|  |  |  |  |
| --- | --- | --- | --- |
| **#** | **Whiskey Mountain Bighorn Sheep Issues February 2019** | **Main Theme** | **Sub-theme** |
|  | More Access: Human access e.g. hunters and motorized and equal access for all. * There were more access points/ recreation back when sheep numbers were high (i.e. noon rock etc.)
* Increased road closures have caused lack of access, leads to fewer predators taken. Increased road closures lead to lack of knowledge.
 | Access |  |
|  | Environmental groups: Communicate with local groups to activate local involvement. More enlargement locally.\* | Communications |   |
|  | Elk herd increase – impact to winter and summer range? Habitat/Nutrition: poor body condition after summer\* | Competition | Elk |
|  | Competition on summer range? Elk (wild) and goats and sheep (domestic)\* | Competition | Summer Range |
|  | Increased stress and displacement levels due to increased human presence. | Disturbance |  |
|  | Sheep’s responses to dogs. | Disturbance | Dogs |
|  | WGFD funding to figure out disease issues.\* WGFD funding and accountability e.g. for summer range studies\* Budget for sheep. | Funding | Funding |
|  | There has been dramatic acidification in the Winds compared to other Mountain ranges. Some relation? * Pollution as driver of affecting habitat/nutrition ( e.g. air, water)
 | Habitat/Nutrition | Acidification  |
|  | Barren Ewe group – relating to habitat. | Habitat/Nutrition | Barren Ewes |
|  | Habitat disturbed/negatively impacted by high recreational use summer and winter and negatively impacted by off-road ATV use. | Habitat/Nutrition | Disturbance |
|  | Advanced succession on key areas/lack of fire\* - Increase prescribed burns forest wide. Conduct thorough, robust forage study. * Poor body condition after summer.\*
* Examine fire use on summer/winter ranges – invite Wyoming Wilderness Association – burns in Wildernesses. \*
* Habitat: Fire – increased sheep.
* Timber thinning and/or fire\*
* Wilderness regulations restrictive of habitat projects\*
 | Habitat/Nutrition | Fire |

|  |  |  |  |
| --- | --- | --- | --- |
| **#** | **Whiskey Mountain Bighorn Sheep Issues February 2019** | **Main Theme** | **Sub-theme** |
|  | Fringed Sage loss – anti-parasite plants | Habitat/Nutrition | Fringed Sage |
|  | Herbicide effects on forage and sheep – current and long term. * Effects on lamb recruitment or health overall?
* Herbicide used on Torrey\* - Selenium
 | Habitat/Nutrition | Herbicides |
|  | Presence of invasives species, poisonous, noxious weeks, nonnative plants. – various stages/seasons | Habitat/Nutrition | Invasives |
|  | Grazing influence on forage stand composition and nutrients\* | Habitat/Nutrition | Nutrition |
|  | Comparing within the herd unit habitat and nutrition factors.\* | Habitat/Nutrition | Nutrition |
|  | Habitat/Nutrition: poor body condition after summer * Summer habitat nutrition in question\*
* Unknowns in nutritional deficits on summer range.
* Poor condition coming off summer range\*
* Summer Range Habitat quality: Specific variables influence summer range quality - Could be acid rain/snow influence.\*
* Poor summer range – decreased nutrition – decrease milk quality – increase disease susceptibility
 | Habitat/Nutrition | Summer Range |
|  | Mild winters affecting distribution, not moving to lower traditional winter ranges. * Lack of data (or shortage) on winter ranges outside Whiskey/Torrey rim.
* Winter range look good because of fewer sheep?
* Increase winter range activity?
 | Habitat/Nutrition | Winter Range |
|  | Climatological changes impacting vegetation quality (i.e. drought, annual precipitation decrease). | Habitat/Nutrition | Climate Impact |
|  | Predation and habitat/nutrition as added stressors that make sheep more vulnerable to disease – all tied together\*\*\* | Habitat/Nutrition | Interrelatedness |
|  | Industrial pollution possibly affecting nutrition, mineral uptake in forage (i.e. acid rain)\* | Habitat/Nutrition | Pollution |
|  | Disease: lack of science/understanding of effects of specific strains of bacteria leading to pneumonia. | Health | Bacterial Strains |
|  | Disease: scrapie possible? CWD? | Health | CWD |
|  | Expression of disease/asymptomatic sheep\* | Health | Disease |
|  | Disease and re-introduction/augmentation dynamics\* | Health | Disease |
|  | North side/Spring Mountain herd\*- antibodies, genetics, difference to WMBHS | Health | Disease |

|  |  |  |  |
| --- | --- | --- | --- |
| **#** | **Whiskey Mountain Bighorn Sheep Issues February 2019** | **Main Theme** | **Sub-theme** |
|  | Disease: main problem that influences the rest of the issues – learn about possible new factors, their hosts\* * Disease transmission: carriers e.g. mites, black flies, eagles, etc.\*
* Parasite, etc. in water BHS are drinking: reduction of overall fitness: susceptible to disease
 | Health | Disease Carriers |
|  | Disease function weak genetics\* * Herd genetics, bring genetics back – Genetic vigor.
* Control group of sheep\* - move to see if habitat or animal genetics, compare Whiskey Mountain herd to other herds.
* Lack of genetic diversity
* Historically healthy herd: genetic changes?\*
* Lack of knowledge on interactions of disease with nutrition and genetics.
 | Health | Genetics |
|  | Migration Corridors and Stress | Health | Migration |
|  | Changes in composition relative to time when sheep populations were doing well, i.e. micronutrients.* Salt/mineral blocks.
* Other species’ selenium levels.
 | Health | Minerals |
|  | Thin skulls relative to other hunt areas – bone density. | Health | Nutrition |
|  | Decrease in nutrition: Disease susceptibility\** Forage quality\*
* Small sheep suggest poor forage.
* Glacier Lake Meadow\* - high protein, nutritious seed, basin wild rye, lions live there (cover)
 | Health | Nutrition |
|  | Lack of science and understanding – need more studying/education re. effects of specific strains of bacteria which lead to pneumonia.\* | Health | Research Needs |
|  | Forage nutrients analysis: selenium, summer habitat\* | Health | Summer Range |
|  | Local pockets of summer range provide disease sink/vector: decreased nutrition. | Health | Summer Range |
|  | Disease: potential white muscle disease. | Health | White Muscle |
|  | Estimate too high. | Population Mgmt. |   |
|  | Seen increases in late season hunting hunter numbers, increased road traffic. | Population Mgmt. | Hunting |
|  | Hunting season – Any ram leads to fewer ram impacts. | Population Mgmt. | Hunting |
|  | Don’t hunt near conservation camp. | Population Mgmt. | Hunting |
|  | Coordinate with tribes – hunting – management. | Population Mgmt. | Hunting |
|  | Influence of capture and collaring on sheep? | Population Mgmt. | Research |
| **#** | **Whiskey Mountain Bighorn Sheep Issues February 2019** | **Main Theme** | **Sub-theme** |
|  | Coyotes at Red Creek? Impacts and behavioral response?\** Coyote vs. lion?
* High coyote numbers.
 | Predators | Coyote |
|  | Predators: eagles?\* plenty of eagles | Predators | Eagles |
|  | Historical effects of predation vs. current conditions.\* | Predators | History |
|  | Winter access for predator hunting\* | Predators | Hunting |
|  | Lion predation being high\** Arizona had a similar problem with some lions (10%) and took out specific, collared Mountain Lions that were taking lambs = effective
 | Predators | Lions |
|  | Habitat: poor nutrition intake because of predator pressures. | Predators | Nutrition |
|  | Predators – indirect impacts – Harassment of BHS - BHS in poorer habitat \** increased predators lead to fewer sheep.
* Stealth vs. coursing predators
* Predator hunting area closures\*
* Reduced predation control.
* Other Predators.
 | Predators | Nutrition |
|  | Wolves: Canadian wolves vs. historical species (smaller)\* | Predators | Wolves |
|  | Wolves: added stressor/increased stress\* * experimental status\*
* 1999 promise to “take them out” if impacting wintering wildlife\*
* Honesty, transparency from WGFD on effect of wolves\*
* Is the priority wolves or sheep (“choose or lose”). \*
* Increased wolf activity/presence – longer/later wolf season.
* eliminate closing date, keep wolf season open until quota filled.
* wolves – area 9,
* control and hunting methods for wolves limited.
* sheep still learning how to deal with increase of wolves.
* predator zone? Increase take? Open WHMA Roads\*
 | Predators | Wolves |
|  | Need results from UW lamb survival study to evaluate impact of predators…. | Predators | Research Needs |
|  | Predation: We don’t know overall impacts of predators on BHS – need the science\*. * Understand underlying reasons predators and sheep relationship has changed\*
 | Predators | Research needs |
|  | Wolves: Comparing effects of wolves within the herd unit, across ranges\* | Predators | Research Needs |
|  | Examination of historical protections, synthesis and gaps?...results.\* | Research Needs | History |