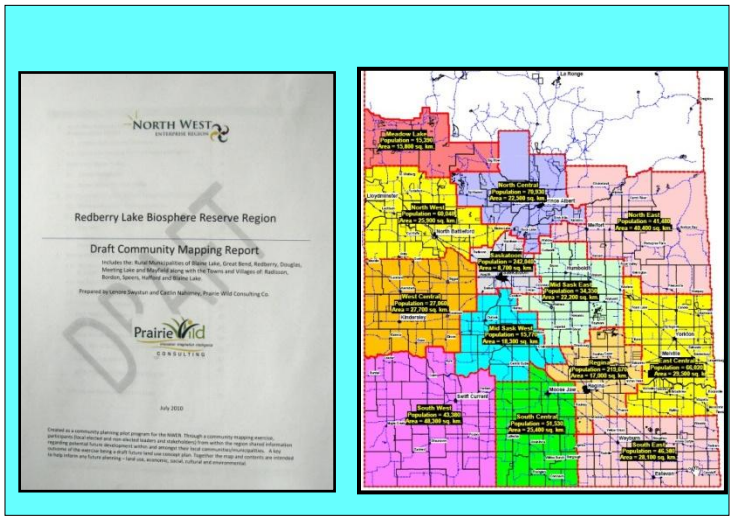
2011

Land Use and Infrastructure Data Collection and Cataloguing (LUIDC) Project in the Redberry Lake Region



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ACKNOWLEDGEMENTS

This paper was co-written by Hilary Lavoie and Shane Parchewski, the GIS Technicians/Data Collector together with Lenore Swystun, Contractor/Project Manager with Prairie Wild Consulting Co.

A special thank you to Annette Haider of Agriculture and Agri-Food Canada for stewarding this project. Thank you especially to Cam Kayter and Cam Kenny of Agriculture Environmental Services Branch Saskatoon for their technical guidance and direct supervision of the project on behalf of the Government of Canada.

Much appreciation to John Kindrachuk, Executive Director of the Redberry Lake Biosphere Reserve, who acted as Co-Project Manager with Lenore. A further thank you to the Board of the Directors of the Redberry Lake Biosphere Reserve who support the vision and long term goals of the Land & Infrastructure Resiliency Assessment Project (LIRA).

Most important to the successful completion of this project is a heartfelt thank you to the community leaders (Administrators and Reeves) who provided important information about each of the participating municipalities. With the giving of their time, most often off the sides of their desks, local wisdom and experience made the comprehensiveness of this process possible within the short timeframe to complete the project.

Last though not least – we thank the families of the GIS Technicians/Data Collectors for giving of their family member's time to this project for the month of March!

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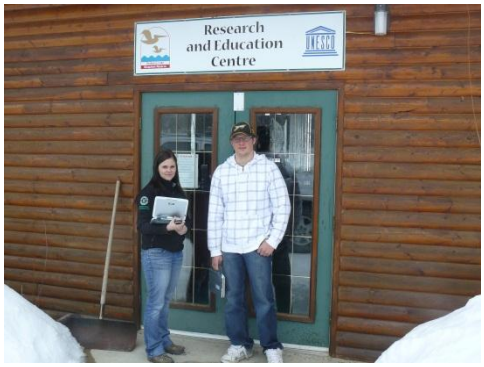
1. Introduction

The *Land Use and Infrastructure Data Collection and Cataloguing Project (LUIDC)* undertaken by Prairie Wild Consulting Co. in the Redberry Lake area is intended to inform the Agriculture Environmental Services Branch of Agriculture and Agri-Food Canada's Land & Infrastructure Resiliency Assessment (LIRA) Project.



Hilary Lavoie & Shane Parchewski

During the month of March 2011, Prairie Wild Consulting Co. assembled a team of GIS Technicians/Data Collectors and worked with a key representative from AESB to 'map' and 'catalogue' a number of land-based features (natural and built) in the Redberry Lake area.

The Redberry Lake area is located 100 km from three major cities in Saskatchewan - Saskatoon, Prince Albert, and North Battleford. This is also a region known as the Redberry Lake Biosphere Reserve (RLBR), a United Nations Science, Education, and Culture Organization (UNESCO) recognized ecological area dedicated to sustainable development objectives. The RLBR is a significant watershed area that includes in whole or parts the Rural Municipalities of Redberry, Meeting Lake, Douglas, and Great Bend. Two additional rural municipalities neighbour this watershed region and also that of the North Saskatchewan River and are considered within the area of cooperation and were included in part for this study - the Rural Municipalities of Mayfield and Blaine Lake.

Over the course of approximately one month, GIS Technicians/Data Collectors were contracted and trained to do the field data collection. This included: collecting digital-based data using specialized GIS outfitted computers and software, conducting field interviews with local municipal officials to assist with collecting municipal infrastructure asset data, and developing a final report to outline the methodology undertaken to capture land-based features.

The remainder of this report provides some further background and context behind this project and outlines specifically the methodology utilized to collect this data. Lessons from the field are also shared.

1.1 Background and Context

Extreme rainfall events can cause flooding that, in turn, can cause significant damage to both the agricultural landscape and rural infrastructure. Climate change may increase the magnitude and frequency of such events and therefore cause even greater damage in future. This raises some important questions: what, if anything, should be done to prepare for extreme rain events now or in

future? Is it possible to "adapt" the local landscape to reduce flood-related damage? Will the benefits of adaptation outweigh the costs of implementation?

The Land & Infrastructure Resiliency Assessment (LIRA) Project is intended to provide decision makers with a means to help answer these types of questions by developing a standardized economic assessment methodology that could be utilized in any region of the country. Currently LIRA pilot studies are being investigated in Saskatchewan, Atlantic Canada and Alberta. The Saskatchewan Association of Watersheds (SAW) is the project proponent for the Saskatchewan based LIRA pilot studies. While external funding is being sought to complete entire LIRA studies in up to four watersheds in Saskatchewan, the *Land Use and Infrastructure Data Collection and Cataloguing Project (LUIDC)* provided pre- study information gathered in the Redberry Lake area in anticipation of a fully funded LIRA pilot study in the region.

The LIRA Project is a five phase approach that will move from applied research to operations. Currently Phase Four is being developed to test the reproducibility of the LIRA methodology in different areas of the country and with different clients (Watershed groups, Integrate Water Resource Management groups, and rural municipalities).

The *Land Use and Infrastructure Data Collection and Cataloguing Project (LUIDC)* will allow AESB to begin initial data compilation and analysis as well as be used to develop a data capture and compilation template that will be incorporated in to AESB's LIRA Phase Four Project Manual.

1.2 Overall Purpose of Project

The initial data captured and compiled by the LUIDC project will specifically assist the Phase Four component of the AESB LIRA Project Manual.

Phase 1 – Scoping Study
Phase 2 – Develop course methodology Regional Analysis only (RM of Corman Park 2006-07)
Phase 3 – Develop detailed methodology – Economic analysis, adaptation options and costing, RM participation. - RM of Corman Park Pilot Site – funded by NRCAN
Phase 4 – Current Phase Refine methodology/test replicability (watershed scale) Develop manual and test a standardized methodology in up to four pilot sites
Phase 5 – Operational status under federal programming Decision makers across Canada utilizing methodology

The LUIDC project data collected will also be of immediate benefit to the RLBR and its member municipalities by providing good base line information to inform both local and inter-municipal strategies, policies and actions. In turn, the larger regional planning framework that is currently underway in the RLBR will make possible regional and local based municipal policies informed by evidence based decision making based on best practices as offered by the LIRA model. This type of data collection has been missing in much of the planning work being done in the province to-date, save a few areas that have benefitted from earlier pilot attempts and some a handful of isolated studies that have helped to inform this current phase.

2. Methodology Overview

2.1 Data Collection/Study Area

The following table lists the participating rural municipalities and their respective towns and villages that were included in this project. Due to their involvement in the Redberry Lake Biosphere Reserve these municipalities are naturally aligned to participate in this project. In addition to the following communities, Regional Parks were also included.

Table 1: RM's, Towns and Villages included in the project area

Rural Municipality	Urban	Regional Park
RM of Redberry	Hafford Krydor	Redberry Lake
RM of Meeting Lake	Mayfair Alticane	Meeting Lake
RM of Douglas	Speers Richard Keatley	
RM of Great Bend	Borden Radisson	
RM of Mayfield (RM not participating formally)	Maymont Fielding Ruddell	
RM of Blaine Lake (RM not participating formally)	Blaine Lake Marcelin	

2.2 Data Collection Process

2.2.1 Data Collection Team

Hilary Lavoie and Shane Parchewski were hired as the GIS Technicians/Data Collectors for this project. Each responded to a job posting – one calling for a Local GIS Technician/Data Collector and another calling for a trained GIS/Technician/Data Collector in early February. Each sent in a resume and were interviewed by members of an ad-hoc hiring team consisting of Prairie Wild Consulting Co. (the Contractor) and members of the Redberry Lake Biosphere Reserve.

Hilary's education and GIS software experience gave the team the technical expertise that was needed for data collection to be smooth and efficient. Shane lent his local knowledge of people and places, allowing the team to prioritize and strategize work plans to work within the timeline.

Shane & Hilary at the RLBR Centre 1

The GIS Technicians/Data Collectors reported to the Project Management Team, consisting of the Project Manager/Contractor, Lenore Swystun of Prairie Wild Consulting Co. (PW Co.), and Co-Project Manager, John Kindrachuk, Executive Director of the RLBR. The Project Management Team also included Cam Kayter and GIS Specialist, Cam Kenny of AESB who provided important technical guidance and process experience. Cam Kayter, acting also as the Project Authority, was able to ensure the execution of the required tasks within both the timeline provided and reasonable circumstance.

The key technical requirements of this work included having the necessary computers and software and trained field collectors to populate the Ag-Capture and infrastructure information databases.

2.2.2 What types of information was captured and catalogued

2.2.2.1 Ag Capture Process

Ag-Capture is an Agriculture Land Use Inventory Tool which was developed by Agriculture and Agri-Food Canada-Prairie Farm Rehabilitation Administration (AAFC-PFRA), Land Use Decision Support (LUDS) Unit to provide local and regional land-use decision makers with a means to acquire detailed information

about agricultural land use activities. The land use inventory Tool is referred to as the Ag-Capture Field Guide to Surveying Agricultural Land-Use Prairie Edition.[1]

Ag-Capture employs a "windshield survey" technique that is designed to capture a single snapshot in time of the agricultural land use and agricultural activities in an area. The survey is typically performed by two people and captures data visible from public land.[2] The information gathered into the survey is documented using a four page form, an initial overview land use activities, livestock and structures present and a summary/comments form (see Figures 1- 6 below).

Standard Ag-Capture collects information regarding agricultural land use, such as annual and perennial crops, livestock, buildings, businesses and residences .This data is inputted into parcels (polygons) which represent a quarter of land, subdivision or lot. Due to the large scale and wide applicability of data capture available through this method, other types of data were collected with the Ag-Capture software such as municipal infrastructure, community buildings and heritage, environmental, social and economic features. If these were present on a parcel, they were mentioned in the comments section of the form (see Figure 6 below).

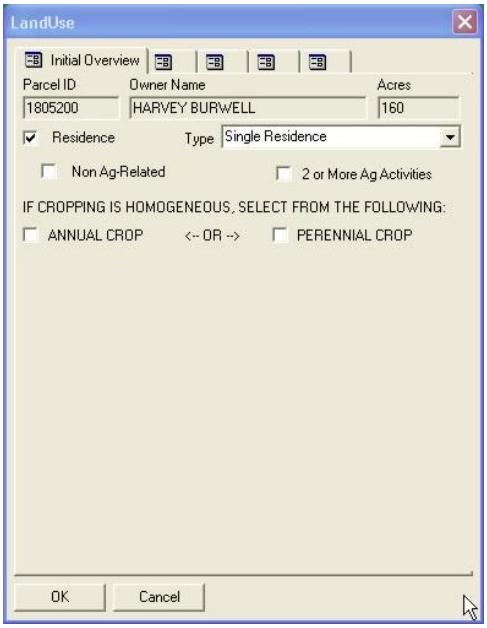


Figure 1: Initial Overview screen on the Ag-Capture program

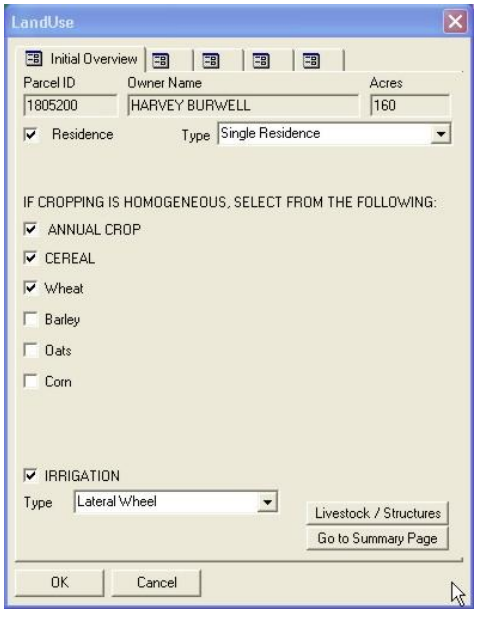


Figure 2: Initial Overview screen on the Ag-Capture program

[1] Land Use Decision Support Unit. 2007. Ag Capture: An Agricultural Land use Inventory Tool, Field Guide, Canadian Prairie Edition. Agriculture and Agri-Food Canada – Prairie Farm Rehabilitation Administration.
[2] Ibid.

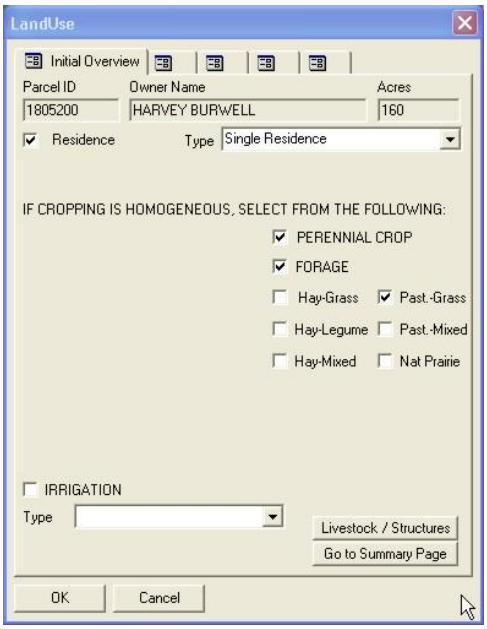


Figure 3: Initial Overview screen on the Ag-Capture program

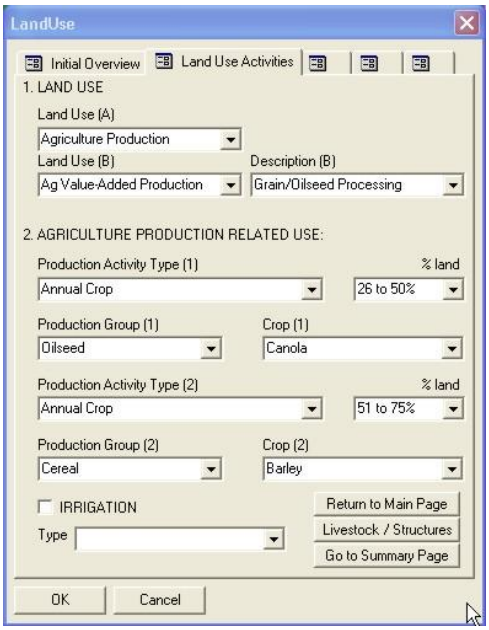


Figure 4: Land Use Activities form on the Ag-Capture program

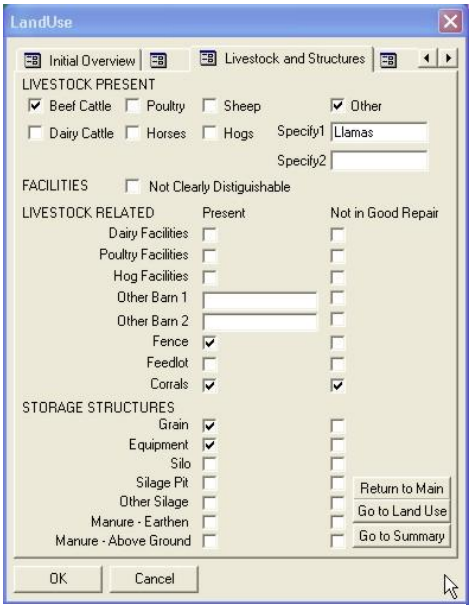


Figure 5: Livestock and Structures form on the Ag-Capture program

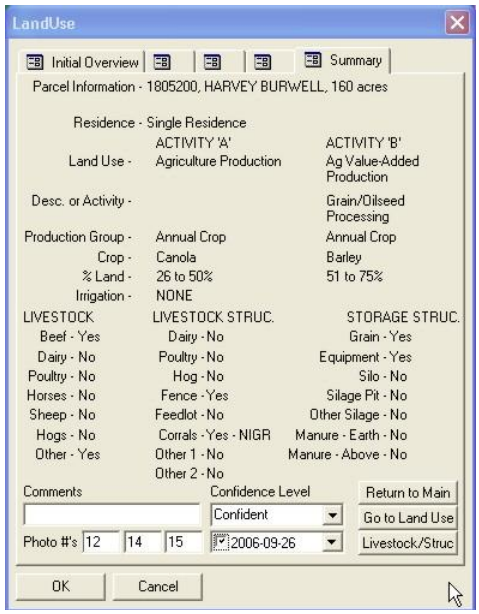


Figure 6: Summary form from Ag-Capture program, which shows

2.2.2.2 Infrastructure Data Base

The infrastructure map loaded onto each of the netbooks was designed to input municipal infrastructure represented as points (see Table 2 and Figure 8 below). For the purposes of this project the infrastructure map was used to capture other types of data as well, such as community buildings, landmarks, municipal services and locations of heritage importance. These features had to be sought out, either by reviewing RM data (such as RM maps), or by interviewing individual towns, villages and RM's. Cemeteries, heritage school sites, churches, communication towers and areas of interest (specifically the Crooked Bush) were present on RM maps and it was not necessary to seek them out on the landscape.

Other infrastructure such as wells, lagoons, landfills, recreational facilities (ball diamonds, arenas, halls), flood prone areas, grain terminals, post offices or boxes, municipal shops, and other significant areas were harder to locate therefore interviews with local Administrators or Reeves of the Towns, Villages and RM's were carried out to acquire this information (see Appendices B-D).

Since the infrastructure map was not designed for this wide array of information, a box intended for culverts was used and the type of infrastructure as typed into the box, such as "Former School Site" (see Figure 7).

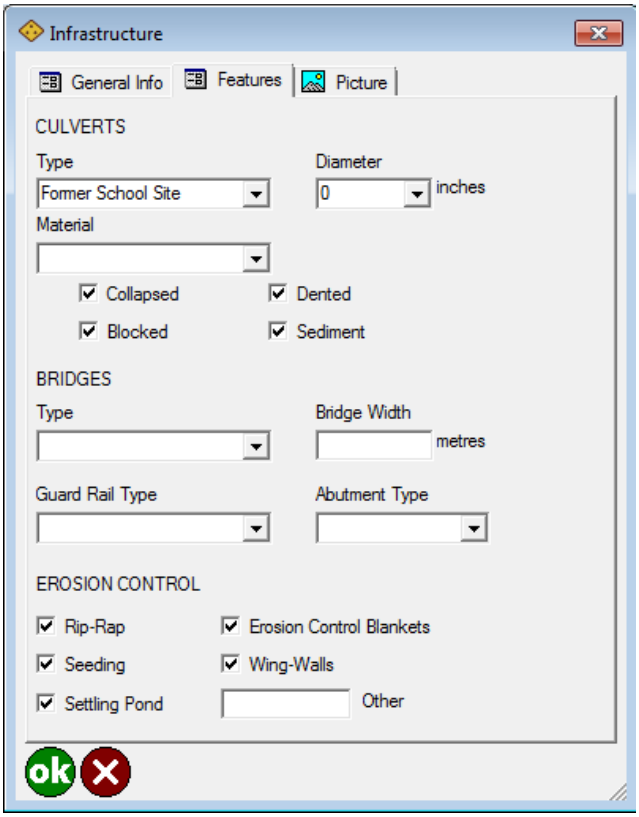


Figure 7: Infrastructure Form with modification

Table 2: Options available in the Infrastructure Map Form

Infrastructure Map Options	
Structure	Culvert
	Bridge
	Crossing
Infrastructure	Approach
	Through-grade
Watercourse	Permanent Stream
	Seasonal Stream
	Drain
	Beaver Flood
	Natural Spring
	Runoff
Erosion Control	Rip-rap
	Seeding
	Settling Pond
	Blankets
	Wing-Walls

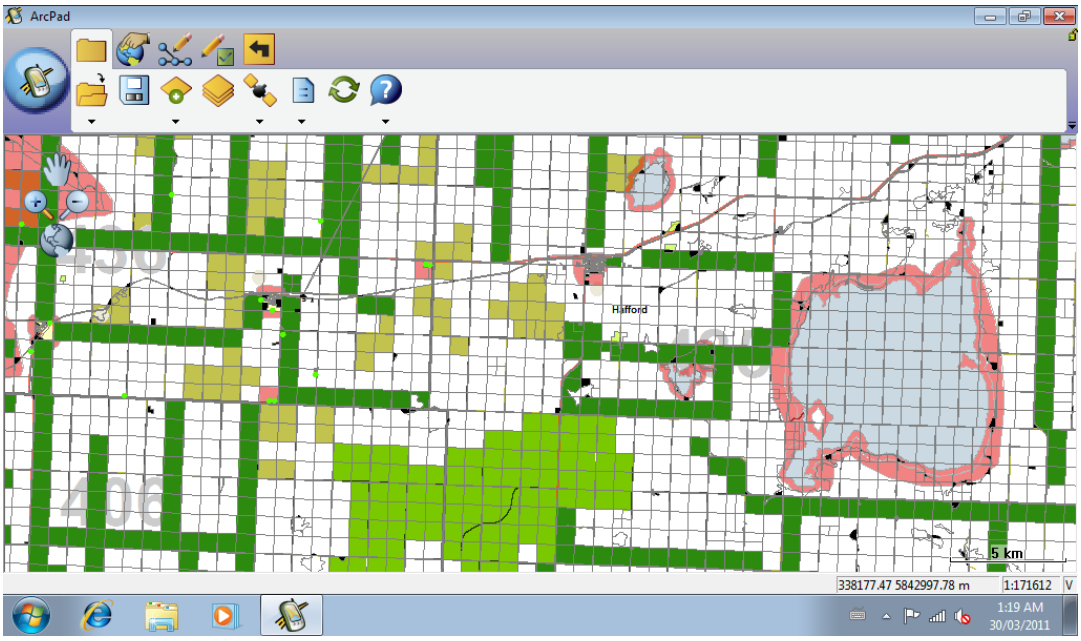


Figure 8: Screen Shot of ArcPad depicting infrastructure in green points and parcels that have been captured in dark green.

2.2.3 How Data was captured

2.2.3.1 Ag Capture Equipment

The RLBR and Prairie Wild Consulting Co. provided the necessary computers and software required to undertake this work. The computers and software utilized for this project were:

- MDG Flip, an 8.9" tablet netbook
- ArcPad 10, a mobile GIS program
- Bluetooth GPS unit, the Qstarz BT-Q818XT
- Power Inverters for netbook

The GPS unit wirelessly connected with the computers and ArcPad, showing where the data collectors were and which way they were travelling. This eased the collection process by keeping bearings and locations correct at all times. GPS units and netbooks were charged overnight. Netbooks only had a four hour change and required additionally charging in the vehicle.

ArcPad is an interactive program that enables users to populate points, lines or polygons with information. In this case, the Ag-Capture map enabled the GIS Technician/Data Collectors to add agricultural land use information to parcels (usually quarter-sections and subdivisions). This is done by simply clicking on the parcel of interest which opens the data-entry screen (seen above in Figures 2-6). The infrastructure map uses points instead of polygons. Points were added to the map by using the location given to us by the GPS, or by using a land location, meaning that each point represents geographical location for the object it symbolizes.

Hilary and Shane capturing data in the field

A critical component to successfully doing the work was the ability of the GIS Technician/Data Collection team to utilize their personal vehicles. When the road conditions were satisfactory (i.e. when the roads were not drifted over) a car was used with both GIS Technician/Data Collectors able to capture data. On three collection days, when road conditions were most unfavourable, a 4X4 truck was used. On two days scheduled data collection was cancelled due to typical March weather conditions. During each data collection field day the GIS

Technician/Data Collection team had with them safety equipment that consisted of: a safety vest, first aid kit, a 'tow truck in a box' vehicle emergency kit, and winter gear.

Additionally, the RLBR Education Centre was used as a base camp for the GIS Technician/Data Collection team. At the Centre municipal maps were studied and used to plan and track data collection routes. This is also where infrastructure data was entered, organized and reviewed. The ability to have such a space was helpful and essential to keeping organized and providing a break from long hours spent in a vehicle capturing data.

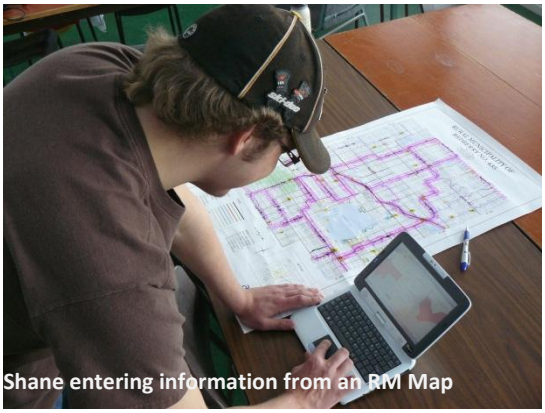
2.2.3.2 Primary and Secondary Research

Ag-Capture surveying was not done for every parcel in each RM. This was in part due to the weather and in part because some infrastructure is not readily visible by Ag-Capture method alone. In order to be as comprehensive as possible in gathering infrastructure data and land features, visits to the local administration offices were made (a type of primary research). Included as part of these visits were interviews by the GIS Technician/Data Collectors with the Administrator or Reeve of the participating RM's, Villages and Towns (See Appendixes B-D for the full listing of information/questions asked). Co-project Manager, John Kindrachuk notified each municipality beforehand letting them know the GIS Technicians would be making an in-person or phone visit with them.

Below is a list of topics that summarizes the types of information the GIS Technician/Data Collectors collected from the municipalities.

- Assets
- Challenges they face
- Tangible Capital Assets
- Agricultural Development (Intensive Livestock Operations, organic farming, other agri-business)
- Natural Resources (gravel, oil, aquifers)
- Transportation Infrastructure
- Industrial/Highway commercial development
- Residential Acreage development
- Recreational development
- Cultural and Heritage Resources
- Lands unsuitable for development (flood prone, slumped, environmentally sensitive, contaminated, critical habitat)
- Flood mitigation and improvements
- Drought concern areas

An important part of each visit included obtaining local municipal maps that outlined key municipal infrastructure and features. This particularly helped with field navigation. Local representatives were also able to point out features on their maps that were not already indicated though helpful to the process. Of note, most RM maps with the exception of the RM of Redberry had the following already mapped: cemeteries, churches, heritage School Sites and communication towers.


Shane entering information from an RM Map

Government resources were also used to obtain data that could be entered into the infrastructure data base. This included the Saskatchewan Register of Heritage Property, and more specifically, Martin Thomas, Community Liaison for Heritage Conservation Branch who provided the team with a list of designated heritage properties for the RM's. This also included a conversation with Kim Weinbender, an archaeologist with the Heritage Resources Branch, who provided information about further base line information that could be made available about archaeological sensitive areas in the region.[3]

Local people such as the Project Management team were also vital in creating a list of sites that needed to be visited and put on the infrastructure map. They were very familiar with local heritage sites, interesting landscapes, flood prone or low areas, etc. This allowed the GIS Technicians/Data Collectors to input this information without visiting the sites directly.

Secondary research was also conducted. This included internet searches to find out information about local school sites (existing or marked) grave sites, rail and trail systems, and archaeological information. This proved to be most helpful in sourcing a cemetery database through the Saskatchewan Genealogical Society that could be searched by RM. This enabled the cemeteries to be named in the infrastructure form and ensure that all were captured in each RM. The following was the link utilized as of March 28, 2011: http://www.saskgenealogy.com/cemetery/cem_rmname.asp. Local history books were also utilized to obtain information on these topics and in one case heritage school site locations were found and plotted.

[3] A follow up of this will be occurring post-project.

2.2.4 Data Collection and Cataloguing Process

2.2.4.1 Data Collection Phases and Steps

The Data Collection team (as listed above) consisted of two GIS Technician/Data Collectors, a Contractor/Project Manager, a Co-Project Manager, and technical guidance from the Cam's of AESB.

There were four key phases involved in the project:

1) Pre-phase: Applying and Hiring
2) Preparation and Training
3) Data Capture: Ag-Capture and Infrastructure
4) Report development

The following eleven steps were undertaken as part of this four phase plan to successfully complete the Ag-Capture and Infrastructure data:

PHASE ONE: Pre-Phase Applying and Hiring

1) Redberry Lake Region identified by AESB as a suitable candidate for undertaking the Land use and Infrastructure Data Collection and Cataloguing Project to inform the LIRA project.
2) RLBR and AESB assembled a request for proposal for a contractor to undertake the work.
3) Prairie Wild Consulting Co. was hired in part due to their local connection and work on a important and connected regional planning project.
4) GIS Technicians/Data Collectors were interviewed and hired by Prairie Wild Consulting Co. and project co-manager, the RLBR, to immerse themselves full-time to collecting the data within a very limited window of time.

PHASE TWO: Preparation and Training

5) Members of the Data Collection team, hosted by the AESB, attended a workshop in Saskatoon to learn how to use the Ag-Capture equipment and programs correctly and safely.
6) The Data Collection Team prioritized areas of importance in terms of data collection and cataloguing for the various municipalities that make up the region. i.e. prioritizing transportation corridors and special areas. The order determined by all parties was to begin with RM of Redberry and then move to Meeting Lake, Douglas, Great Bend, and Mayfield, as well as the major towns in Blaine Lake. Special areas deemed important were also prioritized, including Regional Parks.

7) Surveys for the Municipal administrations were drafted in collaboration by the GIS Technicians/Data Collectors and the Project Manager/Contractor. General lists of important infrastructure to look for were also drafted by this team. Using local knowledge, the Project Manager/Contractor was able to refine the infrastructure collection list specific for each Town/Village, to ensure that their respective heritage and unique properties were collected. See Appendix D: Town and Villages Land Features/ Infrastructure checklist.

PHASE THREE: Data Capture: Ag-Capture and Infrastructure

8) The GIS Technicians/Data Collectors utilized the Ag-Capture forms to collect agricultural land use information and related interests for the purposes of informing the wider LIRA project (completed in order above, see specific work schedule in Section 3.2.4.2).

- This included capturing data into the Ag-Capture and Infrastructure forms while driving down roads. When a parcel contained multiple agricultural information, the data collectors pulled over to ensure safety and a thorough capturing of land fabric details. Netbooks were placed on data collector's laps and GPSs were placed on the dash so that the strongest satellite signal was received. Data was entered into the netbooks as it was seen i.e. 'captured.'


Hilary 'mapping' at the Centre

9) The GIS Technicians/Data Collectors worked with the RMs within the region to gather and catalogue relevant infrastructure and land use information that resides at each of the participating and willing rural municipalities and small communities located within the rural municipalities where relevant. This included:

- Visiting each municipality and working with their administration to collect relevant infrastructure and land use data (not already available through the land use mapping exercise done through the Regional Mapping Initiative or RM maps).
- Interviewing community administration by phone to collect their relevant infrastructure data.

PHASE FOUR: Report Development

10) Developed a draft report documenting the methodology of both field and RM office data collection and cataloguing.

- Utilizing both the administrative support of the RLBR and PW Co. headquarters in Saskatoon along with the guidance of the AESB, this report was developed in weekly segments for delivery to AESB by March 29, 2011.

11) Completed a Final Report incorporating changes, comments and feedback received by the Project Authority (on or before March 31, 2011).

2.4.2 **Detailed Work Plan**

Below is a detailed data collection work plan that outlines the Phases, Steps, time frame, who was involved, and details of the work undertaken by the Data Collection Team.

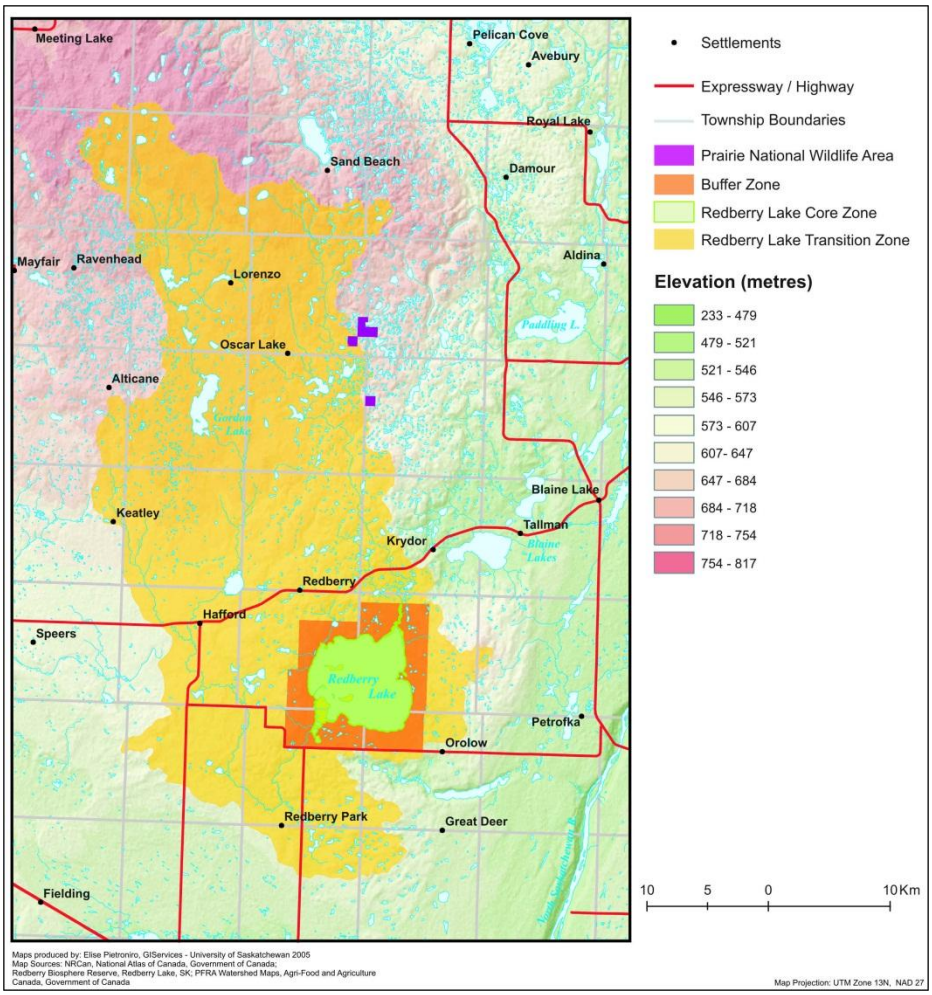
Project Phase	Project Steps	Time Frame/ Dates 2011	Time involved	Detailed description of work undertaken by Data Collection Team
1) Pre-phase: Applying and Hiring	1-4	Jan-early Feb	5-6 weeks of pre-discussion and work related to anticipation of having work done in the RLBR area.	Project Management Team met to discuss potential pre-LIRA data collection being done in the Redberry Lake Biosphere (included John Kindrachuk, Lenore Swystun, Cam Kayter and Andrew Hawyrsh from the RLBR Board- all supportive and understanding of the LIRA Project). An RFP was sent out of which Prairie Wild applied and became the successful Contractor. A hiring process commenced to ensure a group would be ready to hit the ground running in late February/early March.
2) Preparation and Training	5-7	Feb 7 Feb 9 Feb 24 Feb 28 Mar 04	Approximately six days involved in this process by various members.	A ½ day training session was attended by the RLBR and Prairie Wild Consulting in anticipation of being involved in some manner with the project. This took place in Saskatoon with Cameron Kayter at the AESB office. Members of Prairie Wild Consulting met with members of the RM of Douglas regarding their regional plan and shared the potential of the pre-LIRA data collection project. Members of Prairie Wild Consulting met at the RLBR Centre to review maps and discuss work plan. Prairie Wild facilitated a Regional Planning in Hafford. The pre LIRA data collection process was shared. Project was formally contracted to Prairie Wild Consulting to undertake the work. Members of the Data Collection Team met in Saskatoon office to work on project start-up details. Included both GIS Technician/Data Collectors, Hilary and Shane, and Project Manager, Lenore. GIS Technician team shopped for safety equipment for project.
3) Data Capture: Ag-Capture and Infrastructure	8-9	Mar 8-9	2 full days+ Set-up+field GIS/DC Team +Project Management Team members	Members of the Data Collection team met in Saskatoon. AESB provided netbooks with loaded software and maps on March 8. The GIS Technician/Data Collectors tested and began Ag-Capture in the RM of Redberry Lake and by the end of the second day estimated approximately 400 parcels had been done.
		Mar 10	1 full field days+ GIS DC Team	GIS Technician/Data Collectors interviewed the RM of Douglas Administrator in the morning about Infrastructure data. Ag-Capture was finished in the Redberry RM and work began in the RM of Meeting Lake.
		Mar 11	1 Full Field day+ GIS/DC Team +Project Management Team members	Project Management Team met at the RLBR. GIS Technician/Data Collectors worked on Ag Capture in Meeting Lake and met with members of the Project Management Team (Lenore, John and Cam). Continued on to RM of Douglas in afternoon.

		Mar 14	1 Full Field Day+ GIS/DC Team	GIS Technician/Data Collectors continued Ag-Capture in the RM of Douglas and also had an infrastructure meeting with the RM of Great Bend in Borden.
		Mar 15	1 Full Office Day+ for GIS/DC Team +AESB Project Management Member	Hilary met with AESB Cam Kenny in Saskatoon to troubleshoot/ask questions related to data capture. GIS Technician/Data Collectors worked at Centre inputting RM infrastructure data into ArcPad (RM's of Great Bend, Meeting Lake, Douglas and Redberry). Also included Reviewed surveys. Researched cemetery and school site names. Found good website for cemeteries. Sent e-mails to some RM's- RM of Great Bend and Douglas to send them link to Cemetery list website, to RM of Meeting Lake to ask if they finished filling out the survey.
		Mar 16	1 Full Field Day+ GIS/DC Team	GIS Technician/Data Collectors continued Ag-Capture in the RM of Great Bend.
		Mar 17	1 Full Field Day GIS/DC Team	GIS Technician/Data Collectors continued Ag-Capture in the RM of Great Bend.
		Mar 18	1 Full Office and Field Day+ GIS/DC Team +Project Management Team members	GIS Technician/Data Collectors picked up maps and entered some infrastructure data and headed to RM of Mayfield to begin Ag-Capture. Met with members of the Project Management Team over lunch in Hafford.
		Mar 21	1 Full Field Day	GIS Technician/Data Collectors continued Ag-Capture in RM of Mayfield
4) Report Development and remaining Data Capture	10-11	Mar 22	Office Day GIS/DC Team Project Manager	Hilary: researched heritage sites, infrastructure and met with Lenore to outline the remaining work (filling in the gaps), and get details of the report. Shane worked on heritage school sites
		Mar 23	Office Day	Hilary: Office day- called towns/villages to fill out surveys of infrastructure locations (things that we cannot see/making sure we don't miss anything). Started working on draft report format and tables. Shane continued researching and entering in site information
		Mar 24+25	Office and Field Day	Hilary: Office day-called Martin Thomas to get heritage data and continued writing draft report Called towns for surveys . Shane did Ag-Capture around identified areas near the Towns and Villages in RM of Blaine Lake and worked back through the RM of Redberry Lake to capture missing information around urbans and entered in information related to heritage sites on the 25th
		Mar 28	1 Field Outstanding Ag Capture GIS/DC Team	GIS Technician/Data Collectors finished remaining Ag-Capture in various stray parts of RMs and continued development of information for final draft report.
		Mar 29	Full Office Day GIS/DC Team Project Manager	Full Office Day reviewing component of draft report sections and editing into one document various components. Final Draft assembled by Project Manager and sent to Project Authority for review.

In the above detailed work plan, approximately sixteen days of dedicated work related to data collection was undertaken by the GIS Technician/Data Collectors and supported by the Project Management Team. Of the sixteen days, eleven days were dedicated to Ag-Capture/Infrastructure collection with hours ranging from 6.5 to 12 per day. In cases where weather prohibited, effective use of time was maintained by catching up on data entry, research, organizing information and arranging interviews for the remaining days. Office work was primarily done out of the RLBR Education Centre related office work also occurred at the Prairie Wild Consulting Co. office, and the GIS/Data Collector residences.

Members of the Project Management Team kept in regular contact with one another updating each other on various aspects of the project. The Project Manager kept in regular touch with the GIS Technician/Data Collectors by phone, email, text messaging and face-to-face meetings.

Map: Redberry Lake Watershed Area



3. Data Collection-Methodology Learning's

In the section below we share some of the Project Team's learning's about this process – both from the work undertaken in the field and related actions taken to support this work.

3.1 What worked well with the process:

- The Project Team gelled quickly to 'hit the road running'. This was in part due to a combination of the following factors:
  - Experience of the AESB Project Authority provided confidence that the work could be completed in the time frame;
  - Local knowledge of Project and Co-Manager of the broad project and the study area to support GIS Technician/Data Collectors;
  - Combination of skill set, familiarity with local area, and work ethic of each GIS Technician/Data Collector and Project Management Team member lent well to project efficiencies.
- Ability of the GIS Technician/Data Collectors working as a team created an effective use of vehicles and time to undertake data collection and related activities.
  - There was relief and surprise by how much data could be captured spatially in a day. On average, major corridors within a municipality could be completed in two days.
- When possible, having the ability to meet with municipal representative and have a local RM map before doing Ag-Capture so that GIS Technician/Data Collectors could watch for specific things.
  - Having RM maps along with us so that we could mark off the areas that were done and see the roads that should be ploughed (bird's eye view of RM)
- Having office space at both the RLBR and access to the Project Management Team both locally and nearby in Saskatoon was helpful to the GIS Technician/Data Collectors.

3.2 What could be improved with the process

- A longer Data Collection Project Time Frame. This includes:
  - Adequate time to prepare for the project as the Project Management Team – including developing good communication protocol and preparation of full-time GIS Technician/Data Collectors to undertake the work e.g. more time by Project Management to provide information to GIS Technicians/Data Collectors about the links of their data collection to regional planning and other work in the area – apart from flood mitigation. This would also include more planning time with the whole team including create lists of things to look for in Towns and RM's.
  - Adequate time for the Project Team (GIS Technician/Data Collectors and members of the Project Management Team) to obtain a better understanding of the specific data collection equipment and software used to 'hit the ground running.' This includes making sure how to use the infrastructure map

before starting/modifying infrastructure map so that it works for other things too (or simply make a comments or “other” box)

- Shorter time spent each day in a vehicle to reduce strain physically and mentally on GIS Technician/Data Collectors. This could be remedied by splitting the days up more between field and office-based data collection methods.
- Time of Year could be improved by carrying out Ag-Capture and Infrastructure collection in late Summer or Fall when agricultural features are more readily visible and identifiable and access to land via secondary roads and ways would be much easier.

- Improved Technological capacity of Data Collection Equipment i.e. GPS and Netbooks. This includes:
  - Ability to review work and change work without having previoius work entered erased would bring further confidence and understanding to data collected. This could be improved by either learning more advanced setting of program software and/or better equipment;
  - Better wireless (Bluetooth) connection between GPS’s and computers;
  - More reliable portable computers: netbooks prone to crashing, significant lag when trying to Open Ag-Capture forms; Netbook tablet feature did not work well in terms of spatial orientation which caused data collection to be entered via the keypad;
  - Having Microsoft Office (at least Word and Excel) would have been helpful for data entry and notes collection time frame of under one month with additional weather constraints caused by season of data collection made capture of data beyond main corridors challenging.
- Ag-Capture and Infrastructure Collection
  - Meeting with all municipalities before starting Ag-Capture would give the GIS Technicians/Data Collectors a better understanding of the area before doing the data capture
  - Having the ability to research and collect infrastructure asset information and spatial information before Ag-Capture process initiated – this could provide data that both augments and validates data collected in the field and through other methods.
  - Having better access to Ag-Capture areas can be sought through undertaking process during summer/fall season
- Experience is always a hindsight factor – however important to mention as the learnings from the Data Collection Team involved in this process will help to improve and inform the types, kinds and processes used to obtain data in the next project area.

3.3 Other Interesting Observations

- Each RM has different issues and resources. Some of this may be in part due to their unique physical features. Some of these differences speak to their internal organizational features and circumstances. For example:
    - Some RMs have no large culverts while others have a lot.
    - Some RMs have aging equipment and infrastructure while others consider theirs up to date.
    - Some RMs have a lot of TLE/Reserve status land while others have none.
    - Some (most) RM's used a tailor made program that was available for purchase to document their Tangible Capital Assets. Some RMs did not and just made their own excel spreadsheet.

4. Summary and Final Considerations

We are confident that the *Land Use and Infrastructure Data Collection and Cataloguing Project (LUIDC)* will allow AESB to utilize the data compiled to provide a helpful analysis of the replicibility of this process to develop a data capture and compilation template into AESB's LIRA Phase Four Project Manual.

A combination of local wisdom and technical skill and experience made for a good success rate in capturing important agriculture features and local infrastructure elements. Time aside, the learnings from this pre-LIRA project will be of benefit both to local decision-makers and to wider regional integrating planning processes underway and yet to be undertaken in the current and foreseeable future.

Hilary, Shane and Lenore at the RLBR Centre

APPENDICES

APPENDIX A: Sample ArcPad Captures of Data Collection

Image One: Ag Capture Information outputted

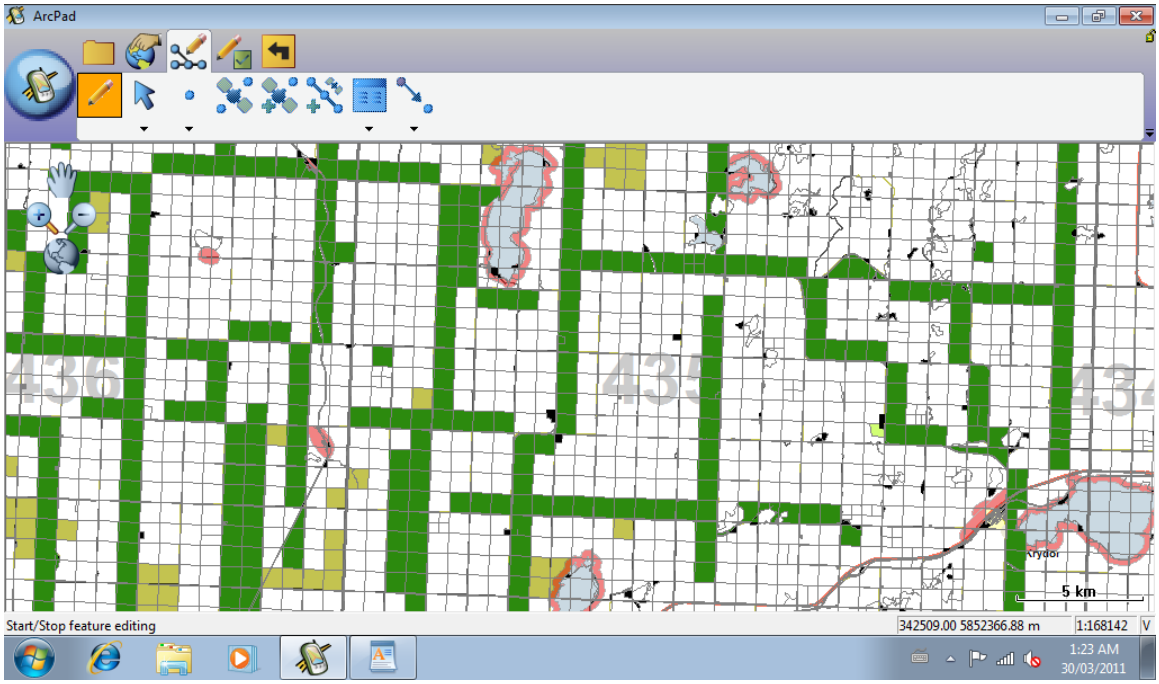
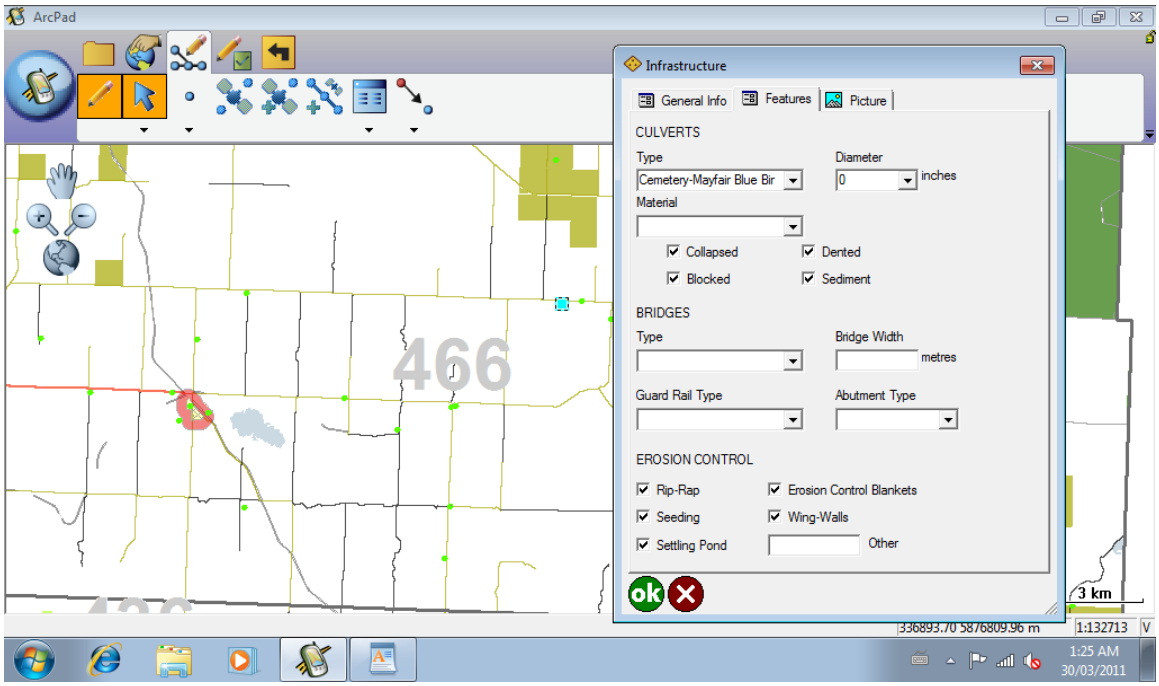


Image Two: Sample Output of Infrastructure Information



APPENDIX B: Questionnaires utilized with Municipal Administrators/Officials

i) PHONE SURVEY WITH TOWN OR VILLAGE

By phone survey, obtain the locations of the following features, if present in the community:

- Wells/water tower
- Lagoons
- Major recreation facilities (rink, hall, ball diamonds, etc)
- Civic/Municipal (Fire Hall, RCMP, hospital/health clinic)
- Environmentally sensitive lands (flood prone, slough, slumped areas, low lying areas)
- Post office or post boxes
- Municipal shops (RM and town-where they store their equipment)
- Grain elevators, terminals, etc.

ii) In Person Questionnaire with Rural Administrator/Officials

Date: _____ **Time:** _____

RM of _____

1. What are the three most important Assets of your Municipality?
    a. _____
    b. _____
    c. _____
2. What are the three most important Challenges for your Municipality?
    a. _____
    b. _____
    c. _____

3. Tangible Capital Asset Inventory
    a. What were some of the strengths that were highlighted?
    b. What were some of the deficiencies that were highlighted?
    c. Do you have the inventory in an excel sheet or another format that we could utilize?

4. Land Use
    a. Based on your local wisdom and experience, please share where these land uses are located now and where there is potential for them in the future. (Use Maps)
    b. Agricultural Development (Intensive Livestock Operations, organic farming):
    c. Natural Resource Development (gravel, oil, aquifers, other):
    d. Infrastructure and Transportation (including major highways and grids) :
    e. Industrial/Highway Commercial Development:
    f. Residential Acreage Development:
    g. Recreational Development:
    h. Cultural and Heritage Resources (please include those heritage elements that exist and should be conserved):
    i. Other (including what you do and do not want to see)

5. Special Areas
    a. Are there lands within your municipality which are unsuitable for development? *(eg flood-prone, slump-prone, contaminated, environmentally sensitive, critical habitat, other important uses etc.)*
    b. More specifically, are there any flood prone areas within the municipality? Where are they?
    c. If yes, has there been or are there any needed infrastructure improvements/replacements due to flooding?
    d. Are there any adaptations that you can think of that would help with flood mitigation in your municipality?
    e. Are there any areas of concern with regards to drought?

6. Is there anything else that would be important to map in your municipality?

APPENDIX C: Rural Municipality Land Features/Infrastructure Checklist

Please indicate on RM map:

- ☐ Cemetery's
- ☐ Air Strips
- ☐ ILO
- ☐ Landfills
- ☐ Lagoons
- ☐ Churches
- ☐ Schools (old/new)
- ☐ Towers (Cell, etc)
- ☐ Bridges
- ☐ Railway Crossings (Railways?)
- ☐ Sloughs
- ☐ Creeks
- ☐ Historical Sites
- ☐ Picnic Areas
- ☐ Parks
- ☐ Unusual things (Other)
- ☐ Wells
- ☐ Abandoned Land
- ☐ Business/Agri Business (Orchard, Dairy's)
- ☐ Wildlife Development Fund Land
- ☐ Ducks Unlimited Land
- ☐ Reserve Land
- ☐ Saline vs fresh water bodies

APPENDIX D: Town and Villages Land Features/Infrastructure Checklist

The last work to be done will essentially be tying loose ends and finishing work up around the towns and villages in the region.

Ag-Capture should be done in a 5 km radius around all towns and villages (including all pink "future growth" areas)

The following infrastructure/services should be marked in the **infrastructure map** as dots, with a GPS location as close as possible.
In each town and village, mark the following (if present):

- Wells/water tower
- Lagoons
- Major recreation facilities (rink, hall, ball diamonds, etc)
- Civic/Municipal (Fire Hall, RCMP, hospital/health clinic)
- Environmentally sensitive lands (flood prone, slough, slumped areas, low lying areas)
- Post office or post boxes
- Municipal shops (RM and town-where they store their equipment)
- Grain elevators, terminals, etc.
- Anything else that you see that is of interest to the town and you think belongs on this list

(If we are not able to do these visually, we will do them by phoning the respective town or village)

In these specific towns, make sure to find the following:
Marcelin

- Catholic church
- School (being reused by U of S for llama wool?)
- Park
- Flood areas (Lenore identified that there is some here)

Blaine Lake

- Doukhobor Prayer Home (main st)
- Town hall (main st)
- Railway station converted into library (main st)
- School
- RCMP
- Golf course/Campground
- post office or post box
- ambulance base

Krydor

- 2 churches
- Main st- senior citizens centre (could be used as emergency plcae)
- campground in krydor
- low lying areas by weird looking tower

Hafford

- Catholic Church
- Orthodox Church
- School
- Ukrainian National Hall
- Hotel
- Pocket parks (2)- Millennium on West side of Main St, Vacant lot with antique tractor on East side of Main St
- Ag-capture future growth areas around Hafford. Be sure to get along hwy by gas stations, and by communiplex (behind)
- Slope behind school

Speers

- Private health care facility
- Catholic Church (and any others)
- Senior centre
- Old school-industrialized
- Hall where they do theatre events

Mayfair

- Seniors centre/library
- Flood prone areas-Lenore identified that there is, mark anything that looks low

Alticane

- Ag-Capture the lots since it is such a small town (to identify where there are actually residences left)
- Mark anything else of interest (refer to above list)

Richard

- Slope and flood issues
- Any buildings in it

Radisson

- Red Bull
- School-acting as hall
- Campground
- Sunridge RV
- Swimming pool

Borden

- School
- Museum
- Low areas
- Old churches
- Foster's store
- Medical Clinic
- Nursing home
- Bar

Redberry Lake Regional Park

- hall
- church
- golf course
- fish pond
- boat dock
- putt n bounce
- bowl
- concession stand
- beach
- cabins
- campground (2- one by bowl, and one behind cabins)
- Pelican Islands/other bird nesting areas
- biosphere centre

Meeting Lake Regional Park

- Campground
- Community buildings
- Ag-capture surrounding areas

- Main gate to park

Vacation Farm

- Log house with lots of vehicles, sign along highway, we drove by it. We need to go back to it and mark it as a dot, maybe could find the land location without driving there.

Redberry Bible Camp

- A-frame building (old regional park) (mark in infrastructure)
- Ag Capture on bible camp if roads are open

Crooked Bush

- Try again to Ag-Capture that road (since we didn't the first time around)

Town of Redberry

- Mark as a dot on the map

Bridge along Hwy (east of Hafford)

- Mark in infrastructure category