Version 6 (Draft 6-22-20)

This commentary is a response by the North American llama (alpaca) community to two issues:

1. The manufactured science and unsupported recommendations regarding llamas presented in the Oct 24, 2017 "Risk Assessment On the Use Of South American Camelids For Back Country Trekking In British Columbia" as prepared for the British Columbia Ministry of Forests, Lands, Natural Resources and Rural Development (BCMFLNRORD) and the Alaska Department of Fish and Game (ADF&G).
2. The Wild Sheep Foundation's role in directing, financing, and ultimately using the assessment as a basis to seek a ban on the use of llamas in all North American wild sheep ranges as posted in the Wild Sheep Foundation's: North American Conservation Vision 2020 document.

The 3000+ llama owners and users represented by the International Llama Registry (ILR), the Greater Appalachian Llama & Alpaca Association (GALA), and the Rocky Mountain Llama Association (RMLA) support the assertions of this commentary regarding the risk assessment and its recommendations as well as its condemnation of the Wild Sheep Foundation's attack on the llama as a pack animal on public lands. The commentary is also presented for the benefit of the many private outdoorsmen, recreationalists, and businesses who hunt, fish, camp, and work on North American public lands and who will be impacted by any implementation of the recommendations made in the assessment and advocated by the Wild Sheep Foundation.

This commentary and all referenced documents may be found online at https://www.PackLlamas.org

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Executive Summary:

The Wild Sheep Foundation (WSF) is pursuing a ban on pack llamas to consolidate their hold on wild sheep hunting and limit competition from private hunters who apply for limited hunt tags. Their effort to ban llamas from wild sheep ranges is being advanced under the false narrative of llamas posing a disease threat to wild sheep. They cite a recently released disease risk assessment designed and orchestrated for the express purpose of creating the appearance of a scientific basis to ban llamas.

Llama owners and users have tolerated the misrepresentation and disparagement of llamas by the wild sheep community for years and the day of reckoning has arrived as they openly seek to ban llamas. Though llamas are the ultimate support for sheep hunting, that application represents a very small fraction of the activities llamas' packing talents support. The competition the Wild Sheep Foundation fears in llamas is not even a bump on the use spectrum for llama owners.

The llama now has well over 40 years of history as a pack animal in the U.S. and is widely embraced as the ideal pack support for a diverse spectrum of wilderness activities. The growing llama community will not tolerate the WSF's dishonest attempt to ban llamas on the basis of disease. To disenfranchise llama owners, businesses, and recreationalists now legitimately applying the llamas' packing ability simply because a special interest group feels threatened, is intolerable.

The WSF effort to ban llamas from wild sheep ranges is driven by a combination of closed mindedness, an unhealthy desire to control, and protection of commercial hunting interests. The represented protection of wild sheep populations from disease is without substance and serves only as a cover for the agendas and failures of judgment actually motivating the ban attempt.

Lack of Scientific Basis

The recently released Centre for Coastal Health (CCH) Risk Assessment is being distributed in the wild sheep community as the definitive statement regarding disease transmission from llamas to wild sheep. The assessment mumbles and meanders through previously posited conjecture and tries to recruit new information from an internet survey to bolster speculation that time has disproven and now renders stale. The assessment is the Wild Sheep Foundation's attempt to revitalize and repackage an image of llamas as a disease threat to wild sheep. It is presented as science, but fails to meet the basic criteria.

The wild sheep community, led by BC provincial wildlife veterinarian Dr. Helen Schwantje, has clearly pursued an agenda to discredit and ultimately ban llamas from wild sheep ranges. Dr. Schwantje's risk assessment in 2003 and follow up collaboration with Dr. Elena Garde, in 2005, speculate(s) that diseases found in domestic sheep and goats are also found in llamas. Peer review dismisses their foundational thesis as flawed, because they fail to recognize the taxonomic species separation of camelids and bovids and more importantly ignore the lack of actual disease occurrence. Though the papers themselves are admittedly inconclusive, they have not been withdrawn and remain available to the unsuspecting or prejudiced members of the wildlife management community.

The Wild Sheep Foundation, through the risk assessment, has partnered with Dr. Schwantje and is using their considerable influence to advance her conjecture. Their strategy of persistently pursuing innuendo and ignoring actual science has had an effect. The conjecture is openly embraced, and consistently cited by members of the BC wildlife and public lands management communities, as they also recommend using the "precautionary principle" as a rationale for a ban of llamas from wild sheep ranges.

To bolster conjecture that is without credible scientific support, WSF casts the llama as an exotic (it historically originated in North America) species recently introduced to North America. The llama is presented as having a very limited history of veterinary research and disease documentation. That is not an accurate portrayal, but rather an image willingly created by ignoring and obfuscating available llama research and documentation.

Ignore Their Own Research

It is particularly striking that Dr. Schwantje's conjecture is quoted and referenced repeatedly by the WSF and their surrogates in the wildlife community. Her analysis stands in stark contrast with actual studies by Washington State University wild sheep researchers that prove llamas are not an apparent disease threat to wild sheep. These studies have taken place over the last 25 years and involve commingling wild sheep and llamas to determine if there is the possibility of disease transmission from llamas to wild sheep. The disease of emphasis is pneumonia caused by Mannheimia haemolytica and Pasturella spp as well as polymicrobial infections involving Mycoplasma pneumoniae.

Dr. William Foreyt 1994 comingled llamas with wild sheep. "Pasturella haemolytica was not isolated from three llamas used in these experiments nor from 14 additional llamas sampled." After 68 days in contact with infected sheep, no isolates were found. In 1995, Dr. Foreyt concluded "All ungulates, except llamas, carry some strains of Mannheimia haemolytica." Dr. Tom Besser in 2008 and 2010 conducted pen studies for Mycoplasma ovipneumoniae enabled transmission that mixed cattle, horses, and llamas with bighorn sheep and observed no pneumonia die-offs. This was discussed at The Wild Sheep Foundation (WSF) Thinhorn Sheep Summit II Synthesis and Summary, April 2017, at the same time banning llamas was a persistent topic throughout the entire discussion.

While it is apparent that the pathogens that are the primary cause of wild sheep die offs are not present in, or transmitted by llamas, it is also apparent that other diseases are likely not transmitted as well, as evidenced by an overall lack of mortality in the comingled wild sheep. It's notable that many members of the BC and AK wildlife community were in attendance at the Summit (most notably Dr. Helen Schwantje) and were part of this conversation.

The CCH Risk Assessment Recommendation

With full awareness of this scientifically documented research, the WSF community persists in seeking a ban of llamas from wild sheep ranges using the "precautionary principle". Feeding off the misrepresentation and pseudo-science of the "wild sheep experts" some wildlife societies and special interest wildlife groups assume these positions have merit and naively parrot and promote them to their members and related interest groups. The resulting misrepresentation of llamas (and camelids in general) has been promulgated and widely used to polarize the general public.

There is a surprisingly cavalier nonchalance about invoking the "precautionary principle" in this particular situation. There is in fact, a fundamental principle that precludes any specific situational invocation of "precautionary principle". "Precautionary principle" is meant to protect the current equilibrium of the situation it is directed toward from potentially significant damage with comparatively little effect on its current status. The Wild Sheep Foundation has failed to recognize the potentially huge costs of banning llamas on the basis of disease transmission. Multiple user groups will be eliminated or restricted. They ignore the fact that these costs produce no actual protection of the wild sheep. This result is an exact inverse of the rationale of "precautionary principle".

Rule of Law and Due Process

The active pursuit of a ban by WSF indicates there is serious consideration of instituting a llama ban on the basis of "precautionary principle". Because scientific evidence demonstrates no disease threat is posed by llamas, any move to ban llamas based on "precautionary principle", would be "arbitrary and capricious". There are laws in the U.S. governing the process for policy formulation and administration called the National Environmental Policy Act (NEPA) process. It has specific requirements of formulating and posting proposed policy updates and changes along with the rationale for the changes, notifying the general public and specifically affected user groups, taking written and oral comment and giving full consideration of the comments in drafting final policy. This process has specific requirements for sequence, notification, and duration of each phase. If these are not met or input is not properly considered, agencies are vulnerable to rescission. The assumption is that Canada would have similar laws and process as a democracy with significant public land holdings and a number of user groups. Llama ban attempts to date have been launched in less than full disclosure or as an emergency declaration. They have failed or are in process of rescission for this reason.

Policy based on "precautionary principle" automatically becomes a zero-tolerance policy. If disease is the zero-tolerance issue, there is an immediate burden that is shared with other potential sources of disease. Cattle, horses, humans, and dogs, immediately come to mind as having a presence in wild sheep habitat and all have a higher potential for disease transmission to wild sheep than do llamas. If protecting wild sheep from disease is the intent of banning llamas, all other species need to meet the same standard. The results would be catastrophic. That is why land management and environmental process is defined and codified. Affected user group response will and should be significant if bans are proposed and process is not adhered to in formulating any policy changes.

Natural Law

Natural law is always the controlling force in wildlife management. The Wild Sheep Foundation has an unbalanced emphasis on wild sheep management priorities above all other species (domestic and wild) and associated user groups. Wild sheep are a valuable wildlife asset and deserve reasonable protection and management to the extent possible. The fact remains they are wildlife and subject to the forces of nature. Disease is one of those forces and has always been a factor in the ebbs and flows of wild sheep populations. As the precursors of domestic species, they have certainly suffered disease losses unrelated to transmission of pathogens from domestic species. To be vigilant is reasonable and seeking scientific understanding of potential impacts and a scientific response is prudent. But wild sheep are a spoke in the wheel and not the hub of wildlife populations. To make all other interests arbitrarily subservient to those of wild sheep is not in the best interests of the total

wildlife community. Pursuing the elimination of user groups without substantiated cause and solid documentation will ultimately undermine the consideration wild sheep now enjoy.

Wild Sheep Foundation's Over Reach

WSF is an organization formed by a group of sheep hunters in 1974 for the purpose of expanding wild sheep populations and the opportunities to hunt them. They have been instrumental in fund raising for research, expanding sheep ranges, and promoting hunting. The North American Wild Sheep hunting industry is lucrative. Non-resident hunters and resident hunters who successfully draw tags can hire a guide to provide full-service hunts at a cost of $10,000 -$50,000+/hunter. WSF has attracted many upper income hunters and has used that connection to raise research funds by auctioning special permit hunts from state game management agencies.

This fund raising has become the foundation of the WSF business model. Millions of dollars are raised each year from them selling public assets (sheep tags) to raise money and allowing the wealthy hunter to cut into the line the public waits in to obtain a sheep tag. While supporting research, it is apparent a significant amount of the funds are diverted to advocacy (lobbying). This is a misuse of public assets particularly when they provide funding to pursue the elimination of legitimate user groups that are part of the public owning the assets.

The WSF tagline is: "To Put and Keep Wild Sheep on the Mountain". They seem to have lost sight of the fact they own neither. Wild sheep are a wildlife resource owned by the public and the lands they occupy for the most part, are public as well. They have a sense of ownership of both and that finds them in the process of usurping the rights of other user groups. Hunters are the fastest growing user group employing pack llamas. However, many fishermen, campers, photographers, climbers; young, old, disabled, and professional are now dependent on llamas to assist in their backcountry activities, and have been for decades. Bans, as advocated by the WSF, will eliminate or severely limit these legitimate, historical user groups.

WSF is driving the effort to associate llamas with disease, ostensibly to protect the return on their investment in the sheep population. WSF has an international presence and their influence spans the borders of sovereign nations. WSF appears to serve as the liaison between Canadian (BC) and US agencies, as evidenced by their ban proposal targeting all North American wild sheep ranges

The following commentary provides an overview of the CCH Risk Analysis, its effects, and the WSF maneuverings and consequences.

The Wild Sheep Foundation has stated its intentions of pursuing a ban of llamas in wild sheep ranges in North America on the allegation they present a disease threat to wild sheep. The recommendations of the British Columbian consulting firm, Centre for Coastal Health (CCH) document are the sole reference they cite as support for this action. The document is not sufficient for this task for two reasons: the science underpinning the assessment is decidedly lacking and the Wild Sheep Foundation's role in directing the formulation of the assessment removes any sense of objectivity or validity.

"Risk Assessment On the Use Of South American Camelids For Back Country Trekking In British Columbia"

Risk Assessment?

A risk assessment is a tool employed in the conduct of business and management to assess the vulnerability of an enterprise or environment to infrequently occurring or unpredictable, often catastrophic events that can have significant impact on the survival of an enterprise or an environment. Risk assessments are typically a projection or forecast based on an event(s) that have occurred previously (tornadoes, hurricanes, employee theft, lawsuits, etc.). Based on history, the target event may occur again. This assessment fails to establish such a risk to assess.

The [1]"RISK ASSESSMENT ON THE USE OF SOUTH AMERICAN CAMELIDS (SACs) FOR BACK COUNTRY TREKKING IN BRITISH COLUMBIA" tries to create the appearance of engaging in the risk assessment process for the purpose of determining the risk caused by a new and unknown species coming in contact with wild ungulates. The title is general. It identifies SACs as non-specific risks in the BC back country. There are 4 species of SACs: llamas, alpacas, vicunas, and guanacos. Only the llama is employed as a pack animal. Vicunas and guanacos are wild and the alpaca is a small fiber animal that is not suited to back country packing. The alpaca has been included, not because it will be present in the BC backcountry, but because it adds potential for identifying pathogens that could be extended to llamas. Clearly, the focus of this assessment is on llamas and trying to identify them as a risk for disease transmission to wild sheep.

It immediately becomes apparent no disease(s) have been identified, and the CCH is looking for possible pathogens. On page 8 it states, *"This review set out to develop a list of* ***pathogens that might create risk*** *of disease transmission from SACs to wild ungulates, and to gather information about the* ***probabilit****y and impact of those pathogens."* They are conducting a survey to establish the need for a risk assessment. Until they do that foundational task, they can provide no numbers for analysis and can't reasonably enter into a discussion of probabilities of disease transmission from llamas to wildlife.

Llamas' History in the Americas is Long and Well Documented

The CCH mistakenly presents llamas as new to North America and largely unknown. On page 15 of the paper they make the following statement: "*Given that SACs were first introduced to North America in the mid 1980's, and "health management and diagnostic medicine practices [in SACs in the North American context] are still relatively new (Crossley, Mock, Callison, & Hietala, 2012)", it is not unexpected to identify novel pathogens in SACs."* They fail to identify llamas' significant history in North America and fail to point out novel pathogens are being identified in many species. The issue with novel pathogens is, are they significant? For llamas, the answer to this point is "no".

Llamas are historically native to North America and migrated to the altiplano region of South America where they were domesticated and became prominent in the native culture and economy. After the Spanish conquest in the 1500's, Castillian sheep were introduced to the altiplano. Llamas comingled for 500 years with these sheep without cross infection or establishment of endemic disease. Llamas were brought back to North America in the late 1800's and were an exhibit species comingled with exotic animals from all over the world including many species of wild sheep and goats. For the next 40 years they coexisted with exotic and wild animal species without developing endemic disease or demonstrating disease transmission.

In the 1970's llamas became an industry based on their use as packing and companion animals. Extremely high prices spawned a rapid proliferation of the llama population and an equally rapid development of formal veterinary care and research. The result is a comprehensive reservoir of veterinary management information. This information, combined with their history in South America and their zoo history, supports the observation of U.S. owners and veterinarians that llamas are naturally healthy and largely free of disease.

Research is ongoing as the Morris Animal Foundation has matched funds raised by the llama and alpaca industries to fund $2.2 million of research since 1990. At Ohio State University the International Camelid Institute oversees both care and research of camelid species on an ongoing basis and a number of University Veterinary Teaching Schools have dedicated camelid medicine programs.

In the early 1990's camelid veterinarians were invited to join the American Association of Small Ruminant Practitioners. A growing number of llama (camelid) veterinarians needed a forum for exchange. Many came from a background of small ruminant practice and few had enough local llamas to focus their practice only on llamas. With the full understanding that camelids were not ruminants and taxonomically different, they were invited to join the existing organization as a forum for collaboration and exchange. Additionally, it provided knowledge, experience, and information to practitioners likely to encounter llamas/camelids as the industry continued to grow.

Ban Attempted in 1994

This survey builds on the same hypothetical disease projections for llamas that have come out of Western Canada wildlife veterinarians/managers without any supporting research or documentation for the last 20 years. This movement in the Northwest Territories (NWT), British Columbia (BC), and Alaska (AK) began in the mid-90's when Canyonlands National Park banned llamas based on the potential of disease transmission to Desert bighorn sheep. The ban was suspected to be without basis and prompted a thorough examination of disease in llamas, which established llamas harbored no endemic diseases [11](letter attached) and they were a safe species to allow in wildlife habitat. The

ban on the basis of disease was rescinded as part of a legal settlement and the furor died down everywhere but the NWT, BC, and AK where wildlife managers continued to pursue a basis for banning llamas.

Schwantje and Garde

There are two names that are repeatedly associated with this ongoing effort. The names are Dr. Helen Schwantje, a BC wildlife veterinarian, and Dr. Elena Garde, a NWT wildlife veterinarian. The basis of their work is to document pathogens in domestic sheep and goats that have the possibility of transmission to wild populations of sheep and goats and then ascribe those diseases to llamas, characterizing llamas as related small ruminants. Their work was peer-reviewed and soundly rejected by the llama and veterinary research community because they failed to acknowledge that llamas are from different taxonomic sub-orders and families than the sheep and goats. This separation provides a natural barrier to sharing diseases with true ruminants. [26] Dr. Murray Fowler-Camelids Are Not Ruminants. Additionally, no endemic diseases or consistently documented pathogens are identified within the llama population leaving them without meaningful threat of disease transmission to any species of wildlife. [2] ADF&G LETTER DR. MURRAY FOWLER APRIL 2012

Llama Researchers Disregarded

It is curious that with this reservoir of information and llamas' long history, wildlife veterinarians, particularly Dr. Schwantje and Dr. Garde, can't seem to access it. They lament the lack of veterinary history and disease data, yet when it is put in front of them, they can't seem to acknowledge or accept what is apparent. It seems it is the nature of wildlife veterinary medicine to work from a base of conjecture and projection because their subject species are wild, the environments are quite variable and doing controlled research is difficult, if not impossible. Given the hypothetical nature of much of their information base, they evidently feel entitled to dismiss or ignore the more structured and documented medical information that characterizes domestic animal species, specifically llamas.

Attached are statements from three leading llama researchers. Two are from the U.S. ([2]Dr.Fowler and [3]Dr. Johnson) and one is from Canada ([4]Dr. Adams). Fowler and Johnson have a combined 70 years of llama medicine and management between them and until recently were the pivot point of exchange for llama/camelid medical information nationally and internationally. They specifically address Dr.Schwantje/Garde's erroneous association of llamas with domestic sheep and goats, the lack of identified disease and transmission to wildlife species, the natural disease resistance of llamas, and the dangers and implications of a ban of llamas based on disease. They specifically dismiss diseases mentioned as possibilities in the CCH's survey and cite higher probabilities for presence and transmission of these diseases in other species, including humans. The statement from Dr. Adams of the Western College of Veterinary Medicine in Saskatchewan is particularly well stated, comprehensive, and concise.

…… it is inappropriate to lump llamas with sheep and goats with respect to infectious disease - this reflects a basic ignorance of the tylopod family. Camelids are not new nor exotic to North America - they originated in North America. The diseases listed as a risk posed by llamas are no different than a list that could be made up for any species entering the back country, not least, humans. For example,

every mammalian species harbors mycoplasma. Contagious ecthema, chlamydiosis and MAP in camelids are rare - far less than in humans.

Interestingly, in the attached papers from Dr. Schwantje and Dr. Garde cited in the assessment, the authors make the following statements:

> [5]Garde, E., et al. 2005. *Examining the Risk of Disease Transmission between Wild Dall Sheep and Mountain Goats and Introduced Domestic Sheep, Goats, and Llamas in the Northwest Territories*.
>
> On page 2 it states*, "Conversely, contact between llamas and wild Dall's sheep or goats may result in disease in wild species, but there is* ***insufficient data available to clearly assess the role of camelids as a source of disease*** *at this time (for additional information see Communicable Diseases Risks to Wildlife from Camelids in British Columbia)."*
>
> [6]Schwantje, et al 2003. *Communicable Diseases Risks to Wildlife from Camelids in British Columbia*.
>
> On page v (Executive Summary) it states *"Risks from camelids to wildlife in British Columbia remain* ***hypothetical*** *after this risk assessment, as no direct evidence was found to implicate camelids as sources of significant diseases in wildlife in BC or elsewhere."*

The CCH Survey

On page 6 the need for the assessment is stated. *"The need for an updated risk assessment has become even more apparent in recent years, with public pushback causing the BC government to replace a proposed province-wide ban on SACs in backcountry areas with a reduced ban restricted to thinhorn sheep and Mountain Goat ranges in the northern half of the province."*

It appears, (it is not clear) that the CCH was hired by the British Columbia Ministry of Forests, Lands, Natural Resource Operations and Rural Development (BCM-FLNRORD) which is the agency Dr. Schwantje works for. Looking closer, the CCH says it was *"Submitted to:"* the ADF&G and The Division of Wildlife Conservation (BCM-FLNRORD), but in the Executive Summary it says *"on behalf of"*. The CCH did the analytical work and presentation for Dr. Schwantje's 2003 Risk Assessment that was both inconclusive and dismissed on peer review.

The mandate to the CCH appears to be to find a problem to match with FLNRORD/Dr. Schwantje's solution of banning llamas. They (llama ban coalition) are losing the PR battle on the dangers of llamas and only got a partial ban that was unwarranted rather than a complete ban that was unwarranted. BC Llama owners are convinced the ban was about politics, special interests (outfitters/guides), and control of the wild sheep hunting industry. This seems to be corroborated by the final structure of the ban having curious proscriptions as a regional prohibition on the use of llamas specifically for hunting sheep during the sheep-hunting season.

Banning a user group demands a serious consideration, such as a disease threat, to be considered as a necessary measure. The CCH's assignment appears to be to try and validate and expand Dr.

Schwantje's 2003 work and her collaborative work with Garde in 2005 to implicate llamas with the pathogens attributed to domestic sheep and goats, but to do it on an analysis of camelids alone. This would revive her earlier work if they could disassociate with sheep and goats.

The CCH failed to separate from the sheep and goat association. They work off the papers written by Dr. Schwantje and Dr. Garde as the basis of the assessment and the potential diseases they identify are the same ones Dr. Schwantje and Dr. Garde identify in their papers. They offer no empirical research references or documentation of disease in llamas.

The pathogens they try unsuccessfully to identify as "emerging" in llamas are in fact the same ones they identify for small ruminants ie. domestic sheep, goats and wild ruminants. *M. ovipneumoniae, M. conjuntivae and Muellerius capillaris have not been documented in camelids, but are important pathogens of small ruminants, domestic and wild.*

Methodology

The internet search the CCH conducted is very suspect. It commences with 2007 going forward. The intent is threefold:

1. The preponderance of llama research and accumulation of disease data predates that cutoff. Llamas have been in the U.S. and Canada since the 1930's and became an industry in the 1970's, which prompted extensive research and documentation. The assessment uses the lack of significant findings from the search as documentation that llamas are unknown and an undocumented disease risk that needs to be studied and observed. In fact, their failure to identify any pathogens of significance emerging in the last 10 years combined with the existing and extensive body of research in the U.S. predating their search, corroborates the llama industry's position that no endemic disease has been identified or transmitted.

2. The truncation of the search window not only overlooks much of the early llama medical research and documentation, it avoids the Canyonlands Summit (a collaboration of the U.S. veterinary community and commercial cattle, goat, and sheep organizations) that concluded llamas were the least likely domestic species to present a disease threat to wildlife [11] (letter attached"). It is significant that the ban on basis of a disease threat was overturned by Canyonlands NP.

3. It also avoids citing some key research by wild sheep and goat researchers that established some of the diseases on the assessment's list of potential threats have not occurred or are not significant in llamas. Beginning in the early 1990's, Dr. Foreyt and later, Dr. Besser, of Washington State University (WSU) comingled wild sheep and llamas and documented them as not carrying Mannheimia haemolytica, Pasturella haemolytica, and M. ovipneumoniae. These pathogens are listed as the primary cause of pneumonias and subsequent die offs in wild sheep populations. These pathogens have the highest significance for proposing a ban.

Survey

-The CCH search of policies from other jurisdictions turned up nothing, which should have given them the idea that no diseases have been identified that require any policy management. There is no precedent or need for a ban.

-Their interviews with camelid disease experts are a mystery. Few notable names appear and conspicuously absent are the longest tenured and most notable llama researchers and institutions in the U.S. They are some of the same researchers on record discrediting the work done by Dr.Garde and Dr.Schwantje. [2,3,4] (See attachments.) Additionally, a comprehensive 700-page compendium ("Llama and Alpaca Care" *Medicine, Surgery, Reproduction, Nutrition, and Herd Health*) was published in 2014. There are 5 co-authors, 50+ contributing researchers and clinicians, and at least 10 University Veterinary Teaching programs involved in this compilation. The publication is not acknowledged in their search. That work standing alone would have greatly increased the information they sought. There is a significant volume of information left unused by ignoring the publication and failing to directly consult with the contributors.

-They cite wildlife managers as contributing to the assessment. Why they use wildlife managers in assessing disease in llamas is not explained. These managers can offer valid comment on the seriousness of the listed diseases in wildlife if introduced, but regarding the probability of llamas carrying disease or transmitting it to wildlife their statements are unsupported conjecture.

-The analyses from the diagnostic labs are random findings including seroconversions and titers, instances of isolated nonrecurring disease, disease in neonates or immunodeficient animals, and isolated culture results that seem indeterminate for disease identification and could be secondary bacteria or contaminants. These findings are obtained mostly from alpacas and not llamas.

Disease Transmission?

Without establishing any recurrent or endemic disease in llamas the CCH curiously sets out to determine the risk of llamas transmitting diseases that haven't occurred. The method used to determine that the probability is medium to medium-high risk is incomprehensible. Based on the probable effects of one of the listed diseases infecting wildlife, how serious would the effects be? Camelid researchers as well as wild sheep researchers have established those diseases, while significant in wild sheep are rarely if ever present in llamas. The risk should accordingly be quite low. A comet or asteroid hitting the earth would be destruction of the planet, but the probability of it happening is infinitesimally small. Using their formula, that event would be classified as a medium- to medium high- risk.

Emerging Diseases?

The assessment can't identify any diseases carried by llamas so they introduce a new exercise in conjecture, identifying emerging diseases. The CCH logic seems that because they can't identify any diseases present in llamas now, doesn't mean they won't develop some new disease that will be transmitted to wildlife. For them, it seems that a disease that hasn't occurred needs proof that it won't occur; a fool's errand proving a negative. The diseases they suggest as emerging are noted in both wild sheep and llama research as rare or nonexistent in llamas, but llamas remain suspect in their assessment.

Anecdotal Evidence?

The CCH's lack of success documenting disease from clinical sources causes them to introduce very questionable anecdotal evidence. Contagious Ecthyma (CE) is a disease that is visually remarkable because of the lesions it creates on the head of an infected animal. CE is endemic in Dall Sheep in AK, and it persists in the environment. It affects both wild sheep and goats and is often spontaneous in larger concentrations of animals, particularly if they have a concentrated mineral source such as salt blocks that facilitate transmission. "Salting" is a technique employed by some guides to bring sheep to their clients rather than moving clients to widely dispersed sheep. An Alaskan game processing guide also recommends hunters wear rubber gloves when processing sheep kills to prevent contracting Orf, the human manifestation of CE virus.

CE is very rare and atypical in llamas. Yet the CCH tries to link a report of a CE infection in a mountain goat as likely resulting from a llama passing through the goat's range on a hunt. They cite no confirmation of contact with the llama or the llama having clinical CE.

Mitigation and Prevention?

In the interest of being thorough, CCH dedicates two and a half pages to prevention, treatment, and mitigation of the diseases they failed to prove as present in llamas. They construct a table of strategies for each of the diseases they unsuccessfully explored as possibly infecting llamas. They lament the lack of proven tests and that there is not enough known about the diseases not present in llamas, thus complicating the formulation of the strategy. The primary complication is no disease incidence to work from.

Disease Transmission From Llamas Still Hypothetical

This assessment is supposed to update the earlier risk assessments by Dr. Schwantje and Dr. Garde that concluded disease transmission from llamas to wild sheep is hypothetical and without documentation. It's remarkable that this assessment is fraught with the terms: *"potential", "limited", "lack", "high uncertainty", "no documented cases", "no evidence", "anticipated impact", "emerging", "not completely understood", "could not conclusively assign causation", "inconclusive", "presumed", "hypothesized", "lack of documented transmission", "extrapolating", "dead end hosts".* This assessment has established that disease transmission from llamas to wild ungulates remains hypothetical and without documentation.

The reasoning the CCH presents regarding the assignment of risk for the identified diseases is disqualified by the conclusions and documentation of llama researchers, wild sheep researchers, and their own findings.

M. haemolytica and Pasteurella spp.

The CCH states*: "M. haemolytica and Pasteurella spp were assigned a medium probability of SAC infection. There is no specific information about prevalence of M. haemolytica and Pasteurella spp in SACs in western North America, however asymptomatic infections in SACs are probable, and both organisms are common in cattle and sheep in North America."*

This statement is in direct conflict with the findings of respected wild sheep researchers at Washington State University. It's particularly notable that given the association between M. ovipneumoniae (M. ovi) and Pasturella spp. infections that subsequent M. ovi research reinforces the validity of that research. The research also disqualifies the speculative characterization of llamas

(camelids) as asymptomatically infected. They neither demonstrate active disease or presence of the pathogens which means they are not susceptible to infection and are not a reservoir for the pathogen.

[12] M.Woolever and T. Schommer cite research (2001): **A Process for Finding Management Solutions to the Incompatibility Between Domestic and Bighorn Sheep**:

"All ungulates, except llamas, carry some strains of P. haemolytica [7](Foreyt 1995). However, experimental exposure of bighorn sheep to elk, deer, mountain goat, cattle, llama, and domestic goats has not resulted in pneumonia in bighorn sheep [7](Foreyt 1992, Foreyt 1993, Foreyt 1994). Bighorn sheep also appear to be attracted to domestic sheep and goats, but not cattle or llamas. Since Pasteurella transmission requires nose-to-nose contact or transfer of mucus through coughing or sneezing, it is most likely to occur between bighorn sheep and domestic sheep or goats."

[21]**A Review of Disease-Related Conflicts Between Domestic Sheep and Goats and Bighorn Sheep_USFS September 2008** (USDA Forest Service RMRS-GTR-209. 2008)

"Planned pen experiments that put captive bighorn sheep in contact with other species do not support the stress hypothesis. Foreyt (1992a, 1994) and Foreyt and Lagerquist (1996) conducted eight independent contact experiments involving bighorn sheep penned with: 1) elk, white-tailed deer, and mule deer; 2) elk alone; 3) domestic goats; 4) mountain goats; 5) llamas; 6) cattle; 7) horses; and 8) steers. Of the 39 bighorn sheep tested in these experiments, only two died. One was an old female whose death was most likely due to a tooth abnormality that adversely affected her feeding ability. The other death was a bighorn sheep in the pen with the steers that died of pneumonia (Foreyt and Lagerquist 1996). These findings suggest that the presence of other species in pens itself is unlikely to lead to bighorn sheep deaths and that species other than domestic sheep are considerably less likely to transmit microbes fatal to bighorn sheep. This latter conclusion is consistent with a lack of historical observations or circumstantial data linking such species to bighorn sheep die-offs"

Statements made at the Wild Sheep Foundation (WSF) Thinhorn Sheep Summit II Synthesis and Summary April 2017: *MOVI IN WILD SHEEP: MANAGEMENT-RELEVANT RESEARCH - Presented by Dr. Peregrine Wolff, State Veterinarian, NDOW, for [20]Dr. Tom Besser, Rocky Crate Chair, WSU*

[10] "There have been numerous pen studies over the past 25 years that have mixed domestic sheep with BHS; greater than 95% of co-mingled BHS have died. When other studies mixed cattle, horses, and llamas with BHS, less than 10% of the BHS died. Tom (Besser) repeated some of these same pen studies with M. ovi-negative DS, and found no die-offs in BHS. (M. ovi is the field term for M. ovipneumoniae)"

The following is posted on the WSF website:

"Mix domestic sheep with bighorn sheep – pneumonia outbreak
Greater than 95% bighorn sheep death loss
Mix cattle, llamas, or horses with bighorn sheep: No pneumonia outbreaks (occasional individual disease)
Less than 10% death"

Besser and others, J Wildlife Dis, 2012; PLOS ONE submitted; Kagudas, WSU PhD thesis, 2016

Pneumonia in wild sheep is the foremost cause of die offs in their populations. Pneumonia in llamas as a primary infection is rare. Research comingling llamas and wild sheep demonstrate llamas to be the least likely domestic species to carry the pathogens associated with these sheep pneumonias. M. ovipneumoniae as a pathogen predisposing wild sheep to bacterial infections and Pasturella spp as the most frequently noted and deadly infections following M. ovipneumoniae shows no prevalence in llamas. The CCH survey has a rather striking conflict with documented research and clinical observation.

CE (Contagious Ecthyma)
The CCH states: "*CE has a medium-high probability of SAC infection, as infection can persist for weeks to months, and the disease is common among small ruminants in western Canada."*

Dr Gregg Adams

[4] *"Contagious ecthyma, chlamydiosis and MAP in camelids are rare - far less than in humans."*

Dr. Larue Johnson

[3] *"Contagious ecthyma (CE) is a very well established viral disease in sheep and goats. It has very rarely been reported in llamas."*

[10] THS Summit II, page 21, Helen Schwantje: "*We used mineral salt blocks to draw BHS away from a highway, but the bighorns got a high amount of orf (contagious ecthyma); therefore, I feel that concentrating animals can lead to disease-transmission issues*."

[10] THS Summit II, page 21, Bill Jex: *"In BC, I believe that concentrating wild sheep is dangerous, from a disease perspective. BC has outfitters that are putting out their own (mineral) blocks, with the thought that it will produce better rams."*

Given that CE is endemic in sheep populations, persistently present in their habitat and extremely rare in llamas, why is CE even considered? It is very puzzling to include CE when ADF&G, Division of Wildlife Conservation is represented as a participant/solicitor in the assessment. Dr. Kimberlee Beckmen is a veterinarian in that division and is a coauthor of a recently released research paper, [25] Orf virus infection in Alaskan mountain goats, Dall's sheep, muskoxen, caribou and Sitka black-tailed deer, that documents the high prevalence of CE as a zoonotic infection freely transmitted between members of the cervidae and bovidae family (sheep and goats both domestic and wild) and humans. The parapoxvirus genus is the pathogen implicated. Camelpoxvirus, [26] Dr. Murray Fowler- Camelids Are Not Ruminants, is the virus implicated in CE infections in camels in Africa and Asia and rarely infects llamas.

Considering llamas as a vector species for transmission of parapox virus/CE to wild sheep is without scientific support. It seems poorly considered for wild sheep advocates to be seeking separation of llamas from wild sheep on the potential of transmission of the parapox virus. Researchers and biologists routinely engage in management practices that are conceptually a highly effective method of transmitting parapox virus from sheep to sheep as well as from humans to sheep.

Routine trapping and handling of groups of wild sheep for testing and transplanting places typically dispersed sheep populations in close contact for extended periods under stressful conditions. The likelihood of endemic CE being transferred from affected sheep to healthy sheep through direct contact is necessarily increased. Add the human handling element of the testing and transmission is even more likely. Controlling a captured sheep typically requires grabbing the animal's horns. The dermal interface between the horns and the head fiber is a reservoir for the parapox virus that typically sees active infection initiate on head and facial areas. Transferral of infected skin tissue on hands, gloves, blindfolds, etc. from one sheep to the next is unavoidable. Zoonotic transmission between sheep and humans makes possible transmission from handlers to a previously CE free sheep population a possibility, a much greater possibility than controlled llamas passing through dispersed sheep populations causing transmission.

BVDV (Bovine Viral Diarrhea Virus)

The CCH states: "*BVDV was assessed as high probability of SAC infection because serosurveillance in North America shows moderate exposure in SAC herds, and it is ubiquitous in cattle in western North America; infected camelids have been demonstrated to transmit virus to other animals; PI and acutely infected animals shed large amounts of virus; and there is environmental survival. It was ranked as having low impact to wild ungulates by experts, giving an overall medium risk"*

BVDV is rare in llamas. The sero-converters mentioned as significant are not infections. These are animals that have been exposed to the virus probably through contact with cattle, but developed immunity, not the disease. The actual infections noted were in a single herd of alpacas. The persistently infected alpacas were crias infected in utero and subsequently did not develop titers for disease resistance. They were contagious, but tended to be weak and expired as neonates, limiting their impact. Exposure to uninfected herd mates would elicit antibody production and immunity. Infection required exposure of a female during a narrow window of the gestation period and only her fetus would be infected and without immune response.

M. avium paratuberculosis (Johne's) (MAP)

The CCH states: "*Johne's Disease was assessed as medium-high probability of SAC infection because the bacteria is known to affect SACs; it is ubiquitous in livestock in western North America; it can be shed by animals without overt signs of disease during a long pre-clinical infection; and it has long environmental persistence."*

[12] Comments from Western Association of Fish and Wildlife Agencies (WAFWA) Wild Sheep Working Group; 2001

> *"There has been ongoing concern about Johnes disease transmission from llamas to bighorn sheep. However, there is no evidence to support the concern. Only 4 confirmed cases of Johnes disease have been documented in the United States in a population of approximately 100,000 llamas. Transmission requires repeated and prolonged nasal contact to high concentrations of bacteria (10-8 per gram). Animals shedding this number of bacteria are in the terminal stages of the disease. They are emaciated and weak which is incompatible with a viable pack animal. In short, this is not a problem for our bighorn sheep herds. For additional information, refer to the Johnes Disease Workshop Proceedings March 1996 available from Melanie Woolever."*

Comments from Colorado State University Veterinary Teaching Hospital Faculty:

"To date, only four cases of Johne's disease have been documented in llamas, although a thorough search of the literature indicates one additional case where typical lesions of the disease were noted but the organism was not specifically identified. Not only has the disease been infrequently found in llamas in North America, but the reported cases have tended to be unusual in being quite young or quite old, as compared to the typically affected cow or sheep. The course of the disease in llamas has been short, with death occurring shortly after clinical suggestion of disease. It is most likely that the low reported incidence of this problem in llamas is a true representation of the disease in the species because it is unlikely that the disease has been inadvertently overlooked. By comparison with our domestic ruminant livestock, llamas have tended to maintain a high individual monetary value and, therefore, death and disease in this species has typically been closely scrutinized using standard but extensive diagnostic methods. Llamas are frequently placed in close contact with domestic ruminant livestock and thus should have ample opportunity to contract the disease and show signs if they were highly susceptible to this problem. While the low reported incidence of Johne's disease in llamas is significant in itself suggesting that llamas are an extremely infrequent carrier of the M. paratuberculosis microorganism."

[11] *Summary letter May 5, 1994 to the Canyonlands Veterinary Symposium signed by Colorado State University Veterinary Teaching Hospital faculty:*
Franklyn B Garry, DVM, MS Assoc Professor Food Animal Medicine and Surgery
David M. Getzy, DVM, Director Diagnostic Laboratory
Terry Spraker, DVM, PhD, Associate Professor, Diagnostic Laboratory
LaRue W. Johnson, DVM, PhD. Associate Professor and Section Chief, Food Animal Medicine and Surgery

Johne's disease is rare in llamas. They do develop titers, but that only indicates exposure. Johne's was the disease threat cited as the reason for banning llamas in Canyonlands NP. Johne's disease in llamas received extensive analysis and the ban was lifted upon determination no significant threat existed. It was determined Johne's infections in llamas were rare, atypical, and terminal. The disease incidence has continued to be rare and limited to endemic areas.

BTV-Blue Tongue Virus

The CCH states: "*BTV was assessed as medium probability for SAC infection and risk of transmission in the limited geographic range and season for the vector, and was assessed as high potential impact to wild ruminants."*

Blue tongue is rare in llamas and dependent on an arthropod vector for infection. Llamas are not a carrier of BTV and the midge vector does not typically occur in BC. Blue Tongue virus is recognized as a cattle pathogen. Other species can be infected, but cattle prove to be the source of the infections. This would be the source for any wild sheep infections as well.

M. bovis - Mycobacterium bovis

CCH states: *"M. bovis was assessed as low probability of SAC infection because it is extremely rare in any animal species in Canada, and the disease is highly unlikely in a SAC born in Canada."*

They rank it as a medium risk in the face of their own statements. Occurrence of M. bovis infections in llamas is similar to that in horses and the disease is not of consequence. The disease has been infrequently documented in endemic areas such as the UK.

A Puzzling Conclusion

The CCH fails to identify a single disease or pathogen that would necessitate a risk assessment, yet they proceed to recommend a llama ban based on their survey. This seems very presumptuous. The shortcomings of their methodology and interpretation, apparent throughout their survey, expose a lack of expertise in the arena of disease epidemiology. To proceed to a recommendation as drastic as banning a species and user group from public lands based on their work is serious over reach. That recommendation is not theirs to make. Peer review from the veterinary community, specifically including that portion focused on llama/camelid medicine is required to make a recommendation of this magnitude.

Yet the CCH concludes: (Page 31) "*In summary, we assessed the composite disease risk posed to wild ungulates by SACs accessing backcountry areas as medium-high with medium associated uncertainty. This assessment was driven primarily by the high impact and the medium-high risk posed by the respiratory pathogens, the medium-high risk posed by CE, and the medium risk posed by Johne's Disease. Mitigation could be practically undertaken to reduce risk posed by respiratory pathogens, although mitigation for CE and Johne's Disease is much more challenging. It is important to note that over time new pathogens might emerge in SACs that create significant new risk not discussed in this report. In particular, if SACs were documented to be susceptible to infection with M. ovipneumonia or M. conjuntivae, this would increase risk"*

Executive summary page 6:
*"Until more information is available**, banning camelids from key wild ungulate habitat is the most effective risk reduction strategy**. However, where access is permitted, careful diagnostic screening for pathogens of concern and mitigation activities might be beneficial in partially reducing risk."*

This afterthought regarding screening seems odd in view of the fact no pathogens have been identified. How would the pathogens to be screened be determined and what would the screening process be for the pathogens yet to be determined. Obviously, since the risk assessment is hypothetical, CCH doesn't feel compelled to supply specifics.

Failure to Consider the Risks of a Llama Ban

On page 6, opening paragraph of their survey, the CCH states: "*Because risk perception can vary between different stakeholders for a variety of social, political, and economic reasons, cost-benefit analysis and surveys on social values may also be conducted to aid in decision making"* Then CCH moves to a discussion of how insignificant the BC camelid industry is and it's reasonable to sacrifice that minor economic interest on behalf of the welfare of the wild sheep and goats. Then they launch into the task they were assigned; to establish llamas as a disease threat to wild sheep. A valid risk assessment would engage all stake holders for input to assure full consideration of all contributing factors rather than arbitrarily dismissing and ignoring some stakeholders as insignificant. This is a particularly significant error considering the stakeholders ignored are the stakeholders affected.

There is an additional glaring oversight that further disqualifies the CCH recommendation: They failed to identify many of the significant stakeholders impacted by such a recommendation. Though the assessment has failed to establish any disease threat to wild sheep from llamas, CCH tries to support their precautionary recommendation to ban llamas on the basis it's the safest approach and there's really nothing to be lost. Llamas are not of significance in BC and economic damage will be minimal. It seems they've lost site of the fact that wild sheep are a North American population and widely distributed. The Wild Sheep Foundation is an organization that promulgates disease information throughout all the sheep ranges and essentially coalesces policy actions across North American land and wildlife management agencies. It is impossible to post this recommendation and not have it spread through all management agencies with wild sheep populations based on unfounded precedent.

The CCH should have done a risk assessment on the comprehensive damage their recommendation will create. It's conceivable, if they had recognized the implications of their recommendation, they would have been more objective and thorough in collecting their data and thought more critically about their recommendation.

Though it is without basis, the recommendation sets in motion and demands a de facto zero tolerance policy. Alaska BLM-EIRMP banned llamas as a disease threat to wild sheep. They have banned the species least likely to transmit disease to wildlife and refer to this CCH document as "after the fact" validation for their unwarranted action(s) of a "Record of Decision". Inevitably, all other species must now meet this standard of protection for wild sheep and goats. Many other species, including humans, pose a greater threat than llamas.

The distribution of wild sheep includes areas throughout the Western U.S., Canada, and AK. If the CCH recommendation is followed, the same measures will necessarily be considered and implemented in various management units throughout the entire region. This is not a hypothetical risk, it is a reality. When the SE-Utah Group of Canyonlands-Arches - Zion NP's ban was imposed; within weeks ban proposals were being planned in Glacier NP, Kofa National Wildlife Refuge, Orange Cliffs-Glen Canyon National Recreational Area- BLM, and Kings Canyon NP. Even a far-removed AK-NPS unit, felt validated considering a ban. [19] (see FOIA memo)

Only testimony by veterinary researchers, scientists, camelid experts, and the llama, cattle and sheep industry that disqualified the ban's merit, convinced the Department of the Interior to abandon support for the action and stop the growing momentum of the ill-advised ban. These management units were reacting to what they thought were legitimate concerns for their wild sheep populations. (Through a FOIA request it was discovered the "domino effect" from this SE-Utah Group proposal to ban llamas proved to be factual, not hypothetical. AK-NPS was part of this discovery.) https://www.packllamas.org/pdf/akban/foia_jeffkarraker_to_walter_dabmey_nps_1994.pdf These agencies assumed the action had merit and they needed to extend the same protections to their wild sheep populations. Upon finding the assumption wrong, they quickly reversed their positions, distancing themselves from the issue.

The Stakeholders and Impacts

The Llama Industry will be heavily impacted if this recommendation stands and is used in management of wild sheep ranges. While the llama industry is fledgling in BC and AK it is

established and growing in the U.S. Because of llamas' low impact and compatibility with fragile environments, they are becoming the pack animal of choice for hunters, fishermen, and family/limited capacity recreationalists. They enjoy status as an historical, proven pack animal as does the horse, in the U.S. Additionally, public lands managers looking to minimize impacts are encouraging their use as a pack animal over traditional equid stock and employing them for maintenance of their own wilderness lands as well as allowing special access for maintenance into areas otherwise closed to pack stock use. If llamas are put under the false cloud of disease risk, their use will diminish and there will be a domino effect throughout the breeding industry. This would be a loss not only to llama owners and packers; it will be a big loss for our public lands.

Hunters Using Llamas will be unnecessarily compromised in hauling in camps and hauling out meat on their hunts if denied access the pack llama currently affords them. There is wide distribution of wild sheep (WS) in the higher and drier reaches of all Western U.S. public lands. A ban will necessarily affect all hunters using llamas as the ranges of common game species typically intersect and have significant overlap with WS ranges.

Hunting with llamas is growing rapidly in the western U.S. Serious hunters are serious conservationists and they appreciate the llama's low impact and compatibility with the wilderness environment. As serious hunters, they have a high success rate and need the llama's packing ability to move meat from remote kill sites. Llamas' versatility and natural adaptation to rugged off trail conditions are a big asset. Hunting guides are in process of retrofitting or starting up using llamas to lower their impacts and liability and to drastically cut maintenance costs of traditional equine operations. They specifically cite the llama as essential to more effectively guide and service low impact sheep hunts.

Fishermen and Recreationalists often target destinations in wild sheep ranges. High lakes, rock formations, and stunning scenery, characterize wild sheep country and are necessary elements for fishing, family camping, climbing, photography, etc. Accessing these areas for these activities requires traveling significant distances and carrying extra equipment. The llama is the perfect low-impact solution. This will be severely curtailed if the CCH recommendation is followed by public land managers.

Domestic Livestock Industries will most certainly be impacted by an action to ban llamas. Sheep and goats are currently under scrutiny and in process of separation from WS ranges. Cattle aren't being considered a threat at this point. However, if they are put to the standard used to ban llamas, cattlemen should prepare for the inevitable ban on cattle grazing in or near wild sheep populations. Taxonomically, llamas are from a different suborder and family and have a natural separation from sheep and goats, both wild and domestic species. This has been ignored even though no endemic disease or transmission to wildlife has occurred.

Cattle, on the other, hand are from the same taxonomic family (bovidae) as sheep and goats and do not have the natural taxonomic separation that llamas do. The pathogens cited in the CCH survey as potentially ("inconclusively" is the operative word) present in llamas are conclusively present in cattle. BVDV, M. bovis, MAP, BTV, & PI 3 are considered prevalent and endemic in cattle and transmissible to other species, wild and domestic. Pasturella spp are often identified in bovine pneumonias. The implications are obvious and the consequences of banning cattle, staggering.

Equine Species enjoy taxonomic separation from sheep and goats and subsequent separation from common pathogens just as llamas do. While pneumonia is relatively rare in llamas it is relatively common in horses. They have a number of species-specific viruses that weaken their lungs and allow the establishment of bacterial pneumonias that are serious. Pasturella spp. can cause these secondary infections and affected horses present a contact risk for wild sheep.

The greater threat posed by horses to wild sheep populations is their natural lack of adaptation to the high environments in which sheep exist. High feed consumption, corresponding high fecal production, residual supplemental feed stuffs, invasive plant species from supplemental feed, and degradation of trails and picketing areas is significant, and a negative impact on wild sheep populations. Feral horses probably have the greatest impact on wild sheep because they markedly reduce the amount of forage available and degrade the overall environment through overgrazing and resulting erosion.

Humans have the potential to negatively impact wild sheep through disease transmission and stress. Humans with Crohn's disease and shedding M. avium paraTB; active or latent M.bovis infection; immuno-compromised individuals; drug users; or persons translocating from M. bovis/MAP endemic areas all have the potential to transmit these mycobacterium spp. to wild sheep populations.

Mycobacterium, in general, are not highly communicable, but are hard to eradicate from an infected individual and they are persistent in the environment. The human vector dynamic is what makes the actual transmission to wild sheep a more significant possibility with humans than other species.

The wild sheep ranges in AK and BC are considered free of mycobacterium. Llamas rarely have mycobacterium infections and the rare animal that has one typically deteriorates rapidly and dies quickly without an opportunity to enter a wild sheep range. An infected llama is a terminal host. Llamas in AK would be a static population, unexposed to animals of any species from endemic areas so they have little potential as a reservoir or vector.

Conversely, humans that enter sheep habitat, particularly in AK and BC, are often translocated hunters, guides, photographers, researchers, etc. that come from a multitude of locations around the world, some of which are endemic for MAP and M. bovis. They could be subclinical, in active treatment, or carrying contaminated gear or clothing, but have the potential to shed the pathogens in the environment.

Direct contact with wild sheep within their habitat would be facilitated when wild sheep raid human campsites and scavenge salt passed in human urine. High salt content in human urine secondary to highly seasoned food, electrolyte drinks, and preservatives is recognized by wild sheep and goats and they become conditioned to patrol human campsites. If a person in a camp is shedding mycobacterium spp. the sheep will be sorting through areas where urine and feces, as well as sputum and mucous are deposited. These are the mediums with the mycobacterium spp. in high enough concentrations to effect inoculation of a wild sheep. If llamas are banned because Mycobacterium spp. are listed as pathogens, by extension it requires serious consideration to ban humans. Consequences are self-explanatory.

The Wild Sheep Foundation (WSF) Seeks a Llama Ban

The Wild Sheep Foundation has declared they are in active pursuit of a ban of llamas in all wild sheep ranges. In their document, [22] North American Conservation Vision 2020 pg 4 sec. 2.6 Goal #2: *"**Based on recommendations of the September 2017 BC Camelid Risk Assessment, advocate for no use of domestic sheep, goats, llamas, alpacas, etc. as pack animals used in thinhorn sheep range for hunting, trekking, weed control, or other purposes."*** This statement is repeated under the Big Horn Sheep Goals: Page 6 sec 2.6, Goal #2

The September Camelid Risk Assessment refers to the CCH Risk Assessment that was supposedly released October 24, 2017. WSF is trying to create the appearance that seeking the llama ban is a byproduct of the Risk Assessment recommendations. The April, 2017 WSF THS Summit transcript contains inquiries to Dr. Helen Schwantje regarding the assessment's release. She indicated it was in draft stage at that point. As part of the WSF cohort, she likely had the assessment well ahead of the actual release. She stressed the need for the assessment to turn public sentiment and to pursue legislation to ban llamas. The assessment is manufactured science, custom built as a base from which WSF can pursue a llama ban.

It's interesting to note "etc." is included in the ban they are seeking. Is "etc." a disease risk? Or is this just an indication of how precise and well-documented they are as they apply this decidedly lacking reference document. It's suggestive that the WSF is not done with banning species and user groups and is leaving their options open.

A visit to the WSF website reveals a heavy focus on hunting wild sheep. It's apparent that wild sheep research is an emphasis to the extent that it supports an expanding population of sheep for hunting. It also reveals an upper income membership and a strong tie to wildlife management and research agencies as well as wildlife non-government organizations (NGO's). Its membership has a very strong representation of guides and outfitters that provide expensive hunts. There is a rather bold emphasis on political access and direction of legislation favorable to their interests.

It is clear that the WSF controls the wild sheep hunting industry. Nothing happens in the arena of wild sheep hunting and management without either the prompting or support of the WSF. They have actively sought and participated in the elimination of domestic sheep and goats from wild sheep ranges. They have done so on the basis of scientific research and evidence of disease transmission from the domestic sheep to wild sheep. It's now apparent WSF wants to ban llamas from wild sheep habitat, lacks a scientific basis, and will not let that deter their agenda. The CCH risk analysis is their attempt to create the illusion of a scientifically demonstrated need for a ban.

A Long History of Opposing Llamas

WSF's desire to ban llamas became apparent in 1994 when the Canyonlands ban was implemented after a meeting of the Desert Bighorn Sheep Council. Unmeasured comments made by Dr. Terry Spraker, a Colorado State University pathologist that implicated llamas with disease transmission to wild sheep prompting the ban. After thorough research by a collaboration of the veterinary community, the ban was overturned and llamas have subsequently been afforded unconditional access to public lands and not considered a disease threat in North America.

The acceptance of this conclusion was grudging in the wild sheep community in AK and BC. In 2003, Dr. Helen Schwantje published her *Communicable Diseases Risks to Wildlife from Camelids in British Columbia*. This was followed by Dr. Elena Garde's 2005 expansion of Dr.Schwantje's paper,

Examining the Risk of Disease Transmission between Wild Dall Sheep and Mountain Goats and Introduced Domestic Sheep, Goats, and Llamas in the Northwest Territories. Both papers termed their findings "inconclusive" but peer review relegated them to status as fundamentally flawed conjecture. They failed to acknowledge that llamas are from different taxonomic sub-orders and families than the sheep and goats and lack any shared or endemic disease presence.

Fifteen years later, with no disease emergence in llamas, this conjecture remains the go to reference for any WSF or The Wildlife Society-AK (TWS-AK) position statements that include llamas with sheep and goats. WSF and TWS-AK do not advocate banning equids and defend their use based on their taxonomic separation from sheep and goats. Yet neither of these "science driven" organizations can make the connection that this same principle erodes the basis on which they advocate banning llamas. They steadfastly equate the camelids (llamas) with bovids (sheep and goats).

It is of interest that the only significant research and analysis of disease in wild sheep outside the direct purview of WSF funding is done by the Western Association of Fish and Wildlife Agencies (WAFWA) Wild Sheep Working Group (WSWG) and the American Association of Wildlife Veterinarians (AAWV). They advocate separation of sheep and goats based on research over the last 25 years that points to domestic sheep and goats as carriers of the lethal pathogens Mannheimia haemolytica and M.ovipneumoniae. The same research demonstrates llamas carry neither pathogen. Neither organization references the conjecture of Dr. Schwantjes 2003 risk Assessment or Dr. Gardes follow-up conjecture in 2005. Any position papers these two groups sign do not reference llamas as a disease risk.

Furthermore, the WSWG in their 2016 document [27] THINHORN SHEEP CONSERVATION CHALLENGES AND MANAGEMENT STRATEGIES FOR THE 21st CENTURY on page 16 defines the effective separation as… *"Effective separation is defined as spatial or temporal separation between thinhorn sheep and domestic sheep or goats. Reducing the potential for association between those* ***taxa*** *and the likelihood of transmission of pathogenic organisms or parasites between species is critically important. Maintaining effective separation is presently the only meaningful tool available for minimizing pathogen transfer and the risk of respiratory disease."*

Clearly, this states that spatial or temporal separation between domestic sheep and goats and wild sheep is applied to the taxonomic sub family of Caprinae. It does not apply to the taxa (families Equidae or Camelidae). Yet, the WSF persists in recommending spatial or temporal separation of llamas as if they belong to the same taxa (sub-family Caprinae).

TWS-AK and WSF-AK Inconsistencies

The Wildlife Society (TWS) needs to confer with their Alaska chapter regarding their advocacy of banning llamas from wild sheep ranges. In 2015, TWS & American Association of Wildlife Veterinarians (AAWV) issued a joint statement recommending separation of domestic sheep and goats from wild sheep ranges that does not mention llamas.

By contrast, in 2013 TWS-AK issued two position statements: one from [13]Jim Herriges, and one from [14]Jerry Hupp that include llamas in their recommendation for separation along with domestic sheep and goats. This was based on the Dr. Schwantje/Dr. Garde papers that included llamas on

erroneous speculation they carried the same diseases as the sheep and goats. Hupp even goes so far as to exempt equine stock on the basis of taxonomic separation of species, the very basis that disqualifies the Dr. Schwantje/Dr. Garde speculation he cites for llamas.

Hupp's position paper was sent as basis for policy to: Mr. Geoffrey L. Haskett, AK- Regional Director U.S. Fish and Wildlife Service. Cc: to Refuge Manager, Arctic National Wildlife Refuge: Refuge Manager, Kenai National Wildlife Refuge: Refuge Manager, Kodiak National Wildlife Refuge: Refuge Manager, Tetlin National Wildlife Refuge).

The [15]WSF/WSF-AK 2016 Executive Summary issued jointly with AAWV and TWS-AK recommends separation of domestic sheep and goats from wild sheep ranges and does not specifically mention llamas. Yet this summary references the [13]Jim Herriges (2013) REDUCING DISEASE RISK TO DALL'S SHEEP AND MOUNTAIN GOATS FROM DOMESTIC LIVESTOCK POSITION STATEMENT - THE ALASKA CHAPTER OF THE WILDLIFE SOCIETY that includes llamas. Was AAWV aware of this? Kevin Kehoe who signed the joint Executive Summary omitting llamas on behalf of the WSF-AK, then forwarded this reference to the Herriges paper advocating banning llamas to the ADF&G. The ADF&G posted it to their website in 2016.

It is also of note that the Herriges TWS-AK paper was used as the basis of the unsuccessful 2015 AK-NPS ban initiative and is cited as the sole documentation for the 2016 AK-BLM- EIRMP ban that is currently in effect. It is of note that Herriges is an employee of that BLM-EI jurisdiction.

TWS and WSF stand on their scientific approach to wildlife management. Science is based in curiosity, truth, and process. Those seem in short supply when llamas are the topic.

15 Kevin Kehoe (2016) AK- Wild Sheep Foundation. **Disease Risk to Dall's sheep in Alaska Executive Summary**. Kevin Kehoe, President, Alaska Wild Sheep Foundation, Anchorage, AK, Kevin Hurley, Conservation Director, Wild Sheep Foundation, Bozeman, MT, Dr. Peregrine Wolff, President, American Association of Wildlife Veterinarians, Reno NV, Alaska Chapter of The Wildlife Society, Anchorage, AK).

16 Clay Brewer (2015) **The Wildlife Society & American Association of Wildlife Veterinarians Joint Issue Statement.**

[13] Jim Herriges (2013) **REDUCING DISEASE RISK TO DALL'S SHEEP AND MOUNTAIN GOATS FROM DOMESTIC LIVESTOCK POSITION STATEMENT** - THE ALASKA CHAPTER OF THE WILDLIFE SOCIETY.

In 2016, Kevin Kehoe, President of WSF-AK gave this same document to the ADF&G who subsequently published it on-line.

14 Jerry Hupp (2013) **THE WILDLIFE SOCIETY - ALASKA CHAPTER - Position Statement** (To: Mr. Geoffrey L. Haskett, AK- Regional Director U.S. Fish and Wildlife Service. Cc: to Refuge Manager, Arctic National Wildlife Refuge: Refuge Manager, Kenai National Wildlife Refuge: Refuge Manager, Kodiak National Wildlife Refuge: Refuge Manager, Tetlin National Wildlife Refuge)

WSF Desire to Ban Llamas is not Supported by Western Association of Fish and Wildlife Agencies (WAFWA), Wild Sheep Working Group (WSWG) Recommendations.

[17] The WAFWA- WSWG recommendations for 2012 address the disease transmission from domestic sheep and goats to wild sheep populations. It specifically mentions Mannheimia haemolytica and M ovipneumoniae as the identified pathogens. Nowhere in the recommendations does it mention llamas. This would be expected since llamas have been demonstrated in exposure trials to not carry or transmit the identified pathogens or demonstrate any endemic diseases enable transmission as an intermediary carrier.

It's notable that Kevin Hurley and Dr. Helen Schwantje are members of the WSWG crafting these recommendations. Kevin Hurley and Dr. Helen Schwantje, in their work with the WSF are on record in the 2017 THS Summit transcript favoring a ban of llamas: Hurley, by fiat of opinion, and Dr. Schwantje through her 2003 Risk Assessment and now her initiation and oversight of the CCH risk assessment. Their stated positions at the THS Summit clearly contradict the WAFWA position they defined with their participation

THS Comments Regarding the Risk Assessment and Banning Llamas

Searching the transcript of the WSF [10] Thinhorn Sheep Summit II Synthesis & Summary held in April 2017 is revealing. There has always been an undercurrent of regional opposition to llamas, but it gains full exposure in this document. Comments at that summit regarding llamas were mostly focused on banning them and anticipating the CCH Risk Assessment as a tool to do that. It is curious that names of biologists, vets, organizations, outfitters and guides, and wildlife management agencies that appear to be independent of one another organizationally, function under the sub-rosa umbrella of the WSF regarding their wild sheep involvement and common agenda. It is in full view in their pursuit of a llama ban.

Using Risk Assessment to Ban Llamas

Comment:

Page 5: In BC, Dr. Helen Schwantje with the Ministry of Forests, Lands, and Natural Resources Operations (MFLNRO) indicated we don't know a lot about THS pathogens. Dr. Schwantje believes Movi could be very important, but it has never been found in Stone's sheep. Thirteen sheep (10 ewes, 3 rams) from the Dease Lake area (captured/tested in February 2017) were all found to be negative for Movi; that information will be used to compare THS pathogens with BHS. ***Dr. Schwantje and colleagues are currently updating a 2003 Risk Assessment for Camelids. They are looking at opportunities for legislation that removes flocks in some high -risk areas.***

Comment:

> *Helen Schwantje: "In BC, we are working to update a 2003 Camelid Risk Assessment; hopefully, this update will give us some resolution to the camelid question."*

The "camelid question" is the exclusive domain of the WSF. Nowhere else is this question posed. There seems to be tacit understanding of what the camelid question is. It is also of note, when WSF makes mention of packing with domestics it refers to pack llamas and pack goats, but not horses.

This is explained on page 3 of the summit transcript. All jurisdictions reported significant progress toward maintaining or achieving effective spatial and/or temporal separation between domestic sheep, domestic goats, alpacas, and llamas collectively referred to as DS (Domestic Species) and THS.

Obviously, Dr. Schwantje was actively involved in the assessment and clearly wants to move to legislating a ban using that report. It appears she knows it is going to recommend banning as she's already moving the conversation to legislation.

Comment:

Page 22: Kevin Hurley: *"In AK, per BOG regulations, you cannot use pack goats or llamas for hunting, but you can use them for non-hunting recreation**. WSF would like to see these domestic animals banned from THS range on all federal lands in AK year-round**."*

This was a misstatement regarding using llamas for hunting. They are allowed.

He represents not just himself, but the WSF as wanting llamas banned on all THS ranges on federal lands all year round. Seeing no push back from attendees, and inclusion of his remarks in this transcript, this would be an accurate statement. This is subsequently confirmed by their declared intent to eliminate pack llamas in the WSF–North American Conservation Vision 2020.

Comment:

Page 22: Helen Schwantje: "*We are also updating our 2003 Camelid Risk Assessment toward wild sheep and mountain goats, and are now in a draft stage. We need to do a better job of communicating with the general public and key politicians. A team approach is needed to solve disease problems."*

Her statement ties the 2003 Risk Assessment she authored to WSF origins. Her comments explain the statement in the CCH Risk Assessment, *"The need for an updated risk assessment has become even more apparent in recent years, with public pushback causing the BC government to replace a proposed province-wide ban on SACs in backcountry areas with a reduced ban restricted to thinhorn sheep and Mountain Goat ranges in the northern half of the province."* She knows the "Assessment" will expose a disease risk that can be used as a basis for a political/legislative exclusion of llamas.

Comment:

Page 33: Bill Jex: "*From our BC perspective, legislation is a very complex and time-consuming process; it is very hard to get passed. Our regulation to ban use of domestic animals for packing while hunting took about 14 intense months to get passed, and was very challenging*."

He's referring to the llama ban in BC. He seems frustrated, even though the ban has no scientific basis, the ban should have been imposed province wide. He refers to the pack animals to be banned as "domestic". Horses are domestic pack animals. Were they included in the ban? Why is disease in llamas only a problem when a person is using the llamas for hunting? Llamas are allowed to be used

in the same time period and region for purposes other than hunting. This ban is an arbitrary restriction of commerce favoring the Guide/Outfitter special interest group in BC supported by the WSF.

Bill Jex also works for MFLNRORD as a biologist. This BC agency seems to be the front of the "ban the llama" movement. Mr. Jex is the raconteur who presented the anecdotal evidence regarding the CE threat from a llama. His access to the CCH through MFLNRORD would explain the inclusion of that risible episode in the survey. He has taken an active interest in using that unsubstantiated and contrived story to generate emotional support for banning llamas.

Comment:

Page 33: Wayne Heimer (ADF&G retired)**: "***Between the outfitters, ADF&G employees, and an army of Alaska hunters, we have been able to keep the domestics out of THS range; that will continue until any regulations are developed."*

It seems like Mr. Heimer is advocating intimidation and misuse of official capacity by his former colleagues. Does ADF&G administration know about this alleged tactic being used by their employees to discourage llamas? Is it agency policy? He notes the outfitters' willingness to use intimidation which is not out of the ordinary given their tendency to be territorial, preemptive, and perpetually threatened. Wayne seems to presume he can speak for all hunters that they don't want llamas.

He is advocating these tactics until regulations eliminating llamas can be passed, ie. a ban imposed. He seems to know legislation to ban will be forthcoming.

Funding the Risk Assessment

Comment:

Page 38: Kevin Kehoe, WSF-AK president: *"For the camelid risk assessment update that Helen talked about, could it possibly be funded through Kimberlee in AK?"*

This is a very revealing question. There is a general awareness of the updated risk assessment and previous discussion has obviously taken place about paying for it. It will come from within the WSF sphere of influence (lots of possibilities), but the agency or individual effecting the payment hasn't been determined. Isn't Dr. Kimberlee Beckmen with ADF&G? Will Dr. Beckmen pull the funds from ADF&G? Has WSF provided her with discretionary funds to pay for such contingencies? What did Dr. Beckmen say? How much did she pay if she did pay for it? Who did ultimately pay the CCH? Who commissioned the assessment? Shouldn't they pay?

It seems that a government agency would avoid this role. There is no compelling need as there is no identified disease. Early in the assessment, CCH indicated the assessment was a fishing trip looking for disease possibilities. It would be hard for any agency to justify expenditure of public funds for this unfocused exercise. Based on some of the CCH commentary, BCM-FLNRORD seems to have commissioned the assessment, but the title page lists them as one of two entities it was "submitted

to". It also indicates it was submitted to ADF&G. Page 6 of the assessment states the report is "on behalf of" both agencies.

(Dr. Schwantjes original RA in 2003 was paid for by the Habitat Conservation Trust Fund. WSF channels tag auction monies to this and other wildlife organizations sympathetic to their agenda and this would provide a means of payment without direct attribution to WSF.)

There is added incongruence when considering that Dr. Kimberlee Beckmen is an employee of ADF&G Division of Wildlife Conservation and was part of a research project on [25] CE/Orf that clearly establishes the endemicity of that disease in wild sheep and goat populations. Why would she oversee an obvious waste of time and money including it as one of the primary diseases the assessment focuses on.

This raises another question. Why would ADF&G pay for a risk assessment done in BC by a BC consulting firm? If there were an emergency situation there might be a cooperative effort, but this clearly is not that situation. A cooperative effort that is international would surely have clearly stated the need, the contracting party, and the funding.

The lack of disclosure of who paid for the assessment and lack of attribution for commissioning is an indictment of its validity. The ambivalence on who's going to pay and the opacity of who contracted the CCH casts serious doubt on the motivation behind the assessment. Until those disclosures are made the assumption has to be that WSF contracted this work.

Update: It is noteworthy that ADF&G in conference with WAFWA-WSWG have subsequently dismissed the significance of the Risk Assessment. Responding on June 11th, 2018 to a letter from the Greater Appalachian Llama and Alpaca Association inquiring about ADF&G's participation in the Risk Assessment, former ADF&G Director Bruce Dale wrote the following response:

"We believed it was a worthwhile project hoping that if potential disease risks could be more accurately assessed we could move on to solutions and disease risk issues with other species. As you know, there is no significant new information presented in the RA. After discussing the document internally and with other biologists from several jurisdictions (including the Western Association of Fish and Wildlife Agency Wild Sheep Work Group - WSWG), we will continue to focus and enhance our evaluation of disease risk from species other than llamas or related camelids. There is not enough information presented in this report or other current publications to warrant spending additional resources on this issue. Also, we understand that the WSWG pulled the RA report from their website partially due to some concerns about the report itself. DFG currently has no plans to change or focus our disease surveillance efforts related to camelids."

The entire letter from former Director of Wildlife and Conservation at ADF&G may be accessed at: https://www.packllamas.org/pdf/akban/alaska_department_fish_game_to_gala_06-11-18.pdf

Political Collusion

In 2014 there are overtones of secrecy and ambivalence regarding banning llamas. It seems the desire to ban the llamas has been day lighted, but a basis has yet to be determined.

These statements are from the [23] 2014 WSF Thin Horn Sheep Summit Summary and Synthesis

Page 5, Item 4

4) Develop a regulation with the help of Co-management Boards and Land Use Planning to prevent use of domestic sheep, goats, llamas, and alpacas west of the Mackenzie River to the Yukon border. Add the same regulation to the tourism license, which would restrict anyone from starting up a business such as a pack goat operation in sheep habitat. Try to get our Yukon neighbors to approve a similar regulation.

They are seeking a ban of llamas by restricting commerce, not disease concerns.

Page 16: Another useful document was completed by Dr. Elena Garde et al. in 2005; it examines the risk of disease transmission between Dall's sheep and domestic sheep and goats, and is an excellent summary of pertinent disease literature.

This references the go-to Dr. Garde document, but doesn't mention llamas though they are included in the assessment as well as the title.

Page 16: BC indicated they have been very fortunate to not have a disease outbreak in Stone's sheep habitat. They are currently working on Forestry Legislation to keep effective separation between wild sheep and domestic sheep and goats. There is a huge lack of education on this issue with locals, particularly in the back-country areas. The use of the documents WSF just mentioned can be very helpful. The disease brochure from WSF is short and concise and of great value for educating the public. Everyone should be using these. The BC legislation will include llama and alpaca's.

They cite disease in domestic goats and sheep as the reason for forestry legislation and then simply add llamas and alpacas without giving reason. This follows the strategy of the Dr. Schwantje and Dr. Garde references.

These comments are from a follow up document: [24] The Kevin and Janine Rinke Thinhorn Initiative-WSF's 2014 Thinhorn Sheep Summit Action Plan Update -March 2015 Update Prepared by: Jeremy Ayotte (04/06/2015) and edited by Kevin Hurley (04/07/2015)

• AK: A 2015 Alaska National Park Service Compendium published in mid-March determined the likelihood of disease transmission between llamas or alpacas to wild sheep or mountain goats was "probably low, although still possible". After a public comment period in February, domestic sheep and goats were banned from Alaska's National Parks, but pack llamas and alpacas were allowed to continue to be used to access alpine areas. (WSF-AK Chapter currently at 114 members, as of 4/7/2015).

• (AK): Consider whether input to NPS public forum on using llamas and alpacas in Alaska National Parks could have been better supported. Although the key focus must be on domestic sheep and goats, we should all be "on the same page" when it comes to discussing camelids as pack animals in the alpine. Continue to work with Wayne Heimer/Kevin Kehoe to support their work to develop a Brief for 2016 Alaska Legislature. Any relevant briefing notes from other jurisdictions should be sent to Kevin K.

The ban attempt by WSF for llamas was in progress in 2014 and a part of the NPS ban attempt in 2015. They are dismayed the ban attempt failed and they are now going to focus and get everyone "on the same page". To them, the ban attempt failed because of their failed strategy, not the fact that the ban on the basis of disease had no merit. This response is a strong indication they have respect for science only as it serves their agenda.

Advancing to the 2017 THS the strategy of influence is coming together. It's about countering the pushback from user groups they are trying to ban.

Comment:

Page 33: Kevin: "*Using BC as an example, we have the Wild Sheep Society of BC, BC Wildlife Federation, Guide and Outfitters Association of BC, First Nations, and others who share common values and goals; pooling together all these NGO's should be quite a force in getting wild sheep priorities to the top. Joining forces on what you agree on is a strong coalition."*

Page 34, 5. Aaron Bloomquist: *"He would like to see collaboration between jurisdictions on management of THS along the borders. In addition, he would like to see better collaboration between government and hunters in AK, on all issues.* Kevin Hurley: *On the wild sheep disease issue, the jurisdictions are already collaborating very well together; there is also a lot of collaboration with Troy, Tony, Darren, and others on THS management.* Helen: *When one of us has a good idea for wild sheep, make sure we are sharing reports and or data with other jurisdictions; it would be really good for each of the State/Provincial/ Territorial-level veterinarians to talk together about DS grower pushback, regulation details, and political support. Bringing Dr. Bob Gerlach (Alaska State Veterinarian) into this group would be a good idea."*

6. Lance Kronberger: *"We have lost a lot of great THS hunting to National Parks in AK; we need an effort to rewrite the subsistence rules for resident hunters, and now might be a good time to do it with a new administration."*

Page 37, 29. Mark Richards: *"Preventing contact between DS and THS will take legislation. RHAK feels we will need to hire our own lobbyist to work with our legislators in Juneau; we would be happy to work with WSF and others. For management plans, we want a diversity of harvest management strategies across AK. The BOG has final authority for those ram harvest strategies. The management plan should involve the public up front, in order to define plan direction. Tony: You can talk to me any time, and public participation will be a huge effort. We can make changes through drafts and BOG anywhere in the process. The draft THS operational plans are scheduled to be at ADF&G headquarters by August 2017. 30. Kevin Hurley: WSF has been trying to raise funds for jurisdictions to do their wild sheep work; let's use BC for an example. At convention, we have auctioned the Minister's special permit for at least 12 years; those funds go into a Habitat Conservation Trust Foundation special sheep account. There is a special committee assigned with the task of directing where that money is spent. WSF wants to inform its members on where the money raised was spent on, and periodically report that information in Wild Sheep magazine. WSF plans to query the agencies that we sold auction tags for, and report the results. Does anyone have suggestions on where WSF can help fund or support their priority THS work?"*

These exchanges are troubling. The collaboration they speak of is *"about DS grower pushback, regulation details, political support, lobbying for legislation, channeling tag funds to sympathetic organizations . Bringing Dr. Bob Gerlach (Alaska State Veterinarian) into this group would be a good idea."*

It's striking they have no specific, stated disease(s) of concern for llamas. They just want them banned and are confident they can exert enough influence and have cultivated the coalition of organizations and agencies to make it happen. It seems odd that many science/research types would

not recognize there must be basis for an action as drastic as a ban. They have exited the realm of collaboration on research and are now talking about political collusion. So, this is the reality of the WSF vision stated on their website!

VISION: To be the best managed, most respected and **most influential** conservation organization in the world, for the benefit of wild sheep worldwide.

It was surprising that Kevin Hurley, a biologist and WSF staff member, participated in the litigated mitigation settlement for the Draft-EIS amendment for the pack goats' acceptable use and allocation on public lands in WY this last spring. It seems that would be a process that would be mediated by the wildlife and land management agency personnel only, and the litigants. It seems inappropriate that he would be included as a special interest representative giving any input beyond testimony. Why was he at the table?

WSF is a special interest hunting lobby advancing their interests at the expense of other stakeholders and not the research organization they try to project in public.

Comment:

Page 1: Kevin Kehoe, Alaska WSF President

"Combining all AK-WSF and state funds with Pittman-Robertson (P-R) 3:1 matching funds, we have the ability to generate nearly $1,000,000 USD for THS conservation every year in Alaska; we have to have a good strategic plan, to move forward."

Comingling state funds with WSF funds seems to be giving control of state funds over to the discretion of the WSF.

Thinhorn Sheep Summit (THS) Comments Regarding Disease and Llamas

The only comments in the transcript about llamas not directed at the CCH risk assessment and its use to pass legislation banning llamas are these three regarding disease transmission of M haemolytica and Movi. Their own discussion establishes llamas are not a disease threat.

Comment:

Page 22-23: Peregrine Wolf presenting Tom Besser' Movi studies: "*There have been numerous pen studies over the past 25 years that have mixed domestic sheep with BHS; greater than 95% of co-mingled BHS have died. When other studies mixed cattle, horses, and llamas with BHS, less than 10% of the BHS died. Tom repeated some of these same pen studies with Movi-negative DS, and found no die-offs in BHS."*

This same statement appears on the WSF website in a pdf . This is one of the three references to llamas regarding disease, all concerning Movi, and llamas are not carriers.

Comment:

Page 25: Ted Spraker*: "My understanding from your talk is cattle, horses, and llamas do not transmit Movi? Peri: Correct, Movi is specific to domestic sheep and goats. However, other disease*

agents are present and do represent a very small risk to BHS. We are not eliminating 100% of the risk, but almost all risk."

Affirming that he heard right. **Llamas do not carry Movi.**

Comment:

Page 28: Question to Helen Schwantje: Chris Barker: "*Can llamas and alpacas which are with domestic sheep and goats transmit Movi to wild sheep, and will that be addressed in the Camelid Risk Assessment revision?* Helen: *"We do not know at this time, but it needs to be researched; I expect that it is possible."*

Two earlier references specifically citing 25 years of studies with direct pen exposure show they don't have M. ovi and Dr. Schwantje needs additional research to answer this question?

Comment:

Wayne Heimer: "*Don't forget about other pathogens playing a big role in wild sheep pneumonia besides Movi. Peri: The new molecular technology has cleared up what has been going on the past decades. When pathologists have gone back to old tissues from die-offs many years ago, Movi was always present. Interestingly, the same strain that led to the first die-of, was still virulent ten years later. Movi is not new."*

This means llamas would have been exposed to M. ovi as well as Pasturella haemolytica in the Dr. Foreyt studies as well as the Dr. Besser studies and showed neither infection after continuous exposure.

A Lack of Understanding

Comment:

Page 31: Jeremy Ayotte, BC Sheep Separation Program (SSP) Coordinator: "*The BC SSP Program was started about 15 years ago after a large BHS die-off occurred in the South Okanogan Region. My role is centered on education, engagement of all parties, assisting with mitigation measures, buyouts, and supporting research, policy, and regulations. Recommendations: 1… 10) buyouts; and* ***11) conversion to cattle."***

This is a very interesting recommendation coming from an organization that is science/research focused and concerned with protecting wild sheep. Cattle are from the family Bovidae just as the wild sheep are. The diseases they list as suspect in the much anticipated update of disease risk with llamas include: BVDV, M bovis, M.avium paratb, BTV, and PI 3. These are all significant in cattle and they historically serve as reservoirs for the diseases and are fully capable of transmission. Additionally, cattle can have Pasturella spp. pneumonias as primary disease (shipping fever) or as secondary complications of primary disease, also transmittable. Maybe WSF really doesn't understand the principle of taxonomic separation and the role it plays in disease susceptibility and transmission? It's become obvious, wild sheep need protection from WSF meddling.

<u>The lack of any credible disease threat and apparent collaboration of agency personnel (perhaps the agencies themselves) mediated by WSF demonstrates actual disease in llamas is not driving the ban</u>

effort. Control of the wild sheep industry and exclusive hunting access as suggested by the BC llama owners, is driving this effort.

Why Do They Want to Ban Llamas?

The only plausible reason WSF wants to ban llamas is because they offer a viable, even preferable alternative to supporting sheep hunts. Additionally, they enable a local hunter with one or two llamas to conduct an effective hunt with lower impact on the environment as well as on the sheep. The outfitters and guides don't want local private hunters competing for tags that are limited and at the same time demonstrating a better alternative than what they offer. WSF has a lot of individual Outfitters and Guides as well as OG associations as members. They cooperate on the auction hunts that generate very significant revenue. WSF does not want to jeopardize any avenue of funding or the control it affords them.

Auction Funding

WSF CEO, Gray Thornton did a good job of explaining how WSF operates at the April 2017 WSF Thinhorn II Summit. He is responding to a question from Kevin Hurley following a discussion of WAFWA coordinating with WSF in attaining their goals and doing their work.

Comments page 15:

It is noteworthy that the organization Kevin is referring to is WAWFA-WSG that has looked at the disease potential of llamas, and never listed them as a disease threat. It makes the llama community nervous hearing Kevin talk about the prospect of WSF funding and to now see the CCH Risk Assessment posted on the WAFWA-WSWG website.

Update: WSWG has subsequently taken the Risk Assessment off their website after noting problems with the assessment.

Kevin Hurley: "How can WSF help your agency in funding THS projects? Gray: Special Governor's or Minister's tags and permits really are part of the North America Model for Wildlife Conservation. Non-resident license fees generate the majority of funds for wild sheep conservation and management. About 74% of all wild sheep management funds west-wide come from auction and raffle of special permits and tags. Since WSF sells the majority of those tags, our involvement is very important, as WSF raises and directs approximately 40% of all wild sheep revenue in the U.S. and Canada. If we do not have non-resident license fees, and if we don't auction or raffle special tags, we simply won't have the wild sheep conservation programs we have today, or need. Much of a jurisdiction's application fee is considered an administrative fee, and is not necessarily used for wild sheep management. Using 2014 16 information, WSF found that in Montana annual resident revenue for BHS conservation was only about $20,000. Funds from the unlimited areas and miscellaneous other hunts generates about another $100,000 in license revenue each year; $120,000 is not much money for BHS management for a state as large as Montana. In 2014, the Montana statewide BHS auction tag sold for $480,000, with 90% of those funds being returned to MT Fish, Wildlife, and Parks for their BHS program. So, special tags are critical. Besides raising wild sheep management funds, WSF can be a catalyst for generating funds which can then be multiplied into a 3:1 match, via P-R. For example, WSF and AK-WSF helped turn $50,000 of Safari Club International Foundation funds into $200,000, for ADF&G to write a comprehensive Dall's sheep management plan for AK."

Kevin Hurley: on average, WSF retains a 7% commission from auction tag revenues, the remainder is returned to the state, provincial, tribal or First Nations wild sheep management agency. WSF's focus is to raise and direct $$ to be put back on-the ground, to directly benefit wild sheep management."

Auctioning tags produces a lot of money. There is incentive for WSF to actively seek special hunt auction tags and incentive for wildlife management agencies to supply them. This is the general accounting from the WSF website:

During the recent 2016-2017 fiscal year alone, WSF directed more than $4.7+ million to mission related programs. Of this 4.7+ million, $3.04 million was directed to state, provincial and tribal agencies to promote wild sheep and other wildlife conservation through the sale of special permits and tags. An additional $1.672 million in mission-directed funding was provided from WSF operations dollars. Of this $1.672 million:

- $716,000+ went to education and advocacy initiatives
- $543,000+ went to support WSF partners in industry and guide/outfitter associations
- $385,000+ went to wild sheep disease research and habitat enhancement programs
- $27,000 went to international initiatives

More than half a million dollars to support partners and OGs? They obviously have a strong tie to the OG members. Almost twice as much money went to education and advocacy (lobbying) as went to research and habitat. Does all this money come from auction tag proceeds? That's what they identify as the source for the $3.04 million that goes to promotion and conservation.

WSF aggregates funds by auctioning elite hunts under the aegis of state and provincial wildlife management agencies providing special tags. The tags generate a large amount of money, which is apportioned back to the agencies, and selected researchers for use in wild sheep management. This provides significant financial help to the agencies with typically tight budgets. WSF contributions come at a price to the American public.

Unhealthy Access

WSF has subtly intertwined with wildlife and land management agencies and their personnel in a relationship lacking accountability. Their role as an aggregator and allocator of funds for wildlife management and research allows a quid pro quo relationship in which WSF feels free to ask for special access and preferential treatment. Managers feel obligated to grant these because they've become dependent on funding from WSF. It's job security.

The obvious question is why has the WSF become the broker of these "special permits" and been placed in control of allocating the funds generated? They are retaining a 7 % commission, picking the guide service conducting the hunt and their level of remuneration, and determining the allocation level and destination of the research funds. Their accounting makes it apparent they are using funds for lobbying under the euphemism of "education and advocacy'. That advocacy includes banning llamas and their user groups. The llama community takes issue with the conversion of public assets of which they are partial owners and allowing them to be converted to cash to fund the elimination of their access.

Wildlife agencies and the public would be better served conducting their own permit auctions to eliminate the handling fees going through WSF. Additionally, they could fully control the sales of assets they own exclusively, insure probity of process, and foster public trust. With limited permits, it's a seller's market and current bidders for the WSF permits would be bidders for the agency sales as well. It would be prudent for agencies and their personnel to distance themselves from WSF by creating a mechanism of distributing the funds raised that does not involve WSF. Otherwise, there is risk of destroying credibility and effectiveness through the appearance of impropriety or potential collusion.

A recent issue in Idaho demonstrates the problem. The president of the State WSF chapter attempted to have ID wildlife officials removed when they refused to allocate more auction tags to WSF for auction fund raising efforts. The individual was removed as WSF state chapter president, but the WSF response was far short of censure. The incident is indicative of an underlying sense of entitlement to public domain on the part of WSF because of their funding. [18] ("Wild Sheep Foundation caught in auction tag fray"- by Eric Barker, Lewiston Tribune, article in the Billings Gazette).

WSF Impacts

WSF fails to consider and account for their own impacts on the environment and wildlife. The wild sheep populations and the lands they occupy are public domain, often with wilderness designation. Honoring the wilderness ethic is a process that requires constant evaluation and examination.

-The WSF doesn't seem to consider hunters and researchers venturing into the heart of sheep ranges in aggressive pursuit of the sheep as having significant impacts. It's apparent that most of the human contact, disruption, and resulting stress on the sheep is produced by WSF hunters and researchers. WSF doesn't acknowledge these impacts while they point fingers at other user groups. Their mindset seems to be WSF monetary contributions enhance the numbers of sheep and their impacts are justified. It seems to be more of a leaseholder improvement concept as opposed to conscious stewardship.

-The camps set up within the wild sheep ranges by guides and hunter clients are large and high impact. Extra personnel, food, and equipment and the equine pack stock used to support the hunts is a significant impact that should be reduced. WSF is encouraging continuation of these impacts and at the same time pursuing the elimination of llamas that considerably reduce these impacts. Is this in the best interests of the wild sheep?

-WSF fails to consider the potential for these campsites as repositories of human disease that may infect wild sheep. Humans have greater potential of disease transmission than llamas, but this possibility has not been considered. WSF lacks full consideration of their own vulnerability as they attempt to ban llamas. Zero tolerance means the elimination of humans from wild sheep ranges as well.

-WSF expresses concern for the impacts of helicopters and planes invading sheep territory, yet that's how many of their member guides conduct pre-hunt scouting and then actually position their hunters. They use aircraft to capture and observe sheep for their surveys, testing, and relocation. This is done outside hunting season, adding further stress to the sheep when they need rest from predation and

hunting pressure. Is this in the best interests of the sheep? Are helicopters a native species in high altitude wilderness?

-WSF fund raising prowess is promoted on the basis of funding research. Yet a significant portion of what is raised goes to lobbying and increasing brand recognition and control. With disease as the dominant issue in wild sheep management, the WSF might consider expending those funds as represented. Rather than exerting political influence to create a bubble for the sheep's existence, it might be time for WSF to ask legitimate questions: "Why are wild sheep so susceptible and immunologically-compromised regarding disease?" and "How can we change this?"

Periodic disease die offs in wild species are part of nature. A remnant population survives and flourishes in proper balance with the environment. The resurgent population then carries resistance or the pathogen subsides and the species once again flourishes. WSF's financial dependence and a narrowly prescribed harvest eliminate the cyclical management option for wild sheep.

In view of that, WSF needs to seek substantive, long term resolution of disease in wild sheep. Wild sheep are the genetic precursors of domestic sheep that are able to withstand the pathogens currently killing wild populations. Finding an answer in that link through research would be the likely place to start, because the world cannot revolve around wild sheep.

-The private hunter, resident and non-resident, using llamas will be significantly impacted by a llama ban. Historically there is significant animosity between private hunters and outfitters over outfitters' impacts and preemptive claims to exclusive rights within their operating areas on public lands. WSF in effect, is attempting to claim a greater portion of public lands as their reserve and the wild sheep they contain for their profit.

This comes at the expense of the tax paying private citizen who foundationally hunts to satisfy a longing to connect with the land and to meet the challenge of harvesting its produce. WSF's influence and control is an apparent attempt to appropriate this experience from the common man for the opportunity to sell it to a rich one seeking a shortcut to the peripheral benefits and notoriety of a trophy hunt.

The Ultimate Pursuit in Hunting:Sheep – New York Times - by John Branch

"As far as sheep-hunting being a rich man's sport, that's absolutely true," said Vance Corrigan, 84, who lives along the Yellowstone River in Livingston, Mont., and is one of the most accomplished big-game hunters in the world. "But if it weren't for the rich man, those sheep wouldn't be there."

Self-aggrandizement aside, this statement is presumptuous as well as instructive. The truth is that, short of a campaign focused on extirpation, wild sheep are going to survive and cyclically flourish and fade as they have throughout the eons. To think otherwise is to underestimate the species and nature's inherent will to survive. The rich man has simply purchased a front row seat to witness the inevitable course of nature or experience its adjustments to his meddling.

A quote from Theodore Roosevelt on Backcountry Hunters and Anglers website:

"Preserve large tracts of wilderness ... for the exercise of the skill of the hunter, whether or not he is a man of means."

WSF actions seem to benefit the man of means at the expense of the man of limited means.

WSF is Violating Their Stated Values

MISSION (WSF WEBSITE)

"We enhance wild sheep populations, promote scientific wildlife management, educate the public and youth on sustainable use and the conservation benefits of hunting while promoting the interests of the hunter."

This statement appears to support wild sheep populations while simultaneously lifting the interests of all wildlife management, hunting, and hunters. WSF's recent attempts to ban llamas and the associated user group without regard for the expanding problems that action creates, indicates their interests in wild sheep are preeminent and the interests of other species and users are subservient to WSF interests.

WSF's objectives are to: Enhance wild sheep populations and their habitats; Promote scientific wildlife management; Educate the public and youth on sustainable use and the conservation benefits of hunting; Promote the interests of the hunter and all stakeholders.

This statement seems to be all-inclusive, but it is apparently limited to the list of stakeholders as defined by WSF. Obviously, they do not want to include llamas and the associated user group(s) as stakeholders. They have become a business enterprise aggressively pursuing the best interests of the stakeholders that comprise WSF at the expense of other legitimate and significant stakeholders.

ISSUES AND POSITIONS

Disease: Pneumonia is limiting restoration of wild sheep because the deadly bacteria are carried by domestic sheep, transmitted to wild sheep, and also passed among wild sheep.

Hunting Regulations and Access: ethical, scientifically regulated hunting is a necessary part of conservation for sheep as well as other wildlife.

Hunting Heritage: hunting and sportsmen-led conservation are important American traditions that must be ensured in policy.

Federal Public Lands: America's public lands are national treasures and are a unique part of our heritage deserving of our best efforts to share their many values widely.

WSF defines pneumonia from domestic sheep as the singular disease threat to wild sheep populations and their increase. They espouse scientifically regulated hunting, sportsmen-led conservation, and sharing widely the many values of America's public lands. WSF needs to explain how banning low impact llamas on the basis of manufactured science, and the conservation-minded hunters and outdoorsmen who use them on America's public lands supports these stated positions.

WSF Values:

Honesty, Teamwork, Accountability, Integrity, Positive Attitude, Stewardship, Respect for others, Respect for wildlife, Loyalty, Hunting Ethics.

WSF's significant drift from a number of these stated values is apparent. They need to look at themselves and recognize their lack of awareness and presumption. WSF is no different than any other organization or business. Their original missional goals and intentions are good and well considered. But just as any other organization, they must periodically reevaluate and recalibrate while thinking critically about their current direction. WSF needs to recognize their over-reach and negative impacts in advocating the elimination of llamas and their user groups from public lands, which they have an inherent right to use. This action has put WSF over the edge and onto a slippery slope that impacts all public lands stake holders. WSF can pull back before they, as well as many others, suffer needless damage and/or restrictions if they continue their current direction. They need to get back to worrying more about the sheep than about controlling who gets to kill them.

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Acronyms

AK - Alaska

AAWV - American Association of Wildlife Veterinarians

AK-BLM-EIRMP - Alaska - Bureau of Land Management Eastern Interior Resource Management Plan

ADF&G - Alaska Department of Fish and Game Management Plan

AK-NPS - Alaska - National Park Service

BC - British Columbia

BCM-FLNRORD - British Columbia Ministry of Forests, Lands, Natural Resources Operations and Rural Development

BHS - Bighorn sheep

BLM - Bureau of Land Management

BTV – Blue Tongue Virus

BVD - Bovine Viral Diarrhea Virus

CCH - Centre for Coastal Health

CE - Contagious ecthyma

DS - Domestic Species (sheep, goats, llamas)

EIS - Environmental Impact Statement

FOIA - Freedom of Information Act

GALA - Greater Appalachian Llama and Alpaca Association

ID - Idaho

ILR - International Llama Registry

MAP - M. avium paratuberculosis (Johne's)

M. bovis - Mycobacterium bovis

M. ovi – Mycoplasma ovipneumoniae

NDOW - Nevada Department of Wildlife

NEPA - National Environmental Policy Act

NGO - Non-Government Organization

NP - National Park

NPS - National Park Service

NWT - North West Territories

OG - Outfitters and Guides

PI – Persistently Infected

PI 3 - Parainfluenza 3

RMLA - Rocky Mountain Llama and Alpaca Association

SAC - South American Camelids

THS - Thin horn sheep (Dall's and Stone's sheep)

TWS-AK - The Wildlife Society-Alaska Chapter

TWS - The Wildlife Society

USFS - United States Forest Service

WAFWA - Western Association of Fish and Wildlife Veterinarians

WSF-AK - Wild Sheep Foundation-Alaska Chapter

WSF - Wild Sheep Foundation

WSU – Washington State University

WSWG - Wild Sheep Working Group

WY - Wyoming