WAFWA Wild Sheep Working Group Meeting Notes
January 17-18, 2017
at Wild Sheep Foundation Convention
Reno-Sparks Convention Center – Room A8
4590 S Virginia St, Reno, NV 89502

WSWG Reps or attendees: Tony Kavalok (AK), Amber Munig (AZ), Bill Jex and Jeremy Ayotte (BC), Tom Stephenson (CA), Andy Holland (CO) Toby Boudreau (ID), Bruce Sterling (MT), Todd Nordeen (NE), Peregrine Wolff (NV), Eric Rominger (NM), Don Whittaker (OR), Chad Lehman (SD), Froylan Hernandez (TX), Rusty Robinson (UT), Rich Harris (WA), Doug McWhirter (WY), Rob Florkiewicz (YK), Sandra Brewer (BLM), Melanie Woolever (NPS), Mark Penninger (USFS), Kevin Hurley and Clay Brewer (WSF), Mike Cox (Chair)

Mike – Agenda overview and Introductions
Kevin – Welcome, Exhibitor or registration can get into opening ceremony with pass
Clay – Dick Weaver not doing well, had a stroke; Clay will be printing an enlarged photo of a bighorn sheep and will ask everyone to sign it for him.

Day 1 (1:00-5:00)

Adaptive Wild Sheep Disease Management Venture

- ***Overview of the new/rebranded DMV "Strategy"***
  - Steering committee meeting held last Nov 17-18 in Duncan, British Columbia; committee members: Rich H., Mike C., Helen S., Peri W., Mike Miller, Frances Cassirer, Tom Besser, (Rusty R. and Emily Almberg by phone); invited guests: Hank Edwards, Karen Fox and Craig Stephen.
  - Developed an improved strategy with more clear mission and objectives:
    - Improve and speed collective learning on respiratory disease and herd response
    - Provide guidance and expertise for jurisdictions in need of assistance
    - Be a clearinghouse for information sharing
    - Facilitate the evaluation of herd monitoring and management actions
    - Encourage jurisdictions to explore other management actions
    - Seek funding to support jurisdictions
    - Summarize outcomes of herd monitoring and management actions

- ***Summary of jurisdictional Candidate Herd Google Survey***
  - Disease/dieoff records from 2012-2014 survey – lost 14,000 sheep west wide, many herds with persistent poor production
  - Jurisdictions that identified candidate herds: YK, WY, WA, UT, TX, SD, OR, NV, NM, NE, ND, ID, CA, BC, and AZ; 104 herds have been identified for possible enhanced monitoring and/or an adaptive management trial
  - Pie Charts of # of herds by Subspecies (Rocky Mtn – 53; Desert – 32; California – 18; Pennisular – 6; Stone – 5; Sierra Nevada – 4; Dall – 3); and Native (48)/Reintroduced (55)
  - Pie Chart of # of herds in each Category (Herd response/pathogen exposure); Top 3 categories with most herds: Healthy herd but at high risk to disease (24), Poor herd performance since dieoff with M. ovi exposure (29), and Herd recovering after die-off with M. ovi exposure (21).
  - Pie Chart - Adaptive Management Actions – 34 herds identified as potential candidates for 1) augmentation and source stock with same/known M. ovi. strain, 2) Depopulation, or 3) Test and Cull
  - Mike – Different herd categories based on Identifying herd performance (recruitment primarily), herd history, pathogen exposure). DMV wants to identify the varied suite of responses that

selected herds have and relate it to environmental, genetic, biological factors and stressors. We are interested in uncovering/detecting certain characteristics associated with particular herds responses but it herds with long term issues or those that recover well.

- Jurisdictional comments on the DMV:
  - Emily – document population changes and issues each year. Work together to reach goals.
  - Chad - supports concept.
  - Don – What are we going to try – likes the structure.
  - Bruce – clearinghouse for information sharing – good structure – improve speed of learning and information sharing.
  - Don – need funding sources.
  - Doug – Had conversation with Hank Edwards and Hank is comfortable with all this – good progress, more unified effort now than when the DMV was first introduced.
  - Bill – Health risk umbrella will tie into this – recent legislative changes with pack goats – interim regulation depending on risk assessment.
  - Andy – Echoed Doug's comments – likes the broadened scope of pathogens and adaptation of the DMV.
  - Mike – Hank Edwards/Karen Fox were invited to share thoughts, research, etc. at the recent steering committee and provided valuable insight to the new DMV Strategy. Not every state or province is created equal so not asking for all to jump on board the same way or at same time. DMV is available for those agencies who want help, please call or ask for help.
  - Mike – Need deliverables and products
  - Andy – define candidate herds?
  - Rich – enhanced monitoring, adds knowledge to the issue. Helps others.

- ***Flowchart visualizing interaction/relationships of herd history, disease risk, herd size and performance, and pathogen testing/exposure in assigning herds to categories to assess variables and consider for adaptive management trials*** *(Mike, Peri)*
  - Peri Wolff gave brief powerpoint –drafted flow chart to allow bios and vets to run wild sheep herds through it to evaluate herd status and future needs for monitoring and pathogen sampling. Still developing flowchart with Rich, Karen Fox, and Helen that also will have a scoring component. The parameters in the Flowchart are: Population trend, Lamb recruitment, Population abundance, Past disease event, Risk of contact, Pathogens sampled, Sampling Method, and Pathogen detected. Broad values or levels (e.g., low/moderate/high, time frame, list of pathogens, etc.) will be associated with each parameter within the flowchart.
  - Comments
    - Andy – he was asked to help Karen Fox and Mike Miller (CO vets) develop a numeric/letter scoring system. All three of them see great utility in the flowchart to direct future sample collection protocols for Colorado herds.
    - Rich – currently a couple of different versions of flowchart which differ due to different objectives. One is more focused on how much future sampling to conduct and the other is oriented on characterizing herd response to pathogens. Both important for managers to understand and identify.
    - Andy – Both flowcharts have many similarities.
    - Peri – will continue to revise and assign values to parameters.
    - Andy – cautious approach with politics, tough to do with so many herds and sub-herds without a simplified process.

- Mike – will continue to develop and refine the current flowchart versions into one. Flowchart will also help to decide whether or not a herd will be a good candidate or not in the DMV.
- Rich – Where do we go from here? Can we make the flowchart work in the CO design and concept?
- Peri – Yes, needs to be fluid, some of it is standardized but this can provide a tool to get their herds evaluated.
- Don – Oregon may delineate herd status and some herds may qualify for further action down the road. What about adding to flowchart more parameters such as habitat/fire impacts/landscape stressors?
- Mike - Yes, those variables have been considered and states may focus on other issues such as sinus tumors, etc.

- ***Fact Sheets, Protocols and other Documents to Educate and Inform***
  - Wild Sheep Respiratory Disease Talking Points - Peri showed slides of handout for folks to use in getting word out to various groups and media outlets. It's on WSWG website Peri – in (Slide
  - Nasal Sinus Tumor - Peri showed slides of normal sinus cavity vs with tumor. The more skulls examined the more they are finding the tumor and what it does to the sinuses. Most don't have outward signs. Can have outward signs of a missing eye, crusting face.
    - Froylan – can you see any outward signs like scars? etc…
    - Peri – Not usually. It is now across all species of bighorns. Karen produced brochure. Was sent out to taxidermist in Nevada to save heads – found some heads that were suspicious. Karen will revise brochure, can tailor it to how individual states want it. Peri will also produce fact sheet of nasal tumors and post on WSWG website.
    - Vern – Is it equally distributed amongst sexes.
    - Peri – Not known but is infectious. Nasal tumors obvious when you make certain cut with band or reciprocating saw.
  - Herd Health Sampling Protocol - Peri – been some changes so will get that updated too.

- ***Update on one of the most promising adaptive management actions being evaluated: "Test and Cull Experiments" occurring in Idaho, Washington, Nevada, and South Dakota.***
  - Francis – PowerPoint covering initial Test and Cull in ID and WA herds
    - Gave good overview of the concepts involved with Test (for pathogens) and Cull (removing pathogen-shedding animals)
    - Target "shedding" individuals for removal rather than entire eradication
    - Could be why naturally some populations recover on their own by having the shedders eventually die with the pathogen fading out of the herd.
    - Hells Canyon – testing and removal of shedders with some of them going to South Dakota State Univ. research facility
    - Experiments of mixing and isolating sheep with certain pathogen exposure status going on at SDSU
    - SDSU – all lambs died with commingling with carriers; all lambs survived when not commingled
  - Chad – PowerPoint on SD Game, Fish and Parks Test and Cull Research in Black Hills
    - Custer State Park herd – treated; Rapid Creek – control herd

- Started testing in 2014 and culling first few animals in 2015
- Immediate improvement of lamb survival after first 2 shedders removed in treated herd; control herd continues to exhibit poor lamb survival with additional adult mortality from pneumonia
- Several good comments and questions on project.

- Mike – California Bighorn Snowstorm Mtn, NV Test and Cull Experiment
  - Movi Strain-type match with stray domestic sheep found in wild sheep herd the summer 2011 that caused 60% loss of adults by pneumonia and negligible lamb recruitment 4 of the next 5 years.
  - Testing of ewes began in 2013; population estimated at 45 animals. By late 2015 all ewes were tested and collared (n=27, including previously marked ewes) with a few of the rams tested and collared to confirm ram dispersal among the 4 subherds. 40% of the ewes PCR positive for Movi.
  - In support of the Test and Cull Research at SDSU, a "non-selective cull was conducted in Dec. 2014 with 10 ewes and 1 ram being captured and translocated to the SDSU research facility. Additional adult losses occurred from lion predation and Blue-Tongue episode.
  - Only 1 lamb was recruited into population summer 2015; 5 lambs recruited from the 25 ewes in the population summer 2016.
  - Capture, testing and culling scheduled for January 31, 2017; PCR positive Movi animals will be transported to the SDSU research facility.

➢ ***Review of Depopulation efforts and experiences; discuss future efforts by jurisdictions***

- Andy, Colorado – Consider entering these actions into the DMV. In last 5 years, depopulated 2 herds, both had poor recruitment for years.
  - Lower Poudre Canyon (RMBS) was depopulated, then restocked from Georgetown herd – doing fairly well. Unit now open to hunting.
  - Gribbles Park (RMBS) (Arkansas River) – moved last 9 sheep to Sybille Research Center. Have restocked sheep to Gribbles Park.
  - Considered depopulating other herds but have not. So far, the depopulations have been well received. Numbers were small so it made the decision to depopulate easy, then quickly go back in to restock. Won't restock areas where domestics still exist.
  - Eric – Could work into the flow charts of the DMV. Could become an important issue on the flow chart.
  - Mike – can develop guidelines for deciding to and conducting depopulation, information delivery, and restoring herd under certain criteria.
- Bruce, Montana – Tendoy Mountains (RMBS) – Pneumonia outbreak 20 years ago. Depopulate initiated in 2014 with allowing hunters to remove remaining sheep. Thought to be about 30 left when this decision was made. Check stations of hunters; harvested about 24. Killed 3-4 with helicopters. Department shot 2-3 from the ground. Still about 9 sheep left. May not get them all killed. Still adjacent domestic sheep on public land. Possible connectivity with Idaho herds (Beaverhead). Roughly $8000 into the project to remove. Domestics on both private and public land which may be difficult to move.
  - Mike/Clay - What is adequate separation to weigh the risk?
  - Rich – needs to be a case by case call, may be tough to put in the DMV.

    - Mike – we should come up with questions to ask.
    - Tom – Sounds like no commitment from Federal agencies to move domestics.
    - Bruce – Not sure the same action would have been done given the domestics still in the area and unlikeliness of their removal.
    - Vern – What resistance would you have run into with depopulation and restocking with domestics still in the area.
    - Bruce – Think will get a lot of resistance from domestic users.
    - Don – Oregon past herd issues.
- Rich, Washington – In 2013, removed the entire Tieton herd (RMBS). Used helicopters, wildlife services and local staff. Had a few left so contracted with a local sharpshooter. Access was easier than other areas. Have addressed small domestic flocks but working on flocks on federal lands.
- Rusty, Utah –
    - Goslin herd (RMBS) – Killed 51 sheep (thought to be the entire remaining herd). The following year area was repopulated with bighorn from source stock that was pathogen tested 1 year before and were negative for Movi. But then animals started dying from pneumonia after they were released. Learned that you need to test just prior to moving sheep.
    - Stansbury herd (CBS) – 200 sheep in population in 2015? Sampled and tested negative for Movi. One month later started losing sheep. Counted 13 left so decided to depopulate. After depopulate efforts, 6 or 7 left to remove. Domestic sheep were observed as well as Mouflon in the area but neither matched the Movi strain detected in the bighorns. Infection from capture nets or equipment? Any concerns about that? Need to try and make sure equipment is cleaned – helicopter crews etc…. How long will Movi last?
    - Besser – Movi is not a strong resilient pathogen. Strains vary dramatically though.
- Mike - Nevada
    - Hays Canyon herd (CBS) 2007. This was a natural depopulation without agency intervention but illustrates same concerns and appropriate actions to take if decision is made to repopulate. Domestic sheep and goats on nearby BLM and private lands. The entire herd of 130 animals died from severe pneumonia event. Five years later the domestic goats were removed from the private land which was thought to be the source of the pneumonia event. In 2013, 30 bighorns were translocated to the area and have been doing well since.
    - East Humboldt Range (RMBS) 2009/2010 - Simultaneously lost over 90% of Rocky Mtn bighorn herds in East Humboldt Range and Ruby Mountains (separated by 30 miles). Both herds summer on USFS lands on top ½ of mountain surrounded by large tracts and checkerboard private lands with farm flock domestics and goat flocks along with USFS domestic sheep summer allotment on Ruby Mtns. Too many to remove. Initial reintroduction in the 1980s was known to be a risk. Because of the sympatric mountain goat herds, we took it as a research opportunity. Captured remaining 15 wild sheep from East Humboldts; rams went to WSU/ Dr. Sri; ewes moved to Ruby Mtns where the survivors shared the same Movi strain. Sportsmen and biologists wanted to "give them a chance". Went to Alberta to get 20 clean and naïve bighorn (same source stock as original bighorn in 1980s) to test theory that mtn goats could be reservoir of deadly pathogens back to bighorn sheep. Bighorns clean for 2 years, then

Fall 2015, pneumonia event began killing bighorn; those tested had same Movi strain as mtn goats, showing transmission can occur back to bighorn from mtn goats.

- Montana Mountain (CBS) herd along Oregon border 2016. – Herd fine during Oct 2015 hunting season (healthy rams and many lambs observed by hunters). Herd estimated to be 110 adults fall 2016. Had been used as translocation source stock several times and kept well below habitat carrying capacity. We started a disease surveillance project with ODFW in early Dec 2015 and during capture had two mortalities – necropsies revealed both severe pneumonia. Captured and collared 5 more sheep to monitor survival. 4 of 5 died within 3 weeks – all severe pneumonia. Developed depopulation plan due to healthy herd less than 10 miles away and adjacent herds in Oregon. Met several times with Directors Office and Public Affairs officers. Depopulated Feb. 14-17; hired Wildlife Services – they killed 24 in 2 days with helo and shotguns; NDOW bios and helo killed remaining 3 with rifle. Necropsied 10 animals. Press release after depopulation and phone calls to all bighorn NGOs – all NGOs supportive, 90% public supportive. Movi detected was a new novel strain, so we know it wasn't from bighorn. Pnuemonia killed 75% of the herd before depopulation started. Been known for several years of local alfalfa ranchers leasing fields adjacent to Montana Mtns in the winter to domestic sheep owner that summers a band of sheep on BLM lands. They truck sheep to fields.

- Kevin – Montana Commission not allowing MFWP to translocate sheep out of state.
- Kurt – Commission putting pressure on agency to move sheep in-state.
- Rich – are we getting all the information gathered and captured? Not everything is published. Information at these meetings should be captured.
- Mike – Yes, the depopulations etc… should be documented. Hard to go back in time to get them all.
- Kevin/Rich – NWSGC and DBC Proceedings may be good venue to publish and accommodate documenting these efforts and management actions.

- ***New Archival Storage Facility***
  - Clay/Peri/Kevin – Caine Veterinary Teaching Center closing. What to do with all their samples. Clay acquired grants in the amount of $50,000 from the WSF and other conservation organizations to help secure storage space for wild sheep sample archival storage facility on the campus of Texas Tech University. The facility is called the Natural Sciences Research Laboratory (NSRL) associated with the Museum of Texas Tech University. Plenty of stainless steel freezers adequate to do the job that are pumped with liquid nitrogen to maintain samples at ultra-cold temperatures for long-term storage. Over 18,000 wild sheep samples can be stored at the NSRL. With the agreement that Clay was able to secure with the NSRL, states and provinces are able to store samples at the NSRL at ultra-cold levels at no cost!

Day 2 (8:00 – 12:00)

Adaptive Disease Management Venture continued:

- ***Brainstorm on DMV funding opportunities and initiatives to help support jurisdictions in conducting adaptive management trials and enhanced monitoring***

- Clay - Multi-state grant proposal (USFWS federal aid grant that had grantee selection and oversight authority given to AFWA) was the single nominated proposal from WAFWA that was forwarded to AFWA spring 2016 to compete for funding. AFWA didn't support the funding for the project because it didn't involve the majority of the U.S. states.
- Kevin - project did initially advance but didn't make the final cut.
- Froylan - how would funding work for each state?
- Clay - could be for a coordinator or support jurisdictional monitoring and on the ground management. All states could tap into it.
- Melanie - tap into NGOs for assistance.
- Clay – his idea: approach private groups in CO, NM, and TX that are selling private lands sheep tags and have them donate a tag to support the DMV.
- Kevin - Thoughts about more additive tags. Concerns about taking away from current auction tag proceeds for jurisdictional wild sheep programs.
- Eric - use private sources.
- Vern - Payment to auctioneers comes from the 7% WSF surcharge of auction tag proceeds.
- Kevin - that is used for grant in aid, etc... Wouldn't work to fund this project.
- Toby - How much funding was available through AFWA Multi-state grant?
- Kevin - 3 million for wildlife, 3 million for fish.
- Don - focus more on new funds, possibly corporate funding; need to identify process of how to distribute funding among states and provinces.
- Rusty - Use Western Hunting and Conservation Expo and WSF Sheep Show to market and raise money from sportsmen. Utah has over 200 auction tags.
- Mike - keep ideas flowing and share funding ideas with him.
- Rich - homework assignment, state projects that are in the works that may already be funded, supply numbers and funding. Funds that would benefit extension of current projects. What is the end product?
- Clay - ask Directors for a single additional tag, not to take away from state's current funds.
- Andy – concerned over current state statutes that govern how many tags can be auctioned; need to look at new funds and not any new tags from the jurisdictions.
- Kevin - NGOs may be able to nominate the Multi-state grant proposal again.
- Rusty - What amount is needed to support monitoring and management trials?
- Mike - it varies.
- Melanie - be more specific on what you need when asking with a specific amount and what the outcome is with the funds.

➢ ***Sheep Separation Programs/Policies/Processes – share knowledge and discuss commonalities and framework and key components for all jurisdictions to consider implementing***

- This topic is a key component to the WSWG and recently there has been several jurisdictions considering various collaborative efforts to support the overall concept of sheep separation. Alberta is currently in the consultation phase of a provincial-wide collaborative bighorn sheep separation policy working with Alberta Lamb Producers. Colorado developed a statewide wild/domestic sheep working group and just held their first meeting. Montana is hosting a symposium with the possible outcome of developing their own state working group.

- Doug – gave powerpoint on the longest tenured collaborative effort, the Wyoming Bighorn Sheep-Domestic Sheep Interaction Working Group. WY started this in 2000, endorsed by governor and state legislators; 52 people at first meeting with federal, state and private participants. Goal - maintain both domestic and wild sheep in Wyoming. Was a slow start to "plow ground" with basic rules of willing participation and open "non-inflammatory" dialog. Had to cover every topic to get started. No net loss of domestic sheep AUMs is a goal but important point is individual producers want to retire their grazing permits and get compensated for it, but the industry representatives want no net loss and are against permit retirements. Priority herd categories: Coordinated Core Herds, Non-emphasis (low priority but still have viable herd), Non-management, Cooperative Review Areas. Though no public land grazing with the Core Herd areas, there are still 5-6 private parcels of domestic grazing.
- Andy – Colorado has a more complicated distribution of domestic sheep on public land. They just initiated a collaborative working group with the first meeting in November 2016. Kevin/Melanie attended and assisted. Membership was definitely "inclusive". Initial meeting had good topics. No decisions on prioritizing areas yet. Still early in development.
- Kurt Alt - Montana Woolgrowers, Fish, Wildlife and Parks, and Wild Sheep Foundation held a preplanning meeting for upcoming symposium with goal of establishing a similar type of working group. Went well to set general ground rules. Many entities invited to attend first meeting. Focus to get people working together.
- Neil Thagard – what would you change in the Wyoming working group – Doug responded "more flexibility".
- Jeremy - BC – Is the lead for the BC sheep separation program. Initially did fencing on private lands but more recently looking at policy development and relationship building. Good communication with domestic sheep producers. Meet every 2 months. Doing more Movi testing of domestic sheep – 300 animals tested across entire province . It's a work in progress. Only 2% of domestic sheep exist in bighorn habitat areas with most of these being hobby flocks.
- Bill Jex – BC – The wild and domestic sheep advocates early on in the process got through the "Our science is better than your science". Advice is to start the program with a person that is not wearing an agency hat!
- Rusty - UT - Getting pressures to develop group. Will likely be heading in that direction.
- Kevin - PRAB has framework of guidelines which can be distributed.
- Neil - be careful with MOUs. Be cautious of what is stated in them, promises.
- Tony - AK - Concerns with hobby farms. Not sure how they are going to approach them since like in the lower 48, there is no organization that oversees them all. Lacking a lot of location information of where these are.

- ***Review and Implementation of BLM's 2016 Manual 1730, "Management of Domestic Sheep and Goats to Sustain Wild Sheep"***
  - Sandra Brewer – *BLM, Nevada state office wildlife lead, sitting in for Frank Quamen gave an overview of the new BLM Manual 1730 - Management of Domestic* Sheep and Goats to Sustain Wild Sheep. Document will be on WSWG website.
    - Purpose: provide policy guidance for coordination and management of domestic sheep and goats to sustain wild sheep on BLM managed lands, recognizing domestic sheep

and goats are carriers of bacteria that may cause substantial wild sheep mortality as a result of respiratory disease via interaction and pathogen transmission. Manual applies to grazing authorizations, trailings, and non-permitted activities.
    - Objectives: 1) support multiple use and sustained yield management, 2) promote sound management of domestic sheep and goats to sustain wild sheep and 3) provide bureau-wide consistency to reduce potential for contact between the species.
    - First test case for Manual 1730 was the BLM Dominguez-Escalante National Conservation Area, in western Colorado. Land use plan was up for revision, they analyzed data and information on risk of bighorn and domestic sheep contact. Unfortunately the land use plan continued to authorize domestic sheep grazing.
- Mike - key points. Manual supports changes and revisions to land use plans and authorizations when they are up for renewal or other appropriate times to attain adequate separation from domestic sheep. BLM has adopted the USFS Risk of Contact Model and recommends the use of the model to assess situations where lack of separation exists. There are 15 different management practices that BLM is promoting to enhance separation. See Manual 1730 document.
- Kevin - It's a step by step progression through these practices.
- Greg Schildwachter - Watershed Results - has open channel communication with new administration. Trying to keep moving conservation forward with USFS and BLM.

➢ ***USDA-APHIS new research/modelling project in collaboration with USGS to describe and model "disease spillover" involving domestic sheep and goats and wild sheep;***

- Kezia Manlove (who recently completed her Ph.D. under Tom Besser) – led discussion on research project with USDA-APHIS (Center for Epidemiology and Animal Health (CEAH)), USGS and WADDL (is ARS involved?) to explore key factors and variables (possibly subtle ones that have been overlooked that contribute to the varied responses of bighorn herds after they get exposed) involved in disease spillover. This is only one focus of a larger USDA Wildlife and Livestock Interface project initiated from a congressional appropriations bill. Most other diseases studied are allegedly spillover from wildlife to livestock (but we know they were originally livestock to wildlife like Brucellosis), but this is clearly spillover to wild sheep from domestic sheep. Kezia is looking for advice from wild sheep bio/vet experts on what situational variables they have seen in their herds and disease surveillance results that are worth digging into and evaluating/modelling. The goal of this project is to enhance our knowledge and "refine" but not replace the existing USFS Risk of Contact Model. Part of the project is continued work on Movi-free domestic sheep herds.
- Melanie - Use caution with sensitivity and Risk of Contact models.
- Mike – Can you give us more background and USDA's impetus for this research?
- Mark - language in Appropriations Committee to work with ARS?
- Eric - what is the cost benefit analysis of domestic Movi free?
- Kezia - looking at lamb recruitment and weigh gains/losses in domestic sheep herds that could affect their bottom line
- Tom - What about commercial vs hobby flocks; Kezia will talk with Tom more on that and collecting strains amongst flocks
- Jeremy – Current modelling assumes all domestic sheep herds have Movi; can we evaluate probabilities of Movi existing in flock on a farm or not across a broad landscape

surrounding bighorn herds? Kezia – can use GIS to model this risk and possible management practices. USDA did conduct testing of limited number of flocks to use in this model.

- Rich - Models are silent about attraction of the farm flock to wandering bighorn rams. Kezia - Potential data sets do exist to evaluate that.
- Emily/Don - How do we assess foray rates? Kevin - Does anyone have any data on differential ram forays and different population densities? Mike - Collared close to 100 rams of all ages in Nevada that you can used to evaluate these questions.
- Kezia - Also considering looking at prevalence on domestic sheep side
- Francis - Does group think movement/foray data would be helpful for model? Can use Nevada foray data.
- Kezia - have funding for analysis for one year but anticipating another year.

➢ ***Update on recent National Wild Horse and Burro Advisory Board Meeting and possible WAFWA involvement to encourage proper management to improve degraded wildlife habitat including that of wild sheep herds.***

- Mike – Only briefly touched on the fact the board voted to have BLM remove horses through euthanasia from holding facilities and herd management areas if they cannot be managed through adoption. Will be hearing more from WAFWA and Mike on hopeful movement on this front.

➢ ***Pressing or New Issues from Jurisdictions, Wild Sheep Foundation, Federal Land Management Agencies, or First Nations.***

- Mark - USFS
  - Region 4 Risk of Contact Analysis. Results supplied to those states that have completed their core herd home range and forage analyses and will be provided to managers for use. Some areas still need to be completed (Nevada).
  - Blue Mountain plan - doing FS plan revision and expect to release this year. Mark is happy with the sheep section. Have not settled the pack goat use yet.
  - The Full Curl Program lead - outreach to fill position but holding off on filling it with new administration coming in.
- Amy Lisk – USFWS
  - Amy works on the National Bison Range in northwestern Montana. They experienced a Movi die-off of bighorn sheep. The entire refuge has a high fence around the perimeter. Not sure how transmission occurred. Could have had bighorn find their way out and come back in? Local domestic sheep flocks adjacent to the range – distance away?? Besser/Cassier helping develop research around this epidemic. Currently 60 known mortalities and still 70 known alive. Working with Montana Conservation Science group? Population has been researched for 35 years. Have lots of pre-event data on all the bighorn herd.
- Melanie - NPS - Have authorized grazing within Parks. Working increasing their education with grazing. Melanie is developing separation strategies. Evaluate and prioritize parks for evaluation and strategies. Develop policies similar to BLM. NPS would like to be more involved with WSWG.

- ***Pressing or New Issues from Jurisdictions, Wild Sheep Foundation, Federal Land Management Agencies, or First Nations.***
  - Tony - Alaska –
    - Been a challenge to deal with the Arctic Red Flag Military activities that occur over Dall sheep herds. Mike – definitely an expanding issue westwide with several military installations in several states that have wild sheep on them. Some open to hunting. Other states working with military to manage populations. Large land withdrawal process going on in Nevada on NTTR and NAS to expand the areas of active bombing involving occupied bighorn sheep habitat.
    - Preparing for Thinhorn summit in April.
    - Looking at lower nonresident permits.
  - Kevin - Working with Canada/Alaska to avoid same issues as bighorns. Thinhorn summit April 11-12 in Anchorage. Bighorn summit March 2018.

- ***Jurisdictional Data and Information Sharing - discuss and develop standards and guidelines for input, timing, format, output, and storage.***
  - Mike – Briefly discuss the future development of attribute/metric standards/guidelines for updating and submitting data annually for 1) Herd status (pop estimates, lamb ratios, etc.), 2) hunt tag/permits and harvest 3) GIS shapefiles on occupied habitat; 3) Translocations; 4) Disease events; 5) Major management actions (depopulations, separation successes, etc.). Mike will start list and send out through email for feedback.
  - Melanie - asked for a definition of occupied sheep habitat.

Upcoming Meetings:

- Domestic & Wild Sheep Management and Disease Symposium hosted by Montana FWP, Montana Woolgrowers Assoc. and Montana WSF Chapter, February 8-9, Helena.
- 2nd Thinhorn Summit, hosted by WSF and Alaska Dept. of Fish and Game, April 11 – 12, Anchorage
- 55th Desert Bighorn Council hosted by Utah Division of Wildlife Resources, April 18 – 21, St. George
- Next WSWG meeting: July in Vail, Colorado in conjunction with summer WAFWA meeting