

CHAPTER FOUR

Zookeepers and
Animal Breeders

*Overpopulation, Range Degradation, and Disease,
1920–1939*

BY THE 1930S, NATIONAL PARKS HAD COME TO BE DEFINED by their roles as reserves for wild animals. In 1933, J. B. Harkin, commissioner of the Parks Branch from 1911 until 1936, stated, “animal Parks fulfil two objects; the primary object is as breeding grounds, and the secondary object is as exhibition places.”¹ Thus, national parks, as reserves for wild animals, functioned in two simultaneous roles: as zoos and as breeding grounds. In Rocky Mountains Park, animals were displayed in the paddock and the zoo to draw tourists, but the game in the park was also encouraged to breed so that the surplus would spill outside the borders to furnish the adjacent area for sportsmen.

While Buffalo National Park attempted to fulfill this dual role, it never accomplished this successfully. Rather, the park came to be defined by the problems it faced. The park’s overpopulation peaked in 1925–26 and again reached dangerous levels in the early 1930s. While the other animal populations, in particular the deer but also the elk and moose, were also increasing, these animals were considered game species.² Measures were taken to reduce the bison herd, but any notion of reducing the other game populations provoked public criticism. The pressure of overgrown animal populations led to the degradation of the range and also contributed to the decline in the bison herd’s health and the spread of disease, of which tuberculosis was the most serious. Consequently, the main impetus of Buffalo National Park, from the 1920s to its closure, was crisis management.

Several investigations of the park were carried out by various experts from 1923 until the park’s closure. The common theme of all these reports was that the condition of the park would not improve unless the bison herd was reduced and new range was secured. Hampered by financial constraints, however, the Parks Branch was never able to reduce the herd effectively and could not carry out the major recommendations made by the experts. By the

1930s, the conditions of the park had not improved and the incidence of disease was on the rise among the animal populations. These were leading factors in the decision to close the park in 1939.

Howard Douglas, the second superintendent of Rocky Mountains Park, realized early on that tourists were drawn to the national parks to see animal life. He began his experiment of displaying wild animals to the public at Rocky Mountains Park by importing plains bison,³ mountain sheep, angora goats, elk, mule deer, and moose.⁴ He built a display paddock, which was later expanded to two hundred hectares. In 1907, however, he opened a zoo in Banff town site and some of the animals were moved to this new location.⁵ Sid Marty argues that the experiment of the zoo made these animals even more accessible to tourists and proved “pivotal in changing the attitudes on wildlife preservation in the national parks. For the first time...[wild animals] were seen as an asset, and a potentially valuable one, as a source of interest to tourists.”⁶ Exhibiting wildlife proved to be a financially successful venture. Janet Foster notes that the Deputy Minister of the Interior, the minister who oversaw the early national parks, was pleased with the success of the animal preserve. By 1905, the revenue in Rocky Mountains Park “more than doubled the amount required for expenditure and maintenance.”⁷

Given that Howard Douglas was heavily involved in the purchase of the animals for Buffalo National Park and acted as commissioner from 1908 to 1911,⁸ it should not be surprising that the park followed a pattern almost identical to that of Rocky Mountains Park. As early as 1910, elk, moose, and pronghorn antelope were purchased for Buffalo National Park.⁹ In fact, some of the first elk were purchased from Michel Pablo: seven elk, two bucks and five does were transported to the park in May 1911.¹⁰ While mule deer would become the most prolific game animal in the park, they were indigenous to the area and became part of the park when the fence was built.¹¹ At this time, two pronghorn antelope bucks were also enclosed inside the park.¹²

Overhunting had severely reduced pronghorn antelope numbers by the early 20th century and in the first years of the tenure of Commissioner J. B. Harkin, parks were set aside in Alberta and Saskatchewan to protect the species. Three of these areas later became national parks.¹³ Four years earlier, however, Buffalo National Park had been charged with the responsibility of saving the antelope. In 1910, Douglas commissioned C. J. Blazier to capture antelope to raise in the national parks because he feared that “in a very few years these animals will be extinct in Alberta and there are no others in any

part of Canada.”¹⁴ Of the thirteen captured by Blazier, nine were delivered to Buffalo Park and four to Rocky Mountains Park.¹⁵

Like Rocky Mountains Park, the northeastern corner of Buffalo National Park was essentially a menagerie, designated to display different species of animals. This Visitor’s Park comprised two enclosures, one known as the Small Buffalo Park and an even smaller enclosure at Mott Lake, which was also a recreational ground.¹⁶ On an early Buffalo National Park map, the area was labelled as an “Enclosure for Elk, Moose, Antelope and a few Buffalo.”¹⁷ As with Banff, there were also exotic animals displayed in the Visitor’s Park. In 1921, eleven male and eight female yak were shipped from Rocky Mountains Park for an exhibition herd.¹⁸ Warden Ray Sharp remembered, “They had about 100 head of buffalo and maybe 150 head of elk in there for people to visit from town. And also yak and some of the cattalo.”¹⁹ Clearly influenced by the successful experiment of displaying animals in Rocky Mountains Park, the Visitor’s Park was placed in close proximity to the town of Wainwright and the railway to attract visitors to the park.

The Visitor’s Park fulfilled its role and attracted many tourists to the park. In May 1918, the Buffalo National Park annual report stated that “about 5,000 visitors from all parts of the continent registered during the year.”²⁰ Furthermore, the *Edmonton Bulletin* stated that while the total number of visitors numbered around 6,000 in the mid-1920s, in 1929, 18,753 visitors registered at the park, and that number was believed to be low given that many visitors did not register. It also reported that on one single day of 1929, 400 motor cars entered the park carrying approximately 1,500 visitors.²¹ Diary entries from 1929 by Davey Davison, warden and keeper of the north gate of the park, substantiate the high volume of tourists at the park. Visitors registered from all over Canada and the United States, England, Germany, and Australia. In the summer months Davison, or one of his family members, toured visitors through the park on a daily basis. On some days, the volume of visitors was quite high. On June 12, a party of 240 Shriners from Charlotte, South Carolina, toured the park. On July 23 and July 24, Davison mentions the park gate registered four pages of visitors.²²

While the animals in the Visitor’s Park succeeded in attracting visitors, their confinement to a small area and the actions of visitors with good intentions often contributed to the decline in the health of the animals. Specifically, the pronghorn antelope, primarily raised in the Home Paddock, did not fare well in captivity and continued to die from unknown causes and

accidents. One of their more common ailments was a condition that involved ulcers on the neck or the jaw. This condition was first noticed in Banff in 1910, when two antelope died from ulcers that appeared on their necks.²³ At that time, A. B. Macdonald, superintendent of Rocky Mountains Park, determined that the condition was due to climate. He believed that the environment of the mountains was not suitable for this prairie species and in 1911 decided to send three of the remaining four animals in Rocky Mountains Park, all of which had evidence of ulcers, to Wainwright.²⁴ However, the antelope continued to suffer in their new location. Of the nine antelope delivered to Buffalo National Park in 1910, six died. Four more were shipped from Rocky Mountains Park, bringing the total to seven, but three of these died during 1911–12.²⁵ High mortality among the antelope was a trend that continued throughout the park's existence.

While the cause of the antelope mortality at Buffalo National Park was unknown, Howard Douglas suspected the lack of some type of weed or brush that they needed for a healthy diet. However, he also believed their deaths could be attributed to the fact they were kept in captivity to protect them from coyotes. Because they were on the verge of extinction, Douglas felt it was necessary to keep them confined for one year, until they were big enough to protect themselves from coyotes, and then turn them out into the main park where they could get the feed they required.²⁶

Years later, Edgar McHugh, superintendent of Nemiskam Antelope Park in southern Alberta, which was established in 1915, commented on the disease to Harkin. McHugh was familiar with the symptoms and believed it to be an ailment of tame antelope confined to small enclosures. He described the symptoms as a lump on the jaw that contained a yellowish discharge. He believed the disease to be contagious and fatal, stating, "I have never known one to recover."²⁷ In his opinion, the ailment resulted from a lack of subsistence food, such as alkali, sage brush, and certain varieties of short grass. He felt it absolutely necessary that antelope have access to sagebrush.²⁸ S. E. Clarke, Department of Agriculture agronomist, and Frank Shutt, Dominion chemist, concurred with McHugh that certain forage types, specifically sage bush and mosses, were important to the health of antelope.²⁹

The antelopes' confinement may have contributed to their ailment. Warden Bud Cotton believed that the high mortality of the antelope resulted from tourists overfeeding them:

The use of hounds was found to be the most effective way to control the coyote population in Buffalo National Park. Herb Dixon tells how his grandfather Herb Walker, park farm superintendent, used a democrat or a sleigh to hunt coyotes. His fox terrier sat up front with him and a greyhound and Irish and Russian wolfhounds were kept in the box on the back. When the fox terrier spotted a coyote, he would start barking, try to run after it and the hounds were released from the box. The greyhound would overtake the coyote and grab one of its hind legs and flip it over. This would happen several times, slowing down the chase until the wolfhounds could catch up. The hounds were trained to hold the coyote and not tear the hide until Walker arrived to kill the coyote. He carried a small revolver or .22 calibre rifle for that purpose.



Later other antelope were shipped in. These were kept in a small, fenced pasture so that the tourists could take pictures of them. They were real tame and would come up for offerings of oats. But they, too, died. I attribute their demise to misplaced human kindness. Some days when the tourist season was at its peak, these antelope got about a gallon or more of oats each. Grain fed to any wild animal will eventually kill it.³⁰

Buffalo National Park never successfully established a viable herd of antelope.

While the exhibition areas were an important place for displaying the animals to draw tourists, parks were also deemed important for propagating game species. In 1921, C. Gordon Hewitt, Dominion entomologist, wrote that this was one of the great advantages of the mountain reserves: “[Rocky Mountains Park], together with Jasper and Waterton Lakes Parks, will serve as unrivalled breeding-grounds for the big-game animals of the Rocky Mountains region, and the surplus wild-life population will afford a constant supply of big-game and fur-bearing animals for the adjacent unprotected regions.”³¹ By supplying areas with game, the national parks were providing a service that benefited both the parks system and the country as a whole.

With the exception of the pronghorn antelope, Buffalo National Park proved very successful as a breeding ground for the bison and other animals. In fact, it was too successful for its own good. As a prairie park, Buffalo National Park could not replicate the propagation scheme of Rocky Mountains Park’s entirely. In the mountain parks, surplus game could spill outside the borders and occupy adjacent regions, furnishing the area for sportsmen. Buffalo National Park, however, was a prairie park in the middle of a settled area. It was never intended that the bison be released and the other animals did not move freely outside the park borders. By the 1920s, Buffalo National Park was experiencing a population crisis. The bison population was at its highest in 1925–26 with 8,832 animals. The other game populations were certainly not as large as the bison herd, but their numbers added additional pressure to the park. The total population was actually 10,528, more than twice the park’s recommended carrying capacity, which was estimated in 1931 to be 5,000 head³²(see Table 4). The overgrown animal populations taxed the resources of the range and created ideal conditions for the spread of disease.

The addition of other game species to the bison preservation effort was not the only factor that contributed to the overpopulation problem. Eliminating coyotes in Buffalo National Park also contributed to overpopulation.

<i>Year</i>	<i>Bison</i>	<i>Moose</i>	<i>Elk</i>	<i>Deer</i>	<i>Total</i>
1922–23	6,780	28	218	-	-
1923–24	6,655	29	288	1,194	8,136
1924–25	8,267	30	290	1,173	9,760
1925–26	8,832	35	368	1,293	10,528
1926–27	6,026	48	400	1,486	7,960
1927–28	4,241	54	472	1,653	6,420
1928–29	4,300	60	565	1,824	6,749
1929–30	5,016	66	654	1,994	7,730
1930–31	6,231	76	766	2,172	9,245
1931–32	6,331	86	916	2,500	9,833

Source: LAC, Memorandum to J. B. Harkin, 15 Feb. 1933, Parks Canada Files, BNP, RG 84, Vol. 50, BU217, pt. 1.

Coyotes, classified as predators, were controlled because they posed a threat to the growth of the animal populations inside the reserve. Not until the 1930s did the national parks system recognize that these predators were essential to maintaining a balanced ecosystem. Rather, coyotes were blamed for the deaths of wild animals and birds, but they were also considered a menace because they destroyed heads and hides that were otherwise profitable when sold.³³ As early as 1913, Park Superintendent William McTaggart noted how plentiful coyotes were in the park and said that he was going to have “all the riders carry rifles on the round up with an endeavour to slaughter as many of them as possible.”³⁴

Coyotes were also killed in Buffalo National Park because of pressure from settlers outside the park, especially those who had property adjacent to its borders. Annie Armstrong, a settler from the Fabyan area whose property was bordered by the park’s page wire fence on two sides, complained that coyotes had eaten chickens, eggs, and a pig, and were posing a threat to small calves. These were revenue sources that she and other settlers could not afford to lose. While people who lived farther away from the park were able to kill the coyotes, she could not: “here where we are right against the ‘Coyote Reserve’ of 100,000 acres, in which shooting is not allowed, the wolves³⁵ have learned to come out and help them selves to the poultry and dash back in again.” She continued, “Now, with this Park, I look upon the Dominion Government as a neighbor of mine who is not being neighborly, when such nuisances are protected to my detriment.”³⁶ The fact that coyotes recognized the park as a safe haven was confirmed by Bernard Hervey, chief superintendent of Dominion Parks in 1916. He stated, “As matters now stand when the coyotes are hunted outside they at once make a break for the Park, [jump] through the fence and leisurely stroll inside knowing that they are perfectly safe.”³⁷

For these reasons, the Parks Branch initiated a campaign to control the coyote population in the park. Because the park consisted of mostly open country, hounds were used to hunt coyotes as it was believed to be the most efficient method. The campaign was very successful. Maxwell Graham reported that in the 1917–18 fiscal year, 65 coyotes were destroyed, over three times the number that had been killed in the previous season. In fact, he considered the use of hounds to eliminate coyotes so efficient that he suggested that trained hounds be used in Jasper, Rocky Mountains, and Waterton Lakes to rid these national parks of predators (see Table 5).³⁸

TABLE 5: CENSUS OF COYOTES KILLED UNDER HOUND CAMPAIGN IN BUFFALO NATIONAL PARK, 1917-28		
<i>Year</i>	<i>Killed by Hounds</i>	<i>Total Killed</i>
1917-18	53	65
1918-19	81	83
1919-20	49	52
1920-21	50	59
1921-22	61	65
1922-23	46	51
1923-24	47	56
1924-25	57	67
1925-26	44	48
1926-27	96	118
1927-28	45	65

Source: LAC, Parks Canada Files, BNP, RG 84, Vol. 55, File BU262, pt. 1.

In the first years of the campaign, owners with hounds were authorized to hunt coyotes under the supervision of park riders.³⁹ However, in the winter of 1918, A. G. Smith suggested, and Harkin approved, that Foreman Herb Walker and Caretaker Dave Davison, who had their own hounds, control the coyote population instead of enlisting private individuals. The men were allowed to keep the hides of the coyotes they killed in payment for the use of their dogs, feed, and any possible loss. Given that hides were worth about three to five dollars each, the incentive was likely somewhat responsible for the high number of coyotes killed over the next ten years.⁴⁰ In fact, the business of eliminating this predator was quite lucrative for park employees. In 1926–27, 118 coyotes were killed. Of the 84 hides that were marketed, employees were averaging at least eight dollars per coyote skin (see Table 6).

In 1928, however, it was decided at the superintendents' conference that wardens would no longer be allowed to keep furs from any animals trapped in the park.⁴¹ After this decision was made, not as many coyotes were killed, although part of the reason was that there were not as many left to hunt. Not until 1934 did coyote numbers increase again to a point where Superintendent Smith believed it was necessary to begin controlling the population again.⁴² However, even in 1935, when the national parks policy changed and predators began to be recognized as an integral part of the ecosystem, Smith thought that in the case of Buffalo National Park this new policy should not be strictly followed. He argued that because the bison were enclosed inside the park they were at the mercy of the coyote. Furthermore, protecting the coyotes would invite trouble from those settled outside the park borders. Instead, Smith advised that a modified coyote population control should go on⁴³ and coyotes continued to be hunted throughout the park's existence.

The designation of the other animal populations in Buffalo National Park as game species was another important factor contributing to the park's overpopulation crisis. Although bison had been slaughtered since 1922 to reduce their population, the status of other animals as game impeded the department's effort to devise an appropriate solution for reducing their numbers. Except for 311 elk in 1938,⁴⁴ none of the other game animals were slaughtered until the closure of the park in 1940. In the case of the surplus deer, for example, most Alberta sportsmen were against controlling this population through slaughter but thought every effort should be made to distribute the surplus deer to benefit sport hunting.⁴⁵ George Spargo, secretary of the Alberta Fish and Game Association, relayed the argument they used; "what is the object of having a concentration of big game within the confines

TABLE 6: SALE OF COYOTE SKINS BY PARK EMPLOYEES, 1926-27				
<i>Hunted By</i>	<i>Total Killed</i>	<i>No Value</i>	<i>Marketed</i>	<i>Amount Received</i>
H. B. Walker	52	6	46	\$556.00
E. J. Cotton	13	1	12	\$99.00
D. W. Davison	43	27	16	\$140.00
H. F. Dunning	10	-	10	\$100.00
<i>Total</i>	118	34	84	\$895.00

Source: NAC, A. G. Smith to J. B. Harkin, 25 Apr. 1927, Parks Canada Files, BNP, RG 84, Vol. 55, File BU262, pt. 1.

of the National Parks if it isn't to increase 'Big Game'...if we are going to shoot the natural increase of what avail is it in keeping these huge tracts of land?...They [sportsmen] state that every effort should be made to have such a surplus distributed so that sport will benefit."⁴⁶

The sensitivity of the issue of slaughtering the park's game population is perhaps best illustrated by the various attempts to reduce the mule deer population. Next to the bison, deer were the most prolific species in the park. Concern over the mule deer population first surfaced in 1923. Dr. Seymour Hadwen, pathologist with the Department of Agriculture, found in his investigation of the park that mule deer were almost as numerous as the bison and believed to be eating up much of their food. He recommended that their numbers be reduced.⁴⁷ While the Parks Branch initially wished to slaughter the animals as it had the bison, they never took this avenue.⁴⁸ Clearly, their status as game was already an issue by 1923 given that J. B. Harkin consulted Benjamin Lawton, the chief game guardian of the province of Alberta, for his opinion on how the department could best dispose of the deer. Lawton suggested three options: sportsmen could be given an opportunity to shoot the deer, they could be slaughtered in the same manner as the bison and the meat used as a food supply, or they could be turned loose outside the park.⁴⁹ A decade later, it appears no action had yet been taken to reduce the herd. The recommendations of S. H. Clark, Game Commissioner in 1932, were solutions that would have certainly been more palatable to sport hunters. He recommended that the deer could be liberated out of the west side of the park into the Battle River Valley, shipped by rail to the foothills to stock this area, or slaughtered and the meat donated to charitable organizations. Clark's first two recommendations would have fulfilled one of the mandates of the early national parks system: to furnish game to areas outside park borders. However, the areas outside Buffalo National Park were settled farmland rather than hunting territory. Clark's third recommendation appears to have been offered as a last resort; he did not support slaughtering the deer at this time as he believed there would be considerable reaction if the first two recommendations were not tried first.⁵⁰ The fact that deer were never slaughtered until the park's closure suggests that this alternative was never deemed acceptable.

Because the department knew that the slaughter of game animals would provoke criticism, they explored other avenues of downsizing these animal populations. The department attempted, with some success, to ship game to other areas in Canada.⁵¹ Shipping costs, however, made the venture very

expensive. Game commissioners Bryan Williams from British Columbia and A. E. Etter of Saskatchewan were both interested in the offer of elk, but the cost of shipping proved to be the biggest roadblock. While Williams was able to take one carload of the animals to British Columbia because the railway granted them free passage, the Canadian National Railway did not grant Etter free transportation. Since he could not raise the necessary funds to transport the elk, he was unable to save any animals.⁵²

While elk could be successfully shipped, the temperament of the mule deer made transportation of these animals problematic. Although there was interest in acquiring deer to stock other areas, Benjamin Lawton, in 1923, was concerned about shipping them. He stated, "I am personally afraid that the loss due to accidents in corralling, loading, shipping and unloading might be sufficient to offset the good that might be done."⁵³ Moreover, transporting deer was more expensive than shipping other game. Although elk could be shipped without crating inside a rail car that would hold up to twenty-five head,⁵⁴ deer were more nervous and prone to injury. Each deer had to be transported inside a crate and they often died from shock during transport or shortly after arriving at a new location.⁵⁵ As a consequence, the Parks Branch never attempted to ship deer.

Trials to liberate the mule deer, considered the best solution for reducing this animal population by the Alberta Fish and Game Association,⁵⁶ started in 1933. The park decided to release deer out the west gate into the Battle River Valley. However, several problems with this plan soon surfaced. In 1933, Harkin believed that the park needed to reduce the deer population by 1,500 animals.⁵⁷ However, S. H. Clark, Game Commissioner of Alberta, thought no more than 300 deer should be released into the Battle River area.⁵⁸ Furthermore, even though the plan was to liberate the deer into an area adjacent to the park, the animals were not easily driven and the Parks Branch soon realized that the effort and labour involved in releasing the deer were going to be costly. In an attempt to offset some of the cost, J. B. Harkin wrote Clark for help. Using the argument that the deer would be a benefit to the province of Alberta, Harkin asked Clark if the province could pay one dollar per deer, for up to 300 deer, towards the cost of releasing them.⁵⁹ But Clark responded that the provincial Game Branch was not in a position, nor did it feel obligated, to put any money towards the proposal.⁶⁰

Initially, the Parks Branch decided to absorb the cost of releasing the deer because it wanted to insure that the province would take more excess deer in the future.⁶¹ Its method of doing so, however, showed that it lacked

the financial will to follow through on the scheme. Park personnel in Wainwright decided to capture deer in the horse pasture at Rocky Ford, an area in the west side of the park. This method involved minimal labour since they enticed the animals into the pasture with salt licks and oat sheaves. Although the low fence proved unable to contain the deer, they fixed this initial glitch by installing a high wire fence.⁶² In 1935, they released 53 deer and A. G. Smith believed that this method could be a means by which a number of deer could be turned out each winter.⁶³

The scheme was never successful enough, however, in reducing the deer herd numbers significantly. Although the park needed to reduce the deer populations in 1933, deliberations over the best and most cost-effective method meant none were released until 1935. In that year, the 53 deer that had gathered in the pen were substantially fewer than the 300 animals allowed by the province. Due to the deep snow in 1936, which localized the deer population in the bush, the park was able to trap and release only 27 deer.⁶⁴ Considering that the park needed to reduce the deer herd by at least 1,500 animals, such a small number did not result in any significant change. Furthermore, the purpose behind releasing the deer, to restock the Battle River area, was precluded when most of the deer released the first winter were shot illegally.⁶⁵

The controversy surrounding the culling of the game in Buffalo National Park resulted in virtually no reduction of the deer, elk, and moose populations during the park years. When added to the overpopulated bison herd, these other animals contributed to the range crisis in the park. Officials were concerned with the affect this overpopulation was having on the conditions of the range and the health of the animals.

J. B. Harkin hired experts to investigate and make recommendations on how to improve conditions at the park. The first major investigation of the park took place in 1923. Dr. Seymour Hadwen, pathologist with the Department of Agriculture, with the assistance of A. E. Cameron, animal pathologist for the veterinary director general from Lethbridge and Dr. Christian, the meat inspector in charge of the slaughter from the Meat and Canned Foods Division, Edmonton, reported on the health of the animals, their management, and the condition of the range.

Hadwen spent over two weeks at Buffalo National Park in January and February of 1923. His report revealed the park was in a serious crisis. Of the herd Hadwen wrote, "The condition of the animals could not be called good." He took several drives around the park with Foreman Herb Walker and did not see any considerable amount of forage cover and noticed the

animals were eating browse and small twigs. This fact was confirmed on the killing floor during the cull that winter: “we found that their paunches were filled with willow twigs and browse, with the exception of those which were eating hay.”⁶⁶

Hadwen classified the range as overgrazed. Ribs showed on most of the animals, proof that the lack of forage was affecting their health.⁶⁷ Although he believed the range might recover to some extent if the upcoming season was wet, he warned that many of the animals had grazed the grasses and plants so short that they could not produce seed. He recommended that park officials secure new range to allow the present range to recuperate and reduce the bison herd greatly. He also thought a study of the range was needed to determine its carrying capacity and how long it would take to return it to its original state.⁶⁸

Hadwen also found that the overpopulated state of the park contributed to the spread of disease among the animal populations. Several parasites, of which *Fascioloides magna*, or liver fluke, was one of the more serious, were discovered in the bison herd during the first cull at the park in the winter of 1922–23. Liver fluke caused injury in five to ten per cent of all the livers examined.⁶⁹ The most serious disease encountered in the slaughter, however, was tuberculosis.

In 1922–23 cull, the high incidence of tuberculosis found among the bison at Buffalo National Park was staggering. Seventy-five per cent, or 195 of 259 bison killed, were found to be affected.⁷⁰ The percentage was so high that Hadwen thought the whole herd should be considered as suffering from the disease.⁷¹ Dr. Frederick Torrance, Veterinary Director General, reported to J. B. Harkin on information he received from inspector A. E. Cameron’s report. He compared the figures from the 1922–23 bison cull at Buffalo National Park with the statistics for cattle killed at Canadian Abattoirs from 1 April to 30 November 1922 (see Table 7) and concluded: “These are most startling figures and indicate that the buffalo at Wainwright are very seriously affected with this disease, in fact the herd must be considered so badly affected that the eradication of tuberculosis from it is a hopeless proposition.”⁷²

While it is not known how this disease spread to the herd, one theory is that it arrived with bison that were imported from the Rocky Mountains Park herd during the purchase years. The disease first surfaced in the national park system in 1910, when Maxwell Graham reported that five bison died from it in Canadian parks. The only parks that kept bison at that time were Rocky Mountains Park, Elk Island Reserve, and Buffalo Park Reserve.⁷³

TABLE 7: COMPARISON OF FIGURES FROM 1923–24 BISON CULL AT BUFFALO NATIONAL PARK AND FIGURES FOR CATTLE KILLED AT CANADIAN ABATTOIRS FROM APRIL 1 – NOVEMBER 30, 1922					
<i>Buffalo killed</i>	<i>No. affected Tuberculosis</i>	<i>Percentage</i>	<i>Carcases condemned</i>	<i>Percentage of affected</i>	<i>Percentage of killed</i>
259	199	76.83	60	30.15	23.16
<i>Figures for cattle killed at Canadian Abattoirs: (April 1 to Nov. 30 1922)</i>					
379,857	24,422	6.44	4,028	16.48	1.23

Source: LAC, Frederick Torrance to J.B. Harkin, 27 Mar. 1923, Parks Canada Files, BNP, RG 84, Vol. 58, File BU299-2, pt. 1.

The first case of tuberculosis in Buffalo National Park was discovered in the post-mortem of a bison bull on 20 December 1916.⁷⁴ Following this discovery, tuberculosis was suspected in many of the bison that exhibited enlarged joints.⁷⁵ Since no tuberculosis was confirmed in Buffalo National Park until 1916 and the Elk Island herd was free from the disease, it is likely that the five animals that died of tuberculosis were from the Banff herd.⁷⁶

If the source was the Banff herd, one or both of the shipments of bison that came from that park could have infected the Wainwright herd. Seventy-seven bison were transferred from Rocky Mountains Park to Wainwright on 31 October 1909 and ten on 31 March 1914.⁷⁷ However, it is unlikely that this was the source of the disease. During the first Montana shipment to Elk Island Reserve, one car of bison bulls and cows was shipped to Rocky Mountains Park in exchange for a carload from this park with an equal number of bison from that herd to go to Elk Island Reserve. Even after this shipment from Rocky Mountains Park, the Elk Island herd remained virtually disease-free.

Other theories were that the herd was exposed to the disease before it was moved to Canada or that the source could have been spread through the milk supply.⁷⁸ During the 1922–23 slaughter, Hadwen noted that “[i]n a number of cases the disease had been arrested and the glands showed a state of calcification, or hardening, which is an indication that the disease is not active.”⁷⁹ It was the general opinion of officials in the Department of Agriculture that the Pablo bison were exposed to tuberculosis in Montana when they were pastured on the open range with cattle.⁸⁰

If the herd was exposed to tuberculosis prior to arriving in Wainwright, it may explain how it became infected so quickly and extensively. The overpopulated conditions and poor range at Buffalo National Park, however, were certainly conducive to the spread of disease. Tuberculosis likely spread through the herd by all the conventional ways in which it was known to spread—by inhalation, through the digestive tract by consumption of milk or other contaminated food, during breeding season, and from a mother to her unborn calf.⁸¹ Torrance believed the overcrowded conditions of the range, which resulted in a scarcity of feed, also contributed to the spread of disease among the bison. He considered the manner in which they were fed, however, as the biggest contributing factor. “...the hay is spread out upon the same ground day after day. This ground becomes contaminated from the droppings of the buffalo, the hay becomes soiled and readily carries infection to fresh victims.”⁸²

Some officials in the Parks Branch were concerned about the spread of disease even before the incidence of tuberculosis was known. In 1916, Maxwell Graham was concerned about the overcrowded conditions of the range and its relation to the spread of disease. He noted, "The number of bison today in Buffalo Park amount to nearly 1700. Whatever danger of an outbreak of contagious disease there might have been in the past, when their number was smaller, is today vastly increased. Such danger becomes increasingly acute during the winter months, as it is then that the animals are confined and restricted."⁸³ However, on the whole, the tubercular state of the bison herd was treated in a passive manner. Part of the reason for this lack of concern was the way in which evidence of tuberculosis was interpreted following the 1923 slaughter. While Hadwen argued that the entire herd should be considered tubercular, he was surprised to find the bison in such good condition: "Taking the herd as a whole (*ante mortem*), however, the disease does not show as markedly as one would expect. It is true that here and there one may see an emaciated coughing animal, but as a general thing the disease is not in great evidence."⁸⁴

Following the slaughter, Harkin met with Department of Agriculture officials Dr. Torrance, Dr. Watson, Dr. Barnes, E. S. Archibald, and A. G. Smith to discuss the tuberculosis in the herd. In a memorandum to Deputy Minister W. W. Cory about the meeting, Harkin said that since the tuberculosis appeared arrested in many of the cases, the situation was not as serious as first thought. He informed Cory that although the high percentage of animals afflicted with tuberculosis was initially alarming, the calcified scars in the lungs of many of the older animals meant the disease was not active. "It was the general opinion that the animals were affected when they were first put in the Park, but the disease had not developed sufficiently to make it at all noticeable unless under special test or *post-mortem* examination."⁸⁵

The commercial value of the bison seemed to trump any concern over the herd's diseased state. While it was impossible to eradicate the disease, Harkin stated the general opinion of these officials "was that the conditions were not serious enough to affect the utilization of the herd for commercial purposes." Harkin continued:

Owing to the natural increase the herd has developed to the state where it was considered it could be of considerable economic value to the country. For the purely sentimental reasons only it is considered,

if possible, effort should be made to maintain a herd in the healthiest condition possible. This is important in connection with all cross-breeding and other experiments to be made with the buffalo.⁸⁶

Another reason that the issue of tuberculosis was downplayed was that it was a taboo issue, and Harkin did not wish to publicize the high incidence of tuberculosis found among the bison. In April, Dr. E. A. Watson, chief pathologist, asked for permission to publish the finding of tuberculosis among the Wainwright herd, arguing it would be “somewhat misleading to publish our general findings as to pathological and parasitological conditions in our buffalo without mentioning the most extensive and important of them all, namely, tuberculosis. New observations on the epidemiology of tuberculosis must always be of value in the study of this problem and should be made available to all concerned in it.”⁸⁷ An article by A. E. Cameron entitled “Notes on Buffalo: Anatomy, Pathological Conditions, and Parasites,” which had been published in the *Veterinary Journal*, gave a detailed analysis of all the other ailments of the Wainwright bison, but gave no indication of the extent that tuberculosis was ravaging the herd.⁸⁸ However, even with Watson’s suggestion that the findings should be published in a foreign journal that would not receive attention from the public, Harkin made it clear that he did not want anything published on the tuberculosis in the herd.⁸⁹ Consequently, in a subsequent article by Cameron, the presence of disease was downplayed and only one sentence near the end of the article alluded to it: “Tuberculosis has been found in the buffalo, as is common in wild animals in captivity.”⁹⁰

Nevertheless, the Parks Branch continued to be pressured to reveal that the herd was diseased. The Veterinary Director General of the Health of Animals Branch, while respecting the request of the Parks Branch not to publish the tuberculosis in the herd, felt that the existence of the disease could be admitted because it was well known. Even when the Parks Branch did begin to admit that the herd was diseased, as was apparent in a 1928 letter to the Saskatchewan Anti-Tuberculosis League, Harkin argued that the tuberculosis was decreasing and it was expected that it would gradually be eliminated.⁹¹

Investigators made several recommendations to aid in the recovery of the range and eliminate disease. Both Hadwen and Torrance recommended that the population of the herd be reduced, especially those in bad condition, and new range be secured to allow the existing range to recover. Since the whole bison herd was considered tubercular, Torrance did not see any practical way of picking out the small number of healthy ones from the diseased

In the winter, the bison herd was moved to quarters in the south part of the park. Traditionally, the herd was fed hay in the winter. During the drought years in the mid-1920s, however, wheat straw, which was purchased from local farmers, helped sustain the herd through the winter.



herd, except perhaps those less than one year old. While their methodology differed, both Torrance and Hadwen suggested a new bison herd be raised by separating calves from their mothers and placing them on new range. To further help reduce infection in the herd, they recommended the present herd be fed well and the feeding ground changed often. Hadwen believed the herd had to be put in better condition before it could be profitably slaughtered that upcoming fall.⁹²

Based on this advice, J. B. Harkin made some recommendations in 1925. His first recommendation, that the herd be cut down by 2,000 head per year until they reached the grazing capacity of the park, was carried out but interrupted for a couple of years when bison were shipped north to Wood Buffalo National Park. However, it is not clear whether calves were separated to create the nucleus for a new healthy herd, and there is no evidence that animals were moved to new pastures. For the remainder of the decade the overpopulated bison herd and the problems associated with it continued to plague the park; lack of forage and disease continued to take their toll on the bison salvage effort.

While the size of the animal population in the park was the primary reason for the overgrazing, the deterioration of the range and spread of disease was also accelerated by environmental factors that park officials could not control. From 1916 to 1923, the time of the first investigations, the park had a series of dry years.⁹³ These conditions contributed to a lack of food available and forced park employees to feed the bison extra hay. Although the animals had been fed hay in the winter from the beginning of the effort,⁹⁴ the need to provide hay outside the winter season escalated as the herd increased in size and forage grew scarce. In 1923, Torrance noted in his report, "It has been shown that the range is much overcrowded, that feed becomes scarce, and the animals are, consequently, reduced in condition towards the close of the summer, and feeding of hay has to be carried out to supplement what they cannot obtain on the range."⁹⁵ Traditionally, Buffalo National Park also supplied other national parks with feed after it had reserved enough hay for its own needs, but the park was no longer in a position to provide food even for itself during the 1920s.⁹⁶

During the mid-1920s, the park continued to be plagued by exceptionally dry years and harsh winters that destroyed vegetation and left the range severely damaged. In 1925, the Wainwright area experienced a prolonged winter. Superintendent Smith stated "This is the first winter we have noticed buffalo pawing snow like a horse, but that is the only way they can get

through it, and they have eaten tons of willow brush.”⁹⁷ The deep snow that year also meant that the range could not be grazed as early as usual.⁹⁸

That same year, the Parks Branch decided to ship 2,000 bison north to Wood Buffalo Park to help reduce the population of the bison herd.⁹⁹ Although transporting bison out of Buffalo National Park was believed to be the most cost-effective means of reducing the herd and alleviating pressure on the range, the decision proved to be a tax on the park’s food supply and placed an even greater financial strain on the park. After 1,179 bison had been segregated for the shipment north in January 1925, Superintendent A. G. Smith advised against rounding up any more in the spring because the cows were heavy at this time and he thought putting them through the corrals could cause serious damage to the herd. Furthermore, the animals already segregated in holding pens had to be fed extra feed. Because primarily younger bison were sent north, these animals were separated from their mothers earlier than otherwise necessary.¹⁰⁰ Smith stated, “Over 900 calves that, if they had not been separated, would have lived almost entirely on the cows, have since had to be fed daily.”¹⁰¹ He warned that if the Parks Branch wished to continue segregating additional animals for the shipment, the park would be out of feed in 30 to 40 days.¹⁰² In addition, it took eleven park riders seventeen days to segregate the animals, and this cost had not been factored into the shipping estimate. Smith calculated that it would cost \$1,323.20 to hire the extra riders and help, to round up the remainder of the bison to fill the shipment.¹⁰³

The park did run out of hay as Smith predicted. In March, he wrote a desperate telegraph to Harkin and informed his superior that they needed more hay immediately.¹⁰⁴ Smith continued to be concerned over the feed supply that summer. Although they had the same number of bison to feed as in the previous year, the park possessed only half the amount of hay. He stated:

You will, no doubt, recollect that we were obliged to purchase one hundred tons of baled hay last spring to carry us through...and we have been obliged to cut down in our feeding to insure having sufficient to carry us until the new hay is harvested.

There is absolutely no upland or prairie wool hay in the park to cut and the slough hay on the Ribstone Meadow will not be fit to cut until about the end of this month.¹⁰⁵

Later on in the summer, Warden Bud Cotton commented on the conditions of the range in his diary. On 13 August he wrote, “South in flats.

Range poor. With recent dry years and the overstocked condition of park, it will take years for the range to come back to its former condition.” Two days later Cotton wrote, “Main herd drifting on flats and sand hills south of Elk Butte Range. In area covered today, devoid of grass, practically dried and eaten out. Looks bad for winter rustling for the buffalo.”¹⁰⁶

Drought and environmental factors continued to damage the range in the years following. In 1926–27, the park experienced its hardest winter since its establishment. Superintendent Smith reported that feed was already scarce as a result of fall frosts and heavy grazing.¹⁰⁷ The gravity of the situation climaxed when 256 bison perished. C. E. Nagle of the Parks Branch remarked that this high rate of mortality was neither unexpected nor avoidable: “The condition of the herd has been poor for the past three or four years as a result of over-grazing of the Park and severe winters.”¹⁰⁸

With snow pack and ice cover that year, employees at the park were forced to supplement the bison’s feed with hay one month longer than usual. Once again, Smith had to purchase feed. However, because the park could not afford the better quality hay, he had to purchase the inferior wheat straw from local farmers.¹⁰⁹ He observed, “Large quantities of wheat straw were fed to the animals during the month and, although the animals, if in good condition, will exist on this class of fodder, they show the effects of the lack of sufficient feed of a more sustaining quality. I believe this fact accounts for the comparatively high rate of loss we sustained during this winter.”¹¹⁰ The 1927 diary kept by Warden Davey Davison, in which he reported on the activity of the North gate and Visitor parks, confirms these accounts. During these winter months, the park was reliant on oat and wheat straw and green feed from local farmers to feed to the animals in the paddocks. Nonetheless, several elk, and some deer and yak in the Visitor’s Park died in the first few months of 1927.¹¹¹

Even when precipitation improved in 1927, the superintendent noted, “I might say that owing to a larger fall of rain this season range conditions are improving some, but the effects of dry years when carrying too large a buffalo herd are still very evident.”¹¹² Warden Cotton confirmed the effects that the lack of food was having on the herd. When segregating bison for shipment north in 1927, he described the “[a]nimals in semi-starved condition and hard to work as they go on the fight at the least provocation.”¹¹³ D. H. Christie of the North West Territories Branch echoed the same sentiments in a telegram to his director O. S. Finnie. He described the condition of the bison upon their arrival in Wood Buffalo Park that year as follows: “Buffalo in poor condition seemed to be starved.”¹¹⁴

A herd of elk in Buffalo National Park. Photo William Carsell.



When Dr. S. E. Clarke, Assistant Agrostologist in the Department of Agriculture, made an investigation of the park in 1929, conditions had not improved. While he found the animals on the range appeared “to be in good thrifty condition, fairly well fleshed and free from disease and insects,”¹¹⁵ overpopulation was continuing to take a toll on the range. His assessment echoed the earlier 1923 investigations. The inferiority of the range was not caused by lack of vegetation because it afforded “a wide selection of forage species, nearly all of which are quite palatable and highly nutritious.”¹¹⁶ Rather, the problem was that the summer range was subjected to continual grazing pressure from early spring to late fall. Clarke believed the physical features of the range also contributed to its depletion. While he noted there were many sloughs and several small lakes near the eastern boundary of the park, he reported “the south western part of the range is not so well watered. The lakes are very small and most of them dry up during dry seasons with the result that stock on these areas have to travel a long distance to water.”¹¹⁷

Grazing in the early spring was especially detrimental because pressure on the range so early in the season did not allow the grass to develop properly. Trampling by the animals at this time of year destroyed seedlings and encouraged water run-off, which caused much of the deterioration. When grass was not permitted to develop, deep-rooted weeds of low forage value were able to take root. Clarke believed that excessive trampling and close grazing might have even prevented weed growth and resulted in soil erosion. While the range was free from poisonous plants, Clarke indicated that the forage was in its last stages:

Prairie sage...that well known indicator of over grazing is very prevalent on nearly all parts of the range...The greater part of the summer range has been over-grazed and the pasture seriously depleted. This condition is most marked on the short grass areas adjacent to watering places...Many of the hillocks and ridges are grey with Prairie Sage (*Artemisia frigida*) and Club Moss (*Selaginella densa*) plants that are of little or no forage value, while the grasses have been almost entirely killed out. Such weeds are indicators of over-grazing and while they are of little forage value they do prevent soil drifting, they represent Nature’s final attempt to cover up her nakedness. On large areas little or no seed of the more valuable forage species was produced during the summer of 1929, and very little will be produced as long as present grazing practices are followed, except it be during unusually wet seasons.¹¹⁸

Clarke made several recommendations to help improve the conditions of the range. First, as with the earlier 1923 assessments, he recommended that they acquire an alternate grazing area as soon as possible. The park already had an area the size of a township on the east side of the park, which had never been used. Clarke recommended that this area (the north half of township 42 and south half of township 43, range 5) be fenced for this purpose. He advised that they also acquire sections 7 to 12 in township 43, range 6 to connect this area to the main park.

Clarke also proposed that the summer range should be divided into a north and south section so a system of rotational grazing could be implemented that would allow pastures to recuperate. For a two-year period, the south field should be grazed in the spring and summer months allowing the north field to produce seed. The bison could graze on the north field in the fall after the plants have shed their seeds. After two years, the process would be reversed. The new area could be used as supplementary grazing for the spring and summer months. He also recommended more watering places be created in the west and south portions of the park, which would allow for more uniform grazing on the range. He believed officials should conduct reseeding experiments in overgrazed areas to see if this method would be a practical way of improving depleted pastures.¹¹⁹

Clarke again made an investigation in 1930. While his report mentioned that the bison, elk, and deer appeared in good condition, he was concerned that all these animals were increasing in number, which was causing the overgrazed condition of the pasture. The bison herd numbered around 5,000 head, but this would quickly increase with an estimated calf crop of 1,300. He believed that the park, which at one time could sustain 5,000 bison, could now sustain only 4,000 head¹²⁰ head of bison (of one year old and up). Since there had been no bison cull in 1930, he estimated that bison herd alone would approach 8,000 head with the calf crops of 1930 and 1931.¹²¹

In his assessment of the range, Clarke found there was little growth of early grasses due to lack of moisture, but rains, which started in mid-June, favoured later grasses and there was considerable secondary growth of the early grasses later in the summer and fall. Yet he still found evidence of overgrazing.

Large areas on the upland pastures are grey with prairie sage (*Artemisia frigida*) and other patches are carpeted with Club-moss (*Selaginella densa*). These, along with other unpalatable weeds, are on the increase,

indicating an overgrazed condition and a general trend towards the perennial weed stage. Sand patches are increasing both in number and in size. The upland pastures had been grazed to a degree of 90% or over, while from 65 to 70% should be the maximum degree of grazing on this area for some years to come.¹²²

Some of Clarke's smaller recommendations had been carried out from the previous year. A fence was moved to give the animals access to Ox-bow lake, connected with the Battle River, which provided slightly more pasture. Four sections and Boundary Lake, which contained good water, were in the process of being fenced to add to the winter quarters. Also, some reseeding tests were underway with different grasses, fescues, and clover. However, the summer range had not been subdivided and the unused grazing area on the east side of the park had not been fenced. Clarke did not believe it was wise to sub-divide the summer range unless park officials added new grazing area to the park and reduced the number of animals in the herd.¹²³

If the Parks Branch could have acted upon the recommendations of the experts, they would have helped regenerate the range and reduce the incidence of disease. However, the Parks Branch was a small one in the Department of the Interior. Buffalo National Park's plight was not a priority to the Dominion government, especially during the Great Depression. The hands of those in the Parks Branch were tied and they did not have the power or the financial means to carry out any larger improvements. In 1933 Hoyes Lloyd, the Parks Branch ornithologist, stated, "Owing to lack of funds we will not be able to go on with the fencing this coming summer, and, therefore, the grazing area cannot be increased. And, so, the crowding and over-grazing will continue for at least this coming season. In the meantime, the range is going from bad to worse." He continued:

As will be seen from the Schedule, there are some 9800 animals in Buffalo Park. There can be no doubt that this is far too great a burden for the grazing area. No opposing view has been expressed, either by those who have made scientific investigations or by the Superintendent. For one reason or another, however, we have been unable to act upon the outstanding recommendations. We sought advice, but were unable to apply the remedy.¹²⁴

Clearly local park employees were concerned about the consequences that resulted from an overpopulated herd and their inability to act on the larger recommendations. In 1932, Superintendent Smith wrote:

The approximate area of our summer range is 71,680 acres including lakes, and during the coming season we shall have about 6200 buffalo one year old and up grazing on this pasture, which is less than 12 acres per animal...I think you will agree with me when I say that the over-grazed condition of our range will result in a herd of unhealthy and inferior animals. The change in the health of the herd, particularly the young animals, is evident in Inspector Waddy's report covering slaughter operations recently completed...The young animals in the herd to-day have not the rugged and healthy appearance of those the same age ten or fifteen years ago.¹²⁵

In May of that same year Warden Cotton candidly reported, "Park range has been overstocked and grazed out for years. No amount of reseeding will do any good as long as animals remain in Park at their present numbers."¹²⁶

As the Parks Branch was unable to follow through with any major recommendations, the crises did not improve. In the beginning of the 1930s, the animal populations were again approaching 10,000, the levels the park had experienced in the mid-1920s. The mule deer had also increased substantially (see Table 4).¹²⁷ While the deer overpopulation was alarming, Smith was actually more concerned about the increasing elk population competing with the bison for food. "It is known that elk do some browsing, but they graze mostly in the summer, and in winter they associate with the buffalo on the feed yards, if possible, which is something the deer never do."¹²⁸ In 1937, R. A. Gibson, director of Lands, Parks, and Forests Branch, reported that "the Elk...have increased in great number on account of protection, and are actually depleting the fodder supply to an extent where it is impossible to provide pasturage for the buffalo for which the Park was established, and which are the justification for its maintenance."¹²⁹

Even more alarming, however, was the high rate of mortality among the deer population. In 1932, the deer population numbered 2,500 animals (see Table 4) and in February of that year, a number of deer and a few elk had been found dead or in a weakened state.¹³⁰ Smith reasoned that the high mortality rate might have resulted from the inferior pasture conditions in combination with the large amount of snow the park received that winter. He also suggested that the high death rate could be attributed to a cycle in which more of the animals died in some years than in others.¹³¹

It was clear to others, however, that more than weather conditions or life cycles caused these fatalities. The high number of deaths was somewhat alarming in light of the crisis experienced by the Kaibab Forest Reserve in

Arizona. There, deer had been under protection in a park void of predators. Numbering 3,000 to 4,000 in 1906, the deer, by 1924, had exploded to a population estimated as high as 100,000 animals. Thousands died from starvation.¹³² Reflecting on the death of the deer in Buffalo National Park, Hoyes Lloyd, the Parks Branch ornithologist, referred to the report of the Kaibab Investigation Committee and deduced that the crisis in Arizona had much to do with overpopulation. Investigators found “that not only were there too many deer in the territory to subsist on the available food, but that the range was so greatly depleted that it was in imminent danger of being totally destroyed.” Lloyd had made the obvious connection to the situation at Buffalo National Park:

The Park is far too heavily populated with Buffalo, Elk, and Deer for the health of the animals, and if the existing overcrowding be permitted to continue, there is little doubt that Nature will take a decisive hand in reducing the herds in spite of human efforts to keep them in a healthy condition.¹³³

There was also concern over how the other animal populations were contributing to the spread of disease among the bison. *Fascioloides magna*, or liver fluke, had also increased in severity among the bison since it was discovered in 1923. The parasite, which seemed to attack elk, caused “malnutrition with a tendency to dropsy and anaemia.” In 1923, Hadwen named the parasite as the most serious disease, next to tuberculosis, found at Wainwright.¹³⁴ Whereas 5 to 10 per cent of the livers examined were injured by the parasite in the 1922–23 cull, in the 1934–35 slaughter, livers of 28.4 per cent of bison were condemned because they were infested with liver fluke.¹³⁵

From 1932–34, W. E. Swales of the Animal Diseases Research Institute investigated the Visitor’s Park, made up of Mott Lake enclosure and Home Paddock, and the Peterson enclosure,¹³⁶ and found a species of snail, *Fossaria*, to be the primary host of this parasite. He determined that Mott Lake enclosure was the centre of the infection.¹³⁷ The elk and yak in the Visitor’s Park and elk in the Peterson enclosure displayed acute symptoms of the disease. This high incidence was likely induced by the crowded conditions of the paddock as autopsies performed on birds and muskrats also showed that they were severely afflicted with the parasite.¹³⁸

When Swales began his investigation, he did not observe symptoms of the parasite in the bison or elk in the main park.¹³⁹ However, evidence from

the 1934–35 cull proved the parasite had spread to the main bison herd. By 1937–38, Inspector J. S. Bowie found that the parasite was occurring more often in the younger bison.¹⁴⁰ Most interesting was the fact that the bison were not believed to be a secondary host to this liver fluke under normal conditions. Rather, Swales found evidence that the overcrowded conditions heightened the bison's vulnerability to the parasite. He added,

elk, and possibly to a lesser degree, deer, have offered evidence which would indicate that their susceptibility as secondary hosts of the fluke, constitutes a very real menace to the health of buffalo when both species of animal are permitted to roam and graze at large, the contamination being communicated to the buffalo through faecula of the elk (or deer) being deposited on the grasses and in the waters of lakes and streams.¹⁴¹

Investigations of the park continued until its closure and the recommendations echoed the findings of earlier reports. Inspector H. W. Cowan, performed investigations for the Health of Animals Branch, Department of Agriculture in 1936 and 1937. In 1936, the park was experiencing drought conditions. While the bison appeared in healthy condition, he recommended the herd be reduced to 5,000 head, including that year's natural increase, as there was uncertainty about the quantity of feed that would be available. While the animals appeared healthy the following year, the slaughter reports showed tuberculosis was on the increase among the bison and had been steadily rising for a period of years. He believed it necessary to build up a new, disease-free herd.¹⁴²

In 1939, the year the park closed, Dr. Hadwen observed that the winter grazing was good but the summer range was in very poor condition from drought and overgrazing, being covered with inedible weeds, mainly sage. He found tuberculosis ravaging the herd and believed there was no way to eliminate disease without eradicating the whole herd.¹⁴³ He wrote, "Personally I feel that in view of the existence of tuberculosis alone in the park that all the large animals should be killed. I made a strong plea for this in 1923 and I feel the same now."¹⁴⁴

By performing the roles of both zookeepers and breeders, the Parks Branch paralleled the policy that had been initiated by Howard Douglas in the early mountain parks. While the display paddock did attract tourists, this prairie park was never able to fulfill its role as a breeding ground successfully. The park's closed borders meant that the game populations could not

expand outside the park and it was never the intention of the park to release the bison. Instead, they contributed to the park's overcrowded conditions. Even with attempts to downsize the bison herd through annual culls, the animals in the park continued to exceed the carrying capacity, and the range was never permitted to recover.

While several investigations were carried out from the early 1920s to the park's closure, the Parks Branch found their hands tied when it came implementing any significant remedies. Clearly, the enthusiasm that the Dominion government had shown for the bison saving effort had waned shortly after the park was established. Problems escalated with the growth of the herd and the Parks Branch was not given enough money to ensure Buffalo National Park functioned properly. By the 1930s, with the onset of the Great Depression, funding to make improvements at the park was not the government's priority. The cost of maintaining an overpopulated animal herd continued to tax the effort until the park's closure and the controversy over reducing the populations of game species only added to this problem. The overpopulation problem only served to exacerbate the spread of tuberculosis through the herd. The Parks Branch was never successful in eliminating or even reducing tuberculosis in the bison herd, and this was one of the main reasons for the park's closure.

Notes

1. LAC, J. B. Harkin to Hoyes Lloyd, 6 Mar. 1933, Parks Branch Files, Buffalo National Park [BNP], RG 84, Vol. 50, File BU217, pt. 1.
2. The department sought advice from the Chief Game Guardian for Alberta and the Alberta Fish and Game Association over the issue of reducing the deer, moose, and elk that were in the park, one of the main indications that these animals were considered game and treated differently from the bison. See LAC, Parks Canada Files, BNP, RG 84, Vol. 50, File BU217, pt. 1.
3. Marty, *A Grand and Fabulous Notion*, 82–83.
4. Foster, *Working for Wildlife*, 56.
5. Marty, *A Grand and Fabulous Notion*, 82–83.
6. Marty, *A Grand and Fabulous Notion*, 83–84.
7. Foster, *Working for Wildlife*, 56.
8. Foster, *Working for Wildlife*, 72, 74.
9. LAC, L. Pereira to Howard Douglas, 17 Dec. 1910, Parks Canada Files, BNP, RG 84, Vol. 55, File BU234, pt. 1; LAC, Extract from Letter from Howard Douglas, 26 Sept. 1910, Parks Canada Files, BNP, RG 84, Vol. 50, File BU211, pt. 1.
10. LAC, Maxwell Graham to J. B. Harkin, 4 Dec. 1915, Parks Canada Files, BNP, RG 84, Vol. 55, File BU234, pt. 1.
11. LAC, J. B. Harkin to R. M. Anderson, 23 Jun. 1933, Parks Canada Files, BNP, RG 84, Vol. 50, File BU211, pt. 2.
12. E. J. Cotton, *Buffalo Bud: Adventures of a Cowboy* (Vancouver 1981), 109.
13. Canyon Antelope Reserve, which became Wawaskesy Park, and Menissawok Park, near Maple Creek, Saskatchewan, were set aside in 1914. Nemiskam Park, near Nemiskam, Alberta was established in 1915. These became national parks in 1922. Lothian, *A History of Canada's National Parks*, 42–45.
14. LAC, Extract from Letter from Howard Douglas, 26 Sept. 1910, Parks Canada Files, BNP, RG 84, Vol. 50, File BU211, pt. 1.
15. LAC, Extract from Letter from Howard Douglas, 26 Sep. 1910, Parks Canada Files, BNP, RG 84, Vol. 50, File BU211, pt. 1.
16. Scribner, *Transitions*, 28.
17. “Buffalo Park,” map, [circa 1912]. On a 1924 map, the area is labelled “The Home Paddock for buffalo and elk.” LAC, “Buffalo Park,” map, 1924, Parks Canada Files, BNP, RG 84, Vol. 50, File BU38, pt. 1.

18. LAC, A. G. Smith to Ernest T. Seton, 28 Dec. 1925, Parks Canada Files, BNP, RG 84, Vol. 55, File BU241, pt. 1.
19. *Home of the Buffalo*, VHS, with commentary by Ray Sharp (n.d.), Battle River Historical Society Archives, Wainwright, AB.
20. *Wainwright Star*, 15 May 1918, "Report Shows Buffalo Increase."
21. *Edmonton Bulletin*, 26 Apr. 1930, "Wainwright: Home of the Large Buffalo Herd in Captivity."
22. BNPFA, Diary of Davey Davison, Jan. 1 – Dec. 31, 1929, Davison fonds.
23. LAC, Superintendent of Rocky Mountains Park to the Secretary of the Department of the Interior, 9 Sept. 1910, Parks Canada Files, BNP, RG 84, Vol. 50, File BU211, pt. 1.
24. LAC, A. B. Macdonald to Secretary, Department of the Interior, 27 Apr. 1911, Parks Canada Files, BNP, RG 84, Vol. 50, File BU211, pt. 1.
25. LAC, Maxwell Graham to Mr. Harkin, 3 Aug. 1912, Parks Canada Files, BNP, RG 84, Vol. 53, File BU232, pt. 1.
26. LAC, F. H. Byshe to Mr. Campbell, 24 Mar. 1911, Parks Canada Files, BNP, RG 84, Vol. 50, File BU211, pt. 1.
27. LAC, Edgar McHugh to J. B. Harkin, 31 Jan. 1929, Parks Canada Files, BNP, RG 84, Vol. 50, File BU211, pt. 1.
28. LAC, Edgar McHugh to J. B. Harkin, 31 Jan. 1929, Parks Canada Files, BNP, RG 84, Vol. 50, File BU211, pt. 1.
29. LAC, S. E. Clarke to Commissioner, 1 Aug. 1929, Parks Canada Files, BNP, RG 84, Vol. 50, File BU211, pt. 1.
30. Cotton, *Buffalo Bud*, 110.
31. Hewitt, *Conservation of the Wild Life of Canada*, 238.
32. LAC, S. E. Clarke, "Report on Investigation of Pasture Conditions at Buffalo National Park," Sept. 1930, Parks Canada Files, BNP, RG 84, Vol. 50, File BU35, pt. 1.
33. LAC, Commissioner to Superintendent, 5 Nov. 1917, Parks Canada Files, BNP, RG 84, Vol. 55, File BU262, pt. 1; LAC, A. G. Smith to Chief Superintendent, Dominion Parks, 10 Nov. 1916 and Commissioner to P. C. Bernard Hervey, 21 Nov. 1916, Parks Canada Files, BNP, RG 84, Vol. 55, File BU234, pt. 1.
34. LAC, W. E. D. McTaggart to P.C. Barnard Hervey, 18 Sep. 1913, Parks Canada Files, BNP, RG 84, Vol. 55, File BU262, pt. 1.

35. Coyotes were also called prairie wolves. Hewitt, *Conservation of the Wild Life of Canada*, 194.
36. LAC, Annie S. Armstrong to William J. Roche, 22 Sep. 1917, Parks Canada Files, BNP, RG 84, Vol. 55, File BU262, pt. 1.
37. LAC, P.C. Barnard Hervey to J. B. Harkin, 13 Dec. 1916, Parks Canada Files, BNP, RG 84, Vol. 55, File BU262, pt. 1.
38. LAC, A. G. Smith to Commissioner, 26 Dec. 1917 and Maxwell Graham to Commissioner, 13 May 1918, Parks Canada Files, BNP, RG 84, Vol. 55, File BU262, pt. 1.
39. LAC, A. G. Smith to Commissioner, 26 Dec. 1917, Parks Canada Files, BNP, RG 84, Vol. 55, File BU262, pt. 1.
40. LAC, A. G. Smith to Commissioner, 21 Nov. 1918, Commissioner to Superintendent, 26 Nov. 1918, and P. C. Bernard Hervey to J. B. Harkin, 13 Dec. 1916, Parks Canada Files, BNP, RG 84, Vol. 55, File BU262, pt. 1.
41. LAC, J. B. Harkin to Superintendent, 8 Oct. 1928, Parks Canada Files, BNP, RG 84, Vol. 55, File BU262, pt. 1.
42. LAC, A. G. Smith to Commissioner, 24 Dec. 1934, Parks Canada Files, BNP, RG 84, Vol. 55, File BU262, pt. 1.
43. LAC, A. G. Smith to Commissioner, 21 Jan. 1935, Parks Canada Files, BNP, RG 84, Vol. 55, File BU262, pt. 1. In 1935, J. B. Harkin outlined the new predator policy: “the presence of coyotes is highly desirable as a control measure for deer, gophers, rabbits, etc., all of which destroy pasture, and that the coyotes play a particularly important part in keeping rabbits under control and in so doing are directly beneficial to the grazing animals.” LAC, J. B. Harkin to Superintendent, 8 Jan. 1935, Parks Canada Files, BNP, RG 84, Vol. 55, File BU262, pt. 1.
44. The elk depopulation was the first and only organized game cull in the park. The meat was shipped to the Indian Affairs branches in Manitoba and Saskatchewan to be used for Native relief. LAC, *Edmonton Journal*, 24 Nov. 1938, “Slaughter of 1,200 Bisons Starts in Wainwright Park,” Parks Canada Files, BNP, RG 84, Vol. 58, File BU299, pt. 14.
45. LAC, George M. Spargo to A. G. Smith, 7 Dec. 1932, Parks Canada Files, BNP, RG 84, Vol. 50, File BU211, pt. 2.
46. LAC, George M. Spargo to A. G. Smith, 7 Dec. 1932, Parks Canada Files, BNP, RG 84, Vol. 50, File BU211, pt. 2.
47. LAC, Extract from a report by Dr. Hadwen, 21 Feb. 1923, quoted in Memorandum to J. B. Harkin, 15 Feb. 1933, Parks Canada Files, BNP, RG 84, Vol. 50, File BU217, pt. 1.

48. LAC, Commissioner to Superintendent, 13 Apr. 1923, Parks Canada Files, BNP, RG 84, Vol. 50, File BU217, pt. 1.
49. LAC, Benjamin Lawton to J. B. Harkin, 16 May 1923, Parks Canada Files, BNP, RG 84, Vol. 50, File BU217, pt. 1.
50. LAC, Report by S. H. Clark, 14 Oct. 1932, Parks Canada Files, BNP, RG 84, Vol. 50, File BU211, pt. 2.
51. For example, Buffalo National Park shipped a carload of elk to Ontario for their Game Department in November 1932. LAC, A. G. Smith to Geo. M. Spargo, 23 Jan. 1933, Parks Canada Files, BNP, RG 84, Vol. 55, File BU234, pt. 1.
52. LAC, A. E. Etter to J. B. Harkin, 19 Jun. 1933 and 30 Sept. 1933, A. Bryan Williams to J. B. Harkin, 20 Jun. 1933, 27 Jun. 1933 and 31 Aug. 1931, Parks Canada Files, BNP, RG 84, Vol. 55, File BU234, pt. 1.
53. LAC, Benjamin Lawton to J. B. Harkin, 3 Oct. 1923, Parks Canada Files, BNP, RG 84, Vol. 50, File BU217, pt. 1.
54. LAC, J. B. Harkin to A. Bryan Williams, 6 Jun. 1933, Parks Canada Files, BNP, RG 84, Vol. 55, File BU234, pt. 1.
55. LAC, J. B. Harkin to H. H. Rowatt, 7 Dec. 1933, Parks Canada Files, BNP, RG 84, Vol. 50, File BU211, pt. 2.
56. LAC, George M. Spargo to A. G. Smith, 7 Dec. 1932, Parks Canada Files, BNP, RG 84, Vol. 50, File BU211, pt. 2.
57. LAC, J. B. Harkin to S. H. Clark, 6 Jun. 1933, Parks Canada Files, BNP, RG 84, Vol. 50, File BU211, pt. 2.
58. LAC, Hoyes Lloyd to Mr. Harkin, 15 Sept. 1933, Parks Canada Files, BNP, RG 84, Vol. 50, File BU211, pt. 2.
59. LAC, J. B. Harkin to S. H. Clark, 13 Oct. 1933, Parks Canada Files, BNP, RG 84, Vol. 50, File BU211, pt. 2.
60. LAC, S. H. Clark to J. B. Harkin, 18 Nov. 1933, Parks Canada Files, BNP, RG 84, Vol. 50, File BU211, pt. 2.
61. LAC, Hoyes Lloyd to J. B. Harkin, 11 Sept. 1933, Parks Canada Files, BNP, RG 84, Vol. 50, File BU211, pt. 2.
62. LAC, A. G. Smith to Commissioner, 5 Jun. 1934, and A. G. Smith to Commissioner, 9 Jan. 1935, Parks Canada Files, BNP, RG 84, Vol. 50, File BU211, pt. 2.
63. LAC, A. G. Smith to Commissioner, 10 May 1935, Parks Canada Files, BNP, RG 84, Vol. 50, File BU211, pt. 2.

64. LAC, A. G. Smith to Commissioner, 4 Jun. 1936, Parks Canada Files, BNP, RG 84, Vol. 50, File BU211, pt. 2.
65. LAC, J. B. Harkin to Game Commissioner, 18 Jun. 1936, Parks Canada Files, BNP, RG 84, Vol. 50, File BU211, pt. 2.
66. LAC, Seymour Hadwen to J. B. Harkin, 21 Feb. 1923, Parks Canada Files, BNP, RG 84, Vol. 58, BU299-2, pt. 1.
67. LAC, Seymour Hadwen to J. B. Harkin, 21 Feb. 1923, Parks Canada Files, BNP, RG 84, Vol. 58, BU299-2, pt. 1.
68. LAC, Seymour Hadwen to J. B. Harkin, 21 Feb. 1923, Parks Canada Files, BNP, RG 84, Vol. 58, BU299-2, pt. 1.
69. LAC, Seymour Hadwen to J. B. Harkin, 21 Feb. 1923, Parks Canada Files, BNP, RG 84, Vol. 58, BU299-2, pt. 1.
70. LAC, A. G. Smith, Copy of a statement handed in at the close of operations by Dr. I. Christian, Veterinary Inspector-in-charge, 1923, Parks Canada Files, BNP, RG 84, Vol. 58, BU299-2, pt. 1.
71. LAC, Seymour Hadwen to J. B. Harkin, 21 Feb. 1923, Parks Canada Files, BNP, RG 84, Vol. 58, BU299-2, pt. 1.
72. LAC, Frederick Torrance to J.B. Harkin, 27 Mar. 1923, Parks Canada Files, BNP, RG 84, Vol. 58, File BU299-2, pt. 1.
73. LAC, Maxwell Graham to Mr. Harkin, 3 Aug. 1912 and "Report: The Canadian Government Buffalo Herds for Calendar Year Ending Dec. 31, 1915," Parks Canada Files, BNP, RG 84, Vol. 52, File BU232, pt. 1.
74. University of Alberta Archives, Edmonton, AB (hereafter UAA), T.B. at Buffalo Park between Dec. 1916 to Jan. 1st, 1922, Buffalo National Park Files, 2002-18-4.
75. LAC, The handwritten notes in this memorandum, which indicate that tuberculosis was suspected, appear to belong to Maxwell Graham. A. G. Smith to J. B. Harkin, 8 Jun. 1917, Parks Canada Files, BNP, RG 84, Vol. 53, File BU232, pt. 1.
76. LAC, "Report: The Canadian Government Buffalo Herds for Calendar Year Ending Dec. 31, 1915," Parks Canada Files, BNP, RG 84, Vol. 52, File BU232, pt. 1; LAC, Memorandum to R. A. Gibson, Report of Dr. Seymour Hadwen on Elk and Wainwright Parks, 15 Sept. 1939, Parks Canada Files, BNP, RG 84, Vol. 52, File BU233, pt. 2.
77. LAC, Superintendent to W. W. Cory, 22 Apr. 1907, Parks Canada Files, BNP, RG 84, Vol. 51, File BU209, pt. 4; LAC, A. G. Smith, "Statement of Original Shipments of Buffalo into Buffalo Park, Wainwright," 14 Sept. 1926, Parks Canada Files, BNP, RG 84, Vol. 51, File BU209, pt. 3.

78. LAC, Frederick Torrance to J.B. Harkin, 27 Mar. 1923, Parks Canada Files, BNP, RG 84, Vol. 58, File BU299-2, pt. 1.
79. LAC, Seymour Hadwen to J. B. Harkin, 21 Feb. 1923, Parks Canada Files, BNP, RG 84, Vol. 58, BU299-2, pt. 1.
80. LAC, J. B. Harkin to Mr. Cory, 23 May 1923, Parks Canada Files, BNP, RG 84, Vol. 58, BU299-2, pt. 1.
81. UAA, Memorandum from Maxwell Graham, 19 Mar. 1919, Buffalo National Park Files, 2002-18-4.
82. LAC, Frederick Torrance to J.B. Harkin, 27 Mar. 1923, Parks Canada Files, BNP, RG 84, Vol. 58, File BU299-2, pt. 1.
83. UAA, Maxwell Graham quoted in Maxwell Graham to J. B. Harkin, 7 Jul. 1916, Buffalo National Park Files, 2002-18-4.
84. LAC, Seymour Hadwen to J. B. Harkin, 21 Feb. 1923, Parks Canada Files, BNP, RG 84, Vol. 58, BU299-2, pt. 1.
85. LAC, J. B. Harkin to Mr. Cory, 23 May 1923, Parks Canada Files, BNP, RG 84, Vol. 58, BU299-2, pt. 1.
86. LAC, J. B. Harkin to Mr. Cory, 23 May 1923, Parks Canada Files, BNP, RG 84, Vol. 58, BU299-2, pt. 1.
87. LAC, E. A. Watson to Dr. Geo Hilton, 4 Apr. 1924, Parks Canada Files, BNP, RG 84, Vol. 58, BU299-2, pt. 1.
88. Tuberculosis in the bison herd went unmentioned except for one passing reference that alluded to the disease's possible connection with lung worms. Cameron stated, "The lesions associated with these worms were emphysema and hard areas which suggested tuberculosis when felt from the outside. The numbers found in a single buffalo were comparatively few, about a dozen." LAC, A. E. Cameron, "Notes on Buffalo: Anatomy, Pathological Conditions, and Parasites," reprinted from the *Veterinary Journal* 79 (10), Parks Canada Files, BNP, RG 84, Vol. 58, BU299-2, pt. 1.
89. LAC, E. A. Watson to Dr. Geo Hilton, 4 Apr. 1924 and J. B. Harkin to J. H. Grisdale, 6 May 1924, Parks Canada Files, BNP, RG 84, Vol. 58, BU299-2, pt. 1.
90. A. E. Cameron, "Some Further Notes on Buffalo," *Veterinary Journal* 80 (1924) 417.
91. LAC, Acting Veterinary General to J. B. Harkin, 25 Aug. 1928 and J. B. Harkin to R. G. Ferguson, 4 Sept. 1928, Parks Canada Files, BNP, RG 84, Vol. 58, BU299-2, pt. 1.
92. LAC, Seymour Hadwen to J. B. Harkin, 21 Feb. 1923 and Frederick Torrance to J.B. Harkin, 27 Mar. 1923, Parks Canada Files, BNP, RG 84, Vol. 58, BU299-2, pt. 1.

93. LAC, Memorandum to Mr. Cory, 23 May 1923, Parks Canada Files, BNP, RG 84, Vol. 58, File BU299-2, pt. 1.
94. LAC, Howard Douglas to W. W. Cory, 15 Jun. 1906, Parks Canada Files, BNP, RG 84, Vol. 51, File BU209, pt. 1.
95. LAC, Extract from a report of Dr. Torrance, Veterinary Director General, 27 Mar. 1923, quoted in Memorandum to J. B. Harkin, 15 Feb. 1933, Parks Canada Files, BNP, RG 84, Vol. 50, File BU217, pt. 1.
96. In 1918, a newspaper article reported that 8,000 bushels of oats were threshed at Buffalo National Park, of which 2,100 bushels were shipped to other parks. That same year, 1,200 tons of hay were cut and stacked and permits were given out to settlers covering the cutting of 671 tons of hay. *Edmonton Journal*, 11 Apr. 1918, "537 Increase in Buffalo at Wainwright Park," LAC, Parks Canada Files, BNP, RG 84, Vol. 53, File BU232, pt. 1.
97. LAC, Extract from letter of Superintendent, 26 Mar. 1925, quoted in Memorandum to J. B. Harkin, 15 Feb. 1933, Parks Canada Files, BNP, RG 84, Vol. 50, File BU217, pt. 1.
98. LAC, A. G. Smith to J. B. Harkin, 18 Mar. 1925, Parks Canada Files, BNP, RG 84, Vol. 52, File BU232-1, pt. 1.
99. LAC, A. G. Smith to Commissioner, 14 Oct. 1924, Parks Canada Files, BNP, RG 84, Vol. 52, File BU232-1, pt. 1.
100. LAC, J. B. Harkin to W. W. Cory, 3 Feb. 1925 and A. G. Smith to Commissioner, 10 Feb. 1925, Parks Canada Files, BNP, RG 84, Vol. 52, File BU232-1, pt. 1; LAC, Memorandum to Maxwell Graham, 22 Jan. 1925, Parks Canada Files, BNP, RG 84, Vol. 52, File BU232-1, pt. 1.
101. LAC, A. G. Smith to Commissioner, 10 Feb. 1925, Parks Canada Files, BNP, RG 84, Vol. 52, File BU232-1, pt. 1.
102. LAC, A. G. Smith to Commissioner, 10 Feb. 1925, Parks Canada Files, BNP, RG 84, Vol. 52, File BU232-1, pt. 1.
103. LAC, J. B. Harkin to W. W. Cory, 3 Feb. 1925 and Extract from the Superintendent of Buffalo Park, 16 Feb. 1925, Parks Canada Files, BNP, RG 84, Vol. 52, File BU232-1, pt. 1.
104. LAC, A. G. Smith to J. B. Harkin, 18 Mar. 1925, Parks Canada Files, BNP, RG 84, Vol. 52, File BU232-1, pt. 1.
105. LAC, Quoted in Memorandum to W. W. Cory, 15 Jul. 1925, Parks Canada Files, BNP, RG 84, Vol. 52, BU232-1, pt. 2.

106. LAC, Extracts from diary of E. J. Cotton, 13 Aug. 1925 and 15 Aug. 1925, quoted in Memorandum to J. B. Harkin, 15 Feb. 1933, Parks Canada Files, BNP, RG 84, Vol. 50, File BU217, pt. 1.
107. LAC, Extract from letter from Superintendent Smith, 11 Nov. 1926, quoted in Memorandum to J. B. Harkin, 15 Feb. 1933, Parks Canada Files, BNP, RG 84, Vol. 50, File BU217, pt. 1.
108. LAC, C. Nagle to Hoyes Lloyd, 7 May 1927, Parks Canada Files, BNP, RG 84, Vol. 54, File BU232, pt. 4.
109. LAC, "Loss of Buffalo, Buffalo Park," Winter 1926–27 and A. G. Smith to Commissioner, 12 May 1927, Parks Canada Files, BNP, RG 84, Vol. 54, File BU232, pt. 4.
110. LAC, A. G. Smith, Report of 20 Apr. 1927, quoted in C. E. Nagle to Mr. Lloyd, 7 May 1927, Parks Canada Files, BNP, RG 84, Vol. 54, File BU232, pt. 4.
111. Only two of Warden Davey Davison's diaries, the years 1927 and 1929, still exist. A comparison of the two diaries shows that the number of animals that died in 1927 in the Visitor's Park, especially during the winter months, was significantly higher than in 1929. BNPFA, Diary of Davey Davison, Jan. 1, 1927 to Jan. 2, 1928 and Diary of Davey Davison, Jan. 1 – Dec. 31, 1929, Davison fonds.
112. LAC, Extract from letter from Superintendent, 25 Aug. 1927, quoted in Memorandum to J. B. Harkin, 15 Feb. 1933, Parks Canada Files, BNP, RG 84, Vol. 50, File BU217, pt. 1.
113. LAC, Extracts from the diary of E. J. Cotton, Buffalo Park, 25 Apr. 1927, Parks Canada Files, BNP, RG 84, Vol. 52, File BU232-1, pt. 2.
114. LAC, D. H. Christie to O. S. Finnie, 23 Jun. 1927, Parks Canada Files, BNP, RG 84, Vol. 52, File BU232-1, pt. 2.
115. LAC, S. E. Clarke, "Report on Investigation of Pasture Conditions at Buffalo Park," Sept. 1929, Parks Canada Files, BNP, RG 84, Vol. 50, BU35, pt. 1.
116. LAC, S. E. Clarke, Report on Investigation of Pasture Conditions at Buffalo Park," Sept. 1929, Parks Canada Files, BNP, RG 84, Vol. 50, File BU35, pt. 1.
117. LAC, S. E. Clarke, "Report on Investigation of Pasture Conditions at Buffalo Park," Sept. 1929, Parks Canada Files, BNP, RG 84, Vol. 50, BU35, pt. 1.
118. LAC, S. E. Clarke, "Report on Investigation of Pasture Conditions at Buffalo Park," Sept. 1929, Parks Canada Files, BNP, RG 84, Vol. 50, File BU35, pt. 1.

119. LAC, Memorandum to Mr. Spero, 4 Mar. 1931, Parks Canada Files, BNP, RG 84, Vol. 50, File BU217, pt. 1; LAC, S. E. Clarke, "Report on Investigation of Pasture Conditions at Buffalo Park," Sept. 1929 and S. E. Clarke, "Report on Investigation of Pasture Conditions at Buffalo National Park," Sept. 1930, Parks Canada Files, BNP, RG 84, Vol. 50, File BU35, pt. 1.
120. LAC, S. E. Clarke, "Report on Investigation of Pasture Conditions at Buffalo Park," Sept. 1930, Parks Canada Files, BNP, RG 84, Vol. 50, BU35, pt. 1.
121. LAC, S. E. Clarke, "Report on Investigation of Pasture Conditions at Buffalo Park," Sept. 1930, Parks Canada Files, BNP, RG 84, Vol. 50, BU35, pt. 1.
122. LAC, S. E. Clarke, "Report on Investigation of Pasture Conditions at Buffalo Park," Sept. 1930, Parks Canada Files, BNP, RG 84, Vol. 50, BU35, pt. 1.
123. LAC, S. E. Clarke, "Report on Investigation of Pasture Conditions at Buffalo Park," Sept. 1929, Parks Canada Files, BNP, RG 84, Vol. 50, BU35, pt. 1.
124. LAC, Hoyes Lloyd to J. B. Harkin, 15 Feb. 1933, Parks Canada Files, BNP, RG 84, Vol. 57, File BU299, pt. 9.
125. LAC, Extract from letter of Superintendent, 24 Feb. 1932, quoted in Memorandum to J. B. Harkin, 15 Feb. 1933, Parks Canada Files, BNP, RG 84, Vol. 50, File BU217, pt. 1.
126. LAC, Extract from Diary of Warden Cotton, 20 May 1932, quoted in Memorandum to J. B. Harkin, 15 Feb. 1933, Parks Canada Files, BNP, RG 84, Vol. 50, File BU217, pt. 1.
127. LAC, Memorandum to J. B. Harkin, 15 Feb. 1933, Parks Canada Files, BNP, RG 84, Vol. 50, BU217, pt. 1.
128. LAC, A. G. Smith to Commissioner, 20 Mar. 1931, Parks Canada Files, BNP, RG 84, Vol. 50, File BU217, pt. 1.
129. LAC, Quoted in Letter to Mr. Williamson, 14 Aug. 1937, Parks Canada Files, BNP, RG 84, Vol. 55, File BU234, pt. 1.
130. LAC, A. G. Smith to Commissioner, 10 Feb. 1932, Parks Canada Files, BNP, RG 84, Vol. 50, File BU217, pt. 1; LAC, A. G. Smith to Commissioner, 6 Jun. 1932, Parks Canada Files, BNP, RG 84, Vol. 52, File BU233, pt. 2.
131. LAC, A. G. Smith to Commissioner, 10 Feb. 1932, Parks Canada Files, BNP, RG 84, Vol. 50, File BU217, pt. 1.

132. John P. Russo, *The Kaibab North Deer Herd: Its History, Problems and Management* (Phoenix 1964), 37, 45–46.
133. LAC, Hoyes Lloyd to J. B. Harkin, 22 Aug. 1932, Parks Canada Files, BNP, RG 84, Vol. 50, File BU217, pt. 1.
134. LAC, Seymour Hadwen to J. B. Harkin, 21 Feb. 1923, Parks Canada Files, BNP, RG 84, Vol. 58, File BU299-2, pt. 1.
135. LAC, A. G. Smith to W. E. Swales, 18 Feb. 1935, Parks Canada Files, BNP, RG 84, Vol. 52, File BU233, pt. 2.
136. LAC, Thomas W. M. Cameron to J. B. Harkin, 21 Jul. 1933, Parks Canada Files, BNP, RG 84, Vol. 52, File BU233, pt. 2. The Peterson enclosure was located on the eastern border, in the northeast section of the park just south of the Visitor's Park. LAC, "Buffalo Park," map, 1926, Parks Canada Files, BNP, RG 84, Vol. 50, File BU38, pt. 1.
137. LAC, Attachment to memorandum, Hoyes Lloyd to Mr. Powell, 11 May 1935, and Thomas W. M. Cameron to J. B. Harkin, 21 Jul. 1933, Parks Canada Files, BNP, RG 84, Vol. 52, File BU233, pt. 2.
138. LAC, A Summarized Report of the Investigation of Parasitism in the Animals at Buffalo Park, Wainwright, Alta., with Special Reference to the Life History and Control of the Large Liver Fluke (*Fasciola magna*), n.d., Parks Canada Files, BNP, RG 84, Vol. 52, File BU233, pt. 2.
139. LAC, A Summarized Report, Parks Canada Files, BNP, RG 84, Vol. 52, File BU233, pt. 2.
140. LAC, A. G. Smith to W. E. Swales, 18 Feb. 1935 and J. S. Bowie to Veterinary Director General, 20 Jan. 1938, Parks Canada Files, BNP, RG 84, Vol. 52, File BU233, pt. 2.
141. LAC, Attachment to memorandum, Hoyes Lloyd to Mr. Powell, 11 May 1935, Parks Canada Files, BNP, RG 84, Vol. 52, File BU233, pt. 2.
142. LAC, H. W. Cowan, Report of Inspector, 23 Jul. 1936 and H. W. Cowan, Report of Inspector, 12 Mar. 1937, Parks Canada Files, BNP, RG 84, Vol. 52, File BU233, pt. 2.
143. LAC, Memorandum to R. A. Gibson, Report of Dr. Seymour Hadwen on Elk and Wainwright Parks, 15 Sept. 1939, Parks Canada Files, BNP, RG 84, Vol. 52, File BU233, pt. 2.
144. LAC, Seymour Hadwen to F. H. H. Williamson, 7 Dec. 1939, Parks Canada Files, BNP, RG 84, Vol. 982, File BU2[548608], pt. 3.

