

SUMMARY REPORT

5.1.

Field Work on the Rocky Mountain Bighorn Sheep Die-off From November 1965 to April 1966.

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#### INTRODUCTION

The purpose of this report is to show the progress and findings of the field work conducted by myself and others on the problem of the Rocky Mountain Bighorn sheep die-off in the East Kooteneys.

This report will show constant counts conducted in the Premier-Quartz Ridges areas, along with the trapping programs carried out.

It will also show the trapping program in the Stoddart Creck and Radium areas, along with the results of the effect of the Cap-chur gun in the tranquilizing of the sheep.

In conjunction with the trapping of these sheep the report will show the tagging system used for future identification of the sheep caught by live trapping and through tranquilization.

The information in this report was gathered from December 1965 through April 1966 inclusive.

The original program was set up by Game Biologist Bryan Gates, however, work was just getting started when he was recalled to Vancouver and for sometime a replacement for him was unavailable. During this time classification counts were carried out in the different sheep wintering ranges by myself and the East Kootenay Conservation Officers.

The information to follow does not include data collected by the other Conservation Officers as this is all in the hands of Game Biologist Don Eastman. SHEEP COUNTS ON PREMIER-QUARTZ RIDGE AREA

During the months of December 1965 to March 11, 1966, the clover leaf live traps were placed in the Premier-Quartz Ridge area in order to live trap the Rocky Mountain sheep for shipment to Dr. P. J. Bandy for biological study as to the possible cause and cure of die-off which is apparent in the East Kootenays. As these traps, once set, had to be checked every day a record of any sheep seen in the area was kept by myself and is shown in Table 1. This record is not as accurate as it would be if classification of sheep only was carried out, however other work was entailed, in the trapping, tagging of sheep and general observation of the apparent sickness to any of these sheep.

|   | Date       | Number                      | Sex  | Area Sighted                     |
|---|------------|-----------------------------|--|----------------------------------|
|   | Nov. 25/65 | 1<br>27                     | lamb<br>ewe  | Quartz Ridge                     |
|   | Nov. 26/65 | 2<br>4                      | ram (2.5 yr.)<br>ewe   |                                  |
|   | Dec. 13/65 | ί<br>7<br>1 η               | ewe  | Premier Ridge                    |
|   | Dec. 15/65 | 2<br>2                      | ewe<br>eve   | UNITED RIDE                      |
|   | Dec. 16/65 | 6<br>1                      | ewe<br>lamb  | Quartz Ridge                     |
|   | Dec. 17/65 | 8                           | ewe<br>eve (dead)  | Premier Ridge                    |
|   | Jan. 6/66  | 1<br>2<br>10<br>29          | ram (3/4 curl)<br>ram (1/2 curl)<br>ewe (yearling)<br>ewe            | Quartz Bidge<br>"""<br>"""<br>"" |
|   | Jan. 7/66  | 2<br>2<br>7<br>1            | lamb<br>ewe (yearling)<br>ewe<br>ewe (live tranned)                  |                                  |
|   | Jan. 10/66 |                             | ewe<br>lamb<br>ewe (yearling)  |                                  |
|   | Jan. 13/66 | 1<br>12<br>2                | ewe (live trapped)<br>ewe  | Premier-Quartz Ridge             |
|   | Jan. 14/66 | 17<br>1<br>3                | ewe (yearling)<br>ewe<br>ram (3/4 curl)<br>lamb                      |                                  |
|   | Jan. 18/66 | 4<br>15<br>1                | ewe (yearling)<br>ewe<br>ram (1/2 curl)                              |                                  |
|   | Jan. 19/66 | 4<br>15<br>2                | ewe<br>ram (1/2 curl)  |                                  |
|   | Jan. 20/66 | 17<br>17<br>2               | ewe (yearling)<br>ewe<br>lamb  |                                  |
|   | Jan. 21/66 | 2 8                         | ewe_(yearling)<br>ewe  |                                  |
| n | Jan. 24/66 | 1<br>1<br>(Both of these we | ewe (yearling)<br>ewe<br>ram (l/l curl)<br>re live trapped in same t | rap)                             |

Table 1. Rocky Mountain Sheep Sightings.

Area Sighted Date Number Sex Jan. 25766 9 ewe Premier-Quartz Ridge 2 11 11 Ħ lamb 11 u 1 ram (1/2 curl)11 11 11 11 1 ewe (yearling) ñ ñ 11 Jan. 26/66 8 ewe . 11 11 2 11 ewe (yearling) 11 Ħ Ħ 1 ewe (live trapped) Jan. 27/66 ÎI. 8 ñ ĩ ewe 2 11 11 11 ewe (yearling) n ĨĨ Jan. 28/66 11 lamb 2 12 11 11 11 ewe (yearling) 11 11 11 ewe Jan. 31/66 -11 11 12 11 ewe 1 11 11 n yearling ů Feb. 4/66 n ñ 3 ewe 11 11 131 11 11 11 ewe (yearling) Feb. 7/66 n ewe -11 Feb. 9/66 11 ram (1/2 curl) ū 1 tt 11 11 lamb 17 11 11 11 ewe Feb. 10/66 ń ĥ 1 11 ewe ù n Feb. 11/66 1 11 ewe Feb. 14/66 Feb. 15/66 ń ii. 3 n ewe n Ű. ii 4 ewe ñ H Feb. 16/66 ź 11 ewe îï 11 Feb. 18/66 Feb. 19/66 11 ļ ewe (live trapped) 11 ram (yearling) п 11 1 15 2 ram (2<sup>1</sup> yr.) 11 11 11 11 11 Ħ ewe 11 11 tI lamb 1 11 11 ewe (yearling) tt. Feb. 25/66 ĺ tť tī 11 ram (yearling) 13 1 5 1 п 11 11 ewe Í1 Ĥ ~lamb 11 11 ewe (yearling) 11 11 Mar. 2/66 11 11 Ħ ewe 1 11 ram (yearling) 11 Ħ 1 1 11 11 11 (yearling) ewe Mar. 8/66 11 11. 11 ram (yearling 11 ŧt. 11 ewe It

## RESULTS OF TRAFPING ON PREMIER-QUARTZ RIDGE AREA

The trapping program was carried out in the Premier-Quartz Ridges area for a period of approximately four months, from December 1965 through to March 11, 1966.

I started with one clover leaf trap which was placed at a point above and on the west side of Quartz Lake. Previous to the placement of the live trap, baiting with alfalfa hay was tried to draw the sheep into the area where the trap was to be placed. It was found however that the sheep did not care for alfalfa and in most cases used it for bedding. Following this I tried Timothy mixed with alcite clover and found that the sheep cleaned it up as fast as I put it out.

After it was established that the Timothy alcite clover was holding the sheep in the desired area the live trap was also baited. This was done by putting the hay on the approach to the trap and sparsely spread inside the trap. On the original trap, hay was tied on a wire suspended some 18 inches off the ground and attached to the trip release on the trap gate, requiring the sheep to pull on this hay, resulting in the trap door being sprung. This system however proved to be unsatisfactory, in that the sheep would clean up the lead hay and hay on the ground in the trap but not on the pull release.

I then changed the trip release from this pull type to a foot release. This was accomplished by placing a piece of plywood some two feet square in the back end of the trap, covered with hay and suspended to a wire leading to the trap door release. When the animal either stepped on the plywood or pawed the hay on it the trip was released and the trap gate closed. This system proved satisfactory and was used ever since.

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It was found that after a comple sheep had been caught in this trap,

they would then shy away for a period of time. It was at this point that I set up another trap in the same area.

A total of seven sheep were live trapped in this (Premier Quartz) area along with three mule deer, which were also tagged.

Due to the fairly small herd of sheep and the vastness of this wintering ground, time spent with the live traps I feel that not many more could be trapped this year.

GENERAL INFORMATION RE. TRAFPING RESULTS OF FREMIER-QUARTZ RIDGES

The first sheep which was live trapped on Premier-Quartz areas was taken on January 7, 1966.

This sheep was to be sent to Dr. P. J. Bandy in Vancouver for biological study and as a result had to be held in Cranbrook over night before shipping via C. P. A.

It was found on approaching the sheep in the live trap that it became extremely nervous and began thrashing around in an effort to break out of the trap.

To remove the sheep from the trap, I found the easiest system was to reach under the gate and grab the two hind legs and secure them by typing together with one front leg. Once this was done the animal became reasonably quiet. This was the system used on all sheep trapped before tagging took place.

After this first sheep was taken from the trap, I administered l cc. of acepromazine maleate (Anatran), a sedative agent, which almost immediately resulted in the sheep becoming extremely docile and easy to handle. It was then transported into Cranbrook in the back of the car with no further problems. It was also noted that regurgatation periodically

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took place, but all was maintained within the sheep.

The dosage of Anatran seemed to hold effect for a period of about ten hours and no after effects were apparent. On the following morning another l cc. of Anatran was administered prior to shipping and once again the animal became extremely docile and the trip via air to Vancouver seemed to show no ill effects.

This process was repeated on January 10, 1966, when another sheep was live trapped and sent down to Vancouver.

Following these two sheep, the remaining five which were live trapped in this area, were tagged and released at the trap sight.

It was noticed on the sheep which were tagged, the placing of the self-piercing ear tags and the plastic streamers, which necessitated the cutting of the sheep's ear, did not seem to cause any pain to the animal.

For a detailed history of the tagging results in this area see Table 2.

Of special note in this area, (Premier-Quartz), sheep number three was caught three times after being tagged on January 24, 1966. This was the only sheep re-trapped, however sightings of other tagged sheep was noticed fairly frequently.

Number 3 was seen January 27 and 28, February 7, 9 and 16, Number 5 was seen on March 10, Number 6 was seen on March 8, Number 7 was seen on March 2.

It was noticed on sighting of these tagged sheep that they apparently had not suffered any ill effects from this process.

|     |           |  | <b>***</b> *                                 |                |  |   |     | •  |   |   |
|-----|-----------|--|--|----------------|--|---|-----|--|---|---|
|     |           | <u>No.</u>   | Date<br>Trapped                              | <u>Sex</u>     | Age  | <u>S.?.E.T.</u>                                       | Ear | Colored Tag  | <u>Ear</u>  | 177792,2007,2007,2007,2007,2007,2007,2007 |
|     |           | 1  | 1/7/66                                       | ę              | 13   | an (1940) a composition (1940) (1940) (1940)<br>      |     |  | -   |   |
|     |           | 2  | 1/10/66                                      | 7              | 21/2   |   |     |  | -   |   |
|     |           | 3  | 1/24/66                                      | 7              | 4麦   | 724   | LT. | Land Contract  | RT.   |   |
|     |           | 4  | 1/24/66                                      | c <sup>7</sup> | 11   | 710   | RT. | DAT  | LT.   | 1   |
|     |           | 5  | 1/22/66                                      | \$             | 67   | 717   | LT. |  | RT.   |   |
|     |           | 6.   | 2/16/66                                      | ç              | 4麦   | 701   | LT. |  | RT.   |   |
| . 4 |           | 7  | 2/18/66                                      | Ŷ              | 21/2   | 702   | LT. |  | RT.   |   |
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|     |           | A  | 3/3/66                                       | Ģ              | Ad   | 703   | LT. |  | LT.   |   |
|     |           | В  | 3/8/66                                       | 0<br>T         | Ad   | 704   | LT. |  | LT.   |   |
| ·   | - <b></b> | Ċ  | 3/9/66                                       | F              | F  | 707   | RT. |  | RT. !   |   |
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Table 2. Sheep Trapped in the Premier-Quartz Areas

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RESULTS OF TRAPPING IN THE RADIUM AREA

On March 10, 1966, with the help of Game Biologist Don Eastman, Fark Wardens Jim Robertson of Banff, Alberta, Fark Warden Glen Faegen, C/O Jack Mackill and myself we live trapped eight sheep in a large permanent trap at Radium.

On arrival at the trap site we found two ewes just outside and feeding contentedly. We decided at this time to attempt to tranquilize these with the Cap-chur gun before working on the ones in the trap. Two darts were prepared with 30 mg. of Succinylchloline Chloride (Anectine) in each. Direct hits were made on these sheep but they failed to go down, indicating too low a dose. As these two steep left the area we went to work on the ones inside the trap. We first tried to force the sheep into a holding but found they became extremely excited when we entered the trap and constantly rammed into the fence, incidently; the fence was made of page wire, causing scrapped noses and cuts about the face and head and finally in a broken neck on a llt year old ewe. Immediately after this unfortunate accident we left the trap and proceeded to tranquilize these sheep one at a time. We found after a couple of shots that 41 mg. of Succinylchloline Chloride (Anectine) was the ideal dosage to tranquilize these sheep. Upon a hit, the average time to drop the animal was from three to four minutes.

The tagging process went along very smoothly from here on and the remaining seven sheep were tagged and released with no further loss of life.

On April 5, 1966, another trip was made to this area, with the intent of tranquilizing the sheep which had darts in them from previous hits with the Cap-chur gun. We were unable to find these particular ewes,

however we were successful in tranquilizing and tagged two other ewes and a 3/4 curl ram.

For a detailed history of the tagging results in this area see Table 3. Some other pertinant information was taken on some of the sheep taken in this Radium such as measurements of girth and hind foot. Also where possible, time of the actual hit and when the sheep went down from the dart was taken (see Table 4).

The measurements of the horns of ram number 16 were also taken. The left horn was 32 1/8" in length and 14" at the base. The right horn was  $33\frac{1}{2}$ " in length and  $14\frac{1}{4}$ " at the base.

### RESULTS OF TRAPPING IN THE STODDART CREEK AREA

The week of March 28, 1966 was spent in the Stoddart area with C/O Jack Mackill and Assistant Fark Warden Cecil Cooper of Radium in trapping and attempting to tranquilize with the Cap-chur gun some of the sheep.

We were successful in live trapping three sheep, but failed to have any success with the gun.

It was found later that the Anectine which we were using was of a different manufacture than we had used so successfully in Radium. We had conversation with a local doctor at Invermere and were advised that the potency of this type would be lost after 12 hours out of refridgeration, which in all likelihood was the reason for the failure.

A great deal of time was spent chasing the sheep up and down the mountain and periodically getting good hits with the darts but no success in tranquilizing the animal. As a result of this poor reaction of the Anectine the gun was put aside and concentration of the live trap was increased.

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|-------------------------------|---|-----|-----------------|-------------------|----------------|--|-----|--|-----|--|------------------|
|                               |   | No. | Date<br>Trapped | Sex               | Age            | S.F.E.T.                                   | Ear | Colored Tag  | Ear | How<br>Taken   | Dosege<br>By Gun |
|                               |   | 8   | 3/10/66         | 7                 | 6 <u>7</u>     | 708  | RT. |  | LT. | Cap-chur gun   | ·41.mg.ce        |
| τα <b>τ</b> . τ <b>ομ</b> ι σ |   | 9   | 3/10/66         |                   | 31/2           | 709  | RT. |  | LT. | Cap-chur gun   | · lil mg. cc     |
| •                             |   | 10  | 3/10/66         | Ç                 | 2불             | 711  | LT. |  | RT. | Cap-chur gun   | *LI merec        |
|                               |   | 11  | 3/10/66         | \$                | 6 <u>1</u>     | 712  | RT. | and the second | LT. | Cap-chur gun   | ·Lil mar Ce      |
| , <b>44</b> 4, <b>5</b> , 1   |   | 12  | 3/10/66         | <i>C</i> 74       | lamb           | 713  | LT. | E  | RT. | By hand  |                  |
|                               |   | 13  | 3/10/66         | \$                | 1를             | 714  | LT. |  | RT. | By hand  |                  |
|                               |   | 14  | 3/10/66         | 2                 | 3불             | 715  | LT. |  | RT. | By hand  |                  |
| , بي حوم م                    |   | 15  | 4/5/66          | 7                 | 47             | 720  | RT. | 1200-74-25-24  | LT. | Cap-chur gun   | 50 mg . CC       |
|                               |   | 16  | 4/5/66          | - <del>3</del> -7 | 51             | 721  | RT. |  | LT. | Cap-chur gun   | .52 mg.c.c       |
|                               |   | 17  | 4/5/66          | 4                 | 3 <del>1</del> | 722  | LT. | E an est   | RT. | Cap-chur gun   | ·45 mer CC       |

Table 3. Sheep Trapped and Tranquilized in the Radium 4rea

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|       | ана <b>ж</b> алар террерини  | 10  | 3.34 | 3.37 | 4.31      | L5.0                            | 15.5  | and the second   |  |
|       | an an star an  | 11  | 3.40 | 3.49 |           | 42.0                            | 16.5  |  |  |
|       | a tha the second and the second  | 12  | ·    |      | -         | 37.5                            | 14.0  | ing the ended of the state of the  | · •••                                    |
|       | e en   | 14  |      |      | i         | 38.0                            | 15.75   | ∬ (1.17 − 1.17 − 1.17 − 1.17 − 1.17 − 1.17 − 1.17 − 1.17 − 1.17 − 1.17 − 1.17 − 1.17 − 1.17 − 1.17 − 1.17 − 1.1<br>2   | en e |
| ***** | 1999   | 15  | 1.40 | 1.46 | 3.25      | 43.0                            | 16.0  | · · · · · · · · · · · · · · · · · · ·  |  |
|       |  | 16  | 2.33 | 2.36 | 4.36      | 45.5                            | 16.5  | n a di ang dipana kananan na a na ang dipana kananan na sa   |  |
|       | ی د میک<br>چ   | 17  | 3.05 | 3.09 | 3.42      | 42.75                           | 16.0  |  |  |
|       |  |     |      | •    | •         |                                 | •   | •  |  |

Table L. Information on Cap-Chur Gur Results

Of particular interest was the capture of two ewes in this trap at one time. On arrival to the trap, we found the sheep about half way up the mountain. It was decided by C/O Mackill and myself that we might try to herd them down to the trap sight and attempt to entice them to feed in this area, and with luck maybe they would enter our trap. This was done successfully by climbing up the mountain around and above the sheep as we broke into the open above the sheep they proceeded down the mountain and in time began feeding in the trap area. As we could see they were quirt, and in the area we wanted them, we sat down ard watched them for about 1<sup>1</sup> hours. Finally a ewe entered the trap, followed very soon by another. Something spooked the second ewe and both turned and ran out of the trap just as the gate was closing, resulting in both escaping the trap. As the gate slammed shut the sheep moved some 25 or 30 feet away from the trap, so we came down the mountain and I walked quietly over and reset the trap. In a very short time they came back and began feeding in the same area, and a ewe immediately went into the trap and began pawing at the hay. A second ewe moved into the trap also and butted the first causing her to jump ahead and trip the gate release with the result both were caught in the trap.

It was noticed that the cate closing caused very little alarm to these trapped sheep and also the sheep feeding outside the trap.

We then went down and took them out one at a time, tagged and released them. All this time the other sheep continued to feed not more than 50 feet away.

Following is a detailed history of the tagging results in this area (see Table 5).

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|--|---|---|--|-----------|--------------------------------------|----------|-------|-------------|---|-----|
|  |   | <u>No.</u>  | Date<br>Trapped                            | Sex       | Age                                  | S.P.E.T. | Ear   | Colored Tag | Ear   |     |
|  |   | 18  | 3/28/66                                    | ÷ [       | 6 <del>1</del>                       | 716      | RT.   |             | IT.   | -   |
|  | - | 19  | 3/29/66                                    |           | 53                                   | 718      | RT.   |             | LT.   |     |
|  |   | 20  | 3/29/66                                    | Ŷ         | 6 <u>7</u>                           | 719      | LT.   |             | RT.   |     |
|  |   | le le relater   | a mana ang ang ang ang ang ang ang ang ang | · · · · · |                                      |          | (a. 4 |             |   | . – |

Table 5. Sheep Trapped in the Stoddart Creek Area

SFECIMENS TAKEN FOR AUTOPSY WORK AND CARCASSES FOUND IN THE FIELD

The following sheep were taken for autopsy work during the month of November 1965 through March 1966.

On November 25, 1965, at the south end of Quartz Lake a  $2\frac{1}{2}$  year old ram.

On December 22, 1965, at the sheep licks on the old Morrissey Game Reserve a adult ewe. I have no record of actual age.

On February 22, 1966, at the Armstrong basin on Columbia Lake a 24 year old ram.

On March 10, 1966, while tagging sheep in the live trap at Padium a ll<sup>1</sup> year old ewe died as a result of a broken neck.

On April 4, 1966, an adult ewe was taken alive from the Columbia Lake area. This sheep was brought into Cranbrook and had hoped to ship it the next day to Vancouver alive, but it died during the night.

Symptoms noticed of this latter ewe showed definite similarities to the condition of the Bull River band during the die-off in 1°6h-65. When I spotted this ewe it was laying down and was unable to support itself on its feet. On welking up to the enimal it tried to stand up but fell over on to its side. Heavy breathing was apparent and heavy nasal drip was evident, and the throat was very raspy and extremely congested, pointing to a pneumonic condition.

Numerous carcasses, most extremely decayed and in sections, were found from time to time. It would appear in most cases that their death could be attributed to predators as most were completely devoured.

> Seven were found in the Fremier-Quartz areas. Two were found in the Morrissey area. Six were found in the Stoddart Creek area.

GENERAL OBSERVATIONS OF TREDATORS IN THE SHEEP RANGES

It was noticed during most of the winter that the population of coyotes was larger in each of the wintering grounds than in the past six or seven years. This is probably due to the abstention of the Crown Land haiting program which has resulted in their increase during the early part of the sheep study in the Fremier-Quartz area. I noticed fresh coyote tracks following right in step with the sheep in their tracks and no doubt a few of these sheep fell prey to them.

Eagles, ravens and magpies were seen constantly in all areas which would indicate that carcasses were in the vicinity, however, many of these were noticed high up in the mountains and due to snow conditions I was unable to check them all out.

In the Stoddart Creek area it was found that the largest predation appeared to take place by cougar and bobcats. This was surmised by the way all the hair and bones were together in a small confined area, which is the typical mode of the cat family.

# COMFARISON OF THE SHEEP IN THE DIFFERENT AREAS

During the early part of the winter it was noticed that the Premier-Quartz sheep appeared to be in the poorest condition. Coughing was prevalent almost from the beginning.

In the remaining areas, noticeable coughing did not take place until late in March when it became anparent in the Columbia Lake and Stoddart Creek bands. There was no large die-off in these bands to date, however, it would appear as though something is happening in the Columbia Lake band. One adult ewe was found and was reacting similarly to the sheep in the Bull Piver die-off.

It was also noticed that the size of the sheep south of Columbia Labe were smaller than those to the north. The length of ewe horns in the Radium and Stoddart Creek bands appeared to be larger than those in the Premier-Quartz and Estella bands. The ageing of these ewes was also made more difficult due to the indistinct year rings after 2 or 3 years of age.

I was not too successful in tagging many rams however, here again, the rams from Stoddart Creek and Radium bands were larger than those in the Fremier-Quartz and Estella bands.

### RECOMMENDATIONS FOR THE TAGGING OF FUTURE SHEEP

Although the live trapping of the Rocky Mountain sheep by use of the Clover trap proved relatively successful I would recommend that if future sheep are to be tagged, more emphasis be placed on the Cap-chur gun.

The main reason for this recommendation is the cost and time involved in the use of the live trap. Once the trap has been set it must be checked each and every day, which is very time consuming as in most cases the trap site will be some distance away. It would also be very rare if more than one or two could be trapped (average) in a week's period.

With the use of the Cap-chur gun, now that I have found the problem, the number of sheep that could be tagged would be increased to practically any number desired.

I feel the problem I had with the tranquilizer was in the type of Anectine supplied. This Anectine was in liquid form and I believe made by the Squibb Co. It was found that this type must be kept refridgerated as it resulted in the loss of potency.

During the course of trial and error with this system, I found that the powered type of Amertine was much more dependable.

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This tranquilizing agent may be purchased from the Burroughs Wellcome & Company of Montreal. It is supplied in a plastic vial of 500 mg. and is labled - Sterile Powder Flo-Pack.

In closing this report I would hope that this information gathered will in part, give some aid in the overall Rocky Mountain Sheep Study.