

Hay River Agriculture Plan



A Comprehensive Strategy for Sustainable Agricultural Development

Prepared for:
The Town of Hay River

Prepared by:
Serecon
Edmonton, Alberta

March 2014



March 26, 2014

Mr. Jordan Stackhouse
Economic Coordinator
The Town of Hay River

Dear Mr. Stackhouse:

Re: Hay River Sustainable Agriculture Plan

We are pleased to provide you with our final report outlining background and recommendations for a Comprehensive Sustainable Agriculture Plan for the Town of Hay River.

Please do not hesitate to contact any of the members of our team directly if you have any questions about this report.

Yours truly,

Markus Weber, P.Ag.
SERECON MANAGEMENT CONSULTING INC.

Edmonton Office

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Overview of Northern Agriculture

Agriculture in the Northwest Territories

Aboriginal peoples have obtained their food from the land in the north, based largely on sustainable harvest of wildlife, since time immemorial. Controlled cultivation of crops and animals was only introduced into the north, primarily by missionaries and fur traders, within the past hundred years or so and consisted largely of small subsistence gardens.

As the northern population grew during the latter half of the 20th century, so did the demand for commercial food products. Transportation links of various kinds have made it easier and less costly to import food stuff from the south. The use of processed and packaged foods also increased demand for southern products, creating less reliance on or demand for locally-grown produce. A small core of farmers has developed, producing agricultural goods for personal and commercial purposes, particularly in the southern NWT between Hay River and the Alberta border, where the soil is more fertile and the climate is more conducive to growing crops. Produce has primarily been sold to local consumers using the 'farm-gate' method of marketing.

Northern treaties had clear provisions to promote and support agricultural development in the NWT, but the agricultural provisions of these treaties were never fully implemented because it was clear that Aboriginal peoples could make a good living in the north through hunting, trapping, and other traditional harvesting activities. Over time, many Aboriginal families developed a taste for fresh garden produce and during the short summer period, tilled and tended their own small gardens. In spite of their success, family and community gardens have declined over the past few decades in most regions of the NWT. In the southern portion of the NWT, efforts during the 1950's through 1970's were made to open up areas of land for commercial market gardens, hay, and livestock production. These efforts were mainly driven by people with previous farming experience who moved into the north to work. Market gardens continued to be successful for subsistence purposes and a few had limited commercial viability. Livestock production was less successful, largely due to the availability of wild meat for local consumption.

Expansion of agricultural lands slowed in the late 1970's with the introduction of land access restrictions, pending the negotiation of land claim agreements between the federal government and Aboriginal peoples. Since then, most agricultural development has taken place on lands that had been sold or leased prior to the access restrictions, or on lands managed by municipal governments that were not affected by the restrictions. It must be noted that Aboriginal governments have always retained the right to approve land lease applications and have done so on occasion where these land transfers have not affected inherent rights or are seen as being of collective interest, but opening lands for agricultural development has generally not been identified as a priority by those organizations.

Other types of agricultural initiatives have been tried over the past two decades, with varying degrees of success. Community and commercial greenhouses for vegetables and/or bedding plants have been established in Fort Smith, Yellowknife, Hay River, Norman Wells, and Inuvik and continue to be of interest to communities and individual farmers. There have been efforts to

establish commercial livestock operations such as cattle farming, bison ranching, dairy farming, and hog farming, but these operations have all closed down for a variety of reasons, including limited market access, conflicts with NWT regulations, and feed costs.

The agriculture sector is not a major contributor to the NWT economy at present, but there is vast potential as the majority of the arable land in the NWT remains largely uncleared and undeveloped.

The Northwest Territories Economic Opportunities Strategy developed industry profiles in the winter of 2012-13 and agriculture in the NWT was summarized in this fashion¹:

Agriculture in the Northwest Territories is a small but emerging sector of the economy. Motivated by high food costs, positive contributions to lifestyles, local product diversity, and increased awareness of nutritional values, participation in local food production is increasing in most, if not all, communities in the NWT. Ranging from small community gardens to commercial greenhouses, regulated egg production and harvesting of “wild” edibles, the local food production sector has grown dramatically over the past decade. The agricultural sector generates approximately \$8-10 million in income per annum in the NWT. The industry can be divided into three categories:

- Small scale - community and market gardens;*
- Commercial agriculture and large scale production; and,*
- Commercial harvest of game.*

Agricultural development in the NWT is currently primarily family-operated enterprises that combine personal with some commercial production. It is driven to a certain extent by market need, but mainly by a dedicated group of farmers who are committed to producing food in the north for the north. The Territorial Farmers Association (TFA) believes that the agricultural potential of the north has yet to be tapped and that there is opportunity for significant growth in the industry over the next few decades. The TFA believes that growth in the agriculture sector, as a renewable resource industry, can help to reduce the North's increasing dependence on non-renewable resources, generate employment and develop business opportunities.

Development of the agricultural industry in the NWT has been slow and sporadic. Land access and related policies have been identified as key barriers to agricultural development. The GNWT has stated that the industry needs to demonstrate more effective use of existing lands before it would support opening new lands for development. Generally, there has been marginal political support for agricultural legislative, or policy changes to the current system. In spite of these critical obstacles, a number of producers, in part through the Territorial Farmers Association, have undertaken a wide range of agricultural initiatives over the past few years and have continued to increase awareness of the potential and value for increased NWT-grown products.

¹ Northwest Territories Opportunities Strategy. *Industry Profiles (and SWOT Analysis), Winter 2012-2013*. Developed with participation from the NWT Chamber of Commerce, Northern Aboriginal Business Association, NWT Association of Communities, and Industry, Tourism and Investment (ITI).

Agriculture in Hay River

The increase in agricultural production and innovation of producers has been particularly evident in the Hay River region over the past decade. The region currently produces a large variety of vegetables, berries, eggs, some livestock, and native grass seeds.

In economic terms, the largest agricultural initiative in the Hay River region is the production of eggs. Despite the area historically not having produced large volumes of chicken either for meat or eggs, the NWT entered the supply-managed egg marketing industry and allocated quota in the Hay River Region. More recently, the GNWT has also supported a private enterprise in establishing an egg grading station. “Polar Egg” is federally inspected and sells over 3 million dozen Hay River-produced eggs across the Northwest Territories. In doing so, these businesses create an economic impact of approximately \$5 million and increased employment for the region.

Vegetable production has a significantly lower financial impact, but its impact is nonetheless very significant in Hay River. Several very active producers have refined management practices in order to grow vegetables on some of the prime agricultural lands in the region (Market Gardens and Paradise Valley subdivisions), as well as some less prime agricultural land that has been proven to also support intensive production. Several producers have generated income upwards of \$10,000 or even \$20,000 in a year. It would not be unreasonable to assume that individual producers, once their operations have been fully developed and with some value-adding, would be able to generate up to \$50,000 per year.

Quite a number of individuals are producing forages. Several individuals own larger tracts of land, southeast of the junction of the Fort Smith and Mackenzie Highways. These parcels are as large as 54 acres, having been developed in part from northern boreal bogs with years of intensive clearing and cultivation. However, there are many other individuals who are growing forages on smaller tracts of land as well. Many of the subdivisions in the Hay River-Enterprise corridor consist of a mix of country-residential and agricultural lands. While there are a few actively growing berries or vegetables, the vast majority are being managed less intensively and are used to grow either hay or pasture.

The forages grown in the Hay River region are fed to cattle and horses. The majority of the livestock is fed on locally-grown forage, but some is also imported from northern regions of Alberta and Saskatchewan. Large-animal livestock numbers are very low. It is assumed that this is due in part to the absence of a commercial abattoir in the region, but also due to the high cost of producing meat and the harsh winter climate.

An abattoir was established in Hay River to process pork and other domestic meat products, but the GNWT cut funding for this project before sustainability was proven. An egg marketing quota was established for the NWT and a large egg layer operation and federally-certified grading facility continue to operate in the Hay River area.

Economic Impact Potential

An economic impact analysis was conducted for the Territorial Farmers Association in 2006.² That study concluded that there is significant potential for agricultural production in the Northwest Territories, with the highest potential in the South Slave and Dehcho regions.

The study prepared an estimate of the potential economic impact on the basis of import replacement of 25%. That is, the agricultural production was estimated based on replacement of 25% of the NWT demand for selected agricultural products produced, or capable of being produced by the NWT agricultural sector. An expansion in the agricultural sector of this magnitude was modelled to estimate the economic impact it would have. Highlights of the 2006 estimate of impact included:

- Investment costs totalling over \$7 million
- An increase in over 5,000 acres of land in agricultural production (overall the NWT has over 900,000 acres of Class 3 land, but much of it remains inaccessible)
- An increase of approximately \$3.8 million of productive value within the sector
- A temporary increase in \$2.9 million in the NWT economy during initial stages
- An ongoing increase of \$2.7 million annually in the NWT economy
- An ongoing increase of up to 60 full-time jobs on an ongoing basis

It was found that agriculture is economically viable in the NWT for certain high-value crops, given an adequate scale of production. The high cost of importing produce to the NWT, and strong demand for fresh produce, both contribute to this. If anything, one would expect that the overall economic impact potential would have increased since that study was conducted, but there remains a need to accurately quantify this potential, especially in light of the devolution of responsibility for Crown land to the territorial government.

Hay River is well positioned to capitalize on this potential, given the production experience that has developed in the region, the land resources available, and the strong demand for locally-grown food. These elements will be explored in greater detail in later sections of this report.

² Territorial Farmers Association, *Economic Potential of NWT Agricultural Production*, Serecon, 2006. (Executive summary attached as Appendix C).

Project Methodology

The Town of Hay River, as part of its Integrated Community Sustainability Plan, has adopted the following as one of its Principle statements:

Hay River will seek out ways to advance traditional harvesting aspects of our Town such as hunting, fishing and farming as well as fostering our business community and recognizing the contribution by all of Hay River's residents.

The primary objective of the current project, was to develop a strategy for the Town of Hay River that will allow for furtherance of this principle, taking into account the soil, water, and climatic resources available for agriculture in the region. The principles outlined in such a strategy would serve to guide decision-making and policy development in the future, particularly as it relates to the potential allocation of lands for agricultural production.

Initial stages of the project involved the aggregation and review of publicly-available literature regarding agriculture in the Northwest Territories, the Yukon, as well as agricultural plans of other communities in the northern regions of Canada's western provinces. This was followed by in-person and telephone interviews with individuals in the Hay River and Yellowknife areas regarding both agricultural production and the markets for locally-grown food.

This was done in order to develop an overview of the current state of the agricultural industry and to draft a preliminary set of findings to serve as a basis for a discussion where the public and industry stakeholders could be brought together. In essence, initial fact-finding was conducted primarily in the month of September 2013 to develop initial hypotheses regarding the current agricultural landscape and to enumerate the strengths, weaknesses, opportunities and gaps.

A public workshop was then held for over three hours on the evening of October 16, 2013. The workshop was extremely well attended, with a lively discussion that resulted from a mix of 38 individuals from the following sectors:

- Agricultural producers
- Non-commercial food producers / gardeners
- Food retailers / processors
- Traditional Harvesters
- Consumers (members of the public)
- Media

Figure 1: Public Roundtable Workshop on Hay River Agriculture

The discussion at the workshop was meant primarily to enumerate the strengths, weaknesses, opportunities and threats facing the agriculture industry in Hay River. Participants gave their insights on existing gaps and barriers, and identified potential actions that could be taken to advance the agriculture industry. They also expressed their opinions on the key principles that should be taken into account in developing a strategy for agriculture in Hay River. The insights and opinions of the attendees to these meetings, as well as the other informants in other stages of this project, are reflected in this report, though contributions have not been attributed to individuals.

The Elements of Agriculture in Hay River

Current Agricultural Production

EGG PRODUCTION

The largest source of agricultural revenue in Hay River is the production of table eggs, which are produced by Choice North Farms and marketed under the “Polar Eggs” label. The barns for this operation are currently located in Delancey Estates. These are not the first barns to have operated in Hay River, with barns having previously been located in town.

Despite the area historically not having produced large volumes of chicken either for meat or eggs, the NWT entered the supply-managed egg marketing industry and allocated quota in the Hay River Region. More recently, the GNWT has also supported a private enterprise in establishing an egg grading station. “Polar Eggs” is federally inspected and sells over 3 million dozen Hay River-produced eggs across the Northwest Territories. In doing so, these

businesses create an economic impact of approximately \$5 million and increased employment for the region.

CROP PRODUCTION

All other food production is of considerably smaller scale in terms of their individual scale or economic impact. However, taken as a whole there remains a vibrant community of producers.

Market vegetable production in particular is common in the area around Hay River. Vegetables are grown in a number of market gardens, as well as private gardens for personal consumption. Some of the most consistently well-



producing vegetables in the area are cabbage, broccoli, cauliflower and carrots. However, other crops being grown in the area include the following (though we are certain that there are many others grown in greenhouses and in small plots):

Summer squash	Cauliflower
Cabbage	Radishes
Onion	Beans
Swiss chard	Tomatoes
Garlic	Various herbs
Kale	Lettuce
Broccoli	Asparagus
Pumpkin	Zucchini
Beets	Saskatoons
Blueberries	Blackberries
Strawberries	Raspberries
Crab apples	Haskap berries
Icicle radish	Carrots

Most gardens are at most 2 to 3 acres in size, but virtually all are supplemented with some type of greenhouse operation as well. The farms are generally operated by their owners and only very few sell their produce at market. Those that do sell their production sell at the Fisherman's Wharf market in the summertime and a winter market established by the Hay River Commons during the winter months.

LIVESTOCK PRODUCTION

Other than the egg production referenced above, there is very little livestock production in Hay River or other area of the Northwest Territories, likely due mainly to the absence of large volumes of grain or other feeds in the area. However, several individuals have been raising cattle for beef production. While it is possible to raise these cattle despite the somewhat harsher northern climate, the cost of feeding them is large. Through creativity and community sharing, producers are generally able to keep their direct cash costs at a minimum. For example, there is considerable sharing of forage with often informal agreements for the sharing of equipment and labour when putting up hay for the winter.

However, if the scale of production for large livestock were to increase appreciably, there would simply not be enough land in the Hay River area to grow the feed required for any significant commercial herds. The feed would need to be brought in from other regions – most likely northern Alberta – at considerable cost. This presents a significant barrier to any significant expansion of domesticated large-animal livestock production.

There are plans being developed as well for farming caribou on the Katlodeeche First Nation. As with cattle, these ungulates will require considerable volumes of forages. While it may be possible for them to obtain all their feed through foraging during the summer months, even wildlife kept in confinement will require that feed be provided to them over the winter months. There may be opportunities for supporting ventures by growing forages, especially on some of the more marginal Class 5 soils. Opportunities should also be explored for collaboration with respect to re-establishing an abattoir to allow for slaughter and marketing of the meat from both caribou and other livestock species.

There is also the possibility of expansion of feeding of smaller livestock. A number of individuals are currently raising chickens for eggs and meat, as well as rabbits, a few pigs and turkeys. While the harsh climate does present a barrier, this barrier has been overcome by these producers, at least partially through housing the animals indoors for a significant part of the year. Small animals also require significant feed if they are to be raised at a commercial scale, but the cost of importing feed could perhaps be overcome with some creativity and adaptation of innovative practices. For example, one individual is currently implementing a barley fodder system, which will be used to rapidly grow barley seedlings, which are to be fed to rabbits and chickens initially. This type of system could significantly increase the volume of feed which could be grown on a limited land base.

There was previously also a hog operation which operated as “Northern Pork”. Those barns have not been in operation for many years. A feed mill remains in existence, as do the foundation of the barn and some elements of the exterior barn structure.

NON-FOOD AGRICULTURE

There are opportunities for perhaps growing landscaping materials, trees, and grasses for commercial purposes. For example, there is currently one farm growing native grasses for the Aurora Research Institute. This operation entails grass seed production from native grass species, in anticipation of those perhaps someday being sold for reclaiming disturbed soils after development (under pipelines, mine reclamation, for example).

There do not currently appear to be any significant producers of ornamental plants or landscaping materials in Hay River itself. Numerous individuals stated that a greenhouse operation in Fort Smith was their favoured supplier for these materials. Yellowknife also has a large producer of ornamental plants, including both bedding plants and tree saplings. While it would certainly appear that it would be possible to grow these plants as well in Hay River, further investigation would be required to determine whether there is sufficient consumer demand to warrant further entrants into this market. It has certainly been the experience of the Yukon that bedding plants were a significant and increasing market niche for the agriculture industry.



Figure 2: Native grass seed production

Resources for Agriculture

LAND

A detailed soil survey and land evaluation was conducted of the Hay River area in 1977 by L.M. Kozak and H.P.W. Rostad of the University of Saskatchewan. This survey provides a comprehensive summary of the soil characteristics in the region. The survey is quite detailed and provides a useful baseline should the Town decide to proceed with agricultural land allocation at some point in the future. The diagram below shows an example of the detail provided through this survey.

This 1977 soil survey was used in 2008 in the Soil Survey Enhancement Project conducted for the GNWT Department of Industry, Tourism and Investment to develop a summary of the capability of soil and climate limitations for agriculture. Electronic files were generated summarizing the soil capabilities for agricultural production.

The first three capability classes are suitable for sustained agriculture, but no Class 1 or 2 land falls within the Hay River study area due to the climatic limitations; Class 3 land is suitable for arable agriculture with only limited restrictions; Class 4 is marginal for arable agriculture; Class 5 is suitable only for improved (seeded) hay or grazing; Class 6 for unimproved (native) grazing; and Class 7 is considered non-agricultural and incapable of agriculture.³

Surprisingly, the Hay River Valley Map area was estimated to have 19,724 hectares of Class 3 land, with 2,772 hectares being within a 20 kilometre radius of the Town of Hay River itself. In addition, it was estimated that 897 hectares of Class 4 land and 38,676 hectares of Class 5 land fall within that 20 kilometre radius. The report summarizes the capability of the Hay River Valley as follows:

	Class 3	Class 4	Class 5	Class 7
Entire Hay River Valley Map Area (ha)	19,724	4,784	109,125	123,561
Hay River (ha in 20 km radius)	2,772	897	38,676	9,749
Enterprise (ha in 20 km radius)	7,003	1,969	41,109	36,030

Most of the Class 3 soils are on the alluvial floodplains. Field observations suggest that the majority of these alluvial plains have moderately to fine-textured soils. The Soil Survey Enhancement Project describes both the surface texture and the parent material of the Hay River Association as being fine sandy loam to silty clay loam texture. These alluvial plains are certainly better drained than are the areas above the river valley, but they do have some inclusions that are poorly drained.

The vegetation in the area consists primarily of native northern forests, including especially white spruce, with there also being some poplar, aspen and birch, especially on the higher-quality floodplains.

While there are some Class 3 soils outside of the Hay River valley, those tend to also have considerable inclusions of excessive wetness in northern boreal bogs, as well as some areas of stoniness. In fact, many of the waterlogged areas have organic soils underlying them – soils which can eventually be made suitable for agricultural production, but only through considerable inputs of time and energy.

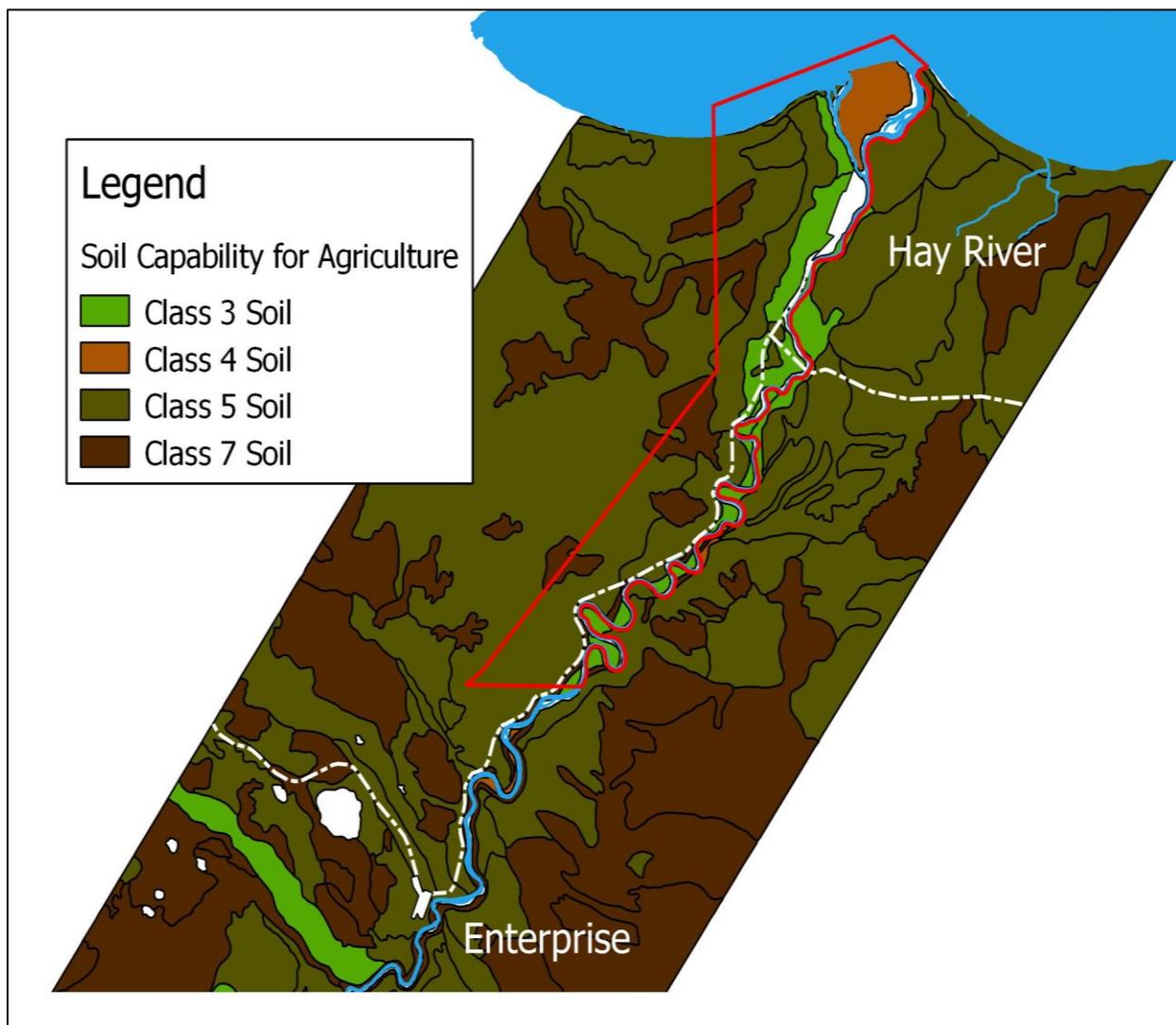


³ GNWT, “Northwest Territories Soil Survey Enhancement Project”, EcoDynamics Consulting Inc., July 2008.

The digital data sets developed through the Soil Survey Enhancement Project were combined with other publicly-available datasets to develop the maps on the following pages. These maps serve as a resource for both development of policy around sustainable agriculture use in the Hay River region and future tactical decision-making about land allocation and feasibility of specific types of production in various locations.

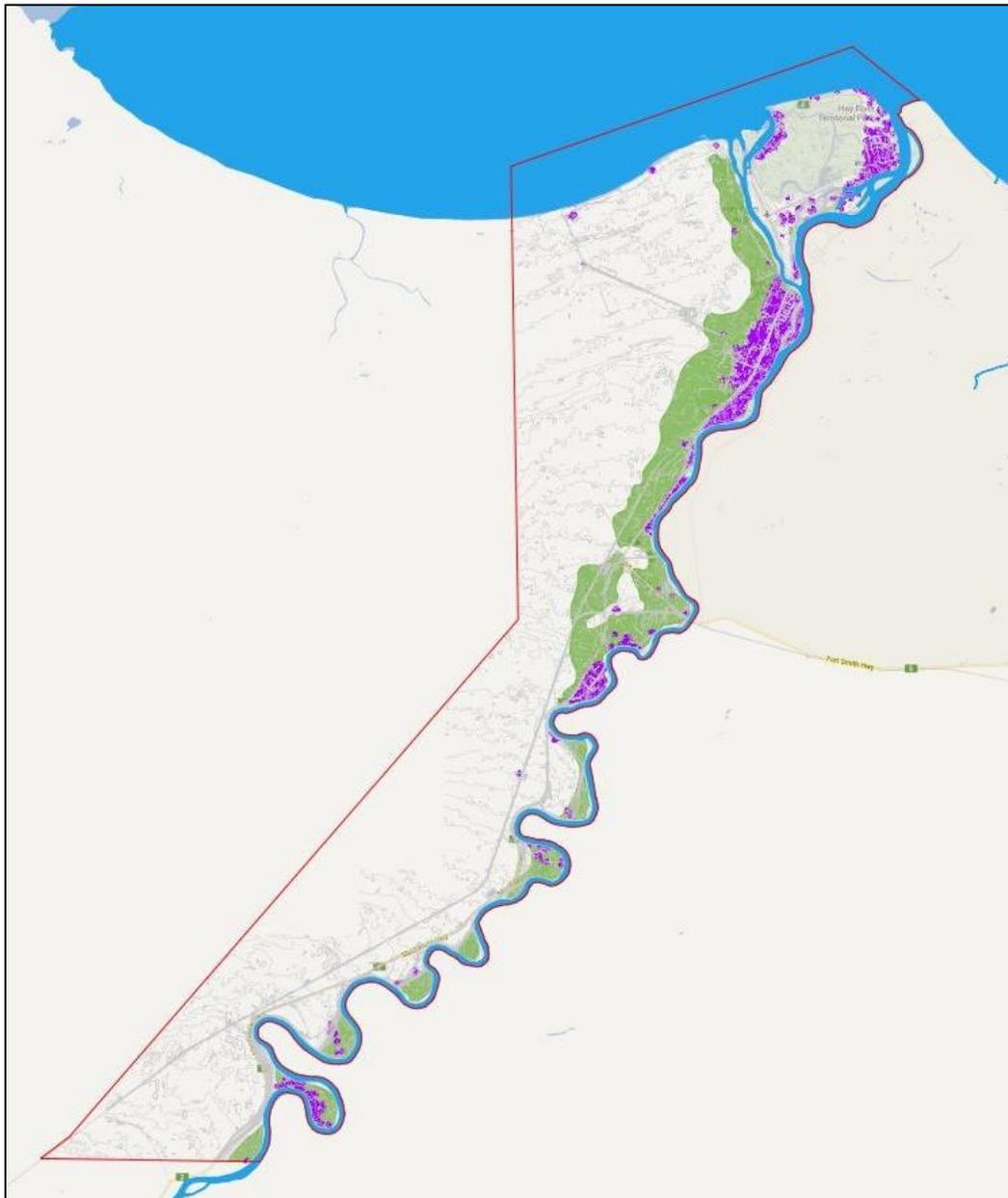
While some of the Class 4 and Class 5 soils may be suitable for forage production, they will not be considered in greater detail in this project. The focus will be on Class 3 soils which have the greatest potential for food production. The map below illustrates all of those lands between Great Slave Lake and Enterprise that fall within the Class 3 and Class 4 designation.

Figure 3: Soil Capability for Agriculture – Hay River to Enterprise Corridor



Access to land by road, as well as uncertainty about ownership status, are considerable limitations at present. The highest-quality land for agriculture immediately adjacent to Hay River appears to be on alluvial plains in oxbows or bends in the river. As can be seen, almost half of the Class 3 land between the lake and Enterprise is on the east side of the river. With the exception of land on the Katlodeeche First Nation, the bulk of the land on the east side of the river can presently only be readily accessed with small off-road vehicles or by boat. It is also outside of the municipal boundary, so will not be considered further in the remainder of this report. However, that land appears to also have similar agricultural potential and should be considered for food production in the future.

Those Class 3 lands with easy access from the existing road network and within the municipal boundary of the Town of Hay River are identified in the map below. Further, the development of land for agriculture will already be considerably limited due to their current use for other purposes. The GNWT's Department of Municipal and Community Affairs provides to the public a database which contains "building footprints". This was superimposed over the Class 3 soils to identify areas that already have considerable residential and/or industrial development. For example, several of the oxbows in the river already have subdivisions which contain a mix of country residential and agricultural uses. The map in Figure 4 shows the Class 3 lands in green with building footprints overlaid on them in purple.

Figure 4: Class 3 Soils within Hay River Municipal Boundary⁴

The alluvial floodplains certainly appear to have the highest potential for agricultural production. The majority of this land appears to never have been cultivated, so there is a surface layer of organic material approximately two inches deep. The surface A horizon below this is approximately four inches deep and consists of moderately-textured sandy loam to silty clay loam soils. The subsurface soil with higher clay content is still well drained in most areas.

⁴ Source: Serecon map developed using data from the GNWT MACA, NWT Soil Survey Enhancement Project, ArcGIS Explorer topographic base map

Figure 5: Typical Soil Profile and Vegetation on Alluvial Floodplains⁵

While these soils do look very suitable for agricultural production, there are only few acres that would be available for immediate use. Most of the land is still treed and the process of clearing such land normally requires approximately 18 months before a first establishment crop could be produced. The cost of clearing, root raking and initial cultivation is also quite substantial – likely in the range of \$800 - \$1,300 per acre. If land is to be made available to individuals, it must be kept in mind that they will incur this large capital cost at the very outset, yet not generate any substantial revenues for several years.

It should be kept in mind as well that, while these soils do have the potential for high productivity compared to surrounding areas, there are other limiting factors that must be taken into account, including the availability of water and heat.

⁵ Photos taken in September 2013 at the “Northern Pork” property owned by the Town of Hay River.

WATER & CLIMATE

The primary limiting factor for crop selection is the low heat units available for crop growth. While some corn has been grown in the area, for example, even the shorter-season varieties developed in recent years do not produce particularly good crops. However, the long daylight does make up for the short growing season for many other crops. Most of the root vegetables and cabbages, for example, can be grown incredibly well in Hay River's climate.

Almost all vegetable producers also require a greenhouse. The use of the short growing season must be maximized, so many start the majority of vegetables in their own greenhouses before transplanting them outdoors.

The frost-free period in most areas of the NWT is in the range of 40-60 days, but the climate around Great Slave Lake has a frost-free period of 60-100 days. There may be an opportunity to perhaps utilize some microclimates along the base of the river banks to slightly extend both the heat units available to crops and the overall growing season.

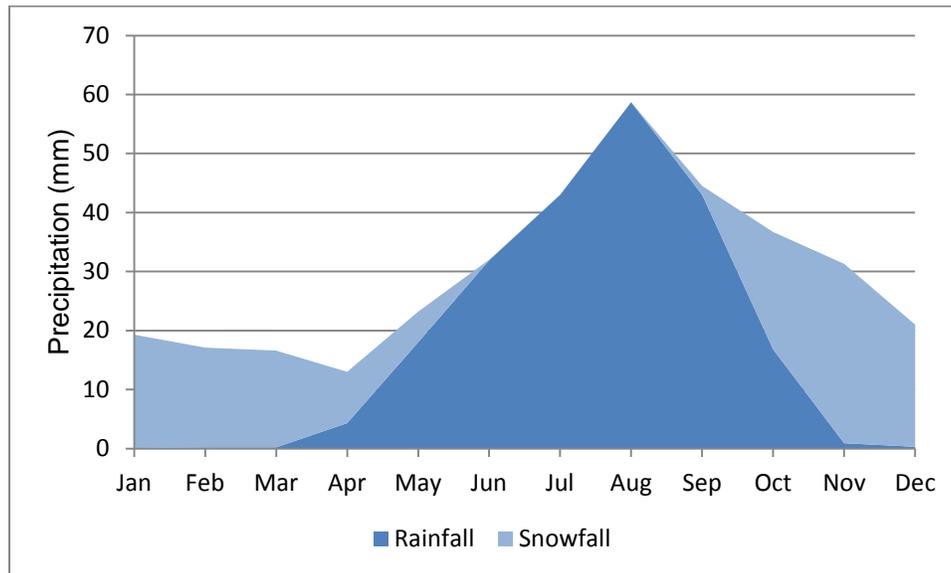
Figure 6: Hay River Climate Data⁶

Record high °C	36.7
Average high °C	2.4
Daily mean °C	-2.5
Average low °C	-7.4
Record low °C	-48.3
Precipitation mm (inches)	336.4
Rainfall mm (inches)	217.4
Snowfall cm (inches)	138.9
Avg. precipitation days (≥ 0.2 mm)	122.8
Avg. rainy days (≥ 0.2 mm)	58.9
Avg. snowy days (≥ 0.2 cm)	72.2

Hay River only receives 336 millimetres of rain per year on average (217 mm of rainfall and 139 mm as snow). This level of rainfall is sufficient for non-intensive grass production on soils with good water-holding capacity, but it is a significant limiting factor for vegetable and even grain production most years.

Current producers are able to find the water required to adequately supply their crops of several acres, but the availability of water for irrigation will need to be carefully considered as the overall crop acreage increases. The cost of installing irrigation systems is substantial and permitting will be required if the river is to be used as a water source.

⁶ Source: Environment Canada, *Canadian Climate Normals 1981–2010*. Climate ID: 2202400.

Figure 6: Annual Distribution of Precipitation⁷

PRODUCTION INPUTS

Most of the growers interviewed during this project had a clear preference for less input-intensive production systems. For some, this appears to be an economic choice while for many it comes from a viewpoint that production with low inputs is more sustainable or environmentally-friendly.

The choice of inputs is particularly important when first cultivating soils and establishing their use for agriculture. Soils that have never been cultivated are typically high in organic matter, especially under heavy forest cover such as those in the Hay River area. For example, soil tests of the Northern Pork property showed organic matter levels of approximately 14%.

Forested soils tend to have low nitrogen and phosphate levels when first being seeded and this too was confirmed through soil testing – potassium and sulphur levels were found to be optimum).

A number of individuals have already started using composted manure as a fertilizer source. Cattle and horse manure have been used by some individuals, but chicken manure is in particularly rich supply of plant nutrients given the current egg operations and previous poultry barns as well. In fact, some of this compost is even being exported from the community to gardeners in Yellowknife, where there is very thin topsoil.

If synthetic or other organic alternative fertilizers are to be brought into the community, the costs of transporting them can be quite substantial. The evaluation of appropriate nutrient sources will require both careful consideration, as well as some trials to evaluate alternative sources.

⁷ Source: Environment Canada, *Canadian Climate Normals 1981–2010*. Climate ID: 2202400.

Few pesticides are currently being used, due largely to the types of crops being grown. There are some issues with birds and mammals as pests, but otherwise most weed and pest issues appear to be adequately dealt with through careful management.

LABOUR & SKILLS

A number of individuals are very effectively producing market vegetables, berries, and some forages for beef & horses. Several individuals have converted previously forested northern boreal bog to hay land and pasture. Clearly, there are many unique skills that have been developed to deal with the unique circumstances of Hay River's soils and climate.

However, there are many others who have much more rudimentary skills related to agriculture, but they do have a strong desire to grow their own food. Growing food on small acreages will therefore require knowledge-sharing and skills development.

Some steps have already been taken in this regard. The GNWT undertook a successful project to establish small community gardens in many NWT communities. Both Hay River and Enterprise continue to have operational community gardens as of the fall of 2013.

In addition, in 2012-13, the Northern Farm Training Institute developed and delivered a set of six three-day farm training workshops in Hay River to assist local growers and small-scale farmers from across the NWT. The program delivered 2,160 hours of training to 28 participants from 14 communities. The Territorial Farmers Association is currently seeking funding and building a business model to continue and expand this educational initiative.

DISTINCT LOCAL FOOD SUPPLY CHAIN

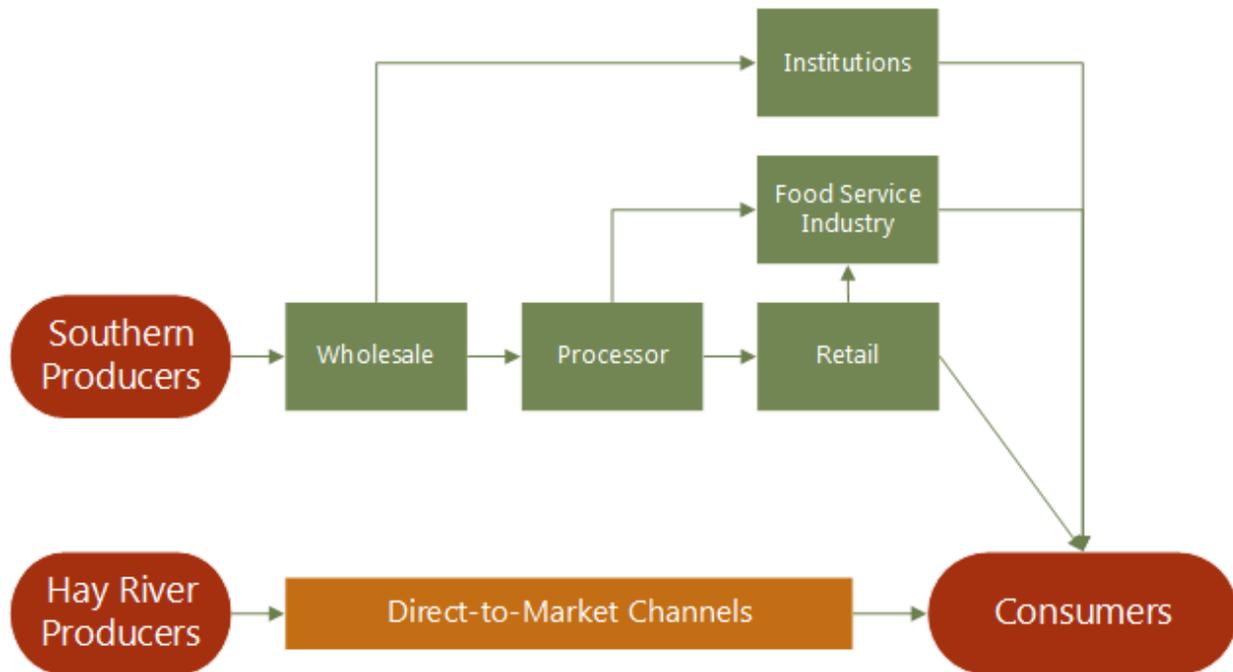
In southern Canada, producers generally have options for selling produce through wholesale, intermediated, or direct-to-market channels. In fact, many producers will sell through different channels depending on the particular product, its supply, consumer demand, product prices, and labour availability. Many producers sell through a variety of channels. Many market garden operations, for example, sell some of their field produce to a wholesaler, some through an intermediated box program, and others at a farm-gate retail store.

In Hay River, however, almost all agricultural production is sold through some type of direct-to-market channel. There have been some limited sales through grocery retail, but the bulk of the production is distributed through private transactions between producer and consumer. In many cases, this is through direct purchase or barter at the farm gate. In addition, two relatively successful markets have developed at the Fisherman's Wharf during the summer months and a "Winter Market" held weekly by the Hay River Commons in a school. These are discussed in greater detail later in the report.

Conversely, almost all production from outside the region is sold through the conventional wholesale food supply channels. Grocery retailers, restaurants, and institutions providing food service buy almost all of their food through the same wholesalers in Alberta and Saskatchewan.

The diagram below illustrates this clear and strong division between the two food supply chains for food grown locally in Hay River and food grown outside Hay River (largely southern Canada and internationally).

Figure 7: Food Supply Chains by Growing Region



This is not to suggest that direct-to-market channels are necessarily negative. In fact, quite the opposite is true. Many producers have been struggling for years in southern Canada to establish direct-to-market opportunities, as these generally offer the highest margins for producers.

Whether farm gate retail, farmers' markets, community-supported-agriculture, or box programs, the retail prices through direct-to-market supply chains tend to be higher than with any wholesale channel. In addition, with fewer middlemen in the supply chain, the producer can also capture a far higher percentage of this higher margin. This should be seen as a huge advantage to Hay River's agricultural producers, as there is almost zero local food available through any "conventional" wholesale and retail channels. There are therefore no lower-cost competitors supplying local food.

However, it must be realized that continuing to rely solely on direct-to-market channels will continue to require significant labour for marketing and distribution. It may also limit the potential for export of product, should there be a desire to build markets outside of the Hay River region. Options for developing other marketing channels are outlined at page 22 below.

The Future of Agriculture

DEMAND FOR LOCAL FOOD

The average NWT household expenditure on food continues to increase. As of 2009, the average household purchased \$8,060 of food from stores and \$1,435 of food from restaurants annually. This is an estimated annual territorial expenditure of \$143.7 million on food. Given large travel distances, almost all of this food is purchased by consumers locally. However, given the lack of infrastructure for the agriculture industry, only a negligible amount of that food is grown locally.

These large expenditures on food, along with the cost of transporting the majority of this food into the territory, present a large potential market for food grown within the NWT. This market has been borne out through the experience of several markets established in Hay River and Yellowknife. These markets have shown strong and consistent demand for locally-grown produce. Vendors at the Hay River Commons winter market and the Fisherman's Wharf in the summer, as well as the Yellowknife Commons, have reported repeatedly selling all of the produce they brought to market. Demand for local produce considerably outweighs the ability to supply local produce.

There has been little quantification of the current demand for local food specifically in Hay River. However, it is clear that the demand for locally-grown food is significantly higher than the current supply. Those producers who sell their product at the Fisherman's Wharf in the summertime or at the Winter Market report consistently selling all of their produce at the market, regardless of the specific item or quantity being sold. They report that they will need to increase production to meet their customers' needs.

One of the commercial kitchens in Hay River, for example, estimates that they alone could use around 300 pounds of vegetables on a weekly basis for their kitchens. Demand would be greatest for root vegetables such as potatoes, red onion, white onion, and carrots. However, if it were possible to get consistent supply, they would also be interested in purchasing some leafy vegetables such as romaine and head lettuce.

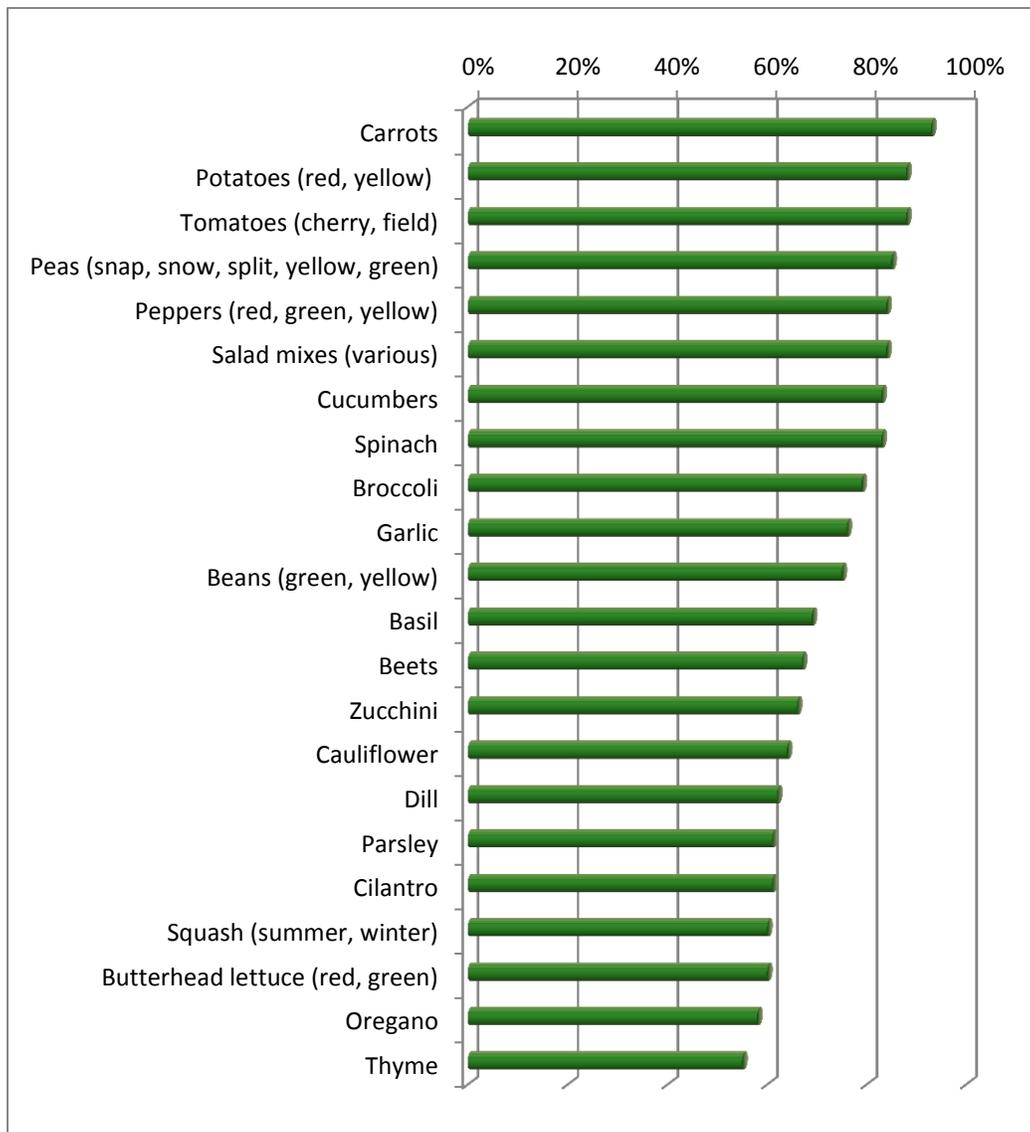
There have also been some products sold through retail grocers, who reported that they too had no difficulty selling the locally-grown produce. In fact, they felt that having the Hay River produce available helped to bring customers into their store specifically to purchase it.

While no public survey has been conducted in Hay River to quantify consumer demand, a series of semi-structured interviews and an online survey of various stakeholders can help to give insight into the types of vegetables for which there might be the highest demand. The survey results were largely from Yellowknife residents, but some participants were from other communities, including six from Hay River.⁸

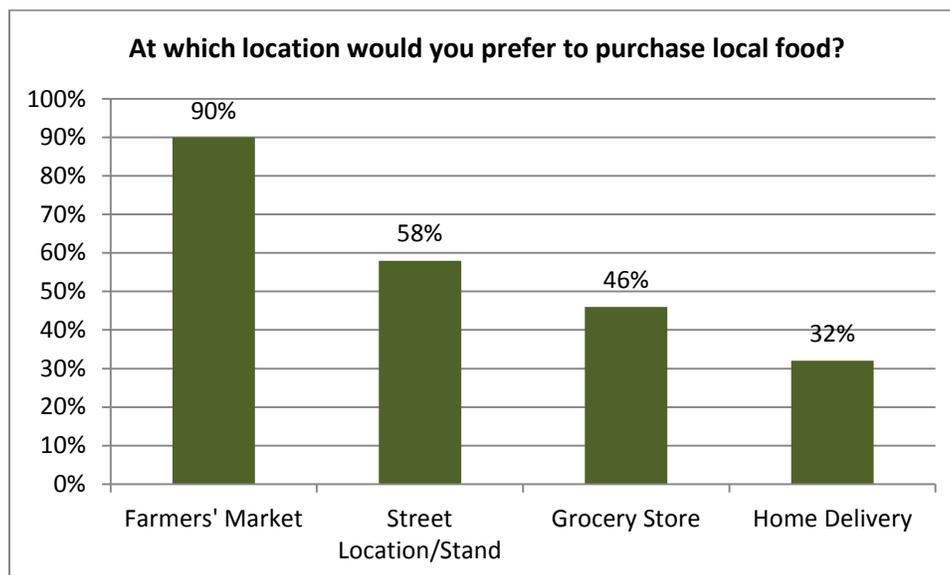
⁸ Amy Lizotte, "Building a Local Food Solution in Yellowknife", a research project submitted as partial fulfillment of the requirements for a Masters Degree in Interdisciplinary Studies at Royal Roads University. November 2012.

When asked which vegetables they would purchase if they were grown locally, respondents expressed that they would likely by the locally-grown produce. When asked which type of vegetables they would be most likely to purchase if a wider range were grown locally, root vegetables were most popular, followed by tomatoes, peas, peppers, cucumbers and leafy greens.

Figure 8: NWT Locally-Grown Food Preferences



The same survey also asked respondents where they would prefer to purchase local food. There was a strong preference for farmers’ markets, though there was also interest in other channels, as shown in Figure 9 below.

Figure 9: Preferred Purchasing Locations for Locally-Grown Food⁹

It is common across Canada for the prices at farmers' markets to be considerably higher than similar items sold at a grocery retailer. Consumers are willing to pay a premium for locally-grown produce. However, the pricing of produce appears to be a challenge for many producers – most suggested that it was their guiding principle to “be fair” to their customers.

It should be noted, for example, that several producers chose to set their prices on the basis of comparable grocery-store prices (at little or no premium), but that does not appear to be the most common practice. While there are no statistics kept on the exact pricing, some examples of pricing for goods sold in Hay River and Yellowknife suggest premiums of 15 to 100% over the retail price for non-local produce.

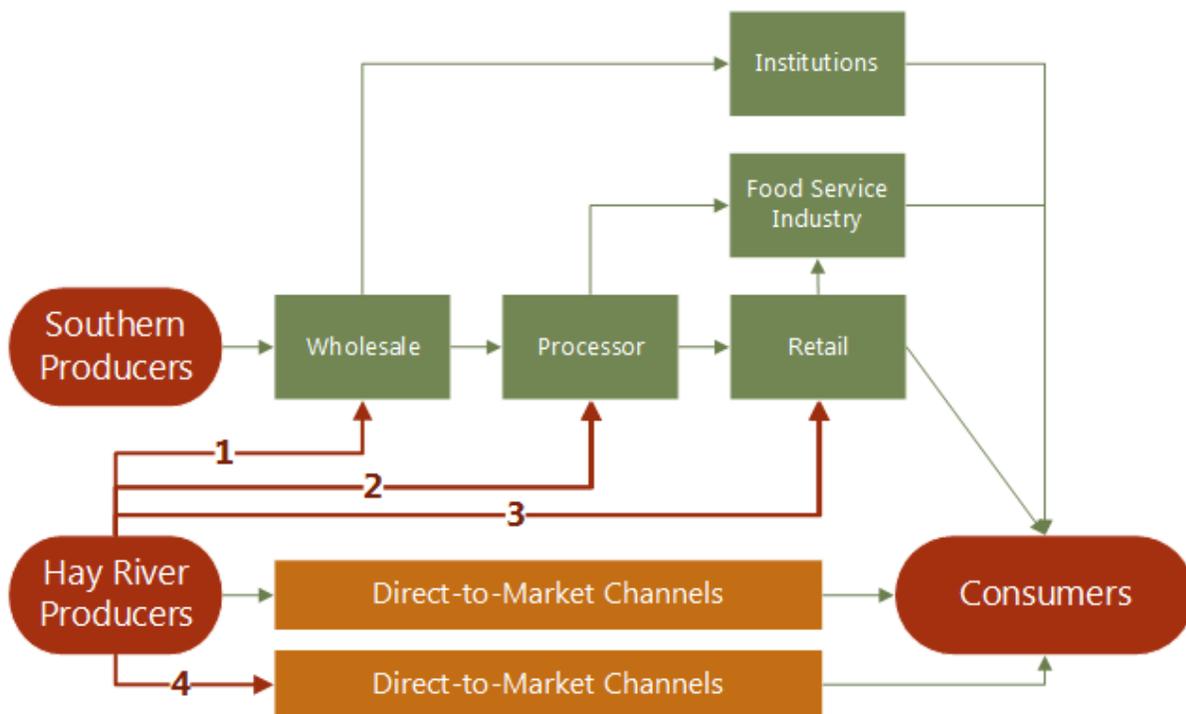
However, there may be opportunities to increase the overall volume of local produce sales if Hay River producers were to access other marketing channels. Both grocery retailers and restaurants expressed interest in considerable volumes of local produce, especially carrots, potatoes, and leafy greens. One restaurant, for example, suggested that it alone could use up to 300 pounds of those vegetables a week.

⁹ Amy Lizotte, 2012.

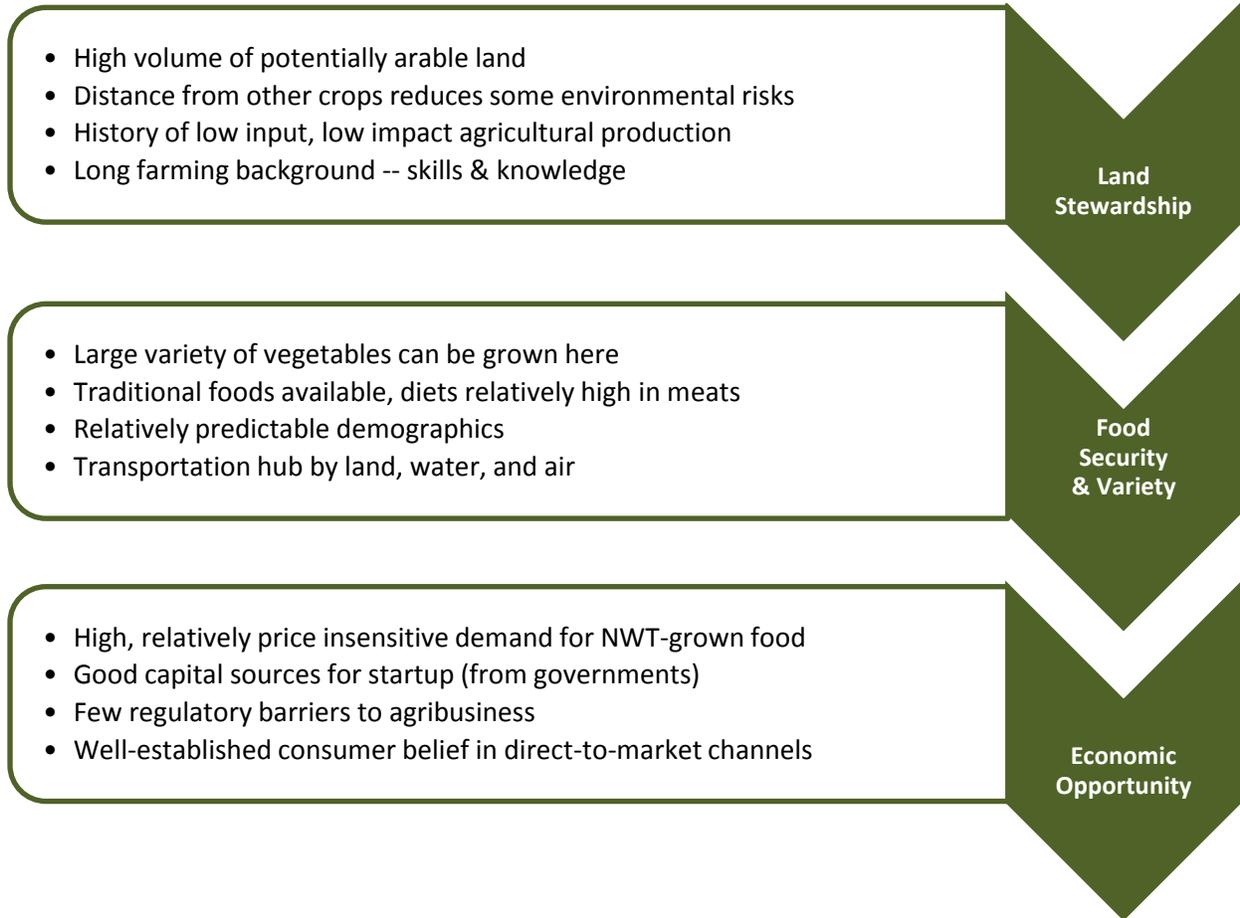
If there is a desire to develop new marketing channels other than the current farm gate and farmers' market sales, the following opportunities could be pursued:

1. Wholesale: Currently, most retail and food service industry businesses purchase their produce from wholesalers in the south. There may be opportunities for a territorial organization to take on a wholesale function, perhaps as part of a cooperative producer effort.
2. Processing: There is considerable interest in crafting unique made-in-the-NWT food products through value-added processing. As such businesses develop, there may be opportunities for supply directly from producers or through a cooperative wholesale organization.
3. Retail: There have already been some retail sales of local fresh produce such as cucumbers during the summer months. The produce was well received and helped to bring customers into the grocery retailer. There are immediate opportunities for this type of retail chain entry, especially for fresh vegetables.
4. New direct-to-market channels: Hay River does not currently have any box program or other community-supported-agriculture type initiatives. It would appear that such initiatives would be favourably received by local consumers and also by residents of Yellowknife and likely other centres, if cost-effective or creative transportation methods can be found.

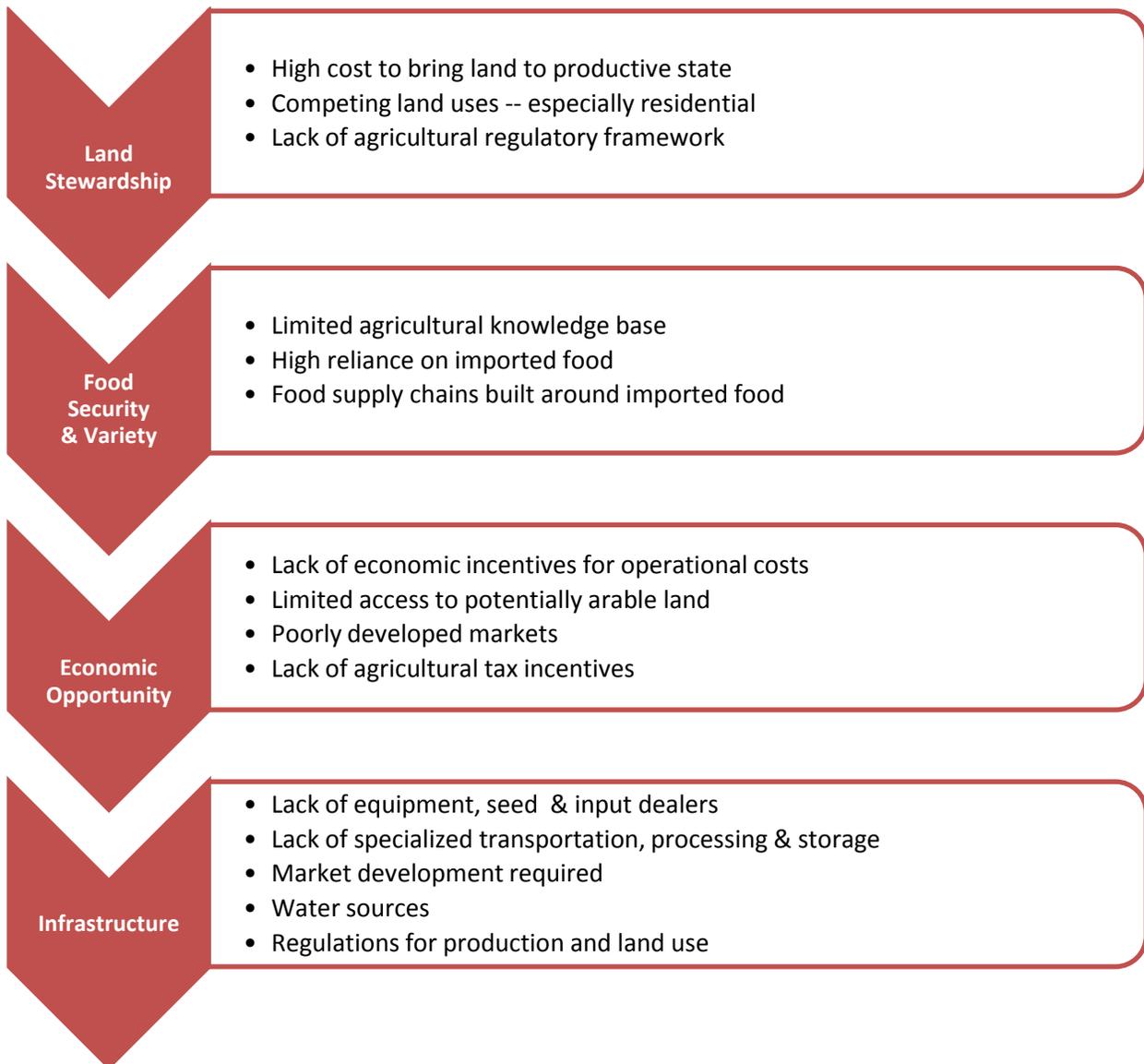
Figure 10: Options for New Marketing Channels



KEY HAY RIVER OPPORTUNITIES / ADVANTAGES



KEY BARRIERS TO SUSTAINABILITY



IDEAS & OPPORTUNITIES

Participants in the background consultations and the public roundtable workshop expressed many ideas for potential ventures that they feel are worth pursuing in Hay River. The details of the various initiatives are beyond the scope of this project, but there is much passion surrounding many opportunities for growing food. A number of the potential initiatives that came up repeatedly are enumerated below:

- expanded market gardening
- caribou farm
- expanding on commercial layer operations
- berries
- beekeeping
- demonstration farm
- small animal production (rabbits, chickens)
- greenhouses, hydroponics
- fodder system
- value-added processed products
- storage solutions

While it is beyond the scope of this project to go into details of each of these initiatives, it should be recognized that interest by stakeholders falls generally into four categories of biggest current interest:

1. More intensive production on existing agricultural and base
2. Expanded use of traditional meats & berries, including potential for market development
3. Increasing value-added processing, particularly of vegetables and berries
4. Expanded agricultural land-base for food security

Sustainable Agriculture Strategy

The Town of Hay River, as part of its Integrated Community Sustainability Plan, has adopted the following as one of its Principle statements:

Hay River will seek out ways to advance traditional harvesting aspects of our Town such as hunting, fishing and farming as well as fostering our business community and recognizing the contribution by all of Hay River's residents.

The purpose of this project was to clearly outline a plan that will allow for furtherance of this principle, taking into account the soil, water, and climatic resources available for agriculture in the region while learning from the failures and the successes of the past. This was done through a series of individual consultations with various stakeholders, including particularly agricultural producers and First Nations, followed by a public roundtable workshop.

The strategic directions outlined below attempt to aggregate the feedback received through that process -- in the form of a vision, strategic goals, and potential opportunities for action.

Sustainable Agriculture Principles

From consultations, it became clear that the key principles which Hay River stakeholders felt should guide the region's agricultural industry in Hay River would be social, economic, and environmental sustainability. Specifically, many felt that while pursuing economic opportunity is important, this should only be done in such a way that it maintains the agricultural capacity of the land while increasing food security and food variety for the region.



Based on those principles, a possible agricultural vision statement for the Town might read:

Vision

“A sustainable, economically-viable agriculture industry providing the Town of Hay River and surrounding regions of the Northwest Territories with greater food security and variety, while ensuring stewardship of its lands. “

Strategic Goals

It is recommended that in pursuing implementation of its Vision, the Town of Hay River should pursue three primary strategic goals, each of which could be supported by a number of individual objectives. The three key strategic goals would be to:

1. **Enable urban agriculture**
Policies to remove barriers to the small-scale production of food within built-up areas of the Town, in ways that do not unreasonably interfere with other uses.
2. **Designate agricultural lands**
Policies to actively support the use of the land with the highest agricultural potential and protect its use so that it is used primarily (or exclusively) for the production of food.
3. **Support agricultural industry development**
Policies that promote access to additional land and other resources for the agriculture industry, both within and adjacent to the Town.

ENABLING URBAN AGRICULTURE

There is strong support in the Northwest Territories for urban agriculture. In a 2012 online survey, 95% of NWT-resident respondents agreed that they support the idea of urban agriculture as a means to provide local food to community residents.

Objective 1: Continue to support direct-to-market food sales

- Several markets have been developed in Hay River, at the Fisherman’s Wharf during the summers and as a Winter Market through the Hay River Commons. Maintaining these markets is crucial as the production of food increases, as they are the primary means of bringing production to the consumer.

Objective 2: Develop rules regarding urban livestock and beekeeping

- While most stakeholders agreed that the lack of restrictive regulations was generally a good thing, a number of individuals expressed the need for bylaws with respect to keeping livestock on residential land.
- This is an issue for municipalities across Canada, and has been resolved in a myriad of different ways. However, given that conflicts have developed around the keeping particularly of backyard poultry, it is advisable to provide clarity through bylaws on what is allowable. In this way, there would be a clear understanding of the overarching rules from both sides – those wishing to keep animals and their neighbours.
- Generally speaking, municipalities should keep in mind the following issues before developing bylaws around keeping livestock:
 - animal health and public health
 - animal care
 - food safety
- It must be kept in mind that Hay River will need to develop a bylaw that treats each individual situation differently. Unlike large urban centres, some of the residential areas in Hay River are in small subdivisions many kilometres away from the Town's core, with neighbours' residences being hundreds of metres away.
- Even though some residences are relatively close to each other for a rural area, their situation is unlike any urban residential neighbourhood. For this reason, it may be best to have a system that requires the issuance of a permit by the Town for the keeping of livestock, rather than general rules around the number of livestock of type of housing. While guidelines would still be required, the specific restrictions would best be set at the time of the issuance of a specific permit.
- A number of individuals expressed desire to start beekeeping during the summer of 2014. In addition to the production of honey, there would be considerable potential benefit through the pollination of fruit and vegetable crops. There may be merit to considering the Town's bylaws around bees at the same time as the backyard poultry flocks.

Other Municipalities' Bylaws

Edmonton does not allow chickens; honeybees only in agricultural zones.

Vancouver allows both hobby beekeeping and chicken and other poultry.

Burnaby allows up to two beehives on some residential lots.

Guelph allows various types of poultry.

Peace River specifically allows up to 6 hens for "urban farming".

Esquimalt allows up to 4 hives of bees and 4 hens.

Saanich allows up to 5 hens in residential areas, but requires registration.

Whitehorse allows up to 6 hens, and has a very interesting and detailed application process that involves canvassing neighbouring property owners.

We are not aware of any municipality that specifically allows roosters.

Objective 3: Develop rules around private & community gardens

- The Town of Hay River's bylaws do not currently have specific bylaws or guidelines with respect to gardens within the built-up areas of the municipality, except some references to vegetation height in the Unsightly Land Bylaw. While there are some gardens in private yards, it is unclear what types of crops would be permitted and what restrictions exist on them.



- Specific attention should be given as well to facilitating the use of municipal reserve land for the purposes of community gardens. Several schools in the area have developed community gardens as well. Community garden initiatives would benefit as well from clarity on where and under what conditions they will be permitted within the built-up area of the town.

Objective 4: Support food & agriculture awareness activities

- There are already significant activities at Hay River's schools aimed at connecting children and youth with food production.
- Several schools have established gardens, both within the municipality and at the Katlodeeche First Nation. These gardens have as their primary purpose the education of children about food, agriculture, and environmental principles. However, the gardens do also provide some food to the children and their families.
- The Town will want to consider how it can support these initiatives, particularly through in-kind contributions of vehicles, equipment, or staff.

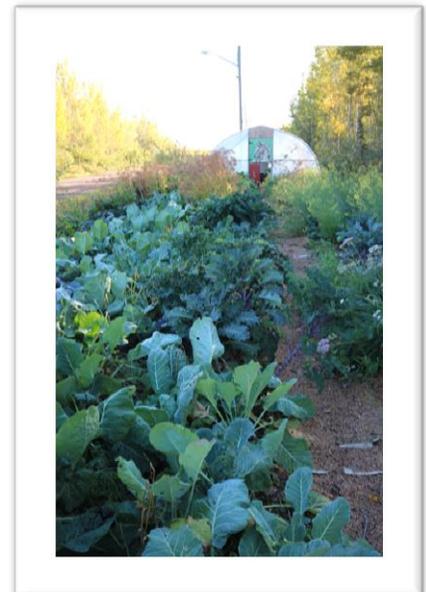
Objective 5: Review the regulatory framework for agriculture

- It became clear from the consultations that there is currently a lack of clarity with respect to many of the regulations that would have impact on agricultural enterprises.
- Greater clarity should be provided on the current land zoning rules and processes. Consideration should also be given to specifically considering agriculture when determining the zoning for new parcels of land.
- There is always the potential for conflict when adjacent lands are used for residential purposes and for agriculture (however small the area). The Town of Hay River will want to review the need for bylaws in this respect, especially with respect to waste management issues, as this is often a particular point of contention.

- Water use bylaws should also be considered. The Town has expanded considerably in terms of its population. As the need for water for human consumption and residential use increases, there may come a time when the town water supply will not allow for sufficient water to meet the agricultural needs of residents with urban agriculture. Clarity on the rules regarding water use should be provided to residents in advance of such a situation occurring.
- Mill rates for lands zoned as agricultural should also specifically be considered, as a way to encourage a positive economic environment for further agricultural development. This is explored further below as part of Objective 14 at page 35 .

Objective 6: Make land available for urban agriculture initiatives

- The Town of Hay River has municipal reserves at various strategic locations throughout the municipality. This land is either in current use for the public good, or there are plans for its future use. In the short term, however, some of this land could be made available to groups wishing to establish community gardens.
- A community garden has already been established in the Town's northwest industrial area and some gardens have been established by schools from time to time. However, there may be opportunities to use other lands which may otherwise have restrictions that will allow for permanent developments. The area to the west of the airport, for example, has Class 3 soils and is partially cleared, but is less suitable for any type of residential or industrial development due to its proximity to the airport. Either temporary private gardens or communal gardens could be established on such lands.



DESIGNATING AGRICULTURAL LANDS

Objective 7: Preserve lands specifically for agriculture

- In the past, leases of land from the Town or from the Commissioner for some agricultural parcels have required their use for agriculture. However, in many instances these lease terms are only loosely enforced, if at all. Leases with restrictions have been shown to be a difficult method for preserving agricultural lands.
- For key areas, including particularly the alluvial floodplains, the Town may wish to consider creating some areas that are the equivalent of an agricultural land reserve. The legal vehicle for this might be restrictive covenants on title, in the case of transfer of ownership, or the transfer of land as an agricultural trust. In this way, the use of such

land for anything but agriculture would require approval from some authority named in the covenant or trust.

- Given the complex nature of land ownership rules in the NWT, compounded with the recent devolution of responsibility for Crown land to the territory, as well as the myriad of ownership structures within the municipality, it is not possible to recommend one legal vehicle for preserving land for agricultural use. The exact legal vehicle will need to be considered for each individual parcel.

Potential Models for Ensuring Continued Use of Land for Agriculture

A model that has been used in Manitoba and for rangeland in southern Alberta, the "[Agricultural Land Trust](#)" may be worth considering in the Hay River context. These land trust models, customized for the NWT legal context, could help to build stable local governance around the use of key agricultural lands within the municipality at first. As devolution of lands from the federal to territorial government proceeds, such a model might serve as an appropriate precedent for future development of Crown lands as well.

Another model that may be of interest would unfortunately require new territorial legislation. [Conservation easements](#) are available to preserve farmland for agricultural use in all provinces and territories except Newfoundland, Nunavut, and the NWT.

The Yukon has an [Agriculture Land Program](#) which has had some success in fostering expansion of their agricultural acreage. The model used is a seven-year agreement for sale, where an applicant must complete certain development commitments in order to gain fee simple title.

The most straightforward option may be to continue to transfer possession of land simply through leases with restrictions that require agricultural use. While experience in the NWT and elsewhere has been that enforcement of such provisions can be difficult to manage, this may be more realistic if combined with restrictions around permanent residences, as outlined below.

Objective 8: Restrict residential development on prime agricultural lands

- Reserving land for agricultural use can be accomplished to some degree through zoning restrictions related to construction on the land. For example, the Town may wish to consider specifically disallowing residences on the alluvial plains as a way to ensure that those key lands are not used as larger country-residential properties. As an alternative, if there is a desire to still allow some residential development, then there should at least be restrictions on the maximum size of dwellings (to allow only small structures requiring little other infrastructure) and/or requiring that all dwellings be non-permanent and removable.

- The key benefit of such restrictions would be the assurance that the focus on development of these lands would remain on their use for agriculture. The other benefits of disallowing permanent residential development on the remaining two alluvial plains (“South of Paradise” also falls in this category) is that it will reduce the development and maintenance costs that would otherwise be incurred by bringing residential utilities and services down the steep hills.
- There may be a need to also revisit zoning requirements around the minimum size of residences, especially if only non-permanent housing is allowed in some areas. There may be a strong desire by some to put either mobile homes or “tiny homes” on those properties. A number of municipalities are considering changes to their bylaws, especially around this newer tiny home trend.

Objective 9: Facilitate access to unutilized land with agricultural potential

- There is considerable Crown land within the municipal boundaries that would have high potential for agricultural production. While these are not immediately under the control of the municipality, steps should be taken to encourage the territory to make some of this land available in parcels large enough to allow for agricultural production.
- Even if not designated exclusively for agriculture, some prime agricultural lands could perhaps be used for growing food without adversely affecting the primary use (along the ISL Road near the airport, for example).
- In the short term, the “Northern Pork” property (described in greater detail below at page 45) would be the most obvious property to make available for agricultural uses. The Town obtained ownership of that parcel in 2012.

Objective 10: Consider agricultural uses when reviewing development applications

- Even where residential or industrial development subdivisions are created or expanded, the Town may want to reconsider policies and processes for greater land use compatibility with agriculture. Early consideration of the conflicts that might arise between agricultural and industrial or residential uses – and the creation of rules and guidelines governing such development -- will help to reduce the friction that could otherwise develop between these competing uses.
- For example, it may be necessary to require vegetated buffer strips and other creative design elements to improve the agriculture-residential interface when beginning new residential developments.
- The use of roads by agricultural equipment will also specifically need to be considered in the design of transportation corridors. In some cases, there may be a need to allow access to agricultural areas over public lands.

- Consideration of agricultural issues in land use planning may be best achieved by creating some type of Agricultural Advisory Committee to play an advisory role in all municipal land use planning processes.

Other Municipalities' Agriculture Committees

As of December 2013, there were 46 Agricultural Advisory Committees (AAC's) in British Columbia. The BC government has also developed Bylaw Standards in a [Guide for Bylaw Development in Farming Areas](#). Good examples are Kelowna's [AAC](#), or the detailed [Terms of Reference](#) of the AAC for the District of West Kelowna.

Alberta has a history of [Agricultural Service Boards](#), though these are for rural municipalities (counties), not urban centres. While their functions come from a history around controlling weed infestations, many now also serve other functions.

Many larger urban centres have created councils to coordinate implementation of new food and urban agriculture policies. A recent example is Edmonton's [Food Council](#).

Objective 11: Facilitate greater productivity from existing lands

- Significant land is already zoned as agricultural, but is not currently producing significant food. In addition to facilitating the clearing of new lands, increasing management intensity on these existing, cleared lands should be considered.
- The specific measures required would depend on the specific circumstances of a parcel, but measures would likely include improved soil management, irrigation, and potentially drainage.
- The responsibility for this will lie mainly with individual producers and potentially with farm organizations. However, there are a number of existing leases which require active agricultural use of the lands. Consideration should be given by the Town to reviewing the sufficiency of the lease terms at the time of renewal, or to enforcing lease terms where appropriate.

Objective 12: Ensure land and environmental stewardship

- Generally speaking, the lack of restrictive regulations is positive for the development of the agricultural industry. However, there is a strong feeling by some that mechanisms are required to ensure that the land and environment are protected.
- Several participants felt that it is important to ensure that there are restrictions on the use of synthetic pesticides and fertilizers. In the absence of large-scale agriculture, it may be difficult to enforce specific regulations in this regard. However, requiring individual farm planning for production on agriculturally-zoned land would be within the purview of the municipality. For example, some provinces require producers to have various types of advance planning with respect to issues such as waste management and fertilizer use (often termed “Environmental Farm Plans” or “Nutrient Management Plans”).
- While the regulatory capacity of both the GNWT and the Town of Hay River would likely be insufficient for rigorous regulatory enforcement, opportunities could be pursued to build such capacity in partnership with other jurisdictions, such as the Yukon or Alberta.

Environmental Farm Plans

Environmental Farm Plans are typically voluntary, with guidance provided by provincial rather than municipal authorities. They generally involve the develop of farm-specific analysis, risk-reduction strategies, and action plans for improving/reducing environmental impact.

Relevant examples in Canada include: the [Yukon](#), [British Columbia](#), [Alberta](#), [Saskatchewan](#), [Manitoba](#), and [Ontario](#).

Most jurisdictions also have mandatory Nutrient Management Plans, but these are usually only triggered by larger livestock or manure storage operations.

Objective 13: Improve information on land availability

- The ownership structures for land in the NWT are varied and difficult to navigate if one is not familiar with the territorial and municipal registry systems.
- In order to encourage potential new producers, develop a database of available lands for sale, lease, or sublease within the boundaries of the Town of Hay River.
- While this type of information may be commonly available to some members of the community, there is not currently a central, publicly-accessible repository for this type of information. Improving access to this information may help to attract interest and investment in agriculture, both from inside and outside of Hay River.

SUPPORTING AGRICULTURAL DEVELOPMENT

Objective 14: Provide a positive economic environment for food production

- Consider differential taxation as a financial incentive to those who might be considering starting an agricultural enterprise. While there appears to be widespread support for a differential tax rate for individuals producing agricultural products, a number of individuals expressed concern that a differential tax rate should only be available to those actively involved in agriculture. It is recommended, therefore, that an individual demonstrate annually that they have generated revenue through the sale of agricultural products. It is suggested that a revenue threshold of approximately \$10,000 annually would currently differentiate the most active producers from those for whom agriculture is not of primary interest.
- Mill rates for agriculture vary extremely widely between different municipalities. This is due largely to the large variety of assessment mechanisms for the value of agricultural land in proximity to residential land. As a general rule, many assessment mechanisms value the land based on its value for agriculture rather than its true market value as land that may likely be developed soon. In addition, some provinces have assessment exemptions for some farm buildings. As a result, the absolute mill rates of individual municipalities would be of little guidance to Hay River. The sidebar box does provide some examples and information from other jurisdictions.
- As a general rule, the tax rate for agriculture will need to reflect the services provided. This would likely vary as well based on what types of residential property, if any, are allowed on those lands.
- Consider differential utility rates for water supplied to agricultural producers. While utility rates are largely driven by economic forces out of the control of the municipality, there may be opportunities to provide differential rates to support the establishment of agricultural enterprises.

Differential Taxation Examples

Mill rates for agriculture vary extremely widely between different municipalities. [Saskatchewan](#) recently conducted a thorough review that specifically examines the mill rates for agriculture, residential, and commercial classes in that province.

While most municipalities have uniform mill rates, Alberta has a system that provides farm [assessment exemptions](#).

An interesting example of agricultural taxation that could serve as an excellent example for Hay River's specific circumstances is the [Farm Property Class Tax Rate Program](#) of the Ontario Ministry of Agriculture. Land owners or tenants must generate \$7,000 of farm income to qualify for a reduced rate of only 25% of the regular taxation for everything after the first acre of land.

Objective 15: Provide a positive regulatory environment

- Regularly review bylaws, development plans and policies to ensure that they provide a positive regulatory climate that provides opportunity for continued growth in agriculture.
- Special attention will need to be given to “urban agriculture” in the immediate vicinity of residences, as distinct from agriculture which may be carried on within the municipal boundaries, but which is less immediate to any residences. The Unsightly Land Bylaw may also require revision to specifically consider gardens within residential areas.

Objective 16: Foster opportunities for cost-effective, environmentally-friendly inputs

- Foster the creation of suitable composting sites in locations where they could be developed as a business supplying soil amendments. Products currently considered waste could perhaps be dealt with in this way -- chicken manure and fish offal in particular could be considered given the scale of those two businesses presently. Other refuse may also be suitable for composting if programs were put in place to separate suitable organic waste from other garbage.
- The Territorial Farmers Association currently assists its members by buying some inputs such as fertilizers in larger quantities and then reselling them to its members. There may be a role for the Town to play in providing locations for such sharing of resources or providing some support in establishing shared tools and equipment for use by multiple producers in the region.

Objective 17: Improve communications around agriculture and food

- It may be useful for both elected town councillors and the Town’s civil servants to get a greater insight into food production. This could include an introduction to the area’s agricultural production and potential through a short formal training or orientation session, perhaps coordinated by the Territorial Farmers Association or similar organization. This could also be promoted through awareness-raising activities such as an annual farm tour, which would expose the municipality not only to the breadth of activities in this sector, but also update them on new trends.
- Foster linkages between the farming community and other organizations. This may perhaps be fostered through the creation of an Agricultural Advisory Committee which could help build linkages not only to the Town, but other organizations which would also communicate with Town staff for the purposes of permitting or promoting their community events.
- There is currently strong support for the Territorial Farmers Association (TFA) to be the key networking organization for all agricultural producers in the NWT, including those in Hay River. However, at the consultation meetings a number of suggestions were raised by participants for ways in which that organization could improve communications with its members, with the municipality, and with the general public. The TFA is developing

plans to establish a demonstration farm, which would give the public access to education, advisory services, and also serve as a communications hub for agriculture.

Objective 18: Consider leading the development of a Hay River or NWT food “brand”

- There are already some initiatives underway to label produce as being grown in the Northwest Territories. Participation in such an initiative, perhaps supplemented by identification of Hay River specifically, would help further improve the perception of Hay River as an area of high agricultural potential.
- Many of the individuals currently growing crops in and around Hay River are growing those crops without synthetic fertilizer or pesticides. For many, this is a conscious choice based on their belief that the use of these products impacts food safety, food quality, and environmental impact.
- However, most of these growers do not currently have certification as organic growers. Establishing an organic zone as a brand for the region would therefore be difficult, as there are specific requirements with respect to labelling foods as organic.
- A number of participants at the roundtable workshops felt that the Northwest Territories should be a “GMO free” zone. Commercial crops with traits altered by genetically modified organisms are not commonly grown in Hay River or other regions of the Northwest Territories. It is also unlikely that crops such as commercial corn, soybeans, or canola would make a significant contribution to the NWT economy, as the climatic conditions are simply not favourable to those crops in any event. For this reason, there may be merit to creating a GMO-free territory by legislation or a GMO-free zone by municipal bylaw.

Objective 19: Lobby for appropriate legislative & regulatory change, where required

- In consultation with agricultural producers, consider developing town bylaws and lobbying for territorial or national laws and regulations in support of specific opportunities to brand either Hay River or the Northwest Territories as “GMO free” or “synthetic fertilizer free”.
- As agricultural production increases, there may be a need to develop regulations pertaining specifically to agriculture. While the authority for some of those regulations may rest with the territorial or federal government, there may be opportunities for the Town of Hay River to bring forward the position of its residents.

Objective 20: Actively support the development of a centre for agricultural incubation

- The agricultural industry in the NWT has yet to develop a critical mass to sustain both the necessary capital requirements and a sustainable knowledge-base in northern food production. However, the agricultural producers are small in number and individually

relatively small in acreage. Opportunities must be sought for incubation of more agricultural enterprises through collaboration and sharing of resources.

- Skills must also be developed and knowledge shared. In 2012-13, the Northern Farm Training Institute developed and delivered a set of 6 three-day farm training workshops in Hay River to assist local growers and small-scale farmers from across the NWT. The program delivered 2,160 hours of training to 28 participants from 14 communities. The first year of this Northern Farm Training Institute (NFTI) was an incredible success.
- Much of the promise for the development of a local food industry would include the development of some value-added food processing capacity or a food distribution system. Support should be provided to enhance the probability of success either by cooperative or private-sector startups, perhaps through support for a food-processing incubator and/or commercial kitchen.
- The Territorial Farmers Association is currently drafting a business plan for the development a “Living Classroom” to continue the work of the NFTI. This model farm campus would foster and support the implementation of sustainable agricultural systems in the NWT by pursuing the following mission:
 - Innovation: applied research to refine northern agricultural management practices, with focus on environmentally sustainable systems
 - Extension: training, accessible and participatory demonstration, and agricultural advisory services
 - Incubation: opportunities and support for startup businesses in the food production and food processing sectors
- The Territorial Farmers Association has specifically requested access to Town-owned lands at the “Northern Pork” site for the purpose of developing this campus to provide extension services in a cost-effective way.



Appendix A: Key Agricultural Lands

Identification of prime agricultural land in Hay River is crucial, as the cost of turning less suitable land into land capable of food production is nearly insurmountable. While some have been able to turn northern boreal bogs into decent forage stands, these require too much effort and resources compared to the benefits. The costs of developing a bog into forage land is comparatively higher than the cost of turning an alluvial floodplain into a highly productive vegetable garden, especially when one considers the comparative volume of food (and revenue) that can be generated from the two types of development.

The soil survey enhancement report was used as a starting point for establishing a list of the most promising parcels for agricultural production. The municipal boundary was then used to delimit the lands to be considered (there is substantial Class 3 land on the east side of the Hay River as well). Lastly, areas that have already been substantially developed (including the town site itself, Market Gardens, Paradise Valley, and Delancey Estates) were removed from consideration for this project

With these restrictions, there remain essentially six significant parcels of land of Class 3 soils that remain largely undeveloped. Three of these are contiguous, but given that they are significantly different areas, they have been treated as distinct areas to be considered separately.

Many of these areas have not yet been surveyed, but consideration should be given to evaluating these parcels in greater detail – including perhaps both formal surveys and evaluation of their soils, hydrography, and topography.

These parcels have also not been formally named, but informal names have been assigned for ease of reference in this report.

Figure 11 on the next page gives an overview of the general location of these six parcels. The pages that follow provide a quick summary and map of each of these parcels, going from north to south:

- A. West of Airport
- B. West of Town
- C. Fort Smith Junction
- D. Oxbow
- E. Northern Park
- F. South of Paradise

More detailed aerial views of each of these areas, with annotations, are appended to this report as Appendix B.

Figure 11: Key Class 3 Agricultural Lands



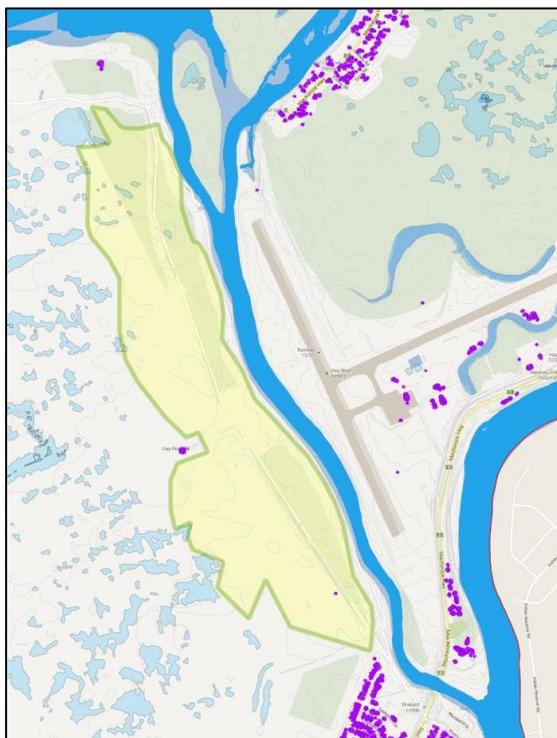
A. West of Airport

There is a large tract of Class 3 soil to the west of a road running along the west side of the west arm of the Hay River, west of the airport. Known locally as “ISL Road”, much of this land is federal and Commissioner’s land with restrictions related to its adjacency to the airport.

Overall, this area would have approximately 398 acres of Class 3 land, the majority of which is part of a large surveyed parcel of Commissioner’s land along the river. Much of it is Class 3 soils capable for supporting agriculture, but there is also some Class 5 land adjacent to it which has already been cleared and may at least be suitable for forage production.

However, it must be kept in mind that there is some federally-owned land which is used for equipment related to the airport. In fact, the proximity to the airport, even though it is across the river, may pose some serious limitations on the use that could be made of this land. Many of these lands would not allow for any permanent development, given the restrictions imposed around aerodromes. In addition, those lands which are zoned as agricultural have restrictions on minimum house sizes, which poses barriers to the use of smaller, temporary structures on those lands.

Figure 12: Overview of "West of Airport" Area



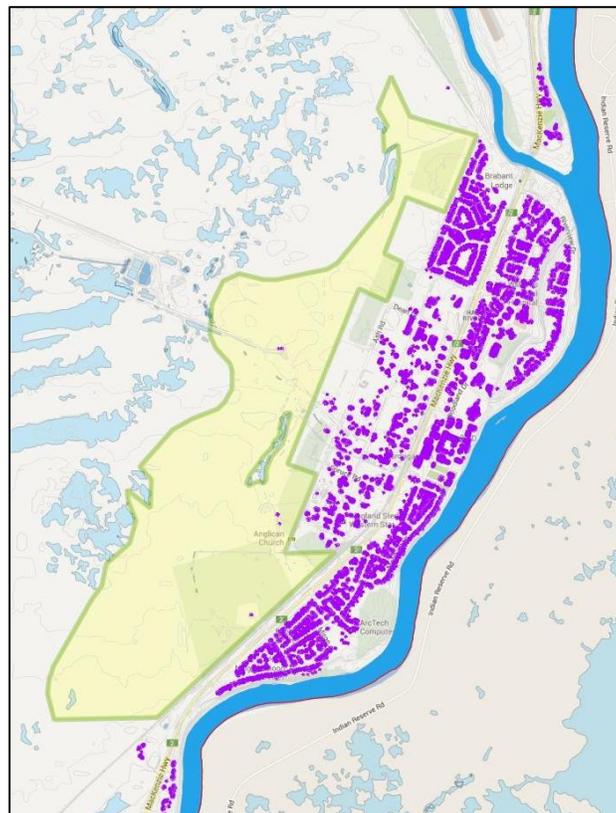
With these restrictions on the divestment of this land, as well as considerable restrictions on the permanent use of this land for agricultural purpose, some creativity may be required to nonetheless make use of some of this prime land for food production. Some participants have suggested that some of these lands could perhaps be used for agriculture nonetheless, as long as there are not any permanent structures that would interfere with the airport-related restrictions. Given its proximity to town, without being immediately adjacent to residences, this area seems.

B. West of Town

The area west of the core of the Town of Hay River consists largely of Class 3 soils, though. Overall, this area would have approximately 780 acres of Class 3 soil, significant portions of which have already been surveyed and some of which is municipal reserve.

However, it appears that there will likely already be concrete plans for much of this land, as it has been formally surveyed and structures already exist on a number of parcels. Even if not formally planned, it could certainly be assumed that much of this land will be required for expansion of the town's core, as the river restricts expansion to the east and airport uses restrict expansion to the north.

Figure 13: Overview of "West of Town" Area

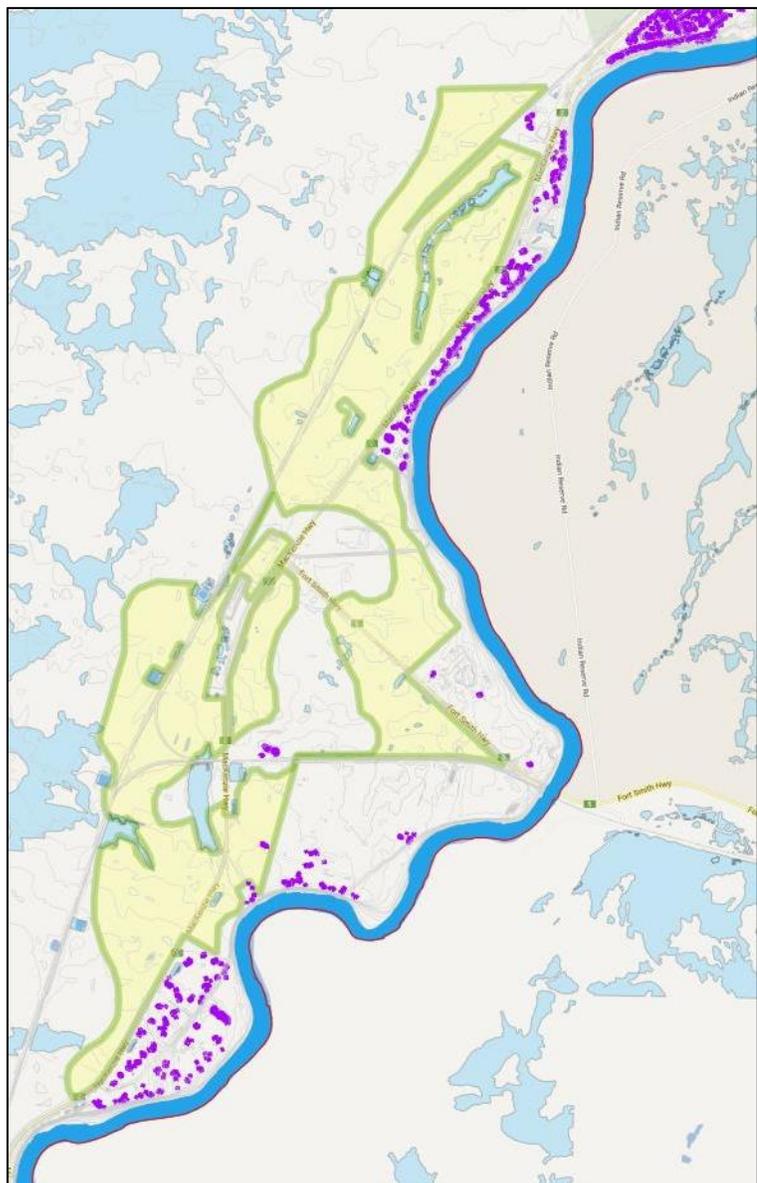


C. Fort Smith Junction

The Delancey Estates subdivision is immediately to the south of the intersection of Highways 2 and 5 (the Fort Smith Highway). It has surveyed parcels ranging from 1.4 to 18.7 acres in size. The areas to the south of Highway 5 and west of the river has also been largely cleared – those parcels are unsurveyed, but range in size from 17 to 54 acres.

However, significant land remains to the west of Highway 2 (beginning immediately across the highway from Delancey Estates and stretching along the west of the highway all the way to the intersection of the Mackenzie Highway with Stewart Drive).

There are some areas of bog, but significant areas appear to be of relatively high quality, though they do require clearing. Overall, we estimate that there would be approximately 1,400 acres of Class 3 soil in this parcel, as well as some Class 5 soils within the municipal boundary to the west. However, this land is considerably fragmented by development and by northern boreal bogs on the upper plateau. Unlike the land in the river's oxbows, these are not alluvial soils.

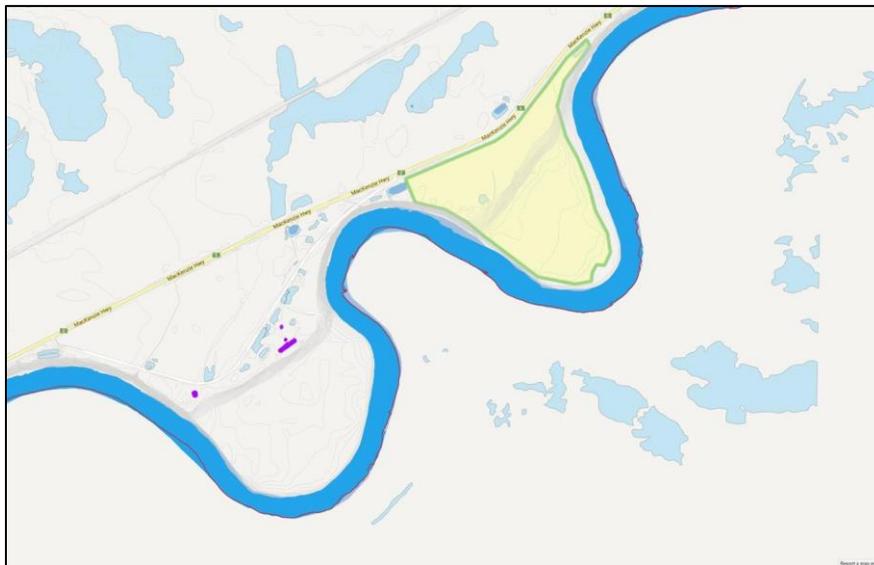


D. Oxbow

This parcel is the next bend in the Hay River to the northeast of the Northern Pork parcel described above. It appears to be entirely native forest, including an upper plateau southeast of the Mackenzie Highway and an alluvial plain in the river's bend. While no physical inspection of this property was undertaken in the course of this project, it appears to be in many respects similar to the other alluvial plains such as Paradise Valley and Northern Pork.

Out of the approximately 120 acres, only 56 acres (the low-lying alluvial plain nearest the river) appear to be Class 3 soil and therefore of primary interest for agriculture. As with the Northern Pork property described below, the upper regions of this parcel may be more suitable for other uses (though this property appears to be somewhat less swampy).

Figure 14: Overview of "Oxbow"



E. Northern Pork

The upper portion of this property, immediately to the east of the Mackenzie Highway, was previously used for hog production facilities. In fact, some of the external structure of the hog barn and its concrete foundation remain in place, as well as a feed mill and grain bins. Just over seven acres of the upper portion of this property have been cleared (around both the barn and the feed mill). There is an access road (the old highway) which provides access to the feed mill and barn site, but these will require improvement if they are to be used for residential or agricultural traffic.

The lower portion of this parcel appears to be of high quality, as its features are very

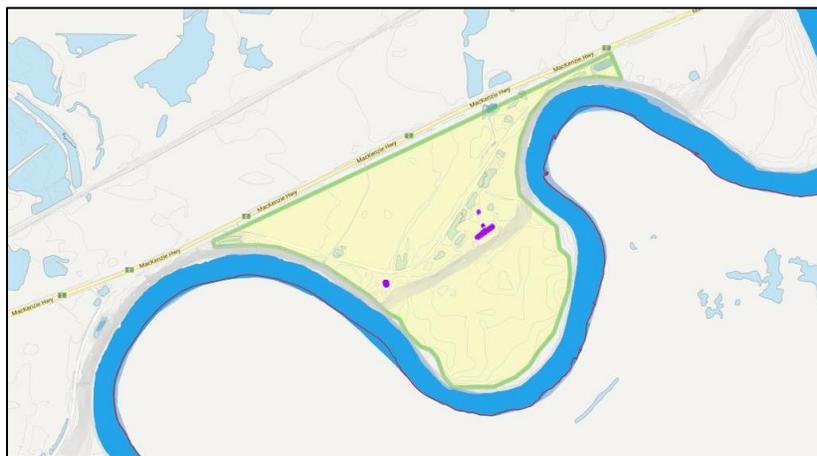
much like those of Paradise Valley to the south. However, only a small area of approximately 2.6 acres has been cleared, with the remainder being native forest. The lower portion cannot currently be accessed by motor vehicle. There are, however, two relatively steep paths that were previously used by agricultural equipment and would appear to be useable with only minimal clearing and improvement. The more northerly of the paths used to lead to the riverbank, but is currently overgrown by tall shrubs and is not accessible to any type of motor vehicle.

The lower portion of this land would be particularly promising for intensive agriculture. In addition to the promising alluvial soils, there appear to be only a few small patches that are poorly drained, with the remainder being sufficiently high ground.

The other reason that this parcel is of particular interest in the short term is that the ownership status, unlike other parcels, is very clear as it was recently acquired by the Town as freehold. The Territorial Farmers Association, by written submission to the coordinator of this project, has requested access to this land, as they feel it would be particularly well suited to the development of a model farm campus (a “Living Classroom” for the continuation of the “Northern Farm Training Institute”). Their request is for the allocation of at least 50 acres of land for this purpose. They state that they would want at least 50% of the land to be from the lower portion of this land (the Class 3 soils).

If such an allocation did proceed, that would allow for up to 75 acres of the remaining Class 3 soils to be allocated to other individuals wanting to start an agricultural initiative. This may be an opportunity for the Living Classroom to serve as both a farm business incubator, as well as an educational initiative and itself a source of locally-grown food for Hay River residents.

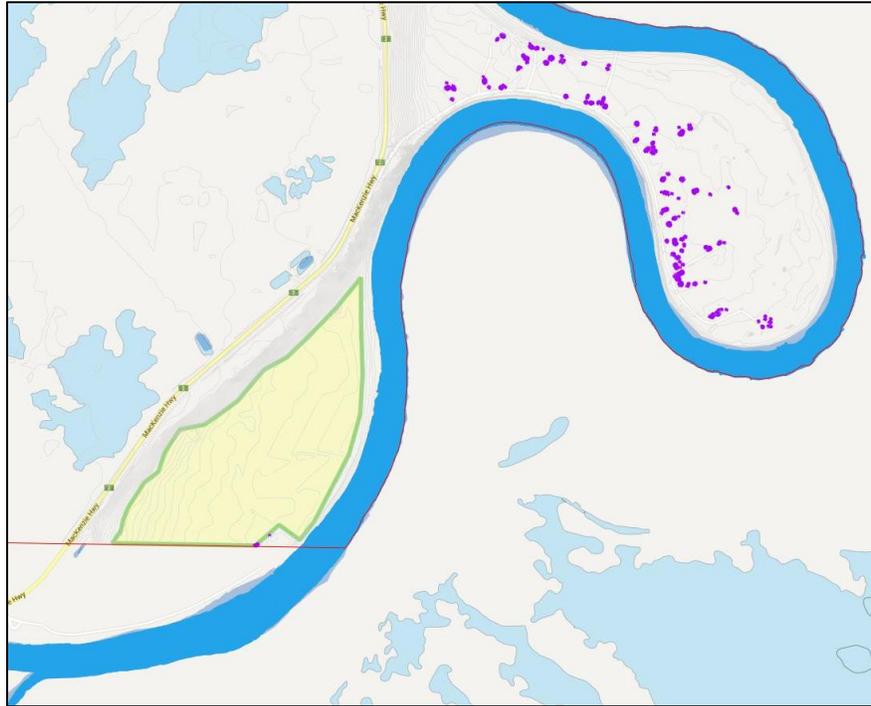
Figure 15: Overview of "Northern Pork"



F. South of Paradise

The total parcel size of this alluvial plain at the very south end of the Town of Hay River's municipal boundaries is 131 acres. This land has not been formally surveyed, with the exception of a small 2 acre parcel at the very southeast corner. The land appears to be Crown land, though it is unclear whether there are any particular plans for this land.

Figure 16: Overview of "South of Paradise"¹⁰



There is an access road outside the municipal boundary, near the south end of this particular loop in the river.

Of the 131 acres of this parcel that fall within the municipal boundary, we estimate that up to 120 acres may be Class 3 soil which would likely be highly suitable for agriculture, based on soil survey maps. On-site inspection was not undertaken of this parcel, but it can be assumed that the conditions will be somewhat similar to those of Paradise Valley, which is immediately to the north along the river and is already producing considerable hay, vegetables, berries and other crops.

At this location, the highway is very close to the sharp drop-off to the Hay River Valley. Aside from this wooded incline, the remainder of the parcel appears to be in native forest on an alluvial plain.

¹⁰ All maps generated using multiple data sources, including [ATLAS](#) Mapping of the Department of Municipal and Community Affairs, Government of the Northwest Territories.

Appendix B: Aerial Views of Areas with Agricultural Potential

Figure 17: Aerial View of “West of Airport” Area



Figure 18: Aerial View of “West of Town” Area

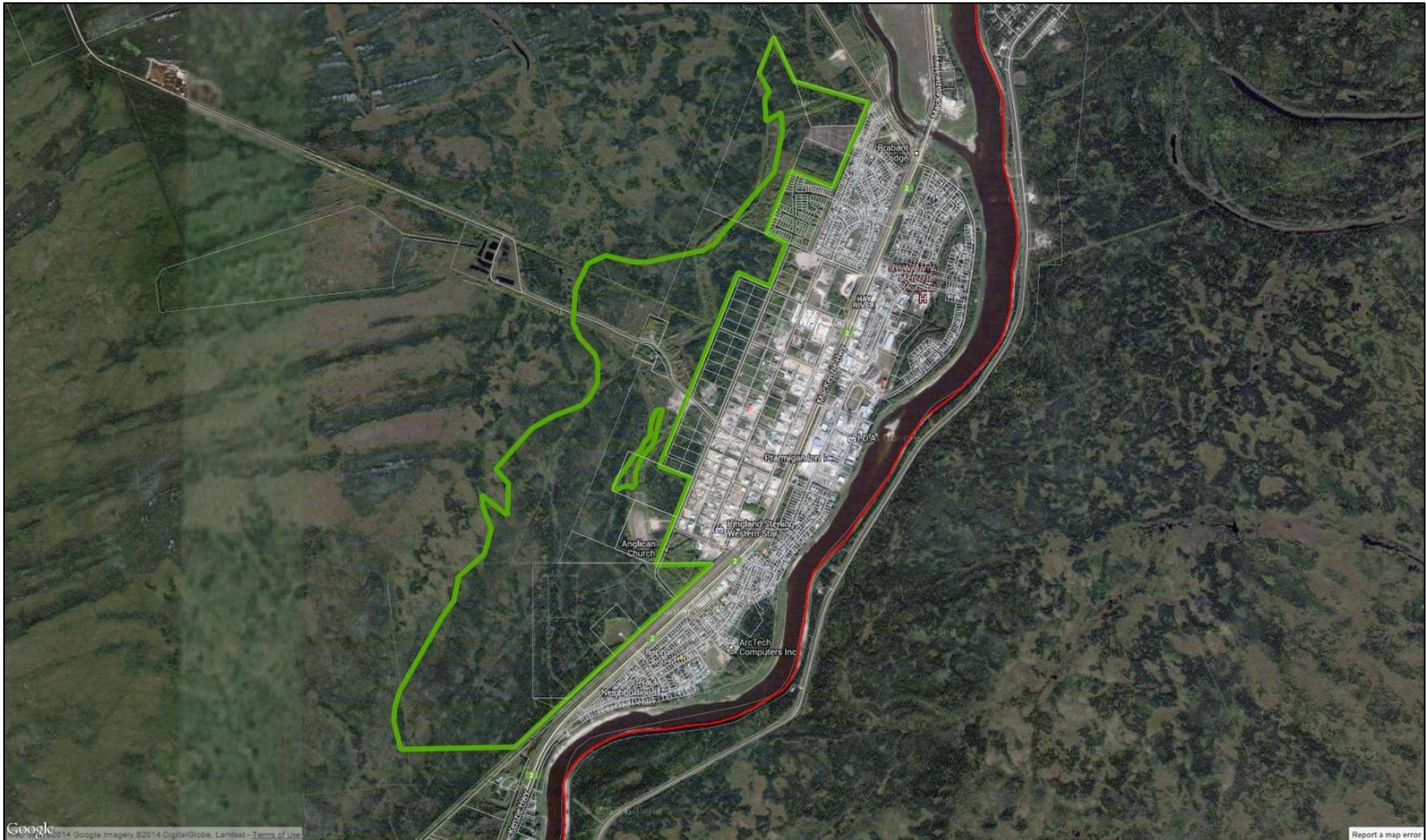


Figure 19: Aerial View of “Fort Smith Junction” Area

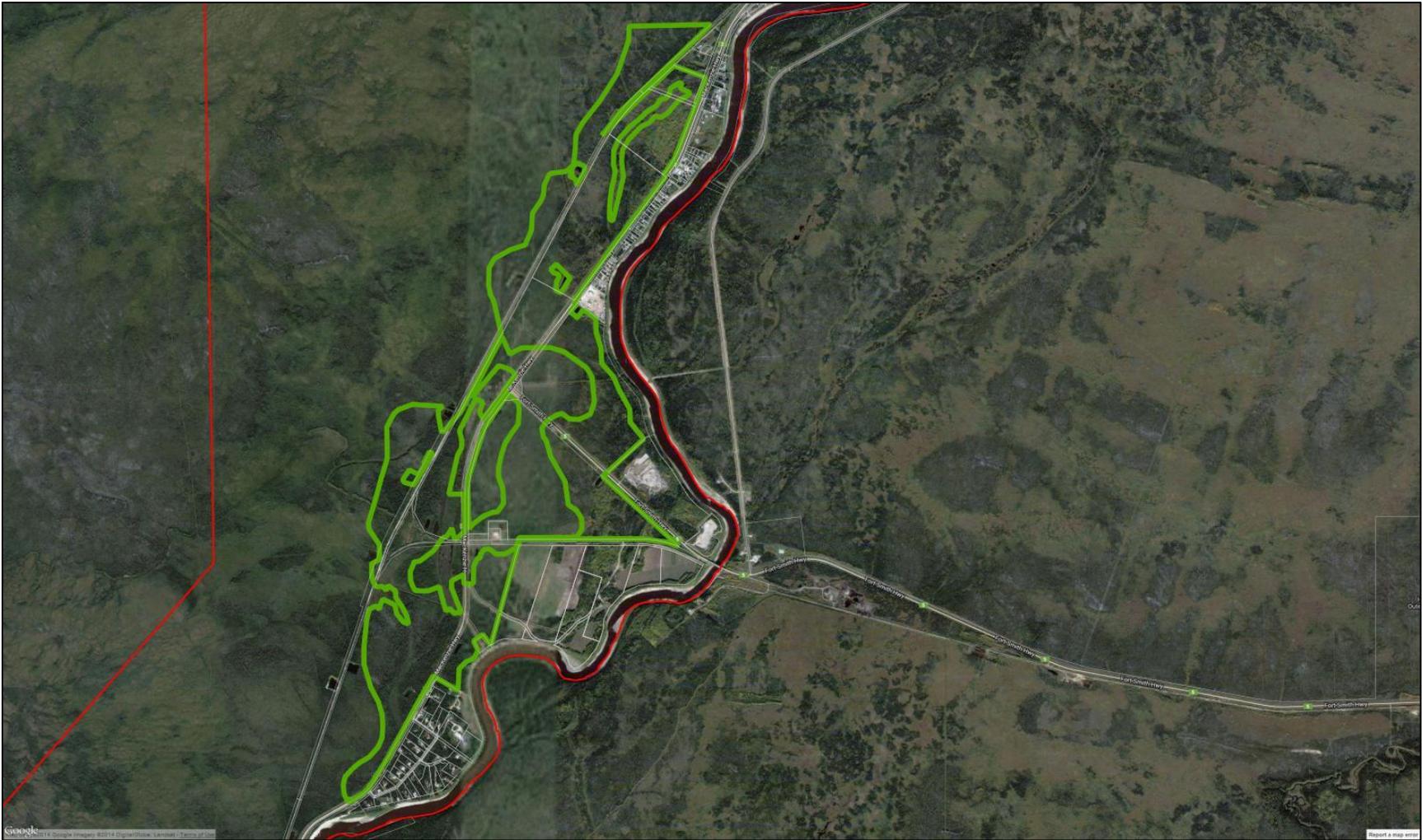


Figure 20: Aerial View of “Oxbow” Area



Figure 21: Aerial View of “Northern Pork” Area



Figure 22: Aerial View of “South of Paradise” Area

