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# Counting sheep

Results of Muskwa-Kechika Stone's sheep study released to industry sponsors James Waterman Staff Writer

After seven years of hard work, research biologists studying the Stone's sheep population in the Muskwa-Kechika region of Northeast British Columbia were finally ready to present their findings and management recommendations to the North Peace Stone's Sheep Sustainability Steering Committee this spring.

That steering committee includes representatives from the Canadian Association of Petroleum Producers (CAPP), the BC Oil and Gas Commission (OGC) and the BC Ministry of Energy and Mines – as well as representatives from other government departments, the Muskwa-Kechika Advisory Board, Kaska Dene First Nations, BC Wildlife Federation, Northern BC Guides Association and the North Peace Rod and Gun Club – xxxxbecause the research directly affects oil and gas exploration and production interests in the area.

The Muskwa-Kechika Management Area Act stipulates that pre-tenure planning is required before land tenures can be sold to energy companies interested in conducting oil and gas operations on that tract of land.

"It identifies what the exceptional values are in that area," said Brian Churchill, discussing the need for pre-tenure planning.

Churchill, an experienced wildlife biologist who operates Chillborne Environmental, is the chair of the Stone's Sheep Science Advisory Committee for the project.

"In the bigger land use plan, there's a balance," he continued.

"There's areas like the Horn River Basin where the land use plan says its priority [is] for industrial activity. And there's places like parks where the priority is for preservation. And the Muskwa-Kechika's in between."

Churchill explained that when the public consultation with government concerning local strategic plans required by the Muskwa-Kechika Management Area Act began in 2003, an area near Stone Mountain Provincial Park was identified by local stakeholders as an important site for Stone's sheep.

That area is known as Sulpher/8 Mile.

“They thought the special values for Stone’s sheep were so high [there] that oil and gas activities would be devastating,” said Churchill.

“There’s an area set aside called the High Elevation Zone,” he continued, “where they don’t want to advance any potential oil and gas tenures until the research has been done to substantiate or not substantiate the concern.”

That research was managed by Pamela Hengeveld and Clint Cubberley, both biologists from Synergy Applied Ecology.

Churchill expects that their findings and recommendations will finally go through the steering committee and the Muskwa-Kechika Advisory Board this June, after which the advisory board will submit a pre-tenure plan to the provincial government.

However, Churchill noted that some elements of that plan may already be fairly obvious simply based on the research that has been published online.

“It’s kind of interesting because there’s never been this extensive a Stone’s sheep project done before,” he said of the work.

A significant component of the project was fitting a group of female sheep with what are known as mortality collars.

“They have a thing on [them] that, if the collar stays still for four hours, it starts sending a different signal,” said Churchill.

That usually suggests that the animal is dead.

“Then we go and find out what killed it, if we can,” added Churchill.

Another aspect of the study was learning what parts of the region actually comprise sheep habitat, a part of which was a winter inventory to determine their range during that season.

“And the interesting part about that is that, because we had all these collared animals out there for mortality, we could know if they were alive or not,” said Churchill. “So, that means they were able to do what we call a mark-recapture.”

By calculating the percentage of marked animals that were actually seen, the researchers could determine the visibility of the whole population, which is about 82 per cent for the Stone’s sheep in that region.

“There’s a significant chunk that are just not visible, even from a helicopter in the middle of winter, and it’s snowy and they’re confined to a very small area,” he added.

They also had GPS collars on a collection of both males and females that they used to mark the locations of those animals on certain time intervals throughout the day and night.

“And then when [you] get the collars back, you get all these data points,” said Churchill. “And we have a total of 58,000 data points.”

Every data point included a date, time and location, which allowed the researchers to map lambing areas and rut ranges, for example.

“You think you got a handle on them for winter,” said Churchill, “because you can fly [over] and see the tracks in the snow and all that. So you can identify where their winter range is. Now what’s important for the rest of the year?

“Obviously, lambing is one of those,” he added.

The study area was actually just a small part of the Sulphur/8 Mile region where potential for oil and gas development has been identified. That area was divided into two sub-regions: the Low Elevation Zone and the High Elevation Zone.

“The first thing was obvious,” said Churchill. “As expected, sheep didn’t show up in the Low Elevation Zone.”

The High Elevation Zone is intersected by the Toad River, one section to the north and one section to the south.

“There’s no sheep in the High Elevation Zone north of the Toad River,” Churchill continued. “The perceived conflict [between Stone’s sheep range and land with oil and gas development potential] isn’t a conflict.”

“It’s pretty clear that the standard guidelines for oil and gas should be applicable,” he added.

The north and south sections of the High Elevation Zone, as defined by the Toad River, are approximately equal in size, just as the High Elevation Zone and Low Elevation Zone are approximately equal in size. The southern half of the High Elevation Zone – the area in which Stone’s sheep are found – is only about one quarter of the total study area.

“And then we refined it down to area that sheep actually use within that southern part of the High Elevation Zone,” said Churchill, concluding that Stone’s sheep only use about ten per cent of the whole study area.

“What the study’s allowed us to do is narrow down our area of concern to about ten per cent of the original area that we looked at,” he added.

Essentially, ninety per cent of the region is free of Stone’s sheep, which means that the animals and efforts to conserve them should not be obstacles to oil and gas development.

However, that isn't all that was learned over the course of the study, which received funding from a handful of companies, organizations and government agencies concerned with the oil and gas industry.

The Ministry of Energy and mines contributed $100,000, BP Canada Energy Company contributed $8,000 and TransCanada Pipelines contributed $175,000. The largest funding partner, the Science, Community and Environmental Knowledge Fund, which consists of funds from fees and levies on oil and gas activity and is overseen by representatives from OGC, CAPP and the Small Explorers and Producers Association of Canada (SEPAC), contributed $650,000. The second largest donor was the Habitat Conservation Trust Foundation, which provided about $350,000 in funding.

The result of that funding was considerable baseline information about a species that has not been the subject of much research in the past.

"They're there all year round," Churchill said of the Stone's sheep in that small section of Sulphur/8 Mile.

"They use all of that ten per cent most of the year," he added. "The only time they don't really use it all is during winter when… the snow confines them to smaller areas."

The sheep tend to disperse from their winter range as soon as spring arrives, but quickly return to that area in June.

Their population density is quite high in that habitat overall.

"Basically, even the winter areas are being used year round," said Churchill. "And all the areas around it, of course, are being used as soon as the snow goes. The only thing that sort of makes them spread out a lot is they need mineral licks. And so they go looking for mineral licks. And most of the mineral licks are outside their sort of real core areas. And some of those mineral licks are along the Alaska Highway."

Churchill was intrigued by the fact that the sheep usually frequent mineral licks along the highway during the high motor traffic hours of 10:00 a.m to 4:00 p.m.

"That was a little bit surprising," he remarked. "That means you've got a high potential for collision. And, of course, we documented a bunch of collisions. And the mortality on female sheep [in the] Stone Mountain Provincial Park area is a significant [concern]."

Churchill didn't express any concern about increased road fatalities in Sulphur/8 Mile if oil and gas development doe occur in that region, but he did note the need for sheep management efforts coinciding with future improvement of the Alaska Highway, which would partly be a byproduct of increasing industry activity in the Horn River and Liard Basins, as well as the associated growth of Fort Nelson.

“Some major consideration is going to have to go into how you reduce that mortality on that part of the highway,” he said, suggesting that the sort of fencing and overpasses used to keep ungulates off the roads in the Banff, Alberta area might be a solution.

“Increased traffic on the Alaska Highway for a variety of reasons including oil and gas – it will be a concern,” he continued. “Upgrading of that highway needs to make provision for reducing or eliminating collisions with Stone’s sheep.”

Two segments of the population – one near Stone Mountain Provincial Park and one near Muncho Lake – are particularly at risk for road mortality.

The study also produced information on diseases affecting Stone’s sheep.

“We wanted information on disease to see how the population’s doing,” said Churchill. “But we’re also looking at the baseline of what diseases are out there. Have these sheep come into contact with, say, domestic sheep that have a bunch of other diseases [that] tend to kill sheep?”

The researchers actually discovered winter ticks on a few sheep, which hasn’t been common in the past.

“There weren’t very many of them,” he said. “So, not a big concern. But it was one of those little interesting tidbits.”

Historical evidence suggests that the sheep won’t eventually extend their range beyond that ten per cent of Sulphur/8 Mile into land that may be tenured for oil and gas, but the reason is unknown.

“Part of the study was to take and upgrade the mapping – the habitat mapping – for sheep,” said Churchill. “And that was done by a professor at University of Northern British Columbia from satellite imaging.

“That upgrades the biophysical mapping as to areas that sheep would use and not use,” he added.

However, that only shows where the sheep live. It doesn’t explain why they don’t live north of the Toad River.

“The part north [of the Toad River] has some elements that look like they could have sheep,” said Churchill, “and yet there are no sheep.”

Discussions with local families and First Nations communities with long histories in the area revealed that Stone’s sheep have never been seen outside of the region identified as their range during the study.

“That’s what you call traditional knowledge,” said Churchill. “And they indicated no knowledge of sheep in that area. And then we also did what we call a community knowledge study. We had [people] go out and meet with all the old, longtime residents and all the old guide outfitters and

stuff from that area, and try to identify if there's any sheep in that area. Again, that came up with no historical evidence of sheep there."

Determining the reason for that would require additional study.

"But we're satisfied that historically, traditionally and currently there's no sheep in that area," said Churchill. "There's better things to be doing than worrying about sheep in that area."

That includes protecting the sheep that do live in that small section of Sulphur/8 Mile.

"It's a really, really important sheep area and a really, really important sheep population," Churchill added. "The largest, most accessible and hunted sheep population of Stone's sheep.

"You're going to have to protect those sheep," he continued. "And you're going to have to protect those sheep's habitat.

"Nowhere [for them] to expand to that we can see. And, in fact, if you take away any of the habitat there, you're going to decrease the number of sheep."

Part of the issue is that the sheep population is "showing density dependent effects"

That means that they have difficulty increasing their population with young sheep.

"There's more mortality in the winter of the lambs," said Churchill. "More health related mortalities from injuries.

"Eventually, they die of heart attacks and everything critters die from."


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