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FARO SHEEP STUDIES

November 1988 to May 1989

by:
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Background:

Curragh Resources in Faro, Yukon, are developing two new ore bodies, the Grum and Vangorda, that lie directly in the traditional migration routes between winter and summer range of a herd of Fannin sheep (Fig. 1). The Department of Renewable Resources in cooperation with Curragh Resources, is undertaking continuing studies of the sheep in an attempt to determine the mine's impact on the sheep population and to mitigate those impacts if possible. This study was a continuation of that work. More detailed background material is contained in McLeod, 1988, Curragh Resources Inc. 1987, Horesji 1988, Lortie 1988, Hoefs 1989, and will not be repeated here.

Objectives:

The objectives of this study were as follows:

1) Habituate sheep to man and hay for capture purposes;

2) Habituate sheep to man and hay for the purposes of influencing their migration pattern and routing;

3) Radio-collar 10 ewes and ear-tag additional sheep that may be captured for the purpose of range-use tracking and determination of birthrate and survivorship of lambs;

4) Classify all sheep observed on a weekly basis;

5) Document range use patterns of sheep on a weekly basis;

6) Document the response of sheep to disturbances, such as vehicles, hunters, A.T.V.'s, and domestic animals, such as horses or dogs, running loose.

7) Monitor illegal activities such as poaching, and in cooperation with C.O.'s or RCMP, attempt to reduce such activities; and

8) Keep public informed about project so that particularly the communities of Faro and Ross River endorse and support it.

Methods:

Most of the work done on this project was simple observation and does not require detailed reporting of methodology. I have included details where more explanation is needed under the appropriate sections. I was called away between May 19-29, 1989, and observations were done during that period by members of the Faro Fish and Game Club (Appendix A).

Results:

Habituating Sheep to Man and Hay

I started carrying hay to the North Trap (Fig. 2) on 16 November 1988, but the sheep initially ignored the hay scattered along their trails and feeding areas. It wasn't until I set up bale segments right in their main trail above the trap that they ate the hay. They very warily approached the upright bale segments before nibbling and then crowding in to get it. Although they had previously walked over loose hay, they could not ignore the upright bundles blocking their path and had to investigate them. I feel this manner of presenting hay to unhabituated sheep influenced them in taking it.

From where they first took hay to 10 metres from the trap is about 150 metres and they had followed a hay trail to that point by 29 November 1988, and to the trap door by 06 December 1988. After that, they repeatedly spooked away from the trap when it would creak in the wind, and it wasn't until 16 December that they first entered the trap. From that day onward, they became increasingly familiar with the North Trap and would enter it without hesitation to get the bait.

Because the South Trap (Fig. 2) was built right on a main trail and erected gradually of natural material, they did not hesitate to entering it right from the start. This was different than the North Trap which was constructed of plywood and appeared artificial and dangerous to the sheep, particularly because it was also noisy and moved in high winds.

I tried other baits, besides hay, such as apples and discarded vegetables, but such bait attracted foxes and wolves more than sheep. Sheep were observed nibbling on melons and apples, but they did not appear to favour them over hay. Salt, however, was attractive to the sheep and was placed, first outside, and then inside, the traps and was used by the sheep whenever they visited the traps.

The sheep quickly habituated to me and would move down the hill when they saw me coming with a load of hay. During late winter when they were hungry, it was not unusual to get within two to three metres from them and on several occasions, I was actually inside the trap with them.

Influencing Migration Patterns

During the winter of 1989, a five to six kilometre pathway was cut through the forest (Figure 1) following the recommendation of Horesji (1988). It terminated on the east bank of Vangorda Creek whose bed and canyon are about 150 to 200 metres wide at that point. It bisected several main migration pathways on the east bank but it did not extend far enough to bisect pathways on the west bank.

A brush fence was erected along the last two-hundred yards of the newly cut trail in an attempt to block sheep from using their traditional trails and to divert them along the cut trail. As well, hay and sheep pellets were scattered for 1/4 to 1/2 kilometre along the cut trail to lure and encourage sheep to use it instead of their traditional trails.

The first recorded use of the Cut Trail was during mid-January when four rams were seen on it near Vangorda Creek (Bowers, pers. comm.). No other use was recorded until the 10th of May when tracks were seen crossing it on Trail #3 heading toward Mt. Mye. From then on, new tracks were seen going either toward Mt. Mye or Sheep Mountain almost every day. I personally did not see any sheep on the migration route between Mt. Mye and Sheep Mountain, but I closely examined the Cut Trail to determine if sheep used it. There was no indication that sheep did anything but cross the newly cut trail and the woods road that paralleled it (see Fig. 1) although during the period I was absent, tracks were seen on the woods road at the west end heading toward Vangorda Creek (Faro Fish and Game Club data, Appendix A). On several occasions it was possible to follow their tracks in new snow and they did not do anything but cross directly and hurriedly over the migration route. There was no indication of dawdling, feeding, bedding or straying from the trail as if they were uneasy in the timber and wanted to cross to higher ground as soon as possible.

No tracks were seen by me on the Cut Trail other than directly crossing it. It turned out, after following the tracks of sheep moving between Mt. Mye and Sheep Mountain, that there is a bulldozed road leading directly from the head

of Vangorda Canyon to the base of Mt. Mye (Fig. 1). Since it is the shortest distance between Mt. Mye and Sheep Mountain and is a wide-open road with hard footing, the sheep appeared to prefer this direct and easy route over all others. This route also affords good escape terrain in the rock bluffs along the lower reaches of Vangorda Creek (although the remainder of the route is timbered and brushy until it reaches Mt. Mye).

Hay was scattered during May in and around the North Trap and along the Cut Trail. There was no evidence that sheep took any of the hay. New growth was naturally available where they customarily fed on both the north and south sides of Sheep Mountain and it appeared from tracks that they did not feed much, if at all, while crossing between Sheep Mountain and Mt. Mye.

Capturing and Tagging Sheep

Trapping of sheep was delayed until the middle of March. At first the sheep would not enter the North Trap and the South Trap was not finished. Then, after the sheep were entering the traps, the door on the North Trap needed to be modified. Curragh (actually their subcontractor Northland's) missed promised deadlines to do this, so finally I rebuilt the trap door. By that time it was after Christmas and so cold that the sheep stayed at the top of Sheep Mountain and did not frequent the traps. After they started using the traps again, it was very difficult to get sheep and manpower to the traps at the same time. We found that it takes two men to hold a sheep and another to

Table 1. Details on the four ewes captured during March 1989.

Date	Trap*	Collar	Frequency	Age	Comments
Mar. 16	S	Yellow/Green	152.400	12	Died March 29, suspected shot
Mar. 29	S	Yellow	152.700	6	Radio possibly malfunctioning by May 29
Mar. 29	N	Red	152.710	5-6	
Mar. 29	N	Black	152.470	8	

* Trap designated as S (South); N (North)

do the tagging. Finally around the 20th of March, the sheep were apparently feeding on new growth on the bare slopes and were less interested in hay. All of this added up to fewer sheep being captured than desired (Table 1). Otherwise, the traps now work well and are in place for additional trapping if required.

Lambing Observations

The ewe that was killed (see section on Mortality of Sheep) was carrying a well-formed male lamb. On 19 May, the yellow-collared ewe (Table 1) had a lamb (Sheep Mountain) but had apparently lost it by 22 May. She was very active compared to the other sheep, moving between Big Bluff and Sandy Creek, and possibly looking for her lamb.

The red-collared ewe was last seen on 23 May when she crossed the AEX road (Davis, pers. comm.) between Mt. Mye and Sheep Mountain, heading for Mt. Mye. She did not have a lamb at that time. She then evidently returned to Sheep Mountain on the 24th which was the last time her signal was heard (Appendix A). I last observed the black collared ewe on 16 May east of the Big Bluff. All radio signals were received that day, which was the last time she was seen or her signal was heard. She did not have a lamb at that time.

In the unmarked sheep, the first lamb was reported on May 4th by workers on the Blind Creek Bridge. I could not confirm this sighting although I searched the area of Sheep Mountain visible from the bridge daily. No one else confirmed the sighting. The first evidence I saw of lambs was on 17 May when tracks of two to three lambs and several ewes were seen where they crossed from Mt. Mye to Sheep Mountain following a snowfall. I tracked them from the AEX road to Vangorda Canyon (west bank). They went directly and hurriedly over this route. The next day I saw three lambs high up in Middle Canyon (the same ones?). Apparently these lambs were born on Mt. Mye and not on Sheep Mountain. Table 2 contains observations of newborn lambs from the 19th to the end of May. The largest number of newborn lambs seen in one day was 6 on the 24th (Appendix A).

Observations of Marked Sheep

With the exception of the red-collared ewe seen crossing the AEX road between Mt. Mye and Sheep Mountain on 23 May (see section on Capturing and Tagging Sheep and Lambing Observations), all other observations and reports of marked

ewes were Jo

Table 2. Observations of Newborn Lambs in Study Area (from Appendix A).

Date	No. of Lambs	Other Sheep in Group	Location	Observed	Tracks Only
May 19	2	6 ewes	Above Faro dump	*	
May 19	5	17 ewes	Above east canyon	*	
May 19	1	7 ewes (1 yellow collar)	Above Big Bluff	*	
May 20	1	3 ewes; 2 yrlgs.	High middle canyon	*	
May 20	4 (1 set of twins)	7 ewes; 1 yrlg.	Between Big Bluff & east canyon	*	
May 21	Yes	Yes	Cross AEX Road toward Mt. Mye.		*
May 21	3	7 ewes; 1 yrlg.	Above east canyon	*	
May 23	4	8 ewes; 5 yrlgs.	West side Sandy Creek	*	
May 24	1	2 ewes; 1 yrlg.	Cross AEX Road toward Sheep Mountain		*
May 24	5	11 ewes; 7 yrlgs.	East of West Canyon	*	
May 25	4	12 ewes; 4 yrlgs.	West of Sandy Creek	*	
May 26	4	9 ewes; 4 yrlgs.	West side Middle Canyon	*	

the southern exposed slopes of Sheep Mountain (Figures 3, 4, 5). The Figures (3 & 4) show direct movements between Sheep Mountain and South Bluff when in actuality, most movements between Sheep Mountain and South Bluff occurred at the Road Cut (Fig. 1). This was particularly true as the snow got deeper and even later after the snow melted. During the rut in November, however, sheep tended to be all over the lower ground and would cross almost anywhere although they favoured using cut lines and the Road Cut.

The northern boundaries of sheep movements are unknown, but it is doubted that sheep used the heavily timbered and snowed-in northern slopes much during mid-winter.

Counts and Classification of Sheep

Because of distance, terrain, vegetation and mobility of the sheep, it was difficult to get complete counts and therefore the numbers in this section are minimum estimates of the sheep that are in the study area.

On 30 November it seemed that most of the sheep were congregated between Big Bluff and Middle Canyon, and I counted 33 ewes and lambs and 12 rams (Table 3). This number did not vary much through the winter and as I got to recognize

Table 3. Counts and Classification of Sheep on the Study Area.

Date	Ewes	6 mos. to yearling	Rams 1/4	1/8	3/4	Full	Location
Nov. 30	11	11	4	3	1	2	North Trap
Nov. 30	5	1	-	-	-	2	Big Bluff
Nov. 30	2	1	-	-	-	-	Middle Canyon
Nov. 30	1	1	-	-	-	-	High Middle Canyon
TOTALS	19	14	4	3	1	4	
Apr. 18	28	21	-	-	-	-	Low Middle Canyon
Apr. 24	-	-	14 (unclassified)				Above Dump
			9 (unclassified)				Middle Canyon
TOTALS	28	21	23				

sheep it seemed that they were loosely aggregated in four bands: 1) 22 to 23 that hung around the North Trap; 2) a small band (led by a dark brown ewe with a large white spot behind each front leg) that preferred the area northeast of Big Bluff; 3) another nursery band that was led by the marked ewe that was shot - they used the South Bluff more frequently than other bands; and 4) the 12 rams that mostly stayed west of the West Canyon. Of course, there was considerable intermixing and without a number of marked sheep it is difficult to say for sure that the nursery sheep were loosely segregated into bands.

As the winter progressed, not only did the sheep move to more remote areas, but their pelage changed and their markings became more indistinct and blurred. Nevertheless, I am sure that there were four new ewes without lambs on the study area on February 10th. One with a black neck and grey body was particularly striking and was seen later in the group that frequented South Bluff. I don't know if they moved in or had been there all the time and I missed them.

It is certain that around the 18th of April a number of ewes, yearlings and 11 rams moved into the study area (Table 3). Lortie (1988) did not notice an increase in ewes, but he did record 12 rams coming into the study area around the same time during 1988. One of the rams had lost a horn and that ram showed up again. The two ram bands joined together and there was considerable aggressive behaviour including intense butting jousts before the two bands established or re-established a dominance order.

The best explanation of where the sheep came from seems to be west of the mine road toward Rose Mountain, although I have no way of proving that. They only stayed around for about two weeks during the time that the sheep were using the lower slopes of Sheep Mountain and South Bluff heavily, and before the mosquitoes became bothersome. After that, bands of ewes, yearlings and rams were seen above the dump and moving west. It seems reasonable to assume that they came the same way. Possibly they move into the area to use the licks along South Bluff.

Last year, Lortie (1988) recorded 13 rams in the study area and 12 moved in during late April. This year I recorded 12 rams on the study area and 11 moved in. If this is an accurate count, then two rams are missing. They could be the two recorded legally taken by sport hunters on the mine road last fall (Williamson, pers. comm.), but that is not definite. The important point is that the number of rams in the area appears to have dropped.

Likewise, the number of adult females appears to have declined from 36 reported by Lortie (1988) to 28 this year. Because of the uncertainty associated with my count (minimal count only) I do not definitely want to state that the herd is declining, nevertheless, the possibility should be noted with a degree of concern.

Ewe to yearling ratios were very high. Either there is phenomenally high reproduction and survivorship of lambs or else there is a group of mostly barren ewes wintering elsewhere. The very high yearling to adult ratios and the high survivorship of yearlings through this winter indicated that the herd should be rapidly expanding, a trend that must have been established for several years now. Nevertheless, the herd seems to be stable or slightly declining, a possibility that should be watched carefully.

If the herd is declining, what is happening to the sheep? There are three possible explanations that could be working separately or together. The first is that sheep are being killed illegally or by unreported native hunting. This seems to be a distinct possibility after the findings of dead sheep this year (see the section on Mortality of Sheep) and the known mortality from previous years. The second is that wolves are taking a number of sheep. Several instances of wolves hunting sheep were recorded this year, including one where three sheep were chased onto the road near Faro; they were exhausted (Loblaw pers. comm.). Other instances saw wolves directly hunting sheep or tracks that clearly indicated hunting. With the possible exception of the remains found at South Bluff (see section on Mortality of Sheep) however, no definite wolf kill was found. The third is that sheep are wintering elsewhere, which is also a distinct possiblity considering the movement into the study area during April by sheep that apparently wintered elsewhere.

Range Use Patterns

There were distinct differences in range use patterns as the season progressed. The rut was in progress during mid-November when the study started and sheep were the most mobile and ubiquitous during this season (Figure 6). Rutting behaviour had declined by early December and the last time a ram was seen with a nursery band on Sheep Mountain was 14 December. After that, rams used the area from West Canyon to above Faro dump and were not seen from the ground again on Sheep Mountain until spring. However, an aerial survey on 23 March disclosed four rams at the very top of Sheep Mountain (out of sight from below) and four rams were seen on the cut line on the north side of Sheep Mountain (see section on Influencing Migration Patterns). After the rut, rams particularly preferred Ochre Bluff (first big bluff east of Faro above the Blind Creek Road), West Canyon, and the hill above the dump, and were seen there throughout the winter and spring.

As snow depths increased and temperatures declined, the nursery sheep became more sedentary and retreated to the top of Sheep Mountain (Figs. 7 & 8). During the coldest time, they quit using South Bluff altogether. Energy conservation was the most likely cause of these changes in range use. The only bare spots were at the top so I assume snow depth was less there. That translates into less digging for forage. Comparison of temperatures at the mine (its elevation is roughly equivalent with the top of Sheep Mountain) with those at the trailer at the bottom of Sheep Mountain, shows that it was warmer at higher elevations (Table 4) particularly during relatively warmer periods. Furthermore, the sun hit the top of Sheep Mountain first and last during the day, giving an added hour or more insolation at the higher elevations.

Table 4. Comparison of Morning Temperatures at Faro Mine and Trailer Site.

Date	Faro Mine	Trailer Site
January 19	31.5	35
January 20	30.5	28
January 24	11.5	25
January 25	7.0	10
January 26	9.0	12
January 27	11.5	22
January 28	5.0	25
January 29	35.5	35
January 30	42.0	36
January 31	41.0	45
February 1	37.5	45

As winter relented, slopes were exposed starting at the top of Sheep Mountain and moving downward. The sheep moved down as a consequence, beginning about the end of March and the first two weeks of April (Fig. 9). When the snow first disappeared, they appeared to be feeding on sage and the red plants that became lush before the green.

The most dramatic movement took place during the last two weeks of April when the green forage was abundant on the lower slopes. At that time, sheep used the the very bottom of Sheep Mountain and again heavily used the South Bluff

(Fig. 10). They also increased their mobility during this time, particularly when joined during mid-April by a band of rams and a band of ewes and yearlings (see section on Counts and Classification of Sheep). This was also reported by Lortie (1988). It is not known where those sheep wintered, but it is suspected that it is west of Sheep Mountain toward Rose Mountain because all of the possible winter range north of Sheep Mountain was surveyed with a helicopter during March without finding any tracks or sheep. Furthermore, ewes and yearlings were seen above the dump during the winter so it seems likely that part of the ewes follow the rams as they move toward Rose Mountain during the summer. This was confirmed by sightings of numbers of ewes and yearlings above the dump during late-April and mid-May.

At the end of the season, the ewes and yearlings used Sheep Mountain from the top to the bottom (Fig. 11) but bands of ewes became more sedentary again and hung out in the rock bluffs and draws prior to lambing. Before mid-May they were more likely seen on open slopes, but after that they preferred higher, rockier, more secluded areas. The rams retreated across the road but they were also seen as far as West Canyon and right in the backyards of the north side of Faro.

Sheep appeared to leave the study area at the middle and end of May by two routes -- northerly toward Mt. Mye, and westerly toward Rose Mountain. I suspect that sheep of all sexes and ages go both ways (Appendix A), but the rams do seem to prefer to go west toward Rose Mountain.

A small lick was made this year by the west side of Big Bluff near the main trail that passes over Big Bluff. Sheep also used the south bluff lick and there is another lick reported to be below Sandy Creek (Lortie, pers. comm.) but I don't know where it is.

Response of Sheep to Disturbance

Despite all of the vehicular activity (ranging from 12 per day during the winter to 6 per hour during May) there were few times when I saw sheep and vehicles in close proximity. That in itself may indicate that sheep practice avoidance of vehicles, particularly noisy ones.

On December 8th a pickup truck passed within 30 metres of two ewes with lambs. The truck stopped, but the sheep were not alarmed to the point of running away. After the truck passed on, the sheep resumed feeding. There were many reported instances of sheep meeting vehicles on the road and not being overly alarmed. For instance, when the red collared ewe and four others were seen crossing the AEX road between Mt. Mye and Sheep Mountain, they were intercepted by a pickup truck. The truck stopped approximately 200 metres from them and so did the sheep. After a pause, the sheep continued on toward Mt. Mye (Davis pers. comm.). I do not believe that quiet vehicles at a distance overly disturb sheep, particularly if the sheep are above the vehicles and the vehicles are moving on a regularly travelled route. I feel that sheep will habituate to quiet vehicles moving over the same route if the sheep are not disturbed by other means such as hunting or are chased by off-road vehicles. This has certainly been demonstrated to be so in National Parks.

Off-road vehicles may be a different matter. They are noisy and their routing is not predictable and regular. On 18 April we watched three people photographing sheep. They were approximately 150 metres from the sheep and not moving at the time that a quad runner ATV came down the road. It was noisy and the sheep spooked although it was between 300 and 400 metres away and not heading directly for them. I don't know whether they would have spooked had the photographers not been there. Certainly the sheep on the side of Sheep Mountain do not spook despite the heavy traffic of all kinds on the Blind Creek Road. On the other hand, with the exception of during the rut, sheep appeared to avoid the road and crossed mostly at Road Cut with no dawdling.

Sheep appeared to habituate to humans on foot if they were no closer than 150 metres and not above them. But even then sheep could be blocked from habitat or rerouted because they tended to move away from humans on foot even though they appeared not to be overly alarmed by nonthreatening human presence. No observations were made of sheep near domestic animals, but horses, goats, dogs, rabbits and home cats were all observed in the area. There are rumous that cattle may be brought in. Perhaps the largest concern is that disease will be introduced to sheep from domestic livestock.

Mortality of Sheep

The remains of five sheep were found. The first, during mid-November, was found 75 metres from the Road Cut. It was an adult ewe. The cause of death is uncertain although it reportedly caught its head in a ~~tree~~ fire-killed tree that had fallen on (Loblaw, pers. comm.).

The second was the radio-tagged adult ewe found dead at the base of the bluff below the South Trap on 30 March. She was alive, acting healthy and eating hay in the South Trap the day before. It is suspected that she was shot with a .22, possibly while crossing Road Cut.

The third was a pelvis picked up by wolf hunters behind the dump. The cause of death is unknown.

The fourth was a hind leg of a yearling picked up in Road Cut on 16 April (Gouche, pers. comm.). The cause of death is unknown. We suspect that the leg was carried to the road by a wolf or fox and dropped when a vehicle came along. The leg had been chewed by carnivores.

The last was the remains of a sheep found below South Bluff on 12 May (Mychasiw, pers. comm.), possibly a wolf kill from the winter.

I think it is significant that three of the five remains were found at Road Cut where the Blind Creek Road intercepts the major crossing route of sheep moving between Sheep Mountain and South Bluff. Four of the five remains were found in areas heavily used by sheep and people. To me, these facts point to a possible poaching problem. The sheep are readily available to vehicular traffic at Road Cut and elsewhere and poaching for meat or ignorant plinking (as apparently happened in the case of the marked ewe) could easily happen on a sporadic, opportunistic basis. I also observed numerous incidences of alcohol use by people using Blind Creek Road. In previous years, numbers of sheep have been known to have been killed by native hunters and poachers, (Wittfoth, Williamson, Gouche, pers. comms.) and several rams by legal hunting. There were rumours during January that two sheep were poached along the Blind Creek Road. I was unable to deny or confirm the reports, but I saw no tracks in the snow where this could have happened. There was also a report that one of the large rams was poached during the winter and his head sold on the black market. Again, this rumour was unconfirmed.

Public Information

I explained the project to over thirty individuals during the course of the study, including the Mayor of the Town of Faro. We attended a public meeting that explained the program and passed out the proposed management plan to several individuals that were interested. We were a catalyst in the formation of the Faro Fish and Game Club which I feel could be an important factor in the management of the sheep in the area, as well as in other species. The killing of the marked sheep during March elevated the project even higher in the interest of Faro people, and I think it is fair to say that very few residents of Faro were ignorant of the project at the end of the winter. Furthermore, I did not hear one negative or non-supportive comment about the conservation and management of that herd of sheep, although ideas about how to best accomplish that varied.

Conclusions and Recommendations

Sheep can be habituated to both man and hay if they are undisturbed and the process is started early enough in the year so that natural forage is dry or covered with snow. They abandon hay in preference of natural forage as soon as the slopes are uncovered in the spring, so although hay was useful as bait for trapping, it was not useful in luring sheep to use the Cut Trail.

Sheep did not use the Cut Trail. Instead, they took the shortest route between the winter and summer range which has escape cover at the lower end and a bulldozed road for most of its length (the trail known as T2). Sheep appeared to cross back and forth between winter and summmer range several times before finally abandoning winter range altogether at the end of May. They did not feed or dawdle, but hurriedly crossed the valley between winter and summer range, therefore it is doubtful that bait will be of any use to lure them to the alternate route. It is also doubful that physical disturbance of topography will cause them to abandon their traditional route because they may prefer the open untreed areas that mining creates. Therefore, I make the following recommendations:

1) Ensure that Curragh maintains the existing undisturbed area between the Grum and Vangorda pits, particularly ~~to~~ the T2 trail area.

2) Closely monitor sheep movements during fall and spring to see their reaction to the development as it proceeds and to accurately define their choice of crossing areas and trails, and with this knowledge design mitigative measures that enhance what the sheep are trying to do.

3) Design ramps or culverts to ensure that sheep can pass on their traditional routes or wherever they choose to cross.

4) Do not spend any more money on the newly Cut Trail until it is determined that the sheep are obviously looking for another routing.

5) Work closely with Curragh to develop operating procedures to allow sheep to cross on their traditional route.

Sheep can be easily captured by trapping, but the process is manpower intensive and must be done when the sheep are visiting the traps every day, which means early (November-December) or late (February) winter.

6) The trapping program should continue next year to:

   a) radio collar sheep to determine where the sheep winter and summer, particularly the group that already is not using Sheep Mountain; and

   b) to mark sheep for good population estimates.

7) Trapping should be done during November and early December or in February.

8) Adequate, dedicated manpower must be available if the trapping program is to be a success. An alternative would be to use a box trap which can be operated by one person.

9) In addition to a winter marking program, a summer program should be considered to try and determine where all of the Mt. Mye sheep winter.

Radio-collaring was not particularly useful in determining sheep movement patterns between winter and summer range because of the quickness of sheep passage over the route and the difficulty of seeing them on the route. This

could be overcome by round-the-clock monitoring of the north side of Sheep Mountain during the last two weeks of May. Radio-collaring was very useful, however, to detect presence on winter range and times of passage. It should also be useful in detecting summer range areas for the sheep wintering on Sheep Mountain.

There is a possibility that the sheep population wintering on Sheep Mountain is declining. Counts and classifications should continue for a number of years to confirm these observations.

10) Count and classify sheep during the fall rut (November) and the spring feeding on lower slopes (April) until a reliable trend is established for the number of adult ewes, yearlings & rams.

The top of Sheep Mountain is the most critical habitat for nursery sheep because it is used during the coldest time of the year. The lick on South Bluff also appears to be important and human pressure on this area should be eliminated. The habitat along the lower slopes and benches could also be enhanced.

11) Move the road downhill onto the Pelly River floodplain to eliminate traffic and poaching problems as recommended by Lortie (1988) and Horesji (1988).

12) Clear the down timber from the lower slopes from the Trap Trail to the Road Cut (Fig. 1). The timber is merchantable for firewood and a small incentive grant should be adequate to accomplish this. Cutting should be done in the summer when the sheep are gone.

13) Consider burning the area from the Trap Trail to Road Cut during late spring to enhance grass growth and destroy brush.

Sheep will probably habituate to human presence and quiet vehicles moving over regular routes if they are not harrassed by ATV's and illegal shooters. Probably the largest impact the mine has had on the sheep population so far is not disturbance but bringing people into proximity with the sheep, thereby creating the opportunity for legal and illegal killing.

14) Enhance law enforcement in the area of Sheep Mountain during the time that the sheep are there by either (a) stationing a C.O. at Faro; or (b) stationing an auxiliary C.O. at Faro; or (c) increasing RCMP patrols in the area.

15) Continue to work closely with the Faro Fish and Game Club and the residents of Faro to manage this herd of sheep for non-consumptive use.

16) Restrict the use of vehicles to designated routes.

17) Monitor the use of sheep range by horses and implement restrictions as required.

18) Ensure that all domestic livestock and feed are free of disease that could be contracted by the sheep in the area.

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Appendix A

Faro Fish and Game Data.