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ANTHRAX IN BISON  
Control Program

Report covering the period May 15, 1965  
to October 31, 1965.

by

L.P.E. Choquette, D.M.V., Ph.D.

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DEPARTMENT OF NORTHERN AFFAIRS AND NATIONAL RESOURCES

Ottawa,  
November 19, 1965

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## PREAMBLE

Anthrax outbreaks occurred in bison in the Northwest Territories (Hook Lake and Grand Detour areas) in 1962, 1963 and in 1964, and in the adjacent Wood Buffalo National Park (Hay Camp, Raup Lake, Lake Claire and the Nyarling River areas) in 1964. Some 800 animals died as a result of these outbreaks in a total area of approximately 10,000 square miles of bison range. In itself the size of the area poses many problems.

In past summers control measures were essentially limited to the search for cadavers and their disposal, mostly by burial under mounds of earth, with the aid of earth-moving equipment. As this was evidently not sufficient to solve the problem, a control program was tentatively agreed upon by an inter-departmental Advisory Committee. This program called for: the inoculation of a vaccine against anthrax to as many bison as possible at Sweetgrass, Lake One, Hay Camp in Wood Buffalo National Park, and at Hook Lake, in the Northwest Territories; the removal of animals from areas where vaccination is not practical and, in so far as possible, the prevention of the re-entry of animals into these areas; the thinning of bison herds through periodic slaughters at Hay Camp and Sweetgrass; the continued surveillance of the areas involved during the summer months for signs of the disease and to ascertain the movements of the animals.

## CO-ORDINATION OF PROGRAM

Two agencies of the Department of Northern Affairs and National Resources, namely the Territorial Division (Game) and the National Parks Service, are administratively and otherwise directly involved in the control program in areas adjacent to each other.

The problem arising as a result of the occurrence of anthrax within and outside Wood Buffalo National Park had to be considered as a whole. It cannot be segmented according to administrative lines dividing the areas under consideration. This would only lead to complications resulting in a less efficient implementation of the program, which must be carried out as systematically as possible, taking into account principles governing the control of infectious diseases.

In view of the seriousness and the complexity of the situation it was decided that the direction of the control program would be centralized so that the various aspects of its implementation would be co-ordinated for maximum efficiency. In May 1965, the undersigned was designated to provide the necessary direction to Department's personnel and to co-ordinate the implementation of the program within and outside Wood Buffalo National Park, and to ensure proper liaison with agencies within and outside the Department. The latter includes liaison with the Health of Animals Branch of the Department of Agriculture, as anthrax is a "named" disease as defined in the Animal Contagious Diseases Act and therefore subject to the regulations made thereunder. At the same time, Dr. N.S. Novakowski, then Resident Biologist, Canadian Wildlife Service, Fort Smith, N.W.T., was also designated to advise the co-ordinator on matters relating to various aspects of the program and its implementation, as well as to assist him in any way he could.

PROGRAM IMPLEMENTATION AND DISCUSSION

During the summer of 1965 there was no case of death among bison and other species that could be definitely attributed to anthrax. However, this could not have been forecast with certainty. Therefore, it was essential to maintain a state of preparedness to cope with any eventual outbreak, at the same time implementing certain phases of the control program.

The following is an account and discussion of various activities relating to the implementation of the program since about the middle of March until the end of October this year.

I. FIELD SLAUGHTER

Field slaughter had been advocated to thin the bison herds in certain areas, particularly those where the disease was known to have occurred and where, for various reasons, vaccination was not deemed practical or desirable. One area selected for such an operation was the Grand Detour where it was hoped depopulation would help in creating a "buffer zone" relatively free of bison between the Hook Lake area on the east side of the Slave River and the northeast boundary of Wood Buffalo National Park.

This operation was conducted in late November 1964 and in early March 1965. Steps were taken to salvage the meat of young adult males and females, yearlings and calves. The bison were shot and dressed in the field. The carcasses were examined for wholesomeness by officers of the Health of Animals Branch of the Department of Agriculture. The carcasses of a number of animals shot in places not easily accessible

and the carcasses of old male and female animals were not examined and were abandoned. Altogether 554 animals were taken and the carcasses of 281 of them examined. Seventy-seven carcasses were condemned because of tuberculosis. Approximately 82,000 pounds of meat were salvaged and given to the Department's Welfare Division and to the Indian Affairs Branch of the Department of Citizenship and Immigration for welfare purposes.

Following this operation there were few bison left in the Grand Detour area. However, air reconnaissance of the area later on showed that a number of bison had moved there. At the beginning of the summer there were approximately 400 to 500 bison in the area. Some of them were probably bison that had come in late March from the Hook Lake area over the ice-covered Slave River and had congregated in an area, west of Long Island, near Fort Resolution, from whence a southward and easterly migration had conceivably brought them into the Grand Detour area. Most certainly there were also bison there that had moved in from the Hay Camp-Raup Lake area via Brown's Prairie.

The situation in the Grand Detour area following its depopulation a few months previously thus does not warrant a repetition of such an operation there, at least for the purpose of creating a "buffer zone". In view of this, it is felt that should anthrax occur again in the Grand Detour area the depopulation policy should be reviewed, taking into account the number of animals present and the casualties in the area, to determine if it should be fully implemented or if efforts should rather be concentrated on the driving of healthy animals off the

area, the slaughter of obviously sick animals and the disposal of cadavers. The latter view is partly motivated by the following consideration: that anthrax is not a contagious disease, that death is not the ultimate course of all forms of the disease in bison and that bison are not the sole living instrument contributing to the spread of Bacillus anthracis; that a speedy and efficient disposal of cadavers can be set up and that the migration of animals into Grand Detour from other areas is almost inevitable. The same applies to those areas, particularly in Wood Buffalo National Park, from which bison could not be driven into corrals and vaccinated.

It may be argued that consideration then ought to be given to the construction of corrals and facilities for the vaccination of the animals in the Grand Detour area. Notwithstanding the vaccination policy initiated in 1965, which will be discussed and dealt with later on, it is questionable if financially and otherwise such an undertaking would be warranted (taking into account the cost of construction and maintenance of corrals, and of roundup in a large area where there are relatively few bison at any time of the year).

## II THINKING OF HERDS

Plans for a summer slaughter of bison at the Hay-Camp abattoir in the early part of the summer did not materialize, one reason being that renovations to the abattoir's refrigeration system were not completed before the end of July. In mid-June it was estimated that there were 1,200 bison in the Hay-Camp-Raup Lake area. However, by the end of July



there were relatively few animals in the area. The density of the foliage at that time would have also added to the difficulty of their roundup and made it a costlier operation.

In view of the non-occurrence of anthrax in the area by that time, it was decided to postpone the roundup. Had anthrax occurred an attempt would have been made to round up the animals for vaccination and hold the animals selected for slaughter at a later date.

In August, advantage being taken of certain opportunities, some 300 animals were corralled. Unfortunately, about half of them escaped from the corral where they were being held pending culling and vaccination. However, because of difficulty in collecting animals it was decided to postpone the roundup until mid-October, when corralled animals were culled and all reactors to the tuberculin test were set aside for slaughter. The other animals were given the anti-anthrax vaccine, branded and released. The slaughter operation began on November 1st.

Irrespective of the occurrence or the non-occurrence of anthrax, the culling and the removal of old or crippled animals as well as diseased bison in Wood Buffalo National Park should be intensified, taking into account population structure and principles governing the maintenance of wild animal populations in given areas and disease control. This would not only result in a thinning of the herds, but would also contribute to a reduction in the number of undesirable animals as well as to disease reduction program.

### III VACCINATION

Altogether 4,271 bison were given the anti-anthrax vaccine, branded and released to freedom.

<u>Location</u>	<u>Date</u>	<u>Number animals</u>	<u>Brand</u>
<u>Wood Buffalo Nat. Park</u>			
Sweetgrass	end March	1,547	Horn "4", "5"
Lake One	May 24-25	1,507	Horn "1", "2", "3"
Hay-Camp	March	249	Horn "X"
Hay-Camp	September 2	179	Horn "6"
Hay-Camp	October	109	Horn "6"
<u>Northwest Territories</u>			
Hook Lake	May 22-23	700	Hip "A"

With the exception of 288 bison (Hay-Camp), all the animals were inoculated by officers of the Health of Animals Branch of the Department of Agriculture.

As pointed out in an interim report submitted at the beginning of June, the roundup of the animals at both Hook Lake and Lake One was initially undertaken at a too early date. It had to be postponed to the third week in May in view of the dispersal of the animals and their reluctance to drive at calving time. This resulted in many costly helicopter-hours being spent to no avail, not to mention the tying up of personnel with little to do but wait and the maintenance of field camps longer than necessary. It is now evident that if this phase of the operation had been further delayed by a few weeks a greater number of animals would have been corralled.

*to be  
hook  
down*

In view of the non-occurrence of anthrax in 1965, it is not possible to postulate as to the efficacy of vaccination as a control measure. However, considering that it has not been possible to vaccinate all the bison in the areas under consideration, it is probable that the vaccination alone of some 4,300 bison would not have sufficed to stamp out the disease if it had occurred, though undoubtedly it would have helped to reduce its occurrence and its spread.

#### IV IMPROVEMENT OF FACILITIES

A wing fence was erected from the Hay-Camp corral to the vicinity of Spruce Island, a distance of approximately 10 miles. Its construction, which began in the third week of May and was not completed before mid-July, took much longer than anticipated, with bad weather being a factor contributing to a slowdown of the operation, which at best could not have been expected to progress too rapidly considering the labour force available for the job.

By the time the erection was completed it was too late to be of much use in the roundup of bison which had been numerous in the area in June but which by then were well dispersed. However, the wing fence proved most useful in the occasional roundup of bison which happened to be in the area from time to time. It will certainly facilitate future herding at times of the year when bison are numerous there. If for no other reason than this, it is felt that the cost of this project was money well spent.

One wing fence at the Hook Lake corrals was also extended over a distance of approximately two miles. This should also facilitate the herding there.

Many animals bogged down in a muddy and watery spot in the Lake One corral and were trampled to death. This was corrected as soon as conditions permitted it.

Corrals at Sweetgrass were in the process of being rebuilt in another location and some of the appropriations for the anthrax control program were diverted to cover part of the cost of this Park's project.

#### V AIR SURVEYS

For the purpose of air reconnaissance the whole area under consideration was divided into three zones: Zone 1- Grand Detour, Hook Lake and Brule Point; Zone 2- an area (designated as the Hay-Camp-Raup Lake zone) north of the Peace River within the boundaries of Wood Buffalo National Park and extending to include Brown's Prairie and extending westerly to include the area in the vicinity of Conibear Lake; Zone 3- an area south of the Peace River within the boundaries of Wood Buffalo National Park, including Sweetgrass and Lake One.

Zone 1 was regularly patrolled once a week in April and was under surveillance during herding in the Hook Lake area in May. Similarly, Zone 3 was also patrolled occasionally in April and was under surveillance during herding in Lake One area in May. Zone 2 was patrolled occasionally in May and the beginning of June. The Myarling River area was also surveyed from time to time.

Regular air reconnaissance of each zone was initiated on June 15th and thus the entire area was under continued surveillance from that date until the middle of September. Prior to this, Jr. Novakowski carried out a few air reconnaissance trips to assess the number of bison and their movements in the various areas.

*Handwritten notes:*  
Sept 1960  
30. 1960

The use of a helicopter for herding and patrolling is expensive and was certainly one of the major expenses in the implementation of the program in 1965. For this reason it is important that in the future proper timing for herding be determined and that schedules for air reconnaissance be drawn and adhered to as much as possible under normal conditions.

#### VI HIRING OF PERSONNEL

Several men had to be hired locally for the construction of the wing fence at Hay Camp. This work was under the supervision of Park personnel. A number of men quit before completion and had to be replaced. As soon as construction was completed most of the hired hands were discharged. Men were also hired for similar work at Hook Lake where Game Division personnel supervised the work, which progressed at a faster clip, partly because of a better crew, better weather conditions and a terrain of a different nature.

Because of the uncertainty of securing necessary and satisfactory labour in the possible event of anthrax outbreaks in July, August and September, it was decided in mid-July to keep eight men on standby for such an eventuality. Most of them proved to be dependable and good workers. Five of these men were located at Sweetgrass where they were engaged in the construction of the new corrals. Some of these men also assisted in the disposal of bison carcasses or remnants of carcasses found in the Sweetgrass area in August. The other three men performed various chores at the Hay Camp station (repair and rebuilding of corral fences, cleaning, hay moving, etc.) in addition to assisting

in the vaccination of bison and in the experiment on the efficacy of the anthrax vaccine conducted between September 8th and October 9th. All these men, except one kept on strength until October 9th, were gradually released in September.

VII FINDING OF BISON CARCASSES AND THEIR DISPOSAL

The remnants of two adult male bison carcasses were found in the Sweetgrass area on August 23rd and August 25th, approximately three miles from the location where bison cadavers had been found during the 1964 anthrax outbreak. In both cases the remnants consisted of bones and fragments of skin. Long bones (humerus and ribs) were collected and taken to the Canadian Wildlife Service at Fort Smith, N.W.T., where they were frozen and have been kept since for eventual examination for anthrax if deemed desirable. It was estimated that in each case death had occurred some ten days previously.

In one case the body remnants and the place where they were found were heavily limed, as it was not possible to bury or burn the material because of the swampy nature of the terrain. In the other case, the burned remnants were thrown into a pit, limed for good measure and buried. The spot where the remnants were found was burned and limed.

The finding of these remnants of bison and their disposal were reported to the Health of Animals Branch in Calgary.

Because the bushy nature of the area would not permit the easy detection from the air of cadavers that might be present, a camp was set up and the area searched by parties walking through it. No other cadavers were found by these parties who spent three days surveying the area.

However, on August 28th, during a helicopter flight to relieve the men at the temporary camp, a dead bison was spotted west of North Inlet, Lake Claire, approximately five miles from the Sweetgrass Station, on the west side of Sweetgrass Creek, about half a mile eastward from the place where remnants of a bison carcass had been found on August 25th. Two members of the party that had searched the area reported that they had noticed, near the place where the dead animal was found, a bison (adult male) which had not been unduly disturbed by their presence nor had made any attempt to run away. Most probably this was the animal which was found dead on August 28th.

The dead animal (adult male) was bloated, blood exuded through the nostrils, but the carcass was intact. The animal could not have died more than 24 hours previously. The skin of the brisket region was incised, blood swabs were prepared and a sample of blood, dark and uncoagulated was collected for laboratory examination. The carcass was thrown into a pit and burned with the aid of wood and fuel oil. The carcass was left burning overnight and very little was left of it by next morning. The remnants were limed and buried. This case was also reported to the Health of Animals Branch. Subsequently the laboratory (Lethbridge) reported that the bacteriological examination of the specimens (blood swabs and blood) failed to reveal the presence of the causative agent of anthrax.

On September 17, the carcass of an adult male bison was found in the Hook Lake area, no more than half a mile from the campsite near the corrals. The intact carcass was bloated but no blood oozed

through the body openings. One blood swab was prepared and a sample of blood was collected for laboratory examination. The blood was red and coagulated. The specimens were taken to the Animal Diseases Research Institute, Hull, Quebec, for bacteriological examination which failed to reveal the presence of Bacillus anthracis in these specimens but revealed the presence of Clostridium septicum which may have been of some pathogenic significance in the death of the animal. The limed carcass was buried in a pit. The finding of this carcass and its disposal, was also reported to the Health of Animals Branch.

The satisfactory disposal of carcass remnants of entire carcasses was relatively easy. Undoubtedly, burning should be, whenever possible, the method of disposal, if disease outbreaks occur again, rather than mounding the carcasses with the aid of earth-moving equipment which is slow, expensive to operate and which has to be guided (by helicopter) to the sites, often a distance apart, where carcasses have to be disposed of. The former method would simply entail helilifting men to the spots where carcasses have been spotted and supplying them with wood and fuel oil. Men could be moved around from site to site by helicopter which would have to be used anyway to spot cadavers spread over a large area. In most places wood would be plentiful or could be found relatively close by and brought to the sites by motorized vehicles. Twenty-five to thirty gallons of fuel oil would be sufficient to burn a carcass to ash. Remnants could be either limed and buried in a shallow pit or simply heavily limed. Surveillance to insure a proper disposal of carcasses would be easier, not to mention that this method of disposal would be safer and cheaper.



### VIII FINANCIAL ASPECTS

The Finance Division, Northern Administration Branch, Fort Smith, N.W.T., handled the bookkeeping and accounts. Attached (see Addendum "A") is a Statement of Allotment and Expenditures as of October 26, 1965. It does not take into account the payment of bills which undoubtedly will be submitted later on. However, it includes all expenditures incurred (building of facilities, labour, maintenance, operations and living expenses of personnel) in connection with the experiment on the efficacy of anthrax vaccine in bison.

Major expenses in the implementation of the program were for:

1. The use of helicopters for driving and air reconnaissance.
2. The use of fixed-wing aircraft for the transportation of personnel, particularly in April and May.
3. The wages (including, in some cases, Northern allowance and maintenance of labourers for the construction of the wing fence at Hay Camp, for repairs and improvement of existing facilities at the Hay Camp Station, and the wages of a number of men engaged in the construction of corrals at Sweetgrass.
4. The rental of equipment (field kitchen, bunk houses, power generator) from the Engineering Division and its transportation from Fort Smith to the site of the camp set up for the crew erecting the wing fence.
5. The purchase of hay and the moving of some of it to Hay Camp by stand-by labourers - the remainder of the hay to be moved later by Park personnel.

6. Material and supplies for some of the above-mentioned projects and repairs to equipment.
7. Material and labour for the construction of a shed, incinerator and appurtenances for the experiment on the efficacy of anthrax vaccine in bison. This alone amounted to \$11,550.00.
8. The payment of overdue accounts for goods purchased in 1964 and the payment of repairs to equipment used that year.
9. The maintenance and staffing of the field camp and the mess hall at Hay Camp, as well as the purchase of food for both places. In a few instances food purchases for Sweetgrass were charged against the appropriations for anthrax control, as well as, for a certain period, the wages of a cook employed there. Throughout the summer months many people were fed at Hay Camp, including Park and Canadian Wildlife Service personnel, stand-by labourers and Engineering and other personnel engaged or connected in one way or the other with the building of facilities for the anthrax vaccine experiment or directly connected with the actual experiment. In several instances it was noted that people who had no real business being there were fed at the Station and probably were not charged for their meals. This was rectified in July when patrolman G. Masson became A/Warden at Hay Camp. Admittedly, labourers and personnel engaged in the building of facilities for the anthrax vaccine experiment were charged \$1.65 per diem for their meals. However, it should be remembered that it costs approximately \$4.00 a day to feed one man, not taking into account the

operation of the mess hall nor kitchen personnel wages. This is clearly subsidized feeding. This seems rather incongruous considering the good wages paid casual labour in the area and the payment of allowances in some cases. However, there may be some reason for this policy.

SUGGESTIONS AND RECOMMENDATIONS

The following suggestions and recommendations are made with regard to:

1 - Terminology and programming

It is suggested:

a) That the present terminology "Anthrax Control Program" be dropped and that all future activities in connection with the control of anthrax in bison in Wood Buffalo National Park be part of a "Disease Control Program".

b) That the above-mentioned program be a part of the total Bison Management Program, which will consider population structure and principles governing the maintenance of wild animal populations in a given area. It is essential that a vigorous bison management program be implemented immediately, and that in view of the incidence of disease in bison at Wood Buffalo National Park, the Canadian Wildlife Service be called upon to play a greater role in the program.

c) That, if the above suggestion is agreed upon, funds, in addition to appropriations for the control of anthrax in 1966, be made available to the Canadian Wildlife Service for the implementation of some phases of the management program to be developed.

*Plus mention  
disease  
Disease control  
and animal  
management  
program  
but they  
can't log  
the two separate  
but correlation  
program  
JK*

d) That operations involving roundups, as well as culling, testing for tuberculosis, vaccination against anthrax and decision as to the number of animals to be disposed of, be the responsibility of the Canadian Wildlife Service as delegated by the Chief of the National Parks Service. The erection and maintenance of facilities such as corrals and abattoirs, the availability of food and the feeding of corralled animals, the slaughter, the processing and disposal of meat, the availability of motor vehicles and of sufficient personnel in connection with the implementation of the management program would continue to be Park's responsibility.

2 - Anthrax control measures in 1966

A) Vaccination - Slaughter - Patrolling

It is recommended that:

1. As many bison as possible be corralled at Sweetgrass, Lake One and Hay Camp for vaccination purposes and that the vaccination policy be reviewed next fall.
2. That the roundup operation begin in late March at Sweetgrass and at the beginning of June at Lake One and that, immediately afterwards, corralling begin in the Hay-Camp-Raup Lake area.
3. That the animals corralled at Hay Camp be tested for tuberculosis and that all reactors and other animals deemed undesirable from a management point of view be set aside for slaughter and the others released after vaccination against anthrax.
4. That a summer slaughter, if possible, be held at Hay Camp and the meat made available for welfare purposes.

5. That air surveys of Zone 2 and Zone 3 for signs of disease outbreak be conducted weekly from June 15th to September 15th, and that similar surveys of Zone 1 outside Wood Buffalo National Park be also conducted.

B) Co-ordination of Program

Considering the nature of this program, it is recommended that again in 1966 it be co-ordinated by Canadian Wildlife Service operating under terms of reference similar to those drawn up for the operation during the summer of 1965.

C) Hiring of Personnel for Stand-by Purposes

To ensure the availability of reliable personnel to constitute the nucleus of a labour force that would be needed should anthrax occur this coming summer, it is recommended that five men be hired for a period of four months, from May 15th to September 15th. These men would assist in the implementation of the vaccination and management programs outlined previously. When not actually engaged in these activities, the men would perform various chores at the Sweetgrass and Hay Camp stations.

D) Estimated Cost of Program in 1966

Attached (see Addendum "B") is a tentative estimate of the cost of this operation. It is a slightly revised version of a tentative estimate prepared earlier.

E) Financial Aspects

It is suggested:

1. That appropriations for this part of the disease control program dealing with anthrax be administered directly by the Canadian Wildlife Service in Edmonton where all bills for material, supplies and wages would be submitted for payment.

2. That all bills submitted for payment be supported by properly authorized requisitions or purchase orders.

3. That a copy of the invoice for each flight duly authorized in connection with anthrax control be filed with the co-ordinator.

4. That the officers-in-charge at Sweetgrass and Hay Camp prepare paysheets of stand-by personnel at their respective stations and submit them, with statements of daily maintenance of these men and northern allowances (where applicable), to the co-ordinator for processing and payment.

5. That Canadian Wildlife Service personnel and other duly authorized personnel involved in the anthrax control operation be asked to sign chits for meals taken at Sweetgrass and Hay Camp, these chits to be submitted for reimbursement to Wood Buffalo National Park.

6. That the cost of meals taken at the stations by other departmental personnel and others involved in one way or another with some phase of anthrax control be charged directly to the agency or the individual involved.

7. That the cost of meals be based on the cost of food and operation of the stations' kitchens, the latter including cooks' wages, to the Park's administration.

#### CONCLUSION

The occurrence of anthrax in bison in the Northwest Territories and in several areas in the adjacent Wood Buffalo National Park in the past three years has been the cause of much concern.

In 1965, there was no case of death among bison that could be definitely attributed to anthrax. This situation may or may not last. Considering the nature of anthrax and its epizootiology as well as the ecology of its aetiological agent, it is likely that the disease will occur again in bison and other animal species in these areas. However, it is not possible to forecast when outbreaks will occur again.

<sup>?</sup>  
Elaborate measures were taken to combat the disease during the summer of 1962, 1963 and 1964. These operations were conducted on a relatively large scale in terms of personnel and machinery involved, and called for the disbursement of large sums of money. It is felt that much of this was unnecessary and stemmed from an element of panic that entered into the picture. ?

As stated previously, in past summers control measures were essentially limited to the search for cadavers and their disposal, mostly by burial under mounds of earth, with the aid of earth-moving equipment. The undersigned feels confident that a satisfactory disposal of cadavers, should outbreaks occur again, could be achieved without the use of heavy equipment and the employment of a large labour force. This would significantly reduce the cost of such an operation.

It is recommended that in 1966 as many bison as possible be corralled at Sweetgrass, Lake One, Hay Camp and Hook Lake and given the anti-anthrax vaccine, the roundup of animals to begin at the most favourable time, taking into account the concentration of animals, their reluctance to drive at calving time and foliage density.

*recommened  
by Hoff*

*Who decides  
this?*

This would be a relatively inexpensive operation considering the facilities now available, the major expense being for the use of a helicopter for the roundup. It is also recommended that the vaccination program at Hay Camp be coupled with the application of management and disease control measures and that a summer slaughter be held there if possible.

*Why only  
Hay Camp?*

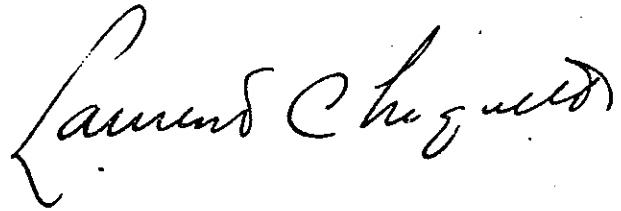
The occurrence of anthrax in a relatively large wildlife population free to roam over a large expanse of range land poses many problems. The yearly vaccination of as many animals as possible is certainly indicated. However, considering that not all the bison can be vaccinated, it is improbable that vaccination alone, in the event of extensive outbreaks, would suffice to stamp out the disease though it would help to reduce its occurrence and its spread.

*why continue  
it!*

Undoubtedly one important question is whether it will be necessary to vaccinate animals every year from now on, in the absence of a vaccine giving a life-long immunity. The implications of such a policy are evident. As stated before, it is likely that the disease will occur again sooner or later. It is proposed that at the end of the summer of 1966 the vaccination policy be reconsidered in the light of the occurrence or non-occurrence of the disease this coming year. It is felt that in the event of anthrax not occurring it may be possible to forego vaccination until such time



as the disease occurs again. Whatever the decision with regard to this matter, preparedness to cope with an ever threatening situation will have to be maintained in the years to come.

A handwritten signature in cursive script, reading "Laurent Choquette". The signature is written in dark ink and is positioned above the typed name and title.

L.P.E. Choquette, D.M.V., Ph.D.,  
Program Co-ordinator.

Ottawa, Ont.,  
November 1965.

*Aircraft Expenses  
Helicopter & Fuel Billing*

ADDENDUM ("A")

WOOD BUFFALO PARK - ANTHRAX CONTROL PROGRAM

VOTE 201 - PRIMARY 20

Statement of Allotment & Expenditures  
As at October 26, 1965.

	<u>Financial Encumbrance</u>		<u>Gross</u>
	<u>51505</u>	<u>51506</u>	
<u>ALLOTMENT</u>			
Original Allotment received	\$ 123,321.43	\$ 40,643.57	\$ 163,965.00
Decrease from allotment	(9,500.00)		(9,500.00)
	<hr/>	<hr/>	<hr/>
Gross allotment	<u>\$ 113,821.43</u>	<u>\$ 40,643.57</u>	<u>\$ 154,465.00</u>
 <u>EXPENDITURES</u>			
400 - Roads, Bridges -- Wages General	\$ 21,637.16		\$ 21,637.16
406 - Roads, Bridges - Catering Service	4,987.93		4,987.93
410 - Buildings - Wages - General	29,600.96		29,600.96
412 - Buildings - Materials & Supplies	9,307.71	\$ 1,860.34	11,668.05
413 - Buildings - Materials and Supplies			
Cookhouse	7,996.24		7,996.24
414 - Buildings - Rentals - Equipment	7,638.00	1,994.00	9,632.00
415 - Buildings - Contract work	6,500.00		6,500.00
417 - Buildings - General or miscellaneous	12,484.58		12,484.58
425 - Equipment - Miscellaneous	12,673.89		12,673.89
	<hr/>	<hr/>	<hr/>
Total Commitments and Expenditures	<u>\$113,326.47</u>	<u>\$ 3,854.34</u>	<u>\$ 117,180.81</u>
Free balance - October 26, 1965.	<u>\$ 494.96</u>	<u>\$ 36,789.23</u>	<u>\$ 37,284.19</u>

ADDENDUM ("B")

WOOD BUFFALO NATIONAL PARK  
DISEASE CONTROL PROGRAM

Anthrax - Bison  
1966-1967

ESTIMATE (1)

Helicopter rental

Air survey	12 weeks - 108 hours	9,700.00
Roundups	Lake One - 30 hours	
	Sweetgrass 30 hours	
	Hay Camp 40 hours	9,000.00

Labour

5-men crew-	4 months	
	wages	9,600.00
	northern allowance	1,800.00

5-men crew -	vaccination at Lake One - 10 days	
	wages	1,000.00

Food for 10 men - 10 days - vaccination operation	500.00
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Cook's wages	200.00
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<u>Purchase of vaccine</u>	5000 doses at 0.25	1,250.00
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Travel expenses

Headquarter and regional staff	1,500.00
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Local labour - transportation by aircraft	200.00
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<u>Sundries</u>	gasoline for motor vehicles	<u>150.00</u>
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TOTAL	\$	34,900.00
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EMERGENCY FUND

Material and Supplies

Fuel oil	1,000 gallons	400.00	
Lime	600 bags	1895.00	
<u>Helicopter rental</u>		9000.00	
Extra labour and maintenance		<u>2500.00</u>	
	TOTAL	13795.00	<u>13,795.00</u>
	GRAND TOTAL		<u>48,695.00</u>

Summary of Estimate

A- Air surveys and vaccination program

Rental of helicopter		
air surveys		9,700.00
roundups		9,000.00
Labour: wages and maintenance		13,100.00
Purchase of vaccine		1,250.00
Travel expenses		1,700.00
Sundries		<u>150.00</u>
	Total	34,900.00

B- Emergency fund (anthrax occurring)

Material and supplies		2,295.00
Helicopter service		9,000.00
Extra labour and maintenance		<u>2,500.00</u>
	Total	13,795.00
	GRAND TOTAL	<u>48,695.00</u>

(1)

This estimate does not take into account money recoverable for meals (at the rate of \$4.00 per diem or \$1.50 per meal) taken at Park's mess halls by standby labour and program personnel, nor expenditures incurred in connection with the experiment on the efficacy of anthrax vaccine in bison.

*Items Omitted*

1. Grand Return
2. Disease control - Park Lake
3. Equipment rental - *bon-barbeis*  
*Mesky, etc.*
4. Transport bus
- 5.
- 6.