

AGFOCUS

A Guide to Agricultural Land Use Inventory

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Introduction

Agriculture is a cornerstone activity important to the health and well being of British Columbians. Since the early days of the province, farming and farm families have played an important role in many BC communities. Land used for agriculture can account for a large part of many local jurisdictions, and has significant relationships with the environment, urban development, transportation and other resource uses. The agri-food sector that has evolved today makes significant economic, environmental and social contributions. Despite the importance of farming and ranching, fewer and fewer people have a direct link with agriculture. This has resulted in the gradual erosion of a first-hand understanding of agriculture, its various land use relationships and the issues associated with operating a farm or ranch.

In an effort to improve links between local governments, provincial agencies and the farm community, the Ministry of Agriculture, Food and Fisheries introduced the Strengthening Farming Program. This program has initiated several projects to improve these linkages and foster agricultural awareness. A key project that was successfully completed under the Strengthening Farming Program was the Pitt Meadows GIS pilot project.

The pilot project was undertaken in partnership with the District of Pitt Meadows to explore the benefits of adding agricultural data and tools to a Geographic Information Sys-





tem (GIS). The results are outlined in the report *AgFocus - An Agricultural GIS*¹. The report highlights the use of GIS in farming areas to provide a broader understanding of agriculture, promote local agriculture and assist with land use decision making processes. A key component of the system was incorporating land use inventory data into the GIS. Since the completion of the pilot project, MAFF has worked with several other local governments, to conduct agricultural land use inventories and incorporate the data into their GIS.

This document, *AgFocus - A Guide to Agricultural Land Use Inventory*, looks at the benefits of an agricultural inventory and considers a range of practical topics associated with conducting an inventory. It is a companion document to the GIS report and is **meant to serve as a guide for communities interested in undertaking an inventory of their agricultural land base**. The guide includes procedures for conducting an agricultural land use inventory, a suggested data model focusing on land use activities and land covers, and a coding system which allows for varying levels of detail.

AgFocus - A Guide to Agricultural Land Use Inventory is intended to build on the Strengthening Farming Program's commitment to ensure strong working relationships between the Province, local governments and the agri-food industry. The Ministry of Agriculture, Food and Fisheries looks forward to working with municipalities, regional districts and other agencies interested in pursuing land use inventory work in their farming and ranching areas and developing an agricultural GIS.

¹ The *AgFocus - An Agricultural GIS* report and summary brochure can be found on the B.C. Ministry of Agriculture, Food and Fisheries web site, <http://www.gov.bc.ca/agf/> under 'Reports & Publications' / Publications Available on the BCMAFF Website / Resource Management.



Part I – Benefits of an Agricultural Land Use Inventory

Effective land use planning requires a comprehensive understanding of a variety of elements, including the spatial patterns of the area under study. Many agencies in British Columbia are finding that Geographic Information Systems (GIS), in combination with land use inventory data, is a useful tool in helping to understand, analyze and display these spatial patterns.

An agriculture land use inventory can serve several purposes, such as:

- provide a record of land uses in farming or ranching areas and act as a benchmark for monitoring land use change;
- improve the understanding of land use and resource relationships;
- identify impacts of proposed policies and regulations;
- improve the information base to assist land use decision-making including official community plan and bylaw updates
- help identify challenges and opportunities to enhance agriculture; and
- identify opportunities for greater land use and resource compatibility.

By incorporating agricultural land use data into a GIS, people can enhance their knowledge of farming areas and be better prepared to plan for and promote agriculture.

Part II– Conducting an Agricultural Land Use Inventory

While there are a number of ways to acquire land use information, the method developed by MAFF involves a team of two surveyors conducting a “windshield” survey. Using a combination of drive-by observations and aerial photographic interpretation, the survey team examines each legal parcel in the study area, recording both the land covers and the land use activities. Examples of land covers include buildings, crops and vegetated areas, while land use activities include such categories as agricultural, residential and industrial use. The information is coded into data tables in a computer, which are then linked to a GIS layer of the survey area’s legal parcels. Using specially designed tools, a GIS user can then query and map the land use inventory information.

The basic steps to collecting an inventory are:

1. Identifying the survey area
2. Deciding what data to collect
3. Preparing for the survey
4. Conducting the survey
5. Recording the data





1. Identifying the survey area

The survey may encompass a subset of the farming community where there is a specific need for information, or it may cover all land in the municipality's ALR if a broad information base is needed. When surveying the entire ALR area, it is a good idea to also include land along the urban side of the ALR boundary. Having information about land use on either side of the ALR boundary will be particularly important if more focussed "edge" planning to promote land use compatibility is anticipated. In addition, if farming areas exist outside of a municipality's ALR lands, these areas should be considered for surveying as well.

2. Deciding what data to collect

Before collecting any data, it is important to identify what information is needed and how it is going to be used. People who might be working with the data in the future should be consulted as to whether there's anything they wish the surveyor to pay particular attention to. For example, people dealing with water and drainage issues may have different needs and interests than those charged with bylaw enforcement or updating an official community plan.

Other factors to consider are the size of the study area and the scale at which the data is likely to be displayed. For a small survey area it might be feasible to record a great deal of detail about the landscape. For a large area, it might be practical to only record major land use activities. While collecting the most detailed level of information gives the most comprehensive data, there might not be the time, expertise, or need for it.



3. Preparing for the survey

The following is a list of the elements needed to conduct a survey.

- Vehicle
- Survey maps
- Street map for navigation
- Laptop computer (if available)
- Adapter for powering laptop from the vehicle
- List of land use codes for recording data (see Part V)
- Any existing data about parcels

When conducting the survey, maps are used to identify properties and features. If a laptop computer is not available for data entry, maps can also be used for recording data. If this is the case, large scale survey maps such as 1:2500 are desirable so there is room to record data on them. If the maps are not used to record information on, a scale of about 1:5000 will suffice. Ideally, the survey maps should include:

- the legal parcel boundaries
- unique identifiers for each legal parcel
- the ALR boundary
- base features such as streets, street names, watercourses and contours
- aerial photography



The survey data is recorded on a parcel by parcel basis, thus it is necessary to have a map layer of the survey area's legal parcels, or cadastre. It is essential that a unique identifier exist for each parcel, as it is used to link the land use data to the GIS cadastral coverage. Many local governments use the BC Assessment roll number to identify parcels, but this value can be problematic because sometimes two or more parcels can have the same roll number. If the local government has some other value to uniquely identify a parcel then this can be used instead.

In addition to the parcel identifiers, a GIS department may already have other information about parcels. If data such as property addresses, ownership, BC Assessment actual use code, inclusion in the ALR, zoning, or data from previous inventories is available, it is useful to have it on hand during the survey. This information will help the surveyors to better locate properties as well as understand land use and land use changes.

Aerial photography makes a good background for the survey maps. Without aerial photography it is difficult to tell which buildings are on which parcels, or to estimate the area of a crop. The photography also helps to identify crops and structures which may not be easily seen from the road if, for example, there are shrubs or trees blocking the view. The cost of aerial photography will vary depending on its age and resolution. Sometimes appropriate photography will have already been flown and can be purchased. If not, contracting to fly new photography may be necessary. Acquiring aerial photography is usually the most expensive part of conducting a land use inventory, however it is a very beneficial layer to have in a GIS. Besides its value while undertaking the survey, aerial photography will be useful for many other mapping projects.





4. Conducting the survey

STAFF

The survey can usually be conducted by two people. One person drives and the other navigates and records land use information. The recorder directs the driver to the next property, then both surveyors look over the property to determine its land covers and land use activities. The recorder notes this information, ideally directly into a laptop computer. For safety reasons it may be useful to have a third surveyor present on difficult roads such as those with a high traffic volume, so that the driver can focus solely on the traffic.

It is critical that at least one of the surveyors have a strong understanding of the agricultural activities and crops which are common in the study area, to serve as the “agricultural eyes” of the survey team. It is recommended that this person be present throughout the entire survey, to ensure consistency in how data is recorded. Besides familiarity with agriculture, other essential skills for the survey team include interpreting maps and aerial photography. If using a laptop, the data recorder should be computer literate and familiar with the data entry tool.

Agricultural expertise may be found within the community itself by way of a retired farmer or rancher or member of a local Agricultural Advisory Committee. An agrologist, with a good general grounding in agriculture, is another option. Where an agricultural land use inventory is undertaken by a municipality or regional district, it is advantageous if at least one of the survey team is



drawn from the local government's planning, GIS, or mapping department staff. This will ensure a local staff person is aware of the details of how the survey was conducted in order to respond to any questions regarding data collection and interpretation.

The Resource Management Branch staff of the Ministry of Agriculture will assist local governments in implementing an agricultural land use survey to the greatest extent possible. This may include providing the electronic data entry form and other 'start-up' assistance. Resource Management Branch staff may also be able to join the survey team for a day or two at the beginning of the survey if further assistance is required. Local district or regional agrologists of the Ministry may be able to assist the survey team in answering any particular questions about agricultural land uses that may arise during the course of the survey.

TIME

On average, surveying can be done at a rate of about 1000 hectares per day. Surveying may be slower than this in an area with small parcels and complex land uses. The rate of surveying will also vary depending on traffic, weather, the experience of the surveyors and the level of detail being recorded. If the data is recorded manually rather than into a laptop, several days or even weeks will be needed for data entry back at the office. If a laptop is used then data entry is done during the survey, but a few days may still be needed to check over the data and fix any errors.



SAFETY CONSIDERATIONS

Conducting a survey requires driving slowly and stopping often, while maintaining a high level of focus on the landscape being surveyed. The following safety considerations will help in dealing with traffic:

- Use a clearly marked government vehicle.
- When stopping frequently, turn on hazard lights to alert other drivers.
- Be aware of which roads have a high volume of traffic, and plan to avoid these routes during rush hours. The least busy time of day is usually in the late morning.
- Be aware of which roads have a wide shoulder or parking lane for stopping, so that roads without a shoulder or parking lane can be avoided during rush hours.

5. Recording the data

TIPS ON SURVEYING

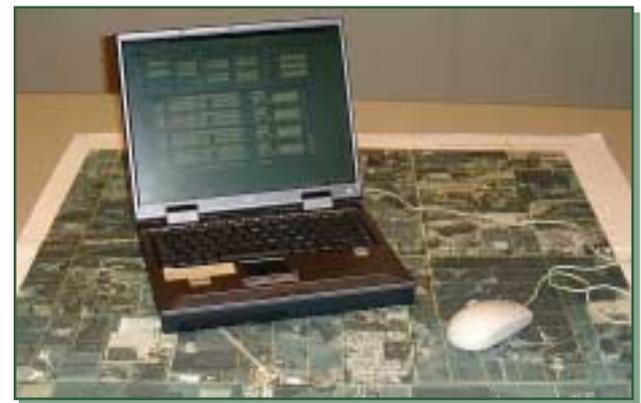
- Be consistent in how you record information, such as observing land covers in a certain order each time. This makes it less likely to skip things. For example, you may wish to record information in the following order:
 - crops, eg. berries, pastures
 - agricultural structures, eg. barns, paddocks
 - livestock types associated with the pastures or structures
 - agricultural practices associated with crops or structures

- non-agricultural structures and land covers, eg. residences, treed areas
- land use activities
- Even if no livestock is visible from the road, sometimes livestock can be identified by other clues, eg. whether a pasture has been recently grazed, the type of fencing or barns, or the presence of a horse trailer in the driveway.
- Look for signs on the road or at the farm entrance for clues about the property. Signs may indicate the farm name or the types of commodities produced, e.g. “Farm Fresh Eggs” or “U-Pick Raspberries”.
- Use the aerial photography to identify structures that can’t be seen from the road.
- Be prepared for questions from residents. It is a good idea to have an information plan to inform people of what you are doing; carry business cards to give out, put an article about the survey in the local paper, and have contact names that people can call with questions.



USING A LAPTOP FOR DATA ENTRY

During the survey, land use data can be recorded directly into a laptop, drawing power from the vehicle. If a laptop is used, the recorder should still make notes on the survey map when necessary. For example, on a large parcel with several different types of crops, the recorder should note on the map which crops are being grown on which sections of the parcel.





USING MAPS FOR DATA ENTRY

If laptop is not available, the surveyors' observations should be recorded directly onto the survey maps. The land covers can be recorded on the map in words or in codes, depending on the recorder's preference. If recording data directly onto a map, observe the following tips:

- Determine beforehand what colour pen shows up best on the map and have several on hand.
- Write neatly and clearly.
- The person who recorded the data during the survey should be the same one to transfer the data into the computer. Data entry should be done soon after the survey is conducted when the details are still fresh in the surveyor's mind.

If the data entry form isn't used, the data can be entered into a spreadsheet program such as Excel. Three data tables are necessary; their fields are described in Part III. Once the data has been entered, the data tables can be exported as a dbase file (.dbf) and added to an Arcview project.

Part III – The Data Model

Land use information can be recorded in many different ways. The following methodology has been developed over time based on MAFF's experience with various land use inventories. A database has been developed in MS Access which can be used to enter and store the information collected via this data model. This database can be provided to interested parties, although some customization may be required to make it suit an area's needs. The following section discusses the three main tables which exist in the database, and the fields within those tables.

The Parcel table

The Parcel table contains existing information about the parcels. This table is essentially the polygon attribute table of a municipality's GIS cadastral coverage, containing information such as the unique identifier, (or Parcel ID), the street address, BC Assessment information, etc..

The Parcel ID is used to link all three data tables together. It is also used to link the land use inventory data to a GIS coverage of the survey area's cadastre so that the survey data can be mapped.

Existing parcel information should be present in the database before the survey commences. In addition, blank fields are added to this table, to be filled in during the survey. These fields include:

- **Farm name** – Farm name (or business name, if a store or other commercial operation exists)
- **Comments** – Surveyor comments about the parcel as a whole, eg. if the property had a "For Sale" sign

- 
- **Confidence** – the recorder’s confidence level about the data for that property. For example, possible values could include “Some features hidden by trees”, “Livestock type inferred, not seen”, “Suspect that livestock were missed” or “Very confident can see all of property”.
 - **Change** – Land use change since the last survey, if a previous survey was conducted. Here the recorder can note such things as “pasture converted to blueberries”. After the survey is complete, the recorder may wish to group this information into a small number of categories. This field allows a map of land use change to be created.

The Activity table

The second data table contains information about land use activities. The Activity table has a one-to-one relationship with the Parcel table; i.e. for each parcel in the Parcel table, only one record exists in the Activity table. The tables are linked together by the Parcel ID.

The fields in the Activity table are as follows:

- **Parcel ID** – The unique identifier for the parcel
- **Primary activity** – This is a description of the primary land use activity taking place on the parcel. This is a general value, such as “Agriculture”, “Hobby Farm”, “Residential Use”, or “Commercial/Service”. The “Agriculture” designation is used when farming is the only use, or the most important use. “Hobby Farm” may be difficult to determine, but is used if farming is obviously recreational and of secondary importance to the residential use. If “Hobby Farm” is recorded, residential use is implied and doesn’t need to be recorded separately as a secondary activity. Examples of hobby farms include



homes with one or two horses, or a very small amount of crops which are not likely a significant source of income for the residents.

- **Secondary activity** – The secondary land use activity
- **Tertiary activity** – The tertiary land use activity
- **Primary agricultural activity** – The primary agricultural land use activity occurring on a parcel, such as “Beef Cattle Farm”, or “Greenhouse Operation”. This value is only filled in if “Agriculture” or “Hobby Farm” is listed as a primary, secondary or tertiary activity. The primary agricultural activity is the one which is likely the greatest source of income. It is recognized that in some cases this may be difficult to determine, so the distinction between primary, secondary, tertiary and quaternary agricultural activity is at times a best guess.

A list of suggested values of both the general land use activity and the agricultural land use activity fields can be found in Part V. More values can be added to the list as needed for a particular area.

- **Primary agricultural activity scale** – If the primary land use activity is a livestock operation, the scale of the operation can be recorded. This value is an estimate of the number of livestock present, based on the number observed and from the size of barns, pastures and other livestock-related facilities. The criteria that has been used in the Lower Mainland is listed below. It is recognized that in areas of the province where much larger operations exist these numbers will need to be adjusted.

	Small	Medium	Large
Horses	1-4	5-10	11+
Beef cattle, sheep, goats, llamas	1-10	11-50	51+
Dairy cattle	1-50	51-100	101+

- **Secondary agricultural activity** – The agricultural land use activity which is of secondary importance, in terms of income generation
- **Secondary agricultural activity scale** – The scale of the secondary agricultural activity
- **Tertiary agricultural activity** – The agricultural land use activity which is of tertiary importance, in terms of income generation
- **Tertiary agricultural activity scale** – The scale of the tertiary agricultural activity
- **Quaternary agricultural activity** – The agricultural land use activity which is of quaternary importance, in terms of income generation.
- **Quaternary agricultural activity scale** – The scale of the quaternary agricultural activity

The Cover table

The third data table contains information about land covers. Land covers include such things as buildings, structures and crops - anything that covers the land. The Cover table has a one-to-many relationship with the Parcel table; i.e. for each parcel in the Parcel table, many records may exist in the Cover table. The tables are linked together by the Parcel ID.



The fields in the Cover table are as follows:

- **Parcel ID** – The unique identifier for the parcel
- **Land cover code** – This code describes the land cover, eg. a building, farm structure, natural feature or crop. There are six major categories of land covers in the coding system; Agriculture, Mineral Extraction, Recreation, Settlement, Water Management areas, and Vegetated areas, which are listed in Part V of this document. The coding system is hierarchical, allowing different levels of detail to be recorded and displayed.
- **Livestock code** – The type of livestock associated with the land cover, if any. This applies to land covers such as barns, paddocks and pastures. More than one type of livestock can be recorded if necessary. For example, a pasture might be shared by both sheep and cows.
- **Practice code** – This code describes the agricultural practice taking place on a land cover, if any. More than one type of practices can be recorded if necessary. For example, a crop may have both irrigation and crop protection associated with it.
- **Condition** – This is a descriptive comment about the condition of a land cover. Possible values include abandoned, inactive, large, neglected, new, small, or under construction. Definitions of these values can be found in Part V. More than one condition can be recorded if necessary.
- **Obtained by airphoto** - This is a Yes/No field, which is set to “Yes” when the land cover has been identified by airphoto alone, because the view from the road was obscured. This indicates to those interpreting the data that there is some doubt about the accuracy of the land cover, as it was not visually confirmed.

- 
- **Count** – This is the total number of a certain land cover where more than one exist, eg. where there are several houses or beef barns on a farm.
 - **Percent of parcel** – This is an approximation of how much of the parcel the land cover takes up, eg. a blueberry field occupying 70% of a farm. This value gives a rough idea of the area of the land cover. The estimate is most easily determined from the aerial photography. Care should be taken that the total for all the land covers on a parcel does not equal more than 100%.
 - **Comments** – Any additional comments the surveyors may have regarding a land cover.

The Data Entry Form

When using the data entry form developed by MAFF as part of its land use database, the recorder enters the unique identifier for a parcel, in order to access the information for that parcel. The recorder can then enter in the data describing the parcel's land use. The data entry form displays information from the three different data tables. Information from the Activity table and the Cover table is displayed in the two “sub-forms” on the main form. When entering a land cover Code (eg. AL141) into the data entry form, the code's description fills in automatically (eg. “Improved pasture”). This helps ensure against errors when typing in codes. A small triangle to the right of a field indicates a pull-down menu, where the recorder can select the appropriate code from a list.

This is the data entry form for a sample farm, displaying information from the Parcel, Activity, and Cover tables:

Land use survey 2002

Parcel ID: **1234**
 Name: Pleasant Meadows Farm
 Address: 722 Cherrytree Lane
 Comment:
 Confidence:
 Change: new field vegetables

General Activities
 Agriculture
 Residential Use

Agricultural Activities
 Beef Cattle Farm
 Field Vegetable Farm
 medium
 Horse Farm
 small

Land Covers

Cover	AL141	Improved Pasture	Condition		Comments	Alphoto
Livestock	AP812	Beef cattle				
Practice			Count	%	75	
Cover	AL150	Field crop production - Vegetables	Condition	new	Comments	Alphoto
Livestock						
Practice	AP280	Trickle irrigation	Count	%	15	
Cover	AL310	Housing Animals	Condition	large	Comments	Alphoto <input checked="" type="checkbox"/>
Livestock	AP812	Beef Cattle	AP813	Horse		
Practice			Count	%	5	
Cover	S111	Single family dwelling	Condition		Comments	Alphoto
Livestock						
Practice			Count	%	5	



Additions to the database – conducting inventory updates

The database can be altered to accommodate different needs. The form can be used when conducting an inventory update, if a previous inventory of the survey area has already been conducted. A button is added to the form, which when selected will copy the previous survey's data onto the new form for a particular parcel. Updates can then be quickly made to that parcel's land use data when re-surveying. By updating the previous information rather than starting data entry from scratch, consistency is maintained between surveys. After updating the information the recorder can then fill in the "Change" field in the Parcel table, if a major land use change has occurred. Although changes in land use can be determined from the data, this field is useful because the surveyor can use their own discretion in determining whether significant land use change has occurred or not. For example, the surveyor may decide that changing from "Forage Operation" to "Pasture" is not significant enough to be considered a land use change.

Additions to the database - incorporating field boundaries

Another adaptation of the data entry method is incorporating field crop boundaries. This method was piloted in the Regional District of Comox-Strathcona where agricultural field boundaries were provided by Ducks Unlimited, one of the partners in the data collection project. In this method, field boundaries are digitized from orthophotography, using relatively permanent physical boundaries such as forests, ditches, roads and buildings. Each field is given a unique identifier. The field boundary GIS coverage is unioned with the cadastre coverage, in order to calculate the area and percentage of each parcel which is inside fields. After the coverages are unioned sliver polygons are deleted, eg. any polygon which is less than 4% of a parcel and less than 0.1 hectares in size.

A fourth data table, the Crops table, is then added to the MS Access database, with the same data fields as the Cover table. A form is also added, so that data can be entered into this Crops table on a field by field basis. The surveyor has both forms open during the survey, so that information can be entered for parcels and for fields. The data about a field need only be entered once, even if the field extends over several different parcels. The field information and percent of parcel will automatically be filled in for all the parcels the field intersects.

Using the regular land use inventory method, only parcels containing a certain crop type can be pinpointed using GIS, rather than the exact locations of that crop type. By integrating field boundaries into the methodology, exact locations of crops can be shown on a map and more accurate acreages of land devoted to crops can be calculated.

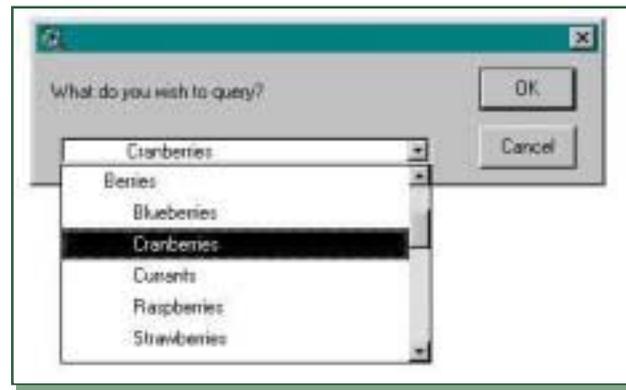
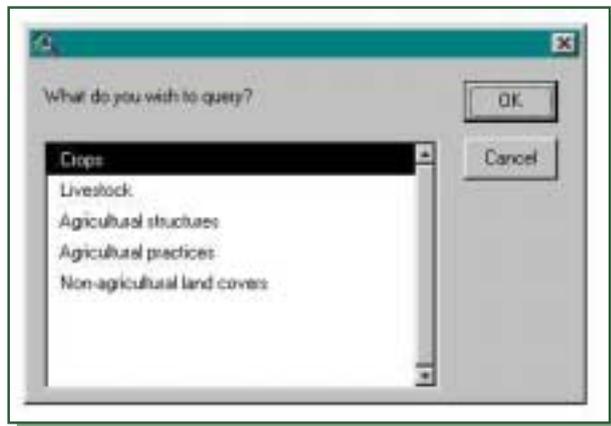
Part IV - Using the Data in a GIS

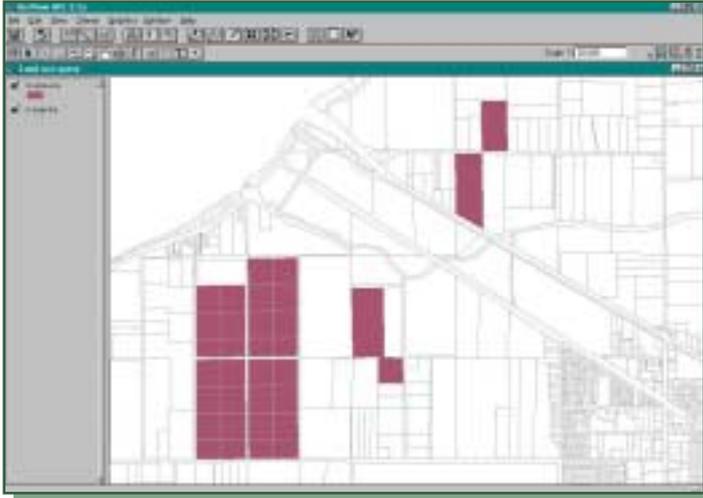
The data tables filled in during the survey can be used in a GIS such as Arcview, either by connecting directly to the Access database or by importing the tables in .dbf format. Using Arcview, MAFF has designed special tools which will join or link the various tables so the data can be easily queried. The survey data links to the GIS cadastre layer using the Parcel ID.

An individual parcel in the cadastral GIS layer can be queried to get its land use inventory information. The Smart Info tool is used to select a specific parcel and get a listing of its land covers or land use activities.



The data can also be examined at a local government or sub-area scale, to see which parcels contain a specified type of land cover or land use activity. Using the data from the Activity table, a map can be made to show parcels colour coded by a particular field, eg. a map of primary agricultural activities. A map can also be made identifying all parcels where a specific land use activity occurs, eg. a map of all horse operations (whether the primary use or not). Using the data from the Cover table, the Land Use Query tool gives the user a list of land covers to select from, then generates a new GIS layer of parcels which contain that land cover.





Since the coding system is hierarchical, the level of detail displayed can vary. For example, a map can be made of all parcels growing any kind of berries, or a map can be made specifically of parcels with cranberries. Maps can be made based on the livestock or agricultural practices fields as well, for example, a map of all parcels with dairy cattle or all parcels with netting over crops. Other GIS layers (eg. aerial photography, streams, ALR boundary, etc.) can be overlaid on the new land use layers in order to create a map.

The drawback to this type of data model is that without adjusting the data, no single map can be made to summarize the entire agricultural landscape. For ex-

ample, a farm with “Beef Cattle Farm” as its primary agricultural use and “Greenhouse Operation” as its secondary agricultural use cannot easily have both activities displayed on the same map. And a farm with both field vegetables and strawberries as land covers cannot easily have both crops displayed.

An alternative data model to the one described is to summarize all the land use activities in a single description. While this allows for making a single overview map of land use, it lacks detail. In an area where farm uses are complex and varied most of the properties will show up as Mixed Use, which is not very informative.

For more information on using land use data in GIS see the report *AgFocus - An Agricultural GIS*.

Part V – Coding the Data

Several fields on the data entry form are selected from pull-down lists. This section describes the values in the pull-down lists.

Land Use Activities

These are the general land use activities which can be entered in the Primary, Secondary, or Tertiary Activity field. Following is a list of suggested land use activities, as well as some examples of each activity. Items may be removed or added to this list, as suits the characteristics of a particular survey area.

Activity	Example
Agriculture	<i>Beef operation, nursery, vegetable production</i>
Commercial/Service Use	<i>Store, gas station</i>
Cultural/Entertainment Use	<i>Zoo, museum</i>
Freshwater aquaculture	<i>Salmon hatchery</i>
Golf Course	
Hobby Farm	<i>Residential property with two horses</i>
Indian Reserve	
Industrial Use	<i>Wood processing plant</i>
Institutional Use	<i>School, church</i>
Land in Transition	<i>Construction site, tree removal</i>
Military Area	
Mineral extraction	<i>Gravel pit</i>
Mobile Home Park	
Not in use	<i>Wetland, trees</i>
Park	
Recreational Use	<i>Trails, running track</i>
Residential Use	<i>House or mobile home</i>
Residential Use – Multi-family	<i>Apartment, townhouse</i>
Transportation and communication	<i>Airport, road right-of-way</i>
Unknown	
Unused farmland	<i>Abandoned pasture</i>
Utility	<i>Power lines, pumphouse</i>

Agricultural Land Use Activities

These are the agricultural land use activities which can be entered in the Primary, Secondary, or Tertiary Agricultural Activity field. Items may be removed or added to this list, as suits the characteristics of a particular survey area.

Agritourism	Game Farm	Poultry - backyard flock
Apiary	Ginseng Farm	Poultry Farm
Beef Cattle Farm	Greenhouse Operation	Range
Berry Farm	Horse Farm	Ratite Farm
Christmas Tree Farm	Livestock Operation - type unknown	Sheep/Goat Farm
Cultivated Land	Llama/Alpaca Farm	Specialty Crop Production
Dairy Farm	Mixed livestock (small-scale hobby)	Swine Operation
Fallow Land	Mushroom Farm	Tree Farm
Feedlot	Nursery	Turf Farm
Field Flower Farm	Nursery (incl. Greenhouses)	Unknown
Field Vegetable Farm	Nut Farm	Vineyard
Forage Operation	On-farm Bed & Breakfast	Vineyard (incl. Winery)
Fur Farm	Orchard	Winery
Game Bird Farm	Pasture	Woodlot



Condition of Land Covers

These are the values which can be entered into the Condition field of the land cover table.

Abandoned – the state of a structure or planting that exhibits signs of prolonged neglect, implying that the original use of the structure or planting has not occurred recently and likely will not be resumed in the future

Neglected – the state of a structure or planting that exhibits some signs of neglect (eg. tall weeds between blueberry bushes) but implying the possibility of resumed or improved activity

Inactive – the state of a structure that does not necessarily exhibit signs of neglect, but the use of which is discontinued for the time being, eg. an empty dairy barn

New – may pertain to any structure or planting and means that the item has obviously just been established or was not found on the most current airphoto. Depending on the date of the airphoto, this can be a somewhat relative term

Large – For purposes of this survey “large” can be described as a commercial structure, or may describe the size of a farm structure or residential dwelling

Small – For purposes of this survey “small” can be described as a non-commercial structure or planting, such as a two-stall horse barn or garden crops, or may describe the size of a storage structure or other facility

Under construction – means that a structure is in the process of being built



Land Covers

The following is a list of codes to use to record land covers information. Codes beginning with AL (Agriculture), M (Mineral extraction), R (Recreation), S (Settlement), V (Vegetated areas), or WM (Water Management areas) describe land covers, and are meant to go in the Land Cover code field of the Cover table. Codes beginning with AP8 (Livestock) are meant to go in the Livestock Code field. Other codes beginning with AP (Agricultural Practices) are meant to go in the Practice Code field. Codes were originally based on the RIC (Resource Inventory Committee) system and have been adapted as needed. Codes may be removed or added to this list, as suits the characteristics of a particular survey area.

AL000 Agriculture

AL100 Field crop production

AL110 Grains, cereals and oilseeds

AL111 Barley

AL112 Canola

AL113 Oats

AL114 Rye

AL115 Wheat

AL120 Tree fruit crops

AL121 Apples

AL122 Apricots

AL123 Cherries

AL124 Crabapples

AL125 Peaches

AL126 Pears

AL127 Plums

AL128 Nectarines

AL130 Vine and berry crops

AL131 Vine crops

AL131.1 Grapes

AL131.2 Kiwis

AL131.3 Blackberries

AL132 Berries

AL132.1 Blueberries

AL132.2 Cranberries

AL132.3 Currants

AL132.4 Gooseberries

AL132.5 Loganberries

AL132.6 Raspberries

AL132.7 Saskatoonberries

AL132.8 Strawberries

AL132.9 Tayberries

AL140 Forage and pasture crops

AL141 Improved

AL141.1 Grass

AL141.11 Perennial

AL141.12 Annual

AL141.2 Legume

AL141.21 Perennial

AL141.22 Annual

AL141.3 Cereal - forage

AL141.4 Corn - forage

AL142 Unimproved

AL142.1 Good condition

AL142.2 Poor condition

AL143 Range

AL150 Vegetable crops

AL151 Cole crop

AL151.1 Broccoli

AL151.2 Brussel sprouts

AL151.3 Cabbage

AL151.4 Cauliflower

AL151.5 Kale

AL151.6 Kohlrabi

AL152 Cucurbites

AL152.1 Cucumbers

AL152.2 Marrow

AL152.3 Pumpkin

AL152.4 Squash

AL152.5 Zucchini

AL153 Leafy vegetables

AL153.1 Celery

AL153.2 Lettuce

AL153.3 Spinach

AL153.4 Swiss chard

AL154 Legumes

AL154.1 Beans

AL154.2 Peas

AL155 Root vegetables

AL155.1 Beet

AL155.2 Carrots

AL155.3 Onions

AL155.4 Parsnip

AL155.5 Potatoes

AL155.6 Radish

AL155.7 Turnip

AL156 Misc. vegetables

AL156.1 Peppers

AL156.2 Sweet Corn

AL156.3 Leek

AL156.4 Tomatoes

AL160 Floriculture

AL161 Bulbs

AL161.1 Daffodil

AL161.2 Iris

AL161.3 Gladiolas

AL161.4 Tulip

AL162 Cut flowers

AL162.1 Aster

AL162.2 Orchid

AL162.3 Rose

AL162.4 Sunflower

AL162.5 Sweet pea

AL163 Bedding plants

AL170 Specialty crops

AL171 Medicinal

AL171.1 Ginseng

AL171.2 Echinacea

AL172 Turf

- AL173 Nuts
 - AL173.1 Hazelnut
 - AL173.2 Walnut
 - AL173.3 Filbert
- AL174 Woody cuts
 - AL174.1 Holly
 - AL174.2 Vibernum
 - AL174.3 Willow
 - AL174.4 Witchhazel
- AL175 Misc. specialty crops
 - AL175.1 Asparagus
 - AL175.2 Garlic
 - AL175.3 Herbs
 - AL175.4 Hops
 - AL175.5 Mushroom
 - AL175.6 Rhubarb
- AL180 Nursery**
 - AL181 Trees (plantation)
 - AL181.1 Christmas trees
 - AL181.2 Fine wood
 - AL181.3 Fibre/pulp
 - AL181.4 Forestry stock
 - AL181.5 Fuel
 - AL182 Ornamentals and shrubs
- AL190 Unspecified/other crops**
 - AL191 Cultivated land
 - AL192 Fallow land
- AL200 Housed crop production**
 - AL210 Residential/hobby greenhouse
 - AL220 Commercial greenhouse
 - AL221 Vegetables
 - AL222 Floriculture
 - AL223 Tropicals and other specialty plants
- AL224 Nursery
- AL230 Cold frame
- AL240 Mushroom barn
- AL300 Housed and site based animal production**
 - AL310 Housing animals
 - AL320 Feedlot
 - AL321 Woodwaste feedlot
 - AL322 Sand feedlot
 - AL323 Concrete feedlot
 - AL330 Seasonal feeding area
 - AL340 Corral/paddock
 - AL341 Woodwaste corral/paddock
 - AL342 Sand corral/paddock
 - AL343 Concrete corral/paddock
 - AL350 Equestrian facility
 - AL351 Outdoor riding ring
 - AL351.1 Woodwaste riding ring
 - AL351.2 Sand riding ring
 - AL352 Indoor riding ring
 - AL352.1 Indoor riding ring w/attached stalls
 - AL353 Equestrian racetrack
 - AL360 Commercial dog kennel
 - AL361 Doggie day care
 - AL370 Bee hives
 - AL400 Code not in use
 - AL500 Freshwater aquaculture
 - AL600 Marine aquaculture
 - AL700 Farm accessories**
 - AL710 Storage
 - AL711 Crop storage
 - AL711.1 Bunker silo
 - AL711.2 Upright silo
 - AL711.3 Hayshed
 - AL711.4 Silage bags
 - AL711.5 Refrigerated storage, fruits and vegetables
 - AL711.6 Non-refrigerated storage, fruits and vegetables
 - AL711.7 Granary/grain bin
 - AL712 Chemical storage
 - AL712.1 Fertilizer storage
 - AL712.2 Pesticide storage
 - AL712.3 Fuel storage
 - AL713 Machinery and tool storage
 - AL714 Woodwaste storage
 - AL714.1 Woodwaste facility
 - AL714.11 Covered
 - AL714.12 Uncovered
 - AL714.2 Woodwaste pile
 - AL714.21 Covered
 - AL714.22 Uncovered
 - AL715 Storage shed, contents unknown
 - AL720 On farm preparation and processing
 - AL721 Crop preparation/processing facility
 - AL722 Egg-sorting facility
 - AL723 Livestock processing facility
 - AL724 Milkhouse or milking parlour
 - AL725 Winery
 - AL726 Winery with restaurant
 - AL727 Feed processing

AL730 Direct marketing structure
 AL731 Permanent store
 AL731.1 Produce
 AL731.2 Floriculture and/
 or tropicals
 AL731.3 Nursery
 AL732 Seasonal/temporary
 produce stand
 AL740 Composting facility
 AL741 Vegetative compost
 AL741.1 Pile on pad
 AL741.11 Covered
 AL741.12 Uncovered
 AL741.2 Pile
 AL741.21 Covered
 AL741.22 Uncovered
 AL742 Mushroom medium compost
 AL742.1 Facility
 AL742.2 Pile on pad
 AL742.21 Covered
 AL742.22 Uncovered
 AL742.3 Pile
 AL742.31 Covered
 AL742.32 Uncovered
 AL743 Spent mushroom medium
 AL743.1 Pile on pad
 AL743.11 Covered
 AL743.12 Uncovered
 AL743.2 Pile
 AL743.21 Covered
 AL743.22 Uncovered
 AL750 Manure facility
 AL751 Concrete or Metal Tank
 AL751.1 Covered
 AL751.2 Uncovered

AL752 Concrete Pad
 AL752.1 Covered
 AL752.2 Uncovered
 AL753 Concrete Lagoon
 AL753.1 Covered
 AL753.2 Uncovered
 AL754 Earthen Lagoon
 AL755 Bin
 AL756 On ground storage
 AL756.1 Covered
 AL756.2 Uncovered
 AL760 Well
 AL761 Domestic
 AL762 Irrigation
 AL763 Stock Watering
 AL770 Pumps
 AL771 Drainage
 AL771.1 Electric Motor
 AL771.2 Combustion Motor
 AL772 Irrigation
 AL772.1 Electric Motor
 AL772.2 Combustion Motor
 AL780 Farm building, type unknown
**AL800 Inactive agricultural land and
 facilities**
 AL810 Abandoned or neglected farm
 land
 AL811 Neglected grassland
 AL812 Neglected vegetative area
 AL820 Abandoned or unused farm
 structure
 AL830 Land in transition
 AL840 Farm yard area

AP000 Agricultural Practices
 AP100 Crop Protection/Enhancement
 AP110 Crop support/Trellis
 AP120 Integrated Pest Management
 AP130 Material application
 AP131 Fertilizer
 AP131.1 Compost
 AP131.2 Manure
 AP131.3 Synthetic
 fertilizer
 AP132 Mulch
 AP132.1 Compost
 AP132.2 Plastic
 AP132.3 Straw
 AP132.4 Topsoil
 AP132.5 Vegetative
 debris
 AP132.6 Woodwaste
 AP133 Pesticide application
 AP133.1 Fungicide
 AP133.2 Herbicide
 AP133.3 Insecticide
 AP133.4 Molluscicide
 AP140 Noise generation
 AP141 AV alarms
 AP142 Bird distress calls
 AP143 Propane exploders
 AP150 Organic/No spray
 AP160 Physical wildlife barrier
 AP161 Fencing
 AP162 Netting
 AP170 Temperature/light control
 AP171 Shade cloth
 AP171.1 Cloth
 AP171.2 Plastic

AP172 Tunnel/floating cover	AP262 Spray emitter	AP814 Swine
AP172.1 Cloth		AP814.1 Breeder
AP172.2 Plastic	AP300 Drainage	AP814.2 Farrow
AP173 Wind machine	AP310 Surface	AP814.3 Farrow-to-finish
AP180 Wind break	AP320 Sub-surface	AP814.4 Finisher
AP181 Fencing	AP400 Direct Farm Marketing	AP814.5 Weaner
AP182 Treed buffer strip	AP410 Products for sale	AP815 Sheep
AP190 Stream bank enhancement	AP420 U-Pick	AP816 Goat
AP191 Grass buffer strip	AP430 Xmas tree cutting	AP817 Donkey
AP192 Livestock fencing	AP500 Agritourism	AP818 Mule
AP193 Riparian planting	AP510 Corn Maze	AP820 Specialty livestock
AP200 Irrigation	AP520 Petting farm	AP821 Llama
AP210 Surface irrigation	AP530 Holiday events	AP822 Alpaca
AP211 Flood	AP540 Accommodation	AP823 Musk ox
AP212 Furrow	AP541 Guest ranch	AP824 Game
AP220 Sub-surface irrigation	AP542 On-farm Bed & Breakfast	AP824.1 Deer
AP230 Sprinkler irrigation	AP600 Agroforestry	AP824.2 Reindeer
AP231 Handline sprinkler	AP700 Cultivation	AP824.3 Bison
AP232 Wheeline sprinkler	AP710 Contour planting	AP824.4 Elk
AP233 Solid set	AP720 Contour ploughing	AP825 Game bird
AP233.1 Undertree	AP730 Conventional till	AP825.1 Partridge
AP233.2 Overtree	AP740 Minimum till	AP825.2 Pheasant
AP234 Microsprinkler	AP750 Downslope planting	AP825.3 Pigeon
AP240 Centre pivot sprinkler	AP760 Downslope ploughing	AP825.4 Quail
AP241 Low pressure pivot	AP770 No till	AP826 Ratites
AP250 Giant gun	AP800 Livestock	AP826.1 Emu
AP251 Stationary gun	AP810 Conventional livestock	AP826.2 Ostrich
AP252 Travelling gun	AP811 Dairy cattle	AP826.3 Rhea
AP253 Solid set gun	AP812 Beef cattle	AP827 Peacock
AP260 Trickle irrigation	AP812.1 Veal	
AP261 Drip emitter	AP813 Horse	AP830 Poultry/Fowl
AP261.1 Drip, buried	AP813.1 Pony	AP831 Chicken
AP261.2 Drip, aboveground	AP813.2 Miniature horse	AP831.1 Broiler breeder
		AP831.2 Broiler

AP831.3 Hatchery
 AP831.4 Layer
 AP831.5 Free range layer
 AP832 Turkey
 AP832.1 Breeder
 AP832.2 Meat
 AP833 Duck
 AP834 Goose
 AP840 Fur-bearing
 AP841 Fox
 AP842 Mink
 AP843 Rabbit
 AP844 Chinchilla
 AP845 Nutria
 AP850 Beekeeping and honey production
 AP900 Commodity specific practices
 AP910 Forage crops
 AP911 Grazing/pasture
 AP912 Seed
 AP913 Silage or hay
 AP913.1 Silage
 AP913.2 Hay
 AP920 Nursery crops
 AP921 Bare root
 AP922 Ball and burlap
 AP923 Container
 AP924 Caliper
 AP930 Tree fruits
 AP931 Espalier

M000 Mineral extraction

M100 Surface mining and quarrying
 M110 Open pit metal mines
 M120 Open pit coal mines
 M130 Quarries-rock and industrial minerals
 M140 Peat extraction
 M150 Topsoil removal
 M160 Extraction of gravels and sands
 M170 Other surface extraction

R000 Recreation

R100 Intensive facility based recreational activities
 R110 Municipal and regional open spaces
 R111 Municipal or regional park
 R112 Picnic area/playground
 R113 Zoo
 R114 Garden
 R120 Golf course
 R121 Driving range
 R122 Clubhouse
 R130 Indoor recreation or sports facility
 R140 Outdoor sports and recreation
 R141 Tennis court
 R142 Swimming pool
 R143 Sports field
 R144 Running track
 R145 Vehicle race track
 R146 Shooting range
 R150 Trail or corridor, walking and bicycle
 R160 Fairground, amusement park

S000 Settlement

S100 Residential

S110 House
 S111 Single family dwelling
 S112 Duplex
 S120 Residential features
 S121 Yard , lawn or landscaping
 S122 Auxiliary building, eg. garage or workshop
 S123 Paved area
 S124 Tennis court
 S125 Swimming pool
 S126 Landscaped/decorative pond
 S130 Attached (apartment and townhouse)
 S140 Mobile home
 S141 Mobile home park/RV Park
 S150 Ancillary residential (eg. picker cabin)
 S151 Home based business
 S152 Home based Bed & Breakfast
 S160 Construction and resource employee camp

S200 Commercial and service facilities
 S210 Retail, services, office
 S211 Store
 S212 Strip Mall
 S213 Restaurant
 S214 Office building
 S215 Automotive shop
 S216 Veterinary clinic
 S217 Gas station
 S218 Garden centre

S220	Wholesale and warehouse facility	S420	Religious facility, eg. church	S700	Not in use
	S221 Storage	S430	Hospitals or medical centre	S800	Military
S230	Hotel or motel	S440	Education facility	S810	Military training facility
S240	Cultural or entertainment facility	S441	Pre-school	S820	Military testing facility
	S241 Museum	S442	Elementary	S830	Other military
	S242 Library	S443	Junior/middle high	V000	Vegetated areas
	S243 Outdoor stage	S444	Senior high	V100	Non-riparian
	S244 Movie theatre	S445	Post-secondary	V110	Treed
S250	Parking lot	S446	Trade school		V111 Coniferous
	S251 Impervious (paved)	S447	Religious		V112 Broadleaf
	S252 Pervious (dirt or gravel)	S450	Jails, prisons, other correctional facility		V113 Mixed
S300	Industrial	S460	Meeting or assembly hall	V120	Non-Treed
S310	Light industry	S470	Adult care facility		V121 Tall shrubs (>2 m)
	S311 Recycling facility	S480	Cemetery/Memorial garden		V122 Low shrubs (< 2m)
	S312 Soil mixing facility	S500	Transportation and Communications		V123 Herbaceous vegetation (fern, grasses, forbs)
	S313 Composting facility	S510	Highway	V200	Riparian
S320	Medium and heavy industry	S520	Railway	V210	Treed
	S321 Cement plant	S530	Airport		V211 Coniferous
	S322 Chemical plant	S540	Marina or dock		V212 Broadleaf
	S323 Wood processing facility	S550	Road		V213 Mixed
	S324 Manufacturing facility	S560	Radio/telecommunications facility	V220	Non-Treed
S330	Food processing	S600	Utilities		V221 Tall shrubs (>2 m)
S340	Oil and gas storage tank farm	S610	Energy transmission and distribution		V222 Low shrubs (< 2m)
S350	Outdoor material and equipment storage	S620	Solid waste facility		V223 Herbaceous vegetation (fern, grasses, forbs)
S360	Auto wrecker	S630	Liquid waste facility		
S400	Institutional	S640	Domestic water tanks and distribution facility		
S410	Government	S650	Pump station		
	S411 Office	S660	Pipeline		
	S412 Fire hall				
	S413 Police office				
	S414 Municipal hall, court house				



WM000 Water Management Areas

WM100 Natural Watercourses

WM110 Streams

WM120 Lakes

WM130 Wetlands

WM140 Foreshore area

WM200 Channelized Watercourses

WM210 Dyked Watercourse

WM220 Straightened Watercourse

WM230 Diverted Watercourse

WM300 Constructed Ditches

WM310 Drainage Ditch

WM320 Irrigation Diversion Channel

WM330 Other Diversion Channel

WM400 Reservoirs

WM410 Farm Ponds (dug)

WM411 Irrigation pond

WM412 Retention/detention pond

WM413 Settling pond

WM414 Wastewater collection

WM420 Damned Reservoirs

WM421 Hydroelectric Reservoir

WM422 Water supply Reservoir

WM423 Multi-purpose Reservoir

WM500 Managed wetlands

WM510 Managed fresh water wetlands

WM520 Managed salt water and
brackish wetlands

WM600 Watersheds

WM610 Designated community
watersheds

WM620 Undesignated water supply
watersheds

Appendix - Contacts

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The AgFocus – An Agricultural GIS report and summary brochure can be found on the B.C. Ministry of Agriculture, Food and Fisheries web site, <http://www.gov.bc.ca/agf/> under 'Reports & Publications' / Publications Available on the BCMAFF Website /Resource Management.

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