

The Portage Bands' Treaty No.1 Land Entitlement: An Economic Analysis

by

Ellery Thomas Henry Penner

A thesis
presented to the University of Manitoba
in partial fulfillment of the
requirements for the degree of
Master of Science
in
Agricultural Economics and Farm Management

Winnipeg, Manitoba

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AN ECONOMIC ANALYSIS

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ELLERY THOMAS HENRY PENNER

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ABSTRACT

This thesis addresses the question of the establishment of a compensation basis for the settlement of outstanding treaty land entitlement between the Government of Canada and Indian Bands. The scope of the study was limited to a determination of compensation based on treaty shortfall lands having agricultural potential. At the present time, entitlement calculations are based solely on the basis of current population. This procedure fails to account for past income losses suffered by Indian Bands as a result of their alienation from treaty lands.

The method established by this study, was applied to the Portage Bands' outstanding treaty entitlement. The method is based on a summation of foregone crop and pasture related rental incomes, between 1881 and 1983, plus market value estimates of land in the treaty shortfall areas. Foregone income is included as a measure of compensation since, the unfulfilled treaty entitlement has deprived the Portage Bands of potential incomes that could otherwise have been realized had the bands been in possession of the disputed lands. The inclusion of current land values in the compensation basis enables the bands to benefit from future returns to the land.

Summing annual rental earnings during each year of the study period captures only part of the foregone incomes due to the shortfall in treaty entitlement. Foregone interest on these monies must be established as well. The study employed long term Canada Savings Bond rates to compound the foregone income streams.

In the interests of comparison, compensation based on the current population principle was also considered a possible settlement alternative. Under this scenario, compensation was determined on the basis of current land values.

Annual foregone incomes were calculated with respect to two systems of landuse. The first system establishes the historical use of private lands (neighboring management), in the treaty shortfall area. The second, documents the historical use of reserve lands already received under the treaty. It is essential that both historic landuse patterns are known, since the income streams are likely to differ.

Treaty shortfall areas were calculated for each of the Portage Bands (Long Plain, Swan Lake and Sandy Bay), on the basis of two separate treaty interpretations specifying the size of an additional twenty-five square mile tract. The size of the treaty shortfall area is critical to the final calculation of compensation, since foregone incomes are determined on a per acre basis. The larger the shortfall, the larger will be the total monetary compensation.

Lands subject to the neighboring management assumptions were more productive than lands developed at the reserve rate. Reserve developments however, were found to be constrained by inferior soil quality in comparison to surrounding townships. In all cases, the estimated values of treaty entitlement compensation were greater when neighboring management was assumed.

Under neighboring management assumptions, Swan Lake achieved the most advanced levels of development, while the Sandy Bay Band had the lowest

percentage of land in a cultivated state. These results were found to be directly related to the location and quality of lands found in the respective shortfalls. Under reserve management, the Long Plain Band was considered to have the greatest amount of land in crop production and the Sandy Bay Band once again had the lowest level of improvements.

Sensitivity analysis revealed that, changes in the interest rate variable were found to have the greatest impact on total compensation while percentage changes in pasture capability had the least effect.

The value of current population based monetary compensation was related to both, estimated unimproved land values and the absolute magnitude of the various band shortfalls. Long Plain compensation was the highest due its high estimated land values. Sandy Bay, despite its large population, had the lowest compensation value, due mainly to low estimated land values.

The thesis did not conclusively establish that foregone income based compensation will necessarily always exceed that of compensation based on the current population principle. Foregone income based compensation was very sensitive to the assumed rate of development and the size of the calculated shortfall. Current population type settlements, on the other hand, are dependent only on current population numbers and current unimproved land values. Advantages to Indian bands for settling on the basis of foregone incomes and current land values definitely exist when large shortfall areas are included and where substantial income losses from these areas may be documented. Should the growth rate of band populations surpass gains in foregone income during subsequent years, future

comparison of the two types of settlement may well reveal definite advantages to settling outstanding treaty entitlement on the basis of current population. Until such a time however, higher estimates of treaty compensation will generally result where measures of foregone income are included.

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FOR MY PARENTS

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Chapter I

THE PORTAGE BANDS' HISTORICAL TREATY ENTITLEMENT

1.1 INTRODUCTION

On August 3, 1871, the signing of Treaty No.1 was formally concluded between representatives of the Dominion Government of Canada and those Chiefs representing the Chippewa and Swampy Cree Tribes of southern Manitoba. In return for the voluntary surrender of their ancestral lands, these Indians were promised reserves of land for their sole and exclusive use. Treaty No.1 was the first in a series of treaties entered into between the Dominion of Canada and the Indians of Canada's Northwest. The fundamental purpose of these treaties was to extinguish Indian title to the land. From the point of view of the federal government, this process was a necessary condition to facilitate the settlement of new immigrants in the Canadian West.

Within a short period of time, many of the treaty promises were under dispute. The Portage Bands in particular, experienced considerable misunderstanding with respect to the extent and location of their reserve. The dissention led eventually to a revision of Treaty No.1 in 1876. After a period of more than one hundred years however, the controversy over reserves has not been eliminated. The Portage Bands claim that their full land entitlement, set out under the terms of Treaty No.1, has yet to be received.

A historical overview is essential to gain a better understanding of this problem. This chapter describes from a historical perspective, the events leading up to and following the signing of Treaty No.1 in 1871. The nature of the current Portage Bands' claim and the state of the treaty land entitlement process in Manitoba and Canada will be discussed. A potential means of calculating an appropriate compensation settlement is then demonstrated, based on a determination of the historical income losses suffered by the Portage Bands on lands not included in the Treaty No.1 settlement.

1.2 EVENTS PRIOR TO 1871

The Indians of the Portage Band were Saulteaux;"near kinsmen of the Chippewas."¹ The Saulteaux evidently, were not the original dwellers of the lands in southern Manitoba. As far back as 1780, it appears that southwestern Manitoba was inhabited by the Cree and Assiniboine Tribes.² The mobile lifestyle adopted by the Plains Indians was necessitated by the ongoing search for herds of buffalo which roamed the prairies. Close proximity to the wandering herds was important for the survival of the prairie Indian since the buffalo provided the basic life essentials (ie. food, clothing, shelter and trade).³

¹ The Manitoban, July 29, 1871.

² Robert B. Hill, History of Manitoba: Early Settlement, Development and Resources (Toronto: William Briggs, 1890), pp.11-12.

³ W.L. Morton, Manitoba: A History (2nd ed.; Toronto: University of Toronto Press, 1979), pp.40,41.

Around 1781, a small-pox epidemic ravaged the Assiniboines, who were living in the area of the forks of the Red and Assiniboine Rivers. The Assiniboines subsequently abandoned this territory and it passed into the hands of the Saulteaux, who had moved up from their lands further south along the Red River. It is with these Indians, that Lord Selkirk negotiated for the surrender of land for his Red River Colony.⁴

The Selkirk colony at Red River was first established in 1811, the result of a land grant from the Hudson's Bay Company to the Earl of Selkirk. Aside from Lord Selkirk's philanthropic reasons for establishing the colony for prospective British settlers, the Hudson's Bay Company also had fundamental reasons for doing so. The existence of an agricultural colony on Company territory was viewed as an opportunity to secure a lower cost source to provide food supplies to the various Company outposts.⁵

The treaty between Lord Selkirk and the Chiefs of the Saulteaux and Cree Nations was signed on July 18, 1817. In return for the annual gifts outlined in the treaty, the Chiefs confirmed to the British Crown, a tract of land, specified as:

adjacent to Red River and Ossiniboyne River, beginning at the mouth of the Red River and extending along same as far as Great Forks at the mouth of Red Lake River, and along Ossiniboyne River, otherwise called Riviere des Champignons, and extending to the distance of six miles from Fort Douglas on every side, and likewise from Fort Doer, and also from the Great Forks and in other parts extending in breadth to the distance of two English statute miles back from the banks of

⁴ Arthur S.Morton, A History of the Canadian West to 1870-71 (2nd ed.; Toronto: University of Toronto Press, 1973), p.21.

⁵ Arthur S.Morton, History of Prairie Settlement, ed. W.A.Mackintosh and W.L.G.Joerg, Canadian Frontiers of Settlement Series, Vol.II (Toronto: The MacMillan Company of Canada, 1938), p.13.

the said rivers, on each side, together with all appurtenances whatsoever of the said tract of land, to have and to hold forever the said tract of land and appurtenances to the use of the said Earl of Selkirk, and of the settlers established thereon, with the consent and permission of our Sovereign Lord the King, or of the said Earl of Selkirk.⁶

The Selkirk Treaty demonstrated the British Crown's recognition that Indian people did hold a special interest in the land. This interest had long been recognized through the Royal Proclamation of 1763.⁷ J.Sissons of the Territorial Court of the Northwest Territories said of the Proclamation in 1963:

Like so many great charters in English history it does not create rights but rather affirms old rights. The Indians and Eskimos had their aboriginal rights and English law has always recognized these rights.⁸

The essential feature of the Proclamation as it related to the Indians, was expressed in 1974 by Lloyd Barber, the former Indian Claims Commissioner for Canada:

The Proclamation provided for the protection of Indian lands from settlers and others until such a time as the Indian rights to the land had been surrendered to the Crown. In effect it precluded anyone other than the Crown from dealing with Indians for land and laid the basis for the treaty making process in Canada.⁹

⁶ Alexander Morris, The Treaties of Canada With The Indians (Toronto: Belfords, Clarke & Co., Publishers, 1880), pp.298-300, see Appendix A for full text of Selkirk Treaty.

⁷ See Appendix B for text of Proclamation of 7 October 1763, relating to Indians and lands reserved for Indians.

⁸ Kenneth M. Narvey, "The Royal Proclamation of 7 October 1763: The Common Law and Native Rights To Land Within the Territory Granted to the Hudson's Bay Company," Saskatchewan Law Review, Vol.38.(1974), p.184, citing per Strong J. at 63; Regina v. Koonungnak (1963), 42 C.R. 143 at 160, 45 W.W.R. 282 at 302 per Sissons J. (N.W.T. Terr. Ct.).

⁹ Lloyd Barber, Indian Land Claims and Rights, from an address at the Royal Society of Canada's Symposium on Amerindians, Quebec, October 1974, C.A.S.N.P. No.46/22, p.3.

The Selkirk Treaty took early steps to extinguish Indian title. However, in Manitoba, this only extended to lots along the Red River, from Lake Winnipeg to the American border and along the Assiniboine River, from the Red River to Rat Creek, a few miles west of Portage la Prairie.¹⁰ By the late 1860's, new settlers from Central Canada were arriving and some began to stake out land claims in the area surrounding the Red River Settlement. The impending transfer of Hudson's Bay Company lands to the Dominion of Canada and the subsequent increase in western settlement, caused a great deal of anxiety among the Metis of Red River. The Metis, "half-breeds" of French-Canadian origin, were the offspring of voyageurs who had toiled for the rival North-West Company.¹¹ Rapidly becoming outnumbered by the new white settlers and English "half-breeds", the Metis had real concerns regarding the protection of their land rights under a new government. These concerns were heightened upon the arrival of surveying parties from central Canada, prior to the transfer of Hudson's Bay Company lands in 1869. Tensions increased to the point where the Metis actively obstructed the surveyors' work. The Metis based their actions on the premise that no lands should be surveyed until the Metis and Indian interest in the land was safeguarded.¹²

In response to the imminent transfer of power between the Hudson's Bay Company and the Dominion Government, the Metis, under the leadership of Louis Riel, formed a provisional government at Red River in December 1869. The Red River Settlement was anything but united under the Provi-

¹⁰ W.L.Morton, op. cit., p.105.

¹¹ George F.G.Stanley, The Birth of Western Canada: A History of the Riel Rebellions (Toronto: University of Toronto Press, 1961), pp.6-7.

¹² W.L.Morton, op. cit., pp. 118-120.

sional Government. Conflicts between French and English factions were evident from the beginning. The conflict came to a head in March 1870, when Thomas Scott, an Orangeman from Ontario, was executed for his refusal to recognize the Provisional Government under Riel. During the same time period, a delegation had been sent to Ottawa with a list of rights drawn up by the Provisional Government, requesting the admission of the Red River Settlement and surrounding districts into the Canadian Confederation. After brief, but intense discussions, an amended bill of rights was accepted, whereby the new Province of Manitoba was created, with a Legislative Council and Assembly, a constitution similar to that of the other provinces and Canadian Parliamentary representation.¹³

The Manitoba Act 1870 came into force on July 15, 1870 and the first Lieutenant Governor of Manitoba, Adams G. Archibald, arrived at Red River on August 24, 1870. Archibald's arrival had been preceded by a regiment of soldiers from central Canada, who were bent on gaining revenge for the execution of Scott. Scott's execution had raised a great deal of anti-French sentiment in Ontario. Riel, forewarned of the regiments mood, managed to slip away just in time to eventual exile in the United States.¹⁴

In the end, the concerns of the land-conscious Metis were addressed. Under terms of Section 31 of the Manitoba Act 1870, 1,400,000 acres were set aside for the benefit of the Metis and "half-breed" residents of Manitoba.¹⁵ While the status of Indian lands had yet to be established,

¹³ *ibid*; pp. 140-41.

¹⁴ *ibid*.

¹⁵ Canada, The Statutes of Canada, 33 Vict., Cap.III, pp. 25-26.

it was to gain a high priority in the federal government's future quest to settle the Canadian West.

1.3 TREATY NO.1

One of the initial tasks of the new Lieutenant Governor was to arrange a negotiated settlement of the Indian lands question. For this purpose Archibald was instructed by his superiors in Ottawa as follows:

1. You will, with as little delay as possible, open communication with the Indian Bands occupying the country lying between Lake Superior and the Province of Manitoba, with a view to the establishment of such friendly relations as may make the route from Thunder Bay to Fort Garry secure at all seasons of the year, and facilitate the settlement of such portion of the country as it may be practical to improve.
2. You will also turn your attention promptly to the condition of the country outside the Province of Manitoba, on the North and West; and while assuring the Indians of your desire to establish friendly relations with them, you will ascertain and report to his Excellency the course you may think most advisable to pursue whether by treaty or otherwise, for the removal of any obstructions that may be presented to the flow of the population into the fertile lands that lie between Manitoba and the Rocky Mountains.
3. You will also make a full report upon the state of the Indian Tribes now in the Territories, their numbers, wants and claims the system heretofore pursued by the Hudson's Bay Company in dealing with them, accompanied by any suggestions you may desire to offer with reference to their protection, and the improvement of their condition.¹⁶

Archibald met with the Indians of Manitoba in the fall of 1870, indicating that treaty negotiations would commence during the following summer. It was apparent that the Indians were as anxious as the Dominion

¹⁶ Canada: Sessional Papers (1871), No.20, p.8.

Government to negotiate. As early as 1860, Chief Peguis, one of the signers' of the Selkirk Treaty, had protested that Indian title had not yet been properly extinguished, even for the lands included in the Selkirk Treaty.¹⁷ Alexander Morris, later to become Lieutenant Governor of Manitoba and the Northwest Territories, and involved in the treaty negotiations after 1872, wrote an account of the treaty negotiations entitled, The Treaties of Canada With the Indians. In his book, Morris describes the position of the Indians at this meeting:

They were full of uneasiness owing to the influx of population, denied the validity of the Selkirk Treaty, and had in some instances obstructed settlers and surveyors. In view of the anxiety prevailing, these gentlemen were of opinion "that it was desirable to secure extinction of the Indian title not only to the lands within Manitoba, but also to much of the timber grounds east and north of the Province as were required for immediate entry and use, and also of a large tract of cultivable ground west of the Portage, where there were very few Indian inhabitants."¹⁸

In 1871, Wemyss McKenzie Simpson was appointed Indian Commissioner upon the recommendation of the Secretary of State of Canada, Joseph Howe. Simpson was given the task of negotiating treaties with the Indians of Manitoba and the outlying areas. Accordingly, Simpson issued invitations for the Indians to meet with him at Lower Fort Garry and at Manitoba Post, a Hudson's Bay fort at the north end of Lake Manitoba, on July 25th and August 17th, respectively.¹⁹ Howe's instructions to Simpson implied the need to minimize the cost to the government, in arriving at treaty settlements:

¹⁷ W.L.Morton, op. cit., p. 105, Morton's footnote no. 12: Nor'Wester, I(3), January 28, 1860.

¹⁸ Morris, op. cit., pp. 25-26.

¹⁹ *ibid.*

The powers entrusted to you are large, and they should be used with constant reference to the responsibility which the Government owes to the Parliament and to the Country for the judicious and economical expenditures of the funds and supplies entrusted to your charge. It should therefore be your endeavor to secure the cession of the lands upon terms as favorable as possible to the Government, not going as far as the maximum sum hereafter named unless it be found impossible to obtain the object for a less amount.²⁰

Howe referred to prior treaty settlements in Ontario and Quebec which had not exceeded four dollars per family of five, but indicated that the maximum compensation allowable was to be twelve dollars per family of five, or in that proportion for larger or smaller families.²¹

The first day of negotiations at Lower Fort Garry were postponed until July 27th, when the Indians, numbering close to one thousand, had all arrived. Lieutenant Governor Archibald was the first to address the assembled Indians. He thanked them, on behalf of the Queen, for coming to negotiate and further related some of Her concerns:

Your Great Mother wishes the good of all races under her sway. She wishes her red children to be happy and contented. She wishes them to live in comfort. She would like them to adopt the habits of the whites, to till the land and raise food, and store it up against a time of want...But the Queen, though she may think it good for you to adopt civilized habits, has no idea of compelling you to do so. This she leaves to your choice, and you need not live like the white man unless you can be persuaded to do so of your own free will. Many of you, however, are already doing this.²²

²⁰ Canada, Department of Indian Affairs, Annual Report 1871 (Secretary of State Howe to Commissioner Simpson, 6 May 1871), p.6, cited by W.E.Daugherty, Treaty Research Report: Treaty One and Treaty Two, (Treaties and Historical Research Centre, Research Branch, Corporate Policy Indian and Northern Affairs, Canada, 1983), p.6.

²¹ ibid.

²² The Manitoban, August 5, 1871.

Archibald then went on to discuss the issue of reserves. He stressed that those same reserves would exist into perpetuity, but he also cautioned them against unrealistic expectations as to their extent:

Your Great Mother, therefore, will lay aside for you lots of land to be used by you and your children forever. She will not allow the white man to intrude upon these lots. She will make rules to keep them for you, so that as long as the sun shall shine, there shall be no Indian who has not a place he can call his home, where he can go and pitch his camp, or if he chooses, build his house and till his land. These reserves will be large enough, but you must not expect them to be larger than will be enough to give a farm to each family, where farms shall be required. They will enable you to earn a living should the chase fail, and should you choose to get your living by tilling, you must not expect to have included in your reserve more of hay grounds than will be reasonably sufficient for your purposes in case you adopt the habits of farmers.²³

Simpson spoke next and requested the Indians choose representatives in which they were confident, from each band, in order that the negotiations could proceed. In subsequent talks, the Portage Band was represented by Yellow Quill, "a Chief from the Portage."²⁴ The negotiations proceeded, but not without some difficulties. The government's proposal was for one hundred and sixty acres per family of five, or in that proportion, on land the various bands were to choose, plus an annuity of twelve dollars per family of five, or in that proportion per head. The Indian concept of a reserve however, did not coincide with the official government proposal. In a letter to Howe, dated July 29, 1871, Archibald describes the confusion:

When we met this morning, the Indians were invited to state their wishes as to the reserves, they were to say how much they thought would be sufficient, and whether they wished them all in one or in several places. In defining the limits of their reserves so far as we could see, they wished to have

²³ *ibid.*

²⁴ The Manitoban, August 12, 1871.

about two-thirds of the Province. We heard them out, and then told them it was quite clear that they had entirely misunderstood the meaning and intentions of the reserves. We explained the object of these in something like the language of the memorandum enclosed, and then told them that it was no use for them to entertain any such ideas, which were entirely out of the question.²⁵

The treaty talks proceeded well into the sixth day, August 2, but not all of the bands were yet ready to consent to the proposed terms. For a time, a settlement did not appear likely. Some of the Indians, led by Yellow Quill, threatened to leave:

But before closing the days proceedings, the Portage Chief and his followers left, formally bidding the Lieut. Governor and Commissioner good-bye. The other Indians were thinking of leaving, but Hon. Mr. McKay asked them to stay over one more night and meet the Commissioner again the next day, promising that in the interval he (McKay) would try and bring the Commissioner and Indians closer together.²⁶

James McKay, at the time, was a member of the Executive Council of Manitoba. He had been requested to take part in the treaty negotiations, as he was a "half-breed" who was well acquainted with the Indian Tribes and held some influence over them.²⁷ McKay managed to help mediate the dispute, and on the following day the Indians were prepared to sign the treaty. In return for their co-operation, Simpson offered them a one-time gift of three dollars per head, a pair of oxen for each reserve, and buggies for each of the Chiefs except Yellow Quill.²⁸

²⁵ Morris, op. cit., p.34.

²⁶ The Manitoban, August 12, 1871.

²⁷ Morris, op. cit., p.25.

²⁸ The Manitoban, August 12, 1871.

Treaty No.1 was formally signed by representatives of the Indians and government on August 3, 1871. In return for the cession of their lands, then covering the approximate area of Manitoba in 1871, the Indians were to receive, among other things, one hundred and sixty acres for each family of five, or in that proportion for larger and smaller families, and also an annual payment of three dollars per head.²⁹

1.4 THE REVISION OF TREATY NO.1

Problems with Treaty No.1 were evident soon after the accord had been reached. Within a short period of time, the Indians came forward with grievances. Their complaints regarded the granting of certain gifts, known as the 'outside promises', which had not been incorporated into the actual text of the treaty. These promises included gifts such as; dresses for each Chief and agricultural equipment for each band.³⁰ In a letter to the Secretary of State for the Provinces, dated February 24, 1873, Alexander Morris, by then Lieutenant Governor of Manitoba and the Territories, described the problems of the 'outside promises':

The proceedings were over but a short time before it became evident that there was some misunderstanding, and with the view of setting the matter at rest, as far as regarded one side His Excellency the then Lieutenant Governor, asked Mr. Commissioner Simpson, the Hon. James McKay and myself, as the persons knowing best the circumstances and details of the matter, to join with him in signing a list of articles which we severally and collectively understood to be the things promised to the Indians but not mentioned in the Treaty. Some little discussion took place about this, but it was eventually signed, and, I believe forwarded to Ottawa with the Treaty in October, 1871.³¹

²⁹ Morris, op. cit., p.315, see Appendix C for full text of Treaty No.1 and accompanying map.

³⁰ Canada, Sessional Papers (1873), No.23, pp.12-13.

The Portage Band was rather reluctant to accept their first annuity payment during the summer of 1872, owing to the dispute over the treaty promises. Eventually Morris persuaded them to accept payment and to wait until their problems could be dealt with by the government in Ottawa.³² Payment was accepted in 1873 as well, but as dissatisfaction with the treaty still existed, they let it be known that payment would not be accepted in the future unless the treaty were to be rearranged.³³

The Portage Band had an important grievance which outweighed any claims to the 'outside promises'. In 1871, during the sixth day of negotiations at Treaty No.1, the Portage Band, represented by Chief Yellow Quill, had threatened to leave. In order to gain their consent to the treaty, the Commissioner had given the Portage Band preferred status with respect to the size of their proposed reserve.³⁴ The key text of Treaty No.1, specifying the extent of the reserve was as follows:

And for the use of the Indians of whom Oo-za-wa-Kwun is Chief, so much land on the south and east side of the Assiniboine, about twenty miles above the Portage, as will furnish one hundred and sixty acres for each family of five, or in that proportion for larger or smaller families, reserving also a further tract enclosing said reserve, to comprise an equivalent to twenty five square miles of equal breadth, to be laid out round the reserve³⁵

³¹ *ibid.*, p.12.

³² *ibid.*

³³ Canada, Sessional Papers (1875), No.8 (Indian Agent Molyneaux St. John to Indian Commissioner Colonel J.A.Provencher, October 22,1873), p.59.

³⁴ Morris, *op. cit.*, p. 129.

³⁵ *ibid.*, p. 315.

The additional twenty-five square mile tract caused a great deal of misunderstanding between the two sides. Morris considered the Band's demands to be unreasonable:

The land to which they were entitled under the treaty was 34,000 acres, but their demands were excessive.³⁶

During this time, the Portage Band was experiencing internal problems. They were divided among themselves regarding the choice of a Chief. A number of the band had settled near the White Mud River, north of the Portage, and now claimed that they had not been adequately represented during negotiations for Treaty No.1. They demanded the right to their own Chief, their own lands on the border of Lake Manitoba, and refused to have anything to do with Yellow Quill's leadership.³⁷ Yellow Quill's leadership was also being challenged by Short Bear, who claimed to be the hereditary Chief of the Portage Band. Short Bear's grandfather, one of the signers of the Selkirk Treaty, had been the original Chief of the Portage Band. Upon the death of his father, Short Bear was too young to assume the band's leadership. In his place, the Hudson's Bay Company appointed Yellow Quill. By the mid 1870's, Short Bear had grown up and now returned to claim his inherited birthright. About half of the band followed his lead.³⁸

In June 1876, Lieutenant Governor Morris met the Portage Band with the intention of settling the reserve dispute. The Band had assembled in three separate camps and Morris addressed each group individually.

³⁶ *ibid.*, p. 129.

³⁷ Canada: Sessional Papers, loc. cit.

³⁸ Morris, *op. cit.* (Morris to the Minister of the Interior, August 2, 1875), p.135.

Initially, a conflict arose between the opposing groups over the proposed location of the reserve. Yellow Quill and his followers favored a united band, sharing one reserve. Short Bear's camp preferred a separate reserve, to be located at the Long Plain, an area they had previously farmed and built houses on. The White Mud River Band wished to be located at Big Point, north of the Portage, but were informed by Morris that this was not possible, as there were already settlers living in that area. Yellow Quill's demands proved to be the main stumbling block in obtaining a settlement, but his objections to separate reserves were eventually overcome and an agreement was reached.³⁹

Under terms of the revised Treaty No. 1, the Portage Band was split into three separate bands, each entitled to their own Chief and reserve. Yellow Quill's reserve, subject to band approval, was to be located in the region his band now inhabited, but not nearer than twenty miles to the Portage. Short Bear's reserve was to be located on the north side of the Assiniboine, in the vicinity of the Long Plain. The White Mud River Band appointed a new Chief, Na-wa-che-way-ka-pow, and their reserve was to be established in the area of the White Mud River, but not in areas already settled.⁴⁰ The extent of each reserve was to be in proportion to the relative numbers of each band:

it is hereby agreed that the separate reserves to be granted to the said three Bands, shall contain an amount of land equal to that stipulated to be given to the original Band, and such land shall be assigned to each Band in proportion to their relative numbers so that each Band shall receive their fair and just share of the said land.⁴¹

³⁹ Canada: Sessional Papers (1877), No.11 (Morris to the Minister of the Interior, July 8, 1876), pp. xxv-xxvii.

⁴⁰ *ibid.*, pp. xxviii-xxix.

In addition, it was further agreed in the treaty revision, that navigation and access rights were to be reserved to the Crown, in the case of a reserve embracing all or part of a river or lake.

The reserves for the respective bands were initially surveyed in 1876, however, they were never officially confirmed by Ottawa. The government was unable to recommend confirmation of the reserves, as outlined in the treaty revision, since some of the land selected, was already surveyed for settlement.⁴² In some cases the chosen land included that set aside for the Hudson's Bay Company. Under Article 5 of the Hudson's Bay Company Deed of Surrender 1869, the Company was entitled to one-twentieth of all lands in the fertile belt of the Northwest, on the condition that this land not be settled at the time their claim was made.⁴³ Section 17 of the Dominion Lands Act 1872, granted the Company an allotment of two full sections (8,26) in every fifth township and one and three-quarter sections (8,26) in all other townships.⁴⁴

In any event, the fact that the proposed locations of the reserves were situated on lands surveyed for settlement and Company lands was not the fault of the Portage Bands. The proposed reserve lands had not yet been surveyed for the use of new settlers at the time of Treaty No.1 in 1871, and the entire province was not actually surveyed until 1873.⁴⁵

⁴¹ *ibid.*, see Appendix D for the full text of the Treaty No.1 revision.

⁴² *ibid.*, p.vii.

⁴³ Alexander Begg, History of the North-West, Vol.II (Toronto: Hunter, Rose & Company, 1894), pp.iii-xi, Appendix 1.

⁴⁴ Canada, Statutes of Canada, 35th, Victoria, CAP XXIII.

⁴⁵ W.L. Morton, *op. cit.*, p.155.

Therefore, it was only due to government delays in establishing the reserves, that suitable lands, not surveyed, were no longer available.

By 1878, the Portage Bands had three reserves surveyed respectively however, they did not choose to settle on them without some dissent. The reserve of Short Bear's Band was established with an area of approximately 10,780 acres, on the north side of the Assiniboine River, in Township 9 and 10, Range 8 West. Hereafter, this Band will be referred to as the Long Plain Band. The Band was not content with it's state of affairs, regarding their reserve. They claimed that the government had not carried out the promises made in the treaty of 1871.⁴⁶ The White Mud River Indians were given a reserve on the west side of Lake Manitoba in Township 18, Range 9, West. The area of this reserve was approximately 12,000 acres. This Band will, from this point forward, be referred to as the Sandy Bay Band. The Sandy Bay Indians were relatively happy with their reserve and the way in which the treaty terms were being carried out.⁴⁷

Yellow Quill's reserve was located in Township 5, Range 11 West, close to Swan Lake, and comprised an area of nearly 11,200 acres. Henceforth, these Indians will be referred to as the Swan Lake Band. It is apparent that this Band was not satisfied with the extent or location of their reserve either, and refused to settle on it. They claimed that their reserve was to extend from the Assiniboine River on the north, to

⁴⁶ Canada, Sessional Papers (1879), No.7 (Indian Agent Francis Ogletree to Superintendent General of Indian Affairs, September 26, 1878), p.52.

⁴⁷ *ibid.*

the Pembina River (Swan Lake) on the south.⁴⁸ The Band was intent on remaining at Indian Gardens, an area around the northeast quarter of Section 11, Township 9, Range 9 West, just southeast of the Long Plain Reserve. They had planted garden crops on this land and insisted that this was the area in which they wanted their reserve established.⁴⁹ By 1890, only ten families were on the reserve at Swan Lake, while ten families remained at the gardens.⁵⁰ In 1901, there were 97 band members living on the Swan Lake Reserve.⁵¹

1.5 THE MANITOBA NATURAL RESOURCES TRANSFER AGREEMENT 1930

The Province of Manitoba was not party to Treaty No.1 in 1871, nor to the signing of later treaties however, it has now become an integral part of the outstanding treaty land entitlement settlement process. Upon entry into Confederation, Manitoba had not been granted outright ownership of its natural resources. Up until 1930, natural resources were exclusively under federal jurisdiction. In 1930, the Manitoba Natural Resources Transfer Agreement was concluded between the two levels of government, whereby ownership of all natural resources was transferred to the Provincial Crown. Traditionally, the federal government had been responsible for the availability of Crown land for the establishment of Indian reserves. Provision of land for this purpose, is included in Section 11 of the Agreement:

⁴⁸ *ibid.*

⁴⁹ Canada, Department of Indian Affairs, Annual Report 1882, pp. 33-34.

⁵⁰ Canada, Department of Indian Affairs, Annual Report 1891.

⁵¹ Canada, Department of Indian Affairs, Annual Report 1902, p.87.

All lands included in Indian reserves within the Province, including those selected and surveyed but not yet confirmed, as well as those confirmed, shall continue to be vested in the Crown and administered by the Government of Canada for the purposes of Canada, and the Province will from time to time, upon the request of the Superintendent General of Indian Affairs, set aside, out of the unoccupied Crown lands hereby transferred to its administration, such further areas as the said Superintendent General may, in agreement with the Minister of Mines and Natural Resources of the Province, select as necessary to enable Canada to fulfill its obligations under the treaties with the Indians of the Province, and such shall thereafter be administered by Canada in the same way in all respects as if they had never passed to the Province under the provisions hereof.⁵²

Section 12 of the Agreement defines land requested by the federal government, to include only that Crown land which had been unoccupied prior to the Agreement. Essentially, the Province has become responsible for the transfer of such land back to the federal government for the purposes of unfulfilled treaty obligations and is thus, part of the current treaty entitlement negotiation process.

1.6 THE MANITOBA TREATY LAND ENTITLEMENT COMMISSION

On September 15, 1982, the Government of Manitoba passed Order-in-Council No.1135, establishing the Treaty Land Entitlement Commission. Leon Mitchell, Q.C., was appointed Commissioner, undertaking the task of reporting on the basis of contemporary treaty land entitlement in Manitoba. The essential responsibilities of the Commission were as follows:

1. To invite, receive and record comments from interested individuals and organizations concerning principles that should be considered by the Government of Manitoba in formulating a fair and equitable policy regarding contemporary settlement of unfulfilled Treaty land en-

⁵² The British North America Act (1930), 21 Geo.V, C.26 (IMP.).

titlement; and

2. To review past and present policies adopted by other provincial governments in Canada in their efforts to settle unfulfilled Treaty land entitlement; and
3. To set out and comment on the views submitted by individuals and organizations and to comment about the policies and practices in other provincial jurisdictions; and
4. To formulate recommendations regarding those matters that must be settled between the representatives of the Bands, Canada and Manitoba for the purpose of achieving a contemporary settlement of unfulfilled Treaty land entitlement on a fair and equitable basis by means of an agreement in writing.⁵³

The fundamental responsibility of the Commission was to provide recommendations for the purpose of formulating provincial policy regarding methods of future settlement of outstanding treaty land entitlement. The Commission's authority did not extend to the area of actual determination of individual band claims. This function is solely a federal responsibility. The federal obligation includes a validation process which reviews claims of entitlement of each band and subsequently determines whether or not a claim qualifies. The Minister of Indian and Northern Affairs, the Hon. J.C. Munro, outlined the federal responsibility in a letter, to the Hon. J. Gary Lane, Saskatchewan Minister of Intergovernmental Affairs:

Validation of a claim and determination of what the outstanding federal obligation under the terms of a treaty is a federal responsibility.⁵⁴

⁵³ Leon Mitchell, Q.C., Report of the Treaty Land Entitlement Commission (January 18, 1983), p.7.

⁵⁴ *ibid.*, p.11.

Canada's obligations under the treaties, as they affect current land entitlement, include obligations to:

1. select, with the approval of the Band, the location of the land to be set aside as Indian reserve land, from the area of land ceded by the applicable Treaty,
2. provide reserve land of quality that would provide the Band membership with the opportunity to derive a living from it, ie., land which will enhance the socio-economic well being of membership,
3. provide the amount of land entitlement as stated in each prairie Treaty (ie. either 160 acres or 640 acres per family of five or in that proportion per member of a Band).⁵⁵

The Commission's Report, The Report of the Treaty Land Entitlement Commission, raised several potential problems in attaining these goals. The Province of Manitoba, as a party to the Natural Resources Transfer Agreement 1930, has become part of the treaty entitlement negotiation process since it must make available, Crown land, unoccupied prior to 1930, in order that valid land claims may be extinguished. A problem could arise should insufficient Crown land, both in quality and quantity, not be available in the specified treaty area. In this situation, the responsibility of supplying land would shift squarely onto the shoulders of the federal government. The provincial responsibility extends only so far as to provide sufficient land, unoccupied prior to 1930. Under these conditions the federal government may have no other option but to purchase the required additional lands.⁵⁶

⁵⁵ *ibid.*, p.51.

⁵⁶ *ibid.*, p.52.

Another problem arises due to the fact that the treaties do not indicate a specific date from which population figures are to be taken for the purpose of calculating per capita entitlement. A number of views are evident and the policy of the federal government has not represented a consensus on this issue. The Office of Specific Claims of the Department of Indian Affairs(O.S.C.),⁵⁷ with the support of the Justice Department, has suggested the most reasonable population date to base entitlement on, is probably no later than the the date of first survey of the reserves. This position directly contradicts historical governmentl policy, which has traditionally based entitlement on current population.

The views of the O.S.C. thus, have not actually corresponded to the principles of land entitlement settlement, espoused by either level of government. The treaties were never specific on the matter of population entitlement dates and the Commission found the position of the O.S.C. to be highly arbitrary, unfair and lacking a sound legal basis.⁵⁸ The principle of current population was adopted by the Land Entitlement Chiefs Committee. In the view of the Chiefs, current per capita entitlement should be based on treaty provisions of 32 acres (Treaties 1, 2, and 5) and 128 acres (Treaties 4, 6 and 10).⁵⁹

The policy for calculating land quantum, eventually recommended by the Commission, was the adoption of the 'Saskatchewan Formula'. The 'Saskatchewan Formula' refers to a 1977 agreement between the Federation of Saskatchewan Indians, the Province of Saskatchewan and the Canadian

⁵⁷ Formerly known as the Office of Native Claims (O.N.C.).

⁵⁸ *ibid.*, pp.69-72.

⁵⁹ *ibid.*, p.75.

Government, with respect to the means of fulfilling outstanding treaty land entitlement. The 'Saskatchewan Formula' essentially fixes the population date for land quantum calculations, at December 31, 1976. In Saskatchewan, the choice of this date was made strictly on the basis of current population principles at the time an agreement was reached. The Commission, on the other hand, made this recommendation as a compromise, hoping to achieve uniformity among various band claims, as opposed to the potential variability of the current population principle.⁶⁰

1.7 THE PORTAGE BANDS' CLAIM

In November 1982, twenty-six Manitoba Indian bands had issued claims of unfulfilled treaty land entitlement. Of these, twenty claims were officially validated in a letter to the respective Chiefs from the Hon. J.C. Munro.⁶¹ The claims of the Long Plain and Swan Lake Bands were among those validated at this time. By 1984, the claim of the Sandy Bay Band had been validated as well.

The basis of the Portage Bands unfulfilled entitlement is unique among claims made by other Manitoba bands. Under terms of Treaty No.1, the Portage Bands were to receive per capita land entitlement of thirty-two acres, plus an additional twenty-five square mile tract, to be laid out in equal breadth around the reserve. No other Manitoba band was granted a similar additional provision. The bands under Treaties 1, 2 and 5 had been promised thirty-two acres per capita, while bands representing Treaties 4, 6, and 10 were entitled to 128 acres per person.

⁶⁰ *ibid.*, p.2, Summary.

⁶¹ *ibid.*, pp.9-10.

The twenty-five square mile tract was a concession granted exclusively to the Portage Band.

The main point of contention between the Portage Bands and the federal government, regarding treaty entitlement, has always been based on marked differences in interpreting the size of the additional twenty-five square mile tract. During the negotiations for the revision of Treaty No.1, Morris continually insisted that the total area of the reserves was not to exceed 34,000 acres. He expressed the view that the Indians misunderstood the meaning of the reserve:

The enclosure around the homestead reserve led to extravagant claims by them. They did not understand its extent, and claimed nearly half of the Province of Manitoba under it.⁶²

In all likelihood, the Portage Indians did not fully comprehend the dimensions of the reserve they had been promised at Treaty No.1. They envisaged a much larger reserve, on both sides of the Assiniboine River. Evidence, earlier in this chapter, has shown that extra concessions were necessary to secure the Bands' approval to the treaty. Their claims for the larger reserve, on both sides of the river, were supported by James McKay, who had taken part in the treaty negotiations. Morris explains:

I spent two days with them, making no progress, as they claimed that a reserve thirty miles by twenty was promised them, as shown in the rough sketch enclosed, made at their dictation and marked "A". I produced the plan of the reserve, as proposed to be allotted to them, containing 34,000 acres, but Yellow Quill said it was not in the right place, and was not what was promised, and moreover it was not surrounded by the belt of five miles, mentioned in the treaty, but was only partially so, and did not cross the river. I told them they could get no more land than was promised in the treaty. They appealed to Mr. McKay whether the Reserve was not promised on both sides of the river, and he admitted that it was.⁶³

⁶² Morris, op. cit., p.129.

The revision of Treaty No.1. served only to cloud the issue, as the boundaries of the reserves were never confirmed and the Bands settled only reluctantly upon them. The reserve dispute has remained unsettled to the present day and the Portage Bands feel they have a sound case for entitlement based on historical evidence. The federal government has recognized this by validating their respective claims. The actual extent of the unfulfilled entitlement has yet to be determined and will have to be negotiated by the respective sides.

1.8 THE PROBLEM STATEMENT

The Manitoba Treaty Land Entitlement Commission, in the interests of uniformity, has recommended the adoption of the 'Saskatchewan Formula' as a means to implement land claim policy. Under this type of settlement formula, treaty land shortfalls are determined by multiplying the per capita entitlement of thirty-two acres (or 128 acres) by the respective bands' population, as of December 31, 1976, and then subtracting from this total, the number of acres previously received. The 'Saskatchewan Formula' effectively establishes band population at December 31, 1976 and entitlement will not grow beyond this point in time.

The choice of the Saskatchewan settlement date for the fulfillment of treaty land entitlement is not very relevant for Manitoba Indian bands. The Saskatchewan date reflects an agreement between the Federation of Saskatchewan Indians and the two levels of government. At the time of its inception in 1977, this settlement date was based on current population. Consequently, it has little relevance for Manitoba bands, who may

⁶³ *ibid.* (Morris to the Minister of the Interior, August 2, 1875), p.135.

also wish to base entitlement on current population at the time an agreement is reached. Aside from its arbitrary nature, this type of settlement policy ignores the fundamental problem of determining compensation on the basis of current or 'near current' population. Settlement of outstanding land entitlement, based on the principle of current population, only redresses future losses of Indian bands. Compensation of land received today, does not compensate past income and wealth lost, due to insufficient entitlement at the time of treaty. A comprehensive, compensation settlement should therefore, include a measure of income and wealth foregone, in addition to current population entitlement.

1.9 SCOPE, OBJECTIVES AND ORGANIZATION OF THE STUDY

The establishment of foregone income, from lands not received in a treaty, requires certain information. First of all, the specific area in question must be defined. This will establish location and resource quality and quantity. The historical landuse of the subject lands must also be documented. Two systems of landuse are necessary. One system will establish the historical use of lands actually received under the treaty. The second, documents the historical use of private lands in the shortfall area of the treaty. It is essential that both historic landuse patterns are known, since the income streams are likely to differ. The annual earnings associated with land in a particular use, for a given time, must be established. Historical interest rates at which the annual income stream will be compounded, are also required.

The focus of this thesis therefore, is to establish levels of compensation for the Portage Bands, based on a determination of income fore-

gone from lands in the treaty shortfall areas. Inasmuch as the shortfall lands are located in rural, agricultural regions of Manitoba, the foregone income is based on historical agricultural income. The past agricultural income stream will be determined from both, earnings originating from the current treaty lands, plus surrounding private lands in the shortfall areas.

The specific objectives of this study are stated as follows:

1. To provide evidence for the establishment of the legitimacy and the validity of the Portage Bands' Treaty No.1 land claim;
2. To calculate various reserve shortfalls with respect to a number of alternate treaty settlement scenarios;
3. To identify two distinct rates of agricultural development relating to typical and reserve management of lands in the calculated shortfall regions;
4. To establish a methodology whereby, incomes foregone from alienated treaty lands may be calculated;
5. To determine, given the above objectives, possible levels of compensation which would be available under the alternate treaty settlement schemes.

Chapter One of this thesis has discussed the historical background of the Portage Bands' claim. In this chapter, the validity of their claim was established. Chapter Two describes the basis and locations of the calculated treaty shortfall areas. In Chapter Three, various approaches to benefit valuation are considered. The basis and rationale for the analytical methods used in this thesis are discussed, along with an ex-

amination of the types of data required by this study. In the fourth chapter the results of the analysis are presented and discussed. At the end, the fifth chapter provides a summary of the study's chapters, examines potential shortcomings of the analysis and presents the study's final conclusions.

Chapter II

THE ESTABLISHMENT OF TREATY SHORTFALL AREAS

2.1 INTRODUCTION

The determination of agricultural income foregone from treaty lands not received by the Portage Bands, is calculated in this thesis on the basis of a monetary value per acre. The value of the total monetary compensation is therefore, dependent to a large extent on the magnitude of the calculated land shortfall. The larger the calculated shortfall, the greater will be the total monetary value of the proposed compensation settlement. For the purposes of this thesis, treaty land shortfalls are calculated for each of the three respective Portage Bands, based upon the revision of Treaty No.1 in 1876. According to the treaty revision, each band was entitled to its own reserve, the size of which was to be a function of per capita entitlement, plus a proportionate share of the twenty-five square mile tract. Establishing both the size and location of these shortfall areas is crucial, as it enables the subject lands upon which agricultural productivity calculations are based, to be identified.

The population base of the Portage Bands in 1876 is important when determining the land shortfalls. The total per capita entitlement of a particular band is calculated by multiplying the per capita entitlement of thirty-two acres by the 1876 population of that band. An accurate

population count of the Portage Band in 1876 is difficult to estimate. The best record of Indian populations for this time period is generally contained in government pay lists which were compiled annually when the various bands assembled to receive their treaty payments. The Treaty and Aboriginal Rights Research (T.A.R.R.) group has compiled some relevant population statistics from this source.¹ The figures for the Portage Bands' populations in 1876, take into account band members who may not have been paid in 1876, but were paid in arrears at a later date. The T.A.R.R. population figures are the basis for the per capita entitlement and shortfall calculations in this section.

Previous discussion in Chapter One has already revealed the conflict which arose over the interpretation of the twenty-five square mile tract. Lieutenant Governor Morris had reiterated his belief that the total area of the additional reserve tract was not to exceed 16,000 acres. The Portage Band, on the other hand, maintained that the twenty-five square mile belt enclosed a much larger area. For this reason, the twenty-five square mile tract will take on a dual interpretation. Under the first settlement scenario, the reserve tract is interpreted as being 16,000 acres (25 x 640 acres). The second settlement option recognizes the Portage Bands' historical understanding of a large surrounding buffer zone. The twenty-five square mile belt is now interpreted as twenty-five miles square or, 400,000 acres (25 x 25 x 640 acres).

¹ Roger Townshend, Treaty Land Entitlement for the Sandy Bay Indian Band Vol.I.(Winnipeg: T.A.R.R. Centre, 1982).

The reserve shortfalls are calculated in the alternate settlement proposals as the difference between the number of acres received in fulfillment of the per capita treaty entitlement (thirty-two acres), plus the Band's proportionate share of either twenty-five square miles or twenty-five miles square, minus the actual number of acres received by the bands. The proportionate share of the additional tract assigned to each band under the two treaty interpretations mentioned above, were based on the proportion of each band's population relative to the total Portage Band population of 635 in 1876. The actual number of acres received by the individual Portage Bands is difficult to establish with absolute certainty. It is evident that under Prime Minister Laurier's administration, during the period 1906-1911, various bands in agricultural areas of the prairies had been pressured to surrender for sale all or part of their reserves, to accommodate new settlers. As a result of this policy, the Long Plain Band lost thirty-five percent of its reserve, while the Swan Lake Band surrendered forty-three percent.²

The figures used in the shortfall calculations for actual land areas received by each of the Portage Bands, are those which have been agreed upon by the O.S.C. and the Land Entitlement Chiefs Committee. The calculated shortfalls were, in each case, hypothetically expanded around the respective reserves, establishing the land quality and location needed to identify agricultural productivities and rates of development. In the following sections, shortfalls for each band are calculated and their locations established.

² Mitchell, Report of the Treaty Land Entitlement Commission Appendix C - (Statement Regarding the Reasons for the Nonfulfillment of Treaty Land Entitlement 1871-1970), pp.7,8.

2.2 THE LONG PLAIN SHORTFALL

The Long Plain Reserve is located southwest of Portage la Prairie, on the north side of the Assiniboine River, in Township 10, Range 8W. According to the Canada Land Inventory (CLI) classification of the area, the agricultural capability of the resident soil is subject to moderate to severe limitations which may restrict the range of crops, and/or may require special conservation practices.³ The reserve area is composed almost entirely of Class 3 and Class 4 land, which limits productivity primarily through excess water due to low moisture holding capacity and poor drainage. Total entitlement and shortfalls are calculated for the Long Plain Band under both the twenty-five square miles and twenty-five miles square scenarios in the tables below.

As can be seen from Table 2.1, a shortfall of 7,164 acres, or approximately eleven sections, is indicated for the twenty-five square miles interpretation. The CLI soil capability of the shortfall area was determined by hypothetically expanding the boundaries of the existing reserve by eleven sections, in order to take in the surrounding crown and private lands. The shortfall area, thus determined, was found to contain land of a quality similar to that of the existing reserve lands.

The shortfall under the twenty-five miles square interpretation, is calculated as 139,599 acres, is shown in Table 2.2, and contains approximately 218 sections. The much larger shortfall area was considered to have soil capabilities similar to the shortfall area defined under the first settle-

³ See Appendix E for a detailed description of CLI soil capability classifications.

TABLE 2.1

The Long Plain Shortfall - Twenty-Five Square Miles

Population(1876).....	219
Total Per Capita Treaty Allotment(acres)... 219×32 (acres)=	7,008
Share of 25 Square Miles(acres)..... $16,000 \times 219/635$ =	5,518
Total Entitlement(acres).....	12,526
Area Received(acres).....	5,362
Shortfall(acres).....	7,164

ment alternative. The total per capita treaty allotment remains the same at 7,008 acres and therefore, the larger shortfall area corresponds directly to the new interpretation of the size of the additional twenty-five

TABLE 2.2

The Long Plain Shortfall - Twenty-Five Miles Square

Population(1876).....	219
Total Per Capita Treaty Allotment(acres).....	7,008
Share of 25 Miles Square(acres)..... $400,000 \times 219/635$ =	137,953
Total Entitlement(acres).....	144,961
Area Received(acres).....	5,362
Shortfall(acres).....	139,599

miles square tract.

2.3 THE SWAN LAKE SHORTFALL

The Swan Lake Reserve is situated on Swan Lake, southwest of Portage la Prairie, in Township 5, Range 11W. The soil capability of the reserve is classified predominantly as Class 3 and Class 4, which limits the range of its crops and may require the utilization of special conservation practices. The major reserve drawback, limiting agricultural productivity, is the existence of adverse topography and soil characteristics. Total entitlement and shortfalls for the Swan Lake Band are calculated under the alternate settlement proposals in subsequent tables below.

Under the twenty-five square miles settlement option, the Swan Lake Band's shortfall is calculated as 6,482 acres and is noted in Table 2.3. Expanding the the reserve acreage by 6,482 acres, or by approximately ten sections, encompasses surrounding private and crown land which is of

TABLE 2.3	
The Swan Lake Shortfall - Twenty-Five Square Miles	
Population(1876).....	201
Total Per Capita Treaty Allotment(acres)...	201 x 32(acres)=6,432
Share of 25 Square Miles(acres).....	16,000 x 201/635=5,065
Total Entitlement(acres).....	11,497
Area Received(acres).....	5,015
Shortfall(acres).....	6,482

somewhat superior quality to that of the reserve.

The twenty-five miles square alternative shortfall, shown in Table 2.4, is 128,031 acres or, 200 sections. Expanded around the existing reserve boundaries, this shortfall area includes a larger proportion of Class 2

TABLE 2.4	
The Swan Lake Shortfall - Twenty-Five Miles Square	
Population(1876).....	201
Total Per Capita Treaty Allotment(acres).....	6,432
Share of 25 Miles Square(acres).....	400,000 x 201/635=126,614
Total Entitlement(acres).....	133,046
Area Received(acres).....	5,015
Shortfall(acres).....	128,031

land and is thus considered to be more productive than the reserve lands.

2.4 THE SANDY BAY SHORTFALL

The Sandy Bay Reserve is found northwest of Portage la Prairie, on the west shore of Lake Manitoba, in Township 18, Range 9W. Except for an isolated area of Class 3 land in the centre of the reserve, the predominant land classification is a mixture of Classes 3, 4 and 5. The reserve subject area has limited agricultural cropping potential due to stoniness and excess water. For these reasons the area is generally better suited to livestock operations, although grains such as wheat may be grown. Shortfall and entitlement calculations for the Sandy Bay Band are found in Table 2.5 and Table 2.6 below.

In Table 2.5, a shortfall of 1,312 acres was determined for the twenty-five square miles scenario. The quality of land does not change

TABLE 2.5	
The Sandy Bay Shortfall - Twenty-Five Square Miles	
Population(1876).....	215
Total Per Capita Treaty Allotment(acres)...	$215 \times 32(\text{acres})=6,880$
Share of 25 Square Miles(acres).....	$16,000 \times 215/635=5,417$
Total Entitlement(acres).....	12,297
Area Received(acres).....	10,985
Shortfall(acres).....	1,312

appreciably when this shortfall is expanded around reserve boundaries.

Entitlement and shortfalls under the twenty-five miles square settlement option are represented in Table 2.6. A shortfall of 131,328 acres is indicated in this case, a one hundred fold increase over the first settlement alternative. Once again, the magnitude of the shortfall area is directly related to treaty interpretation. Expansion of this 131,328 acre shortfall around the present day reserve results in a marginal improvement in the agricultural quality of the land, with some Class 2 and Class 3 land now included.

TABLE 2.6

The Sandy Bay Shortfall - Twenty-Five Miles Square

Population(1876).....	215
Total Per Capita Treaty Allotment(acres).....	6,880
Share of 25 Miles Square(acres).....	400,000 x 215/635=135,433
Total Entitlement(acres).....	142,313
Area Received(acres).....	10,985
Shortfall(acres).....	131,328

2.5 CURRENT POPULATION BASED SHORTFALLS

Land entitlement based on current population is also considered a possible alternative for the settlement of the Portage Bands' outstanding treaty land claim. Under this settlement option, entitlement is calculated by multiplying current population numbers by the per capita treaty entitlement of thirty-two acres. Shortfalls are then determined as the difference between the total area received by the bands and the current population entitlement. Compensation would thus, be determined based on the current value of lands located within the respective shortfall areas. The most recent population figures available, were for 1982.⁴ The shortfall areas for the three respective bands are calculated in Table 2.7.

⁴ Canada, Indian and Northern Affairs, Registered Indian Population by Age, Sex and Residence for Bands, 1982.

TABLE 2.7

Estimated Current Population Shortfalls

BAND	POPULATION	TREATY ALLOTMENT (acres)	TOTAL ENTITLEMENT (acres)	AREA RECEIVED (acres)	SHORT FALL (acres)

Long Plain Band	1,183	32	37,856	5,362	32,494
Swan Lake Band	613	32	19,616	5,015	14,601
Sandy Bay Band	2,103	32	67,296	10,985	56,311

From Table 2.7, it is evident that under a current population settlement, the Sandy Bay Band has certain advantages as to the size of their shortfall when compared to the other two bands. Under this settlement alternative, the Sandy Bay shortfall was significantly larger than either of the other Portage bands. This is entirely attributable to the large growth in the Sandy Bay population. In 1982, the population of the band was 2,103, nearly twice that of the Long Plain Band and more than three times the population of the Swan Lake Band. Consequently, the Sandy Bay Band would be better off under this treaty settlement alternative relative to its sister bands.

Chapter III

THE DETERMINATION OF MONETARY COMPENSATION

3.1 INTRODUCTION

The determination of an appropriate settlement of the Portage Bands' land claim includes compensation for both past income losses, as well as full current entitlement of treaty lands. The federal and provincial levels of government are prepared to deal with the issue of determining compensation for outstanding treaty land entitlement. However, what constitutes the eventual compensation agreement will undoubtedly be a contentious issue.

Compensation may be interpreted in different ways. One acceptable interpretation defines compensation as: 'something that constitutes an equivalent or recompense, such as something that makes up for a loss'.¹ If the recommendations of the Manitoba Treaty Land Entitlement Commission, were followed, compensation for Manitoba Treaty land claims would depend solely on per capita entitlement, based on the 'Saskatchewan Formula' population cut-off date of December 31, 1976. This type of settlement policy disregards any past income losses that the Portage Bands have experienced as a result of treaty land shortfalls.

¹ Webster's Third New International Dictionary (Springfield, Massachusetts:G.& C.Merriam Company,1981).

The federal government's criteria governing the determination of compensation for specific claims appears to make provision for such income losses from shortfall areas:

Compensation may include an amount based on the loss of use of the lands in question, where it can be established that the claimants did in fact suffer such a loss. In every case the loss shall be the net loss.²

The previous chapters have already established that the Portage Bands have a valid land claim. The focus of Chapter Three establishes that an income loss has been incurred by the Portage Bands in the treaty shortfall area.

A means of determining past income was fully developed in this chapter whereby annual net income, per acre of land, was compounded over a predetermined period of time, establishing a total monetary value of foregone income per acre. This foregone income stream was based on the productivity and rate of development of lands in the area of both the particular reserves, and the surrounding privately owned lands. Differing rates of agricultural improvement and productivity between the reserves and private lands will have implications for determining the appropriate income stream. It will be shown that the two rates of development vary substantially.

Current land values of the subject area must also be determined. The inclusion of these values is important if the Portage Bands are to benefit from future agricultural returns to the land. The compounded value of the income stream plus the current land values represent the total

² Canada, Department of Indian Affairs and Northern Development, Outstanding Business: A Native Claims Policy - Specific Claims (Ottawa, 1982), p.31.

compensation settlement.

For the sake of comparison, compensation is also based on the current population principle. Under this particular scenario, the total compensation is simply the current value of unimproved land times the number of acres in the calculated current population shortfall.

The sequence of this chapter first of all discusses a number of alternate approaches to benefit valuation. Thereafter, the method of analysis employed by this thesis will be described. Further, the agricultural productivities of the subject shortfall areas will be identified, along with the two specified rates of development. One rate follows the progress of typical management on farms in municipalities surrounding the reserves, while the second rate is one which reflects the developments which have been carried out upon the individual reserves themselves. In the final section, supporting data is provided.

3.2 ALTERNATE APPROACHES TO BENEFIT VALUATION

The determination of compensation for the Portage Band's land claim is based upon the value of income losses which have occurred in the past, as a result of the Portage Bands not having ownership over lands not received under the terms of Treaty No.1. Compensation for past income losses, or benefits foregone from these lands, may be justified if it is accepted in principle, that the use of these lands by others in the past, has precluded their use for the benefit of the Portage Bands. The following sections discuss various approaches to benefit valuation.

3.2.1 The Benefit-Cost Analysis Approach

The concept of valuating benefits from land is well established in benefit-cost analysis, especially in the area of resource and land development. In its most common role, benefit-cost analysis is an accepted method of evaluating the relative merits of competing public investment decisions. By imputing values to the relevant social costs and benefits of various projects, in terms of dollars and cents, benefit-cost analysis provides a comparison of alternate projects in a manner similar to the way in which firms evaluate the feasibility of various investment decisions, after examining the expected revenue-cost stream over the life of the project.³

While benefit-cost analysis is very useful in imputing values to unknown social costs and benefits, it may also be utilized effectively where dollar values are known. The role of benefit-cost analysis in valuating agricultural benefits from land is in evidence where decisions must be made whether to proceed with publicly funded projects, such as irrigation developments and land reclamation through drainage.⁴ Evaluating the merits of such projects must account for the future discounted value of benefits over some predetermined time frame. These discounted benefits are then weighed against a stream of future discounted building and maintenance costs. Projects are usually selected where the net present value of costs and benefits are maximized. In general, the

³ Canada, Planning Branch, Treasury Board Secretariat, Benefit-Cost Analysis Guide (Ottawa:Minister of Supply and Services Canada, 1983), pp.3,4.

⁴ A.R.Prest and R.Turvey, "Cost-Benefit Analysis: A Survey", The Economic Journal, Vol.75.(December 1965), 706-708.

project investment decision criteria may be expressed equally, where either:

1. The present value of benefits exceed the present value of costs or,
2. The ratio of the present value of benefits(numerator) to the present costs(denominator) exceeds unity.⁵

For example, the primary benefit of irrigation projects is the availability of a reliable source of water for agricultural production. However, often it is difficult to estimate and predict the future price of irrigated water. An alternate means of evaluation, in this case, is to measure the direct benefits that will be realized once the project has been completed. Direct benefits include changes in agricultural output as a result of improved moisture in the irrigated area. Estimation of output changes requires that both prior and post irrigation levels of agricultural production be known. Production, prior to irrigation, may be determined by simply observing past records of crop yields, prices and the levels of improved and unimproved land in the affected area. Calculating future agricultural output is slightly more complicated since it is necessary not only to determine the improved yields, but also to forecast price changes and the rate of development of production on the newly irrigated lands. Farmer response to the completed irrigation project is not always immediate, and thus a lag in the output change may be expected. These difficulties aside, it is apparent that the change in agricultural output may be viewed as a direct benefit of irrigation and, as such, valuated for the purpose of project selection.

⁵ *ibid.*, p.703.

3.2.2 The Income Appraisal Approach

Benefit valuation has also been used extensively in the appraisal of farmland. One farm appraisal approach, the income approach, assumes a relationship exists between the income a farm property is capable of producing and its market value.⁶ Utilizing this approach, it is possible to derive a value for land based on its net operating income:

$$V_0 = \sum_{j=1}^n \frac{NI_j}{(1+i)^j} \quad (3.1)$$

Where:

V_0 - the appraised value of the land.

NI - estimate of annual net income to the land.

i - the market rate of interest.

n - the number of years between the present and when future income is received.

j - the year in which income is received.

Assuming that the income stream of the property continues forever into the future, the appraisal value may be estimated by the following standard formula:

$$V_0 = \frac{NI}{i} \quad (3.2)$$

The interest rate, also known as a discount rate, is a rate of return considered essential for weighting future income levels in terms of current values. Manipulation of the above formula defines this rate of re-

⁶ Ralph W. Ashmead, Advice On Methods and Techniques for Evaluating Alternatives: Appraisal Techniques (A Joint Project of The Expert Committee on Farm Management Services, Canada Committee on Socio-Economic Services and Agriculture Canada, 1983), p.20.

turn simply as the ratio of net operating income to market value:

$$i = \frac{NI}{Vo} \quad (3.3)$$

Appropriate discount rates are usually calculated by comparing market values and net operating incomes from similar properties in the area of the subject property. However, these rates should be used with caution. Property values have been found to be very sensitive to changes in the discount rate. Minimal errors in the rate can result in large fluctuations in the estimated value of a property.⁷

Establishing the net operating income of farm properties is a necessary step in determining value. Calculations of net operating income are expressed in terms of gross crop receipts less variable and fixed expenses. Typically, these expenses include all those necessary to maintain the income flow of a property with the exception of requirements to service a debt on the property.⁸

Three basic methods are used in obtaining net income estimates for land and buildings in the income appraisal process. These methods are based on on three different types of farm operations; the cash rental; the crop share rental; and the owner-operator farm type.⁹

⁷ *ibid.*, p.25.

⁸ *ibid.*, p.22.

⁹ William G. Murray and others, Farm Appraisal and Valuation, (6th ed.; Ames Iowa: The Iowa State University Press, 1983), pp.101-111.

Net operating income is easiest to estimate under a cash rental operation, as revenue is expressed simply in terms of a per acre cash return plus rental on buildings. In a cash rental lease, the tenant is usually only responsible for the variable expenses involved in the grain and/or livestock operation. Therefore, expenses, in the landlord's net operating income calculations, are solely of the fixed variety; i.e. property taxes, insurance, maintenance and management.

Calculating net operating income under a crop-share rental type of operation is slightly more complicated. In past decades, landlords assumed costs of the fixed variety, similar to arrangements worked out under a cash rental system. In more recent times however, landowners are expected to contribute their share of the variable costs, in addition to the fixed costs previously mentioned. Revenues are based on a percentage share of crop receipts, depending on the terms of the leasing arrangement (e.g. one-third or one-half crop shares to the landlord).

Owner-operator farm properties are often more difficult to appraise than rental based operations. Revenue statements include all gross income from land and livestock while expenses include all variable and fixed costs except mortgage payments on land. Therefore, a greater number of calculations and estimates are required to determine the net operating income. The appraisal procedure is somewhat further complicated by estimates of additional variable expenses such as unpaid labor and returns to management. Omitting these factors will result in valuations which reflect not only the residual return to land and buildings, but a return to labor and management as well.

3.2.3 Land Claim Settlements in the United States

The method of determining income and wealth foregone has been utilized in the United States to settle Indian claims for lands west of the Mississippi River. One such appraisal of the Sioux cession in Iowa and Minnesota, establishes a fair market value for the land in question at the time of the treaty signing.¹⁰

Three basic approaches are available for establishing fair market values when carrying out a land appraisal; the market data, income and cost approaches, respectively. The market data approach analyzes sales of similar properties in order to estimate the most likely sales price of the property being appraised. The income approach uses estimates of expected annual net income to derive a value estimate of a specific property. Either expected future, or past income may be discounted to establish a present value estimate through the process of capitalization. The third type of land appraisal is the cost approach. The value of a subject property is determined by estimating the contributory value of improvements and then adding the value of unimproved land which has been estimated by a study of similar market sales. This approach is useful when appraising properties with buildings and other improvements.¹¹

¹⁰ William G. Murray, Appraisal of Sioux Cession In Iowa and Minnesota-Royce Area 153- In 1931, Docket 359 Before The Indian Claims Commission, U.S. Department of Justice, 1964.

¹¹ William G. Murray and others, Farm Appraisal and Valuation pp.17-20.

The Murray Appraisal of the Sioux lands made use of the market data approach. The income approach was ruled out since the subject lands were not, at the time of cession in 1831, earning an income which could be used in the appraisal. The cost approach was also found to be inappropriate as there were practically no buildings or improvements from which a cost could be computed.

Once a fair market value for the lands in question has been established, the amount of income it could have earned between the treaty date and today is calculated. For example, had these market value funds been available as investment capital, they could have earned additional income in securities such as bonds, or alternately, through simple savings bank interest. This sum of money is then added to the current fair market value of the land. The combined package of the current market value of land and the compounded sum representing the past income stream, represents the total settlement.

3.2.4 The Determination of Foregone Income

Discussion of native land claim settlements in Manitoba to date has generally dealt with the fulfillment of outstanding land quantum entitlement as specified in the relevant treaties. The issue of basing compensation on incomes foregone from lands not included in a treaty settlement has often been overlooked. The recommendations of the Manitoba Treaty Land Entitlement Commission favored the adoption of the 'Saskatchewan Formula' which precludes this type of compensation basis. The 'formula' essentially only offers compensation in the form of current market values for the specific lands in question, or alternatively, sur-

rounding lands of similar quality. No mention or provision is made in this formula for income losses which have occurred historically due to the alienation of those said lands. From the standpoint of formulating a comprehensive compensation package recognizing these past income losses, the 'Saskatchewan Formula' falls short as an acceptable alternative for the Portage Bands.

The actual determination of foregone incomes from lands not included in treaty covenants can be considered a lost benefit. Given a scenario whereby the Portage Bands were in control of all lands specified as theirs under the terms of Treaty No.1, a certain level of agricultural income could reasonably have been expected to be derived during a period of time between the treaty date and the present. As a result of their alienation from the treaty shortfall areas, the Portage Bands have been ultimately deprived of a potential source of earnings.

How then, should the issue of calculating foregone incomes and wealth be approached? The alternatives for valuating benefits, discussed earlier in this chapter, were found to be deficient for a number of reasons. The benefit-cost methodology measures benefits by placing a value on their future use. This is not practical when appraising levels of foregone income. The measurement of foregone incomes is actually a view of what has occurred in the past. Benefit-cost analysis on the other hand, is a view of production events on a future, distant time horizon. It evaluates those net benefits likely to accrue in the future and consequently, cannot be considered for the purposes of this thesis.

The Murray method, although used to settle Indian claims in the American midwest, was also found to be inappropriate in the context of Manitoba treaty land entitlement. When treaty lands were negotiated in the American midwest, a rural real estate market existed for the new land being settled.¹² In Manitoba however, only a very limited real estate market existed within lands settled prior to The Dominion Lands Act, 1872. Up until the Hudson's Bay Company land transfer in 1869, the Red River Settlement existed under a very primitive land tenure system. Some lots were sold in fee simple with 999 year leases. Quite often records of land sales were not kept by the local Hudson's Bay Company outpost. In the outlying areas, inhabited mainly by Indians and "half-breeds", squatters rights generally prevailed and the Hudson's Bay Company did not interfere.¹³ Prior to 1873, the new Province of Manitoba had not yet been entirely surveyed and in most cases, any new settlements were merely extensions of the river front system.¹⁴ The limited real estate market for lands in the Red River Settlement would not be valid in establishing prices for lands included or not included within Treaty No.1, in 1871. Therefore, the method of determining income and wealth foregone, which establishes a fair market value at the time of treaty, is not applicable.

A fair market value for the treaty shortfall lands could not be established at the time of cession. Consequently, a feasible alternative method of determining the lost benefits of the Portage Bands bases the

¹² Murray, Appraisal of Sioux Cession In Iowa and Minnesota - Royce Area 153 - 1831, op. cit., pp.25-33.

¹³ Arthur S. Morton, History of Prairie Settlement, op. cit., p.42.

¹⁴ W.L.Morton, op. cit., pp.155,165.

foregone income stream upon the historical productivity of the lands in question. This methodology is similar in approach to the income appraisal method. Yearly foregone income from the treaty lands are first of all established, and then compounded annually at some appropriate interest rate during a period between the treaty date and the present. As in the first method, this sum of money is added to the current market values of lands not received, to arrive at a total settlement.

3.3 METHOD OF ANALYSIS

The determination of total monetary compensation for lands not received under Treaty No.1. has previously been described in terms of two components. The first component is based upon a determination of agricultural income foregone per representative acre, over a period of 103 years from 1881-1983.¹⁵ This foregone income, or rent, reflects the past returns of the land and is a function of the historical agricultural productivity of the proposed reserve land shortfall. Past agricultural income is included as a measure of the monetary compensation, since the unfulfilled treaty entitlement has deprived the Portage Bands of a potential income that could have otherwise been realized had the Band been in possession of the land.

The second component, which is to be discussed more fully in a later section, takes into account the current prices of land in the shortfall areas. These current land values are a reflection of the expected future returns to land, and as such are included, since at the very least,

¹⁵ The rationale for the period of the study is discussed in the following section.

the Portage Bands should be compensated for an amount of land equal to that of the calculated shortfall in the unfulfilled treaty entitlement. Provided with compensation funds equivalent to that of the current market value of the shortfall lands, the Portage Bands would have the financial capability of buying back alienated treaty lands and thus, benefit from future expected income. The sum of these two components results in a dollar figure for compensation per representative acre.

3.3.1 Assumptions

Levels of foregone income were estimated, based on lands contained within the relevant treaty shortfall areas. Several assumptions were necessary in order to establish these levels.

First of all, the procedure assumed the Portage Bands were in possession and control of all lands promised under Treaty No.1. These lands were privately and/or publicly held in the past and provided their owners with an income. Under the control of the Portage Bands, those lands would also have contributed to their income.

The assumption of control is important, as it implies the bands were able to determine their own rate of development upon the reserves. In addition, the magnitude of foregone incomes calculated by this study, assumes a certain degree of freedom to allow the bands to negotiate the terms of their leases. In actual fact, this may not have been the case. Reserve developments in the past were constrained by government regulations. Leasing reserve land, for example, would only have been possible with official government approval. Through the issue of Location Tick-

ets, it had been the policy of the Department of Indian Affairs to vest in individual natives, recognized ownership of individual pieces of property and these owners were in many cases permitted to lease their lands to neighboring settlers.¹⁶

This study also assumed that potential foregone earnings by the Portage Bands would have been based on agricultural utilization of the reserve shortfall lands. It is recognized that the Portage Indians may have pursued other activities, such as hunting, trapping or fishing in the shortfall area. Under these conditions, the determination of compensation based on foregone income will have been somewhat more broadly based. The focus of this thesis however, is concerned primarily with the measurement of agricultural benefits foregone. For this reason, the other potential income accruing activities were not included.

The assumption of a crop-share lease arrangement was adopted for calculating annual crop revenues accruing to the Portage Bands. In an historical context, rental earnings in general, are preferable indicators of land-related income versus total farm income less non land-related expenditures. It is often a difficult, if not an impossible task to accurately estimate the various costs of farming during the early years of pioneer settlement in rural Manitoba. Yield and price information from this time period are more readily available compared to information pertaining to the costs of early prairie farming. Therefore, it was assumed that the Portage Bands' shortfall lands were leased and revenue was determined on the basis of a crop-share arrangement.

¹⁶ Canada, Department of Indian Affairs, Annual Report (1936), p.23.

The underlying assumption of the study, ties the rate of native development explicitly to rates of development which have been observed upon the respective Portage reserves. While these rates adequately demonstrate actual reserve patterns of development, they do not account for differences in soil qualities which could exist between Indian held properties and neighboring farms. It is quite evident that reserve lands chosen for the bands, were not strictly suited to farming pursuits. This was particularly evident in the case of the Sandy Bay Reserve. Had the Portage Bands received lands of superior soil productivity, their development path would have perhaps more closely resembled that of neighboring farmers.

The fundamental issue is whether or not land quality is a determining factor with respect to the rate of reserve improvements. Unfortunately, data to test this hypothesis is not readily available. Given these data limitations, the rate of native development was calculated in this study, without regard to the factor of soil quality upon the reserves.

The choice of time frame (1881-1983), for calculating the annual income losses, was made for several reasons. Although the date of the Treaty No. 1. settlement is 1871, there does not appear to be a significant amount of agricultural activity being carried out in the treaty shortfall areas prior to the 1880's. As late as 1870, the possibility of growing cereals on the prairies more than two miles back from the Red and Assiniboine Rivers, had not yet been attempted. By the early 1870's, the total amount of land under cultivation was minimal and there was not yet a market to supply, except that of the home market, and perhaps to fulfill the needs of the Hudson's Bay Company. Consequently, there was

little incentive on the part of early Manitoba farmers to increase their levels of production. In fact, it was only in 1876 that the very first export shipment of wheat left Winnipeg, bound for Toronto, and that consisted merely of 857 bushels of Red Fife which was to be used for seed.¹⁷

Manitoba wheat production and exports became more significant once the Canadian Pacific Railway line between Winnipeg and the Lakehead had been completed. The very first shipment of grain, via the new CPR line, left Winnipeg in the fall of 1883.¹⁸ The period of productivity analysis in this study therefore commences in the year 1881, since this year represents a realistic point in time when agricultural production may have been initiated upon the shortfall lands, and also importantly, statistical data relating to Manitoba historical agricultural development and production were available beginning in 1881.

3.3.2 The Foregone Rent Model

The model employed by this study estimated the annual income losses suffered by the Portage Bands. These losses were incurred as a result of their alienation from the said treaty shortfall lands. Incomes foregone consisted of potential crop and pasture revenues, as well as the costs of developing this land over time. The equation describing the net loss is defined below:

¹⁷ A.H.Reginald Buller, Essays On Wheat, (New York: The MacMillan Company, 1919), p.30.

¹⁸ C.F.Wilson, A Century of Canadian Grain: Government Policy to 1951, (Saskatoon:Western Producer Prairie Books, 1978), p.14.

A

B

$$R_i = \frac{1}{3} [I_i * P_i * \{A_{Y_i} * (1 - F_i)\}] + [(1 - I_i) * (AU * G_i)] - [(I_i - I_{i-3}) * P_i * \{A_{Y_i} * (1 - F_i)\}] \quad (3.4)$$

C

Where:

- R_i - the net rents foregone in year i (\$/acre).
- I_i - the share of land in crop production in year i.
- P_i - the price of wheat in year i (\$/bushel).
- A_{Y_i} - the average yield of wheat in year i (bushels).
- F_i - the share of land in summerfallow in year i.
- AU - the carrying capacity of pasture land in animal unit months.
- G_i - the grazing rental rates for cattle in year i (\$/AUM).
- I_{i-3} - the share of land in crop production three years prior to year i.

The rent calculation portrayed above is essentially a financial accounting of annual net income accruing to a representative acre within the various treaty shortfall lands. The first part (A) of the equation encompasses those monies which could have been earned through wheat production. Wheat was chosen for the analysis since it is a representative crop of the area and also for the purposes of simplifying the model. This portion of the net rent is calculated simply as the revenue available through wheat production, reduced proportionately by the share of the total area presently under cultivation. Average wheat yields must also be adjusted since not all cultivated land produces a crop in a given year. A portion of all improved lands are summerfallowed in every

year and consequently, do not contribute to that year's rent calculation.

Recalling the assumption of a crop-share, owner-tenant rental arrangement for the disputed lands, only one third of the total crop revenue is available to the Portage Bands as landholders. The remaining two-thirds of the crop revenue are assumed to belong to the tenant.

Revenues from unimproved or pasture grazing areas were also considered available to the bands. Lands in the treaty shortfall areas not currently capable of crop production, were considered to be unimproved and as such, only capable of sustaining pasture forage crops. Pasture grazing rents (B) are determined by multiplying the carrying capacity (AUM) of the specific land in question, by the current grazing rate (\$/AUM). Summation with the crop revenue component establishes, a figure for total agricultural revenue.

Developing agricultural land over the years would have entailed a cost to the Portage Bands. These costs must also be included in the calculation of annual income losses. Assuming that the appropriate lands had been granted to the Portage Bands by 1876, it is most probable that these lands would have been received by the respective bands in an unimproved state. Discussion earlier noted that very little land in Manitoba was under cultivation during the 1870's. The main thrust of immigration and agricultural production did not occur until the 1880's. Therefore, it is highly unlikely that any of the specified reserve lands received in 1876 will have been in an improved state.

In the analysis, the treaty shortfall areas of the respective Portage Bands were gradually converted to improved land over the period of the study. The rate at which these lands were converted depends upon the type of ownership assumed. In this thesis, two levels of development are assumed. The first would be comparable to the type of development carried out by settlers in the treaty shortfall areas. The other management level is based upon that rate of development which has actually taken place on the various Portage reserves between the treaty date and the present. These levels of development will be discussed in greater detail in a later section.

In any event, costs were naturally incurred during the process of converting land from an unimproved to an improved state. These costs include the costs of cleaning, picking rocks and roots plus the actual breaking of the land. The physical breaking of the land was until more recent times, very labor intensive and time consuming. From a historical perspective it becomes difficult to quantify the amount, or value of, labor required to improve the land. For this reason, development costs in this analysis are related to the crop revenues received from recent improvements. The costs of development (C), in a given year, have been set at a value equivalent to the crop revenue received from lands which have been improved during the past three years.¹⁹ Consequently, the magnitude of the costs in a given year, vary and are a function of the amount of land cleared over the past three years.

¹⁹ The author was unable to provide documentation for this type of cost structure other than historical tradition which stipulated the costs of breaking land to be the first three crops from that land.

3.3.3 The Current Value of Foregone Rents

In the thesis model, foregone incomes were established whereby net revenues attributed to land in any year between 1881-1983 equalled the total rent minus any costs incurred to clear the land. The rental income was related to a crop-share lease arrangement on the cultivated land and grazing fees for the unimproved land. Summing these individual, annual foregone rental incomes only captures part of the total income lost due to the shortfall in treaty land entitlement. Had these annual receipts been available to the bands over the years, they could conceivably have been entrusted in an appropriate investment fund. Therefore, interest foregone on these monies should also be established. The role of interest rates in compounding the foregone income stream is indicated in equation form below:

$$RC_i = B_i(RC_{i-1}) + RC_{i-1} + R_i \quad (3.5)$$

Where:

RC_i - the value of compounded accumulated rents foregone per acre, in year i (\$/acre).

B_i - the rate of return on long term Canada Bonds in year i .

RC_{i-1} - the value of compounded accumulated rents foregone in all years previous to year i (\$/acre).

R_i - The value of rents foregone in year i (\$/acre).

Rates of interest utilized by this study were those of long term Canada Bonds. These rates were applied to the accumulation of all past years' rents in every year. For example, consider the first few years of the proposed investment scheme above. In year one, foregone income

was earned and placed in a relatively safe investment such as long term Canada Bonds. No interest was earned until the second year. At that time, the current interest rate was applied to the first year's income and this total then added to the current income earned in the second year. In the third year, interest was applied to the accumulated income of the previous two years and summed with the income earned in the present year. The fund effectively rolls over each year, based on the rate of interest and the amount of new income received. This procedure was carried out in each succeeding year over the entire period of the study, establishing at the end, a total current value of income foregone.

Simple addition of yearly income, without interest, would not be considered a viable alternative for establishing the value of past income losses. Basic summation without interest, ignores not only lost investment opportunities, but also does not convert past incomes losses into current values. For example, a dollar earned in 1881 obviously does not have the same purchasing power as one earned in 1983. Thus, calculating the value of foregone income, with interest, is likely more representative of current value, along with exhibiting acceptable rates of return on investments.

3.3.4 Estimating Current Land Values

The availability of current land values is essential for calculating the Portage Bands' total compensation settlement. While the previous equation (3.3) established past income losses from the treaty shortfall areas, current appraisal values of these lands represent estimates of the value of their future returns. In order for the Portage Bands to

benefit from these future returns, the calculated compensation settlement also includes the amount of funds required to restore alienated lands back to the bands. Total compensation will equal the combined estimates of past and future incomes.

Determining market values for lands within the specified shortfall boundaries was complicated in part, due to the large area in question and the diverse characteristics of those lands. An individual appraisal of the value of each parcel of land within the total subject area was obviously beyond the scope and time constraints of the study. One possible alternative considered, establishes current market value based on the comparative sales approach. This appraisal approach estimates value through comparison of similar properties within the vicinity of the subject acreage. Unfortunately, very few parcels of land within the treaty shortfall areas actually exchanged hands in the two year period prior to 1983. Only comparative market sales data of bare land were considered relevant. This was necessary since that is the state in which land would have been received at the time of treaty. Land sales containing residential, commercial or farm buildings, and transactions between family members were not considered applicable. As a result, very few bona fide sales were available for comparison and thus, another approach was required.

Assessment-sales ratios are often good indicators of market value. These ratios are generally utilized to provide information on the uniformity of property tax assessments within a particular municipality or area. Dividing the assessed value by the sales price of a property establishes the ratio:

$$A/S = \frac{\text{Assessed Value}}{\text{Actual Sales Value}} \quad (3.6)$$

The clustering of individual ratios around an average indicates that assessments are fairly uniform. A wide variance of ratios usually suggests that improvements in assessment are necessary.²⁰

Assessment-sales ratios were employed in this study to estimate current market values within the various treaty shortfall lands. Since information on assessment-sales ratios and property assessment values are readily available, it was possible to determine the third variable, actual sales value, by simple manipulation of (3.5):

$$\text{Actual Sales Value} = \frac{\text{Assessed Value}}{A/S} \quad (3.7)$$

A representative sample of property assessment values was available from municipal tax assessment rolls. Value assessments included, were once again those composed only of bare land. Dividing the total assessed value of all lands analyzed, by the total number of acres contained in the representative assessments results in an average assessed value per acre in the specified shortfall areas. Representative A/S ratios were available from comparative market sales data of specific municipalities included in the three shortfall areas. The average sales value of a representative acre from one of the treaty shortfall regions was calculated by dividing the average assessed value by the appropriate A/S ratio.

²⁰ William G. Murray and others, Farm Appraisal and Valuation, pp.269-271.

3.3.5 Compensation Based on Current Population

In the interests of demonstrating a comparison to another settlement alternative, treaty entitlement compensation was also based on the principle of current population. Relying on the type of settlement agreement manifest in the 'Saskatchewan Formula', compensation was calculated using recent population statistics of the three Portage Bands.

Whereas the Saskatchewan agreement freezes band population as of December 31 1976 for the purposes of settling outstanding treaty entitlement, this study makes use of current population figures which better represent the present status of the Portage Bands' claim. According to the provisions of Treaty No.1, entitlement was to be of the order of thirty-two acres per person. Multiplying this figure by the current population, less the area actually received by the Portage Bands, determines the size of the current population based, land shortfall.

Where lands are not available to make up the shortfalls, monetary compensation of their current value would be considered. Total compensation under this alternative is simply the current value of unimproved lands times the quantity of acres in the calculated shortfall. The value of unimproved land is required as opposed to that of improved land, since that is the state in which the land would have been received by the bands in 1876.

Inherent in the price of all farmland is a factor relating to the costs of improving that land. Consider, for example, two identical parcels of land composed of similar soil characteristics, topography and location. One parcel however, is currently under crop while the other

is presently in an unimproved state, being utilized for pasture. The value of these two properties will differ according to their productivities. All other things considered equal, the property under cultivation will have a higher productivity and thus, be valued higher. In this case, the difference in value between the two properties may be directly attributed to a factor of improvement costs. This improvement factor relates to the current costs of improving the land. Consequently, the market values for improved land in this analysis are adjusted to reflect current development costs.

3.4 DATA

This section provides an overview of the type of information and data required to carry out the analysis. The discussion is divided into several parts. The first part deals with sources of information identifying two distinctive rates of agricultural development which may have occurred within the treaty shortfall areas. The second part details determinants of agricultural productivity in these regions. This data consists of wheat yields, pasture grazing capacity and levels of improved summerfallow. Another part discusses determinants of agricultural revenue. Included in this discussion is data on wheat prices, land leasing arrangements and interest rates. The fourth section determines market values of land in the specific shortfall areas. Current band population figures are documented in the final section.

3.4.1 Two Rates of Agricultural Development

Rates of development in this thesis refer to annual changes in levels of improved agricultural land over the period of the study. Two developmental rates were assumed. One refers to typical management practises which have been carried out in, and within close proximity to the treaty shortfall areas. The other, identifies rates of improvement which have been evident upon each of the respective reserves. The two rates illustrate the range of development possibilities which might have occurred on the shortfall lands. The two rates were necessary since the resulting income streams were likely to differ.

3.4.1.1 Typical Management

Typical management is a term frequently used in farm appraisal referring to the most likely or average level of management. This practice aids in the evaluation of farm property by avoiding either extremes of over and under valuation resulting from superior or deficient management techniques in the past.²¹

Typical management levels for areas within the shortfall boundaries were available from Census Canada data of municipalities in the vicinity of the reserves. Taken at intervals of five or ten years, information indicating levels of improved land within the relevant municipalities was available. Improved land was that considered currently capable of crop production. In Table 3.1, levels of improvement are indicated, representing years in which census data were available. Levels of improvement between census dates were estimated by extrapolation among available data.

The municipalities relating to the development of each reserve shortfall were chosen according to the location of each reserve. While the Long Plain reserve is located within the R.M. of Portage la Prairie, the soils of its immediate area conform more to the area of the neighboring municipality of North Norfolk. Consequently, census data from this municipality were chosen. The choice of data from the R.M.'s of Lorne and Lakeview for the Swan Lake and Sandy Bay shortfalls respectively, were made using similar rationale. The municipalities chosen, conformed best to the areas of the specific treaty shortfalls.

²¹ William G. Murray and others, Farm Appraisal and Valuation, pp.30,31.

TABLE 3.1

Historical Agricultural Development

N. NORFOLK		LORNE		LAKEVIEW	
YEAR	%IMP	YEAR	%IMP	YEAR	%IMP
1886	2.00	1886	5.00	1886	8.00
1891	6.00	1891	6.00	1891	10.00
1901	20.00	1901	21.00	1901	12.00
1911	34.00	1911	21.00	1911	14.00
1921	51.30	1921	54.23	1921	18.27
1926	53.71	1926	63.83	1926	18.17
1931	51.65	1931	66.61	1931	15.85
1936	54.02	1936	69.17	1936	16.33
1941	55.28	1941	73.21	1941	17.64
1946	53.47	1946	73.06	1946	22.79
1951	57.58	1951	76.06	1951	27.91
1956	60.73	1956	75.55	1956	31.66
1961	64.24	1961	80.33	1961	30.81
1966	66.77	1966	81.07	1966	31.08
1971	65.83	1971	80.91	1971	33.24
1976	66.48	1976	81.96	1976	36.90
1981	74.57	1981	82.44	1981	39.50

Source: Census Canada, (Various Issues 1886-1981).

Examination of Table 3.1 demonstrates that the area around the Sandy Bay Reserve experienced the least amount of development during the period of the study. Lands around the Swan Lake Reserve, in the R.M. of Lorne, realized the greatest degree of agricultural development. This is consistent with observations made in Chapter Two which showed Sandy Bay lands to be the least suited to crop production. According to Canada Land Inventory classifications, the Swan Lake area has the greatest crop potential of the three reserve shortfall regions.

3.4.1.2 Reserve Development

Development in the shortfall areas was also based upon actual rates of agricultural improvement on reserve lands held by the Portage Bands. Census data does not provide information on agricultural development specific to the various Portage reserves. Therefore, it was necessary to consult other sources of information.

Annual reports of the Department of Indian Affairs proved invaluable in establishing early levels of improvement upon the three Portage reserves. From reports of Indian agents during this time period, it was readily apparent that agriculture was virtually nonexistent upon the reserves. Prior to 1883, any reserve agriculture was almost entirely devoted to small garden plots. In the case of the Long Plain Reserve, very little new ground had been broken by 1881. The particular state of agricultural development upon this reserve was blamed upon a lack of manpower owing to demands for men on the railroad and other public works.²² The Sandy Bay Reserve had very little crop planted due to high

²² Canada, Department of Indian Affairs, Annual Report (1882), pp.33,34.

water levels but was considered to have a productive future.²³

The Swan Lake Band, on the other hand, seemed to be very averse to farming. By 1881, they had not yet even moved to their surveyed reserve, subsisting mainly by hunting. Their agriculture consisted solely of the garden crops which they had planted at the Indian Gardens. These lands had been cultivated by generations of their forefathers, long before Treaty No.1 was signed.²⁴

For the purposes of this analysis, the beginning of agricultural development upon the Long Plain and Swan Lake reserves commences in 1883. It was reported then, for the first time, that cereal crops had been successfully planted. Eight acres of wheat were harvested off both reserves and new land was in the process of being broken. The Sandy Bay Band however, was not having the same luck growing grain crops. Some of their earlier agricultural promise had not yet been realized. Their lands were now considered to be more suitable for raising livestock. In 1883, this band owned twenty-five horses and fifty-one head of cattle.²⁵

Later on, after the turn of the century, reports of the Indian Affairs Department express levels of agricultural development upon the reserves solely in terms of their total crop production. During these years, total improved acres may be estimated by dividing the total production of cereal crops, by the Manitoba average yields of those crops. Table 3.2, depicts the levels of improvement upon the two reserves dur-

²³ *ibid.*

²⁴ *ibid.*, pp.152-153.

²⁵ Canada, Department of Indian Affairs, Annual Report (1884), p.48.

ing the year 1910. Estimated in this manner, the Swan Lake Reserve shows the highest level of improvement. These estimates should be treated with caution as they are very sensitive to what the average

TABLE 3.2

Reserve Improvements - 1910

Crop	LONG PLAIN RESERVE			SWAN LAKE RESERVE		
	Total* Prod'n (bu)	Man.** Ave.Yield (bu/ac)	Improved Acres	Total* Prod'n (bu)	Man.** Ave.Yield (bu/ac)	Improved Acres
Wheat	1,727	13.5	128	5,773	13.5	428
Oats	1,733	25.1	69	3,642	25.1	145
Barley	252	15.7	16	567	15.7	36
Total			213			609

Sources:* Canada: Sessional Papers (1911), No.27, p.94

** Manitoba, Department of Agriculture and Conservation, 'The Story of Manitoba's Agriculture - 80 Years of Progress Recorded Statistically' (June 1961).

yields actually were upon the reserves.

The Sandy Bay Band did not begin production of cereal crops until 1912, when interest in farming began to take greater hold. In that year, approximately ten acres were under cultivation.²⁶ In 1913, twelve acres were under crop while more land was being broken.²⁷ The newly broken acreage is in production the following year along with the twelve acres previously improved. This brings the 1914 total improved acreage

²⁶ Canada, Sessional Papers (1913), No.27, p.109.

²⁷ Canada, Sessional Papers (1914), No.27, p.108.

to about sixty-two acres.²⁸ By 1915, a total of 272 acres were under the plough and this included seventy-two acres from the Roman Catholic private school.²⁹

After this point in time, Indian Affairs reports are not specific enough to make judgements on annual levels of improvement upon the Portage reserves. The establishment of a rate of development between 1910 and 1983 was based on two other sources. Manitoba Forestry Inventory maps obtained from the Manitoba Department of Natural Resources were very instrumental in determining current (1982) levels of agricultural improvement the reserves.³⁰ These maps were very useful as they indicated not only the possible forest covers upon the reserves, but also illustrated how other types of agricultural lands were being employed. Utilizing these maps as a base case, it was possible to determine local levels of land improvement upon the reserves in 1982. Examination of aerial photographs of the reserves from the late 1950's and early 1960's permitted the gap in actual data between 1910 and 1983 to be narrowed somewhat.³¹ The aerial photographs were compared, section by section, to the base Forest Inventory Map, yielding an intermediate rate of development for each of the reserves. Once again, yearly development levels were calculated by extrapolation between dates of available data.

²⁸ Canada, Sessional Papers (1915), No.27, p.48.

²⁹ Canada, Sessional Papers (1916), No.27, pp.47-48.

³⁰ Manitoba, Department of Natural Resources, Forestry Branch, Provincial Forest Inventory (1982).

³¹ Aerial photographs of the reserves and surrounding areas were available from the Provincial Mapping Branch.

In Table 3.3, the schedule of development for each of the Portage reserves is shown. Some of the figures bear closer examination. In particular, numbers relating to the actual size of the reserves should be examined more closely. One of the greatest difficulties in assembling relevant reserve data, was determining accurate measures of the actual sizes of the reserves. There is very little agreement among various sources as to the actual area of the reserves. Discussion with band leaders regarding the actual reserve area was of no avail either, as certain boundaries are still under dispute. For the purposes of determining yearly improvement levels, consistent reserve acreages were required. Manitoba Forestry Inventory information was found to be suitable since the reserve lands were clearly delineated from that of private or crown lands. These figures were used for calculating levels of improvement upon the reserves.

The greatest period of agricultural development for the Long Plain and Swan Lake reserves was during the fifty years after 1910. The percentage of cultivated lands increased by nearly forty-six percent in the case of the Long Plain Reserve, while the Swan Lake lands were improved by approximately twenty-five percent. The Sandy Bay Reserve, on the other hand, showed very little development prior to 1960. At this time, only four percent of the entire reserve was even considered to be improved. A large increase in reserve development was evident however, by 1982. Between 1960 and 1982 the level of improved lands had increased ten-fold to forty percent.

TABLE 3.3

Rate of Reserve Development - 1883-1982

Year	LONG PLAIN RESERVE (8,188 acres)*		SWAN LAKE RESERVE (6,816 ACRES)*		SANDY BAY RESERVE (15,055 ACRES)*	
	Improved Acres	Improved %	Improved Acres	Improved %	Improved Acres	Improved %
1883	8***	.10	8***	.10		
1910	213****	2.60	609****	8.93		
1912					10^	.07
1913					12^^	.08
1914					62^^^	.41
1915					272^^^^	1.81
1958	3,980**	48.61				
1959			2,354**	34.45		
1962					605**	4.02
1982	5,543*	67.69	3,574*	52.44	6,907*	40.50

Sources:

- * Manitoba, Department of Natural Resources, Forestry Branch, 'Provincial Forestry Inventory' (1982).
- ** Manitoba, Provincial Mapping Branch, (Aerial Photographs)
- *** Canada, Department of Indian Affairs, Annual Report (1884), p.48
- **** Canada: 'Sessional Papers' (1911), No.27, p. 94.
- ^ Canada: 'Sessional Papers' (1913), No.27, p.109.
- ^^ Canada: 'Sessional Papers' (1914), No.27, p.108.
- ^^^ Canada: 'Sessional Papers' (1915), No.27, p. 44.
- ^^^^ Canada: 'Sessional Papers' (1916), No.27, pp.47,48.

3.4.2 Determinants of Agricultural Productivity

Estimates of annual losses suffered by the Portage Bands, as a result of the alienation of treaty lands, are dependent to a large extent upon the historical productivity of those said lands. Agricultural productivity relates to the relative capability of the soil for crop production and the support of livestock. In this study, improved lands produced annual farm incomes according to yearly levels of wheat production while pasture fees were derived from rental of unimproved lands. This section provides an insight into the calculation of wheat yields and pasture capability on lands within the shortfall boundaries.

3.4.2.1 Wheat Yields

Crop revenue returns from the foregone rent model were based on annual levels of wheat production. Average wheat yields were estimated for each of the shortfall areas considered, under the treaty settlement alternatives. The index of yields varied according to the productivity of the soils in each shortfall zone. Historical yields were available from several sources. From 1881-1915, wheat yield data was based on the average Manitoba yield.³² Manitoba crop reporting districts were the basis for average yields between 1916-1959.³³ Manitoba Crop Insurance Corporation (MCIC) wheat yields which related to the soil capability of the shortfall lands were available from 1960-1983.³⁴

³² Manitoba, Department of Agriculture and Conservation, The Story of Manitoba's Agriculture - 80 Years of Progress Recorded Statistically, (June 1961).

³³ Manitoba Agriculture, Manitoba Agriculture Yearbooks, (Various Issues, 1915-1960).

The MCIC wheat yields were considered to be the best estimate of actual yields, since they correspond directly to the productivity of resident soils found in the various shortfall areas. Consequently, yields over the entire study period were adjusted to better reflect their soil productivities. MCIC wheat yields (1960-1983) of predominant soil classes within the various shortfall zones were first of all compared to the Manitoba average yield during that same specific time period. A ratio describing the relative relationship between the two types of yield was thus established for each particular shortfall:

$$\text{Yield Ratio(1960-1983)} = \frac{\text{Soil Zone Yield}}{\text{Manitoba Ave.Yield}} \quad (3.8)$$

Once the ratios were estimated, they were used to adjust the Manitoba average yields during the period 1881-1915. The yield in each of these years was multiplied by the respective ratio to arrive at an adjusted yield. These yields were thus, more representative of the actual productivity of the shortfall lands. This same procedure was employed during the period 1916-1959, except this time, crop district yields were used in the place of Manitoba average yields. Table 3.4, exhibits the adjusted wheat yield ratios.

In Table 3.4, the greatest discrepancy between soil zone yields and Manitoba average yields occurred in soil zones E5, H9 and I9 respectively. Wheat yields in soil zone E5 were considerably higher while in soil zones H9 and I9 they were significantly lower. This same pattern was also evident in the comparison of crop district yields.

³⁴ Canada - Manitoba Crop Insurance Corporation, Risk Rates and Coverages, (1960-1984).

TABLE 3.4

Adjusted Wheat Yield Ratios

	LONG PLAIN		SWAN LAKE		SANDY BAY	
*****	25sq.mi.	25mi.sq.	25sq.mi.	25mi.sq.	25sq.mi.	25mi.sq.
Type of	Soil	Soil	Soil	Soil	Soil	Soil
Wheat	G10	G10	F5	E5	H9	I9
Yield						

Manitoba						
Ave.Yield	1.05	1.05	1.03	1.11	.85	.83
Crop Dist.						
Ave.Yield	1.04	1.04	1.02	1.10	.92	.83

Wheat yields were also adjusted to account for the percentage of improved lands which are left fallow every year. The practice of summer-fallow rotation leaves a portion of improved land uncropped every year, in order to retain acceptable levels of soil moisture. Annual wheat yields were thus further adjusted to account for the percentage of land not producing a crop:

$$\text{Effective Yield} = \text{Adjusted Yield} \times \% \text{Cropped} \quad (3.9)$$

Levels of improved land actually producing a crop, were calculated by subtracting the percentage levels of summerfallow from the percentage levels of improved land.³⁵

Table 3.5, depicts percentage levels of summerfallow from municipalities closely approximating the shortfall lands. These figures were available from census data at five and ten year intervals. Summerfal-

³⁵ Due to a lack of summerfallow data from the reserves themselves, effective wheat yields were calculated using the same municipal census data for both the typical and reserve management scenarios.

low data were unavailable for the years prior to 1911. In all other years, estimates of summerfallow were calculated by extrapolating the data.

The pattern of summerfallow usage shown in Table 3.5 illustrates a growing reliance upon the practice which reaches a high point in 1961 in all of the three municipalities observed. Thereafter, a decline in the practice is evident, a probable outcome of greater dependence on other methods of moisture preservation such as minimum tillage or snow-trapping methods, among others.³⁶

3.4.2.2 Pasture Capability

It is assumed in this study that lands not in crop production and in an unimproved state have a capability for pasture grazing, measureable in terms of animal unit months (AUM). One AUM measures the maximum number of animals that may be sustained on one acre of land over a pasture season of five months. Animal unit months calculated in this thesis were based on a cattle feeding requirement of about twenty-two lbs. of grass, per day, per cow. This amount of daily feeding provides a cattle weight gain of approximately 2.0-2.5 lbs. per day.³⁷ Extended over the entire pasture season of five months, a total requirement of about 3500 lbs. of grass per cow resulted.

³⁶ Environment Canada, Lands Directorate, Policy Research and Development Branch, Stress on Land in Canada, Folio No.6, Ottawa, 1983, p.235.

³⁷ Documented range cattle forage requirements were unavailable. Grass requirements for range cattle were based on figures determined in consultation with the Department of Animal Science at the University of Manitoba.

TABLE 3.5

Historical Summerfallow Rates

	N.NORFOLK	LORNE	LAKEVIEW
Year	%	%	%
1911	6.99	3.00	2.00
1921	11.88	2.60	3.88
1926	11.97	8.15	4.24
1931	14.61	16.32	4.29
1936	13.89	14.09	4.07
1941	15.32	20.68	4.80
1946	13.57	18.44	6.00
1951	12.84	18.70	4.75
1956	14.24	19.63	6.88
1961	14.42	22.38	8.48
1966	11.92	18.19	7.04
1971	10.26	14.56	7.37
1976	6.54	9.46	7.48
1981	2.91	3.88	3.76

Source:Census Canada (Various Issues 1911-1981).

The capability of pasture lands was calculated on the basis of MCIC grass forage yields from predominant soil classes within the treaty shortfall areas. Animal Unit Months are calculated in (3.91):

$$\text{AUM} = \frac{\text{Soil Zone Grass Yield} \quad \text{Kg/acre}}{\text{Cattle Grass Requirement} \quad \text{Kg/cow}} = \text{-----} \quad (3.91)$$

Forage yields from MCIC data reflect grass yields obtainable from improved pasture lands.³⁸ Since lands not in crop production were assumed to be unimproved, pasture yields needed to be adjusted. It is evident that pasture forage production can be severely limited on unimproved land. To account for the lesser forage yields expected from the unimproved shortfall lands, MCIC grass yields were reduced by fifty per cent.³⁹

In Table 3.6, AUM's for each of the treaty shortfall alternatives were calculated. In the case of Long Plain twenty-five square miles and twenty-five miles square shortfall alternatives respectively, the pasture capability remained roughly the same. The predominant soil mix did not change appreciably when the shortfall area was expanded from the first settlement alternative to the second. The main soil group was considered to be Zone G.

The Swan Lake shortfall showed slight improvement from soil zone F to soil zone E when expanded to the second alternative. Representative grass yields improved under the larger shortfall alternative and thus,

³⁸ Grass yields refer to all grass species for hay production which have less than twenty-five per cent alfalfa in the stand.

³⁹ Eastern Grassland Society, Annual Report, 1984, p.2.

TABLE 3.6

Pasture Capability - Animal Unit Months (AUM)*

LONG PLAIN		SWAN LAKE		SANDY BAY			
Grass	AUM	25sq.mi.	25mi.sq.	AUM	25sq.mi.	25mi.sq.	AUM
lbs/ac	cow/ac	Grass	Grass	cow/ac	Grass	Grass	cow/ac
		lbs/ac	lbs/ac		lbs/ac	lbs/ac	
1365	.39	1280		.37	1125		.32
			1345	.38		1100	.31

Source: Canada-Manitoba Crop Insurance (1984), 'All-Risk Rates and Coverages.

* Animal unit months are calculated based on a cattle feeding requirement of 3,500 lbs. of grass per cow per season.

pasture capability improved from .37 AUM to .38 AUM.

The Sandy Bay shortfall experienced a slight decrease in pasture capability when the the shortfall boundaries were extended to the twenty-five miles square alternative. Soil capability decreased from Zone H to Zone I and pasture capability was reduced marginally from .32 AUM to .31 AUM. For the purposes of the analysis, pasture capabilities remained constant for each of the settlement alternatives, over the entire period of the study.

3.4.3 Revenue Determination

The model employed in estimating annual foregone income essentially calculates rental returns adjusted for improvement costs. The stream of rental revenue was compounded annually by an appropriate interest rate which yields a dollar value for total rents foregone. The following

sections discuss those factors which contribute directly to the rental income calculations.

3.4.3.1 Wheat Prices

The prime source of agricultural revenue is that received from crop production. Wheat prices over the period of the study, were obtained from various sources and are listed in Table 3.7. From 1881 to 1888, the estimates are average prices of Winter No.2 White at Toronto. For the period from 1889 to 1904, prices are for No.1 Northern at Winnipeg. Prices from 1905 to 1907 refer to the Winnipeg cash closing No.1 Northern, basis in store, Fort William and have been adjusted for transportation costs.⁴⁰ Manitoba farm gate prices are used as the basis from 1908 to 1985.⁴¹

3.4.3.2 Grazing Lease Revenues

The other source of agricultural revenue is in the form of rents received from grazing leases. For the purposes of this study, it is assumed that some revenue could be derived from land not in crop production (unimproved land).

Grazing revenues from unimproved land are based on a fee structure comparable to the type of grazing leases offered by the federal and provincial governments for rental of crown lands. Prior to 1930, crown

⁴⁰ M.C.Urquhart, Editor., Historical Statistics of Canada, (Toronto: The Macmillan Company of Canada Ltd., 1965).

⁴¹ Manitoba Agriculture, Manitoba Agriculture Yearbooks (Various Issues).

TABLE 3.7

Historical Wheat Prices

Year	Wheat Price \$/bu	Year	Wheat Price \$/bu	Year	Wheat Price \$/bu
1881	1.34	1916	1.23	1951	1.61
1882	1.08	1917	2.05	1952	1.63
1883	1.13	1918	2.06	1953	1.36
1884	.86	1919	2.40	1954	1.31
1885	.84	1920	1.83	1955	1.42
1886	.83	1921	.91	1956	1.30
1887	.83	1922	.83	1957	1.32
1888	1.05	1923	.67	1958	1.36
1889	.99	1924	1.24	1959	1.38
1890	.90	1925	1.22	1960	1.61
1891	.93	1926	1.09	1961	1.76
1892	.80	1927	1.06	1962	1.70
1893	.73	1928	.92	1963	1.71
1894	.61	1929	1.06	1964	1.63
1895	.72	1930	.55	1965	1.65
1896	.66	1931	.41	1966	1.78
1897	.79	1932	.38	1967	1.64
1898	.93	1933	.52	1968	1.31
1899	.71	1934	.65	1969	1.24
1900	.75	1935	.61	1970	1.42
1901	.75	1936	.91	1971	1.37
1902	.73	1937	1.02	1972	1.86
1903	.79	1938	.61	1973	4.30
1904	.92	1939	.55	1974	4.00
1905	.69	1940	.58	1975	3.53
1906	.71	1941	.57	1976	2.80
1907	.97	1942	.80	1977	2.67
1908	.83	1943	1.16	1978	3.61
1909	.87	1944	1.26	1979	4.62
1910	.84	1945	1.67	1980	5.52
1911	.67	1946	1.67	1981	4.59
1912	.67	1947	1.66	1982	4.10
1913	.71	1948	1.66	1983	4.89
1914	1.01	1949	1.63		
1915	.90	1950	1.62		

Sources: 1881-1907 - M.C.Urquhart, ed., 'Historical Statistics of Canada', (Toronto: The Macmillan Company of Canada Ltd. 1965).

1908-1958 - Manitoba, The Department of Agriculture and Conservation, 'The Story of Manitoba's Agriculture - 80 Years of Progress Recorded Statistically,' (June 1961).

1959-1983 - Manitoba Agriculture, 'Manitoba Agriculture Yearbooks,' (Various Issues).

lands in the three prairie provinces were under the jurisdiction of the federal government. The Natural Resource Transfer Agreements signed in 1929 and 1930, transferred ownership of crown lands and natural resources from the federal to the provincial governments of Manitoba, Saskatchewan and Alberta respectively. These agreements placed the three prairie provinces on an equal basis with the other provinces which had exercised control and ownership of crown lands since Confederation.

The first crown grazing leases in 1881, set annual rental at a rate of ten dollars for every one thousand acres grazed, or one cent per acre.⁴² In 1886, the annual rental was increased to a rate of two cents per acre.⁴³ This rate was continued in force with minor alterations from time to time until 1903.⁴⁴ Beyond this point in time, information regarding grazing fees is virtually nonexistent. Provincial leasing arrangements after 1930 were negotiated primarily on an individual basis and took into account the productivity of the pasture land in question. Upon request, the Manitoba Department of Natural Resources, Agricultural Crown Lands Branch, has provided an average rental rate for grazing on crown lands. These average rates are based on a cross section of Manitoba crown land grazing permits between 1961 and 1983. The average rental rate was calculated at seven cents per acre in 1961. In 1975, the Crown adopted a new fee structure whereby rental rates were expressed in terms of AUM's. To be consistent for the analysis, all previous rates were also converted to a charge per AUM. In 1975, Crown

⁴² Canada, Sessional Papers. No. 18, 45 Victoria A., 1882, p.6.

⁴³ Canada, Sessional Papers. No.7, 50 Victoria A., 1887, p.54.

⁴⁴ Chester Martin, Lewis H.Thomas ed. Dominion Lands Policy, (The Carleton Library, No.69, McClelland and Stewart Ltd., 1973) p.179.

pasture rental was set at twenty cents per AUM. During the previous year, rental had been set at ninety-nine cents per acre. All pasture rental rates during the period of the study were converted to AUM charges reflecting this conversion factor of one-fifth of the rental value per acre. Grazing rates representing both types of charges are listed

TABLE 3.8
Crown Grazing Rates

Year	Grazing Rate \$/ac	Grazing Rate \$/AUM	Year	Grazing Rate \$/ac	Grazing Rate \$/AUM
1881	0.01	0.002	1972	0.44	0.088
1886	0.02	0.004	1973	0.49	0.098
1961	0.07	0.014	1974	0.99	0.20
1962	0.07	0.014	1975		0.20
1963	0.07	0.014	1976		0.56
1964	0.30	0.060	1977		0.75
1965	0.26	0.052	1978		0.90
1966	0.27	0.054	1979		2.14
1967	0.32	0.064	1980		2.25
1968	0.34	0.068	1981		2.28
1969	0.35	0.070	1982		2.21
1970	0.43	0.086	1983		2.70
1971	0.42	0.084			

Source: Manitoba, Department of Natural Resources, Agricultural Crown Lands Branch.

in Table 3.8.

3.4.3.3 Crop Share Lease Arrangements

The Portage Bands' crop revenues are assumed to be based on rental earnings. It was not entirely uncommon for Indian Bands to negotiate agricultural leases of reserve lands even though ultimate ownership of these lands was vested in the crown.

In Manitoba, the predominant practice of share rental agreements in the past has been based on the customary one-third to two-thirds share lease.⁴⁵ Under the assumptions of this type of arrangement, the Portage Bands receive one-third of crop revenues in a given year while tenants receive a two-thirds share.

3.4.4 Interest Rates

Net revenues attributed to land in any year between 1881-1983 equalled the total rental income minus any costs incurred to clear the land. Rental income was related to a crop share lease arrangement on the cultivated land and grazing fees for the unimproved land. Annual rental incomes were estimated for representative acres in each shortfall area, for a period of 103 years: Adding foregone rental incomes, captured only part of the total income lost due to the shortfall in treaty land entitlement. It was necessary to also calculate interest foregone on these monies.

⁴⁵ J.C.Gilson, Economic Aspects of Tenant-Operated Farms in Southwestern Manitoba, (Research Report No.5, Faculty of Agriculture and Home Economics, The University of Manitoba, February 1960).

Annual interest rates, utilized in this study to compound foregone income, are listed in Table 3.9. Ideally, the rate should be representative of a security with similar risk to the investor over the entire period of the study. Long term government bonds are fairly representative of securities providing minimal risk to an investor. There were some difficulties however, in finding a bond which was similar over the whole period, 1881-1983.

From 1919-1983, long-term Canadian government bonds were used as the financial instrument to compound foregone income.⁴⁶ During the period 1900-1918, Ontario provincial bonds were employed as the representative security after being adjusted to long-term Canada bond yields.⁴⁷ Unfortunately, historical statistics of Canadian interest rates are somewhat incomplete prior to 1900. At best, various sources tend to give only a general trend of interest rates. Rates of interest offered by savings banks were in the three to four percent range during the period 1881-1899, while government railway bonds issued in this period returned annual rates of between four and seven percent.⁴⁸ Therefore it was concluded, a relatively safe investment during this period would have offered a rate of return of four percent.

⁴⁶ Statistics Canada, Cansim Database, (1984).

⁴⁷ Urquhart, op.cit.

⁴⁸ Canada, Canada Yearbooks (Various Issues).

TABLE 3.9

Historical Interest Rates

Year	Interest Rate %	Year	Interest Rate %	Year	Interest Rate %

1881	4.00	1916	4.80	1951	3.23
1882	4.00	1917	5.90	1952	3.56
1883	4.00	1918	5.90	1953	3.70
1884	4.00	1919	5.60	1954	3.18
1885	4.00	1920	6.35	1955	3.14
1886	4.00	1921	5.65	1956	3.62
1887	4.00	1922	5.32	1957	4.11
1888	4.00	1923	5.11	1958	4.11
1889	4.00	1924	4.88	1959	5.07
1890	4.00	1925	4.86	1960	5.18
1891	4.00	1926	4.82	1961	5.05
1892	4.00	1927	4.38	1962	5.11
1893	4.00	1928	4.71	1963	5.09
1894	4.00	1929	4.02	1964	5.18
1895	4.00	1930	4.56	1965	5.21
1896	4.00	1931	5.42	1966	5.69
1897	4.00	1932	4.83	1967	5.94
1898	4.00	1933	4.62	1968	6.75
1899	4.00	1934	3.46	1969	7.58
1900	3.65	1935	3.67	1970	7.91
1901	3.72	1936	2.97	1971	6.95
1902	3.68	1937	3.17	1972	7.23
1903	3.68	1938	3.09	1973	7.56
1904	3.68	1939	3.16	1974	8.90
1905	3.58	1940	3.28	1975	9.03
1906	3.63	1941	3.10	1976	9.18
1907	4.17	1942	3.06	1977	8.70
1908	3.92	1943	3.01	1978	9.27
1909	3.82	1944	3.00	1979	10.21
1910	3.92	1945	2.93	1980	12.48
1911	3.92	1946	2.61	1981	15.22
1912	4.17	1947	2.57	1982	14.26
1913	4.31	1948	2.93	1983	11.79
1914	4.17	1949	2.87		
1915	5.15	1950	2.86		

Sources: 1881-1899 - Canada, 'Canada Yearbooks,' (Various Issues).
 1900-1918 - M.C.Urquhart, 'Historical Statistics of Canada,'
 (Toronto: The Macmillan Company of Canada Ltd.,
 1965).
 1919-1983 - Statistics Canada, 'Cansim Database' (1984).

3.4.5 Current Land Value Estimates

Land values were estimated using information from municipal tax assessment rolls and comparative farmland sales data.⁴⁹ Applying equation (3.6), actual sales values were computed based on representative samples of property tax assessments and weighted A/S averages from lands in municipalities within the shortfall areas.

Property assessments chosen, included only those from private properties containing bare lands.⁵⁰ Assessments on Crown lands were also not included. In Table 3.10, average assessed values for each shortfall are displayed. These averages represent a broad sampling of various types of farmland, from several different municipalities in each shortfall. The assessed values ranged from a high of \$34.17/acre within the Long

TABLE 3.10

Estimated Land Values - (1983)

Reserve Shortfall Area	Total Area Assessed (ac)	Total Assessed (\$)	Average Assessed (\$/ac)	A/S	Estimated Sales (\$/ac)
*****	*****	*****	*****	*****	*****
Long Plain	13,991	478,120	34.17	.078	440
Swan Lake	14,915	428,580	28.73	.051	565
Sandy Bay	16,339	196,537	12.03	.080	150

⁴⁹ Information on property tax assessments and current market sales were available from the Municipal Assessment Branch.

⁵⁰ Properties containing residential, commercial, or farm buildings were not included as the building assessments were felt to have an undue effect upon the remaining assessment accorded to the land portion of the property.

Plain shortfall to a low of \$12.03/acre at Sandy Bay.

Assessment-sales ratios are also shown in Table 3.10. Based on comparable farmland sales for 1982 and 1983, these ratios were calculated as weighted averages according to the area of the respective municipality included in the total assessment area. Once again, only A/S ratios relating to farmland sales of bare land were included.

Estimates of current land values in the various treaty shortfall areas were calculated from information available in Table 3.10. The current market value of land was calculated by dividing average assessed values by the appropriate A/S ratio. Lands in the Swan Lake area were valued the highest of all at approximately \$550/acre, while Sandy Bay lands were valued the lowest at \$150/acre. These values, as expected, coincided with the relative productivities of each area. Lands in the Swan Lake shortfall area were previously considered to be of the highest productivity in relation to the other shortfalls, while Sandy Bay lands were considered the least productive.

Chapter IV
EMPIRICAL RESULTS

The results of the empirical analysis conducted in this study are presented in Chapter Four. The results are reported in terms of total monetary compensation for each individual band and for the Portage Band as a whole. Total monetary compensation per acre, accumulating over the entire period of the study was estimated based on the compounded rent represented in Equations 3.4 and 3.5, plus land values calculated in Equation 3.7. The sum total of these two components, multiplied by the total number of acres in the treaty shortfalls, represent the value of total monetary compensation under various treaty settlement alternatives.

In the chapter's first section, comparisons of typical and reserve management development rates are discussed. Changes in this variable are expected to alter the foregone income streams significantly. The following sections demonstrate the range of compensation values which were calculated under both typical and reserve management assumptions. Total monetary compensation is also calculated on the basis of current population entitlement. The results of this analysis are presented in the final section.

4.1 COMPARISON OF DEVELOPMENT RATES

Two possible development rates, relating to the shortfall areas of the individual Portage Bands, were identified in this study. The first, corresponds to a rate of development which would likely have been conducted by farmers in surrounding municipalities. This rate of development is considered typical or neighboring management. The second rate, refers to actual historical levels of improvement which have been identified upon the Portage reserves themselves. This development rate is referred to as reserve management.

The comparison of the two rates of development for the Long Plain, Swan Lake and Sandy Bay shortfalls, are depicted graphically in Figures 4.1 to 4.3, respectively. Development rates, described in terms of the percentage of lands improved, were plotted over time, during years when information was available. Under typical management assumptions, improvement data was available during census years at five and ten year intervals. This provided fairly detailed pictures of historical development rates in municipalities surrounding the shortfall areas. The portrayal of reserve development is somewhat more limited however, due to large gaps in information. Based on this assumption, data was only available during four individual years over the entire period of the study. Comparison of rates of development were thus, made with caution, given the limited nature of the available data.

Comparison of Development Rates

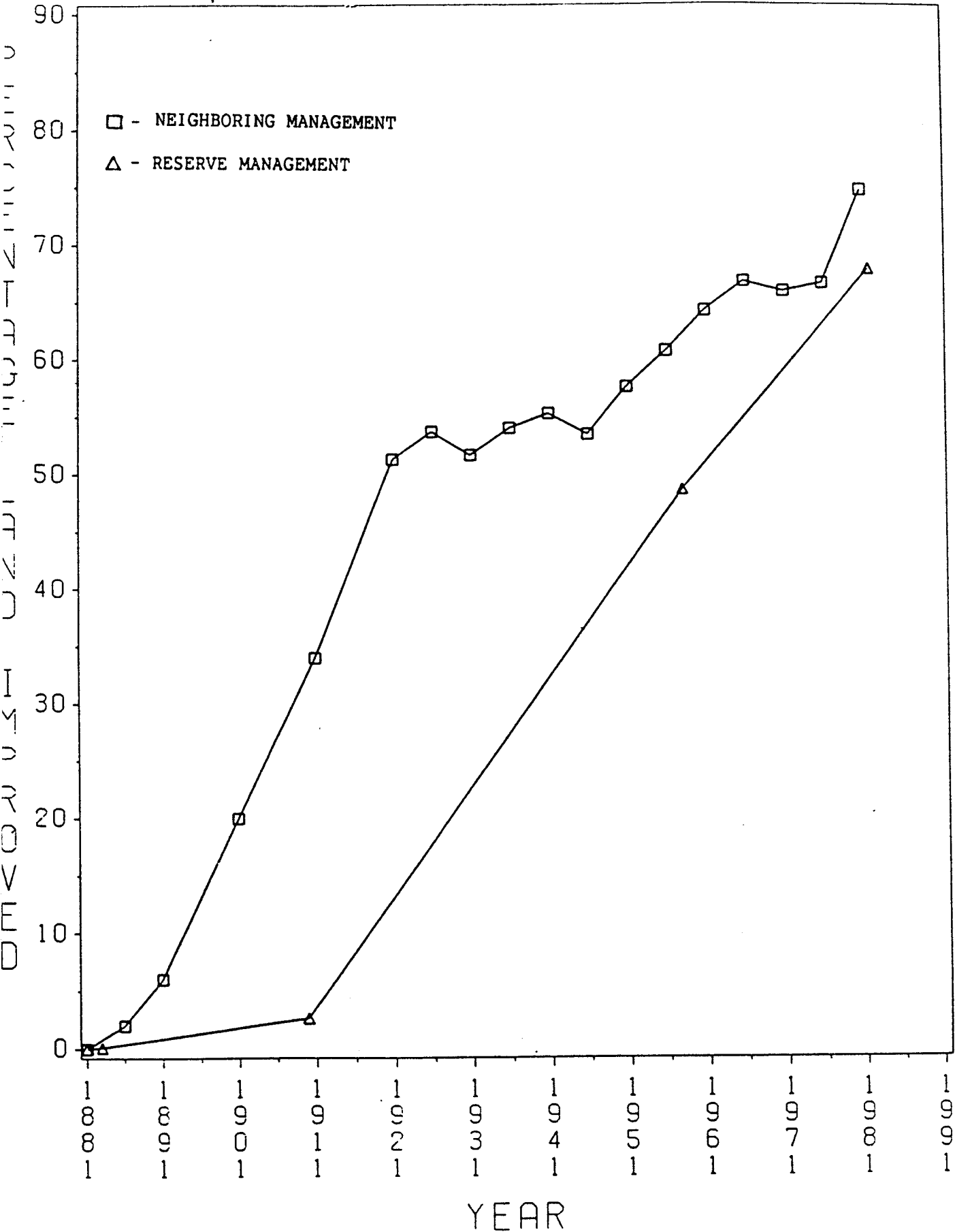


Figure 4.1: Comparison of Development Rates - Long Plain Shortfall

Comparison of Development Rates

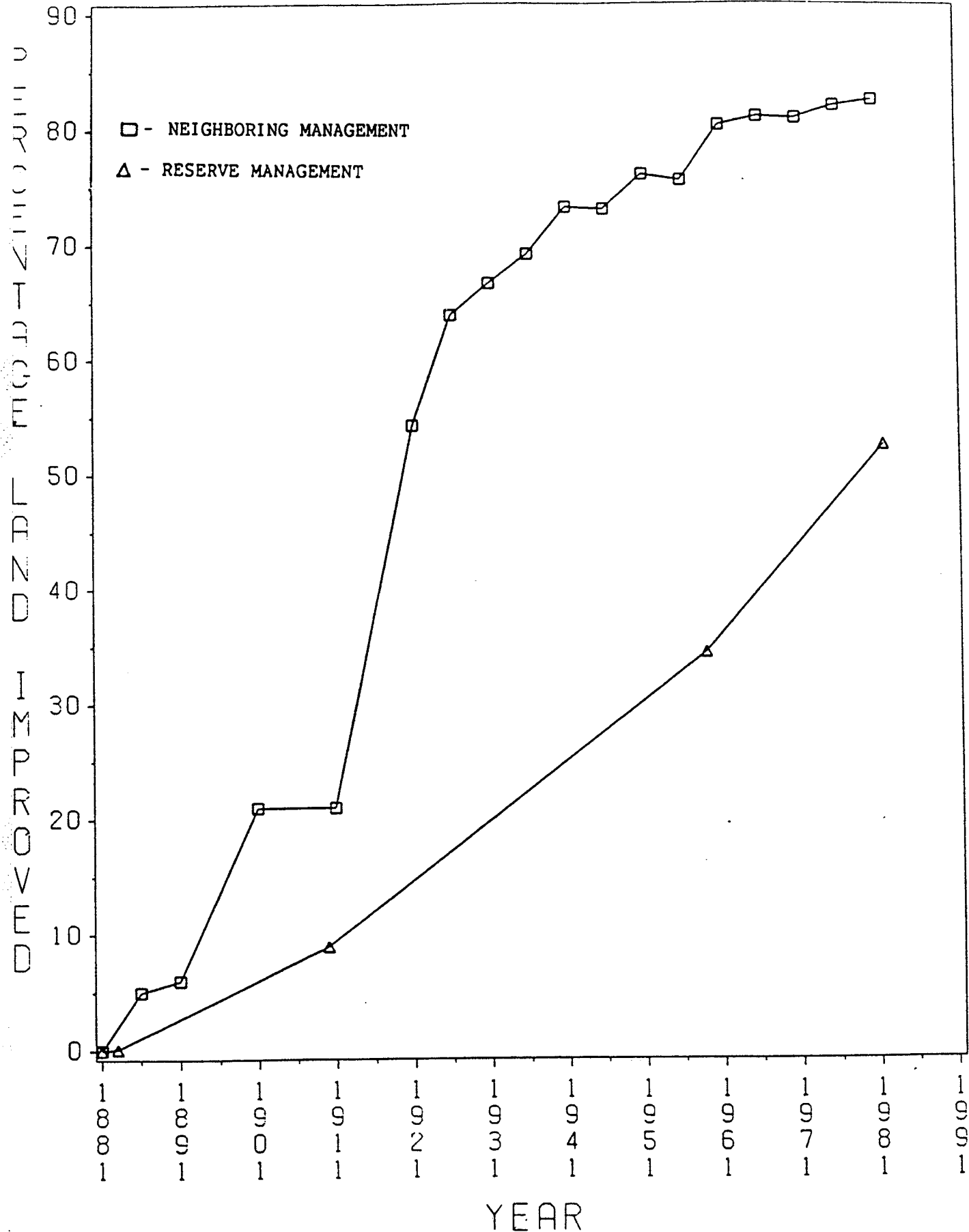


Figure 4.2: Comparison of Development Rates - Swan Lake Shortfall

Comparison of Development Rates

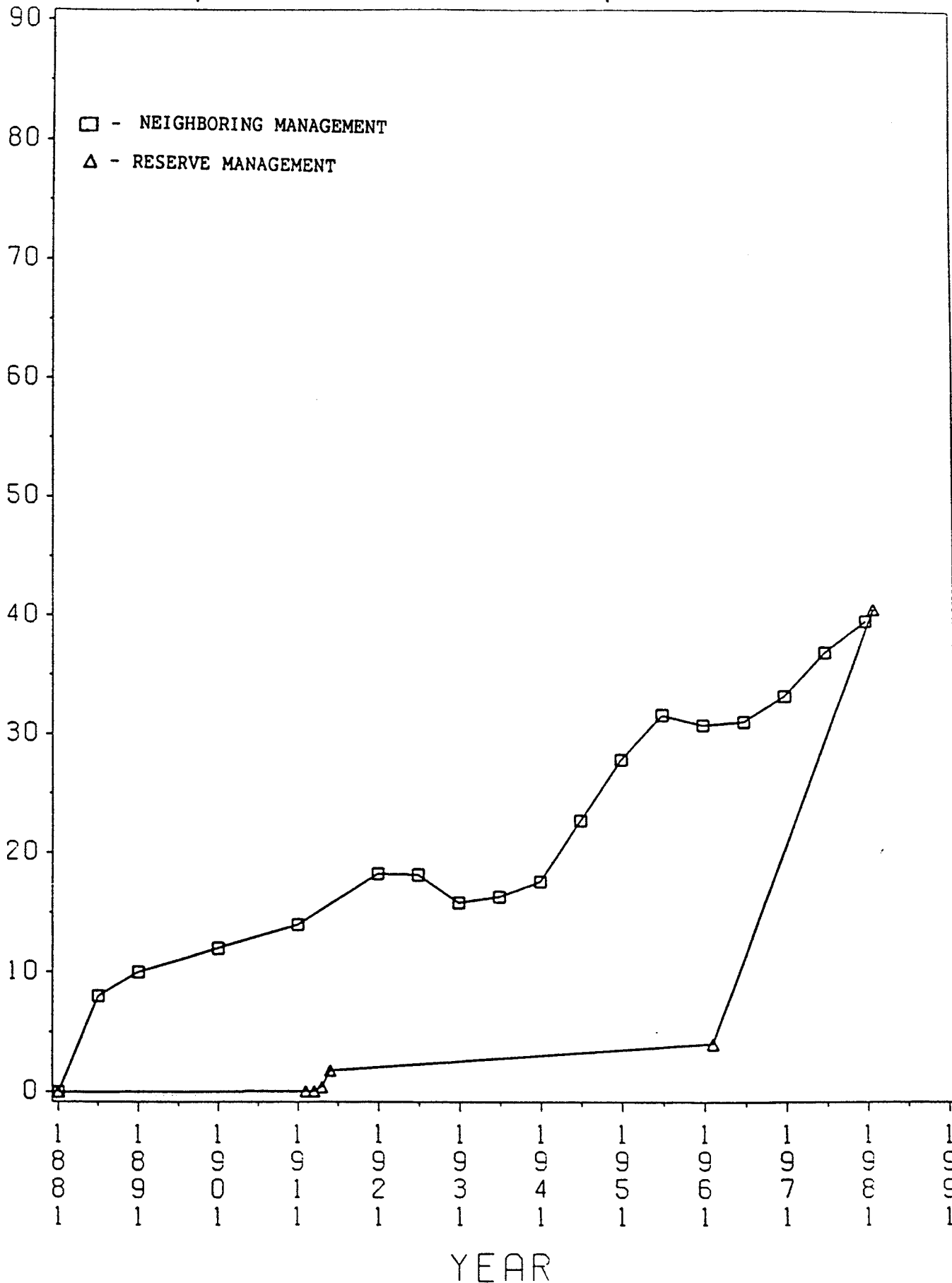


Figure 4.3: Comparison of Development Rates - Sandy Bay Shortfall

4.1.1 Developments in the Long Plain Shortfall

In Figure 4.1, development rates of the Long Plain shortfall are compared. Under the neighboring management scenario, development commences in 1881. The sharpest increase in development, occurs during the period 1891-1926 which corresponds to the period in Canadian history when a large part of Canada's western region was settled. Thereafter, the percentage of improved lands remains relatively constant, development being hindered primarily by events such as the 1930's depression and World War II. Sharp increases in development are noted in both the earlier post-war period and the late 1970's. These gains paralleled the postwar recovery period and also rising commodity prices, increasing land values and technological advances which characterized the period of the 70's. By 1982 seventy-five percent of all shortfall lands were in an improved condition.

Development under the reserve management assumption, followed a much slower course. The first improvements upon the reserve were only evident in 1883 and by 1910 less than three percent of the reserve lands were being utilized for grain production. During subsequent years, the level of improvement increased at a steady rate, attaining an improved level of sixty-eight percent by 1983.

4.1.2 Developments in the Swan Lake Shortfall

Figure 4.2 demonstrates a graphical comparison of development rates occurring within the Swan Lake shortfall area. Development, under neighboring management displayed the greatest increase between 1891 and 1926. The percentage of improved lands grew from six percent to over sixty-three percent during this period. This large increase is again

interpreted as corresponding to the influx of settlers to southern Manitoba. Rate of development during the remaining period of the study is steady, reaching a level of eighty-two percent by 1981.

Under reserve management, improvements upon the Swan Lake Reserve were first evident in 1883. In contrast to typical management developments, improvements proceeded at a much slower rate, culminating in a level of fifty-two percent by 1982.

4.1.3 Developments in the Sandy Bay Shortfall

In Figure 4.3, the comparison of Sandy Bay shortfall development rates is displayed. Improvements in this region are considerably less advanced when compared with developments in the other bands' shortfalls. The state of improvements in and around Sandy Bay may be traced to location and soil capability factors, as well as to the type of management assumed. The Sandy Bay Reserve is located off the main path of historical settlement in Manitoba, and thus, development of the area proceeded at a slower pace. In addition, as it was earlier noted in Chapter Two, soil capability around Sandy Bay was considered more suited to pasture use as opposed to cereal crop production. Consequently, much of the land has yet to go under the plow.

Considering the neighboring management scheme, steady increases in improvements were noted during the entire period, with two exceptions. The main period of decline was noted between 1926-1931 when the percentage of improved land decreased by two percent from eighteen to sixteen percent. Another decrease is noted between 1956 and 1961 but the loss in improved land was by less than one percentage. The level of development peaked in 1981 when close to forty percent of all lands were im-

proved.

Under reserve management, improvements upon the Sandy Bay Reserve did not take place until 1912 and this consisted merely of ten cultivated acres. During the next fifty years progress was very slow upon this particular reserve, as only four percent of the reserve was considered improved by the year 1962. Since then, improvements have proceeded at a much swifter pace. By 1982, the percentage level of improved land upon the reserve was estimated to be over forty percent, which works out to a tenfold increase in only twenty years. At that point in time, development of improved lands upon the Sandy Bay Reserve actually exceeded that of surrounding lands improved under the typical management assumption.

In the next sections, total monetary compensation is calculated under both neighboring and reserve management assumptions. The author hypothesized that since reserve lands were brought into production later, and at a much slower rate, the income stream would be significantly reduced when compared with that of neighboring lands brought into production under typical management. The sum of the appropriate foregone income streams and land values provides an estimate for total monetary compensation under the various treaty settlement alternatives.

4.2 TOTAL MONETARY COMPENSATION

4.2.1 Neighboring Land Management

Total monetary compensation, with respect to both treaty interpretations of the twenty-five square mile tract, were calculated for each of the Portage Bands under neighboring management assumptions in Table 4.1. Combining current land values with established foregone income levels,

determines a total dollar value per acre of land. Total monetary compensation is calculated by simply multiplying this dollar value by the number of acres in each band's estimated shortfall.

TABLE 4.1

Total Monetary Compensation - Neighboring Land Management

Treaty Settlement Alternatives	Income Foregone (1881-1983) (\$/acre)	Market Price of Land(1983) (\$/acre)	Short Fall (acres)	Total Monetary Compensation (\$)

Long Plain				
25 Square Miles	1,657	440	7,164	15,022,908
25 Miles Square	1,657	440	139,599	292,739,100

Swan Lake				
25 Square Miles	2,165	565	6,482	17,695,860
25 Miles Square	2,333	565	128,031	371,033,830

Sandy Bay				
25 Square Miles	302	150	1,312	593,024
25 Miles Square	304	150	131,328	59,622,912

The value of income losses suffered by the Long Plain Band, over the period 1881-1983 was appraised at \$1,657 per acre under both treaty settlement alternatives. Monetary compensation values did not change between alternatives, since soil capability remained essentially the same when the shortfall was expanded. The difference in the values of total monetary compensation between the two alternatives is thus, entirely due to the magnitude of the calculated shortfall area. Including the current market value of land of \$440 per acre, the total monetary compensation value under the twenty-five square miles settlement alternative was

estimated at \$15,022,908. Subject to the twenty-five mile square settlement option, total compensation increased to a level of \$292,739,100.

Higher overall soil productivities in both Swan Lake shortfalls translated into higher compensation values. Estimated foregone incomes were calculated as \$2,165 per acre and \$2,333 per acre under the first and second treaty alternatives, respectively. Land values in the area were assessed at \$565 per acre. The difference in total monetary compensation values between the two alternatives was a function of both, the increased acreage of the area in question, plus, an increase in the soil productivity. Under the twenty-five square miles option, total monetary compensation was \$17,695,860. The value of compensation in the second option was estimated to be \$371,033,830.

The accumulation of foregone incomes on Sandy Bay shortfall lands were valued at levels considerably lower than those accumulated on shortfalls surrounding the other Portage reserves. The existence of lower soil productivities and a lagging development rate have combined to significantly impact the total accumulation of income foregone by the band. Under the first treaty alternative, total foregone income was estimated to be only \$302 per acre. Soil capability was only marginally more productive when the shortfall was expanded to twenty-five miles square and consequently, the value of foregone income experienced only modest gains to a value of \$304 per acre. Land values in the Sandy Bay area were estimated a value of \$150 per acre. Total monetary compensation of \$593,024 was available under the first treaty alternative while a value of \$59,622,912 was appraised under the expanded option.

4.2.2 Reserve Management

Total monetary compensation was also calculated for the Portage Bands based on a rate of development reflecting the pattern of past improvements upon the respective reserves. Total compensation values were once again a function of foregone incomes, current land values and shortfall acreages. All variables in the analysis remained unchanged with the exception of the percentage improved variable, which was adjusted to parallel agricultural developments upon the reserves. Reserve developments were not assumed to be a function of land quality.

Significantly reduced foregone income levels were predicted when reserve management assumptions went into effect. These results, for each of the Portage Bands, are verified in Table 4.2. From Figures 4.1 to 4.3, it is readily apparent that surrounding municipal agriculture has in most cases, far exceeded that of improvements upon the reserves. Correspondingly, the value of income foregone from neighboring municipal lands has greatly surpassed that of reserve lands over the period 1881-1983.

For instance, in Table 4.2, the value of foregone income accruing to the Long Plain Band was \$823 per acre, nearly a fifty percent reduction in lost income when contrasted with the typical management scenario. Consequently, total monetary compensation is only \$9,048,132 under the first alternative and \$176,313,531 under the second.

Even greater reductions in foregone income resulted for the Swan Lake Band. Past income losses were estimated at \$854 and \$919 per acre for the two treaty settlement options respectively, a decrease of approxi-

TABLE 4.2

Total Monetary Compensation - Reserve Management

Treaty Settlement Alternatives	Income Foregone (1881-1983) (\$/acre)	Market Price of Land (1983) (\$/acre)	Short Fall (acres)	Total Monetary Compensation (\$)

Long Plain				
25 Square Miles	823	440	7,164	9,048,132
25 Miles Square	823	440	139,599	176,313,531

Swan Lake				
25 Square Miles	854	565	6,482	9,197,958
25 Miles Square	919	565	128,031	189,998,000

Sandy Bay				
25 Square Miles	53	150	1,312	266,336
25 Miles Square	55	150	131,328	26,922,240

mately sixty-one percent over the previous calculation. As a result, total monetary compensation is reduced to \$9,197,958 and \$189,998,000 for each respective settlement alternative.

The Sandy Bay Band experienced the greatest reduction in foregone income when the reserve development assumption was adopted as the basis for monetary compensation calculations. While at best, the Sandy Bay area is not considered one of the most productive crop regions in the province, the assumption of a reserve rate of development further reduces accumulated foregone incomes to minimal levels. Foregone incomes were reduced by eighty-two percent, to \$53 and \$55 per acre between the two respective treaty alternatives. Total monetary compensation under the twenty-five square miles alternative is only \$266,336. Expanding

the shortfall to twenty-five miles square establishes a monetary compensation value of \$26,922,240.

Total monetary compensations for the Portage Bands as a single entity were calculated in Table 4.3. A comparison of compensation values between typical and reserve management conditions are depicted under ei-

TABLE 4.3
Total Monetary Compensation - Portage Bands

	LONG PLAIN	SWAN LAKE	SANDY BAY	PORTAGE BANDS
Treaty Settlement Alternatives	Total Monetary Compensation (\$)	Total Monetary Compensation (\$)	Total Monetary Compensation (\$)	Total Monetary Compensation (\$)

25 Sq.Miles				
Neighbor Mgmt.	15,022,908	17,695,860	593,024	33,311,792
Reserve Mgmt.	9,048,132	9,197,958	266,336	18,512,426

25 Miles Sq.				
Neighbor Mgmt.	292,739,100	371,033,830	59,622,912	723,395
Reserve Mgmt.	176,313,530	189,998,000	26,922,240	393,233,770

ther treaty settlement alternative.

Monetary compensation values with respect to the twenty-five square mile settlement option vary for the Portage Band from \$33,311,792 under typical management assumptions to \$18,512,426 when reserve development was in place. Once the twenty-five miles square option was invoked, total monetary compensation increased significantly. Under the condition of typical management, total monetary compensation equalled

\$723,395,842. Subject to actual historical reserve improvements, total monetary compensation for the Portage Band was \$393,233,770.

4.2.3 Sensitivity Analysis

Estimating total monetary compensation on the basis of both neighboring and reserve management assumptions identifies a range of values from which appropriate monetary compensation levels may be chosen. While it is difficult to know for certain, actual rates of development upon the various band shortfalls, had the Portage Bands been in possession of those lands, the management assumptions employed by this study provide reasonable estimates of the most likely range of development in the various areas. Development was viewed both in terms of improvements by typical farmers in surrounding municipalities and also with respect to actual agricultural accomplishments on band reserves to date.

It has been evident that development on the Portage reserves lagged considerably in comparison to corresponding municipal developments. For this reason, total monetary compensation, calculated under the reserve management assumption, rested at the lower end of the range of compensation values. Neighboring management on the other hand, refers to average or most likely development and this accounts for both poorly managed farms and above average operations. It was considered important to the analysis that development rates not be overstated, as they impact significantly on total compensation values. The employment of neighboring management assumptions, while resulting in foregone income totals at the upper bound of the compensation range, did not overstate the nature of past improvements. This assumption merely represented a plausible view of historical municipal developments.

The comparison of compensation values in Tables 4.1 and 4.2 indicated the effects of a change in the development rate assumptions. In each treaty settlement alternative, foregone income totals were significantly reduced once the reserve management assumption was considered. The choice of development rate was obviously crucial in determining final compensation values. However, the effects of changes in other model variables should also be examined. What would be the effect of these variable changes on foregone income values, and ultimately, the value of total monetary compensation?

The sensitivity of foregone income to changes in model variables is demonstrated in Table 4.4. In this table, sensitivity values represent the percentage change in foregone income in response to a one percent increase in one of the equation variables, *ceteris paribus*, in each year over the entire period of the study. Since all variables in the model (with the exception of the summerfallow variable), are positively related to foregone income, any increases in these variables will result in a net increase in the value of foregone income.

The concept of sensitivity may be thought of in the following manner. A sensitivity value of one represents a proportional relationship between the dependent and independent variables. A one percent change in one of the independent variables is followed by a proportional change in the value of foregone income. The relationship is essentially a scalar one. Sensitivity values greater than one depict more than proportional increases in foregone income. However, values less than one indicate that the change in foregone income is less than the one percentage change in the independent variable. Sensitivity values described the

relationship of variable changes in the foregone income model (reserve management assumption). In Table 4.4, sensitivity values applying to foregone income were calculated with respect to changes in four variables: 1) share of land in crop production, 2) wheat yields, 3) pasture capability and 4) interest rates. Foregone values for each shortfall

TABLE 4.4
Variable Elasticities of Compensation

Alternate Treaty Settlements	Land Improvement Sensitivity	Yield Sensitivity	Pasture Sensitivity	Interest Sensitivity
***** Long Plain *****	.964	.987	.004	1.554
Swan Lake				
25 sq.miles	.982	.987	.004	1.848
25 miles sq. *****	.981	.987	.003	1.852
Sandy Bay				
25 sq.miles	.738	.795	.126	1.249
25 miles sq.	.761	.816	.120	1.214

alternative were considered.

From Table 4.4 it is evident that total foregone income values were not very sensitive to the one percent change in levels of improved land or wheat yields for both the Long Plain and Swan Lake shortfalls. Sensitivity values ranged from 0.964 to 0.987 when the improvement and yield variables were altered. In other words, a one percent change in either improvement or wheat yield variables was followed by just less than a proportional increase in foregone income.

The effect on foregone income of changes in these same two variables was somewhat less sensitive with respect to Sandy Bay shortfall lands. Here, sensitivity values ranged from 0.738 to 0.816. These lower values are attributed to the nature of the Sandy Bay shortfall areas. The soil productivity in the Sandy Bay area was considerably lower than in either of the other bands' shortfalls. In addition, the development rate of this area was observed to be significantly less advanced when compared to the other shortfalls during the entire period of the study. The lower sensitivity values are thus, related to the fact that wheat production upon improved lands have not contributed proportionally as much to the final value of foregone income when compared to the contribution of wheat production in the other shortfalls.

Sensitivity values associated with changes in levels of pasture grazing capabilities were also estimated. These values were almost negligible, ranging from 0.003 to 0.004 for both the Long Plain and Swan Lake shortfalls. This result may be interpreted as an indication that since the greater proportion of land in these shortfalls has been devoted to crop production, very little lost revenue is attributable to that received from grazing rentals. Increasing pasture capability by one percent has only a marginal effect upon the total value of foregone income.

Sandy Bay foregone income totals were slightly more sensitive to changes in pasture capability. The sensitivity values, ranging from 0.126 to 0.120, were likely due to the greater proportion of unimproved lands in the Sandy Bay shortfalls, contributing to total foregone income. Even so, changes in pasture capability were not considered to have a very significant effect on the total value of foregone income.

Foregone incomes were most sensitive to changes in the interest rate variable. Interest rates were utilized in every year of the study to compound the accumulated income stream. The Swan Lake shortfalls were the most productive agricultural regions while the Sandy Bay area was the least productive. Accordingly, the value of Swan Lake's total foregone income was also the highest. The Swan Lake sensitivity values were also the highest (1.848; 1.852), while the Sandy Bay sensitivity figures were the lowest (1.249; 1.214). The influence of changes in interest rates on foregone incomes were greater the larger the value of the total foregone income. Increasing interest rates by one percent resulted in a more than proportional increase in foregone income for each shortfall alternative.

Sensitivity values are best understood when viewed in light of their effects on total monetary compensation values. For the purposes of demonstrating these monetary effects, sensitivity values relating to the Swan Lake twenty-five square miles scenario were examined. New compensation values were calculated under this scenario, on the basis of changes in foregone income when certain model variables were altered by one percent. Since sensitivity values applied solely to the foregone income portion of total monetary compensation, land values were not affected and remained constant.

The improvement sensitivity value (0.982), resulted in an increase of total monetary compensation to \$9,250,916. Recalling Table 4.2, original compensation was estimated at \$9,197,958. A one percent increase in the level of improved land thus translated into a \$52,958 increase in compensation. Yield sensitivity analysis revealed compensation increases of similar magnitude.

Total monetary compensation proved most sensitive to changes in the interest rate variable. The interest sensitivity value (1.848), established a new monetary compensation level of \$9,298,883. Compensation increased by \$100,925 as a result of change to the interest rate.

4.2.4 Discussion

The schedule of annual and accumulated foregone income totals which were derived according to various settlement alternatives and management assumptions are depicted in Appendix F. Foregone incomes were estimated here, on the basis of both yearly and total accumulated earnings for the period 1881-1983. The foregone income results are displayed in Tables F1 to F10, respectively.

A number of observations were made after examination of the foregone rent tables in Appendix F. Firstly, it was observed that negative incomes existed during certain years. The concept of a negative annual income may best be understood when recalling the foregone income cost component definition from Equation 3.3. Here, clearing costs in a given year were set equal to the value of crop income earned on lands improved over the past three years. Put simply, negative incomes occurred during years when these costs exceeded wheat and grazing revenues.

Under neighboring management assumptions, negative earnings were experienced by the Portage Bands during the 1880's and 1890's. This time period corresponds to the western settlement era when rapid agricultural development was underway. The greater the rate of development during those years, the greater was the possibility of foregone earnings being negative.

Foregone incomes earned under reserve management assumptions were negative during periods of accelerated development upon the various Portage reserves. On the Swan Lake Reserve this period occurred during the 1880's, while the Long Plain Reserve experienced income losses from 1912 to 1916. Since Sandy Bay agricultural development took place at a much later date, negative incomes were not evident until the 1960's. It was during this decade and the next that the Sandy Bay Reserve realized its most extensive agricultural improvements. Negative annual incomes were thus, largely related to periods of increasing agricultural development.

A second observation of tables in Appendix F, concerns the relative rate of growth of the accumulated foregone income streams. An interesting comparison was made, of the point in time when each band attained a total accumulated value of one dollar per acre. Table 4.5, demonstrates

TABLE 4.5
Comparison of First Dollar Accumulation

Band	Neighboring Management First Dollar Accumulated (Year)	Reserve Management First Dollar Accumulated (Year)
*****	*****	*****
Swan Lake Band	1905	1914
Long Plain Band	1907	1923
Sandy Bay Band	1908	1947

this comparison.

Since development, for the most part, occurred the earliest under neighboring management, band shortfalls under this assumption attained the one dollar accumulated value, first. The Swan Lake shortfalls

reached this milestone the earliest, by 1905, and the Long Plain short-falls were next in 1907 and the Sandy Bay Band by 1908. The one dollar threshold level occurred much later under reserve management assumptions. Swan Lake, once again, was the first to reach this plateau in 1914, Long Plain accumulated this value by 1923 and the Sandy Bay Band finally attained one dollar per acre by 1947.

The post World War II period was characterized by fairly stable wheat prices and interest rates. The relative growth rate of the accumulated foregone income streams during this period, may similarly be described in this manner. Growth was fairly steady, with no large fluctuations. This situation was altered dramatically in 1973 however, as world wheat prices soared. In the space of one year, the price of wheat received by Manitoba farmers more than doubled, from \$1.86/bu. to \$4.30/bu (Table 3.7). The effect on the Portage Bands annual foregone earnings was immense. For example, in 1973, lost incomes accruing to the Swan Lake Band catapulted from \$10.01/acre to \$22.39/acre (Table F2). This large increase is attributable, almost entirely to the rise in the price of wheat.

An even greater income effect was also taking place, during this time, with respect to the total foregone income levels. Between the years 1972 and 1983, total foregone income expanded nearly fourfold, from a level of \$561/acre to \$2,165/acre, in a space of only twelve years. To a large extent, the massive increases in accumulated income are attributed to rising double digit interest rates, which existed during the late 1970's and early 1980's. By 1976, interest on long-term Canada Bonds was approaching nine percent and hit a peak of 15.22 per-

cent in 1981 (Table 3.9). The total sum of yearly income increases alone, between 1972 and 1983, amounted to only \$258.04/acre. At the same time however, the total value of income accumulated during the same period increased by \$1,604.10/acre, (the difference between \$561.14/acre in 1973 and \$2,165.24/acre in 1983). In summary, therefore, it was concluded that interest rates were largely responsible for the rapid accumulation of foregone income during the latter part of the study.

4.3 COMPENSATION BASED ON CURRENT POPULATION ENTITLEMENT

For the purposes of providing comparisons to the types of compensation settlements favored in the past by various governments and commissions, monetary compensation in this study was also based on the principle of current population entitlement. Total monetary compensation for this settlement alternative, is calculated by multiplying the number of acres in the treaty shortfalls (Table 2.7) by the respective current market land values from areas surrounding the three reserves (Table 3.10).

Before proceeding with this calculation however, several adjustments were made to the estimated market prices of land. Market prices were, first of all, adjusted for the costs of improvements, since implicit in this price, is a component reflecting the costs of improving the land. Consequently, compensation is based on land in an unimproved state, as that is the condition land would have been received, under terms of Treaty No.1.

A recent Alberta study, estimated the cost of clearing land to be \$164.50/acre.¹ In that study, costs included those associated with the removal of tree cover, the initial breaking of the land and the working of the land into seed bed condition. Similarly, the costs of improvement under a current population settlement proposal, were set at \$175/acre.

The second adjustment accounted for the percentage of land improved in each of the three reserve shortfall areas. The effective improvement costs were therefore, a function of land currently in a state of improvement. Current percentage estimates of improved lands in municipalities surrounding the three reserves are shown in Table 3.1. The effective market price of land then, equals the current market price of land minus the percentage of land improved times improvement costs (\$175/acre). Effective land market prices and related monetary compen-

TABLE 4.6

Total Monetary Compensation - Current Population

Band	Short Fall (acres)	Market Price of Land (\$/acre)	Costs (\$/ac)	Land Imprvd. (%)	Estimated Unimproved Land Values (\$/acre)	Total Monetary Compensation (\$)
Long Plain	32,494	440	175	74.57	310	10,073,140
Swan Lake	14,601	565	175	82.44	420	6,132,420
Sandy Bay	56,311	150	175	39.50	80	4,504,880
Portage Bands						20,710,440

sation levels for each of the Portage Bands are displayed in Table 4.6.

¹ Alberta Agriculture, Land Clearing and Breaking Equipment Costs, 1981.

It is apparent from the table above, that total monetary compensation is related to both, estimated unimproved land values and the magnitude of the various band shortfalls. Sandy Bay had the largest shortfall area (56,311 acres), yet the lowest monetary compensation value (\$4,504,880). This low level of compensation may be attributed to depressed unimproved land values of only \$80/acre. Long Plain compensation was the highest at \$10,073,140, based on a shortfall of 32,494 acres and estimated unimproved land values of \$310/acre. Swan Lake had the highest unimproved land values (\$420/acre), but the smallest shortfall area (14,601 acres). Total monetary compensation for the Swan Lake Band was estimated at \$6,132,420.

The Portage Bands total outstanding monetary compensation under current population entitlement is \$20,710,440. How did this compensation value compare to other alternatives proposed by the study? With reference to Table 4.3, it is evident that the current population entitlement compensation scenario compared favorably with at least one other study alternative. Compensation, calculated with respect to the twenty-five square miles option (reserve management assumption), was in the approximate range of current population compensation at \$18,512,426. An advantage of 2.2 million dollars favored the current population compensation estimate.

While, as a unit, the Portage Bands gained monetarily under this settlement, there were winners and losers with respect to the individual bands as well. The Sandy Bay Band was a definite winner, as their share of the compensation increased from \$266,336 to \$4,504,880. The Swan Lake Band, on the other hand, was in a losing position since the level of

its compensation dropped from a value of \$9,197,958 to \$6,132,420. The Long Plain Band gained slightly, from compensation of \$9,048,132 to \$10,073,140.

Sandy Bay also gained when current population compensation was compared to the twenty-five square miles alternative (typical management assumption). The gap in levels of compensation was only narrowed somewhat, but still largely favored the current population proposal. The Long Plain and Swan Lake Bands however, were both better off under a twenty-five square miles (typical management) settlement, as compared to the current population alternative.

All bands were better off under the twenty-five miles square options. The large compensation values under these alternatives related primarily to the sheer magnitude of the calculated shortfalls. The eventual choice of an appropriate compensation settlement should thus, take into account the relative benefits accruing to individual bands versus the Portage Band as a whole. As the results of the study have shown, definite advantages exist for the different bands under various settlement strategies.

Chapter Five provides a summary of the thesis. Possible shortcomings of the analysis are discussed and at the end, the conclusions of the study are stated.

Chapter V

SUMMARY, LIMITATIONS AND CONCLUSIONS

5.1 SUMMARY

A recent trend in Canada, regarding native issues, has increasingly focused on the question of the establishment of a compensation basis for the settlement of treaty land claims. In particular, provincial and federal levels of government have agreed upon the necessity of settling specific claims where treaty land entitlement has, as yet, been left unfulfilled. This situation is no more evident than in regards to treaties signed with Indian peoples of the three prairie provinces during the last century. Having agreed upon the necessity to resolve this problem, and having established the validity of various bands' claims, it is now in the hands of the two levels of government to formulate, in close cooperation with native representatives, a comprehensive compensation settlement arrangement which is acceptable to all parties.

One such settlement proposal, the 'Sakatchewan Formula', is based on the concept of current population land entitlement. This proposal has been rejected as a possible solution by the Portage Bands of Manitoba. These particular bands believe that compensation should be based on a historical accounting of income losses from alienated treaty lands, plus the current market value of those particular lands. This thesis has undertaken to develop a compensation settlement proposal which accounts

for both of these factors. The specific objectives of this thesis, restated, were as follows:

1. To provide evidence for the establishment of the legitimacy and the validity of the Portage Bands' Treaty No.1 land claim;
2. To calculate various reserve shortfalls with respect to a number of alternate treaty settlement scenarios;
3. To identify two distinct rates of agricultural development relating to typical and reserve management of lands in the calculated shortfall regions;
4. To establish a methodology whereby incomes foregone from alienated treaty lands may be calculated;
5. To determine, given the above objectives, possible compensation levels which would be available under alternate treaty settlement schemes.

In Chapter One, the Portage Bands' treaty land entitlement problem was structured with respect to its historical background, current significance and present need for solution. At first, the historical background preceding the Portage Bands' signing of Treaty No.1 was examined. Many difficulties, regarding past failures to fulfill land entitlement, may be traced to misunderstandings which occurred during treaty negotiations in the summer of 1871. The main point of contention arising out of these negotiations involved the granting to the Portage reserve of an additional twenty-five square mile tract, which was to enclose the reserve equidistantly at all points. The Portage Bands proclaimed a unique status, demanding the additional acreage apart from other bands at the negotiations. The Portage Bands claim that the actual number of

acres promised within the tract, have never been received and consequently, treaty entitlement has remained unfulfilled.

Chapter One also discusses the current state of the land claim settlement process, along with the roles played by the federal and provincial governments. The crux of the problem, as far as this thesis was concerned, was that even though governments more recently have been willing to negotiate the settlement of unfulfilled treaty entitlement through current population principles, this form of compensation only covers present and future losses. It does not compensate for lost benefits as a result of the bands not having possession of the said lands. It was assumed that levels of agricultural income could have been earned in the years since the date of treaty. In the view of the Portage Bands, compensation should also include some measure of benefits foregone.

Chapter Two calculated various treaty shortfalls for the Portage Bands. The area of these regions depended on which treaty interpretation was utilized. Shortfalls were determined as the difference between the acreage entitlement under various treaty interpretations and the area actually received by the Portage Bands. Treaty interpretation was based upon the revision of Treaty No.1 in 1876. These regions varied according to the interpretation given the twenty-five square mile tract. The first interpretation estimated the tract to be composed of 16,000 acres. Shortfalls under this interpretation ranged from 1,312 acres for the Sandy Bay Band to 7,164 acres for the Long Plain Band. The second interpretation views the additional belt as twenty-five miles square, or 400,000 acres. Total reserve shortages calculated under this interpre-

tation were in the range of 128,031 to 139,599 acres for the various Portage Bands.

Shortfalls for the Portage Bands were also estimated based on current band populations. Reserve acreage deficiencies were calculated as the difference between current population based entitlement and the actual area received. The Sandy Bay Band had the largest current population (2,103) and thus, the largest shortfall (56,311 acres). The Swan Lake Band, on the other hand, had the lowest current population (613), and also the smallest shortfall (14,601 acres).

Chapter Three discusses a number of acceptable methods of calculating incomes or benefits from land. For various reasons these methods proved unsuitable for the determination of foregone incomes from alienated treaty lands. In their place, a more effective method was developed whereby foregone net incomes, based on crop and grazing revenues and development costs, were calculated for each year of the study (1881-1983). The annual foregone income streams were then compounded annually by long term Canada Bond rates to simulate the potential investment earnings of the foregone monies.

Since actual rates of agricultural improvement upon the shortfall lands could not be established for certain, two development rates were assumed by the study. The first, referred to as neighboring management, assumed a path of development which has been followed by farmers on lands surrounding the respective reserves. The second, assumed a rate of development which occurred on reserve lands in the past. The specification of different development rates was important as the resulting

income streams were likely to diverge substantially. Current land values in the shortfalls were also calculated, as they represent estimates of the value of their future returns. The sources and nature of the various data required, were discussed at the end of the chapter.

Chapter Four is composed of the empirical results of this study. In the first section, a comparison of the development rates of the three Portage Bands was made. Under neighboring management assumptions, Swan Lake achieved the greatest levels of development while the Sandy Bay Band had the lowest percentage of land in a cultivated state. These results were found to be related directly to the location and quality of lands found in the respective shortfalls. Under reserve management, the Long Plain Band was considered to have the greatest amount of land in crop production and the Sandy Bay Band once again had the lowest level of improvements.

Numerical results, calculated in terms of monetary compensation for each band, were determined with respect to alternate treaty interpretations (additional reserve tract) and two rates of development. Swan Lake lands achieved the greatest levels of compensation under both development alternatives. This result may be traced to higher quality soils and land values when compared to the other band shortfalls. Sandy Bay shortfalls were estimated to receive the least in compensation benefits.

In another section, the sensitivity of total monetary compensation values to percentage changes in model variables was examined. Changes in the interest rate variable were found to have the greatest impact on

total compensation while percentage changes in pasture capability had the least effect.

Total monetary compensation was also calculated with respect to current population entitlement. Under this settlement alternative, the Long Plain Band received the largest share of the compensation by virtue of a combination of a large shortfall (32,494 acres) and higher unimproved land values (\$310/acre). The Sandy Bay Band, even though having the largest estimated shortfall (56,311 acres), had the lowest monetary compensation value. This was due to a very low unimproved shortfall land value of \$80/acre.

5.2 LIMITATIONS OF THE STUDY

The results of this study have provided a wide range of possible compensation alternatives for the Portage Bands. The estimation of total monetary compensation was based on three vital components: 1) the magnitude of various shortfall areas, 2) the estimated values of foregone income from the respective shortfall areas (1881-1983) and 3) the current estimated market values of land. Estimation of each of these components was carried out given limitations with regard to some of the required data. The potential shortcomings of the study are pointed out in light of the data limitations.

The calculation of treaty shortfall areas was made difficult since actual reserve acreages received were not readily available. Recall that shortfall acreages were determined as the difference between Treaty No.1 entitlement interpretation and the actual number of acres received

by the Portage Bands. Discussion with the Provincial Survey Branch determined that, as of 1984, exact legal definitions of the reserves had yet to be established. Therefore, figures reflecting actual acreages received should be employed cautiously.

The estimation of total foregone income values were dependent, to a large extent, upon the assumed rate of development. Problems, due to large gaps in available information, were reduced somewhat by interpolation between available years. Under the typical management scenario, the period of interpolation was never more than ten years and usually only five years. With respect to reserve management, the periods of interpolation were much larger, since in some instances, only four years of data were available over the entire period of the study.

In practise, large intervals between available data may reduce the reliability of the perceived rate of development which occurred under reserve management. The result of this interpolation was a constant, increasing rate of development upon the reserves. In all likelihood, reserve developments did not occur in this manner. Realistically, significant reserve developments probably took place during short bursts of clearing activity. During other years, little or no improvements were likely evident. The significance of this relates to the study assumption that land contributes very little to foregone income until it has been converted to crop use. The sooner land is in production, the more it contributes to the overall value of foregone income. Interpolation is mentioned as a possible study shortcoming, since it does not determine the actual point in time when the majority of reserve lands were brought into crop production.

The study results were limited by assumptions surrounding the rate at which reserve lands were brought into production. The Portage Bands' agricultural improvement rates were based on reserve lands containing soils of relatively poor quality. These areas were not chosen by the Bands in the first place, and any developments upon these lands were constrained by government regulations dictating their usage.

A more accurate measure of the Portage Bands rate of development must be based on lands which match the quality of lands cultivated by neighboring farmers. The Portage Bands would also have to be put on an equal footing; the same as surrounding operators in terms of their ability to conduct leasing arrangements on their own. Under these conditions, a more precise picture of reserve developments and the resulting potential incomes, would likely emerge.

Towards this end, future study might be directed at a determination of agricultural developments by the Portage Bands at the Indian Gardens. This area of early Indian farming, would meet the necessary criteria for such a study based on a number of factors.

In the first place, these lands are of a superior soil quality than lands currently held by the bands. This would satisfy the need to compare development rates between reserves and neighboring farms on the basis of similar soil productivities.

Secondly, this area was cultivated by the Swan Lake Band during the early post-treaty era. Agricultural improvements were much more successful here during this period than on the actual reserves.

Thirdly, since the Indian Gardens were not formally part of the Portage reserves, they were not subject to regulations governing their use. This would allow for a greater degree of freedom in establishing leasing arrangements with neighboring farmers.

The third component of monetary compensation estimated the current value of shortfall lands. Market sales data of similar properties is generally considered the best indicator of market values for land. Since so few bona fide market transactions were available from the shortfall regions, an alternate method of determining market value was employed. Establishing value on the basis of tax assessment information was a valid alternative. The reader should be aware, however, that distortions may exist in these values due to differences in assessment techniques between assessors and municipalities.

5.3 CONCLUSIONS

A number of conclusions may be stated based on the study results. First of all, it was demonstrated that the Portage Bands have not received their treaty land entitlement, as has been verified through historical documentation and validation by the federal government.

Secondly, regardless of which treaty interpretation was employed, land shortfalls were evident for each band. The magnitude of the calculated monetary compensation values were influenced largely by the size of the respective shortfall areas. Monetary compensation based on a treaty interpretation of an additional reserve tract of twenty-five miles square (400,000 acres), was considerably increased when compared

to the twenty-five square mile (16,000 acres) compensation option. The range in size of the various shortfall areas represent maximum and minimum acreage scenarios.

Thirdly, it was demonstrated that two rates of development have existed in the treaty shortfall regions of the three respective Portage Bands. The two development rates referred to neighboring and reserve management in the area of the shortfalls. As predicted, neighboring management of areas surrounding the reserves proceeded at a more rapid pace. As a result, total foregone incomes were substantially higher under neighboring management. The range of foregone income values, based on the two rates of development, represent high/low estimates of past income losses.

Fourthly, from evidence of historical development in the treaty shortfall areas, it was established that past income losses were indeed experienced as a consequence of the Portage Bands not having possession of the said alienated treaty lands. The value of the foregone income losses, per acre, were considered to be a function of the assumed rate of development plus the agricultural soil capability of the specific areas in question. The more rapid the assumed rate of development and the greater the soil capability, the higher were the values of foregone income.

Finally, it has been the essential premise of this thesis that compensation composed solely of current population entitlement, is insufficient compensation when considering foregone income losses. In retrospect, it is apparent that compensation based on current population

entitlement exceeded at least one of the alternatives representing foregone income losses. In this instance, the alternative in question assumed reserve management and the twenty-five square miles (16,000 acres) treaty adhesion. In the other alternatives, where neighboring management and the larger treaty tract (400,000 acres) were assumed, this compensation easily surpassed that of current population entitlement. In the end, it could not be conclusively established that foregone income based compensation will necessarily always exceed that of compensation based on current population entitlement. Foregone income based compensation was very sensitive to the assumed rate of development and the size of the calculated shortfall. Current population type settlements, on the other hand, are dependent only on current population numbers and current unimproved land values. Advantages to Indian bands for settling on the basis of foregone incomes and current land values definitely exist when large shortfall areas are included and where substantial income losses from these areas may be documented. Should the growth rate of band populations surpass gains in foregone income during subsequent years, future comparison of the two types of settlement may well reveal definite advantages to settling outstanding treaty entitlement on the basis of current population. Until such a time, however, higher estimates of treaty compensation will generally result where measures of foregone income are included.

From the point of view of the Portage Bands, a number of questions arise. For instance, what type of compensation policy is in the best interests of the Portage Bands? As a unit? As individual bands? Or, how should the compensation funds once received, be administered?

Should compensation be received in monetary terms or in the form of additional reserve lands? These are but a number of the important questions which must be addressed by the Portage Bands before a new treaty entitlement compensation policy can effectively be implemented.

The purpose of this thesis was to provide an alternative method of establishing treaty entitlement compensation, based on historical agricultural utilization of the land. Where income or benefit losses have been established, this method is justified. In the final analysis, the range of compensation values calculated by this thesis may be viewed perhaps as an appropriate point of reference from which to begin negotiating a fair and equitable compensation settlement for the Portage Bands. The resolution of the Portage Bands' treaty question will, no doubt, be an important future step in resolving the issue of treaty land entitlement in Canada.

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Appendix A
THE SELKIRK TREATY

THE SELKIRK TREATY.

THIS INDENTURE, made on the eighteenth day of July, in the fifty-seventh year of the reign of our Sovereign Lord King George the Third, and in the year of our Lord eighteen hundred and seventeen, between the undersigned Chiefs and warriors of the Chippeway or Saulteaux Nation and of the Killistine or Cree Nation, on the one part, and the Right Honorable Thomas Earl of Selkirk, on the other part :

Witnesseth, that for and in consideration of the annual present or quit rent hereinafter mentioned, the said Chiefs have given, granted and confirmed, and do, by these presents, give, grant and confirm unto our Sovereign Lord the King all that tract of land adjacent to Red River and Ossiniboyne River, beginning at the mouth of Red River and extending along same as far as Great Forks at the mouth of Red Lake River, and along Ossiniboyne River, otherwise called Rivière des Champignons, and extending to the distance of six miles from Fort Douglas on every side, and likewise from Fort Doer, and also from the Great Forks and in other parts extending in breadth to the distance of two English statute miles back from the banks of the said rivers, on each side, together with all the appurtenances whatsoever of the said tract of land, to have and to hold forever the said tract of land and appurtenances to the use of the said Earl of Selkirk, and of the settlers being established thereon, with the consent and permission of our Sovereign Lord the King, or of the said Earl of Selkirk. Provided always, and these presents are under the express condition that the said Earl, his heirs and successors, or their agents, shall annually pay to the Chiefs and warriors of the Chippeway or Saulteaux Nation, the present or quit rent consisting of one hundred pounds weight of good and merchantable tobacco, to be delivered on or before the tenth day of October at the forks of Ossiniboyne River—and to the Chiefs and warriors of the Killistine or Cree Nation, a like present or quit rent of one hundred pounds of tobacco, to be delivered to them on or before the said tenth day of October, at Portage de la Prairie, on the banks of Ossiniboyne River. Provided always that the traders hitherto established upon any part of the above-mentioned tract of land shall not be molested in the possession of the lands which they have already cultivated and improved, till His Majesty's pleasure shall be known.

In witness whereof the Chiefs aforesaid have set their marks, at the Forks of Red River on the day aforesaid.

(Signed) SELKIRK.
MACHE WHESEAB, His x mark.
Le Sonnant.
MECHKADDEWIKONAIE, " x "
La robe noire.
KAYAJIESKEBINOA, " x "
L'Homme Noir.
PEGOWIS, " x "
OUCKIDOAT, " x "
Le Premier.

Signed in presence of

THOMAS THOMAS.
JAMES BIRD.
F. MATTHEY,
Captain.
P. D. ORSONNENS,
Captain.
MILES MACDONELL.
J. BTE. CHARLES DE LORIMIER.
LOUIS NOLIN,
Interpreter.

Source: Alexander Morris, The Treaties of Canada With The Indians, (Toronto: Belfords, Clarke & Co., Publishers, 1880), pp.298-300.

* Appendix B

PROCLAMATION OF 7 OCTOBER 1763 - RELATING TO INDIANS AND
LANDS RESERVED FOR INDIANS

The part of the Royal Proclamation of 7 October 1763 relating to Indians and lands reserved for Indians:

And whereas it is just and reasonable, and essential to Our Interest and the Security of Our Colonies, that the several Nations or Tribes of Indians, with whom We are connected, and who live under Our Protection, should not be molested or disturbed in the Possession of such Parts of Our Dominions and Territories as, not having been ceded to, or purchased by Us, are reserved to them, or any of them, as their Hunting Grounds; We do therefore, with the Advice of Our Privy Council, declare it to be Our Royal Will and Pleasure, that no Governor or Commander in Chief in any of Our Colonies of Quebec, East Florida, or West Florida, do presume, upon any Pretence whatever, to grant Warrants of Survey, or pass any Patents for Lands beyond the Bounds of their respective Governments, as described in their Commissions; as also, that no Governor or Commander in Chief in any of Our other Colonies or Plantations in America, do presume, for the present, and until Our further Pleasure be known, to grant Warrants of Survey, or pass Patents for any Lands beyond the Heads or Sources of any of the Rivers which fall into the Atlantick Ocean from the West and North West, or upon any Lands whatever, which, not having been ceded to, or purchased by Us as aforesaid, are reserved to the said Indians, or any of them.

And We do further declare it to be Our Royal Will and Pleasure, for the present as aforesaid, to reserve under Our Sovereignty, Protection, and Dominion, for the Use of the said Indians, all the Lands and Territories not included within the Limits of Our said Three New Governments, or within the Limits of the Territory granted to the Hudson's Bay Company, as also all the Lands and Territories lying to the Westward of the Sources of the Rivers which fall into the Sea from the West and North West, as aforesaid; and We do hereby strictly forbid, on Pain of Our Displeasure, all Our loving Subjects from making any Purchases or Settlements whatever, or taking Possession of any of the Lands above reserved, without Our especial Leave and Licence for that Purpose first obtained.

And We do further strictly enjoin and require all Persons whatever, who have either wilfully or inadvertently seated themselves upon any Lands within the Countries above described, or upon any other Lands, which, not having been ceded to, or purchased by Us, are still reserved to the said Indians as aforesaid, forthwith to remove themselves from such Settlements.

And whereas great Frauds and Abuses have been committed in the purchasing Lands of the Indians, to the great Prejudice of Our Interests, and to the great Dissatisfaction of the said Indians; in order therefore to prevent such Irregularities for the future, and to the End that the Indians may be convinced of Our Justice, and determined Resolution to remove all reasonable Cause of Discontent, We do, with the Advice of Our Privy Council, strictly enjoin and require, that no private Person do presume to make any Purchase from the

said Indians of any Lands reserved to the said Indians, within those Parts of Our Colonies where We have thought proper to allow Settlement; but that if, at any Time, any of the said Indians should be inclined to dispose of the said Lands, the same shall be purchased only for Us, in Our Name, at some Publick Meeting or Assembly of the said Indians to be held for that Purpose by the Governor or Commander in Chief of Our Colonies respectively, within which they shall lie; and in case they shall lie within the Limits of any Proprietary Government, they shall be purchased only for the Use and in the Name of such Proprietaries, conformable to such Directions and Instructions as We or they shall think proper to give for that Purpose: And We do, by the Advice of Our Privy Council, declare and enjoin, that the Trade with the said Indians shall be free and open to all Our Subjects whatever; provided that every Person, who may incline to trade with the said Indians, do take out a Licence for carrying on such Trade from the Governor or Commander in Chief of any of Our Colonies respectively, where such Person shall reside; and also give Security to observe such Regulations as We shall at any Time think fit, by Ourselves or by Our Commissaries to be appointed for this Purpose, to direct and appoint for the Benefit of the said Trade; and We do hereby authorize, enjoin, and require the Governors and Commanders in Chief of all Our Colonies respectively, as well Those under Our immediate Government as Those under the Government and Direction of Proprietaries, to grant such Licences without Fee or Reward, taking especial Care to insert therein a Condition, that such Licence shall be void, and the Security forfeited, in case the Person, to whom the same is granted, shall refuse or neglect to observe such Regulations as We shall think proper to prescribe as aforesaid.

And We do further expressly enjoin and require all Officers whatever, as well Military as Those employed in the Management and Direction of Indian Affairs within the Territories reserved as aforesaid for the Use of the said Indians, to seize and apprehend all Persons whatever, who, standing charged with Treasons, Misprisions of Treason, Murders, or other Felonies or Misdemeanors, shall fly from Justice, and take Refuge in the said Territory, and to send them under a proper Guard to the Colony where the Crime was committed of which they stand accused, in order to take their Tryal for the same.

Given at Our Court at Saint James's, the Seventh Day of October, One Thousand seven hundred and sixty three, in the Third Year of Our Reign.

GOD save the KING.

Source: Saskatchewan Law Review, Vol. 38 (1974), pp. 232,233.

Appendix C
TREATY NO.1 - (1871)

TREATY NUMBER ONE.

ARTICLES OF A TREATY, made and concluded this third day of August, in the year of our Lord, one thousand eight hundred and seventy-one, between Her Most Gracious Majesty the Queen of Great Britain and Ireland, by Her Commissioner Wemyss M. Simpson, Esquire, of the one part, and the Chippewa and Swampy Cree Tribes of Indians, inhabitants of the country within the limits hereinafter defined and described by their Chiefs, chosen and named as hereinafter mentioned, of the other part :

Whereas, all the Indians inhabiting the said country have, pursuant to an appointment made by the said Commissioner, been convened at the Stone Fort, otherwise called Lower Fort Garry, to deliberate upon certain matters of interest to Her Most Gracious Majesty of the one part, and to the said Indians of the other ; and whereas the said Indians have been notified and informed by Her Majesty's said Commissioner, that it is the desire of Her Majesty to open up to settlement and immigration a tract of country bounded and described as hereinafter mentioned, and to obtain the consent thereto of her Indian subjects inhabiting the said tract and to make a treaty and arrangements with them, so that there may be peace and good will between them and Her Majesty, and that they may know and be assured of what allowance they are to count upon and receive, year by year, from Her Majesty's bounty and benevolence.

And whereas the Indians of the said tract, duly convened in Council as aforesaid, and being requested by Her Majesty's said Commissioner to name certain Chiefs and head men, who should be authorized on their behalf to conduct such negotiations, and sign any treaty to be founded thereon, and to become responsible to Her Majesty for the faithful performance, by their respective bands, of such obligations as should be assumed by them the said Indians, have thereupon named the following persons for that purpose, that is to say : Mis-koo-kenew, or Red Eagle, (Henry Prince) ; Ka-ke-ka-penais, or Bird for ever ; Na-sha-ke-penais, or Flying down Bird ; Na-na-wa-nana, or Centre of Bird's Tail ; Ke-we-tayash, or Flying round ; Wa-ko-wush, or Whip-poor-Will ; Oo-za-we-kwun, or Yellow Quill ; and thereupon, in open Council, the different bands have presented their respective Chiefs to His Excellency the Lieutenant-Governor of the Province of Manitoba, and of the North-West Territory, being present at such Council, and to the said Commissioner, as the Chiefs and head men for the purposes aforesaid, of the respective bands of Indians inhabiting the said District, hereinafter described ; and whereas the said Lieutenant-Governor and the said Commissioner, then and there received and acknowledged the persons so presented as Chiefs and head men, for the purpose aforesaid ; and whereas the said Commissioner has proceeded to negotiate a treaty with the said Indians, and the same has finally been agreed upon and concluded as follows, that is to say :

The Chippewa and Swampy Cree Tribes of Indians, and all other the Indians inhabiting the district hereinafter described and defined, do hereby cede, release, surrender, and yield up to Her Majesty the Queen, and her successors for ever, all the lands included within the following limits, that is to say : Beginning at the International boundary line near its junction with the Lake of the Woods, at a point due north from the centre of Roseau Lake, thence to run due north to the centre of Roseau Lake ; thence northward to the centre of White Mouth Lake, otherwise called White Mud Lake ; thence by the middle of the lake and the middle of the river issuing therefrom, to the mouth thereof in Winnipeg River ; thence by the Winnipeg River to its mouth ; thence westwardly, including all the islands near the south end of the lake, across the lake to the mouth of the Drunken River ; thence westwardly, to a point on Lake Manitoba, half way between Oak Point and the mouth of Swan Creek ; thence across Lake Manitoba, on a line due west to its western shore ; thence in a straight line to the crossing of the Rapids on the Assiniboine ; thence due south to the International boundary line, and thence easterly by the said line to the place of beginning ; to have and to hold the same to Her said Majesty the Queen, and her successors for ever ; and Her Majesty the Queen, hereby agrees and undertakes to lay aside and reserve for the sole and exclusive use of the Indians, the following tracts of land, that is to say : For the use of the Indians belonging to the band of

which Henry Prince, otherwise called Mis-koo-ke-new, is the Chief, so much of land on both sides of the Red River, beginning at the south line of St. Peter's Parish, as will furnish one hundred and sixty acres for each family of five, or in that proportion for larger or smaller families; and for the use of the Indians of whom Na-sha-ke-penais, Na-na-wa-nanan, Ke-we-tayash, and Wa-ko-wush, are the Chiefs, so much land on the Roseau River, as will furnish one hundred and sixty acres for each family of five, or in that proportion for larger or smaller families, beginning from the mouth of the river; and for the use of the Indians, of which Ka-ke-ka-penais is the Chief, so much land on the Winnipeg River, above Fort Alexander, as will furnish one hundred and sixty acres for each family of five, or in that proportion for larger or smaller families; beginning at a distance of a mile or thereabout above the Fort; and for the use of the Indians, of whom Oo-za-we-Kwun is Chief, so much land on the south and east side of the Assiniboine, about twenty miles above the Portage, as will furnish one hundred and sixty acres for each family of five, or in that proportion for larger or smaller families, reserving also a further tract enclosing said reserve, to comprise an equivalent to twenty-five square miles of equal breadth, to be laid out round the reserve; it being understood, however, that if at the date of the execution of this treaty, there are any settlers within the bounds of any lands reserved by any band, Her Majesty reserves the right to deal with such settlers as she shall deem just, so as not to diminish the extent of land allotted to the Indians.

And with a view to show the satisfaction of Her Majesty with the behaviour and good conduct of her Indians, parties to this treaty, she hereby, through her Commissioner, makes them a present of three dollars for each Indian man, woman and child belonging to the bands here represented.

And further, Her Majesty agrees to maintain a school on each reserve hereby made, whenever the Indians of the reserve should desire it.

Within the boundary of Indian Reserves, until otherwise enacted by the proper legislative authority, no intoxicating liquor shall be allowed to be introduced or sold, and all laws now in force or hereafter to be enacted to preserve Her Majesty's Indian subjects, inhabiting the reserves or living elsewhere, from the evil influence of the use of intoxicating liquors, shall be strictly enforced.

Her Majesty's Commissioner shall, as soon as possible after the execution of this treaty, cause to be taken an accurate census of all the Indians inhabiting the district above described, distributing them in families, and shall in every year ensuing the date hereof, at some period during the month of July in each year, to be duly notified to the Indians, and at or near the respective reserves, pay to each Indian family of five persons the sum of fifteen dollars Canadian currency, or in like proportion for a larger or smaller family, such payment to be made in such articles as the Indians shall require of blankets, clothing, prints (assorted colors), twine or traps,

at the current cost price in Montreal, or otherwise, if Her Majesty shall deem the same desirable in the interests of Her Indian people, in cash.

And the undersigned Chiefs do hereby bind and pledge themselves and their people strictly to observe this treaty, and to maintain perpetual peace between themselves and Her Majesty's white subjects, and not to interfere with the property or in any way molest the persons of Her Majesty's white or other subjects.

In witness whereof Her Majesty's said Commissioner and the said Indian Chiefs have hereunto subscribed and set their hand and seal, at the Lower Fort Garry, this day and year herein first above mentioned.

Signed)	WEMYSS M. SIMPSON, <i>Indian Commissioner.</i>	[L. S.]
	MIS-KOO-KE-NEW (or Red Eagle) (Henry Prince).	His x mark.
	K.A.KE-KA-PENAI (or Bird Forever) (William Pennefather).	" x "
	NA-SHA-KE-PENAI (or Flying down Bird).	" x "
	NA-NA-WA-NANAN (or Centre of Bird's Tail).	" x "
	KE-WE-TAY-ASH (or Flying Round).	" x "
	WA-KO-WUSH (or Whip-poor-will).	" x "
	OI-ZA-WE-KWUN (or Yellow Quill).	" x "

Signed, sealed and delivered in the presence of (the same having been first read and explained)—

(Signed) ADAMS G. ARCHIBALD,
Lieut.-Gov. of Manitoba and the N.-W. Territories.
JAMES MCKAY, P.L.C.
A. G. IRVINE,
Major.
ABRAHAM COWLEY.
DONALD GUNN, M.L.C.
THOMAS HOWARD.
HENRY COCHRANE.
JAMES MCARRISTER.
HUGH MCARRISTER.
E. ALICE ARCHIBALD.
HENRY BOUTHILLIER.

Source: Alexander Morris. The Treaties of Canada With The Indians.
1880, pp. 313-316.

Appendix D

THE TREATY NO.1 REVISION - (1876)

Whereas the whole Band of Indians, of whom Oi-ya-wo-kwin was Chief, were parties to the treaty with Her Majesty the Queen, made at the Stone Fort on the 2nd day of August, 1871.

And whereas there was some misunderstanding as to the terms of the said treaty, and in order to do away with the same, the Governor General of Canada, on the 20th of April, 1875, approved a Minute of the Privy Council, a copy whereof is attached hereto, for the purpose of adjusting all difficulties; which Minute has been accepted by all the Bands of Indians, parties thereto, except the first-mentioned Band.

And whereas the said Band are now assembled, and have had the said Minute communicated to them, and are satisfied therewith;

It is hereby agreed between Her Majesty, represented by the Hon. Alexander Morris, Lieutenant-Governor of Manitoba and the North-West Territories, subject to Her Majesty's approval, and all the Indians who have been heretofore included in said Band as follows:—

1st. The said Indians accept of the said Order in Council as a satisfactory settlement, and agree to continue bound by the said treaty as supplemented by the said Order in Council.

2nd. Owing to the size of the said original Band, and the divisions existing among the Indians composing it, the said Band is divided into two Bands, namely, the Band composed of those who adhere to Oo-ya-wo-kwin and the Band composed of those who adhere to Short Bear.

3rd. Inasmuch as there has been a difference of opinion between the said Indians and the Commissioner of Indian affairs as to the Reserve to be allotted to the said Indians and its locality, a Reserve having been surveyed on the south side of the River Assiniboine, but not accepted by the said Indians, and it is desirable to settle all matters with the said Indians, it is hereby agreed with regard to the Reserve promised by the said treaty, that to the band of Yellow Quill, a Reserve shall be assigned by Her Majesty's Commissioner or by a Commissioner appointed for the purpose, to be selected in the region of country they now inhabit, and to be approved of by the said band, but said Reserve shall not be nearer to the Portage than twenty miles, and it is further agreed that a Reserve shall be assigned to the Band, of which Short Bear is Chief, by Her Majesty's said Commissioner or special Commissioner on the north side of the Assiniboine River, in the vicinity of the Long Plain. And it is further agreed that the Indians residing heretofore, and now in the neighbourhood of the White Mud River, shall be recognized as a distinct Band, and Na-wa-che-way-ka-pow shall be accepted as their Chief, that as some of them have settled there and desire to remain, those of them who have substantial improvements shall be protected in their holdings, except in cases where the land so occupied has already been sold or granted by the Department of the Interior to other parties, but the said Indians will not be allowed to occupy or take up any other lands, than those already *bona fide* occupied by each of them.

And with regard to the remainder of the Band, a Reserve shall be selected for them in some suitable locality, by Her Majesty's said Commissioner or special Commissioner, with the approval of the said band; it being expressly understood that Her Majesty reserves with regard to all the said Reserves, the right to deal with any settler who may be found after the selection of any Reserve theretofore settled within its limits as she shall deem just, but so as not to diminish the extent of lands allotted to the Indians, and inasmuch, as by the said treaty, the Reserve to be allotted to the original band, was one hundred and sixty acres of land for each family of five, or in that proportion for larger or smaller families, together with a tract enclosing the same equivalent to twenty-five square miles of equal breadth, it is hereby agreed that the separate Reserves to be granted to the said three Bands, shall contain an amount of land equal to that stipulated to be given to the original Band, and such land shall be assigned to each Band in proportion to their relative numbers so that each Band shall receive their fair and just share of the said land, but in case any of the said Reserves embrace any river or lake, or any part thereof, the free navigation and free access to the shores thereof, for all Her Majesty's subjects, is hereby expressly

reserved; it is further agreed that the head men for each of the two first Bands shall be four instead of two as written in the said Order in Council, but there shall be only two head men for the White Mud Band.

In witness whereof, Her Majesty's Chief Commissioner of Indian affairs for the Manitoba Superintendency, the said Honorable Alexander Morris, and the Indian Chiefs and their Councillors, have hereunto subscribed and set there hands at the Long Plain on the Assiniboine, this twentieth day of June, in the year of our Lord one thousand eight hundred and seventy-six.

ALEXANDER MORRIS.
Lieutenant-Governor.

Oo-QA-WE-KWIK.	his
<i>Chief.</i>	x
	mark.
	his
Oo-SA-WE-PEEC-KECE.	x
	mark.
	his
WAY-RE-WAT-KEE.	x
	mark.
	his
WEE-AN-NE-TAH-COUSZ	x
	mark.
KES-KEE-MAH-QUA, OF	his
SHORT BEAR,	x
<i>Chief.</i>	mark.
	his
KE-CHE-WEZ-SE.	x
	mark.
	his
PETER PRINCE.	x
	mark.
	his
NA-WA-CHE-WAY-KA-POW,	x
<i>Chief.</i>	mark.
	his
BAPTISTE SPENCE.	X
	mark

Signed, sealed and delivered: The said having been first read and explained to them by Malcolm Cumming, and a copy of the said Minute in Council, delivered to each of the said Chiefs in the presence of.

JAS. F. GRAHAM.
J. LESTOCK REID.
MALCOLM CUMMING.
HARDY COOK.
F. C. MORRIS,
E. PELLY,
JOHN DUGAL MCKAY.
his
KAS-A-WAY. X
mark.

Appendix E

CANADA LAND INVENTORY - AGRICULTURAL LAND CLASSIFICATION
SYSTEM

THE AGRICULTURAL LAND CLASSIFICATION SYSTEM

In the CLI classification system of land capability for agriculture, mineral soils are grouped into seven classes according to their potential and limitations for agricultural use. The most highly rated soils, those having no significant limitations for cropping, are designated Class 1. Soils with no agricultural potential are designated Class 7. Soils designated Classes 2 to 6 indicate, in declining order, capability for agriculture. A separate category has been established for organic soils, category 0. Summary descriptions of each agricultural capability class follow.

Class 1

Soils of this class have no significant limitations for crop use. They are generally level, or have very gentle slopes, deep, well-to-imperfectly drained and have good water-holding capacity.

Class 2

Soils of this class have moderate limitations that restrict the range of crops or require moderate conservation practices. Class 2 soils are deep and have good water-holding capacity. Limitations are moderate and crops can be grown on these soils with little difficulty. The limitations of the soils in this class may be for example, adverse regional climate, moderate erosion, poor soil structure or low fertility which is readily correctable.

Class 3

Soils of this class have moderately severe limitations that restrict the range of crops or require special conservation practices. Although these soils have more severe limitations than those in Class 2, they are still fair to moderately high in productivity for a fairly wide range of field crops adapted to the region. Limitations may be a combination of those described under Class 2, or are of the following; moderate climatic limitations, moderately severe erosion, intractable soil mass or very slow permeability, correctable low fertility, moderate to steep slopes, frequent runoff accompanied by crop damage, stoniness necessitating some clearing, etc.

Classes 1 to 3 are considered to be capable of sustained annual production of common cultivated crops.

Class 4

Soils of this class have severe limitations that either restrict the range of crops or require special conservation practices or both. Soils in Class 4 have such limitations that they are suitable for only a few crops, or the yield for a range of crops is low, or crop failure is high. These soils are low to medium in productivity for a narrow range of crops but may have higher productivity for a specially adapted crop. Limitations may include steep slopes, severe past erosion, frequent surface runoff - with severe effects on crops, severe salinity, extreme stoniness, or severe aridity.

Class 5

Soils of this class have very severe limitations that restrict their capability to produce perennial forage crops. Class 5 soils have such serious physical, climatic or other limitations that they are not capable of use for sustained production of annual field crops. Class 5 soils are amenable, however, to improvement and, with intensive management practices, may be used for permanent pasture. The limitations described in Classes 2 to 4 may be present for Class 5 areas. Cultivated field crops may be grown in Class 5 areas where adverse climate is the main limitation but crop failures will occur under average conditions. Soils of Classes 4 and 5 are considered suitable for most varieties of forage crops.

Class 6

Soils of this class are capable only of producing perennial forage crops, and improvement practices are not feasible. Class 6 soils have some natural, sustained grazing capacity for farm animals, but they have such serious climatic or other physical limitations that the application of improvement practices is impractical. Although Class 6 soils are marginal for any agricultural use, they can often support periodic rough grazing.

Class 7

Soils of this class have no capability for arable culture or permanent pasture. Combinations of severe climatic and physical limitations preclude economic use of the land for agriculture. All classified areas, except organic soils, and soils not designated as Classes 1 to 6, are placed in this class. Class 7 therefore includes areas of exposed rock and bodies of water too small to delineate on maps.

Appendix F

THE PORTAGE BANDS' ANNUAL AND ACCUMULATED FOREGONE INCOME

TABLE F.1

Long Plain - Neighboring Management

Year	Income Losses	Accumultd Foregone	Year	Income Losses	Accumultd Foregone	Year	Income Losses	Accumultd Foregone
Year i	Year i	Income	Year i	Year i	Income	Year i	Year i	Income
(\$/ac)	(\$/ac)	(\$/ac)	(\$/ac)	(\$/ac)	(\$/ac)	(\$/ac)	(\$/ac)	(\$/ac)
1881	----	----	1916	.37	5.01	1951	2.78	104.78
1882	----	----	1917	.80	6.16	1952	2.97	111.58
1883	----	----	1918	1.34	7.93	1953	2.62	118.42
1884	.001	.001	1919	1.61	10.08	1954	1.54	123.78
1885	.001	.002	1920	1.34	12.15	1955	2.32	130.06
1886	.001	.004	1921	.57	13.43	1956	3.03	137.90
1887	-.001	.003	1922	.94	15.13	1957	2.26	145.92
1888	-.001	.002	1923	.43	16.36	1958	2.84	154.87
1889	-.001	.001	1924	1.67	18.91	1959	2.83	165.70
1890	-.002	-.001	1925	1.54	21.45	1960	4.15	178.65
1891	-.002	-.004	1926	1.74	24.31	1961	2.09	189.87
1892	-.002	-.01	1927	.82	26.23	1962	3.78	203.55
1893	.003	-.01	1928	1.09	28.61	1963	2.23	216.26
1894	-.005	-.02	1929	1.15	30.95	1964	4.58	232.28
1895	-.005	-.02	1930	.77	33.18	1965	5.00	249.64
1896	.002	-.02	1931	.39	35.39	1966	4.63	268.74
1897	.008	-.01	1932	.39	37.51	1967	5.54	290.57
1898	.02	.01	1933	.49	39.75	1968	5.10	315.64
1899	.03	.04	1934	.83	41.99	1969	3.45	343.28
1900	.02	.06	1935	.45	43.99	1970	3.05	373.72
1901	.07	.14	1936	.83	46.16	1971	4.81	404.85
1902	.10	.24	1937	1.50	49.18	1972	6.55	441.14
1903	.08	.33	1938	.70	51.42	1973	13.56	489.08
1904	.12	.47	1939	.81	53.88	1974	10.87	544.44
1905	.13	.62	1940	.87	56.54	1975	12.45	607.18
1906	.15	.79	1941	.84	59.16	1976	9.91	673.74
1907	.17	1.00	1942	1.73	62.75	1977	11.05	744.37
1908	.20	1.25	1943	2.14	66.85	1978	15.64	830.46
1909	.24	1.55	1944	1.69	70.59	1979	18.34	935.46
1910	.20	1.82	1945	2.19	74.91	1980	15.76	1,069.93
1911	.25	2.15	1946	2.74	79.68	1981	19.66	1,255.42
1912	.33	2.57	1947	1.79	83.56	1982	21.63	1,459.15
1913	.31	3.01	1948	2.87	88.97	1983	22.90	1,656.79
1914	.37	3.52	1949	1.92	93.50			
1915	.67	4.41	1950	2.48	98.72			

TABLE F.2

Swan Lake Band - Neighboring Management (25 Sq.Miles Option)

Year	Income Losses Year i (\$/ac)	Accumultd Foregone Income (\$/ac)	Year	Income Losses Year i (\$/ac)	Accumultd Foregone Income (\$/ac)	Year	Income Losses Year i (\$/ac)	Accumultd Foregone Income (\$/ac)
1881	---	---	1916	.10	3.59	1951	3.96	117.66
1882	---	---	1917	.28	4.10	1952	5.15	127.18
1883	---	---	1918	.60	4.97	1953	5.39	137.48
1884	-.01	-.01	1919	.85	6.15	1954	2.42	144.34
1885	-.01	-.01	1920	.84	7.44	1955	4.52	153.54
1886	-.01	-.02	1921	.33	8.21	1956	4.17	163.41
1887	-.005	-.02	1922	.73	9.42	1957	4.39	174.70
1888	-.001	-.02	1923	.40	10.33	1958	4.51	186.58
1889	.01	-.01	1924	1.52	12.43	1959	4.68	200.95
1890	.01	.01	1925	1.85	14.97	1960	5.06	216.68
1891	.01	.03	1926	2.34	18.15	1961	1.98	229.70
1892	.02	.03	1927	1.55	20.56	1962	7.59	249.41
1893	.01	.03	1928	2.00	23.63	1963	5.46	267.84
1894	-.001	.03	1929	1.36	26.00	1964	7.00	289.08
1895	-.01	.02	1930	1.20	28.43	1965	6.68	311.17
1896	-.01	.02	1931	.28	30.26	1966	7.13	336.41
1897	.01	.03	1932	.67	32.43	1967	6.77	363.56
1898	.02	.05	1933	.68	34.64	1968	6.87	395.44
1899	.03	.09	1934	.67	36.53	1969	5.90	431.76
1900	.02	.11	1935	.56	38.45	1970	5.85	472.23
1901	.09	.21	1936	.80	40.41	1971	7.70	513.29
1902	.15	.37	1937	1.94	43.70	1972	10.01	561.14
1903	.14	.53	1938	1.04	46.12	1973	22.39	627.64
1904	.20	.76	1939	.98	48.58	1974	13.78	698.51
1905	.19	.99	1940	1.25	51.47	1975	16.98	780.10
1906	.18	1.22	1941	1.36	54.46	1976	13.55	866.50
1907	.18	1.46	1942	2.59	58.80	1977	17.14	960.53
1908	.19	1.71	1943	3.69	64.38	1978	22.34	1,073.87
1909	.20	1.98	1944	3.64	70.06	1979	26.49	1,212.71
1910	.15	2.21	1945	3.80	76.03	1980	23.37	1,390.34
1911	.16	2.46	1946	4.61	82.75	1981	31.01	1,637.68
1912	.15	2.73	1947	3.77	88.74	1982	32.17	1,907.97
1913	.08	2.93	1948	5.07	96.56	1983	28.19	2,165.24
1914	.01	3.06	1949	3.34	102.77			
1915	.09	3.32	1950	4.19	110.02			

TABLE F.3

Swan Lake Band - Neighboring Management (25 Miles Sq. Option)

Year	Income Losses Year i (\$/ac)	Accumultd Foregone Income (\$/ac)	Year	Income Losses Year i (\$/ac)	Accumultd Foregone Income (\$/ac)	Year	Income Losses Year i (\$/ac)	Accumultd Foregone Income (\$/ac)
1881	---	---	1916	.11	3.86	1951	4.26	126.99
1882	---	---	1917	.31	4.41	1952	5.55	137.26
1883	---	---	1918	.65	5.36	1953	5.80	148.36
1884	-.01	-.01	1919	.92	6.63	1954	2.61	155.77
1885	-.01	-.01	1920	.91	8.02	1955	4.89	165.70
1886	-.01	-.02	1921	.36	8.86	1956	4.50	176.35
1887	-.001	-.02	1922	.79	10.16	1957	4.74	188.53
1888	.01	-.02	1923	.44	11.14	1958	4.86	201.34
1889	.01	-.01	1924	1.64	13.40	1959	5.04	216.85
1890	.01	.01	1925	1.99	16.14	1960	6.16	234.56
1891	.02	.03	1926	2.53	19.57	1961	3.30	249.88
1892	.01	.03	1927	1.68	22.18	1962	7.76	270.80
1893	-.001	.04	1928	2.17	25.50	1963	6.03	290.92
1894	-.01	.03	1929	1.48	28.06	1964	7.42	313.79
1895	-.01	.02	1930	1.29	30.69	1965	6.70	337.20
1896	.001	.02	1931	.30	32.67	1966	7.78	364.60
1897	.01	.03	1932	.73	35.01	1967	7.57	394.28
1898	.03	.06	1933	.73	37.39	1968	6.96	428.32
1899	.03	.09	1934	.72	39.43	1969	5.79	467.02
1900	.03	.12	1935	.60	41.50	1970	5.78	510.20
1901	.10	.23	1936	.85	43.61	1971	8.07	554.29
1902	.16	.40	1937	2.10	47.16	1972	10.08	605.17
1903	.15	.57	1938	1.12	49.77	1973	23.41	676.10
1904	.22	.82	1939	1.05	52.43	1974	15.25	752.88
1905	.21	1.06	1940	1.35	55.54	1975	18.57	841.12
1906	.20	1.31	1941	1.47	58.78	1976	14.36	934.01
1907	.20	1.57	1942	2.80	63.47	1977	18.82	1,035.72
1908	.20	1.84	1943	3.98	69.48	1978	24.12	1,158.08
1909	.21	2.13	1944	3.94	75.63	1979	29.43	1,308.75
1910	.16	2.39	1945	4.11	82.07	1980	25.46	1,500.72
1911	.17	2.65	1946	4.99	89.34	1981	33.15	1,767.33
1912	.17	2.94	1947	4.07	95.81	1982	33.30	2,057.39
1913	.09	3.15	1948	5.46	104.24	1983	29.96	2,333.45
1914	.01	3.30	1949	3.61	110.95			
1915	.10	3.57	1950	4.51	118.76			

TABLE F.4

Sandy Bay Band - Neighboring Management (25 Sq.Miles Option)

Year	Income Losses	Accumultd Foregone Income	Year	Income Losses	Accumultd Foregone Income	Year	Income Losses	Accumultd Foregone Income
	Year i	Income		Year i	Income		Year i	Income
	(\$/ac)	(\$/ac)		(\$/ac)	(\$/ac)		(\$/ac)	(\$/ac)

1881	---	---	1916	.08	2.12	1951	.52	17.78
1882	---	---	1917	.19	2.45	1952	.68	19.12
1883	---	---	1918	.19	2.80	1953	.62	20.47
1884	-.02	-.02	1919	.18	3.14	1954	.39	21.52
1885	-.02	-.03	1920	.15	3.50	1955	.17	22.37
1886	-.01	-.05	1921	.04	3.74	1956	.49	23.69
1887	-.004	-.05	1922	.05	3.99	1957	.63	25.32
1888	.01	-.04	1923	.03	4.22	1958	.59	26.98
1889	.02	-.03	1924	.15	4.58	1959	.70	29.08
1890	.03	0.00	1925	.15	4.95	1960	.60	31.22
1891	.04	.04	1926	.16	5.35	1961	.71	33.54
1892	.03	.07	1927	.09	5.69	1962	.21	35.47
1893	.03	.10	1928	.15	6.12	1963	.99	38.32
1894	.03	.13	1929	.11	6.47	1964	.97	41.32
1895	.05	.19	1930	.07	6.84	1965	.67	44.18
1896	.03	.22	1931	.04	7.25	1966	.66	47.39
1897	.03	.26	1932	.04	7.65	1967	.85	51.11
1898	.04	.32	1933	.05	8.05	1968	.93	55.56
1899	.04	.37	1934	.07	8.40	1969	.84	60.67
1900	.02	.41	1935	.03	8.74	1970	.76	66.28
1901	.06	.48	1936	.08	9.08	1971	.83	71.78
1902	.06	.56	1937	.09	9.46	1972	1.06	78.10
1903	.04	.63	1938	.05	9.81	1973	2.62	86.82
1904	.05	.71	1939	.08	10.20	1974	1.42	96.10
1905	.05	.79	1940	.05	10.59	1975	1.71	106.64
1906	.05	.87	1941	.07	10.98	1976	.94	117.46
1907	.05	.96	1942	.12	11.44	1977	2.64	130.54
1908	.06	1.05	1943	.15	11.94	1978	3.35	146.30
1909	.06	1.16	1944	.16	12.46	1979	4.06	165.71
1910	.05	1.25	1945	.19	13.02	1980	4.39	191.32
1911	.05	1.35	1946	.25	13.62	1981	4.93	226.13
1912	.06	1.48	1947	.18	14.16	1982	5.63	264.81
1913	.06	1.60	1948	.44	15.02	1983	5.13	301.76
1914	.07	1.74	1949	.30	15.76			
1915	.11	1.94	1950	.47	16.70			

TABLE F.5

Sandy Bay Band - Neighboring Management (25 Miles Sq. Option)

Year	Income Losses Year i (\$/ac)	Accumultd Foregone Income (\$/ac)	Year	Income Losses Year i (\$/ac)	Accumultd Foregone Income (\$/ac)	Year	Income Losses Year i (\$/ac)	Accumultd Foregone Income (\$/ac)
1881	---	---	1916	.09	2.12	1951	.55	18.53
1882	---	---	1917	.21	2.46	1952	.62	19.83
1883	---	---	1918	.21	2.83	1953	.34	20.91
1884	-.02	-.02	1919	.20	3.19	1954	.13	21.71
1885	-.02	-.03	1920	.16	3.57	1955	.46	22.87
1886	-.01	-.05	1921	.04	3.81	1956	.50	24.22
1887	-.004	-.05	1922	.05	4.07	1957	.49	25.73
1888	.01	-.04	1923	.03	4.30	1958	.59	27.39
1889	.02	-.02	1924	.16	4.68	1959	.53	29.34
1890	.02	0.00	1925	.16	5.07	1960	.58	31.48
1891	.04	.04	1926	.17	5.50	1961	.19	33.27
1892	.03	.07	1927	.10	5.85	1962	.86	35.87
1893	.02	.10	1928	.16	6.29	1963	.58	38.31
1894	.03	.13	1929	.12	6.67	1964	.59	40.91
1895	.07	.20	1930	.08	7.05	1965	.68	43.76
1896	.02	.23	1931	.04	7.47	1966	1.15	47.47
1897	.03	.28	1932	.05	7.89	1967	.77	51.10
1898	.04	.33	1933	.05	8.31	1968	.56	55.15
1899	.03	.38	1934	.07	8.67	1969	.81	60.20
1900	.02	.42	1935	.04	9.02	1970	.94	65.97
1901	.06	.49	1936	.08	9.38	1971	.56	71.16
1902	.06	.57	1937	.10	9.77	1972	.86	77.23
1903	.04	.63	1938	.06	10.13	1973	2.87	86.15
1904	.05	.71	1939	.08	10.54	1974	1.35	95.28
1905	.05	.79	1940	.06	10.95	1975	1.30	105.31
1906	.05	.87	1941	.07	11.36	1976	1.16	116.25
1907	.05	.96	1942	.13	11.83	1977	3.02	129.65
1908	.05	1.06	1943	.16	12.35	1978	3.65	145.66
1909	.06	1.16	1944	.17	12.91	1979	4.89	165.91
1910	.05	1.25	1945	.21	13.50	1980	5.20	192.46
1911	.05	1.35	1946	.27	14.13	1981	4.83	227.32
1912	.06	1.47	1947	.20	14.70	1982	4.80	265.22
1913	.06	1.60	1948	.47	15.62	1983	6.87	304.17
1914	.07	1.73	1949	.33	16.40			
1915	.10	1.93	1950	.51	17.40			

TABLE F.6

Long Plain Band - Reserve Management

Year	Income Losses	Accumultd Foregone Income	Year	Income Losses	Accumultd Foregone Income	Year	Income Losses	Accumultd Foregone Income
Year i	Year i	Year i	Year i	Year i	Year i	Year i	Year i	Year i
(\$/ac)	(\$/ac)	(\$/ac)	(\$/ac)	(\$/ac)	(\$/ac)	(\$/ac)	(\$/ac)	(\$/ac)
1881	----	----	1916	-.002	.19	1951	1.74	25.80
1882	----	----	1917	.02	.22	1952	1.87	28.65
1883	----	----	1918	.07	.31	1953	1.67	31.44
1884	.002	.002	1919	.13	.47	1954	1.08	33.56
1885	.001	.003	1920	.14	.64	1955	1.63	36.30
1886	.002	.006	1921	.07	.75	1956	2.16	39.85
1887	.001	.007	1922	.12	.92	1957	1.80	43.36
1888	.001	.008	1923	.06	1.03	1958	2.14	47.37
1889	.001	.010	1924	.26	1.35	1959	2.18	52.06
1890	.001	.012	1925	.26	1.69	1960	2.80	57.71
1891	.001	.014	1926	.33	2.11	1961	1.59	62.29
1892	.002	.016	1927	.16	2.38	1962	2.87	68.49
1893	.002	.018	1928	.23	2.73	1963	1.69	73.76
1894	.002	.021	1929	.25	3.10	1964	3.47	81.22
1895	.003	.025	1930	.18	3.43	1965	3.81	89.47
1896	.003	.029	1931	.10	3.72	1966	3.56	98.33
1897	.004	.034	1932	.11	4.02	1967	4.20	108.62
1898	.005	.041	1933	.15	4.37	1968	3.82	120.02
1899	.005	.048	1934	.29	4.82	1969	2.55	131.86
1900	.004	.054	1935	.16	5.17	1970	2.30	144.77
1901	.010	.070	1936	.32	5.65	1971	3.68	158.77
1902	.010	.080	1937	.59	6.44	1972	5.15	175.77
1903	.010	.100	1938	.28	6.93	1973	10.94	200.82
1904	.010	.110	1939	.34	7.50	1974	9.01	228.50
1905	.010	.130	1940	.37	8.13	1975	10.44	260.53
1906	.020	.150	1941	.38	8.77	1976	8.43	293.64
1907	.020	.180	1942	.78	9.84	1977	9.97	330.03
1908	.020	.210	1943	.98	11.15	1978	14.98	377.00
1909	.020	.240	1944	.78	12.29	1979	18.73	436.13
1910	.020	.270	1945	1.05	13.73	1980	15.87	508.42
1911	.002	.280	1946	1.37	15.50	1981	19.52	608.29
1912	-.020	.270	1947	.98	16.90	1982	17.68	715.23
1913	-.040	.240	1948	1.70	19.15	1983	21.34	823.42
1914	-.040	.210	1949	1.24	20.98			
1915	-.030	.180	1950	1.63	23.25			

TABLE F.7

Swan Lake Band - Reserve Management (25 Sq.Miles Option)

Year	Income Losses	Accumultd Foregone	Year	Income Losses	Accumultd Foregone	Year	Income Losses	Accumultd Foregone
	Year i	Income		Year i	Income		Year i	Income
	(\$/ac)	(\$/ac)		(\$/ac)	(\$/ac)		(\$/ac)	(\$/ac)
1881	-----	-----	1916	.10	1.39	1951	1.44	38.87
1882	-----	-----	1917	.21	1.69	1952	1.85	42.18
1883	-----	-----	1918	.36	2.17	1953	1.92	45.73
1884	-.0001	-.0001	1919	.45	2.77	1954	.86	48.07
1885	-.0020	-.0020	1920	.39	3.35	1955	1.63	51.26
1886	-.0020	-.0050	1921	.14	3.69	1956	1.54	54.71
1887	-.0040	-.0090	1922	.26	4.16	1957	1.70	58.72
1888	-.0020	-.0110	1923	.12	4.50	1958	1.83	63.04
1889	-.0003	-.0120	1924	.41	5.15	1959	2.00	63.34
1890	-.0003	-.0130	1925	.50	5.92	1960	2.13	74.12
1891	.0001	-.0130	1926	.63	6.88	1961	.83	78.13
1892	.001	-.012	1927	.40	7.59	1962	3.06	85.96
1893	.002	-.010	1928	.49	8.46	1963	2.18	92.63
1894	.004	-.007	1929	.32	9.14	1964	2.78	100.35
1895	.008	.001	1930	.29	9.85	1965	2.71	108.43
1896	.006	.008	1931	.07	10.46	1966	2.95	117.72
1897	.01	.018	1932	.17	11.15	1967	2.85	127.73
1898	.02	.04	1933	.18	11.85	1968	2.94	139.48
1899	.02	.06	1934	.18	12.44	1969	2.56	152.82
1900	.01	.07	1935	.15	13.06	1970	2.60	167.71
1901	.04	.11	1936	.22	13.68	1971	3.49	183.10
1902	.04	.16	1937	.55	14.68	1972	4.65	201.33
1903	.03	.20	1938	.31	15.45	1973	10.67	228.02
1904	.04	.25	1939	.30	16.24	1974	6.76	255.68
1905	.04	.30	1940	.38	17.17	1975	8.46	288.00
1906	.04	.35	1941	.42	18.14	1976	6.93	322.00
1907	.04	.41	1942	.79	19.51	1977	8.88	359.66
1908	.05	.48	1943	1.12	21.25	1978	11.65	405.73
1909	.05	.55	1944	1.09	23.01	1979	14.21	462.81
1910	.04	.62	1945	1.16	24.88	1980	12.78	534.95
1911	.04	.69	1946	1.45	27.01	1981	17.11	636.08
1912	.06	.78	1947	1.23	28.97	1982	17.95	747.30
1913	.06	.88	1948	1.72	31.59	1983	16.45	853.79
1914	.09	1.01	1949	1.18	33.71			
1915	.16	1.23	1950	1.50	36.22			

TABLE F.8

Swan Lake Band - Reserve Management (25 Miles Sq.Option)

Year	Income Losses Year i (\$/ac)	Accumultd Foregone Income (\$/ac)	Year	Income Losses Year i (\$/ac)	Accumultd Foregone Income (\$/ac)	Year	Income Losses Year i (\$/ac)	Accumultd Foregone Income (\$/ac)
1881	-----	-----	1916	.10	1.49	1951	1.55	41.93
1882	-----	-----	1917	.23	1.82	1952	2.00	45.49
1883	-----	-----	1918	.39	2.34	1953	2.07	49.32
1884	-.0002	-.0002	1919	.49	2.98	1954	.92	51.84
1885	-.0020	-.0020	1920	.42	3.61	1955	1.76	55.29
1886	-.0030	-.0050	1921	.14	3.97	1956	1.66	59.01
1887	-.0040	-.0100	1922	.28	4.48	1957	1.83	63.34
1888	-.0020	-.0130	1923	.13	4.85	1958	1.97	68.00
1889	-.0004	-.0140	1924	.44	5.55	1959	2.15	73.71
1890	-.0004	-.0140	1925	.54	6.38	1960	2.59	80.26
1891	.0001	-.0150	1926	.69	7.41	1961	1.38	85.76
1892	.001	-.0140	1927	.43	8.18	1962	3.13	93.42
1893	.003	-.0120	1928	.53	9.12	1963	2.41	100.71
1894	.004	-.0090	1929	.35	9.85	1964	2.94	109.02
1895	.009	.0003	1930	.31	10.63	1965	2.72	117.56
1896	.007	.007	1931	.08	11.28	1966	3.22	127.65
1897	.01	.02	1932	.19	12.02	1967	3.19	138.61
1898	.02	.04	1933	.19	12.78	1968	2.98	151.14
1899	.02	.06	1934	.19	13.42	1969	2.52	165.31
1900	.01	.07	1935	.16	14.08	1970	2.57	181.15
1901	.04	.12	1936	.24	14.75	1971	3.66	197.65
1902	.04	.17	1937	.60	15.83	1972	4.69	216.97
1903	.03	.21	1938	.33	16.65	1973	11.15	245.37
1904	.04	.26	1939	.32	17.51	1974	7.48	275.35
1905	.04	.32	1940	.41	18.51	1975	9.25	310.31
1906	.04	.38	1941	.46	19.56	1976	7.34	346.80
1907	.05	.44	1942	.86	21.04	1977	9.74	387.56
1908	.05	.51	1943	1.20	22.92	1978	12.62	437.28
1909	.06	.59	1944	1.18	24.82	1979	15.75	499.29
1910	.04	.66	1945	1.26	26.84	1980	13.90	577.23
1911	.05	.74	1946	1.56	29.14	1981	18.28	686.15
1912	.07	.84	1947	1.33	31.26	1982	18.58	805.22
1913	.07	.94	1948	1.85	34.08	1983	17.04	919.21
1914	.09	1.08	1949	1.28	36.37			
1915	.17	1.32	1950	1.62	39.08			

TABLE F.9

Sandy Bay Band - Reserve Management (25 Sq.Miles Option)

Year	Income Losses	Accumultd Foregone Income	Year	Income Losses	Accumultd Foregone Income	Year	Income Losses	Accumultd Foregone Income
Year i	Year i	Year i	Year i	Year i	Year i	Year i	Year i	Year i
(\$/ac)	(\$/ac)	(\$/ac)	(\$/ac)	(\$/ac)	(\$/ac)	(\$/ac)	(\$/ac)	(\$/ac)
1881	----	----	1916	-.02	.05	1951	.09	1.48
1882	----	----	1917	-.03	.01	1952	.11	1.64
1883	----	----	1918	.02	.04	1953	.09	1.80
1884	.001	.001	1919	.02	.07	1954	.06	1.91
1885	.001	.003	1920	.02	.09	1955	.03	2.00
1886	.001	.004	1921	.01	.11	1956	.07	2.15
1887	.001	.006	1922	.01	.13	1957	.08	2.31
1888	.001	.007	1923	.01	.14	1958	.07	2.48
1889	.001	.009	1924	.02	.17	1959	.08	2.68
1890	.001	.011	1925	.02	.19	1960	.07	2.90
1891	.001	.012	1926	.02	.22	1961	.09	3.14
1892	.001	.014	1927	.01	.24	1962	.03	3.33
1893	.001	.016	1928	.02	.27	1963	.01	3.51
1894	.001	.018	1929	.01	.29	1964	-.08	3.60
1895	.001	.020	1930	.01	.32	1965	-.13	3.65
1896	.001	.022	1931	.01	.34	1966	-.09	3.77
1897	.001	.024	1932	.01	.37	1967	-.07	3.92
1898	.001	.027	1933	.01	.40	1968	-.02	4.16
1899	.001	.029	1934	.01	.42	1969	.03	4.51
1900	.001	.031	1935	.01	.45	1970	.08	4.95
1901	.002	.035	1936	.01	.47	1971	.13	5.43
1902	.002	.038	1937	.02	.51	1972	.22	6.06
1903	.002	.041	1938	.01	.53	1973	.66	7.23
1904	.002	.045	1939	.02	.56	1974	.48	8.40
1905	.002	.048	1940	.01	.60	1975	.66	9.88
1906	.002	.052	1941	.01	.63	1976	.49	11.32
1907	.002	.056	1942	.02	.67	1977	1.29	13.71
1908	.002	.060	1943	.03	.73	1978	1.74	16.88
1909	.002	.065	1944	.04	.79	1979	2.34	21.18
1910	.002	.069	1945	.05	.86	1980	2.68	26.84
1911	.002	.074	1946	.06	.94	1981	3.17	34.58
1912	.001	.078	1947	.04	1.01	1982	3.71	43.75
1913	.001	.083	1948	.09	1.13	1983	3.53	52.85
1914	-.002	.084	1949	.06	1.21			
1915	-.020	.060	1950	.08	1.34			

TABLE F.10

Sandy Bay Band - Reserve Management (25 Miles Sq.Option)

Year	Income Losses	Accumultd Foregone	Year	Income Losses	Accumultd Foregone	Year	Income Losses	Accumultd Foregone
Year i	Year i	Income	Year i	Year i	Income	Year i	Year i	Income
(\$/ac)	(\$/ac)	(\$/ac)	(\$/ac)	(\$/ac)	(\$/ac)	(\$/ac)	(\$/ac)	(\$/ac)
1881	----	----	1916	-.02	.04	1951	.09	1.54
1882	----	----	1917	-.04	.01	1952	.10	1.70
1883	----	----	1918	.03	.03	1953	.05	1.82
1884	.001	.001	1919	.02	.06	1954	.02	1.90
1885	.001	.003	1920	.02	.09	1955	.07	2.03
1886	.001	.004	1921	.01	.10	1956	.07	2.17
1887	.001	.005	1922	.01	.12	1957	.06	2.32
1888	.001	.007	1923	.01	.14	1958	.07	2.49
1889	.001	.009	1924	.02	.16	1959	.06	2.68
1890	.001	.010	1925	.02	.19	1960	.07	2.89
1891	.001	.012	1926	.02	.22	1961	.03	3.06
1892	.001	.014	1927	.01	.24	1962	.10	3.33
1893	.001	.015	1928	.02	.27	1963	.01	3.51
1894	.001	.017	1929	.01	.30	1964	-.04	3.64
1895	.001	.019	1930	.01	.32	1965	-.13	3.69
1896	.001	.021	1931	.01	.35	1966	-.16	3.73
1897	.001	.024	1932	.01	.37	1967	-.06	3.89
1898	.001	.026	1933	.01	.40	1968	-.01	4.14
1899	.001	.028	1934	.01	.43	1969	.03	4.49
1900	.001	.030	1935	.01	.45	1970	.09	4.94
1901	.002	.034	1936	.02	.48	1971	.09	5.38
1902	.002	.037	1937	.02	.52	1972	.18	5.97
1903	.002	.040	1938	.01	.55	1973	.72	7.19
1904	.002	.043	1939	.02	.58	1974	.46	8.34
1905	.002	.047	1940	.01	.61	1975	.51	9.64
1906	.002	.050	1941	.01	.65	1976	.59	11.17
1907	.002	.055	1942	.03	.69	1977	1.46	13.73
1908	.002	.059	1943	.04	.75	1978	1.88	17.06
1909	.002	.063	1944	.04	.82	1979	2.76	21.84
1910	.002	.067	1945	.05	.89	1980	3.13	28.09
1911	.002	.072	1946	.06	.98	1981	3.10	35.94
1912	.001	.076	1947	.04	1.05	1982	3.18	44.70
1913	.001	.080	1948	.09	1.17	1983	4.66	55.18
1914	-.002	.082	1949	.06	1.27			
1915	-.020	.060	1950	.09	1.40			