AgFocus

A Surveyor’s Guide to Conducting a Land Use Inventory

November 2014 Edition
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For more information or to receive an additional copy of the AgFocus: Surveyor’s Guide to Conducting a Land Use Inventory, please contact the Strengthening Farming unit at:

BC Ministry of Agriculture
Innovation and Adaptation Services Branch
Strengthening Farming Unit
1767 Angus Campbell Road
Abbotsford, BC  V3G 2M3
(604) 556-3001

References:
Land Use Decision Support Unit, 2007
Ag Capture: An Agricultural Land Use Inventory Tool, Canadian Prairies Edition
Agriculture and Agri-Food Canada
Prairie Farm Rehabilitation Administration
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INTRODUCTION
AgFocus is an Agricultural Land Use Inventory (ALUI) System developed by BC Ministry of Agriculture and Lands (MAL), Sustainable Agriculture Management Branch (SAMB), Strengthening Farming Program. AgFocus provides the tools to efficiently capture detailed information about land cover and land use on agricultural lands.

The Surveyor’s Guide is a companion document to AgFocus - An Overview of Agricultural Land Use Inventory, and AgFocus - A GIS Analyst’s Guide to Agricultural Land Use Inventory Data.

All three documents were revised significantly in 2009. In 2005, together these three documents replaced the original AgFocus - A Guide to Agricultural Land Use Inventory. The Surveyor’s Guide is a reference when performing an AgFocus Windshield survey, either in the capacity of an agrologist or a data entry person. The guide includes a description of the field survey method and tips on conducting a safe and accurate survey. It describes the data model so that surveyors are aware of the type of information that needs to be collected.

The Surveyor’s Guide can be used in conjunction with the AgFocus Field Guide which lists all the required codes.

CONDUCTING AN AGFOCUS SURVEY

Survey Method
AgFocus employs a “windshield” survey method designed to capture a snapshot in time of land cover and land use on legal parcels. The survey is typically performed by a team of two people. It mainly captures data visible from publicly accessible lands and roads. Where visibility is limited, data may be interpreted from aerial photographs and local knowledge.

Identifying the survey area
The survey may encompass a subset of the farming community where a specific need for information exists. If a broad information base is needed, the survey may cover all land in the municipality’s ALR. It is a good idea to include land along the urban side of the ALR boundary when surveying the entire ALR area. This information will be particularly important if more focused “edge” planning to promote land use compatibility is anticipated. Potential farming areas outside of a municipality’s ALR lands should also be considered for surveying.

Parcels are selected for survey if they are wholly or partially within the identified survey area or if they are classified as a Farm by BC Assessment.

Survey Team & Expertise
The survey can usually be conducted by a team of two. 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. This surveyor serves 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 the data is recorded. The other team member should be computer literate and familiar with the data model and data entry tool. Other essential skills include interpreting maps and aerial photography.

The surveyor with the most agricultural expertise is responsible for driving and identifying land cover and land use. The second person records the information into a database on a laptop computer. A data entry tool built in MS Access has been designed for this purpose. On difficult roads or in heavy traffic conditions it is often necessary to add a third surveyor to focus solely on driving.

Together, the survey team examines each legal parcel in the study area and records both the land covers and the land use activities. The database is later linked to a GIS layer of legal parcels in the survey area. A GIS analyst can then query, analyze, and map the inventory information.

It is advantageous to have one surveyor from the local government’s planning, GIS, or mapping department staff when an ALUI is undertaken by a municipality or regional district. This ensures a local staff person is aware of how the survey was conducted and is able to respond to questions concerning data collection and interpretation. This person can also provide valuable local knowledge of an area’s history and current land use.

**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, the size of the survey team, and the level of detail being recorded.

**Safety Considerations**

Conducting a windshield survey requires driving at low speeds 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:

- Survey should be performed by a minimum of two people. One person drives while the other navigates and records information.
- Use a clearly marked government vehicle.
- Turn on hazard lights to alert other drivers when driving slowly and stopping frequently.
- Be aware of congested or high speed roads with narrow shoulders. Plan to avoid these routes during rush hours.

**Survey preparation**

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

- Vehicle
- Survey maps
- Street map for navigation
• Laptop computer with data entry tool
• Adapter for powering laptop from the vehicle
• Memory stick for backing up data
• AgFocus Field Guide
• Moving map software and GPS receiver to aid in parcel identification
• Binoculars (optional)
• Camera (optional)

Maps are used to identify properties and features when conducting the survey. Maps should be at a scale of 1:2500, 1:5000, or 1:10 000, and include:
• The legal parcel boundaries (cadastre)
• Unique identifier for each legal parcel (Parcel ID)
• The preliminary land cover polygon boundaries (digitized prior to field survey using aerial photography)
• Unique identifier for each preliminary land cover polygon (Cover ID)
• The boundary of the Agricultural Land Reserve (ALR)
• Base features such as streets, street names, watercourses and contours
• Aerial photography

Aerial photography provides a valuable source of information. It helps orient the surveyor and provides visual references to assist with locating the mapped parcel on the ground. The photography also helps to identify crops and structures which are not easily seen from the road.

**Tips on Surveying**

Consistency in survey technique is essential to minimize errors. It is recommended that land covers be recorded first and land uses be recorded second.

The presence of livestock can sometimes be identified by other clues when it is not visible from the road. Examples of clues include a recently grazed pasture, 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 for people to call.

**DATA MODEL**

Ministry of Agriculture and Lands (MAL) has developed a data model based on past experience with inventories. A compatible MS Access database with a data entry form is used to enter and store the information collected. Customization of the database may be required prior to starting a survey to incorporate the local area’s parcel information. The database contains three main data tables:
• Parcel
• Use survey
• Cover survey

Parcel Table
The Parcel table contains existing information about the parcels. This table is initially derived from the polygon attribute table of a municipality’s GIS cadastral layer. It typically includes the street address, property type, crown administration, parcel area, ALR inclusion, and zoning. Data from BC Assessment and other inventories is integrated to give the surveyor as much information as possible about the parcel.

Use Survey Table
This table stores the survey data for land use on a parcel. Several different use types are stored for each property in the categories of agricultural use, residential use, and other use.

Cover Survey Table
This table stores the survey data for land covers on a parcel. The table may contain more than one record for each parcel as it is common for more than one land cover to exist on one parcel. Information recorded for each cover polygon includes physical cover type, irrigation, and agricultural usage limitations (ex topography).
DATA COLLECTION

Data Entry Tool Overview
The data entry tool is designed to work in conjunction with maps that identify parcel boundaries, land cover polygon boundaries and associated identifiers.
Parcels selected for survey are drawn with a thick yellow border, have a bold yellow Parcel ID label, and have one or more blue land cover polygons. Each land cover polygon has a blue Cover ID label.

Figure 1: Survey Map
Launch MS Access (2007 or 2010) and open the database developed for your project. If a security warning appears underneath the top ribbon, you must “Enable the content” so the built in macros will run.

The form may not respond, may break, or may return error messages if the content is not enabled. If an error message occurs in the database, press ‘Esc’ to close it. After enabling the content, the database will close and then reopen.

The form header contains basic parcel information such as parcel area, parcel area in the ALR, and parcel address if known. The header also contains arrows to navigate between parcels and a help button.

The help button displays a list of shortcut keys for navigating the form. Using the shortcut keys will significantly increase data entry speed. It is worthwhile for the data entry person to become familiar with the shortcut keys.
Enter a Parcel ID number referenced from one of the field maps into the green “Find” field and press Enter. The form will move to the existing record for that parcel. The yellow Parcel ID field is a reference only field and numbers cannot be entered into it.

The form has four tabs that will be explained in greater detail. Use the shortcuts below to navigate to the “COVER”, “USE”, “Summary”, and “Error List” tabs.

- **<F1>** to navigate to the “COVERS” tab
- **<F2>** to navigate to the “USE” tab
- **<F3>** to navigate to the “Summary” tab
- **<F4>** to navigate to the “Error List” tab

Each parcel requires data to be entered in COVER and USE tabs. The Summary tab provides additional parcel information to aid the survey crew in making decisions while the Error list tab ensures all records have been surveyed correctly.
Figure 6. COVER Tab

Parcel 691 has two existing land cover records. Each record corresponds to a land cover polygon on the map.

Note: If this parcel had NOT been selected for survey, the COVERS tab would be blank.

Figure 7. USE Tab
Note: If this parcel had NOT been selected for survey, the USE tab would be blank.

Figure 8. Summary Tab
Land Cover Survey

The primary purpose of a land cover survey is to separate the parcel into homogeneous components or land cover polygons and assign each a description based on predefined classifications. Prior to the field survey, land cover polygons are delineated in the office using orthophotography and assigned a preliminary classification. Further delineation may occur during the field survey until one of the following is achieved:

- Minimum polygon size (500 sq M (~5400 sq ft)) or minimum polygon width (10 M (~33 ft)) is reached
- Polygon is homogeneous in physical cover and homogeneous in irrigation method
- Maximum level of detail required is reached

NOTE: Each land cover polygon must correspond to a land cover record. If a land cover polygon is delineated in the field, a corresponding record must also be added to the database.

The primary level of stratification is based on (bio) physical land cover. It distinguishes between anthropogenic and natural / semi-natural lands. Further distinctions are made between terrestrial, aquatic, vegetated, and non-vegetated lands. See Appendix A for the full classification.

Once stratified, each polygon may also be assigned additional attributes such as crop specific practice or agricultural limitation.

The secondary level of stratification is based on irrigation method.
Each land cover record has an identifying number starting at “000”. Combined with the Parcel ID, the Cover ID provides the link between the map and the database. Data entry fields are color coded to indicate if additional information is required for the current record. As data is entered, the color shading will update automatically.

Select the primary physical ground cover using the Main, Group and Detail fields. Making selections in the Main and Group fields will filter the options available in the Detail field. A selection may also be typed directly into the Detail field.
Further description of the currently selected code is presented in the top right corner of the form. Browse through all the options and choose the one which most accurately describes the dominate features of the land cover polygon.

If the main ground cover is ATVC, a secondary ground cover is optional. For some specific crops, a crop specific descriptor is required. The color codes will indicate this.
Figure 14. Irrigation

If ground cover is “Cultivated or Managed Vegetation”, select the type of irrigation system present. If no system is present, use I900: No system. A secondary irrigation system is optional once the primary system has been selected.

If the irrigation system is disabled or has not been in use during the current season, check “NOT IRRIGATING THIS SEASON”.

Note: I900 with “NOT IRRIGATING THIS SEASON” is an INVALID selection as a nonexistent irrigation system cannot be disabled or not in use.

If an irrigation system is clearly being used, but is not visible, use I800: Sprinkler (default).

Figure 15. Limitation to Agricultural Potential

If the ground cover is Natural & Semi-Natural Terrestrial Vegetated (NTV) or Anthropogenic Terrestrial Non-vegetated Built (ATNB), the limitation field is required. The main factor that limits agricultural potential is listed here.
If the land cover polygon is not viewable from the ground, it can be surveyed from the air, by using photo interpretation or by using local knowledge. Record the method used.

Preliminary land cover polygons and associated classification are based entirely on ortho photography which is often not current or does not provide a clear understanding of the patterns of ground cover. Edits are often required.

Land cover polygons can be “merged into”, or “split from” adjacent land cover polygons.

A new land cover polygon may be added by clicking on the “Add Cover” tab at the bottom of the page. The land cover polygon number, survey type, and comments can then be added. New polygons must be hand drawn on the appropriate orthophoto.
**Land Use Survey**

The primary purpose of the land use survey is to determine and record the presence of agricultural and agricultural related activities on the land parcel. The information recorded in the land use survey is important for understanding how the parcel is utilized.

**Figure 19. Agricultural Availability**

Determine if agriculture is presently in use, available but not currently in use, or unavailable. Two non-agricultural land use categories can be selected. **NOTE:** If there is no current use of agriculture, the rest of the form does not need to be filled in.

**Figure 20. Parcel Accuracy**

The level of accuracy is based on the degree of the property that can be seen. Refer to the description box in the top right corner for more information.
Figure 21. Livestock

The type of livestock is selected from the dropdown box. Further classification may be selected from the detail field.

If more than one type of animal is present and occupying the same area, select the mixed herd field.

If more than one type of animal is present and they occupy separate areas or have separate shelters list each livestock type in a separate field.

Up to three methods of animal confinement may be selected. The scale of the livestock operation is required. The number of animals is an optional field.

Figure 22. Crop Production Practices

Important information about crop production and preservation practices can be entered here. The detail field contains additional options for each selection.

Additional subforms exist for water management, equines, apiculture (bees) and aquaculture, storage, compost and manure, direct marketing, processing and agritourism.