't understand one of my questions, will you let me know?
A. Yes, absolutely.
Q. I'm going to assume that if you answer my question, that means that you understood the question. Is that a fair assumption?
A. You can assume that.
Q. Okay.
A. I mean, we're talking about human communication here, right?
Q. Yes.
A. And the vagaries of the human language and grammar.
Q. Okay.
A. But, yes, probably a fair approximation.
Q. Okay. I plan on taking a break once every hour. Is that going to be sufficient for you or do

here to represent the Defendants in this case. I'm trying to understand what you know.
A. Okay.
Q. And figure out what we don't know.
A. Okay.
Q. Is that okay?
A. That's fine. I mean, if that's how you want to represent it, that's fine.
Q. So, Dr. Mattson, can you please tell me what you did to prepare for today's deposition?
A. I looked at the Subpoena and got a gist from that. But, also, there was something that Tim forwarded and I'm trying to remember. It wasn't the Subpoena, but it might have been. That's why I was looking at it and trying to recall.
But there was a list of documents and materials and topics that were identified as being of relevance. So I, with due regard for those, I looked at what was in my declaration and also looked at relevant research papers to be better acquainted than I already was with them. I printed out some that I thought might be relevant to points that I would be bringing up that are not probably in the record, as far as to my knowledge, anyway.
Q. Okay.

A. And other than that, I corresponded briefly with Tim. Actually, I had a phone call with Tim yesterday afternoon where he briefed me on what I should expect. So that is, in a nutshell, what I did to prepare.

Q. Okay. And, now, you mentioned that there was a document, I guess, that Tim forwarded along to you. Is that correct?

A. It was something that you had sent to him that he forwarded to me.

Q. Okay.

A. And I honestly can't remember what it was titled. But it was in legalese and flagged certain papers like the Haroldson, et al., 2002 paper; the Kasworm 2022 monitoring report.

And I'm trying to remember what other publications were flagged in there: Issues, topics, being able to differentiate between the methods being used by Cecily now versus in the past, sort of what the Bjornlie method amounted to. Those are what I remember in particular.

Q. You mentioned there were some topics on there. Was there any topics that you didn't touch upon as far as, you know, Haroldson, Kasworm, Bjornlie that were on there?

A. There could have been. I honestly don't remember.

Q. Okay. And, again, that was sent to you by Tim, correct?

A. Yes.

Q. In preparation for this deposition?

A. Yes.

Q. And do you recall when he sent that to you?

A. No. I was in California enjoying myself and don't have a clear recollection of when I got the materials from Tim, but it was within the last two weeks.

Q. Okay, thank you. And then you mentioned that you reviewed some research papers. Do you mind telling me what research papers you reviewed, what information?

A. Costello, et al., 2016; Kasworm, et al., 2022, 2021; Costello, et al. -- or Costello and, whatever, the monitoring report for NCDE from 2018 to get a better sense of what the method was they used for establishing occupied area; and the Bjornlie paper and Haroldson paper. I think that's all that comes to mind offhand. There very well could have been others that I looked at.

Q. Was there a particular reason you looked at those research papers?

A. Because they were flagged in this material that, apparently, had come from your office that Tim had forwarded to me.

Q. Okay.

A. I don't recall that it was authored by Tim.

Q. Okay.

A. It was something he forwarded.

Q. Did you look at those documents, also, to refresh your recollection for today?

A. Yes.

Q. And was there anything in those documents, because I heard you mention, at some point earlier, you mentioned that you wanted perhaps to include information that was not in your declarations.

Was there anything in those papers that you thought, after reviewing them today, that should have been in your declaration?

A. Possibly, but I'm not actually clear on what the claims or issues are because I haven't kept up with what transpired in front of Judge Molloy or the Ninth Circuit.

Q. Okay. You mentioned that you also had a phone call with Tim. So without mentioning exactly what you spoke about with Tim, was that phone call to prepare you for today's deposition?

A. Yes.

Q. Did you look at any other documents in preparation for this deposition?

A. "Any other documents," well, they are ones that I pulled out that I thought might be relevant because it was apparent that weight of evidence, burden of proof were going to be an uncertainty of estimates, were probably relevant to certain aspects of this, especially judging when bears were in dens and out of dens.

So with that in mind, I pulled up some papers that I had authored that addressed the whole phenomenon of how you deal with risk and uncertainty, and interface between science and policy, which I thought may be relevant at some point.

Q. And when did you pull that paper specifically?

A. Those papers?

Q. Those papers.

A. Books, chapters, papers yesterday.

Q. Yesterday, okay. Do you mind just going in some sort of detail and telling me what those

papers are about, if you could just go numerically down the line?

A. There's a book chapter that was a University of Chicago Press book on carnivore conservation that dealt with complexity in the policy environmental-ecological field data interface that emphasized the extent to which agency science is inevitably politicized because of all the structural incentives and disincentives within agencies, which seems relevant because there seems to be a lot of claims about certainty and uncertainty in this case, at least from what I've read.

Q. Okay.

A. Which was the main gist of what I was looking at in that particular chapter. There was another chapter that I wrote with John Craighead back in -- it was published in 1995 in an Island Press book that delved into the same issues, to what extent uncertainty in science is used to politicize the whole science-policy interface.

Q. Okay.

A. But the same basic themes: How you allocate burden of proof, how you deal with uncertainty, what questions are asked, what questions aren't asked in terms of science by whomever, but,

specifically, agency scientists.

There was a paper that I publish in BioScience in 1995 that looked at the topic, dealt with the topic of ethical obligations for scientists working for federal/state agencies. And the focus there was on how agency scientists can be affected by the organizations they work for and contesting ethical obligations that, ultimately, when you look at the whole constellation of factors, can lead to a corruption of science and a problematization of that science-policy interface.

There was - I have them in a folder with me - another book -- I guess the book chapter, I talked about already, about complexity. There was another one that I pulled and that was relevant. I'd have to look to see which it is. But it was along the same theme, you know, elaborating on it in different ways in each successive piece.

And then there was also a report that I put together that reviewed and critiqued the science that's been done for the Northern Continental Divide Ecosystem for grizzly bear monitoring. In there, I addressed the problems with how Cecily has been going about estimating population growth and estimating population size. And there's a raft of problems,

which I thought might be relevant.

Then there's a paper that I wrote that was published in Ursus back in 2005 that looked at the spatial demography of Cabinet-Yaak grizzly bears and looking at how sensitive the prognosis is for Cabinet-Yaak populations to changes in human lethality and human numbers. I also printed out -- again, because I thought that that might be relevant to some of the issues that are unfolding in this case.

And I also printed out, looked at an objection, it was an objection I wrote to the Black Ram timber sale up in the Yaak portion of Cabinet-Yaak Ecosystem. In there, I address a lot of the problems with how Wayne Kasworm dealt with estimating population-size growth and dealt with uncertainty in those estimates.

And the final -- and then there was also a piece I wrote on the efficacies of hunting grizzly bears, sport hunting grizzly bears, effects and efficacies. That also contained a section that addressed the systemic incentives and disincentives that affect state wildlife biologists, scientists, managers, anybody that works for an agency.

I'd have to look at what I brought because I don't actually fully recollect all the papers I've printed out because there were a bunch that I was

looking through.

Q. Do you plan on referring to those documents at all throughout today?

A. I don't know.

Q. Okay.

A. I brought them along just in case.

Q. I just want to let you know, if you do look at them today, we will also need to be provided a copy.

A. Sure, that's what I brought them for.

Q. Okay. So thank you for mentioning all of those. Do you mind telling me, were you --

A. Oh, there was another paper -- sorry to interrupt you.

Q. Sure. No, go on.

A. I'm doing what you told me not to do.

Q. No, let's go on, go on.

A. A paper that I published in 2003 on foot loadings and track widths for grizzly bears in Yellowstone based on field data.

Q. Okay.

A. Which was relevant to how vulnerable bears might be to, especially, leg-hold traps.

Q. And throughout all of those papers or those articles, were you releasing those papers

individually, or were you working for a government agency, or were you working as a consultant for anything?

A. For all of the policy-related papers, I was employed at the time by the U.S. Biological Survey, which became U.S. Biological Service for political reasons, or for the U.S. Geological Survey.

Insofar as the report, looking at the efficacies of sport hunting and also problems with the methods used to estimate population growth and size for the NCDE, I did those completely on gratis on my own time under auspices of what I call "the Grizzly Bear Recovery Project," which is devoted to educating the engaged public, as well as attorneys and judges, and anybody who might have an interest in that kind of information.

Q. Okay.

A. Insofar as the deposition goes, I honestly -- or not the deposition but the objection, I did that gratis as well. I was thanked profusely by the Yaak Valley Forest Council, but that was on my own dime as well. I would have to look at them all. There might be one where I got some remuneration from somebody other than entities that I mentioned.

Q. Okay.

A. I mean, the Grizzly Bear Recovery Project is supported by grants from foundations.

Q. And a majority of those articles or research papers were done during your time at U.S. Biological Survey, which I assume is the same as USGS, correct?

A. No.

Q. They're two different entities?

A. Well, do you want to know the entire history of Babbitt's brainchild? The U.S. Biological Survey was under the Department of Interior. It swept up all the sciences from U.S. Fish and Wildlife Service and National Park Service into one entity. I think BLM scientists got caught up in that as well.

And, then, for political reasons, the name was changed to "Service" because "Survey" sounded too intrusive. And then the scientists who had formally been in the Survey got swept up into the U.S. Geological Service/Survey as a separate entity within that larger umbrella organization.

So I would say that, most of the time I was writing, what I wrote probably was while as an employee of the U.S. Geological Survey.

Q. Was what you wrote a project that you were working on while you were at USGS or was this

something that you --

A. Specific projects.

Q. Okay.

A. Everything I did, I had to be able to put it in a bin, a project, which is in my research scientist record. Each and every project is named there.

Q. Was there a specific reason that USGS wanted you to write those research papers at the time?

A. "A specific reason" in the sense that I was given opportunity to exercise a lot of initiative because of my senior status and the trust that my supervisors had in me.

Q. And did you look over those documents on your own or with anyone else?

A. On my own.

Q. On your own, okay. And did you talk to anyone else in preparation for this deposition besides Tim?

A. Yes, my wife.

Q. Do you mind telling me what you spoke to your wife about?

A. I said, "Well, this is a pain in the ass," or something along those lines, "and I hope it doesn't last too long."

Q. Okay.

A. But I didn't share any of the details.

Q. Okay.

A. I would have been talking to my dog as well but, unfortunately, he died two months ago.

Q. Oh, I'm sorry. Hopefully, he lived a long life.

A. Oh, he did, 14 years, 14 plus.

Q. Did you talk to anyone with WildEarth Guardians prior to this deposition or in preparation for this deposition?

A. Not in preparation for this deposition, no.

Q. Okay.

A. I mean, prior to for how many years past? Months?

Q. If you can recall, you can tell me.

A. I've had conversations with Adam Rissien over a period of a number of years about various matters, and I couldn't recall exactly what they were insofar as this case is concerned.

He called me and said, "Would you be available, interested in writing a declaration?"

And I said, "Possibly."

And he gave me -- he basically gave me a

thumbnail description, which was not very helpful, and then said that Tim Bechtold would be getting ahold of me to provide whatever details were needed. That was about the upshot of my communications with them as it relates directly.

Q. Okay. And you said you spoke to Mr. Rissien previously. Were all of those conversations about grizzly bears or were they about any other species?

A. Grizzly bears, almost certainly.

Q. Were they about grizzly bears in a specific ecosystem?

A. Given that his interests focused -- well, they would have been for the GYE, the NCDE, Bitterroot -- I don't recall that we had any conversations about this, explicitly about the Cabinet-Yaak or Selkirks.

Q. And those communications spanned over how many years would you say?

A. Probably four years - five years. I don't actually know how long he's been in the position he's been in with WildEarth Guardians. It wouldn't have been probably to when he attained whatever position he's in.

Q. Did you meet Mr. Rissien in person or how

did those communications begin?

A. I've seen him on Zoom a couple of times. I probably crossed paths with him in person but I couldn't actually recall when or where.

Q. So do you mind telling me how those communications originally began? You mentioned you saw him on Zoom.

A. I honestly don't recall.

Q. Okay.

A. Other than I seem to be sort of a go-to person for people interested in matters related to grizzly bear ecology, demography, and relations between science and policy, so it's hard for me to keep track of who comes to me with what matters when.

Q. Why did Mr. Rissien reach out to you in regards to those ecosystems?

A. He wanted to be informed of my opinion regarding fairly specific technical matters.

Q. And were they all pertaining to Montana's efforts or other states' efforts as well?

A. It would have been inclusive, I'm assuming, of Wyoming, Montana, Idaho. Yeah, certainly when it came to the Bitterroot, it would have included Idaho.

Q. Any other provinces like, as an example,

British Columbia or Alberta?

A. No; no, not with Adam.

Q. And did you speak with anyone else with WildEarth Guardians at any previous time besides Mr. Rissien?

A. I'm sure I did. I can't recall who. They've had enough staff turnover. I did a Zoom seminar for WildEarth Guardians members with -- is it John Horning who's the executive director - as well as Adam.

But the only communications I had with John, I think -- okay. So, actually, WildEarth Guardians has taken an interest in reintroducing grizzly bears to the Southwest, and I wrote a report on the prospects of successfully reintroducing grizzly bears to the Southwest.

And there's somebody with WildEarth Guardians who's regionally located in the Southwest who approached me about using that report for their purposes, and John was emailing with me about that as well, John Horning.

And I'm trying to remember if Sarah McMillan -- does that sound right? I have a horrible memory for names, proper names, any more. She was with WildEarth Guardians. I was talking to her at one point in time

several years back, probably four or five years back.

Q. You mentioned a paper about reintroducing grizzly bears to the Southwest. Was that paper about reintroduction to grizzly bears in specific states other than Idaho, Wyoming, and Montana?

A. It was inclusive of Utah, New Mexico, Arizona, Colorado. And I went through a stepdown analysis, basically excluding anywhere in Utah from being a candidate. So those three states.

Q. Okay.

A. That is to say Colorado, New Mexico, and Arizona as the candidate states.

Q. Do you recall when that paper was published or written?

A. 2022 or early 2023. I think it was 2022, actually, late 2022.

Q. I'm going to jump back because I just thought of this. You mentioned that you wrote papers and articles that helped you prepare for today's deposition. Were those papers peer-reviewed and published?

A. All except the reports I've been producing and the objection that I submitted for Black Ram.

Q. Okay. And did you speak to anyone with Flathead-Lolo-Bitterroot Citizens Task Force at any

point prior to this deposition or in preparation for this deposition?

A. Mike Bader sent me an email saying: "Great job on your declaration." And other than that, I corresponded, reviewed a paper, a report that Mike sent me on expansion of grizzly bears out from the NCDE towards the Bitterroot Ecosystem, so it was in the nature of a technical review.

And I have fairly routine email communications with Mike. I have not talked with him very often on the phone. But, yeah, I've known Mike from way back from when he worked as a ranger in Yellowstone Park.

Q. So your relationship with Mr. Bader spans how many years, would you say?

A. Going back to the mid 1980s.

Q. And you've stayed in communication with him ever since?

A. No. I mean, there was a -- I mean, I knew him casually back in the 1980s. And there might have been some, a handful of communications with Mike. It would have been in the late 2000s, 2008-2009. And I don't recall pertaining to what other than grizzly bears. I mean, if I gave it some thought, I might recall a topic.

But the nature of the communications, as I

recall, are almost always in the nature of Mike reaching out to me about some technical question and saying, "So what do you think of that? What's your perspective on it?" Which I provide.

Q. How do you provide your perspective on that? Is that via another some form of declaration? Is it in relation to lawsuits? Or is it just a "this is my opinion"?

A. That's my perspective opinion shared in the form of an email. I'm trying to remember if Mike has solicited me to write a comment or an objection on any decision process, for any decision process undertaken by the Forest Service, in particular. And I don't recall that I did. I mean, I usually ended up doing what I did for my own reasons. And usually if I was to do something like that, I was working with a lawyer who reached out to me.

Q. Was there anyone else besides Mr. Bader that you've spoken to that you're aware of, that you're aware is associated with Flathead-Lolo-Bitterroot Citizens Task Force?

A. I mean, in terms of communications such as they are, I'm on a group email that includes a lot of the members, to my understanding, of the Lolo-Bitterroot Citizens Task Force, but rarely any

direct communication.

I mean, I know that Lizzy is, I guess, on. I'm trying to remember if I -- I mean, I've met her, I'm sure. Again, I have a really -- my memory is not great any more for people's names. I'd recognize faces pretty well. But I gave a talk, and I'm sure I met her at least at a couple of talks that I gave, that addressed grizzly bear ecology policy-management.

Q. And do you mind telling me about the email list that you're included on? Was that something that you signed up for or were you invited to that?

A. As I recall, I was invited. I honestly don't remember how I got included, other than I think that it was put together with a certain idea about who might be interested, and my address, my email address was on it. And I did not unsubscribe or unsign.

Q. How many people would you say are on that email list?

A. More than a dozen, less than 50, I think, something like that.

Q. Okay. And what type of email communications do they send you? What are the emails about?

A. About sort of here's something that's going on that may be of interest, updates. It's,

primarily, a platform for sharing information, keeping people abreast of issues that are unfolding.

Q. So are scientists like yourself included on that email list or are these, perhaps, just members of the general public?

A. There's a couple of scientists I know for sure that are, Brian Horejsi and -- I don't know, this is where my memory fails me. He's actually a good friend who's retired and living in Canada and had half his face torn off by a bear.

Q. We can try and come back to that.

A. Yeah, so those are the two that I know of. The only reason I know that those people exist on this email is when they might send something specifically themselves and so their name pops up.

Q. Okay. And are they --

A. I think Lance Craighead is also on there, but I wouldn't swear to that.

Q. Okay. And are they communications from Flathead-Lolo or are some members of Flathead-Lolo on that email list?

A. It's a group communication, so I don't know that there's any formal representation of affiliation.

Q. Are you, yourself, a member of WildEarth

Guardians or Flathead-Lolo?
A. No.
Q. Are you a member of any nonprofit organization?
A. Other than Conservation Congress, which is our fiscal sponsor for the Grizzly Bear Recovery Project. And I actually might be a member of WildEarth Guardians because they wanted me to be on their membership list. But I didn't -- if I was on their membership, in their membership, it was because my wife joined us up together. I have very little cognizance of that, actually.
Q. Okay.
A. I mean, there are people that solicit me to belong to all sorts of things. I've never been a belonger.
Q. And if you had to talk to someone or had questions about wolves or grizzly bears, who would you contact?
A. They're all dead. Who would I contact? Yeah, it would have been Chuck Jonkel, or John or Frank Craighead. Any more, there's not anybody that comes to mind.
Q. Those names that you mentioned, did they reside in the United States?

A. Yes.
Q. Okay. None were outside of the United States?
A. No.
Q. Okay.
A. I mean, you're asking me who I would approach to get information about grizzly bears that I was not privy to. Was that the nature of the question? Because I know a lot of grizzly bear biologists. It's not that I seek them out, though, for information.
Q. Well, let's just say you knew information but you wanted to assure that information was correct. Who would you reach out to?
A. Oh, well, Clayton Lamb; Mark Haroldson; Bruce McLellan; Frank van Manen; before him, Chuck Schwartz. I'm privy to a lot of what Cecily Costello says so I don't feel I need to communicate with her much. Those are the people that come to mind. There's Gord Stenhouse up in Alberta, not so much Mark Boyce any more. Anyway, those are some names that come to mind.
Q. Are they all scientists or bear biologists to some extent?
A. They are.

Q. Okay.
A. They're well-credentialed scientists, each and every one of them.
Q. Is there a specific reason that you would reach out to those individuals?
A. If I had a question about something that was opaque in what they had published, I probably would, but not with certainty because I usually go on the basis of the published record.
Q. And would it be safe to assume that you would reach out to them because you trust them?
A. No; no, not at all.
Q. Okay.
A. I mean, I trust them in the sense that I'm sure I would get their perspective on all sorts of things. As to whether I would consider them to have the final word on anything science related, no, absolutely not.
Q. Have you ever published a paper that spoke differently than what they opined as to?
A. Yes.
Q. Do you mind telling me what paper that may have been or papers that may have been?
A. So this is more in reference to papers that Richard Knight wrote, who was head of the Grizzly

Bear Study Team before Chuck Schwartz, as well as Chuck Schwartz himself; some papers by Frank van Manen.
And the papers, specifically, were a critique of a method used for monitoring grizzly bears based on unduplicated females with cub-of-the-year in Yellowstone. That was published in 1997. There was a paper that critiqued how unknown, unreported mortality was estimated, or the lack of any sort of credible estimator for that in Free Yellowstone, specifically, in 1998 -- or not '98 -- 1998. And, subsequently, the Cherry, et al., method published in 2002 was trying to address the issues that I raised.
There was a paper that I coauthored with Craig Pease reanalyzing demographic data for the Yellowstone population, which was published in Ecology in 1999; to some extent, the chapter I co-authored with John Craighead was a critique of sorts of the science that had been done by Richard Knight and the Grizzly Bear Study Team by that point in time.
I think I might have included, actually, a paper that I published in -- I'm actually thinking about papers that I wrote. It's sort of addressing issues with how grizzly bears are researched or managed, a paper in Conservation Biology in 1996 with Craig

Pease, Gerry Wright, and Steve Herrero. And there was some element of critique in there. Those are all that come to mind. There might have been another that I may well recollect.

Q. You mentioned Cecily and that you're privy to a lot of her information. Would you ever reach out to her, though, if you had a question pertaining to her research?

A. Not at this point in time, no.

Q. Is there a specific reason why?

A. Because I am not on good terms with her personally because I think she sees me as a critic and an enemy and doesn't deal with those things very well, at least is my perception.

Q. So let me ask this: How long have you known Cecily?

A. Since she and Mark Haroldson were first dating back in -- however long ago that would have been; back then, yeah. My time horizons fade, so that was probably the mid-late 1980s. I crossed paths with her at a bear conference before that. I saw her at their wedding, Mark and Cecily's wedding. I crossed paths with her when she was sort of in limbo in Bozeman. But I really haven't interacted with her since she got the job working for Montana, Fish,

Wildlife and Parks.

Q. And, previously, would you reach out to her if you had a question about her research?

A. If I did, I would, but I didn't.

Q. Okay. So you've never reached out to her about her research.

A. No, not about that specifically.

Q. Can you tell me, in your words, what you think this case is about?

A. I think it's about the possible harm caused to grizzly bears at large, individual grizzly bears, perspectively from the new trapping regulations promulgated in 2023 by the State of Montana that allows for an earlier onset of trapping.

I think there's also the issue of the potential harm arising from the late termination of the trapping effort on wolves which has to do, then, with the exposure of bears to the potential harm perpetrated by trapping for wolves.

Q. I'm just going to jump back to Cecily really quickly. Do you think the science that Cecily is producing -- do you have any issues with the science that Cecily is producing?

A. Absolutely.

Q. Is it because of where she's working or is

it because of the science that she's actually --

A. The science that she's actually done.

Q. Okay.

A. Lots of issues with it.

Q. We'll get into that later.

A. Okay, good.

Q. Do you mind telling me how you came to write the declaration in this case?

I know you mentioned earlier that either WildEarth or Flathead reached out to you, and then Tim subsequently reached out to you.

A. Not -- Lolo-Bitterroot --

Q. Task Force?

A. -- Task Force. It was Adam who, very briefly, made preliminary contact with me and asked if it would be okay if he referred me to Tim. And I said, "Sure."

Q. At that point in time, did Adam tell you what they were intending to do? Was there already a lawsuit filed?

A. As I recall, I knew very little about what was going on other than I was willing to engage, prospectively engage with the issue, but contingent on what I heard more fully from Tim.

Q. Okay.

A. At that point, I hadn't read the regulations. After reading the regulations, I saw what the issues were.

Q. Can you recall whether the lawsuit was already filed at that time when Tim reached out to you?

A. Honestly, I couldn't. I mean, I think not, but I don't know for sure.

Q. So when Tim reached out to you, was he reaching out to you, asking you to file a declaration in this case?

A. Yes.

Q. And was there a specific reason you agreed to write a declaration in this case?

A. Because I thought that there were problems with the new regulations after I had read them that needed to be addressed and that that warranted litigation, given that there didn't seem to be any other options for addressing them.

Q. So previous to Tim reaching out to you, you were unaware of FWP's regulations pertaining to wolf trapping?

A. I was not keeping on top of it, no.

Q. Do you recall the last time you were aware of FWP's regulations for wolf trapping?

A. Yeah, it was -- I was getting into the data on wolf take, when and where in Montana and Idaho, back when I was submitting comments on the 2017 delisting rule for Yellowstone grizzly bears because an issue there was how credible would state management of grizzly bears be. And I looked to wolves as being instructive.

Q. Was there a specific reason you looked at wolves as being instructive in 2017?

A. Because they had been delisted by legislative fiat, and I was curious as to what had happened with wolf take: Where; with what, you know, what level attrition.

Q. So that was the first time you became aware of FWP's regulations pertaining to wolf trapping?

A. Specifically, yes. I mean, I had been aware of matters related to wolves going back well before that.

Q. But not the regulations, right?

A. Not the regulations.

Q. So after the 2017 -- let me rephrase this. Was the 2017 grizzly bear delisting pertaining to a case or was it a U.S. Fish and Wildlife Service rule?

A. It was a rule that I was commenting on.

Q. Okay. And was there any reason you lost ties or lost focus on FWP's regulations after 2017?

A. I was busy dealing with other things.

Q. What other things were you dealing with?

A. I was dealing with my health, I was dealing with grizzly bear issues.

Q. Okay.

A. And my bandwidth did not include wolves in any detail, other than kind of a casual awareness.

MR. SCOLAVINO: I think we'll take a break here for five minutes.

(A brief recess was taken.)

MR. SCOLAVINO: Back on the record at 10:08.

BY MR. SCOLAVINO:

Q. I'm just going to jump back to try and clarify a few things, Dr. Mattson. You mentioned that you did some presentations for WildEarth. Could you tell me what those presentations were for and why you were either asked to make those presentations or --

A. So the only -- sorry.

Q. No, that's fine. That was it, that's it.

A. Now I'm moving ahead too quickly relative to the pace of your question, I guess. The only presentation in the form of a webinar, the only

presentation that I recall explicitly giving for WildEarth Guardians was relatively recently and it was for members. It was a webinar.

Adam approached me and it was to -- the intent was to better inform members. There was a lot of questions, you know, a lot of Q and A. First of all, it was to provide ample opportunity for members to ask questions. But the focus was on what are -- what's been the trajectory of, first of all, extra patience, recovery, challenges, issues, better confronting grizzly bears now, and conservation and meaningful recovery.

There were also some other people on the panel that covered strategies for coexistence, and the promise and prospects of coexistance, which is -- yeah, I think that's pretty much all we covered.

Q. And were you paid for those presentations or was that something you did voluntarily?

A. Um-hmm [affirmative].

Q. Voluntarily?

A. Later, the latter, voluntarily; not paid.

Q. Okay. If I'm not mistaken, in your declaration, you mentioned that you made two presentations. One I believe, was at the Smithsonian?

A. Um-hmm [affirmative].

Q. And there was another presentation.

A. American Museum of Natural History, yeah.

Q. Can you tell me about those two presentations?

A. They were back in the 1990s. It would have been 1990s. I can't remember the exact year, but it was, basically, the same themes as described for the webinar, like: What did we have? What have we lost? Where are we now? But also basic ecology of grizzly bears: What do they eat? Where do they eat what they eat? And when? And what are the challenges facing them?

Q. And did you make those two presentations as a U.S. Biological Science employee?

A. Lolo-Bitterroot Ecosystem Task Force?

Q. Yeah.

A. Yes, I did. I was a government employee, Federal Government employee. And insofar as under what auspices I would have been giving those presentations, I might have still been working for the National Park Service, but if not the National Park Service, then the National Biological Survey/Service.

Q. And were those two presentations just you or were there any other government scientists?

A. Just me.

Q. Jumping back to before you mentioned that you were chatting with Tim about this lawsuit, and I wanted to know if you commented on the 2023 wolf regulations.

So when you became aware of the lawsuit, did you comment on Montana Fish, Wildlife and Parks' 2023 wolf regulations?

A. The first written material I submitted was in the form of the declaration.

Q. Okay. And your declaration, is that something that you wrote and then Tim edited, or did you write it entirely? Did you review it and Tim kind of helped you write it? How did that work?

A. He sent kind of a template, a barebones of draft, and at which point, I completely rewrote it. I retained a few things, like I don't think I would ever have written on my own volition: "I am more than 18 years of age and competent to make this Declaration." It never occurred to me. But thanks to Tim, I put it in there.

Q. Okay. And just --

A. And I don't -- excuse me. But as far as his editing, I don't recall. He might have had a comment or question on a couple aspects of declaration, but not extensive.

MR. SCOLAVINO: And, then, just for the record, Mr. Mattson, Dr. Mattson was looking at -- your first declaration; is that correct?

THE WITNESS: My only -- well, my first declaration, yes.

Q. (By Mr. Scolavino) Okay. And so you primarily wrote your declaration, and then Tim may have polished it up just a little bit?

A. Or had some questions.

Q. Okay.

A. I think the final verbiage was mine.

Q. You mentioned that you were deposed before. In those depositions, do you mind telling me which cases those were you were involved in?

A. It was as in the position of being a National Park Service employee/biologist/researcher, and it related to litigation over Fishing Bridge, the expansion of the compound at Fishing Bridge on Yellowstone Lake in Yellowstone Park.

Tom France was the lawyer who deposed me and he didn't do a very good job, as I recall. That's the bulk of what I remember of that deposition.

Q. Was that the only previous deposition you've ever been involved in?

A. Yeah, in terms of a deposition as, you

know, sitting at a table somewhere other than a courtroom.

Q. In that case, were you being deposed or representing the defendants in that case, or how did that work?

A. I was representing the Defendants. I had a lawyer from the Park Service sitting next to me.

Q. Was that Mr. France, that lawyer?

A. No. Tom France was working for National Wildlife Federation, I think, even back then.

Q. And you said that that case pertained to Yellowstone Lake and putting in a bridge?

A. Expansion of the Fishing Bridge Campground on Yellowstone Lake.

Q. Okay. And then one last thing. So earlier, and then I remember seeing in your declaration reference to the Grizzly Bear Recovery Project.

A. Um-hmm [affirmative].

Q. Do you mind telling me about that?

A. I, basically, created the project on my own. Like I said, the mission vision is, basically, to better educate the engaged public, and all others who have an interest in grizzly bear issues, on the ecology of grizzly bears, demography, all aspects of,

you know, physiology, morphology, as well as policy management, challenges, threats.

So its intent is education/information, in addition to putting out reports that summarize synopsize existing research, which is the primary purpose of the reports.

I also have a couple websites, one which is called "Allgrizzly" are under auspices of the Grizzly Bear Recovery Project, and then Mostly Natural Grizzly Bears," which is focused on, well, primarily Yellowstone grizzly bears, but other grizzly bear populations.

Q. The name of that other website is "mostlynaturalgrizzlybears.com"?

A. Yes -- not "dot-com"; "dot-org."

Q. Dot-org, okay.

A. Yes.

Q. I just wanted to make sure that you weren't referencing something else. When did you create the Grizzly Bear Recovery Project?

A. It was a brainstorm of mine in, probably, 2015-2016, something like that. Before that, I had been working with People and Carnivores, which was after my retirement, and it sort of overlapped with my ongoing appointment at Yale. People and Carnivores is

an organization focused on promoting coexistence between grizzly bears and people.

And when I wrapped that up, when Seth Wilson went off to Slovenia or Slovakia, whichever it was, that's when I started the Grizzly Bear Recovery Project.

Q. Is there a website for the Grizzly Bear Recovery Project?

A. Not as such, although a lot of the content can be found on the two websites that I referenced, "Allgrizzly," one word, and "Mostly Natural Grizzlies."

Q. Is there a reason you created those two websites and didn't just create a website for the Grizzly Bear Recovery Project?

A. No, not particularly. I mean, just -- no, not specifically.

Q. Is there a reason why there's one that's Allgrizzly and then there's one that's Mostly Natural Grizzlies?

A. I was running out of room on the Allgrizzly website, so I had to come up with a different website to host all the information that I was posting.

Q. But the information is the same, correct?

A. No; no, it's non-duplicative, for the most part. Allgrizzlies, so far, is focused on morphology, history, prehistory, stuff like that, whereas Mostly Natural Grizzlies focuses more on contemporary stuff. And summarizing contemporary food habits for grizzly bears is another focus.

Q. Does Allgrizzly encompass all grizzlies or is it tailored to a specific ecosystem or population?

A. All Ursus arctos.

Q. Okay.

A. Past, present, future, including ones residing in Eurasia.

Q. And then you mentioned the Mostly Natural Grizzlies. Earlier, you mentioned reference to the GYE, is that website tailored to GYE bears?

A. Not exclusively, no. I mean, there's an aspect of the site that addresses diet and behavior of grizzly bears. So there's pages that look at consumption of army cutworm moths, for example. That behavior is exhibited by bears up in the Glacier Ecosystem as well as GYE.

Consumption of fruit, so the primary focus there was in Northwestern Montana, adjacent British Columbia, Alberta, anywhere that bears eat fruit. In fact, it sort of encompasses the variation in

behaviors related to consumption of fruit from the Arctic on south and North America. So it's more focused on North America.

There's another page on consumption of whitebark pine seeds, historically where bears might have eaten pine seeds, as well as currently where they do, loss of whitebark pine due to bark beetle outbreaks, blister rust. So you can kind of work your way on down through the primary food groups.

And then there's another major part of the site that's focused on challenges, threats, issues, so like the effects of mountain biking on grizzly bears, for example; of people on foot, their impacts on grizzly bears.

Anyway, there's a whole laundry list of stuff related to. But the intent is to summarize, pretty much, all the extant literature that pertains to each one of these topics on these different pages and different reports that you can download on those pages.

Q. And when did you create Allgrizzly's website and when did you create the Mostly Natural Grizzlies website?

A. Probably I started on Allgrizzly in 2014, '13, shortly after I retired. And then Mostly Natural

Grizzlies probably was a couple years later, 2016-2017 something like that.

Q. Is the Grizzly Bear Recovery Project in those two websites funded through you personally?

A. Most of my time is donated, but we also, my wife and I, get supported for our work by donations from funders.

Q. Do you guys do any sort of campaigning to raise donations or is that just via word of mouth?

A. So my wife puts out a newsletter periodically and she solicits donations from the readers of our newsletter. So we get small donations from people from all over the world, basically. And, otherwise, the donations we get, the funding we get from foundations is rarely because we're out beating the pavement, it's because they're coming to us saying, "Hey, we really like your work and we want to support it."

Q. Okay. Is that a nonprofit organization?

A. Um-hmm [affirmative].

Q. Okay. And how many members are in the Grizzly Bear Recovery Project or a part of?

A. So the Grizzly Bear Recovery Project does not have any membership.

Q. Okay.

A. So my wife started this thing called "Grizzly Times," which is more in the vernacular, to inform people about sort of the same constellation of topics: So where we've been, where we are now, where we're headed, threats, how to address those threats, keeping people abreast of what's going on, new issues, new concerns.

She produced, as part of that, a primer on how people can become constructively engaged with grizzly bear conservation efforts, sort of the different domains that people can operate in and how.

So we don't have members, as such, for Grizzly Times. We have subscribers to our newsletter.

Q. How many subscribers are subscribed to your newsletter?

A. I think it's about 1600, something like that.

Q. Okay.

A. I haven't kept close track. She does.

Q. Do you know when that newsletter started?

A. It would have been back when we first started Grizzly Times, which would have been around 2014-15, something like that.

Q. Okay.

A. Probably '15.

Q. Okay. We're going to jump topics here. Could you describe your postsecondary education for me?

A. "Postsecondary"; after high school, you mean?

Q. Well, yeah, after high school.

A. I got a bachelor's degree in forest resource management. I was enrolled between 1972 and got my degree in '79 because I couldn't stand being in classrooms very long. And, then, '79 was when I started working for the Grizzly Bear Study Team.

And then Dick Knight, at the time, recruited me to do a master's project looking at wetland vegetation in Yellowstone Park, primarily because it was becoming clear that grizzly bears were focusing in on using wetlands, and he wanted a better understanding on the synecology of wetlands. So I started doing fieldwork on that in 1980.

I finished writing my master's thesis in '84 because I got co-opted by Dick Knight as a permanent employee in 1982 for employment with the Grizzly Bear Study Team. And then in '85, I think it would have been, '85-'86, I was set up to start a Ph.D. program with Steve Herrero up at the University of Calgary, including how to study, plan in hand and funding, and

I chose not to pursue it because I didn't want to disrupt my family's life, having settled here in Bozeman.

So I demurred, but continued on as a full-time employee and used that study plan as a basis for collecting data from '86 to '93, at which point I reembarked on my Ph.D. program at the University of Idaho with Jim Peek.

And then I was a full-time employee still of the National Biological Survey/Service, U.S. Geological Survey with the Forest Rangeland Ecosystems Science Center but stationed at the University of Idaho.

I got busy writing, took my class work, wrote a lot of papers, and so didn't get around to wrapping up my dissertation until 1999-2000. By that time, I had been recruited to go down to the Southwest Biological Science Center at Colorado Plateau Research Station in Flagstaff.

The dissertation was on diets, behaviors, causes, and consequences of dietary differences for Yellowstone grizzly bears based on data I had collected and been involved in collecting back to 1979 through '93. But, also, I had privy -- had access to data going back to '75 and up through 1996.

Q. It seems that you may have briefly touched upon your work history or you may have went through it all. But can you just go through your work history since graduating from college?

A. "Since graduating"; graduating with my Ph.D.?

Q. With your bachelor's.

A. With my bachelor's.

MS. CLERGET: Just if we haven't talked about it before.

THE WITNESS: Well, so I was brought on as a permanent employee in 1982, I think it was, and charged with analyzing the grizzly bear habitat data, and then was in charge of, basically, field investigations where I was, all the time the bears were active, I was following them around in the field, along with the crews I supervised, collecting data, what they were doing, where they were doing it, as well as a bunch of side projects like looking at monitoring of studies focused on bear use of cutthroat trout and tributary streams to Yellowstone Lake; surveying bear use of carrion on winter ranges through use of transects, also transects in whitebark pine stands, so a number of side projects going on.

I was monitoring biomass of different foods in the ecosystem and was getting into analyzing

demographic data, collaborating with a guy named "Craig Pease," who was at the University of Texas - Austin, who was a well-esteemed or well-recognized demographer.

So Dick Knight, my supervisor at the time, allowed for sharing demographic data with Craig Pease. And that would have been in 1995 maybe -- no, not 1995. It was 1992, 1991, something like that.

And he discovered an error in the way that Lee Eberhart and Dick Knight had calculated vital rates for Yellowstone grizzly bears. So they inflated estimated population growth rate.

I took that error to Dick and said in private, "Here, this is a problem. You probably need to fix that."

And at that point, he prohibited me working with Craig Pease any more on the project.

That error was also identified by Bruce McLellan and Fred Hovey in analysis data, so we weren't the only ones. And because it was out there in the public, Dick and Lee had to remedy their analysis of population growth rate and revise it down for Yellowstone grizzly bears. And they did in the context of an annual report and it flew under the radar screen.

I wrote a paper in Bioscience in 1990, 1990, a co-authored paper, and raised the issue of the threat of climate change, which was a very inconvenient kind of topic for Servheen to be considering in the 1993 recovery plan, also the importance of road management.

And at that time, there was unchecked, unbridled clearcutting in a lodgepole pine forest on the Targhee National Forest. Based on the tasks, adoption of the tasks and hypotheses that clearcutting lodgepole pine on relatively infertile sites benefited grizzly bears and that roads were not a problem, and so adopting that hypothesis as the basis for management action without any supporting evidence.

At which point, Dick Knight and I wrote a white paper posing alternate competing hypotheses, which is better supported by the weight of evidence that clearcutting and roading lodgepole pine habitats in Targhee are detrimental to grizzly bears or they're beneficial, you know, which is supported by the weight of evidence. It was pretty clearcut as to where the weight of evidence fell out, which antagonized a bunch of forest supervisors.

That led to being drug into a room like this with a whole table lined with forest supervisors where they attempted to intimidate me to not, to

And if you want the gory details, I can give you the gory details. But at this point in time, a revised grizzly bear recovery plan was being promulgated, was being produced, the 1993 revision. I hadn't been prohibited from talking to Craig Pease and I continued to talk to him just as a colleague.

I was sharing my concerns about the recovery plan with him because I wasn't in a position to take on the issues head-on. And so Craig contributed comments, submitted comments during the formal comment period for the 1993 recovery plan.

And shortly after that, I was privy to a conversation that I overheard, because we had an open office space, of the recovery coordinator at the time, Chris Servheen, calling my boss Dick, saying, "If you continue to let Dave Mattson communicate with Craig Pease, I'm going to pull all your funding."

At that point, Dick came in and told me, "You will have no further communications with Craig Pease," at which point I did not have any future communications.

But that was creating tension between Dick and myself because I was making life uncomfortable for him and I was making life uncomfortable for Chris Servheen because I was becoming more openly critical.

forthwith and henceforth, not to say anything about Forest Service management and how it affected bears. But that made Dick uncomfortable because it put him in the crosshairs as well.

Then there was a meeting that was in a room full of Forest Service district rangers, supervisors, in 1993 where Rick Mace was there, as well as Bruce McLellan and myself, to summarize all the science related to impacts of roads on grizzly bears. All three of us were offering our unvarnished perspective. I really had to smile because Rick was out there as much as I was.

You know Rick, I'm sure, yeah. But it was really getting under the skin of the forest supervisors, the biologists, district rangers because, again, it was incredibly inconvenient.

And so Chris and Dick had a dinner that night and Chris laid down the law and said, "You need to get, you know, get on top of Mattson and crush him," as per what Dick said.

And so I came into my office the next day and all my data had been erased -- my hard drive had been erased and all the data taken from my office, and travel prohibited, and mail read incoming/outgoing, which was -- Dick took me in the coffee room and said,

"You know, I'm going to destroy you," basically, because I had become such a problem for him.

And after that, I proceeded to write a series of memos to Dick, and then laying out what had happened and saying, "Is this, in fact, what happened? Could you verify or confirm or deny what happened?"

And this goes back, covered a pretty long history. And he was dumb enough to respond in writing. And then I rebutted with another series of memos, and then he responded with yet another series. I took that stack and set it on the desk of Bob Barbee and John Varley, who were two tiers up in the chain of supervisors, the head of natural resources in Yellowstone Park, and Bob Barbee was the superintendent.

And Bob Barbee said, basically, "Make this problem go away. Give Mattson what he wants."

So John Varley walked into my office, closed the door, and said, "What do you want?"

Because from my perspective, Dick Knight was offering a good-news story about growth of the grizzly bear population, so they couldn't get rid of him, they had to save him.

So I said, "I want a new location, a new supervisor, access to all the data, and to have my

Ph.D. program paid for," which led to me being relocated to University of Idaho, which is when I embarked on my Ph.D. program.

And so that's where I sat for several years, working on my coursework, writing my papers, many papers. And at which point, then, it was reaching wrap-up stage, so then it was a matter of me being offered any number of positions in any number of locations, and I chose Flagstaff.

So, I mean, do you want my full history post --

Q. I think you gave it to me.

A. Well, there's more, there's more. I had a position with the -- I mean, I've been going back to give seminars at the Yale School of Forestry and Environmental Studies going back to 1993-1994, so I had an informal relationship with Yale. That was formalized in 2006 as being a lecturer, visiting senior scientist, and that employment lasted until 2014.

I spent one year in residence, 2006-2007, then was invited to be a visiting scholar at MIT for the following year. I came back, was appointed research station leader for the Colorado Research Station. I didn't like that because I didn't like being an

administrator, but I was acting center director, research station leader subsequently as needed.

But when I moved to Flagstaff, I started research projects from scratch as well, concurrent with my teaching obligations. That eventually included five different study areas: The north-south rim of the Grand Canyon; Flagstaff area; Capitol Reef; Zion National Parks; Nevada National Security Site.

Q. Okay. That kind of tangents me into another question. In your declaration, it said that you worked for the IGBST for ten years; is that correct?

A. Longer than that.

Q. Longer than that?

A. Yeah. I started in '79. I mean, I was at the University of Idaho as a graduate student but being paid by the Grizzly Bear Study Team from 1979 through 1993. So that would be, what, 15 years.

Q. Okay. And, then, what did you do during your time for the IGBST?

A. I started out as a field technician, then was given responsibility in 1983 for all data analysis, publications related to habitat use, behaviors, diets of grizzly bears. I supervised the field crews that were following/tracking grizzly

bears, collecting the food habits, habitat-use data, all these other ancillary projects.

From that point on, it was part of a project, 1984-1985, where we deliberately provoked grizzly bears in the backcountry. I take credit for not designing that study, but Mark Haroldson and I basically ramrodded it. So, yeah, that was basically what I was doing, and writing a fair number of papers.

Q. Was there any reason you left IGBST?

A. I just went through that.

Q. Okay. In your declaration, it stated that you then, I guess, swapped over to mountain lions and led six mountain lion projects and worked on mountain lions pretty substantively.

What did you do, particularly, with mountain lions?

A. I created the project from scratch, found money, so was a hundred percent responsible for funding the various projects. I worked with colleagues and collaborators to build out the projects in different areas, worked to establish relationships with the National Park Service, Arizona Game and Fish.

I was involved in the capture of mountain lions and investigating -- by that time, we had GPS Argos satellites, which was great, which meant that,

basically, we knew in real time where the lions were. So we could go out, basically, within 24 hours to find out what they were doing.

So I went out and, you know, personally investigated probably 600 kill sites. I also had people working for me doing that work. I had a couple of graduate students.

Q. Okay. And was there a reason you switched from grizzly bears to mountain lions?

A. Because there were limited opportunities for a Federal Government employee to study grizzly bears in the contiguous U.S. because that was largely the domain of biologists in state agencies: Montana, Idaho, Wyoming, and the Grizzly Bear Study Team.

At that time, I didn't want anything more to do with the Grizzly Bear Study Team personally and going back to the Yellowstone Ecosystem because it had been such a grotesquely unpleasant experience with the politics of that ecosystem.

So it was a blessed relief to work on a different species in a different area where it was less politicized, although you wouldn't think that about mountain lions. And, basically, I was offered any number of places I could have gone to work. And Flagstaff looked great for my family, so that's where

I went.

And I scanned the horizon for opportunities, and it looked like there might be opportunities to work with mountain lions on national park jurisdictions, but it built out from there.

Q. Can you tell me your understanding of the definite roles between FWP and the commission?

A. The commission oversees the policies/procedures of the agency. It's populated by appointees that are appointed for various and sundry reasons. They have ultimate authority over what goes on in the agency. Fish, Wildlife and Parks, the agency employees, are tasked with implementing the policy, whatever has been adopted by the commission.

Q. Do you know who sets the wolf trapping season?

A. As I understand, I mean in terms of the formal setting process, it's the commission. But, usually, there's a conversation between people in FWP in the agency itself, permanent employees, and the commissioners where the commissioners, as I understand it, seek input usually, often, from their, you know, line staff.

But, ultimately, it's up to the commission. And the commission also operates at the behest of, from my

perspective, of what other parties would like who show up to testify who have personal communications with the various commissioners.

Q. When you say "other parties," what do you mean?

A. Anybody with whom they have a personal relationship or are willing to listen.

Q. Do they also listen to constituents, meaning somebody that they may not have had a personal relationship with?

A. With varying degrees of receptivity, from what I've seen.

Q. Personally, that you've seen?

A. Yes.

Q. Do you mind elaborating on those personal instances?

A. Over video, watching the commissioners in responding to testimony from various entities, different people.

Q. So when was the last time you watched a commission meeting?

A. It was when they were deliberating over allowing the use of hounds in pursuit of black bears.

Q. Do you recall what year that was?

A. Not that long ago; it was just a couple

years back.

Q. Was there any other previous instances that you've have had with -- that you've noticed the commission?

A. Yeah, but not that I remember as clearly as that because it's a bit more recent in time.

Q. You mentioned "climate change" earlier. What would you call an appropriate frequency for the commission to review the wolf hunting and trapping season?

A. An appropriate frequency for them to review the trapping regulations?

Q. Yes.

A. From my perspective or from their perspective?

Q. From your perspective.

A. I think as frequently as warranted by the unfolding events on the ground.

Q. And by "unfolding events on the ground," is there something in particular that you would want the commission to convene on?

A. To review what is known and what is not known about grizzly bear distribution, ecology, population growth to better inform, then, their judgments regarding risk to grizzly bears as it

relates to the regulations.
And that would be in response to new critiques/concerns being raised about all of those methods as well as, obviously, any incidental take, any review of information that's new or has not been fully deliberated upon that might bear on the risks of trapping to bears.
Anytime there's new information of any sort that relates generally, specifically to the topic of trapping in areas occupied by grizzly bears, I think it would be appropriate for the commission to review that.
Q. If you were to put a number on that, how many times a year? Would it be once a year?
A. As appropriate, as needed, given the new information that's coming to light being offered to them by any number of people in their constituency.
Q. Okay.
A. Not just from staff of Fish, Wildlife and Parks.
Q. Do you know when the first wolf trapping season was?
A. I only know, based on the data that I've been able to dig up online, the wolf trapping report. The first wolf trapping report or wolf harvest report

things. First of all, the requirement on trappers was that they check traps once every 48 hours, which is concerning, because if you're only checking traps once every 48 hours, it increases the odds that there will be distress and trauma inflicted on any bear that is inadvertently captured.
It was the dimensions and pressure requirements for the pans on the traps, the snares, the weight required to break loose the snares and traps, the pounds of pull. There was the fact that this floating date, there were a couple of things, so that the floating date in occupied habitat could begin as early as the first Monday after Thanksgiving, which would be, roughly, November 27th, but pushed back if there were radiocollared grizzly bears still out of dens. It wasn't clear how many would be a critical amount out of dens yet.
And there was no -- nothing was addressed in terms of what that sample would offer of bears that were trapped, how reliable the information would be that you might get from trapped bears and their dates of denning, dates of den entry and exit.
There was the difference in how regulations were promulgated for areas outside, occupied formally, designated occupied habitat and elsewhere within the

that I came across was 2012 when the department started reporting take of wolves by hunters and trappers. So I've looked at all the data that had been reported by the department since 2012.
Q. And what are some recent actions that the commission has taken regarding wolf trapping?
A. Recent actions?
Q. Correct.
A. I don't know what the most recent are. I know of some recent ones. When I look at the website, there's a notification there that says because of a court injunction, trapping was delayed till January 1st and ending March 15th.
I'm assuming that that later preexisting date was because of the Ninth Circuit ruling that allowed for the extension through March 15th, which is the normal end of the season.
Other than that - and I would assume that that was by virtue of instruction from the commission that that notification was put on the website, but I don't know that for a fact - it's the adoption of the 2023 regulations in 2023.
Q. Was there anything in those regulations that caught your eye pertaining to wolf trapping?
A. There were a number of things, a number of

area encompassed by grizzly bears may be present, where there was a hard set to the season beginning.
So there were concerns about the progressively earlier season for trapping, which had been pushed back to, from what I could see from the wolf harvest reports, from December -- anyway, it had been pushed back to December 1st already.
And the fact that the trapping season extended until March 15th, and in my personal experience, those are problematic dates, especially the March 15th date, in terms of bears being out and about in areas where were there would be traps set. So those are all issues that got my attention and were of concern.
Q. Okay.
A. So it didn't take long after Tim brought my attention to these trapping regulations, I downloaded them, read them, that I saw, yeah, there was ample cause for concern.
Q. What are some recent actions that the legislature has taken regarding wolf trapping and, specifically, the Montana legislature?
A. I'm not familiar with recent actions by the legislators, other than they've been promulgating a lot of new legislation that covers wildlife management.

Q. Are you aware of any actions that FWP has taken regarding wolf trapping and snaring?
A. There's an education certification course that everybody has to go through. If they've been trapping anytime during the previous two-three years and have been previously certified, they can continue to. So it looks like the department is making an effort to try to improve the skills of the trappers to minimize by-catch and harm.
Q. And do you know when that action was taken?
A. The certification education?
Q. Yes.
A. As early as 2012.
Q. Okay.
A. I mean, as I recall, there were like 1500 people that were certified licensed to trap.
Q. Did you get that data off FWP's website?
A. (Nodding head affirmatively.)
Q. Okay.
A. Yep. For your benefit, "yes."
Q. Was that data something that you looked at recently in regards to this lawsuit or were aware about before this lawsuit?
A. I started looking at it recently in regard

to this lawsuit.
Q. Are you familiar with Montana Code Annotated 87-1-901?
A. I have a hard time remembering my kids' birth dates. No, not by number; no.
My wife gives me grief about forgetting her birthday, but anyway.
MS. CLERGET: I have the same problem.
MR. SCOLAVINO: I think we'll take another break here for five minutes and then we'll come back.
(A brief recess was taken.)
MR. SCOLAVINO: We're back on the record. It is 11:13.
BY MR. SCOLAVINO:
Q. I just wanted to touch upon, just go back to some previous stuff that we may have covered. So I asked you a question about some recent actions the commission has taken regarding the wolf season. I just want to assure I have everything down. You mentioned 48-hour trap-check requirements?
A. Um-hmm [affirmative].
Q. The dimensions in the pans of the traps?
A. The pressure set for the pans on the traps, as well as the dimensions of the jaw traps, leg-hold traps.

Q. You also mentioned the floating date and, specifically, November 27th being the earliest date, and some pause about the criteria going into shutting down the season, if I'm not correct.
A. Well, pause it just because it's not altogether clear other than to be monitoring bears that are collared going into their dens, keeping track of their den-entry dates.
But, honestly, I'm not clear as to whether it's like all of them need to be in the dens before some review of the regulation or the opening date is undertaken, or whether a certain percentage. That's what I wasn't clear about.
Q. And then you also mentioned the area outside of the estimated occupied range, which we could coin as the "may-be-present area"?
A. Um-hmm [affirmative].
Q. And then the trapping season extending to March 15th?
A. And the fact that in the may-be-present area, there's a hard beginning date of the first Monday after Thanksgiving.
Q. Okay. Was there anything else, though? I just wanted to make sure I --
A. Yeah, those were the main issues that

concerned me, as well as on the traps, the required pressure for a breakaway.
Q. Oh, yes.
A. Between 500 and 1,000 pounds, depending on a trap set.
Q. Okay. And that was it, correct?
A. Um-hmm [affirmative].
Q. And then I just wanted to ask you about whether you're aware of the differences between previous regulations. So are you aware of the differences between the 2022 and the 2023 regulations?
A. 2022, not clear, just based on what I could see of the wolf harvest reports in terms of the exact dates. The last time there was any dates reported in the wolf harvest reports that I saw, at least on the material posted online, was something like 2013-2014, '13.
It was a fairly conservative early start date, as I recall. I'm trying to remember. That's what I -- the impression I was left with. And then there had been a creep. I'm not sure when the pushback of the date was, when that was established, because it wasn't in the wolf harvest reports.
Q. So is it safe for me to assume that you wouldn't be aware of the differences, let's just say,

between 2021 and 2022, and 2020 and 2021?
A. In terms of the dates?
Q. Well, just anything about the regulations.
A. Yes, that would be a fair assumption.
Q. Okay.
A. Other than it already seemed to be a problematically early date prior to 2023 regulations.
Q. Okay.
A. Because that had become clear. And again, I don't have an exact recollection of a year when there was a pushback of the beginning date.
Q. Okay.
A. And it's also not clear to me whether there was a distinction between trap dates in occupied grizzly bear habitat versus outside of occupied grizzly bear habitat at any previous time.
Q. We're going to jump topics here and I'm going to start to just ask you some questions about grizzly bears now. Can you tell me about the distribution of grizzly bears in Montana?
A. Tell you about?
Q. Yes.
A. So I'm not sure what you mean by "about the distribution of grizzly bears." Like what is the extent of and how is it defined?

Q. Yes.
A. I couldn't give you the exact square kilometers, but it certainly extends well beyond what's been described as the primary conservation area and Demographic Monitoring Area in the NCDE, as well as the GYE.
So I know in the GYE, there's been probably a three- to fourfold increase, threefold increase, depending on when you, when you start looking at distribution data in the GYE.
There's not much change in the distribution of the Cabinet-Yaak population, although there's been a creep in the distribution of the NCDE population as defined, as occupied towards the Yaak portion of the ecosystem.
And in the Bitterroot, there's been -- and in areas in between the Bitterroot and the NCDE and GYE, there have been numerous verified, reliable reports of grizzly bears based on different sign, different evidence.
Q. When you say "verified reports," who is verifying those?
A. Montana Fish, Wildlife and Parks. And for the most part, where there are people such as Jamie Jonkel or, before him, Tim Manley that would go out,

or investigate the documentation, or go out and visit the site to certify -- you know, determine whether, in fact, this looked like to be grizzly bear sign evidence. Also there's telemetry locations, GPS locations that feed into that, as well as conflict reports. Conflict reports are pretty reliable.
Q. Has the population in the GYE and the NCDE increased?
A. By all indications, they have increased, yeah. It depends on by how much and with what bounds of uncertainty.
Q. Do you know how much it's increased by or in your professional opinion?
A. In my professional opinion, I can tell you what Rick Mace and what Cecily Costello came up with. Rick Mace came up with 3.2 percent for data covering 2004-2008, and then Costello came up with 3.2 percent -- or, no. It was 3.2 percent, and then she came up with a 2.3 percent growth rate, subsuming all of Rick's data in the data she used which spanned up to 2014, because the most recent estimate of population growth rate was reported in 2016 for data ending 2014.
The bounds of uncertainty, though, if you project out those growth rates, the lower conference limit, the upper conference limit for both of them, if

you project out Rick's estimate, despite the fact that you have a 3.2 median or a central tendency to the estimate, you could currently have anywhere from 300 bears to over 2,000, because that's how bounds of uncertainty expand as you project forward in time.
If you look at Cecily's estimate, which is revised down substantially from Rick's estimate, you have bounds of uncertainty that are similarly wide if you project them out. Interestingly, that's not what's reported. What's reported is just a rote projection, sort of a central tendency projection, going out 2.3 percent from the base year of 2004, which was when Kate reported her estimate for the NCDE of 765 bears.
So it's all referenced back to 765 bears, plus or minus. And it's virtually never the case that the uncertainty intervals are utilized in reporting any of this information to managers or anybody else.
And the problem with the data and the estimates is that the population growth rate estimate has not been revised since 2016 for data ending in 2014. So you, when you look at the average age of the data that were used to come up with the current estimate of 2.3 percent, it's currently between 15 and 16 years old.
There's been no updating, no inclusion of data

from the last 20 years in any kind of estimate of population growth rate. It's all been on the basis of projecting out population growth from the baseline of 2004 using estimates that were used, made from data that are stale, to say the least.

So in terms of the veracity of doing that, there is no justification, really. I mean, there's no good justification in terms of any kind of credible scientific practices.

The other thing is, too, that Cecily used RISKMAN to come up with some projections, which is a software package that you can load in your vital rates, treat uncertainty in all sorts of different ways. And I closely scrutinized how she treated uncertainty in her projections, simulations, and it was lowballing the effects of uncertainty at every step along the way.

So when I took her vital rates and -- so there's a problem of projecting out from the past into the future based on data that are obsolete, uninformative in terms of current on-the-ground conditions, but also a haphazard, ill-informed treatment of uncertainty in all those estimates by whatever means or methods.

But interestingly enough, if you look at --

there is a requirement in the monitoring protocols that the death rates/survival rates of adult females be revised using a six-year moving window of data. The death rates of adult females have increased from about 4.6 percent; for the data that Cecily used, about 7 percent.

So that's a 43 percent increase in death rates of adult females since 2014, according to Cecily's own estimates. That increase in female, adult female mortality rates has not been fed back into the revised estimate as yet of population growth rate. Although, as I understand it, she's working on a revised estimate for population growth rate.

But if you looked at what happened, just by including a few more years of data to what Rick was using that Cecily then used, and you've got a downward revision of population growth trajectory from 3.2 to 2.3 percent. It would suggest that, in fact, the population growth rate has been declining, if you project the second derivative, especially, essentially of what's happening with growth rate out into the future.

If you look at 7 percent more death rate for females as being, basically, at the limit of what's considered to be a threshold of sustainability, it

would suggest by the weight of evidence that population growth rate has been near zero percent recently, than 2.3 percent or 3.2 percent, the other problem with population monitoring, the big problem that I've seen in terms of how population monitoring has been treated.

I mean, the other thing that weighs in, in terms of how to judge Rick's 3.2 percent versus Cecily's 2.3 percent is if you look at when Rick collected all those data, reported mortality was at low ebb. So his data encompassed a pretty auspicious time in terms of what was going on with bears.

You had increasing mortality subsequent to the data that Rick used that probably account for why the population trajectory estimate for Cecily's work came down a bit, which was conciliant with having a bump in reporting mortality. And reported mortality has continued to trend upward, so that would suggest that we're not in a particularly auspicious time.

But going back to where I left off, what's also problematic is that this projection, which is not defensible by any credible scientific standards that I'm aware of, it's for the entire population, without respects to whether it's for the PCA, the Demographic Monitoring Area, or the population in toto.

So if you look at the distribution of the NCDE, there's currently more than 30 percent of the distribution outside the Demographic Monitoring Area. So if you're looking at what is the size of the population within the Demographic Monitoring Area, it's certainly less than whatever the total is you've calculated for the entire population because there's no geospatial balance set to that.

So at every step along the way, there's this intent to inflate what's been going on with the grizzly bear population size trend. You can look systematically at all the decisions that have been made.

MS. CLERGET: I'm just going to tell you that you've got to slow down or you're going to kill Candi.

THE WITNESS: Oh, I'm sorry. I'm sorry.

Q. (By Mr. Scolavino) Who is Rick?

A. Rick Mace. He was in charge of grizzly bear research prior to Cecily stepping into his shoes.

Q. So Rick, his study or data was pulled off of the NCDE?

A. NCDE.

Q. Okay.

A. This is all in reference to the NCDE.

Q. Okay.
A. I can get you the GYE, but that's the NCDE.
Q. And even though Cecily's data was revised, you still have questions about her conclusion?
A. The estimate, the estimate of population growth rate that is currently being used to project out population size was based on data up through 2014, which is ten years old. And those data were already old because you're backcasting, you're folding in data from 2004.
So when you look at the age of the data and, actually, I looked explicitly at the breakdown of the years that contributed to the dataset, the average age of the data used, be it for projecting out the current size of the population, is 15 to 16 years old. And there's none of the data that went into this 2.3 percent estimate that's younger than 10 years old.
So there's two different things going on here. There's a projecting out of population size based on an estimate made on old, stale data. But concurrently, and at that time, the estimated mortality rate of females was about 4.6 percent.
And it was determined through Cecily's exercises with RISKMAN, which is this software, that 7 percent

mortality rate for females was sustainable. So, originally, 2014, we were looking at 4.6 percent. Baseline, you know, what was considered tolerable sustainable was 7 percent, so a comfortable balance, seemingly.
There's a provision in the monitoring strategy for the NCDE that the female death rates, survival rates, which are the inverse of each other, be updated on the basis of a six-year moving window of data.
Ever since that's been done, death rates for females have been between 6 to 7 percent per annum, and that's not accounting for uncertainty of the estimate, which is another problem. But even taking that central tendency estimate of 6 to 7 percent, that is right at what would be considered barely sustainable.
So it's more consistent with concluding that the population growth rate is near zero percent than 2.3 percent because of that 43-plus percent increase in death rates for adult females. And all these estimates of population growth rate are piggybacked on what's going on with adult females.
Q. And so is there something that you're aware of that is causing the adult females to die more rapidly?

A. By all the indications, if you look at the data, the number of bears that have been recorded to have died, that's been an increasing trend, especially in recent years, if you're looking at a three-year moving average, which is the more credible way to do that.
I mean, also, just to insert, to amplify a certain point, managing on the basis of estimated survival rates and population growth rate, invariably, you're managing looking in the rear-view mirror because you have to have enough data to come up with a reliable estimate. And, invariably, then you have to draw on data that are old, or at least retrospective, which doesn't tell you what's going on right now.
So an additional problem with monitoring in the NCDE is, unlike in the GYE, there's no realtime provision for monitoring trend or status of the population because there's not a similar program in the NCDE as there is in the GYE of tracking numbers of unduplicated females with cub-of-the-year, which gives you that realtime data that then you can fold into your estimates of what's going on or understanding what's going on with the population.
So there's no realtime check. It's all based on old data being indefensively projected forward in

time.
Q. But is there something in particular that is causing those females to die, an increase from 4.6 percent to 7, 6 to 7?
A. It depends on which side of the ecosystem you're on. There's a whole different constellation of mortality causes on the west side of the ecosystem versus the east side of the ecosystem.
On the east side of the ecosystem, it's much more driven by encounters with big game hunters and ag-related conflicts, so conflicts over attractants in the form of crops, livestock, boneyards.
On the west side, there's a higher incidence, has been always, continues to be a higher incidence of bears being killed by black bear hunters, a mistaken ID. There's also many more deaths from conflicts over garbage attractants that are associated with high densities of people in the Flathead Valley. And documented poaching occurs at a higher rate on the west side.
And that's the imponderable. So there's also this category of unknown human caused or just unknown cause. Those are the two categories that are the buggers, like how do you reliably track the numbers of bears dying because of malicious killing, poaching, or

in a suggestive way in that category of human caused but unknown? You find remains that suggests that the bear died from a human cause, but you don't have an investigation that can pin it to some malfeasance or maliciousness.

So, plausibly, that category, rather than being standalone, can be treated sort of as the range of options, as also prospectively including poaching, malicious killing.

Q. I'm trying to phrase this question and I don't know if I'm going to phrase this right. What would you need or what do you think would make the data current? What year span?

You're saying it's old data from 2004. What would make it current in your eyes?

A. Cecily doing what I understand she is doing, which is updating the estimate of population growth rate using data collected during more recent years. The problem is that you're still backcasting. You're still looking in the rear-view mirror because to come up with a population of estimated -- an estimate of population growth rate, you have to use data that goes back multiple years.

So I'm not sure how much data she's going to be folding in to come up with this revised estimate, but

ideally, you would truncate it to as few years as possible to give as much of a realtime estimate as possible.

The problem is that the bounds of uncertainty on your estimates increase, which means, then, if you're projecting out, then you have the same phenomenon of the exploding confidence intervals in terms of estimated numbers of bears.

So that's a tradeoff. But I would argue that's the desirable tradeoff, to use more recent data and have estimates that are more uncertain, rather than using data that go back to the point of being irrelevant to understand what is currently going on.

Q. Okay.

A. But we don't have that estimate in hand yet.

Q. Okay.

A. Another -- anyway, there's multiple problems here, but I won't get into all of them unless you ask me.

Q. Do grizzly bears in Montana differ from those elsewhere in the world?

A. In what regards are you wondering?

Q. Just species wise, are they the same species?

A. All the grizzly brown bears in the world, although they're not grizzly bears in Eurasia, are Ursus Arctos. The taxonomy of Ursus arctos is really a bugaboo. To understand what might be somewhat unique about grizzly bears in Montana, actually inclusive of everything south of some southerly latitude in B.C. and Alberta, is that they belong to a different genetic lineage. It's called "clade 4," which has a unique history and biogeography.

Clade 4 grizzly bears arrived probably 70,000 years ago in Beringia. They, by all indications, were in at mid latitudes prior to the coalescence of the continental ice sheets, and then they were subsequently isolated by the ice sheets. All clade 4 bears everywhere else in the world went extinct.

So we're still talking about the same species, just a different clade, which is a finer-grained differentiation, except there's one small relic of clade 4 bears in Hokkaido in Japan. So bears at mid latitudes in North America, inclusive of all the bears that were down to Mexico, were of this clade 4. And of that clade, we've lost probably, if you include what we have in Canada, probably 90 percent of the former numbers in distribution of that clade.

In the U.S., we probably have 4 percent of the

former numbers in distribution of that clade that we once had in the contiguous U.S. So in terms of evolutionary history and genetic lineage, all the bears at mid latitudes in the U.S. are at clade 4.

Q. What about habits between bears? So bears in the GYE and the NCDE, do they have similar habits, the same habits?

A. As in are you asking whether they have a similar or different diet?

Q. Diet, denning.

A. Foraging behaviors --

Q. Yes.

A. -- denning? It's been really well, pretty well demonstrated. I mean, in terms of fundamental behaviors, behavioral proclivities, we have no reason to think that grizzly bears in the Arctic differ from grizzly bears in the GYE or grizzly bears anywhere in between. It's what is thrown into relief by their environment in terms of their behavioral tendencies: What they choose to do, when they choose to do it, and where.

So the fundamentals are the same. There's no reason to believe they differ. If you look at digestive ecology, you look at morphology, you look at, you know, dentition, you look at any aspect, it's

basically, if there's any variation, it predictably is because of variation in body size, period. And that's a function of diet.

So insofar as what we have in the GYE versus the NCDE, it depends on what time period you're talking about. There's good evidence to suggest, from the work that Keith Aune did along the East Front, that bears along the East Front ate a lot of whitebark pine seeds when whitebark pine were still extant. Chuck Jonkel found good evidence that bears ate whitebark pine seeds in the Whitefish range back in the 1960s. We co-authored a paper on that.

So at one time, diets of bears along the East Front were probably remarkably similar to diets of bears in the GYE, in the sense of consuming a lot of whitebark pine seeds and also eating a lot of meat. So bears along the East Front have always eaten more meat than bears elsewhere in the NCDE.

I mean, Keith Aune showed that with his work, but also Rick Mace did some isotopic analysis of bear hairs, bear tissues that showed this grading of meat consumption as you went from the far northwest corner of the state east and south. So by the time you get to the Blackfoot, you have a lot of meat consumption. By the time you get to the East Front, you have a lot

of meat consumption.

So there's a remarkable similarity in terms of diets and presumed behaviors. I mean, if you look at Keith Aune's report for the East Front study, you look at habitat use, I mean, yeah, the habitat types were different, but the basic orientations were much the same.

As you go further northwest, you have an increase in fruit and foliage in the bear diets. So you reach sort of a peak in terms of consumption of fruit and foliage. When you get to the Cabinet-Yaak population far northwest corner, Glacier area - northwest corner, the NCDE outside of Glacier, north of Highway 2, basically, into southeast B.C., you get over into Alberta, you have -- hedysarum roots are a major component of the diet, buffalo berry is a major component of the diet.

So there was also a lot of root digging on the East Front. Biscuit root was prominent, is still as far as I know. Nobody has really looked at it recently, you know, in detail, food habits on the East Front. But they ate a lot of biscuit root, apparently. The same as in Yellowstone.

So there's a lot of similarities, some differences. Grizzly bears in Yellowstone didn't eat

fruit. And, of course, you have to factor in that there's been a lot of variability attributed to just individuals. Different bears make different choices in terms of what they consume, outside of the modality of eating probably what's most abundant and what's most nutritious.

Also, there's some major distinctions in terms of sex/age classes of bears. Just about every ecosystem, males eat more meat than females. And that also is the case in southeastern B.C., northwestern Montana. Where bears get meat differs. In northwestern Montana, a lot of it is from scavenging kills made by hunters: Remains of deer, for the most part; moose, also. There's more moose consumed by bears in southeastern B.C.

When you get down to Yellowstone, you get to the East Front, there's more elk, but livestock are the main source of meat. You get down to the GYE, elk have always been a prominent source of meat; bison, to a certain extent.

You look at trends over time, increasingly, bears in the GYE are eating more meat from livestock. That increase in consumption has been by virtue of the loss of whitebark pine seeds. I mean, you know, there's a strong temporal correlation. Bears are

eating increasing amounts of army cutworms moths in the GYE, probably also compensatory.

We're learning more about bear consumption of army cutworm moths in Glacier. We don't know that much about their consumption of army cutworm moths as we go further down through the NCDE, although the Craigheads, or at least John Craighead documented it in the Scapegoat, and Keith's documented it in the -- further north. I forget the exact place.

So there's a lot of variability. There's some general themes, general trends, but more fruit to the north and west, adults eating more meat. And evidence from Yellowstone suggests that the advent of wolves has introduced a whole new dynamic in terms of bear diets, especially for males.

Q. What about just den entry and emergence? A difference?

A. There's a lot of evidence that den entry and emergence dates correlate strongly with climate. So the further south you get and/or as you get into areas that are a bit warmer and a shorter duration snowpack, you will have later den-entry dates, earlier den-exit dates.

In southeastern B.C., for example, which is called by some an "inland rain forest," they get huge

amounts of snow that accumulate early, last late. So you have a fundamentally different denning phenology there which is more prolonged.

You get down to the Cabinet-Yaak, which is warmer, less snowpack, still wet, you have later den-entry dates, earlier den-exit dates.

In the GYE, you similarly, as you're getting into a different environment, you have earlier den-exit dates, later den-entry dates compared to in southeastern B.C.

Q. So is it safe to assume that latitude affects den-entry dates, then?

A. Latitude, strongly modified by local climate.

Q. Okay.

A. And that is evident by just going from southeastern B.C. to the Cabinet-Yaak.

Q. Okay. Does elevation affect that at all?

A. Yes.

Q. Okay.

A. Although southeastern B.C. is at a comparable elevation, for the most part, except for the highest peaks. But where you look at the distribution of dens, it's not that dissimilar to the Cabinet-Yaak.

where bears are deliberately fed in the Balkans area, into Romania, that there's delayed den entry when there's food available. So that's the basic phenomenon.

There's also lots of evidence from Sweden, in particular, of this intra-specific interaction between grizzly bears and wolves: Wolves making kills; brown bears, grizzly bears usurping those kills and affecting wolf behavior.

But the idea, it's been shown that grizzly bears, especially in Norway, or Sweden and Norway, there will be bears that specialize in following wolves to usurp their kills, which makes total sense.

Q. That's in Sweden?

A. Sweden.

Q. Has that been documented here as well?

A. In northern Yellowstone Park, yes, predominantly.

Q. Okay.

A. Actually, in Yellowstone Park at large, but in Yellowstone, yes.

Q. This is a clarification question: Do all grizzly bears follow wolves or is it certain grizzly bears that create this specialty over time?

A. Do all grizzlies -- are all grizzly bears

Q. You previously mentioned grizzly bears changing their diets because of wolves on the landscape. Do you mind talking to me about or discussing grizzly bears and wolf kills, how prominent it is?

A. From everything I understand, and a lot of this work has been done by Kerry Gunther and Doug Smith in Yellowstone in the contiguous U.S., there was also some previous work looking at usurpation of cougar kills on the north fork of the Flathead, but a similar phenomenon.

There's also work along those lines from Yellowstone. So it's one predator killing an animal, and then a bear moving in and usurping that carcass, is the basic general phenomenon. And that's been well-documented. Going back to the 1980s, I think that's when the north fork work was done.

But it's been much more evident in the GYE since the arrival of wolves. It's suggestive that there are males that are following wolves around, potentially well into the winter, usurping wolf kills. I mean, there's a lot of evidence from different studies, basically, globally, looking at Ursus arctos, to suggest if you have an augmented food supply, bears will stay out of their dens. And that's been evident

right-footed or left-footed? That's kind of an inane question. There are, by all indications, there are some bears that specialize in following wolves, just like there are some grizzly bears that specialize in predating on livestock, or predating on bull elk and bull moose, or that specialize in digging roots, or that specialize in grazing in certain -- in avalanche chutes as opposed to scavenging for spring carrion.

There's a lot of variation amongst individuals, but it is a pronounced pattern of bears, of there being a significant number of bears specializing in eating meat, which attenuates their activity period.

Q. Does it occur more prominently during certain periods of time?

A. To my understanding, from what's been documented in Yellowstone with wolves and cougars, as well as cougars in the north fork, it's been more evident in the winter. But it's not clear to me whether that's because of the monitoring program regimen that they're detecting it more in the winter, but it seems to be a year-round phenomenon in Yellowstone.

Q. Okay. I know you mentioned "males" earlier, but do females also -- have there been documented cases of females doing this and females

with cubs doing this?

A. Rare for females with cubs to run the risk of appropriating a wolf kill. The evidence seems to be pretty conclusive about that. In Scandinavia, it seems like females will specialize in appropriating wolf kills along with males.

There hasn't been any updated publications or reports that have folded in recent information about grizzly bears following wolves in Yellowstone since Doug Smith and Kerry Gunther published the results back a number of years now. So I'm not sure what's going on now other than a lot of anecdotal observations, as well as my own personal observations, of bears appropriating wolf kills in Yellowstone during the spring.

Q. Does pack size affect whether a bear will usurp -- is that correct?

A. Usurp [pronouncing].

Q. -- usurp a kill, a wolf kill, the wolf pack size?

A. Not clear. I'm not sure that I've seen any information to suggest that would be a factor one way or another.

Q. When these grizzly bears usurp these kills, are they actually claiming the kill and the

wolves will never push them out, or is there a possibility that the wolves are pushing them out?

A. "Possibility" as in a 1 percent, 2 percent, 5 percent, 10 percent possibility. There's a possibility that wolves will push the bears out; that it's not always the case that grizzly bears will terminally possess the carcass.

I mean, in addition to what I've been describing, there was a compilation put together by Chris Servheen and Dick Knight for this analysis projecting what might happen with reintroduction of wolves into Yellowstone that dates back to whenever that was happening, 19 -- early 1990s.

And they reviewed all the records of bear-wolf interactions from around the world, including Eurasia and Canada. And based on that compilation, brown bears, grizzly bears, were the winners of a competition for a carcass most of the time.

Q. Okay. And earlier, you mentioned the 1980s, so it's --

A. That was in relation to cougar, cougar predation, usurpation of carcasses by bears. So it was more specific to cougars on the north fork.

Q. When did grizzly bears usurping wolf kills come to light? Was there a specific time period?

A. That was part of the comprehensive review that Chris Servheen and Dick Knight put together based on a compilation of data from throughout the northern hemisphere prior to the reintroduction of wolves in the GYE.

So there was already pretty clear evidence that there was this dynamic in places where we had both brown bears, grizzly bears; and wolves. And those data span 1950s, as I recall, up through the time that that report was published.

In terms of specific to Yellowstone, anecdotally, it was evident that this was a phenomenon shortly after wolves were dropped on the ground. But in terms of something published, it wasn't until that paper by Kerry and Doug in, I forget when it was, the early 2000s.

Q. Okay.

A. And then more recently, the Scandinavian research program got off the ground and it's been gangbusters. And it's produced some pretty compelling evidence of inter-dependency, inter-relations between wolves and grizzly bears, brown bears affecting wolves, tracking bears, usurping their kills.

Q. Okay. Have you, yourself, ever witnessed a grizzly bear with an injury?

A. Yes, absolutely.

Q. How many?

A. Probably a half-dozen.

Q. And that's spanning your entire career? How many years would that span?

A. Yeah, I mean, aside from the bears that were dead where I saw their remains, you know, on the ground, yeah, that would have been primarily during the time that I was working in the park.

Q. Okay. What type of injury did those bears have?

A. All kinds of injuries: A lot of injuries to the head, to the shoulders, to the legs, to the hindquarters. I mean, it depended on the bear, and some were pretty serious.

Q. Were any of those injuries what you could correlate to being a trap-like injury?

A. In terms of research trapping or are you talking about recreational trapping?

Q. I think it would be difficult to determine, but you tell me.

A. Definitely, injuries from research trapping from having canines broken on barrel traps, to foot injury, and one foot injury I know of from a snare set. I've certainly seen injuries to cougars

from snare sets.
Q. When you say "snare set," is that a foot snare?
A. Foot snare, yeah.
Q. How many bears have you seen with a foot-snare injury?
A. One.
Q. Where was that bear located?
A. In Yellowstone.
Q. Do you remember when that was?
A. It would have been somewhere during the time that I was working for the Grizzly Bear Study Team.
Q. Okay. And was there anything that indicated to you that it was an injury from a foot snare?
A. By knowing that the bear had been in a foot snare.
Q. Oh, Okay.
A. And was released from a foot snare.
Q. So the injury occurred from the foot snare?
A. Yes.
Q. And there's no way that you could determine that that injury occurred before it was

trapped in the foot snare?
A. There's no way that I could determine that my leukemia preceded the time it was detected. So, you know, asking for that kind of counterfactual is kind of a stretch.
Q. Okay. Do you have any photos documenting that injury?
A. No.
Q. Okay.
A. No.
Q. And was that grizzly bear euthanized?
A. No.
Q. Did it exhibit any struggle when it left your possession or your site?
A. Yes.
Q. What type of struggle did it exhibit?
A. As in lame, limping, difficulty moving, there was evidence of impaired foraging afterwards based on radio monitoring.
Q. Okay. So I'm assuming you radiocollared it, then?
A. Yes.
Q. And how long did that bear live for?
A. I don't recall for how long.
Q. Do you recall how long it was collared

for?
A. No, other than it had a collar with a strap that would weather, and the collar would automatically drop off. And that would be after about three years at the maximum.
Q. Do you recall if that occurred naturally or if the bear was deceased before then?
A. If we lost a collar, you have different ways of treating that analyses because you don't know whether it was because it died, or just dropped the collar, or what the circumstances were.
Q. Okay.
A. Unless you retrieve the collar.
Q. Did you, yourself, retrieve that collar?
A. I don't think I retrieved that collar. I retrieved a lot of other collars.
Q. Was that foot snare -- or "leg-hold snare," I believe it's called, correct?
A. Foot snare.
Q. Foot snare. Was that foot snare put out for research purposes?
A. Yes.
Q. Okay.
A. And it was closely monitored.
Q. How old was that bear at the time, do you

recall?
A. I don't recall other than I think it was an adult.
Q. Was it a male?
A. No.
Q. It was a female?
A. I think, I'm pretty sure it was, yeah.
Q. Have you ever witnessed a grizzly bear with an injury in a foothold trap?
A. No, I haven't.
Q. Okay. Have you ever witnessed a grizzly bear with an injury from a body-gripping trap?
A. No, nor have I witnessed two semis colliding on the highway or an airplane falling out of the sky. So these are, intrinsically, low probability but potentially high-impact incidents, which is a difficult one to assess in terms of probabilities, likelihoods.
And in terms of personal knowledge, even though I haven't had personally observed things, my sphere of personal-lived experience is not infinite.
Q. Okay. How many -- I'm going to rephrase this question. At what point does the bear lose the ability to forage if they lose their claws?
How many claws would they have to lose?

A. How many claws? There's no absolute answer for that. I mean, so much of this is based on probability and likelihood. You know, some likelihoods and probabilities are intrinsically difficult to judge with any precision, especially for that kind of stuff where it's a low incidence but potentially high-impact kind of phenomenon.

It's a classic problem/issue with risk analysis. You know, how do you estimate these sort of probabilities, other than you know by virtue of configuring circumstances that something like that is that going to happen if you have enough of the right configuring circumstances on the land.

Q. I'm going to jump back to that foothold-snare bear. You mentioned that you collared it. Did you monitor that bear after it left the trap, personally observe it?

A. As in watch it walk away?

Q. Well, after it walked away. So let's just say two months later and you went out in the field, were there any instances where you went out in the field and you personally observed it again?

A. I observed it. It was not that often that I came face-to-face with a grizzly bear. There were instances where I could watch them forage, but most of

what I examined were the signs of their feeding activity after they had left.

So back then, they were using VHF, so we did aerial overflights at the 7- to, basically, 14-day intervals. So you would go in and then you would visit these sites, so that would be the nature of the evidence.

As to associating evidence specific to that bear with those kinds of site investigations, I don't recall.

MS. CLERGET: Do you want a lunch break?

MR. SCOLAVINO: Yeah, we can do a lunch break.

THE WITNESS: All right. Sounds good.

(The lunch recess was taken.)

BY MR. SCOLAVINO:

Q. Okay.

A. You were asking about membership in organizations. And I recollected, the problem is my wife signs me up as a couple for these different organizations, but the Northern Plains Resource Council and the Yellowstone River Bend Council, I think it is.

Q. Okay.

A. Yeah, I'm on the books.

Q. Okay. Awesome, thank you for --

A. Recollecting --

Q. -- getting back, yeah.

A. -- this important information.

Q. So I just want to discuss some things that we were chatting about before we took our lunch break. We were talking about growth rate.

I wanted to know what you think the growth rate is because I heard you talk about Cecily's and Rick's percentages. What do you think the growth rate is?

A. The best available information to my mind and looking at weight of evidence, I would say it's closer to zero percent.

Q. So you think it's zero percent.

A. Probably not -- less than 2.3, 2.3 percent for sure; probably closer to zero percent.

Q. Okay.

A. Based on the second derivative of what was happening to growth rates between Rick's estimate, Cecily's estimate, and then factoring in that the RISKMAN projections suggested that 7 percent adult female mortality was sort of the maximum tolerable, and the NCDE population has been that for the last four years that Cecily's updated that estimate. It was 6 percent one year, but a 3-year, 7 percent using

a 6-year moving average.

Q. Okay. Is there any specific data that you are relying on to come to that assumption or conclusion?

A. The data that's available in Cecily's 2016 report, the monitoring report subsequent to that, Rick's 2012 report, and the monitoring reports that he put out.

Q. Do you run your own data off of that, or are you finding uncertainties in their data to base your own conclusions? How do you come to that conclusion?

A. I take the values that they offer, and then I do a very simple projection, for one. In the case of the RISKMAN software, I took the reported vital rates from the 2016 report and input them and ran through different scenarios of how you could treat the uncertainty that she reported. And then based on that, I went through the same calculations she went through. So nothing too terribly dramatic but, basically, working with existing data information.

Q. When you say you think the population growth rate is somewhere below 2.3 percent but closer to zero percent, is that based off of a 95 percent confidence interval?

A. Oh, if I was saying 95 percent confidence interval projecting out the uncertainty based on the previous estimates of growth rate, it could be anywhere from negative, you know, a large negative figure to a very large positive figure.

Q. Okay.

A. But the problem is that there's under-accounting of uncertainty as reported by Cecily. So I would argue that she has no basis for offering an informed perspective on the uncertainty around the estimates she's been putting out there. And there's little basis, in fact, no defensible basis for the current population estimate she's been reporting.

Q. When you say "no basis," could you just elaborate just so I understand?

A. No scientific, no credible scientific standards could be invoked to justify taking a population growth rate that relies on data that are, on average, 15 to 16 years old; haven't been updated for the last 10 years; and projecting it out ad nauseam, pegging it to a 2004 estimate of population size.

Q. Okay.

A. That doesn't even pass muster as speculation.

Q. We also talked about the distribution, and we tangented off to the population in Montana. I wanted to know: How many bears do you think are on the ground in Montana?

A. I don't have a clue. I mean, I don't have an estimate that I could say, "This is how many I think." I think there's bounds. You know, if we look back to when the grizzly bears were listed in '75, the population estimate was anywhere from 450 to 650, and that was a ballpark guess, sort a back-up-the-envelope guess.

The only reliable estimate, I think, is the one Kate Kendall published in 2000-whenever, it was 2006, but based on 2004 data of 765, and there was a pretty significant uncertainty envelope around that estimate. That's the last time, I think, we had any good understanding of how many bears are on the ground in the NCDE for sure.

And then subsequently, Kate did her work based on DNA hair snagging, or hair snagging and DNA, and in the Cabinet-Yaak to come up with an estimate for those populations, which comported with what had been currently estimated by Wayne Kasworm. But that's like maybe 65 all told, including the Cabinets-Yaaks, and including augmentation bears.

There's good reason to believe we have more bears than 765, but I don't think we have any credible basis for saying just exactly how many there are on the ground.

Q. So you think that the population is somewhere close to that 765 number, though?

A. I would say it's more than 765 but less, significantly less than 1,000 in the NCDE.

Q. Okay. And you've talked about, I believe it was, Kate Kendall's data?

A. Yes.

Q. Who is she and where does she work?

A. She worked for the U.S. Geological Survey, the base -- the same agency I worked for before that, but for the National Park Service. She got subsumed for the same reasons I got subsumed in U.S. Geological Survey. I think she might have been hijacked by the National Biological Survey/Service when I was.

She undertook a pretty ambitious program to estimate total population size for grizzly bears in the NCDE. She started with Glacier National Park. It was based on hair snagging that used hair corrals to trap hair, basically snag hair. And then she found that she could be remarkably efficient just using rub trees, picking hair off of rub trees, and then running

it through an analysis to come up with a DNA profile or individual bears. And then she did a mark-recapture analysis to come up with her total estimate of population.

So it was comprehensive and rigorous, which doesn't characterize anything that's been done even in Yellowstone.

Q. Do you know what population estimates Cecily assesses in the NCDE?

A. I think her central tendency estimate, which is sort of the straight line, is, last I saw, 1,165, which is inane.

Q. Okay.

A. It's absurd that you could report a population estimate with that kind of precision. And I'm trying to recall if she even reported what the uncertainty around that estimate might be. She might have, but I didn't notice it. In any case, if you project out the uncertainty envelope, it's absurdly small from how she's dealt with RISKMAN.

Q. Okay.

A. Absurdly, indefensibly small.

Q. So if you think there are fewer bears than what Cecily estimates, would that equate to it being less likely that there are bears out on the landscape?

A. "Out on the landscape," you mean outside occupied habitat?

Q. Just anywhere. If there's fewer bears in the population, there should be fewer bears on the landscape; is that correct?

A. If you look at it in terms of area potentially occupied, occupied may be present, and you have maybe a couple hundred bears more than you had in 2004, then the bears are going to be spread out or at least redistributed.

So you might have more bears in areas where you didn't have them before, fewer bears in other areas where you had more bears before. And I think there's reason to believe that because of some pretty substantial habitat changes in the core of the ecosystem, you've had a redistribution of that several hundred more bears on the landscape more towards the periphery.

Q. But couldn't it, also, couldn't also less bears mean that there's more core habitat that they can occupy?

A. No, not if carrying capacity in the core of the ecosystem has declined. It depends on what you mean by "occupy." As transients or taking up permanent residence? Not necessarily.

are dying at a higher rate than they can be replenished locally. So there's a dependence on dispersal out from Glacier National Park as well as areas just immediately south of Highway 2.

Q. Okay.

A. I mean, the other relevant piece here to this larger picture is that you look at areas where bears are dependent on berries like huckleberry, shepherdia, serviceberry, and you look at how those species, the productivity of those species varies with disturbance on landscape, wildfire.

And there's a fair amount of research that shows where you get peak productivity after a wildfire. And you look at the amount of area in the core of the ecosystem in the Bob Marshall, in particular, but also the Great Bear Wilderness that's been burned since 2004, it's a huge, huge amount.

And you look at -- and there's no doubt that once you go through and burn a landscape, you eliminate the berry-producing shrubs. It takes a little time for the shrubs to come back and then to reach maximum productivity.

And we have not caught up with where we were in 2004 in terms of the productivity in habitat, just based on looking at the acreage burned and the lag to

If you're talking about dispersal of bears, there's this phenomenon of negative density-dependent or inverse density-dependent dispersal. So you can have a redistributed population lesser carrying capacity as a hypothetical, and you can still have accelerated dispersal of bears. It's been documented for black bears. It's also been documented in Alberta in the Scandinavian bear studies.

Q. Is there any data that you're relying on to indicate that their core habitat is not sufficient and they are dispersing now?

A. I don't know that I would use the term "sufficient." We're talking about potential changes in carrying capacity and also looking at source-sink population structure as indicated by estimates of population density that were reported in 2016 by Cecily.

And then you look at the number of bears reported to have died in these different parts of the NCDE relative to the number of bears that were estimated to be there, and this is -- and using different scenarios to account for unreported, unrecorded mortality, it's highly likely.

I would say weight of evidence suggests that there's a source-sink population structure where bears

where you regain productivity. We also lost pretty much all the whitebark pine that was there.

So we've lost a significant amount of food in the core of the ecosystem, which would suggest that we've lost some carrying capacity at the same time that we probably have a sink, source-sink dynamic unfolding laid on top of that.

Another interesting piece of evidence to look at is when bears really started to disperse out onto the plains at an accelerated rate on the East Front. And that correlated pretty well with that increase in frequency of large wildfires in that area, hard on the heels of losing whitebark pine.

So, you know, there's no mystery as to why they would have accelerated their dispersal along these riparian corridors out on the plains, driven by those kinds of core dynamics. Another piece of evidence, too, goes back to the Blackfoot Challenge, which is just on the immediate south of the ecosystem, where there's been a pretty comprehensive coexistence program, a conflict abatement program that's been highly successful.

They had a dramatic, dramatic increase peaked, and then they instituted all of these preventative measures, including carcass removal, fallen trees,

electric fencing. And there was a huge, a big wildfire just to the north in the Scapegoat, just immediately to the north. And despite having all these preventive measures in place, there was this dramatic spike in conflicts the year after that, which would, again, be consistent with the redistribution of bears towards the periphery.

And interestingly enough, in terms of areas on the periphery of the ecosystem, the Blackfoot is one area that one could credit as being a source population area. You look at where we're seeing these may-be-present bears, you can just sort of project a number of them out from the Blackfoot drainage which, again, is consistent with this being a source area, or at least there being enough bears to where there's going to be some dispersing a significant distance on the landscape.

Q. And so you're basing the dispersal on solely the wildfires; is that correct?

A. No.

Q. So what other data are you basing it off of?

A. The dispersal is a derivative of the fact that there are more bears in an ever-larger area reckoned against the fact, the probable fact that

there are not as many bears as is being estimated by Cecily for reasons that I've articulated, and also because of sort of the predictable way that bears disperse on the landscape and the potential drivers behind that, which there's no reason to believe that they wouldn't be afoot in terms of triggering this kind of dispersal.

And the other evidence is that there's bears in a lot of areas were there weren't before. And so what would be driving that? You know, to a certain extent, it's a hypothetical.

But on the other hand, you look at the weight of evidence: What is the most plausible explanation? And what I've just articulated, I think is the most plausible explanation.

The alternative explanations would be what? I don't know, because there's not much credible evidence to support alternative plausible or alternative explanations.

Q. So what evidence is there to support - and when I say "evidence" - what papers, research papers, have been published that demonstrate that dispersal and then lack of food, etc.?

A. Papers that demonstrate that?

Q. Yes.

A. There's a U.S. Forest Service database that compiles acreage burned every year and also perimeters. You can download that data, you can superimpose it on a map. There's data that were collected by Bob Keene, and another guy that I don't remember his name, documenting the demise of whitebark pine.

So there's very compelling evidence of changes in habitat over a substantial area of the ecosystem. And you can look at temporal correlations between those changes and where we see bears showing up and when, and the pace at which they're showing up in terms of ever more peripheral areas, which belie any kind of explanation other than dispersal. And it could be negative or density-independent or inverse density-independent dispersal likely, because that's been a demonstrated phenomenon.

Unfortunately, Cecily has not published any papers addressing that issue directly. Nobody that I know of in that ecosystem has inquired into those dynamics. So what we're left with is a vacuum of information. And you can adopt different competing hypotheses and see which are best supported in weight of the available evidence.

And these hypotheses that there has been no

habitat change, that there's been an increase in the population as per Cecily's estimate, that is indefensible. The weight of evidence does not support that conclusion relative to the scenario that I've just described.

Q. But if no one else has ever done any research on that, how are we supposed to discredit Cecily's when she's the only one that has done that?

A. Because you can look at the available evidence, what she's purported; weigh that evidence, critique it; see whether it passes muster; look at alternative competing hypotheses, which she has not done.

So I would say her work does not pass muster. In fact, she has not published anything -- at best, you can invoke that progress report from 2016 plus the subsequent monitoring reports. You're left with looking at the evidence she presents, the data she presents, looking beneath the veil of what she's presented in the absence of any real critical scrutiny to then try to articulate: What's going on here? What are the plausible competing hypotheses?

This is not unlike the situation with the Forest Service that I described earlier, where they were adopting, tacitly adopting the hypothesis that

clearcutting lodgepole pine benefited bears and that roads had no impact.

So you could say because the Forest Service issued these decisions saying that was the case, that that's the only credible basis for reaching any judgements about were there negative effects arising from clearcutting a lodgepole pine forest and building roads.

But when you marshal available evidence with a critical eye, alternative competing hypotheses, it's pretty clear where the weight of evidence falls out. So this is a scenario not unlike that.

Q. And if you felt so strongly about Cecily's evidence or hypotheses being incorrect, why wouldn't you publish your own paper stating to the alternative?

A. I've got it and I can give it to you. It's a report that marshals the evidence, let's people reach their own conclusions based on the evidence that's reported, much like somebody might reach their own conclusions looking at the evidence that Cecily reported in 2016 and subsequent.

Q. And is that report just your own science? Is that report just solely you as the publisher?

A. It's me as the publisher, but it draws on a compilation of all the reported available

peer-reviewed or other science that bears on trying to reconstruct or construct or come to an understanding of what is likely happening in the NCDE, as opposed to blindly reaching a conclusion that comports with status quo arrangements, which is basically what we're dealing with.

Q. But doesn't Cecily's report do the same: Pull upon peer-reviewed, published articles? And it is actually authored by three individuals, if I'm not mistaken; is that correct?

A. That was by Lori Roberts, Rick Mason, but that does not debar the point I just made.

Q. But going back, earlier you talked about wolf traps and you mentioned that you witnessed one grizzly bear in a foothold snare.

A. Um-hmm [affirmative].

Q. I just want to assure that you have never witnessed a grizzly bear in a recreational wolf trap. Is that correct?

A. That is correct, I have never personally observed that. But it's unlikely that I would have observed it because there hasn't been wolf trapping going on that long.

It's, again, as per what I tried to articulate, the problem, the conundrum of risk analysis is it's

intrinsically a low probability even, but given certain configurations of circumstances, something that's almost certainly going to happen.

Like slippage of the San Andreas fault, we know damn well it's going to happen, that something like that is going to happen. We don't know with what frequency, what magnitude, severity, but we can see with a hundred percent certainty that it will happen because there is evidence supporting the conclusion that you will have cumulative probability over a certain amount of time that it will indeed happen.

Q. Do you know when the last time a wolf was trapped in a recreational wolf trap in Montana?

A. I know of several that were trapped in 2021 in a recreational coyote trap.

Q. But when was the last time one was trapped in a recreational wolf trap?

A. I don't know because they don't -- probably all have not been -- they probably have not all been reported.

Q. When was the last reported instance?

A. Not -- to my knowledge, I don't know.

Q. Okay. Earlier, we talked about denning, and that denning bears, when they denned depended on weather and latitude. Where were you getting --

A. Climate, climate and latitude, also weather are superimposed.

Q. Where are you getting that data from that supports that inference? What reports?

A. Johnson, et al., 2018. And I don't think I have all of them here. Haroldson made reference to that in his paper. Gonzalez-Bernardo, 2020; Fowler --

MR. SCOLAVINO: Just for the record, Dr. Mattson is reading off of his first declaration.

A. -- Fowler, et al., 2019; Delgado, et al., 2018; Bojarski -- Bojarska, 2019. So I think there's some that didn't show up on what I printed out, but there's others.

Q. Earlier, we also -- well, you mentioned "Jamie Jonkel." And my question is: In relation to denning and in relation to climate change, wouldn't Jamie Jonkel be monitoring those changes on the landscape based upon those climate changes?

A. Is that a double negative? Would he not? Is he monitoring that?

Q. Yeah. Is he monitoring that?

A. I don't know if he is.

Q. Do you think he is?

A. I don't know what to think. I haven't talked to Jamie about that in probably -- I haven't

talked to Jamie for years so I don't know what he's doing.

Q. Would you assume if there was a change on the landscape, he would recognize that?

A. I don't know. I mean, I don't know what he's doing, where he's doing it, how close he's paying attention to that kind of stuff. I mean, like all of us, we live experiencing the weather, so I'm assuming he's experiencing weather like we are.

Q. You mentioned the winter bears earlier. How prevalent are winter bears?

A. Percentage? And when you say "winter," what are you defining "winter" as?

Q. Well, you said "winter bears," so you define it for me.

A. I said out during the winter as in December, January, February, into mid March.

So how prevalent? Insofar as the data goes, if you look at Yellowstone data, roughly, 10 percent of the females would be out prior or at the time of November 27th. Roughly, 38 percent of the males would be out prior to March 15th. And that's for Yellowstone.

In the Cabinet-Yaak, 35 percent of all bears would be out still on March 29th based on the data.

These are cumulative probability curves. A lesser percent, 5 percent of all bears would be out in the spring after March 15th.

So there's two different configurations of exposure, and the percentages range, depending on the sex, from 10 to 38 percent, depending on fall to spring, to 35 to 5 percent Cabinet-Yaak. And that's, again, cumulative probability curves for the Cabinet-Yaak. Those data go back to 1983, so they're not very realtime.

For Yellowstone, those data were collected, I think, primarily between 1975 and 2000, which is definitely a retrospective. And even then, they were detecting a trend in terms of male bear exit dates that correlated with spring temperatures.

MR. SCOLAVINO: Just for the record, Dr. Mattson was reading off of his first declaration again.

THE WITNESS: So those, again, are cumulative probability curves, and there's not uncertainty intervals attached to them so it could have been significantly fewer or less in terms of realtime.

Q. (By Mr. Scolavino) okay.

A. It's a sample of total entry and exit

dates for the population.

Q. And you're basing it off of just that, correct, just those studies? Is there anything else that you're basing it off of, bears being out in those winter months?

A. No, there's more. There have been news reports of bears being out that I've come across that seem credible, reports on National Park Service website for Yellowstone Park about bears being out, active in the winter. I've seen a bear out after Christmas in Yellowstone feeding on a carcass on the northern range. So there's personal observations, news reports that are credible.

Q. And when did you witness that grizzly bear out in Yellowstone?

A. I saw it within the last, probably, eight years.

Q. Those news articles, are those referenced in your declaration?

A. I think a handful of them are. Again, I don't think I printed out all the pages here, but there was one here that's Heinz, dated December 8th, 2022, and there were a couple of others. I don't think that they printed out on the copy that I have. I have a Smith, et al., 2023; Kearse, 2019; Sherer,

2021; Heinz, 2022. And that's not based on a comprehensive scrutiny of news articles.

Q. So just for clarification, are there any articles that you are referencing that are not included in that declaration?

A. In terms of providing evidence that we have bears out and at risk in the fall and the spring during the prospective season of trapping for wolves in the bears may-be-present zone, these are the two primary ones I relied on.

Q. Okay. What do you know about Montana's estimated occupied range of grizzly bear map?

A. I have rudimentary knowledge of the methods behind it, the current as well as the past.

Q. And what rudimentary knowledge do you have about the methods?

A. Currently, they're taking 3 x 3 kilometer cells, and registering against those cells any credible evidence of grizzly bears being present during the previous 15 years. So they're using, in the NCDE, a 15-year moving average and, in the Cabinet-Yaak, a moving 20-year average, accumulating those observations that include conflicts, reliable sightings, tracks, scats, GPS locations, VHF locations, and scoring those cells according to

whether there has been presence within those 3 x 3 kilometer cells, which are designed to approximate the daily foraging radius of grizzly bears in the Yellowstone, just north of the Continental Divide and CYE.

So they're using anywhere from a 12- to 15-kilometer radius for a daily foraging radius use, which was the rationale with coming up with that 3 x 3 kilometers square area.

As to why they chose a daily foraging radius, I don't know. That seems a little arbitrary to me. When they're trying to establish occupancy, it's not on a daily basis, it's on an annual basis.

So the way it was, so just in terms of the cell size aspects of it, previously in the NCDE, they were using a 7 x 7 kilometer square area, which correlates roughly with the size of an adult female home range, annual range, which seems more logical in terms of establishing occupancy, residency, however you want to define that.

So I'm puzzled by the logic to shrink the cell size. And regardless of the cell size, there was use of this technique that's called "ordinary kriging," which is a way of interpolating based on the semivariogram, the basically spatial autocorrelation

of occupancy of the different cells to create sort of a somewhat-smooth surface.

So you're going to kind of get a finer grain distribution, but also, obviously, a more contracted distribution using current methods. So the ordinary kriging was used with the 7 x 7 kilometer cell size before that. So that's occupied range.

As to the justification for saying that when you look at a cell and the adjacent cells, and score that compilation of cells between zero and nine so you've got eight plus one, and saying that the cutoff is one, greater than one versus less than one, I'm not sure of the logic behind that.

And I'm not sure of the logic behind the definition of "occupancy" as opposed to "may be present," especially when you're looking at a lot of the may-be-present locations well beyond any distance that most bears would travel sprinting, during a given year, back and forth.

So it begs the question of: What defines "occupancy"? I mean, it's hard to give credit to the idea that you've got bears that are 60 to 90 miles away making an excursion out, and then racing back to what's been defined in a somewhat arbitrary way as "occupied."

I mean, it would suggest more likely that if you're looking at where -- how do you define "occupy"? As in "being present"? As in "making a living year-round"?

I mean, how many bears do that in a 3 x 3 kilometer cell? Not any that I know of, unless they live one day and then die.

Q. Do you know who formulated the 3 x 3 kilometer method and the kriging method?

A. Dan Bjornlie. He's with Wyoming Game and Fish with the Interagency Grizzly Bear Study Team.

Q. Do you agree with the Bjornlie method?

A. "Agree"? It's a method. I'm mystified by a lot of the decisions that were made in terms of delineations and coming up with the size of the cell for reckoning whether bears are present or not; occupy, you know, whether it's occupied or not.

He did say that it was probably a conservative estimate of occupancy. But, again, that still begs the question of the definition of "occupancy" and sort of the justification for that definition.

So do I agree? I'm mystified. I find some of the distinctions, the definitions, delineations not particularly defensible. Again, I would have thought that a larger cell size would make more sense and that

a more liberal definition of "occupancy" would make more sense.

But it gets back to the mysteries of the lifecycle of the grizzly bear. You know, what does "occupancy" mean to them and what does "occupancy" mean in terms of the time in residence, the time during which they would exposed and vulnerable to some sort of hazard?

Q. So what does "occupancy" mean to you?

A. "Occupancy" means that a bear was there, and if you're looking at a time-specific hazard or risk, exposed to that risk, or that benefit if you're looking at whatever that benefit might be there.

So if you're being very generous, I would say "occupied" is everyplace where we've documented, reliably documented, that grizzly bears were present during some reasonable backcast time period, and most places in between, because bears don't get from Point A to Point B by sprouting wings and flying. They are walking on their feet and so they're transversing that ground. And I would argue that that's tantamount to occupancy.

Q. And how long would a bear have to stay there for it to be coined as "occupied habitat"? Just one observation?

A. By my definition, it would be if a bear was observed there, it occupied that space at that point in time. I mean, if you're talking about "occupied" as some sort of demographic process like we have demonstrated that a bear reproduced, survived for some credible period of time, that an adult female reproduced and survived long enough to replace herself, that would be one definition of "occupancy" that would be more rounded in demography as opposed to just simple use of space.

If we use that as a definition, we would have quite a small area of occupied habitat. If you were going to adopt the definition of needing to provide enough resources to be safe enough to where a female could live there and reproduce and replace herself so you had some kind of sustainable situation, that would be a pretty small area.

Q. So if there was a verified observation and then there was no other verified observation for another three years, should it still be considered occupied at that point?

A. It would depend on the likelihood of detection, and that would depend on who's out looking for it, on what basis, with what credibility, and what skill.

So it's not just about a bear being present, it's about the likelihood of being detected. And that's about people doing what they do or don't do. Bears can be remarkably cryptic. I mean, I've discovered that in tracking bears around Yellowstone where bears were present by our radiotelemetry well before there was any knowledge of bears on the ground amongst locals or at least common knowledge.

So you can have evidence of bears that are not very visible, not leaving much sign especially for people that aren't skilled in interpreting bear sign or even curious enough to bring it to the attention of somebody who is.

The other confounding factor is, and it's there in print in the monitoring reports that Cecily puts out, that trapping and collaring is focused within the Demographic Monitoring Area. So if there's a bias towards putting radiocollars on bears toward the core of the ecosystem and a bias against collaring bears that are outside on the periphery, so you're unlikely to be detecting bear occupancy/bear habitat use beyond the Demographic Monitoring Area just because there's a bias towards putting radiocollars on bears towards the core.

Q. But isn't it possible that some of those bears that are collared in the Demographic Monitoring Area can then move outside of it --

A. For sure.

Q. -- at least the outer confines?

A. For sure. And they have, to my knowledge.

Q. So is there still a bias at that point?

A. Yes, absolutely, because it's not just a matter of whether preexisting bears that have been collared in a given location, given their likely movements, have moved outside of the Demographic Monitoring Area. It's whether you are tracking that front proportionally to get a similar density of sampling based on radiomarking, radiocollaring.

Absent that, you can't say whether a bear has established or not established a home range or is in some sort of multiyear residency within a given area. So you're chronically biasing your sample towards areas that are already occupied, as opposed to being recently occupied, by grizzly bears.

Q. When you're referencing the term "bias," are you also taking into account other observations from the public?

A. Which gets back to the point I was making, like you've got a radiocollared bear, you're going to be collecting data for as long as that collar is on.

So given that you have a collared bear, the probability of getting some documentation of space-and-time use is high.

If you've got a bear out there free-ranging, uncollared, as to what kind of documentation you have depends, in a vary vagarious way, on how many people are out there likely to detect that bear, their skill at detecting bears and interpreting bear sign.

So the uncertainties compound comparatively when you're looking at data other than what you collect from radiocollars. And conflicts are not a good reckoning, either, because that depends on bears engaging in certain types of behaviors that lead them to be recognized, acknowledged, documented on the part of the people that are on the receiving end of the conflict.

Q. So if a bystander that has limited knowledge of grizzly bears but brings a photo to someone that may have knowledge, would you consider that a verified report at that point?

A. More likely than not if it was credibly timestamped, geolocated, and if the person that looked at it was skilled.

Q. When you say "skilled," are you --

A. Somebody like Jamie Jonkel or Ken or Eric

Wyman.
Q. Earlier, we also just talked about wolf kills and bears usurping wolf kills. You mentioned that they also usurp lion kills.
A. Correct.
Q. What would be different about a wolf kill versus a lion kill and a bear usurping that?
A. A lion kill would be more cryptic. They tend to bury/sequester their kills so that they're less detected. So you have to have a similar kind of phenomenon where bears are tracking cougars. So it's probably less likely that a bear would find a cougar kill than they would find a wolf kill.
That's the most immediate difference that comes to mind. But, otherwise, it's meat on the ground and the hard work has been done by another animal. And so if you could appropriate the food, bears are going to do it.
Q. Do they usurp any other predator kills? I'm just thinking like coyotes, a pack of coyotes, or anything like that.
A. The problem is coyotes kill smaller animals. They are rarely going to kill a bigger animal. The problem with small prey is that they're consumed in a pretty short period of time by the

animal that killed it, and/or scavenged by other animals that might find that prey item before a grizzly bear would find them.
Q. Okay.
A. So when we did our work with exploitation of carrion in Yellowstone Park, we found a really strong correlation between size of the carcass and probability that a grizzly bear would have used it.
So by the time you get up to the size of an elk, there's a high probability that a grizzly bear will find that carcass regardless of whether they've been closely tracking a wolf. Now, the advantage of following wolves by first principles is that even when a wolf is killing a deer, which is a smaller carcass, if the bear is there monitoring the wolf behavior, they'll be able to exploit that carcass.
Q. When these bears are following wolves, are they only following them within their home range?
A. Within the wolves' home range or the bears' home range?
Q. The bears' home range. Or do they just continuously follow them around?
A. I don't know. I haven't seen any results of radio-tracking to say that they do or they don't. But what I know about especially home ranges of adult

males, they can be remarkably fluid and highly dynamic. It depends on food resources, it depends on access to mates. So it's not like it's a static, fixed area even, you know, absent wolves.
Q. Okay.
A. So there's good reason to think that their home ranges will be very adaptive, more so than female home ranges.
Q. Okay. Are you aware of Montana's estimated occupied range of grizzly bears map for 2022?
A. Yes, I am. Actually, I'm aware of what the Fish and Wildlife Service produced in their species list map, which is the may-be-present map.
Q. That also has our estimated occupied range map on there?
A. Yes.
Q. Okay. Do you agree with that map for 2022?
A. Agree with what aspect of it? I mean, it was a map, it was a piece of paper. There were polygons on it so I could register the information that was there.
In terms of do I agree with the methods? Do I agree with the definitions? No, I don't.

Q. So even though --
A. So for the reasons that I just articulated, because I think that 3 x 3 kilometer cells are hard to justify in terms of their size. I think the delineation after the kriging of where the boundary was between occupied and unoccupied was somewhat arbitrary, that there's no coherence between the definition of "occupied" within the boundaries where you have denser data versus watersheds where you have less data but lower probabilities of detecting bears.
Just by, you know, the Oxford English Dictionary, "occupancy" would suggest that those areas are occupied every bit as much as the areas that's within, quote-unquote, occupied, the areas that are within the watersheds delineated to accommodate the presence of sign may be present.
Q. Do you know what kilometer-by-kilometer grid was used for 2022?
A. I suspect -- I don't know for sure, but 2022 was when Cecily reported -- it would have been 2022 that she, I think, first applied the 3 x 3 kilometer cell. Before that, it was 7 x 7 kilometer, based on what I remember of the monitoring reports.
Q. Is there anything that you would change,

particularly, about that method?
A. Well, first of all, I'd use a 7 x 7 kilometer cell, grid cell. And I might try universal kriging as opposed to standard or simple or normal kriging, whatever the distinctions are, because it allows for sort of a decay in the probability of including cells as you go further out from the focal cell of interest.
I would seriously consider other cut points for what was occupied or not occupied, and I would make allowance for the logical premise that if you have a bear here and the nearest source is there, that there must be something going on to connect that area with this area, as opposed to the bears sprouting wings.
I would also reckon my definition of "occupancy" against the considerations at stake. So are we looking at occupancy as a way of reckoning exposure to risk, exposure to hazards? Then I would say occupancy is inclusive of all of these peripheral locations and much of the area in between those peripheral documented locations and where we have the denser registration of bears being present.
Q. Okay. You just mentioned that the Feds had a species list map; is that correct?
A. Right.

Q. And the species list map is what was previously coined as the "may-be-present map," correct?
A. Correct.
Q. Is there a reason that the Federal Government has both of those boundaries on a map?
A. Because they were faced with a conundrum of what do we do with documented instances of bears being present, and what do we do about measures to protect those bears under the ESA?
So it was really a way of stabilizing expectations for management agencies regarding where there would need to be Section 7 consultation.
Q. So just for clarification, the may-be-present map or species list map is used for Section 7 consultation purposes?
A. To my understanding, right.
Q. Is it used for anything else?
A. That is the primary rationale that I saw written on the legend of the map posted on the Fish and Wildlife Service website.
Q. And if the service didn't agree with their estimated occupied range, why would they list it on their website?
A. I don't know why they would, except out of

convenience, political expediency, I mean, because they rely on the states as cooperating partners and they don't want to violate the State's prerogatives or expectations. It's primarily for political reasons, would be my guess.
Q. Okay. Are you aware of Montana's grizzly bear assessment?
A. Grizzly bear assessment?
Q. So the assessment that is used to determine the floating start date.
A. The floating start date, as I understand it, is based on when radiocollared bears have been documented to enter their dens. And that would apply to occupied, the so-called "occupied area."
Q. Okay.
A. And I'm not clear from what I read as to whether there's a certain percent cutoff or whether it's after a hundred percent of the bears have been documented to be in their dens or whether there's something less than that, other than to my understanding, the commission would deliberate over that choice in light of updated information. That's my understanding.
Q. Is there anything else that goes into that floating start date or determining when that should

begin?
A. It sounds pretty fuzzy to me as in other considerations/deliberations, but not that I saw that was out there in black-and-white print described.
MS. CLERGET: Do you want to take five minutes now?
MR. SCOLAVINO: Yes. We'll take another five minutes.
THE WITNESS: Sounds like a plan to me.
(A brief recess was taken.)
MR. SCOLAVINO: We're back on the record and it is 2:13.
BY MR. SCOLAVINO:
Q. Just a few things, Dr. Mattson. So you mentioned a report earlier that you said you had.
A. I do.
Q. What is the name of that report?
A. Do you want it? I've got all the papers that I've referenced in here -- (gesturing.)
Q. I don't need it right now but I will want it later, but if you have to look at it to recall.
A. Well, given my memory, I think I will look at it. It is called:
"Heart of the Grizzly Bear Nation, An Evaluation of the Status of Northern Continental

Divide Grizzly Bears."
Q. Do you mind taking that out just so she mark it as exhibit?
A. Sure.
MR. SCOLAVINO: We'll mark that, just for the record, as Exhibit 20.
(Document marked Deposition Exhibit No. 20 for identification.)
THE WITNESS: So I produced that in 2019 based on data inclusive of 2018.
BY MR. SCOLAVINO:
Q. Based on data inclusive of?
A. 2018.
Q. 2018, okay. And was that report included in your declaration?
A. No, I'm pretty sure not.
Q. Was there any reason why you didn't include that in there?
A. Because I wasn't addressing issues related to demography, as such, of the NCDE population. I was just addressing exposure of bears, potential exposure of bears to traps and the spatial extent of that exposure.
Q. So what, exactly, is that report based upon, then, or what does it discuss?

A. So the Table of Contents include: Deep History, Diets, Habitat Dynamics, Habitat Monitoring, Population Dynamics, Spatial Demography, Fragmentation, The Future, and then a summary of the critique. And it's 63 pages long.
Q. Is that report for the NCDE?
A. Yes, strictly for the NCDE.
Q. Okay. You said that the data was inclusive of data from 2018. Where did that data come from?
A. So it was all of the monitoring reports dating back to when Rick Mace started producing them up through the 2019 monitoring report that reported 2018 data that Cecily put out, as well as the 2016 report that she co-authored with Rick and Lori, and then Kate's publication, Rick's 2012 publication on demography, but also, basically, all the peer-reviewed literature and other relevant data that would be considered reliable and available pertaining to the NCDE.
Q. And all of those reports are referenced in that report itself?
A. Yeah, there's a comprehensive list of references and citations in here.
Q. Okay.

A. Actually, it's longer than that. It's pages 57 through, actually, 80 are all references.
Q. Okay. And do you have any experience where the Federal Government has differed from the states pertaining to grizzly bears?
A. "Federal Government" meaning the grizzly bear recovery coordinators versus people in the department versus commissioners? And is that regarding matters of policy? Is it regarding private conversations or private exchanges or all public exchanges?
Q. So let's start with like the U.S. Fish and Wildlife Service, and matters pertaining to the commission and Montana Fish, Wildlife & Parks. Has there ever been an incident, in your experience, that you noticed the Feds differ from the states?
A. There was a lot of contentious conversation behind the scenes between people from the Fish and Wildlife Service, people from the Forest Service, people from the State regarding management, regarding monitoring, regarding methods. It was so commonplace that I would be hard-pressed to describe all of those incidents, or even sort of the focus, other than in generic terms that I just described.
But the general pattern was to -- and only

rarely would you see countervailing narratives in the media based on interviews of differing perspectives, opinions, demands between the Federal and the State Government.
But, usually, all that was worked out behind the scenes for - I think I could say this without prejudice and fairly accurately - for political reasons, to create a united front against sort of consolidating the basis for defending policy positions against litigation. And that was the primary purpose as near as I could tell.
Q. I believe I mentioned in the question "differences," and then you've referenced "differences" in your answer; is that correct?
A. Yes.
Q. Was there any time that the Federal Government deferred to the State for expertise or recommendations?
A. There probably were. I couldn't say, specifically, which instances but, yeah. I mean, it was an exchange, but oftentimes contentious. And sometimes the Fish and Wildlife Service, their perspective prevailed, and sometimes the State's position prevailed, and it was often for political reasons.

Q. Did any of those situations occur when you were working as a Federal Government employee?
A. Yes.
Q. Okay.
A. Yes. I mean, that I was privy to conversations going on behind closed doors.
Q. Where the Federal Government was deferring to the State for expertise?
A. Where there were major disagreements. And there were occasions when the State deferred to the Fish and Wildlife Service, and occasions when Fish and Wildlife Service deferred to the states, Forest Service deferred to the states, the Fish and Wildlife Service deferred to the Forest Service. So there were a lot of deferments, as well assertions, on everybody's part.
Q. Okay. Those all occurred while you were working as a federal employee during the '80s to '90s, right?
A. Correct, although there was conversations that took place in public that I was privy to by virtue of video, basically, video recordings at the Interagency Grizzly Bear Committee meetings. Now, the trend that I've seen over time is that those more public contentious discussions or differences have

been increasingly sequestered behind closed doors.
So you are less and less privy as a member of the public to what's going on, whereas there was a time when, actually, these IGBC meetings were a forum where you could hear different perspectives being aired and some of that give-and-take.
Q. Okay. Do you think bears are more likely to be detected in open environments like those in central Montana?
A. Well, if you're talking about central Montana, you're talking about the riparian corridors in central Montana, definitely, because that's where all the people are concentrated and that's where the bears tend to concentrate.
If you're talking about south central Montana more towards the Sapphires, Long Johns [verbatim], the bears tend to be distributing themselves in the higher elevations, the less-roaded areas. So I would just, by first principles, think that they're much less likely to be detected to the south and to the southwest compared to when you're getting out onto the plains.
Q. Yeah, okay. My question was in reference to the plains.
A. Okay.

Q. So just to clarify, if there was a grizzly bear out in the plains, it would be more likely to detect that bear?
A. Yes.
Q. Is it likely that there are more bears or higher densities of bears in the estimated occupied range versus the may-be-present map?
A. Odds are that there is a higher density of bears within the occupied delineation.
Q. Okay.
A. If you were to average it, yeah.
Q. And in your first declaration, so I'm going to actually jump back to our previous discussion which was the may-be-present map, in your first declaration, you have a figure, Figure 1 in there. And if you have to refer to your declaration --
A. I think, yeah, I can visualize it.
Q. It's a map. Can you describe that map to me?
A. It has a superimposition of the occupied distribution as per the species list map from the U.S. Fish and Wildlife Service, plus all of the 12-digit watersheds and adjacent watersheds that correlate with the documentation of grizzly bear sign of whatever sort, whether it's by radiotelemetry or conflicts, on

down the laundry list of evidence that's used, plus the area that the 2023 trapping regulations apply, which was the brownish-colored area.
Q. Can you tell me who made that map?
A. The map of the occupied range?
Q. That figure, I'm sorry, Figure 1. Who made Figure 1?
A. I did.
Q. Why did you make that map?
A. The logic goes like this: That if you're trying to get a handle on risk, risk consists of exposure to hazards, and then you have the acuity of hazards. So exposure is logically reckoned in space and time, so you've got these two different dimensions.
So that was an attempt to try to reckon with or visualize, represent the spatial extent of exposure or potential exposure of grizzly bears to the risk posed by trapping for wolves. And then you put that together with the available data regarding den entry/exit dates for relevant ecosystems, and that gives you some sense of the temporal exposure.
And I double-checked that, that map against the distribution of locations of trapped wolves from the harvest reports for wolves. And there's a substantial

overlap, although I didn't include an estimate of that overlap between where wolves were trapped and where bears, by my reckoning, may be present.

Q. Okay.

A. Which would substantiate the idea that that's a pretty good reckoning of exposure of bears to the hazards associated with trapping.

Q. You mentioned denning entry dates and exit dates. How are those accounted for on that map?

A. They are not accounted for on that map.

Q. Okay. I may have misunderstood. That's my fault.

A. No, that's just a spatial reckoning of exposure. And then you have to sort of logically interpolate what the temporal exposure might be by looking at the bracketing data for the GYE and Cabinet-Yaak Ecosystems for den entry/den exit.

Q. When did you make Figure 1?

A. When I was putting together the declaration, which was during the week or so that I worked on it prior to it being submitted, which I don't know even know what the date is on that. So that -- when was that submitted? It doesn't say.

But anyway, whenever, during the week or so before when it was submitted.

MR. SCOLAVINO: Okay. Can we mark that as Exhibit 21.

(Document marked Deposition Exhibit No. 21 for identification.)

THE WITNESS: So that one's the complete copy.

BY MR. SCOLAVINO:

Q. Dr. Mattson, so on there, there's a mention of "high risk" and "intermediate risk."

A. Right.

Q. Can you just describe those areas to me again?

A. So high risk, I'm just adopting the definition of "occupied habitat" versus "may be present," so characterizing areas where you have some reckoning as it being occupied by the U.S. Fish and Wildlife Service definition as being high risk/intermediate risk because it's less certain how many bears might be there, what the level of exposure might be compared to the high-risk area.

Q. So I just want to make sure I'm understanding it, but the high risk, darker-shaded red is the estimated occupied range, while the intermediate risk, which is the red color --

A. Is may be present.

Q. -- is the may be present.

A. Correct, yeah.

Q. Okay. When you say "high risk," what do you mean by that?

A. That it's comparatively higher risk than areas that are intermediate risk. I mean, all these risks are subjective because there's nobody that can attach a probability to it because the data aren't there to do it.

To come up with any reckoning of probability, you need to have a sample size to get some kind of reliable estimate of a hundred. So the best you can do is bracket the risk exposure in sort of broad categorical terms like that.

Q. So you couldn't assign a percentage to either risk?

A. No, no.

Q. Okay.

A. Other than, as I said before, it's the conundrum of risk analysis. You have exposure and the probability given a certain amount of exposure, combined with the magnitude of the consequence, to come up with risk. And so that's really probably more of a reckoning of exposure than anything else because there's probably less information in terms of what's

going on with bears in the may-be-present area compared to the occupied area.

So, for example, trying to estimate den entry and exit dates in the may-be-present area, there are many, many fewer proportionately, I would argue, almost certainly fewer radiomarked bears as a portion of the total bears out there compared to in the core.

So you're going to -- or the occupied, what's called "occupied," so you're going to be overassessing temporal risk in the high-risk area sort of paradoxically as opposed to in the intermediate risk area because you have fewer reliable data telling you what's going on with bears there.

Q. You mentioned "exposures." So if I am understanding you correct, there's a high risk of exposure in that area, correct?

A. By that crude reckoning, higher risk, yeah, as opposed to lesser risk in the peripheral area, but that's just a way of bracketing and sort of categorizing the information that is there in the distribution map relative to the area covered by the trapping regulations.

So at some level, it's just adopting the definitions that the Fish and Wildlife Service adopted, without me ascribing some absolute

probability because I could have gone into more detail about the undersampling of bears in the may-be-present area in terms of what their temporal exposure might be.

Q. Okay.

A. Or even their absolute numbers.

Q. We discussed a little bit earlier Figure 2 or, actually, you mentioned it. And that was Haroldson, et al., and Kasworm, et al.

A. Um-hmm [affirmative].

Q. So can you just tell me about those two figures or those two charts in Figure 2?

A. They're extracted directly from what is presented in the first case from the Haroldson, et al., publication. They presented cumulative bears in dens and out of dens, differentiating males from females, which I did in my rendering of the data that explicitly came from that paper.

In the case of the Kasworm paper, I transformed the data that he presented as a bar graph by week of dates of entry, dates of exit. So you still had that cumulative percentage of bears that had been radiomarked that were in dens or out of dens.

So the important thing to recognize with both of those figures is that applies only to data from

radiomarked bears and that percentage as a percent of the population is adopting, on the face of it, estimates of population size, typically, around 10 percent of the total independent bears, which are the ones that are monitored to determine dates of entry and dates of exit.

And so what is not represented there is the statistical uncertainty that arises from sampling, just the problem of sampling variability. You can go out and you can radiomark the same number of bears over and over and over and get a certain range of results.

And those bounds are not shown there, so in addition to just those deterministic estimates of percentage out/percentage in for periods of time that go back, well, back to '83, inclusive, for Cabinet-Yaak and that were dated as well for Haroldson, et al., I think they first -- we first started collecting den-entry dates in 1975, and that is up through 2000, I think, that his data goes, Mark's.

So the bounds of it, certainly, are going to be plus or minus 9 percent - 10 percent, probably, just as a ballpark estimate.

Q. Okay.

A. And that's part of the problem, too, with estimating den entry dates from a radiomarked sample in the NCDE. Reaching conclusions about whether all bears are in their dens or not is that on average, the number of bears that have been marked in the NCDE, independent bears, is most recently about 70 bears that were monitored during a given year, as high as 90 bears when Rick was still doing his work somewhere in the '80s.

And you look at just the variability uncertainty attributable to sampling error, you can say plus or minus 7 to 9 percent. So you can say that 10 percent of the bears, 10 percent of your collared bears were in their dens, but the uncertainty would suggest it could be anywhere from, you know, there could be as many as 20 percent that were still out just because you're not tracking all the bears.

And the other thing, as I was describing, is if you're undersampling bears with collars outside of occupied range or the Demographic Monitoring Area, then you're going to have even -- your data is going to be even less reliable for those bears that are in that peripheral area. You'll even know less about them.

Q. Okay. When does the trapping season begin

on these charts, or "bar graphs," I should say? Is that correct?

A. You could call them "cumulative distribution curves."

Q. Okay. When does the trapping season begin and end on these curves?

A. Trapping season in terms of when people are out trapping bears and putting radiocollars on them?

Q. My apologies, wolf trapping.

A. Yeah, the wolf trapping season --

Q. Yes.

A. -- yeah, that's bracketed by that trapping season, that's November 27th through March 15th, is what I've delineated.

Q. And so these two curves --

A. I think that's right. Julian date, 3/25, which would be -- yeah, what do I say here -- I should have put calendar dates because I'm not even sure what Julian dates convert to. I should have put that down there.

I think, as I recall, so the deal, too, is that most of the bears that are monitored for den entry and den exit were monitored during -- or were collared during previous years. Most of the collars stay on

about three years.
Q. Okay.
A. So you have a cumulative sample of trapped bears.
Q. So in the figure, there's a sentence that says:
"The period during which wolves and fur-bearers can be trapped is delimited by solid horizontal lines in both graphs."
A. Right.
Q. "In most areas from the first Monday after Thanksgiving until March 15th."
A. Right. So that would be November 27th, yeah.
Q. So do these curves or graphs account for the floating start date?
A. No, they don't.
Q. Okay. So the percentage could be lower, correct?
A. It could be lower, yeah; if you were to attenuate or abbreviate the trapping season, yeah. This would be more relevant to bears outside of what's delineated as occupied habitat.
Q. Okay. These also don't account for any emergency closure that the commission may institute,

correct?
A. No, it doesn't.
Q. And you touched upon the two studies, Haroldson, et al., and Kasworm, et al. Do you mind telling me about the Haroldson, et al., study and what years that data encompasses?
A. Well, I think -- so it was published in 2002. I know that data were collected on den entry dates - well, actually it would have been '75 because that's when the first collars were put out - probably beginning '76, '76 through, I'm assuming, at least 2000. I can't remember, I don't remember the exact end date for Mark's data.
But as I said earlier, I think the sample sizes were, the total number of den entry dates, 120-plus den exit dates were comparable to that, which is a small proportion of the total times that all the bears in the population were entering and exiting dens, so there's a -- you know, that's a small sample size, really. So you have to wonder about the uncertainty around any of these estimates.
But as I said, too, what Mark found was that there was a trend towards males exiting dens earlier that correlated with March temperatures, I think it was. So he was already picking up a signal that could

be attributable to changes in climate and weather.
So then I go back to these studies that I referenced earlier that more conclusively document the effect of change of climate, you know, changes in climate with latitude change of the climate over time on den entry dates and exit dates.
And there is absolutely no doubt, you could read the IPCC reports, that we are in a period of ever warmer climates. So you can look at the data from NOAA for our region, and the weather has been warming since, especially, the 1980s. So again, these are a snapshot of what was going on in the past when we had a colder climate compared to what we have now.
Insofar as the Kasworm study goes, because they have such a small sample size, he had to cast back to when they first started gathering data on den entry/den exit dates. I think that would have been 1989 up through whenever, 2020, probably.
So that, again, is fairly stale-dated information relative to what's been going on with climate change that's conclusively.
Q. In those studies, those were, if I'm not mistaken, you mentioned earlier, those were only radiocollared bears, correct?
A. Correct.

Q. And they didn't use any other sort of system to verify whether those bears were out. It was only via VHF radio transmission.
A. Or GPS.
Q. Or GPS.
A. Yes.
Q. Okay.
A. And they had some visual observations of bears that might have been active, loafing outside of the dens. There were aerial observations during aerial overflights, which was the way you could gather VHF telemetry locations.
Q. Okay.
A. Likewise, den exits, you could have visual observations of bears loafing outside of dens.
Q. So you've mentioned that there is some uncertainty in regards to these figures, correct?
A. Yes. In terms of making inferences to the population from the sample, correct.
Q. Okay.
A. So it really begs the question, then: What do you want to do with that uncertainty when you're dealing with an endangered and threatened species? Do you want to employ the precautionary principle which is where you want to minimize what's

called "Type 2 error" as opposed to "Type 1 error"?
So would you rather conclude that more bears are out when your data suggests there are fewer, or that there's fewer bears out when your data suggests there are more?
And so it's, I think, pretty well-accepted that the precautionary principle applies to rare and endangered species under the ESA. So if there's doubt as to which way to deal with uncertainty, it's to avoid making a conclusion that's likely to lead to harm to the species, rather than the opposite, assuming all is well when it isn't all well.
Q. In your opinion, what would be a scientifically sound sample size?
A. It's not just sample size, it's bias. So it's not just the number of bears you marked, it's the distribution of those bears, whether they're random with respect to the population. And it's clear that there's not a uniform distribution of bear captures in the NCDE. And, certainly, there's an undersampling of bears on the periphery.
So I think I would look at not only sample size, but reduction in bias, so paying more attention to, in fact, getting a well-distributed sample of radiocollared bears that is inclusive of bears outside

the DMA. So it changed the priority from strictly trapping bears inside the Demographic Monitoring Area to trapping bears wherever they may occur. So that would be one approach I would take.
And then be very clear, very clear on how you're dealing with uncertainty arising from bias, sample size, and justifying how you're dealing with uncertainty, uncertainty in terms of exposure risk and the precautionary principle. So I think all of those tasks need to be attended to.
In terms of what's an adequate sample size? If you've attended to all those things, you probably don't need to sample the bears. I mean, the thing that you could do is just not expose bears to hazards, known hazards, probable hazards. That way, it's less incumbent upon you to have these kinds of precise data, accurate data, to judge risk.
So you can either deal with the hazards, or you can deal with the data and put an ever more burden on the data collection and the data collectors, so I think that's sort of a two-pronged approach.
Q. And I assume you would say the same thing for these two research papers, for Haroldson and Kasworm?
A. The same thing as in --

Q. Well, because these two studies go over den entry and den exit dates, correct?
A. Correct, based on a fairly small sample cumulatively of bears in the ecosystem over time so there's no explicit representation of uncertainty, although there's sampling of uncertainty or bias, for that matter. And they're both there, but there was no reckoning of how that bias or that sampling uncertainty played out.
So what I did is just took the cumulative curves, cumulative distribution probability curves, without trying to account for all of that uncertainty. So whatever those figures are that I put on these figures would be much larger than this, than the 35 percent, 5 percent, 10 percent, 38 percent.
Q. But they could be lower, though?
A. Which brings me back to: How do you deal with uncertainty relative to the precautionary principle?
And so it's equally likely they could be much higher. So are you willing to just assume all is well in the absence of dispositive information, or are you going to be precautionary on how you approach managing risk for bears?
Q. So I'm going to ask a question. So it

could be lower and it could be higher, correct?
A. It could be lower, it could be higher. That's the nature of sampling uncertainty. But on the other hand, what I can say with greater certainty is that there's a bias towards collaring bears towards the core of the NCDE.
So there's less information about what's going on with bears and den entry/den exit dates outside of that so-called "occupied" -- not just occupied, but Demographic Monitoring Area, which is a subset of the occupied range as defined by the Fish and Wildlife Service.
Q. Do you know if these bears that were trapped and collared or studied here were only within the DMA as well?
A. This goes back to even before the DMA was delineated, at least in GYE, so there was no DMA. The distribution is expanded in the GYE. So by definition, all of these bears were trapped within the area that we now call the "DMA."
The problem is that the distribution of bears in GYE as well as NCDE has been highly dynamic, and it begs the question, "What's driving those dynamics?" which gets me back to putative cause and effect.
Q. So I guess what I'm trying to get at is:

You're saying that the sample size in the NCDE, there's bias or there's uncertainty to it.
A. And bias.
Q. Both. But that would also be applicable here because it's the same circumstances. They're in the DMA, these here. They're only radiocollared bears. Is that correct?
A. In the GYE, the DMA was not even relevant because we didn't have bears. We hadn't defined a DMA and we had bears almost wholly confined in terms of distribution inside the area that eventually became the DMA. So there wasn't the opportunity to collar bears outside the DMA back then.
So there was not going to be bias introduced by not collaring bears outside the DMA because the DMA didn't exist and no bears existed outside the DMA, by all indications. So it's a moot point in terms of the bias aspect of this. The sampling error would apply in both instances, but that still doesn't account for bias even within the bounds of what was called the "recovery area," then the "primary conservation area."
Q. Okay.
A. Then the "Demographic Monitoring Area."
Q. Okay. Are you well-acquainted with the filings in this case?

A. No.
Q. Okay.
A. I mean, I did a quick read of Carter Niemeyer's declaration, which I found really interesting. But other than that, no.
Q. Okay. So other than Mr. Niemeyer's declaration, you didn't read any of the other filings?
A. No. I mean, I was actually looking for Chris Servheen's declaration but I didn't see it in the materials I got.
Did he file a declaration?
Q. No, he did not.
A. Oh, okay.
Q. In the court filings, there is reference to January 1st to February 15th trapping dates where they would allow trapping to continue. Did those dates come from you?
A. Yes, they did. I mean, I had a conversation with Tim about what relief would look like. And I invoked the precautionary principle and said, "Well, based on my knowledge of when bears, that I have known of, have been last out, first out, there have been bears in Yellowstone out as early as the later part of February."
That's documented. So I thought, Well, to be

precautionary, that would be a safe window.
Q. So was there any data that you -- what data did you base those dates upon, specifically what data?
A. I've just described the data.
Q. What reports, though?
A. The reports, for example, in the Haroldson, et al., 2002 report, which again is an old report, there's a bear that was out, an adult male out in the last week of February. And there have been others, other bears that I've heard of that have been out that have been in the news. It always makes the news as to when bears are out.
So I always try to ballpark, based on my current knowledge, when you're likely to avoid risk to pretty much all the bears pretty confidently. So based on the data here as well as those, the specific date in Haroldson, plus to my knowledge, the data that postdated what Mark relied on, plus these what I would consider to be reliable news reports, including posting on the Yellowstone National Park website, those were the evidence that I was drawing on.
But then the other thing that it keeps coming back to in terms of how you deal with uncertainty like for these dates, entry and exit dates, is like where

is the burden of proof and where is the burden of risk? And how do you apply the precautionary principle? And is that the recommended approach under the ESA? That informed what I shared in terms of coming up with some dates.
MR. SCOLAVINO: Okay. We'll take another quick break.
(A brief recess was taken.)
MR. SCOLAVINO: We're back on the record at 3:12.
BY MR. SCOLAVINO:
Q. And, Dr. Mattson, when we ended our last conversation right before the break, we were talking about the January 1st to February 15th date.
There you mentioned that there was some news articles and Haroldson that you were relying upon for creating those dates or creating the certainty around them?
A. There's no certainty to be had around that kind of stuff. You're looking at probabilities, likelihoods relative to risk, and then kind of judging on how to allocate that risk.
And as I recall, I think I was hearing from people on the Grizzly Bear Study Team that they were having bears out, subsequent to the Haroldson paper,

earlier in February. I couldn't say exactly when I heard that or from whom, probably from Mark, but it created a certain consistency.

Q. You mentioned a gentleman named "Mark." Can you --

A. Mark Haroldson.

Q. Mark Haroldson?

A. Yes.

Q. Okay. Who created Haroldson, et al.?

A. Right, using data that only went up to about 2000, I think, or 2001.

Q. So there was some subsequent reports that Mark mentioned to you after he published his report?

A. Right, as well as the news articles that were credible.

Q. Then how long after he published his report did he provide you with some additional data?

A. Probably not long after.

Q. Was it a few years or for how long after?

A. A couple of years. I couldn't say exactly how many years.

Q. Okay. Is there anything else that you relied upon for those dates?

A. No, other than what I said in terms of the evidence and sort of the judgment on how to deal with

A. It was not in the smorgasbord of issues that immediately struck me because I was not aware that there was any points of contention regarding growth of the population.

Q. Okay.

A. And it was only subsequently that I was becoming aware, and it was sort of indirectly of that being a prospective issue. At which point, then I rebriefed myself on the material I put together and then updated my assessment based on examining some of the more recent records. So that would have been, I don't know, prior to being informed of the deposition even.

Q. When you say update your assessment, was that your own personal assessment or was someone asking you for an assessment?

A. That was at my own initiative.

Q. Okay.

A. Because it was -- I would be hard-pressed to say exactly where I queued into it as being an emerging issue, but as I recall, I became aware of it. And so I thought, Well, I'll reacquaint myself with the critique I did and update it.

Q. And I bring that up because it seems like today, we spoke a lot about the demography of grizzly

uncertainty and risk.

Q. At what point did you present those dates to Tim?

A. As I recall, when Tim was trying to determine what a remedy would look like that would be credible, and so we had a very brief conversation about that.

Q. Was that conversation when he spoke to you about your declaration or was it thereafter?

A. It was during the deliberations in front of Molloy, as I recall. I actually couldn't say when exactly it was in terms of those, relative to those deliberations or, you know, where exactly where it was in the process. It was after I had submitted the declaration, though.

Q. Okay. And you said earlier -- scratch that, sorry.

I believe it's Exhibit 20. Yes, it's Exhibit 20, "Heart of the Grizzly Bear Nation." So in that report, you mention it dealt with the demography for bears in the NCDE. Well, you did not include that in your declaration --

A. No.

Q. -- because it pertained to demography, correct?

bears, and I just was wondering what you thought changed or why you brought that today.

A. I'm not sure, actually, other than it seemed to be on the docket and it was touched upon by a question you asked, I couldn't remember exactly what it was, but about the status of the population.

It seems to me that it's not directly relevant but potentially relevant information as to what the prospects are for the population, whether it's in as good a shape as being currently perceived, which would inform what kind of impacts even a small increase in bear mortality might have on prospects for not only just the NCDE population, but connectivity between the NCDE and Bitterroot Ecosystem, which is, I think, the more important issue.

Q. Okay. So I'm going to jump back to just Figure 1 in your first declaration, which is Exhibit 21. As we discussed earlier, in Figure 1, there's two areas: High-risk areas and then intermediate-risk areas.

I guess I want to bring up a previous point that you mentioned, too, which was pertaining to like mountain biking and recreational activities besides recreational trapping.

Wouldn't mountain biking, per se, cause high

risk to grizzly bears in these areas as well?
A. It would be a risk-enhancing activity by people in areas occupied by grizzly bears.
Q. Are there any other activities that could cause similar effects?
A. There's ample numbers of human activities that could harm grizzly bears or affect grizzly bears depending on the individual bears and how they respond, to whether they habituate or not.
I mean, the problem with mountain bikers is that you have somebody traveling at high speed with limited visibility where there's little warning for the bear to respond and a trail with limited visibility often. So that's a particularly risky behavior on the part of people.
Q. So the risk associated with that, and let's just say we're looking at Figure 1, the risk associated with that in a high-risk area would be a high risk, correct?
A. Higher there than elsewhere, but especially high in places where there's lots of mountain-biking activity. I think the important point to all that is there's a context within which you add increments of risk. If you've got already a high baseline risk attributable to other human activities,

like people active on roads, people active on trails, people mountain biking, then that amplifies the effects of the additional increments of risk on bears.
That is the problem even with activities respectively like trapping where you have widespread exposure of the bears, which is the point of that map, to a low probability event that has particularly hazardous outcomes for the bear.
I mean when a bear's encountering mountain bikes, they may hit a mountain bike or a mountain biker, and it's the mountain biker that's going to pay the price. As per the incident in Glacier National Park or near Glacier National Park where the mountain biker literally collided with a bear, they couldn't even track down the bear to kill it. So it's really who's bearing the brunt of that increment of risk, that type of risk.
Q. And so to just recap, so hiking and backpacking or camping or let's just say even wildlife viewing could result in --
A. They create a certain baseline of risk. And that's important against which to register added increments of risk because if you don't look at -- I mean, then that gets back to the notion of cumulative effects, which is a well-established problem, like

death by a thousand cuts.
So at which point do you have too much in terms of hazards loaded onto a landscape? That's a really tricky problem to come to grips with. I was involved in clarifying the application of cumulative effects analysis to grizzly bears in the mid 1980s. In fact, I was a consultant for Parks Canada, the National Parks Service, a number of different agencies on how to conceive of cumulative effects and how to apply it on the ground.
So that's absolutely, from my perspective, an absolutely critical context for understanding any kind of added and cumulative risk, in this case, potentially attributable to trapping because any single road, any single activity is not going to conclusively, you know, put a grizzly bear population in a death spiral. It's at some point, you have too much of what's going on on the landscape.
Q. In reference to "too much," wouldn't it be safe to say that there is more mountain biking and other recreational activities than there is trapping?
A. So it gets back to the opportunities to intervene to effect change on the landscape, and there doesn't seem to be any receptivity on the part of the Forest Service to curbing mountain biking on Forest

Service trails, any public land management agency, in curbing mountain biking on trails.
So you can identify a risk and you can identify the opportunity to intervene. To my knowledge, I mean, there may have been people that try to litigate the harm caused by mountain bikers to bears, but I don't know that it's been successful if it has been undertaken.
But, I mean, the virtue of litigation is it provides an opportunity to intervene in a decision process to remedy harm, and that's a key part of the whole equation. It's just not about what's causing what level of risk. Like you could argue that the people in Flathead Valley or Missoula are imposing a much higher level of risk on bears than trapping would.
But what are the opportunities for intervention? Talk to somebody like Tim Manley, talk to somebody like Jamie Jonkel. You know, how are you going to intervene in that system when you have to deal with county commissioners and you have to deal with the issue of zoning?
So kind of think of it as a two-dimensional schematic where you have likelihood of harm or magnitude of harm and opportunities to intervene. And

so if there's an opportunity to intervene to prevent additional harm, there's a logic to that.

Q. And so just jumping off of harm, isn't the harm here as "take" defined by the Endangered Species Act?

A. Harm can be as per individual animals, and also habitat, also populations. I mean, it's been an established principle that you could harm a bear by impairing its habitat.

That was the genesis of the successful litigation of the 1993 recovery plan, to come up with habitat-based recovery criteria to where bears don't live in a vacuum. They are affected in terms of their birth and death rates by the hazards embedded in the environment that they live in.

Q. But for purposes of this case, the harm here is "take" as defined by the ESA, right?

A. From my perspective, the harm is that which is incurred by bears due to trauma, physical suffering. Part of the issue with evidence here is that we don't have a reliable assessment of the historical take by trappers of bears. You have a report on whether there was a take or harm to the bear.

And the other point I try to make is that I'm

acquainted with how researches trap bears, and we have fairly reasonable data from Alberta as to the toll that trapping takes on bears even without injury as in stress, as evidenced in stress hormones, as impaired life performance afterwards. So there's pretty reliable data by a guy named "Cattett," who I reference in my declaration.

So there's different ways that have been recognized that you can harm individual bears and it's not just by killing them. But then you never know how many of these bears that have been found in the field that are decomposed, dead, likely caused by humans, unreported, unknown, that were unreported by trappers who may have accidentally trapped a bear in a set.

And I wouldn't want to be a trapper who accidentally caught a grizzly bear especially after 48 hours had transpired, because I guarantee you, there's damn few trappers, if any, that are carrying around immobilization kits that have been qualified to immobilize a bear to release a bear under those circumstances.

Q. I think what I'm trying to understand, though, and you mentioned "trauma" or "stress," whether the trauma is physical or not, but trauma and stress were two things that you previously mentioned.

Can't mountain biking and/or camping and/or hiking cause trauma or stress upon the bear?

A. And I'll go back to what I just said. There's ample documentation of lots of impacts attributable to human activities. And if you look at any one increment of that in isolation - a single road, a single house, a single activity - you don't get a complete picture of the hazards embedded in that landscape for bears.

So if you can prevent the loading of additional hazards on landscape for bears, that's desirable, especially if the status of the population is uncertain, and especially if the opportunities to intervene to reduce other hazards are not there.

There has been successful litigation that controls road densities and roading, but not trail use, not mountain biking. I think the prospects for limiting recreational activity, those kinds of recreational activity are limited outside of national parks or limiting housing or building overpasses/underpasses, which a lot of people have been beating their head against that wall to get something to happen.

So it's not about a risk in isolation. It's the risk relevant to the totality of risks embedded in

landscape and opportunities to intervene.

Q. Okay. If we're trying to limit the risk to the totality, is it safe to say that we should just shut down the entire western portion of Montana because grizzly bears are at risk from every human activity? Whether that be mountain biking --

A. Well, I can say this for a fact, that grizzly bears fared well in this part of the world prior to the advent of European settlement. I can say that for a fact. And it's clear, clear from the fates of bear populations in areas that are relatively unpopulated that bears do a heck of a lot better without human activity. There's no doubt about that.

It's not a matter of: What is the perfect world for grizzly bears? It's a matter of: What can we do to make it a tolerable world for grizzly bears to sustain them, to recover them? Which is why I think demography is relevant vis-a-vis that issue, like: How well is the population doing, in fact?

And even if we have a thousand bears, is that enough to assure recovery? Which gets back to a lot of issues embedded in the recovery planning process.

Q. So, again, if we're going to try and limit the risk, the totality, in those high-risk areas, should we shut down mountain biking? Should we shut

down hiking? Should we shut down camping and wildlife viewing in those high-risk areas as well?

A. Should we/can we? Is it plausible? Is it feasible?

I would say you have to judge impacts on people in the equation. And when it comes to trapping, for example, you look at the wolf harvest reports. And on average, 68 trappers have successfully trapped a wolf or more than one wolf in a given year.

So are you talking about depriving 70 people of the opportunity to kill a wolf? And the percentage of wolves that have been killed by trapping is a minority of the total of wolves killed. It would not prevent Montana from achieving its harvest objectives for wolves.

You look at that in contrast to mountain biking, the number of people that engage in that activity, the number of people that hike. So it's about balancing a number of factors, from my perspective, if you're wanting to be implementing effective policy.

So from my perspective, it's a no-brainer where the points of intervention are with the least cost to the totality of people in western Montana.

Q. So it's not about "take" as defined by the ESA to you, because "take" means to harass, and a

mountain biker can harass an individual.

A. No. It's about harassment, it's about stress, it's about harm. That is a fact. And it's also about the practicalities, because nowhere ever has the Fish and Wildlife Service said, "We're going to close all roads, we're going to prohibit all recreational activity on public lands," because it's always about judging how far things can be pushed politically relative to what's needed to recover grizzly bear populations.

So I am not saying what you're saying, that it's about closing down all human activity. I'm talking about what increments of human activity that result in potential harm, as in stress and harassment, can be managed with the least cost to people that are here. So there's the tractable arenas and the intractable arenas.

Q. And just because one is retractable --

A. "Tractable."

Q. -- one is tractable and one is intractable, we should just honor one rather than the other, though?

A. No, and that's not what's been done. Like I said, I work with people in carnivores and am acquainted with a lot of -- in fact, I'm

well-acquainted at what's been done in the Blackfoot Challenge and previously on the East Front.

It's about engaging in ways that one can, using the levers that are available, to try to promote better coexistence, less risk embedded in the landscape. So there's any number of ways that you can approach that, well-proven ways.

So it's not just about a blanket closing down of all human activity. Roads can be removed, torn up. That's another thing that can be done to reduce hazards, risk, to try to achieve some increment of benefit for bears that might allow us to progress towards recovery.

And under the ESA, the people in the United States made a commitment to recover endangered and threatened species. So it's a manifestation of our public interest as codified in law what we can do and it's a pragmatic exercise.

Q. I heard earlier that you mentioned 68 trappers. Is that referenced in an FWP article?

A. Yes, in all the harvest reports. There's the total number of trappers that killed one, two, three, four, five, six, seven, and now eight wolves in a season. So all you have to do is add that into a database and you can average that over the last

handful of years.

There hasn't been really an increase in the number of trappers who have taken wolves. It's a minority of the total take compared to people who are shooting them or killing them with archery equipment.

Q. So a loss of 68 people's activity has less of an effect on the bears then all of those that ride mountain bikes or mountain bikers, correct?

A. Loss of an activity for 68 people has less of an effect? I'm not sure that I understand your question. I'm talking about the balance of burden on the bears relative to burden on people as reckoned as residents of Montana. People engage in different activities.

My point is that there might be a certain number of people that get licenses to trap. Of those, there's apparently only a handful that are competent enough to catch a wolf that are actually benefiting, however you want to reckon that, from that activity.

If you're going to say, "Okay, if we want to manage risk on the landscape, do we do it in a way that deprives a handful of people, literally, a couple of dozen people of an opportunity to engage in activity? Or are we going to tackle depriving, literally, thousands of people of the opportunity to

engage in an activity?
Don't get me wrong. I think there should be places where we don't allow mountain biking where there's high impacts on bears. But the Forest Service had jurisdiction over that and they have been unresponsive to any request/opportunities to change the decision they make regarding distribution of mountain bikers. So in this case, we have a decision, a decision point.
Q. I think what I was trying to get at with that question was: Sixty-eight people have a much lower effect than mountain bikers --
A. No.
Q. -- which are a presumed higher amount?
A. Are you talking about per person, which -- we're talking about per capita terms here, risk engendered by an individual and their activity, or as opposed to the totality of all those activities?
If you're looking at per capita loading, it's hard to say which person is going to have the greater effect. But as I said with mountain bikers, you may have displacement, you may have stress, but the bear isn't injured or, that I know of, isn't injured, only very rarely removed, but under extenuating circumstances.

What we're talking about here is about a device deliberately designed to hold an animal. And that's a -- that which engenders almost axiomatically some kind of injury, tissue trauma, as well as stress. And that's going to be exacerbated by the 48-hour window.
Now, if you wanted to minimize harm, you could say trappers need to check their traps every 24 hours or less and have a radiomonitoring device that's triggered when a trap is released so that they can be out there expeditiously to check the strap. That would minimize stress and potential for harm.
They could change release weight from 500 and 1,000 to something less or more, maybe. I don't know which way that plays in terms of potential harm for a bear. Do you want a bear walking around with a trap dangling off its foot or not?
So it's not like there's nothing that can be done even in terms of how trapping is implemented to reduce the prospect of harm. But the longer a bear is in a trap, it's predictable that's going to be more injurious.
So that, again, is a key distinction between people hiking, people on mountain biking -- mountain bikes. They are not out there with spikes on their bike aiming at bears or any other animal. It's purely

accidental. Likewise, people out recreating, hiking, you know, they may carry a handgun but that's a whole different matter in terms of how they respond to the encounter.
Q. But for purposes of this case, I will let you know that it deals with take, and "take" means "harass." So whether you're harassing the bear as a mountain biker or as a hiker, you are taking under the ESA.
A. Okay. That's your purview, not mine.
Q. Earlier you stated that data within reports was either skewed or repressed because of political reasons. Could you tell me what those are, what those political reasons are?
A. Which reports are you referencing?
Q. You've stated throughout your deposition today that there are many political reasons that go into factoring.
A. Yeah, I mean, amongst other things, there's things that are quite predictable, which I have witnessed and experienced internal to an agency: Group loyalty; group think; living in a silo; creating boundaries so you have the enemy without, the friends within, which creates a silo effect; you have data monopolies that are held by government agencies so you

don't have the opportunity for independent scrutiny by other scientists with free access to the data.
Despite what people might think, a scientific progress does not happen just because you've done an analysis and get it through peer review. It's been pretty well documented that error detection by peer review is about equivalent to throwing a dice. So peer review is no guarantee of an error-free result.
And any result is provisional by nature in terms of any scientific result. It can only stand for some temporary time until it's revised in light of new data or new scrutiny or new analysis.
So one of the big problems is when you have any monopolistic arrangement where people don't have free access to raw, underlying data for independent analyses, creating an opportunity for replication or not, to test what other people have done.
So there's a number of factors that conspire to make the pursuit of science internal to federal and state agencies really problematic. Monopolies, fairly well, you know, in terms of what journals you see scientists publishing in and which ones are going to be friendly to the perspective agenda of the host agency of the scientist, there's a dramatic skew towards a certain set of journals versus others. So

there's that evidence.
And you look at, if you go to look at email exchanges amongst people internal to agencies obtained via FOIAs, you can see a pattern of defensive posturing, of sequestering data of defensive behaviors, of money, funding being applied with the intent to produce a certain result.
Not all arenas are beset as much as the grizzly bear arena because it so politicized because it's set in this context of contestation between federal and state authority. So anytime you get this polarized, contested environment as you get with management of endangered and threatened species, lynx, grizzly bears, you create an opportunity that's ripe for corruption of the scientific process, which has been well documented in any number of cases in addition to grizzly bears.
It besets ESA research, research into protected species more than most other species. So you can have management of mule deer, management of whitetail deer, which are not going to be nearly as politicized, not necessarily beset with these corrupting effects and influences.
I mean, there's just, you know, bookshelves in libraries full of case histories affirming this. So

that's the general pattern, that's the general phenomenon. That would be what I would invoke as sort of an explanation for these patterns.
And I look at the peer-reviewed publications and reports that I've seen published, and there's bias in terms of what questions are asked, how they're asked, how the analyses are done, what factors are considered, what factors aren't considered, how results are interpreted.
Each step in that path is ripe with the opportunity for bias. And I could say that applies to every publication that's come out of the NCDE, every publication related to grizzly bears that's come out of the GYE, and also out of the Cabinet-Yaak.
And so this is probably as thorough documentation as you will get for the NCDE. I also have some -- this objection that I put together for the Cabinet-Yaak bears, which describes the problematics with work that's been done there.
So there's no Ecosystem that's immune from these syndromes and it's evident in multiple ways, tearing back to what you can find out by looking at email exchanges or any kind of exchanges of documentations that you can get through a Freedom of Information Act request and a Freedom of Records request.

Q. You mentioned that this also occurs in instances where these reports are being peer-reviewed. So why wouldn't the scientists that are peer-reviewing it notice these biases or political shifts or lack of hypotheses that may have been tested?
A. Scientists, in my opinion, physical scientists, are some of the most acontextual people I know in terms of their judgments being completely, utterly divorced from any cognizance of a larger policy environment that might configure what's going on to even be able to pick up on patterns that might be there.
If you look at the payoff for investing in peer review, when you've got a full docket, people don't. It's rare that people really invest themselves in peer review to critically look at it.
The other thing is you've got a predictable stable of reviewers that know each other from bear conferences that are friends that end up being reviewers. So you've got, you know, personal loyalties, acquaintanceships. You've got lack of time and energy to reward the investment in peer review. You've got people that are not familiar with the political/social culture environment in which that research was done that don't even -- where that

doesn't even penetrate their consciousness.
You've got scientists who make claims to objectivity that compounds this syndrome, you know, the failure of peer review. There's people that can't even inquire into themselves to recognize bias where it occurs.
And, for example, having had spent almost as long as we've spent here talking to the former head of the Grizzly Bear Study Team about how scientists are not objective, they're subjective beings like every human being. They're subject to everything that preys upon human beings and human judgment.
And after four hours, he said, "I've got a headache. I get your point. Go away."
But that was after -- this was an intelligent man. We engaged in a very deliberative conversation for four hours, and even then it was hard for him to upload that.
And I've taught students at Yale and MIT about all of this. It's not transparent. It's rarely transparent to anybody. So you've got people who are opaque to themselves, a system that's opaque to people that are scrutinizing it, especially within a community of physical and biological scientists.
Q. So in your eyes, it doesn't matter if the

article is peer-reviewed or not?
A. The data show about 50 percent chance that error has been detected. And another instance, for example, where people have taken the same exact dataset, farmed it out to numerous scientists, and said, "Do you see a significant result, insignificant, or evidence of an effect, no evidence of an effect, evidence of there definitively not being an effect?" You can just roll your dice.
Q. Okay.
A. So the paradox of peer review. It's kind of like what Winston Churchill said about democracy. I forget the exact quote, but it's: Of all the systems that have been tried from time to time, it's probably the best, but it's not -- it's far from perfect.
And that's the same that could be said of peer review. It's better, probably, that we have it than we don't, but it's no guarantor of quality.
Q. And we've talked about Cecily today. Do you have reason to believe that Cecily, Cecily Costello, is politically motivated?
A. I think she's prey to all these influences. I think it's rare that people even recognize when they are swayed by political

influences. I think there's a lot of incentives and disincentives intrinsic to any agency environment that people who are subject to them don't even recognize.
So I don't think she's malicious, but I don't think she's very cognizant, from anything I've seen knowing her going back quite a ways. I mean, she's another one that I would say is not very cognizant of these dynamics and the effects they have when they're systemic. So it's not maliciousness, by any stretch, in my judgment.
Q. When was the last time you collected data about grizzly bears?
A. 1993. And it depends on what you mean by "data" because I've subsequently collected geospatial data that I published in 2002, 2004, 2005, but it was data that were public accessible. But that gets back to the problem of data monopolies where when you are not in an agency where you have free access to data, you can't do independent scrutiny other than by virtue of what data can be harvested through the public domain, which is what I've relied on.
So in terms of collecting, collating, analyzing, yeah, probably actively -- I mean, it depends on how you want to look in these reports, but up through at least 2004.

Q. Okay.
A. But field data, 1993.
Q. Field data was 1993, okay. And data that you've received after 1993 is data that's publically available?
A. I've got data up through 1996 from the Grizzly Bear Study Team because I agreed to provide them with some funding to support their operations, and part of the exchange is that I had access to certain data sets up through 1996.
Q. Do you believe there is any data that is being withheld from you with regards to grizzly bears specifically?
A. That I don't have free access to?
Q. Correct.
A. Yeah, an immense amount. All the raw data pertaining to what went into reckoning occupancy conflicts even, radiotelemetry locations, VHF locations, known fates of bears, and I don't know that there's been much work done on diets and behaviors explicitly, no, none of that is available.
And what I've seen is that if you want to gain access to data, it's with the proviso that there be control exercised by the people providing the data, which, as I just said, is antithetical to making

reliable scientific progress with critical scrutiny.
I do know, in my own personal experience, the paper I published with Craig Pease back in 1999, we respectfully requested the data from the Grizzly Bear Study Team post 1993-1994. There was a series of exchanges, but with the proviso of control still being exercised by bear study team scientists. It went to the top of the food chain in the U.S. Biological Service at that point, and it came down to litigation to get that information released.
So in my experience, either you're still under the sway of the people who collected the data, that worked for the agencies, or it's virtually impossible to get the data. And if you want to get the data, you probably have to litigate under the Freedom of Information Act and request.
But, then, there is ample redaction because there's this putative concern about disclosure of locations, grizzly bear locations, which might allow poachers with access to the data online to track down the bears, which is not a restriction on the government researchers. They have precise geospatial locations.
Q. What about in regards to FWP or the commission, is there any data that you think we were

withholding from you?
A. All of the above. I mean, I haven't even bothered because I'm absolutely positive that it would come with the same strictures and requirements, and I don't want to beat my head against the wall. And I'm taking that stance not in the absence of any lived experience. It is well-informed by lived experience.
Q. Okay.
A. I mean, withholding any data, what I do have access to is what is reported in the monitoring reports, which are incredibly brief, cursory, terse, especially compared to the Grizzly Bear Study Team reports from Yellowstone.
Q. Just jumping back to the political biases and my question pertaining to political reasons: Is it fair to say that you can't trust any state or federal agency scientists?
A. Are you asking me do I trust them and in what ways and on what basis?
Q. Yes.
A. It depends. I would trust all of the state researchers to be nice people. I would expect that of them. In terms of what they produced, I would always cast a critical eye on what they produced because of all these potentially configuring, biasing

influences that I know are afoot.
So I wouldn't take anything that's produced at face value. That's the nature of scientific inquiry. You always look at it with a critical eye. That is antithetical to being a good scientist, to take anything that anybody puts down on paper on faith.
That applies to everybody, but especially for people working in situations where there's a monopolistic arrangement with the data and where there are all these configuring influences in a highly charged, highly politicized environment that typifies just about all management of endangered and threatened species.
MR. SCOLAVINO: We'll take one last break. And then we'll come back and we'll finish it up.
THE WITNESS: Sounds like a plan.
(A brief recess taken.)
MR. SCOLAVINO: Back on the record, and it is 4:10.
BY MR. SCOLAVINO:
Q. So, Dr. Mattson, I'm going to jump to Exhibit 21, which is your first declaration, Paragraph 33. And in Paragraph 33, you cite some scientific research reports, and then state in your professional opinion.

Is there a difference between what is in those reports and your professional opinion?
A. Oh, well, no. The sourcing population dynamic is pretty well-documented in those papers. And, actually, elements of those papers substantiate my statement regarding -- well, actually, well-substantiate my professional opinion that this sourcing population dynamic has produced many of the gains in population distribution.
I mean, that's been shown by estimates of population growth rate for those different source areas and sink areas. You have declining populations locally in the sink areas, most of which are on the periphery, and you have increasing estimated growth in source areas.
So axiomatically, you can't sustain bears in a situation where you have a locally declining population without influx of bears from the source areas, which has been documented in the estimated flow rates between the source-sink areas.
I'm trying to remember which of those papers they estimated the flow rate of bears from the source to the sink and vice versa. But, I mean, it is sort of by first principles, you can't have bears where the population is locally in decline for very long without

some supplementation/augmentation from the source-sink structure. And that's the conclusion that was explicitly reached in all of those papers.
Q. So when you say in your professional opinion, that's not different --
A. No.
Q. -- than what is in those research papers.
A. It isn't. It isn't. It's entirely consistent with the conclusions in those papers.
Q. I only ask because in certain other areas, you just reference the reports and then don't say "in my professional opinion," and it stuck out to me here.
A. Yeah, yeah. Well, "opinion" is a vagarious thing. But, yes, what I said here is entirely consistent with what is in those papers and is not any undo inference or highly subjective inference.
Q. So earlier today, you mentioned your time working with U.S. Biological Survey or Science.
A. Survey Service.
Q. At that time, you were working under Mr. Servheen and Mr. Knight; is that correct?
A. I was working for -- by that time, I was no longer working for Richard Knight. I was working for Gerald Wright, who was my supervisor at the

University of Idaho.
Q. So was there any point in time where you were working under both Mr. Servheen and Mr. Knight?
A. Christopher Servheen did not have any direct-line authority over me; Dick Knight did. He was my supervisor in the Interagency Grizzly Bear Study Team. Chris Servheen was the recovery coordinator. He worked for the Fish and Wildlife Service. He provided substantial funding to the Interagency Grizzly Bear Study Team. And the recovery coordinator continues to provide substantial funding to the Interagency Grizzly Bear Study time -- Study Team.
Q. Okay.
A. From the onset, that's been the case. So they exert considerable influence indirectly through funding.
Q. If I'm not mistaken, earlier today, you mentioned that -- I thought it was Mr. Servheen had informed someone else to pull your funding, or something along those lines. I thought Mr. Servheen told Mr. Knight. Is that not correct?
A. Servheen threatened to pull our funding unless Dick Knight told me to terminate all communications with Craig Pease, who had been my

collaborator up to that point, explicitly on an analysis up through whenever it was, 1992.
But then I continued to correspond with him on other technical matters up through 1993, which informed his comments on the grizzly bear, revised grizzly bear recovery plan.
Q. Okay.
A. And it was Chris Servheen responding to Craig Pease's comments and his reading into them my input which he took offense at, that led him to threaten to pull our funding, which led my boss to come to me and say to me, and I'd overheard part of the conversation by virtue of the open-cubicle nature of the office, but come explicit to me -- say explicit to me that, "Chris Servheen threatens to pull our funding unless you stop communicating with Craig Pease at this point in time. You need to stop," which I did.
Q. So given your past experiences with Mr. Servheen and Mr. Knight, would you trust any work that they produced?
A. I go back to what I just said. I don't take on faith any scientific products that any scientist produces. I read everything that's been published with a critical eye, but I read publications

coming out of the Federal Government with an especially critical eye, especially that have been produced in the crucible of grizzly bear conservation management science.
So I don't think -- I mean, Dick definitely, Dick Knight, had his virtuous sides. He didn't think of himself as being dishonest, I know that. But there were all these configuring circumstances that led him to make the kinds of choices he did make.
Chris Servheen, I know for a personal fact, exercised routine intimidation and threats as part of his operating and modus operandi, not just me being on the receiving end, but other people who worked for the Fish and Wildlife Service who were involved in Section 7 consultation.
Q. So is it safe to say if the two of them were government employees working on grizzly bears, you would question their research more so than a regular scientist?
A. I would look at a critical eye at any research produced by any agency scientist working with grizzly bears in the contiguous United States for all the reasons that I described: Because of the data monopolies; because of the configurations of political influences; funding influences; the highly

politicized, inflamed nature of the arena.
I had cause to doubt Dick's research based on my familiarity with raw data, so that was a bit of a difference compared to what you might just see in a published paper.
Q. Okay. I guess I just want to make sure that I'm understanding you correctly. So if they were a government scientist, you would criticize their work more so than a scientist that is not employed by the government; is that correct?
A. Especially in a situation where they had a monopoly on the data or where you could not -- you did not have the opportunity to replicate an experiment, if you will, or an analysis independent of any kind of influence.
So that's a peculiar circumstance of research undertaken by most government scientists of any stripe, involved with any species, any endangered and threatened species.
Q. After looking, as you stated, with a critical eye at the data in this case that was produced by agency scientists --
A. "In this case" meaning data that bear on the impacts potentially, prospectively, of trapping wolves in areas occupied by grizzly bears?

Q. So Cecily's data.
A. Okay.
Q. Do you believe that that data is sound or do you still suspect that science?
A. There's a difference between the data and the analysis and the reporting of the analysis. Upon looking with a critical eye at what she's produced, it has not given me any great confidence in those results and has led me to doubt about -- doubt the relationship between the data and the results.
But more than that, it's not just the data, it's the analysis. It's the way of applying the analyses to management deliberations, which takes me back to what I was saying about taking an analysis relying on data that are 15 to 16 years old on average, that doesn't include any data from the most recent 10 years, and projecting that out ad nauseam into the future linked to a 2004 estimate of population size without accounting for what changed between the time when Mace made his estimate of 3.2 percent, Cecily made her more recent estimate of 2.3 -- 3.2 to 2.3 percent.
How you can reconcile an increase, near 40 percent or more increase in estimated adult female death rates to your estimate pegged to data that ended

in 2014, that doesn't pass the test of logic or prudent application of science to management.
As to why she did that, I don't know, but I can invoke the potential for political expediency or all of the opaque incentives and disincentives within an agency context.
MR. SCOLAVINO: No further questions.
MR. BECHTOLD: I have no follow-up.
(The deposition concluded at approximately 4:30 p.m.)

* * * * *

STATE OF MONTANA)
: ss.
County of Silver Bow)

I, Candice L. Nordhagen, Court Reporter - Notary Public in and for the County of Silver Bow, State of Montana, do hereby certify:

That the witness in the foregoing Deposition, David J. Mattson, was by me first duly sworn according to law in the foregoing cause; that the deposition was then taken before me at the time and place herein named; that the deposition was reported by me in machine shorthand and later transcribed by computer, and that the foregoing two hundred fourteen (214) pages contain a true record of the witness, all done to the best of my skill and ability.
IN WITNESS WHEREOF, I have hereunto set my hand and affixed my notarial seal this _____ day of _____, 2024.

_____
Candice L. Nordhagen
Notary Public for the State of Montana residing at Butte, Montana. My commission expires October 26, 2024.
(NOTARIAL SEAL)

DEPOSITION OF: DAVID J. MATTSON
DEPOSITION DATE: MARCH 7, 2024
IN RE: FLATHEAD-LOLO-BITTERROOT, et al. v. STATE OF MONTANA, et al.

COURT REPORTER: CANDICE L. NORDHAGEN

I have read my deposition and make the following corrections or additions:

PAGE # LINE CORRECTION

Signed under penalty of perjury this _____ day of_____, _____.

_____
DAVID J. MATTSON