
# DATA CUSTODIANSHIP GUIDELINES FOR THE NATURAL RESOURCE SECTOR

Version 1.1
June 2008
Province of British Columbia

# Document History

| Version | Description of Change, Review or Approval | Date |
|---|---|---|
| | Earlier versions of these guidelines were prepared by the former Ministry of Sustainable Resource Management. | |
| 0.9 | First draft for distribution of a newly edited version of the guidelines, substantially edited and updated so as to apply for the whole Natural Resources sector. | 7th August 2007 |
| 0.92 | Updates to Section 5. | 17th Sept. 2007 |
| 0.95 | Minor clarification to the language describing the activities and roles in Section 4.2. Approval by NRSIC | 19th Dec 2007 |
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| 1.1 | Changes to the description for the Data Standards Manager and Data Resource Manager roles | 10th June 2008 |

**Sponsors**

- Evert Kenk, Chair NRSIC
- Members of the Natural Resource Sector Information Council

**Endorsements**

- Members of the Natural Resource Sector Information Council
- Members of the Natural Resource Sector Information Working Group

**Editorial Team**

- Peter Friesen, Head, Corporate Data Architecture and Warehouse Operations, GeoBC
- Jeremey Janzen, Senior Data Architect, MoFR
- Ray Bonner, Team Leader, Data Management Services, Integrated Registry, GeoBC
- Glenna Boughton, Head, Regional Data Architecture, GeoBC
- Stephen Gidden, Senior Information Architect, OCIO
- Brent Grover, Senior Manager, OCIO
- Elaine Dawson, Manager, GeoBC Information Services, ILMB
- Tony Baker, Consultant

# Document Approvals

Dave Nikolejsin
Chief Information Officer
Province of British Columbia

Date: Jan 31/08

Evert Kenk
Chair NRSIC, Chief Resource Information Officer and
Executive Director
Integrated Land Management Bureau

Date: Jun 30/08

Doug Say
Chief Information Officer and Executive Director
Information Management Branch
Ministry of Agriculture and Ministry of Environment

Date: Feb 1/08

Gloria Wills
A/Chief Information Officer and Director
Information Management Group
Ministry of Forests and Range

Date: Jan. 25/08

Bob Buckingham
Chief Information Officer and Director
Information Management Branch
Ministry of Transportation

Date: 4 February 2008

Stewart Symmers
Chief Information Officer and Director
Information Management Branch
Ministry of Energy, Mines and Petroleum Resources

Date: Jan 31/08

Debbie Fritz
Chief Information Officer and Director
Information Systems Branch
Ministry of Tourism, Sport and the Arts

Date: Jan 25/08

# Table of Contents

# 1 THIS DOCUMENT

## 1.1 Purpose & Scope

The purpose of these guidelines is to describe the role, responsibilities and practices required for Data Custodianship as it applies to land and resource data within the Government of British Columbia.

This includes information about the geography of British Columbia – land, water, cities, towns, roads and utility networks – and information about interests and resources across this geographic fabric – ownerships, rights, natural and mineral resources, and any current or planned uses of lands, water and resources.

The Government Chief Information Officer (CIO) has delegated responsibility for managing data custodianship in the natural resource sector to the Natural Resource Sector Information Council (NRSIC). **This Data Custodianship Guideline is aligned with and supports the Government IM/IT Plan fostering partner engagement to integrate information management activities within the IM/IT community.** NRSIC has appointed the Chief Resource Information Office (CRIO) as steward of this management function.

The Data Custodian Guidelines are intended to conform to applicable government policies laid out in Chapter 12 of the Core Policy and Procedures Manual.

## 1.2 Audience

The intended audience for the document is:

- Existing and prospective Data Custodians in the natural resources sector
- Other people who interact with Data Custodians in various capacities – e.g., Data Stewards, Data Standards Managers, Data Resource Managers, Discipline Authorities, and data users
- Those concerned with information management at all levels, including staff from the Integrated Land Management Bureau (ILMB), the Government CIO, and ministry CIOs.

## 1.3 Owner

These guidelines are published and maintained by the CRIO on behalf of NRSIC.

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# 2 CONTEXT FOR DATA CUSTODIANSHIP[1]

## 2.1 The Need for Data Custodianship

The reliance of the Government of British Columbia, its business partners, and members of the public on land and resource information is quite clear. Mining, farming, forestry, transport, tourism, planning, all make use of land and resource information. However, while there are major benefits to be derived from increasing the application of land and resource information, full utilization is not being achieved because underlying data is not being acquired, maintained and managed in a coordinated manner.

It is neither possible nor desirable for a single group to manage all land and resource information. However, it is possible, and highly desirable, to have the various data authorities acting in a coordinated and fully aware manner. This coordinated data management model is based on the existence of *Data Custodians* – senior managers responsible for collecting and maintaining land and resource data in an appropriate manner and, where possible, making this data readily and publicly available.

## 2.2 Data Custodianship Objectives

The objectives of data custodianship are to:

- Ensure consistency of data management practices so that goals for integrated data can more readily be achieved.
- Maximize the value of investments in data collection and maintenance from a provincial perspective.
- Increase certainty regarding accountabilities for data.
- Minimize data duplication.
- Maximize the business benefit derived from data sharing and widespread use.

## 2.3 The Benefits of Data Custodianship

Custodianship is at the heart of information management because it establishes accountability for data, and identifies authoritative sources that give users a measure of consistency and certainty. In addition, custodianship is the foundation for:

- providing a trustee and standards bearer for data;
- eliminating unnecessary duplication in the collection and maintenance of data;

[1] Parts of this chapter were adapted from "Geospatial Information Custodial Guidelines for Victoria", Land Information Group, Department of Natural Resources and Environment, State of Victoria, Australia, 2001, who had developed their guidelines from work originating in part in the BC Ministry of Forests in 1989.

- managing data on behalf of the entire enterprise;
- providing a sound land and resource data infrastructure;
- assisting the production and management of land and resource data products; and
- facilitating the collection of data.

Collectively, Data Custodians manage data as trustees in a partnership with national, provincial, regional and local providers and users to enable the integration of land and resource data for the benefit of the entire community.

Custodial activities – including negotiations with other agencies and users and development of data products – must take place for the betterment of the whole community rather than any individual agency. The overriding philosophy in all these activities should be one of a trustee acting in partnership for all participants. Custodianship reinforces the concept of one senior individual being responsible and accountable for the data that others might use. This gives users confidence in the level of integrity, timeliness, precision and completeness of data, and in the quality and soundness of decisions made based on that data.

## *2.4 Data Custodianship Principles*

In pursuing these objectives, the following six principles act as guideposts for assessing the appropriateness of possible actions.

### *2.4.1 Principle 1 – Data Custodian is Corporate Trustee*

*Data Custodians operate as trustees on behalf of the entire community of data users throughout the Province.*

Data Custodians do not "own" data within their care, but rather act in the interests of all data users. Data custodial activity takes place for the betterment of the whole community, rather than any one agency, including the Data Custodian's own agency. The result is an emphasis upon collaboration, teamwork, cooperation and sharing.

### *2.4.2 Principle 2 – Data Custodian is Standards Bearer*

*Data Custodians ensure the development and enforcement of standards for data within their care.*

It is important to set standards for the description, format, structure, classification, collection, accuracy, consistency, quality, access and retention of data and associated metadata. Data Custodians must ensure that appropriate standards are set, taking into account the needs of users, and that these standards are then followed.

### *2.4.3 Principle 3 – Data Custodian is the Authoritative Source for the Province*

*Data Custodians are the authoritative source for data within their care.*

This principle serves to lessen confusion for users and overcomes accuracy and reliability problems that may be encountered when supposedly identical data is held separately by several

agencies; where several agencies contribute data to a common database, or where data provided by different agencies is combined.

### 2.4.4 Principle 4 – Data Custodian is Accountable

*Data Custodians are accountable for the data within their care.*

Data Custodian accountabilities for the data under their care include: determining the information required to meet business goals, for establishing and maintaining the standards and rules for that data, for managing the data as a vital resource, for identifying responsibility for data integrity, security, privacy, and quality, and for ensuring that conflicts in business needs are successfully resolved. Although a Data Custodian may delegate any of their custodial responsibilities to one or more Data Stewards (see Section 3.2), their *accountability* for the data is retained by the Data Custodian.

Custodianship accountabilities are only extinguished when all retirement obligations of the Data Custodian have been adequately fulfilled (especially concerning records retention, destruction and archive).

### 2.4.5 Principle 5 – Data Custodian Ensures Availability

*Data Custodians will ensure that data are available to qualified users.*

To derive the maximum benefit from data through data sharing, Data Custodians will ensure that data within their care are made available and are accessible to all authorized users.

### 2.4.6 Principle 6 – One and Only One Data Custodian

*Each set of data*[2] *has a single, designated Data Custodian, without exception.*

Data will always have a designated official Data Custodian. Absence of data custodianship implies absence of accountability, and therefore absence of such things as assurance of quality, integrity, availability and relevance of underlying data. In addition, there can be no more than one Data Custodian for any given data. If data had more than one Data Custodian, it would admit the possibility of more than one source, multiple standards, and unclear accountability for the data.

[2] *Set of data* has a specific meaning in this document. It is defined as a discrete corporate information subject that is of a lasting nature, about which relevant data is collected, managed, and used to serve an essential defined business purpose for government. May also use the term "corporate data" for similar meaning in the context of a ministry's business (i.e. ministry corporate data) or in the context of government-wide standards (i.e. government corporate data).

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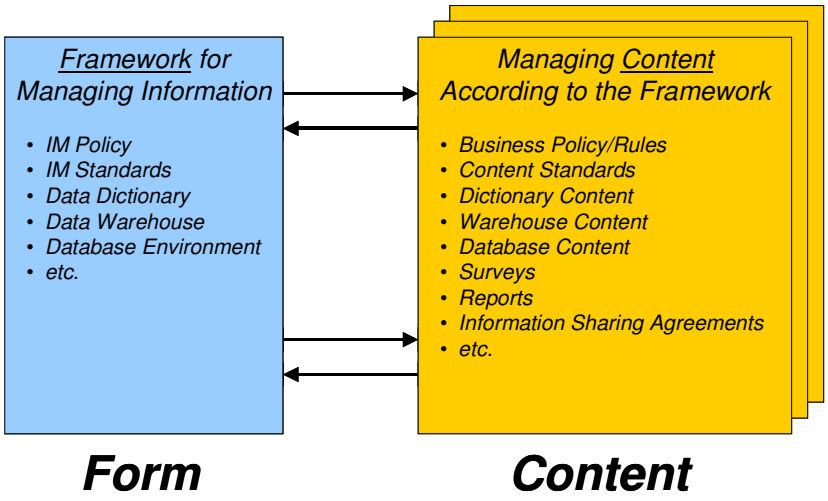
# 3 MANAGEMENT FRAMEWORK

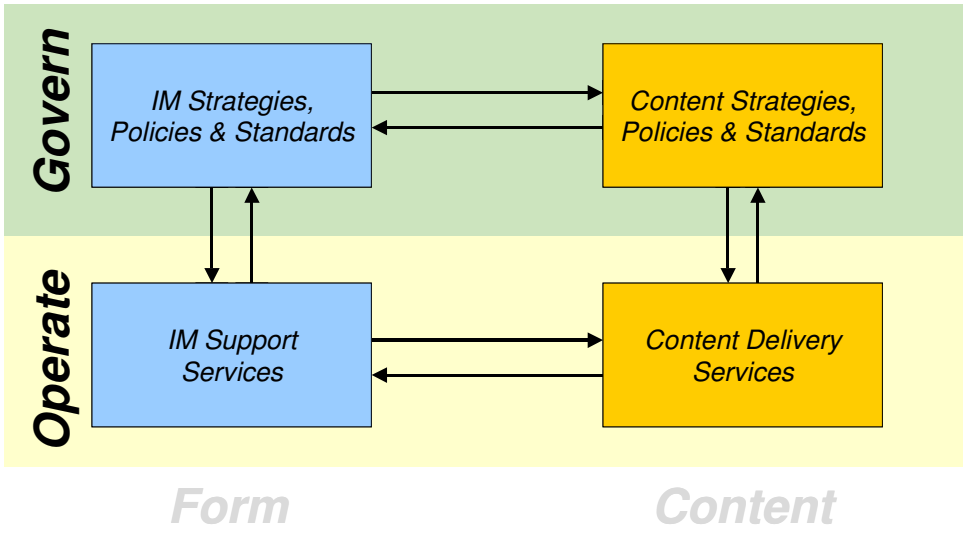
## 3.1 Accountability Framework

In establishing accountabilities for data, two key accountability principles must be applied:

1. ***Separation of Form and Content***: Accountabilities for establishing the framework (or "form") under which all data should be managed must be separated from accountabilities for managing specific data in accordance with the framework. Accountabilities for "form" reach horizontally across the entire organization, whereas accountabilities for "content" fall vertically within a specific business area.




2. ***Separation of Governance and Operations***: Within each of the two domains of form and content, there is a further need to distinguish between accountabilities for governance and delivery.



## *3.2 Definition of Roles*[3]

### *3.2.1 Form-related Roles*

**Government Chief Information Officer**

- Accountable for Government-wide data management frameworks, standards and infrastructures.
- Accountable for ensuring the appropriate standards, structure, content, care, use and disposal of shared or common sets of data.

**Chief Resource Information Officer**

- Provides governance, direction, standards and support to Corporate Resource Information Management efforts across the natural resource sector, and the Data Custodian for spatial data ***standards*** across government.

**Ministry Chief Information Officer**

- A Ministry CIO (MCIO) may set policies and standards that are appropriate for the Ministry to supplement those established by the GCIO.

**Data Administrator (Data Architect)**

- Ministry-wide role providing data management leadership, data modeling expertise, and custodianship of the corporate data models. Provides and promotes the framework for consistency in scope, meaning, and handling of data across the entire organization. Manages the ministry's corporate metadata to support the organization's data related goals and objectives, ensuring timely, accurate, and sharable data across diverse program areas.
- The Data Administrator position is usually at the senior technical specialist level.
- ***Related Roles***: Other roles involved with "form" at the operational level include *Database Administrators* and *Application Architects*.

### *3.2.2 Standards-related Roles (i.e., Form and Content responsibility)*

**Data Custodian**

- Accountable for operational policy, definitions, rules, standards, structure, content, use and disposal for data under their responsibility.
- Custodial authority is typically either "statutory authority" as defined in legislation or "administrative authority" as defined in policy (or similar source of mandate).

[3] See the GCIO Data Administration Forum glossary of terms (http://www.cio.gov.bc.ca/other/daf/IRM_Glossary.htm) for more information

- Core Data Custodian responsibilities: *Local Leadership*; *Data Standards*; *Consultation*; *Assessing Compliance*; *Business Training and Support*; and *Information and Reporting*. For more details see http://www.for.gov.bc.ca/his/datadmin/dc_lang.htm
- ***Variations***: Also referred to as *Business Owner* of the set of data.

**Data Standards Manager**

- Person who develops and sets data standards that reflect the data policies established by the Data Custodian.
- Responsible for the day-to-day management of the data according to the defined data standards and data management plan. Examples of duties include authoring the data management plan, checking for data standards compliance, resolving issues, advising other roles – particularly Data Resource Managers.
- There is one Data Standards Manager for a set of data, and that person is appointed by the Data Custodian. The Data Standards Manager does not necessarily have a management classification.
- ***Variations***: ILMB and the former Ministry of Sustainable Resource Management used *Data Manager* to refer to this role.

**Discipline Authority**

- A business expert or specialist who understands the business relevance of the data standards within their scope of work. They must actively use their knowledge in support of the broad scope of business and established data standards.
- Interprets the meaning and appropriate use of detailed data standards to meet organizational needs.
- A primary resource for the Data Standards Manager, though not a direct reporting relationship. May be multiple Discipline Authorities (e.g. one per large geographic organizational area for a particular business mandate). A Discipline Authority for a particular subject area or set of data does not necessarily work in the same ministry as the Data Custodian – if they are business experts, they are a good resource for the Data Custodian to use to provide comments on data standards.

**Data Steward**

In some situations, Data Custodians may not have the appropriate operational or technical resources to meet their custodial responsibilities. Also, there may be resources that are better able than the Data Custodian to provide certain services (e.g., through aggregation of common needs across multiple Data Custodians).

In these situations, a *Data Steward* can be engaged by the Data Custodian to fulfill specific aspects of custodial responsibilities. Data Stewards provide a set of services on behalf of Data

Custodians. These should be formally described in a Data Stewardship Agreement[4] between the Steward and the Custodian.

Note however, that even though a Data Steward may assume some responsibilities on behalf of the Data Custodian, accountability for the data remains solely with the Data Custodian (in accordance with Principle 4 – Custodian is Accountable).

### *3.2.3 Content-related Roles*

The accountability framework and roles described are focused toward the creation and management of data. These can be extended to *data use*, as follows.

**Data Resource Manager**

- A designated employee with responsibility for the collection and/or management of corporate data, to the standards set by the Data Custodian. Note that full accountability rests with the most senior person in each office (e.g. a district manager, or branch director) for ensuring corporate data collection and management is conducted to the defined standard.
- Includes responsibility for data collection and update to defined standards as well as the right to give operational input into the business design decision-making process.
- Note that anyone who uses or updates information in any form is accountable to a Data Resource Manager and thereby must ensure that activities are consistent with standards set by the Data Custodian.

**Data Usage Contact**

- A technical database resource or sophisticated business user who understands the business data and how it has been physically implemented. Manipulates and queries physical database content to support operational information needs.
- May define user views for repeated queries.
- A primary resource for Data Resource Managers and Data Users.
- Representative for a community of data users. (User communities will generally be defined by organizational boundaries or by professional roles.)

**Data User**

- A consumer of the data. Someone who uses the data to conduct analysis, make decisions or otherwise do their job.

**Data Product Provider**

- A person responsible for creating and publishing a data product that is derived from one or more sources of primary data. (See Section 4.3.)

[4] See Section 7 for an example.

- Accountable as a Data User for respecting the standards and policies set out by Data Custodians of the primary data.

## *3.3 Identification and Registration of Data Custodians*

### *3.3.1 Identification*

- As noted above, ministries receive their custodial authority for data from legislation or government policy.
- Within a Ministry, the MCIO has the sole authority for identifying Data Custodians of sets of data. The MCIO will identify a Data Custodian for a given set of data by applying these criteria:
    - Has sole statutory responsibility or other mandated accountability for creation, capture and/or maintenance of the set of data in the Province;
    - Has the greatest operational need for the set of data;
    - Is in the best position to establish standards and define business needs;
    - Heads the office of record for changes to the set of data.
- Data Custodians are usually Branch directors or above.
- Once identified, the Data Custodian is registered and thereby assumes the rights and obligations set forth in this document.

### *3.3.2 Processes for Managing the Register of Data Custodians*

- NRSIC will maintain and publish an official register of data and Data Custodians for the natural resources sector.
- After registration by NRSIC, the role of the Data Custodian becomes official.
- The respective MCIOs will notify NRSIC of additions, changes and deletions to the register.

## *3.4 Data Sharing*

**Data Sharing**

**Data Sharing** refers to multiple organizations accessing a common pool of data, independent of applications and technology. The concept of a single source for any particular set of data is implied by this definition. The source Data Custodian should consider the implications of data sharing when defining data standards and practices.

**Why Share Data?**

- The same source of data is used for business decisions. This guarantees consistency and accountability of data.

- Makes data management easier. Only one source needs to be managed – provides efficiencies with respect to security, back up and recovery, data administration, and so on. Thus, data management effort is reduced. (However, propagation of updates of the source data to users has to be considered; otherwise "stale" and inaccurate copies may proliferate.)
- Avoids incidences where multiple derived sets of data exist, each one managed in a different way, with perhaps inconsistent amalgamation with other sets of data, and unclear or incomplete metadata to describe the set of data. These together lead to poor decision-making that is difficult to support.
- Multiple uses of a set of data by many audiences encourages improved quality. The better the data, the more people benefit.

## The Data Sharing Challenge

For a set of data that is to be shared for a number of uses, it's important to make decisions regarding the following:

- What standards apply for the respective uses of the data
- Who is responsible for which aspects of data management, particularly version and currency management?
- What is the relationship between the parties sharing the data?

## A Data Sharing Agreement

### Creating an Agreement

The questions outlined above highlight the need to formally recognise the relationship between the parties sharing data. This can be done by means of a data sharing agreement. The agreement should set out the terms of use of the data (e.g., recognizing copyright restrictions), any payment schedule, and any requirements to provide updated data in return (as in a data exchange arrangement).[5]

This doesn't have to be a long or complicated document. In fact, at its simplest, it may just be a short web page that a user clicks OK to acknowledge in order to access a data source.

A long-term data sharing relationship (such as with an industry group) that involves several types of data might require a more complex agreement. This may be a paper document that includes sections for each aspect of the relationship. It allows the data sharing partners to express their requirements and expectations in an organised way. The parties sign the agreement once it's complete, and it becomes the basis for the data sharing relationship. If the relationship changes over time, then the agreement needs to be revisited and updated. Such an agreement should be formally cancelled when the data sharing relationship ends.

A sample of a basic data sharing agreement is provided at the end of this document.

[5] A project currently underway is examining data sharing agreements and ways to streamline their creation and use.

**Types of Agreement**

Typically, these types of agreement exist:

- Open – i.e., open access to data (subject to copyright and liability protection);

- Priced – the user must pay some sort of charge for the data – e.g., so many dollars per mapsheet.

Data exchange – the user must provide some data in exchange for access. Usually, this means the user provides data related to their activities in a particular area (e.g., roads, cut blocks, survey data). These data are then used to update the source data, thus improving its accuracy and currency. Such data exchange agreements support the concept of the public good of Government-held data.

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# 4 RIGHTS & OBLIGATIONS

## 4.1 The Data Lifecycle

### 4.1.1 Lifecycle Model

Figure 1 illustrates the data lifecycle. It represents the activities that are undertaken to manage a data collection throughout its lifecycle. In fact, it comprises two cycles:

1. The Standards Cycle, which represents activities relating to governance of the business relevance and architecture of the data. (Though not shown in the diagram, the Standards Cycle occurs within the context of a "Form" framework that's defined by broader CIO and data administration policies and standards.)

2. The Content Cycle, which represents activities relating to the management of the actual data, as it passes from acquisition to consumption by users. This cycle occurs within the context of the Standards Cycle.

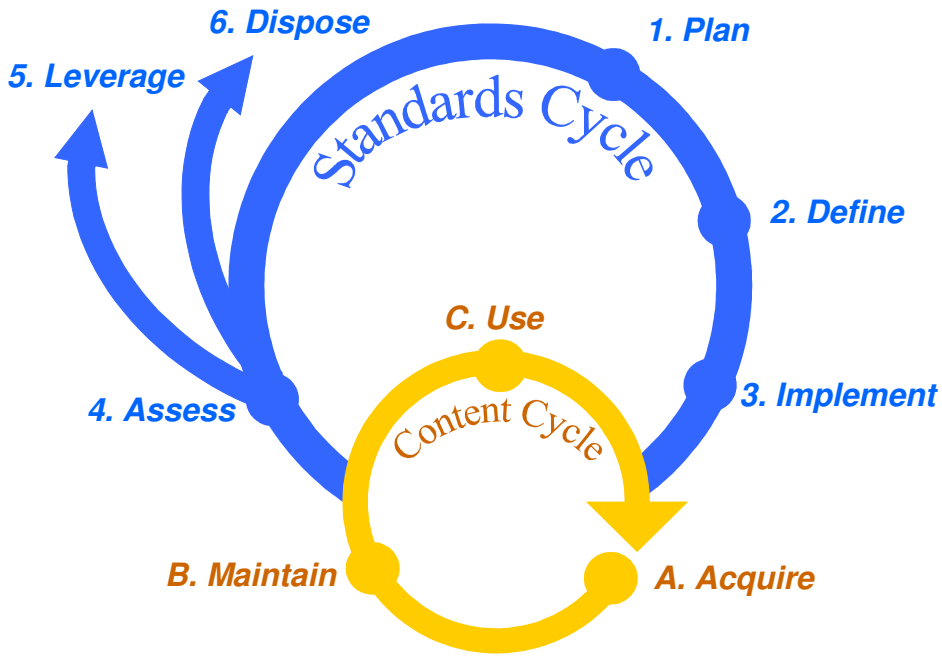


**Figure 1. The Data Lifecycle**

The activities shown in the diagram are described below.

### 4.1.2 Standards Cycle

1. **Plan** how the data will be managed, maintained and provided for use. This establishes the framework for the complete Standards Cycle. The plan defines how all other activities will be conducted.

2. **Define** the contents and scope of the data collection, its structure (i.e., conceptual, logical and physical schema), and applicable policies, standards and processes.
3. **Implement** the plan and defined standards in order to create the business and technical environment for the data, which then allows the Content Cycle to be initiated (see below).
4. **Assess** the value and continued relevance of the data to its intended use. This is the part of the cycle where the custodian reviews how the data collection is being used and whether it is still meeting its business purpose. As a result of the assessment, there may be opportunities to change the scope, structure, acquisition, definition or use of the data. This activity feeds directly back into the planning process, which factors in the improvements in an updated data lifecycle plan.
5. **Leverage** existing uses. This is an open-ended activity whereby the Custodian, users and others seek to increase the value of the data collection, such as by linking it with other data collections, by changing its presentation, by applying post-processing to create data products, or by other means.
6. **Dispose** of the data. If the Data Custodian determines that collection, management and use of a set of data are no longer required, the Data Custodian may initiate retirement of the data by notification to the affected community and NRSIC. Disposal must conform to applicable data retention and disposal policies. This causes both the Standards and Content cycles to close.

### *4.1.3 Content Cycle*

A. **Acquire** the data. This is usually a continuous (or at least, regularly repeated) process for collecting new data.
B. **Maintain** the data by applying QA processes, integrating new data, purging old data, and making operational changes to the business and technical environments.
C. **Use** the data. The data are made available to users according to applicable policies and standards established by the Data Custodian.

## 4.2 Rights & Obligations throughout the Lifecycle

The following table describes the rights and obligations of people holding roles identified in Section 3.

In this context, an *obligation* is defined as a commitment to a course of action (e.g., provide a service). A *right* is defined as an entitlement to receive a service.

Note that the role of the Data Standards Manager is to conduct the day-to-day activities associated with the Data Custodian's rights and obligations. The Data Standards Manager role is a subset of the Data Custodian's role and does not appear as a separate column in the table below.

| *Activity* | Data Custodian | Discipline Authority or Data Resource Manager (on a representative basis) | Data Users (on a representative basis) | Other | Data Administrator (a.k.a. Data Architect) |
|---|---|---|---|---|---|
| ***Standards Cycle*** | | | | | |
| ***1. Plan how the data will be managed, maintained and provided for use within the context of the strategic direction and business plans. This establishes the framework for the complete Standards Cycle. The plan defines how all other activities will be conducted.*** | | | | | |
| *Define strategic direction* | Obligation to support enterprise (government-wide) goals | | | GCIO has the right and obligation to define government-wide policies and standards | Right to define ministry information management standards |
| *Define business plans* | Obligation to link business plans to Ministry goals | | | Obligation on Data Steward if accepted | |
| *All user needs* | Obligation to consider (but not necessarily to incorporate all stated needs) | Right to identify and present business case | Right to identify and present business case | | |
| *Funding for program* | Right to request from users | Obligation to consider, but not necessarily accept | Obligation to consider, but not necessarily accept | | |

| *Activity* | Data Custodian | Discipline Authority or Data Resource Manager (on a representative basis) | Data Users (on a representative basis) | Other | Data Administrator (a.k.a. Data Architect) |
|---|---|---|---|---|---|
| *Data management plan* | Obligation to create | Right to be consulted (on a representative basis) | Right to be consulted (on a representative basis) | | Right to be consulted |
| ***2. Define the contents and scope of the data collection, its structure (i.e., conceptual, logical and physical schema), and applicable policies, standards and processes.*** | | | | | |
| *Business-level data policies, standards, processes* | Obligation to define. Obligation to follow GCIO and internal ministry corporate policies | Right to be consulted. Obligation to follow. | Obligation to follow. | GCIO has the right to define government-wide policies and standards | Right to be consulted. (this is "data modelling") |
| *Data administration policies, standards, processes (including metadata)* | Right to be consulted. Obligation to follow. | Obligation to follow. | Obligation to follow. | GCIO has the right to define government-wide policies and standards | Obligation to define at Ministry level. |
| *Data quality standards* | Obligation to establish (see Data Custodian Principle 2). | Right to be consulted. Obligation to understand and follow for collection, update, or use. | Obligation to implement | Data providers have obligation to follow | Obligation to define at Ministry level. |
| *Day-to-day operational procedures for data capture, quality assurance and maintenance* | Obligation to establish | Right to be consulted. Obligation to follow. | | | Right to be consulted. Obligation to follow |
| *Metadata management* | Obligation to establish business-level standards and provide metadata | Right to be consulted. Obligation to implement by understanding purpose for data. | Obligation to read and understand metadata and ensure that corresponding set of data is fit for purpose and used appropriately. | | Obligation to establish technical standards |

| *Activity* | Data Custodian | Discipline Authority or Data Resource Manager (on a representative basis) | Data Users (on a representative basis) | Other | Data Administrator (a.k.a. Data Architect) |
|---|---|---|---|---|---|
| *Data access and sharing* | Obligation to define authorization, access and sharing rules, policies and requirements | Right to be consulted. Obligation to follow. | Obligation to follow. | GCIO has the right to define government-wide policies and standards | Obligation to establish enterprise policies and standards for a shared data approach to information management |
| *Data security* | Obligation to approve/implement policies for protecting data (e.g., backup, archiving, disaster recovery) | Obligation to follow. | Obligation to follow. | GCIO has the right to define government-wide policies and standards. Ministry Security Officer has right & obligation to define security policies at the Ministry level (which must conform to GCIO policies and standards) | |
| ***3. Implement the plan and defined standards in order to create the business and technical environment for the data, which then allows the Content Cycle to be initiated*** | | | | | |
| *Implementation activities* | Obligation to plan and lead implementation activities | Right to be informed about proposed changes to data structures, standards, content or processes | Right to be informed about proposed changes to data structures, standards, content or processes | | Right to be informed |
| ***4. Assess the value and continued relevance of the data to its intended use. This is the part of the cycle where the custodian reviews how the data collection is being used and whether it is still meeting its business purpose. As a result of the assessment, there may be opportunities to change the scope, structure, acquisition, definition or use of the data. This activity feeds directly back into the planning process, which factors in the improvements in an updated data lifecycle plan.*** | | | | | |

| *Activity* | Data Custodian | Discipline Authority or Data Resource Manager (on a representative basis) | Data Users (on a representative basis) | Other | Data Administrator (a.k.a. Data Architect) |
|---|---|---|---|---|---|
| *Continued relevance and fitness for purpose of data* | Obligation to review regularly and determine priorities for changes from a business perspective | Obligation to review regularly from a business perspective<br><br>Right to request enhancements to data structures, standards, content or processes, based on new and emerging business or user needs<br><br>Obligation to advise custodian of errors, omissions or corrections to data structures, standards, content and processes, relative to business practices or stated user needs (per specifications) | Right to request enhancements to data structures, standards, content or processes, based on new and emerging user needs<br><br>Right to advise custodian of errors, omissions or corrections to data structures, standards, content and processes, relative to business practices or stated user needs (per specifications) | | Right and obligation to enforce the requirement for technical data impact assessments for any proposed changes in the structures, content, standards and processes, from the Data Custodian. Obligation to provide guidance for same. |
| ***5. Leverage existing uses. This is an open-ended activity whereby the Custodian, users and others seek to increase the value of the data collection, such as by linking it with other data collections, by changing its presentation, by applying post-processing to create data products, or by other means.*** | | | | | |
| *Increase the value of the data by applying secondary integration, processing, analysis and/or by creating derivative products* | Obligation to set standards for downstream use<br><br>Obligation to have policies, standards and restrictions of the source set of data respected | Right to leverage data for new uses, but with the obligation to respect applicable primary custodial standards | Right to leverage data for new uses, but with the obligation to respect applicable primary custodial standards | | |
| ***6. Dispose of the data. If the Data Custodian determines that collection, management and use of a set of data are no longer required, the Data Custodian may initiate retirement of the data by notification to the affected community and NRSIC. Disposal must conform to applicable data retention and disposal policies. This causes both the Standards and Content cycles to close.*** | | | | | |

| *Activity* | Data Custodian | Discipline Authority or Data Resource Manager (on a representative basis) | Data Users (on a representative basis) | Other | Data Administrator (a.k.a. Data Architect) |
|---|---|---|---|---|---|
| *Decommission a set of data when there is no longer a business case for its continued existence* | Obligation | Right to be informed | Right to be informed | | Right to be consulted. Obligation to assist analysis. |
| *Appropriate disposal of data* | Obligation to approve and ensure staff follow applicable policies | | | Obligation of Ministry Records Officer to ensure that applicable policies are followed[6] | |
| ***Content Cycle*** | | | | | |
| ***A. Acquire the data. This is usually a continuous (or at least, regularly repeated) process for collecting new data.*** | | | | | |
| *Data collection and update processes* | | Obligation to execute. | | | |
| *Data quality management* | Obligation to ensure that data quality is monitored and managed within defined quality standards | Obligation to execute. Right to be informed and consulted on quality issues. | | | Obligation to assist in analysis projects to resolve quality problems, and lead overall quality programs for ministry. |
| ***B. Maintain the data by applying QA processes, integrating new data, purging old data, and making operational changes to the business and technical environments.*** | | | | | |
| *Processes for QA and integration of new data, and purging of old data* | Obligation to establish. | Obligation to follow, right to be informed and consulted. | | | |

[6] Government records must be disposed of in accordance with the *Document Disposal Act*, which stipulates the approvals required before they can be destroyed, transferred to the legal custody of the British Columbia Archives, or alienated from the Crown. The *Document Disposal Act* covers records in all media, including paper, microforms, electronic records, audio-visual records, cartographic records, photographic records and other media formats as defined in the Interpretation Act. Additional requirements are specified in Core Policy & Procedures Manual. Consult with the Ministry Records Officer for technical guidance on record retention requirements and policy.

| *Activity* | Data Custodian | Discipline Authority or Data Resource Manager (on a representative basis) | Data Users (on a representative basis) | Other | Data Administrator (a.k.a. Data Architect) |
|---|---|---|---|---|---|
| *Data available on a day-to-day basis according to applicable policies and standards* | Obligation to ensure | Right to expect | Right to expect | | |
| Audit | Obligation to audit (e.g., fiscal, security, risk, data quality, currency, completeness & integrity) | Right to participate in the rectification of errors, omissions or corrections, as appropriate | Right to participate in the rectification of errors, omissions or corrections, as appropriate | GCIO has the right to define government-wide policies and standards | |
| ***C. Use the data. The data are made available to users according to applicable policies and standards established by the Data Custodian.*** | | | | | |
| *Access to data according to applicable policies and standards* | Obligation to establish and publish rules and restrictions governing use, modification or distribution of data<br><br>Right to revoke use of data by specified users where clear and continuing infringement or violation of custodial rights occurs | Obligation to abide by governing policies and standards | Obligation to abide by governing policies and standards | | |

| *Activity* | Data Custodian | Discipline Authority or Data Resource Manager (on a representative basis) | Data Users (on a representative basis) | Other | Data Administrator (a.k.a. Data Architect) |
|---|---|---|---|---|---|
| *User support* | Obligation to appoint an official contact to support queries and issues of data users | | | | |
| *Land & Resource Data Warehouse*[7] | Right to use services. Obligation to follow applicable standards and procedures to establish data in LRDW (e.g., metadata definition, publication processes, access control, etc) | Right to request access via the LRDW | Right to request access via the LRDW | Right for LRDW administration to set standards for establishing a data collection in the LRDW. Obligation to assist Data Custodians and Data Standards Managers wherever possible. | Right to be consulted. Obligation to follow applicable technical data standards and procedures defined by ILMB. |

[7] The steps for Data Custodians and Data Standards Managers to establish a data collection in the LRDW are described in a separate document.

## *4.3 Data Products*

### *4.3.1 Definition*

A Data Product is created by combining or manipulating one or more sets of data in order to address a particular business need. A data product is a set of data that:

- Interprets, modifies or aggregates other sets of data;
- Incorporates significant parts of the data from which it is derived; and/or
- Is managed as a set of data.

Data Products may also be called resultants, derivative products, analytical products, value-added sets of data, integrated sets of data, and more.

The following are not considered a Data Product:

- Modifications or aggregation of sets of data where the data is not exposed outside of the Data Custodian's business area where the data is used.
- Alternative presentations (e.g., a database view) of a source set of data – the Data Custodian's policies and standards still apply.

### *4.3.2 Management Principle*

Data Products present a management challenge because they contain elements of source sets of data with Data Custodians defining the associated usage and standards. Data Product standards are determined within the context of the following principle:

> *The policies and standards (e.g., for access, security, availability, integrity, fitness for purpose) for a Data Product must not infringe upon or contravene the most restrictive interpretation of the collective standards and rules of the source sets of data the Data Product is created from.*
>
> *This principle applies unless otherwise specified by written agreement with the Data Custodians for the source sets of data.*

So suppose, for example, that Data Product X is created from source sets of data Y and Z. The Data Custodian for Y has restricted access to Government staff only, but Z is freely available to anyone. Therefore, unless otherwise agreed, X may only be accessed by Government staff.

### *4.3.3 Role of Data Product Provider*

Data Products do not have Data Custodians. Instead, there is a somewhat analogous role called a Data Product Provider who has the following rights and responsibilities only:

- accountable for the Data Product

- may set standards (e.g., terms of use, access rights, quality, pricing), but only insofar that these standards do not contravene those of the source sets of data (consistent with the principle above)
- enters into written agreements with Data Custodians of source sets of data regarding standards of the Data Product.

From the perspective of the Data Custodian of a source set of data, the Data Product Provider has the same rights and obligations as any other Data User (unless modified by a written agreement).

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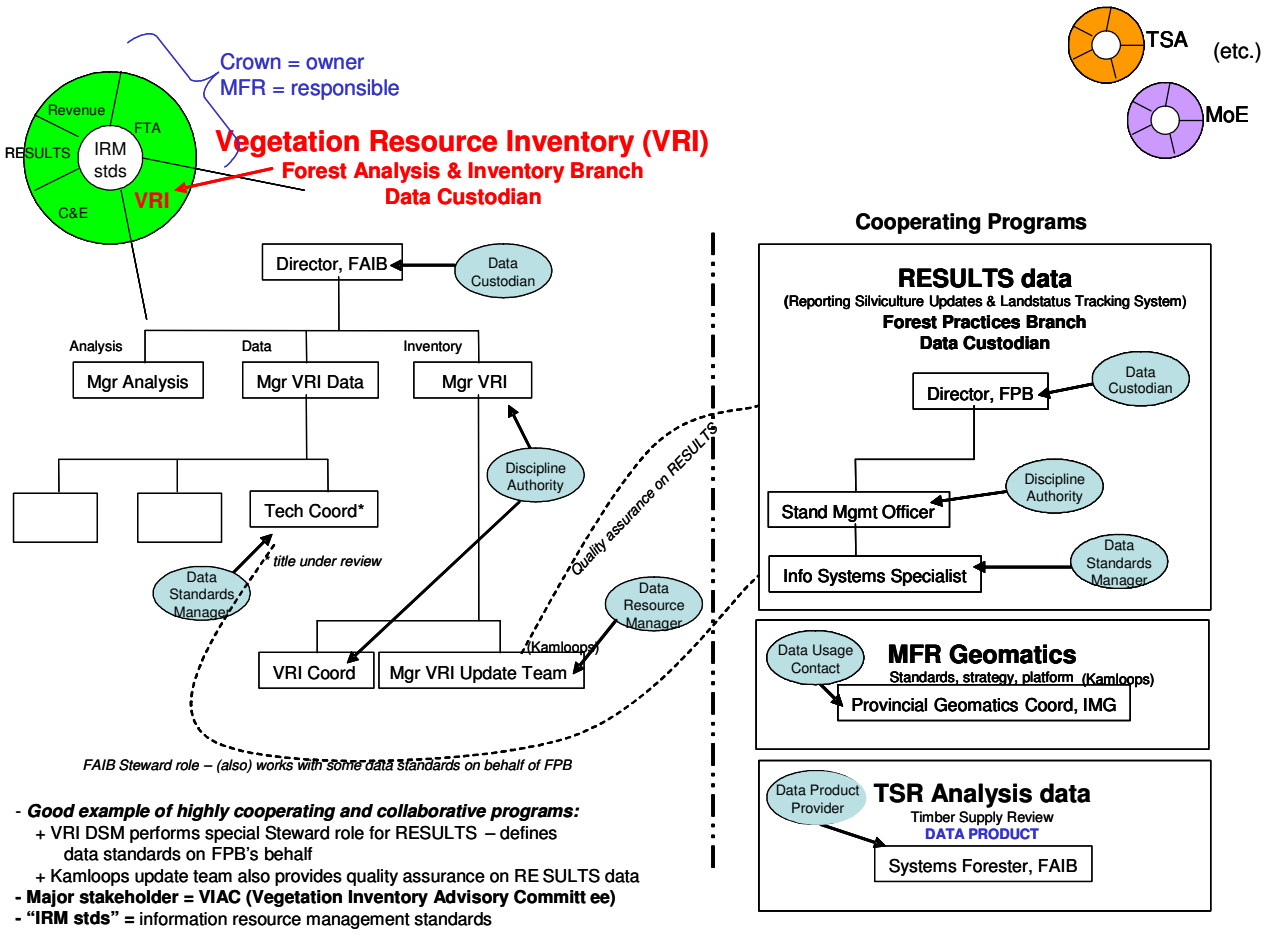
# 5 ILLUSTRATIVE EXAMPLES

## 5.1 Primary Sets of data

### 5.1.1 Vegetation Resource Inventory

This example shows the data management roles assigned for MoFR's Vegetation Resource Inventory (VRI). Two of the "cooperating programs" displayed on the right are external to Forest Analysis and Inventory Branch (FAIB) - i.e., different reporting relationship within the ministry. Data standards for VRI are interrelated with the data standards from RESULTS and Forest Tenure Administration (FTA), and the respective Data Standards Managers work to common cooperative business goals.




- ***Good example of highly cooperating and collaborative programs:***
  + VRI DSM performs special Steward role for RESULTS – defines data standards on FPB's behalf
  + Kamloops update team also provides quality assurance on RESULTS data
- **Major stakeholder = VIAC (Vegetation Inventory Advisory Committee)**
- **"IRM stds"** = information resource management standards

### *5.1.2 Crown Land Management*

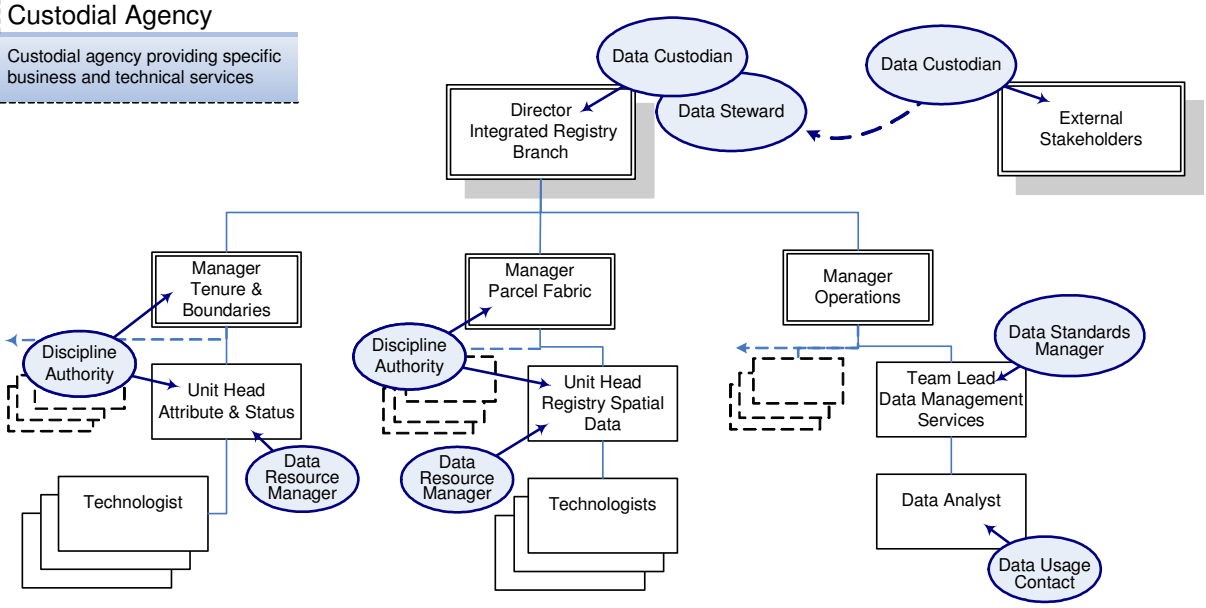
This is an example of a complex distributed data management environment. The context depicted does not include all data management performed by the organization. Its intent is to portray the concepts of the implemented data management roles and is not meant to be a reference for business interaction.

Some details:

- The information system is a high transaction processing system delivering in the order of 6000 data element changes per day
- The data consists of land parcel and survey information and crown land dispositions including client information. Parcel and disposition management are currently distinct business functions but they are highly inter-dependant and integrated .
- Organizational and business evolution yields a collaborative custodianship model with one of the custodians supporting both custodial and stewardship responsibilities.
- The data resource is managed in multiple dimensions including: parcel; disposition; spatial; attribute, headquarters, regional (i.e. Front Counter BC), and legislative authority (e.g. Ministry or agency). This yields a high number of Data Resource Managers distributed both organizationally and geographically.
- Discipline Authorities tend to be specialized along the above data resource management dimensions.
- A regional office organization chart was used as a typical example for the 'Distributed Agencies' involved. Variations in both the organization and implementation of the data management roles will occur across these resource agencies.

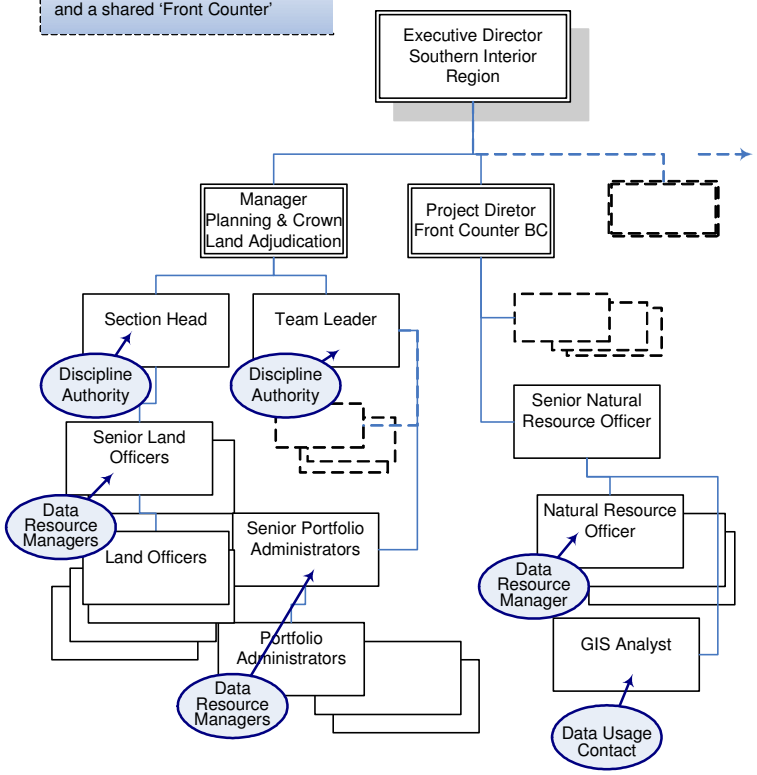
## Custodial Agency

Custodial agency providing specific business and technical services



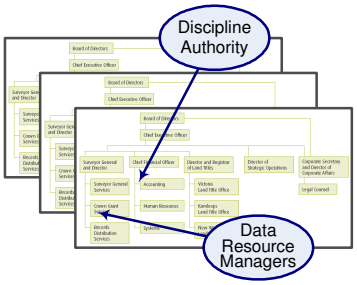

## Distributed Agencies

Includes distinct Resource Agencies and a shared 'Front Counter'




Similar patterns apply within partnering agencies. These Include:

- Other regional offices
- Land Title and Survey Authority (LTSA)
- Ministry of Agriculture and Lands
- Ministry of Forests and Range
- Ministry of Tourism, Sport and the Arts
- Ministry of Transportation
- Oil and Gas Commission

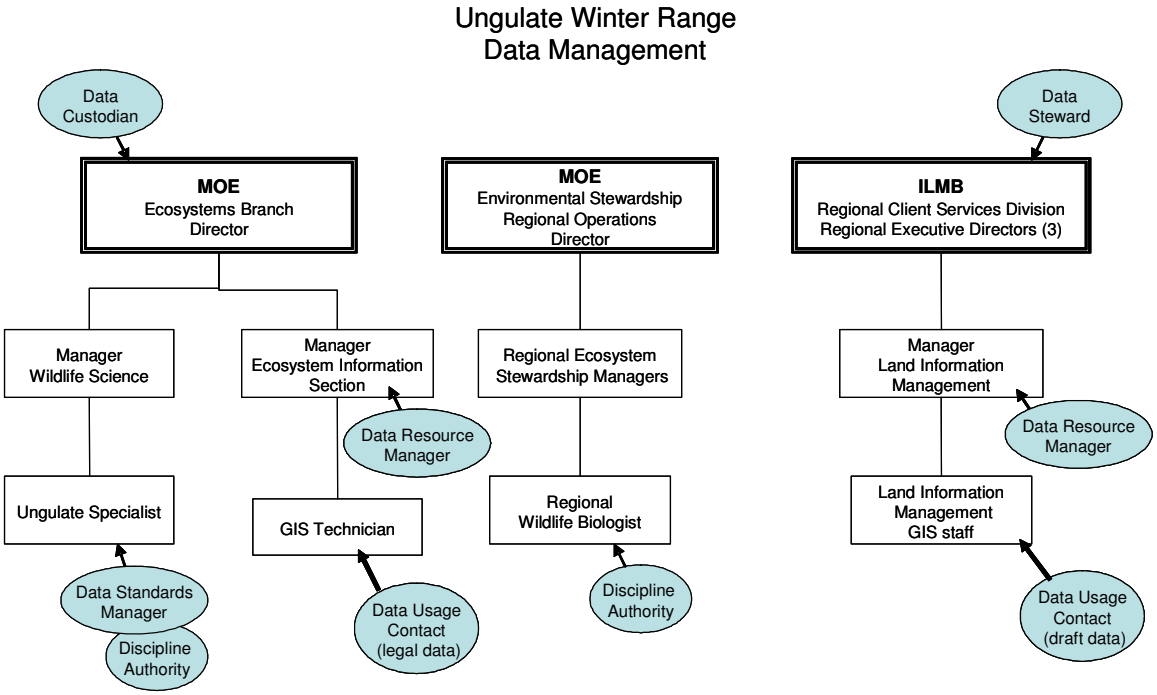


### *5.1.3 Ungulate Winter Range*

This set of data contains approved legal boundaries for ungulate winter range and specified areas for ungulate species. It provides an example of data created in regions and illustrates various data management roles across and within the organisations involved.

The data is created by MOE regional biologists and ILMB regional GIS specialists following content and form standards developed collaboratively by MOE headquarters and regional staff.

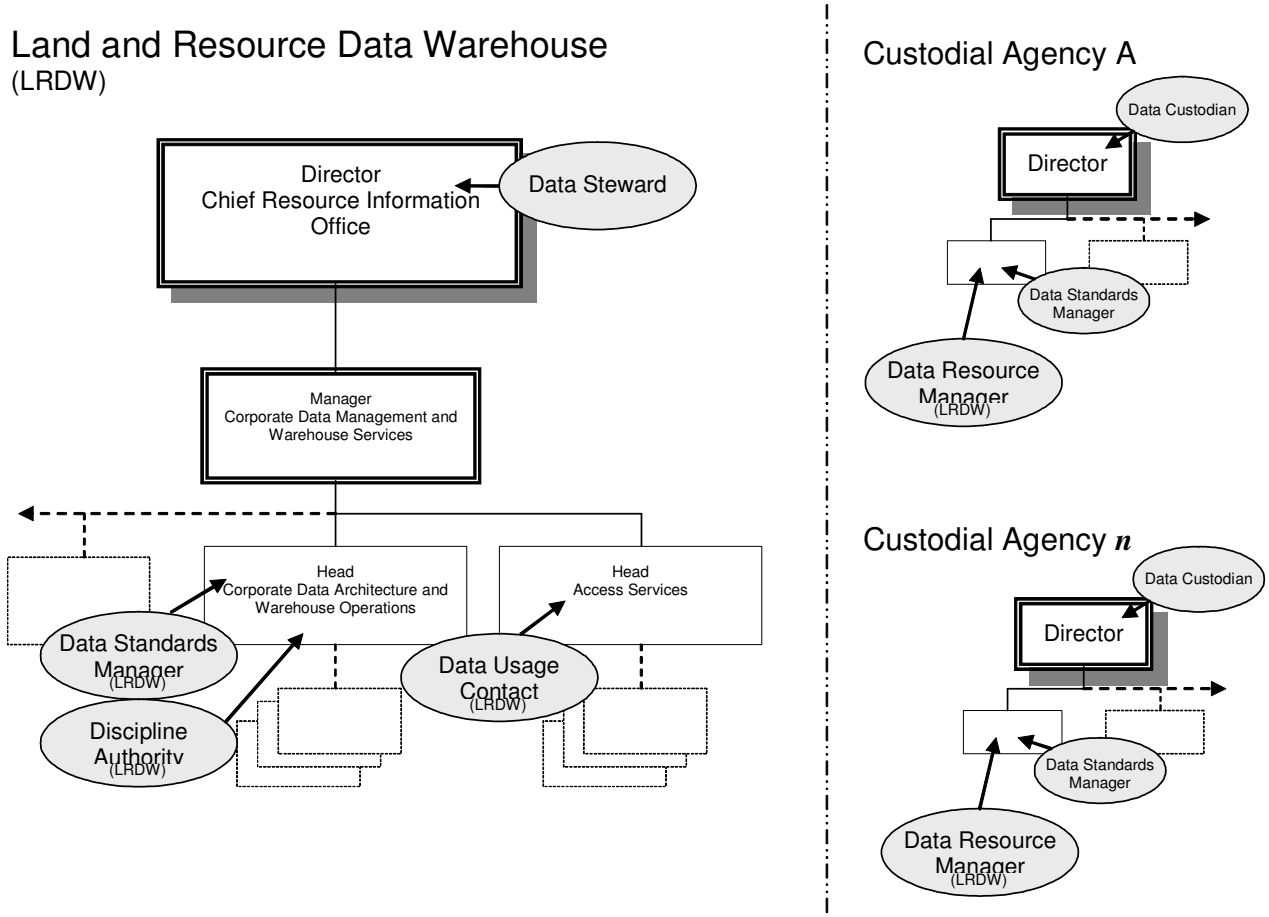
Data is managed by ILMB GIS staff and stored locally until it becomes legal. Once legal, Ecosystems Branch GIS technicians manage the data.



## *5.2 Integration and Access: The Land and Resource Data Warehouse*

The Land and Resource Data Warehouse (LRDW) acts as the Data Steward for the sets of data under its care. The Data Standards Manager (LRDW) is responsible for the development and application of the LRDW metamodel and associated standards. This position currently carries the role of Discipline Authority (LRDW) as well. Note that this role provides expertise related to the data standards applied to the LRDW specifically and spatial data warehousing in general, and is not the Discipline Authority for the individual sets of data under stewardship. Similarly, the Data Usage Contact (LRDW) provides expertise and understanding of the business relevance and appropriate use of Corporate Access Services and not the usage of the sets of data under LRDW stewardship.

In this example, Custodial Agencies supply sets of data to the LRDW for stewardship. Typically, the custodial Data Standards Manager also serves as the Data Resource Manager (LRDW). This role is defined as supplying data to the LRDW to the standards set by the LRDW Data Steward.



## 5.3 Data products: SRMP

ILMB regions build a data product, called the Sustainable Resource Management Plan (SRMP) file. This file forms the basis of regional planning activities for the next four years and is based upon resource analyses on a chapter-by-chapter basis, i.e. there is a chapter for bio-diversity, timber, commercial recreation and tourism, sub-surface resources, water, First Nations and so forth. The content of the file comes from multiple custodial sources and may also contain new information from SRMP planning partners such as the forest industry. Because regions want the data to be used as a source for multiple activities and have an enduring value, they enter discussion with the source custodians to establish usage contracts to ensure continued alignment of sets of data.

Data products such as landscape unit and SRMP boundaries, old growth targets, old growth management areas, recruitment targets, wildlife tree retention targets, and defined socio-economic measures for a given resource value have enduring corporate value. Thus, a person in the Resource Management Division may be designated as the Data Product Provider for this resulting information. ILMB regions may also have local information specific to internal SRMP analyses needs, i.e. for management of a locally specific value unique to only one area of the province. A person in the region may be designated as the Data Product Provider for this locally specific SRMP information.

## 5.4 Planning Projects: LRMP and SRMP

A Land and Resource Management Planning (LRMP) or Sustainable Resource Management Planning project starts up. It requires the use of many sets of data. The project leader makes copies of the data into a project working area. Once in this work area, the data have these characteristics:

- No longer subject to regular custodial updates (i.e., frozen in time)
- May be modified for local use e.g., clipped to project boundary; generalized; additional attributes added; etc.
- Any such use must be within the Data Custodian's definition of appropriate use for the set of data
- This data is used in its modified form within the project but nowhere else, and distribution is limited to project participants (e.g., LRMP table members or SRMP planning partners using a secure FTP site or map viewing site)

The project may also require new data collected by the region. For example, a planning table considers it essential to collect data on particular avalanche tracks that, because of aspect, green-up and other factors have importance for grizzly bears in the region. A biologist and a helicopter are hired to collect this data and the data is delivered to the planning table.

If this data is considered of enduring value to other business purposes, it will constitute a new set of data. The Regional Director would likely become the Data Product Provider for this *new* set of data.

As the project proceeds to completion, one or more new sets of data may be derived from the project, such as Resource Management Zones (from LRMPs) or bio-diversity objectives (from SRMPs). If this data already has a designated Data Custodian, then the data will be sent to them for inclusion in the official source. For example to Director, Resource Planning Branch as Data Custodian for old growth management areas and related bio-diversity targets. Otherwise, the Regional Director would become the Data Product Provider, for example for any data that would only be of use within the originating Region.

At the end of the project, all modified data in the project work area is subject to normal retention and disposal schedules, and will likely be held in long-term digital storage for another seven years.

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# 6 REFERENCES


1. Data Administration Forum, Information Resource Management Glossary, http://www.cio.gov.bc.ca/other/daf/IRM_Glossary.htm
2. Data Management Roles and Responsibilities Guidelines, Version 1.3, Data Administration Forum, Government of British Columbia, April 12, 1999. http://www.cio.gov.bc.ca/other/daf/DMRolesRespV1.pdf
3. Guidelines for Custodianship, ANZLIC, The Spatial Information Council, July 2000. http://www.anzlic.org.au/policies.html.
4. ILMB Digital Data Retention and Archive Procedures - available from ILMB.
5. Land and Resource Data Warehouse Conceptual Architecture, Business Requirements, Ministry of Sustainable Resource Management, June 2002.
6. LRDW Guide for Data Custodians & Data Managers; November 2006 – available from ILMB.
7. Management Guide to Custodianship, Guide S35, Ministry of Forests, Information Management Group, January 2000. http://www.for.gov.bc.ca/his/datadmin/s35.htm
8. Ministry of Finance, Core Policy and Procedures Manual, Chapter 12, Information Management and Information Technology Management. http://www.fin.gov.bc.ca/ocg/fmb/manuals/CPM/12_Info_Mgmt_and_Info_Tech.htm
9. Ministry of Forests & Range, Information Management Group Glossary. http://www.for.gov.bc.ca/his/datadmin/

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# 7 APPENDIX

## 7.1 Data Stewardship Agreement Template

This template is intended to facilitate stewardship arrangements in which one agency has statutory or other mandated authority for all aspects of a given set of data, but is either unable or feels that a second agency is better positioned to provide some or all of the associated set of data management services. The second agency generally does not have any particular mandate or authority to provide the services, but is willing and able to enter into an arrangement to do so. In effect, this template applies to situations where there is a genuine service provider relationship between a Data Custodian and a Data Steward.

This template also allows for the creation and distribution of interpretive or derivative product sets of data by the Data Steward, based on source sets of data provided by the Data Custodian, and in a manner that can still be constituted as a service by the Steward to the Custodian. This may or may not apply to all cases, and may need to be adjusted accordingly.

In the event that an agency requires information from another agency to fulfill its mandate the Data Sharing Agreement template can be modified. A data usage- or data sharing- agreement may be more appropriate as a peer-to-peer relationship exists between two custodians.

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# DATA STEWARDSHIP AGREEMENT
## Short Form

This form is to be completed and submitted to the Corporate Resource Information Office for registration and tracking purposes. Please complete all sections of this form and submit it according to the instructions at the bottom of this form.

This agreement is being undertaken within the general terms of the "Data Custodianship Guidelines" as established by the Corporate Resource Information Office. Specific interpretations of items in this agreement will be based on the Guidelines, unless noted otherwise.

| | | |
|---|---|---|
| **Source Dataset** *(name of the dataset that is to be provided by the data custodian under the terms of this agreement)* | | |
| **Data Custodian** *(the organization accountable for the source dataset with authorities typically defined by either policy or legislation)* | | |
| **Custodial Organization** | | |
| Section | | |
| Branch | | |
| Ministry | | |
| **Custodian's Representative** | | |
| Contact Name | **Last:** | **First:** |
| Location / Regional Centre | | |
| Contact Telephone | (  )  - | |
| Contact e-mail | | |
| **Data Steward** *(the organization that will provide a designated set of data management support services to the data custodian, as formally agreed between both parties)* | | |
| **Stewardship Organization** | | |

| | | |
|---|---|---|
| Section | | |
| Branch | | |
| Ministry | | |
| **Steward's Representative** | | |
| Contact Name | **Last**: | **First**: |
| Location / Regional Centre | | |
| Contact Telephone | ( ) - | |
| Contact e-mail | | |
| **Purpose of Agreement** *(synopsis of the business purpose and/or data services that the data steward will address/provide under the agreement)* | | |
| **Term of Agreement** *(how long the agreement is to be in force)* | **Start Date** (yyyy/mm/dd) | **End Date** (yyyy/mm/dd; for no end date, enter "Indefinite") |

| **Specific Conditions** *(use drop-down boxes to specify responsibilities; include clarifying comments as needed; see Data Custodianship Guidelines for detailed descriptions and interpretations)* | **Responsibility** | **Comments** |
|---|---|---|
| **Planning, Definition and Standards** | | |
| … of source dataset | Custodian Role | |
| … of information products | Custodian Role | |
| **Maintenance and Enhancement** | | |
| … of source dataset | Custodian Role | |
| … of information products | Custodian Role | |
| **Source Capture, Collection and Update** | | |
| … capture of source data beyond that currently in the source dataset | Custodian Role | |
| **Products** | | |
| … creation of information products based on or including source data | Custodian Role | |
| **Quality Control, Assurance and Audit** | | |
| … of source data | Custodian Role | |
| … of information products | Custodian Role | |
| **Storage, Protection and Authorization** | | |

| | | |
|---|---|---|
| … of source data | Custodian Role | |
| … of information products | Custodian Role | |
| **Warehouse Population, Integration and Access** | | |
| … of source data | Custodian Role | |
| … of information products | Custodian Role | |
| **Records Retention, Disposition and Preservation** | | |
| … of source data | Custodian Role | |
| … of information products | Custodian Role | |
| **Use, Distribution and Support** | | |
| … of source data | Custodian Role | |
| … of information products | Custodian Role | |
| **Marketing** | | |
| … of source data | Custodian Role | |
| … of information products | Custodian Role | |

**We acknowledge and agree to the terms and conditions:**

Steward Organization Director

Custodial Organization Director

Custodial Director - Please enter your name and the name of the steward organization direction in the spaces above and attach this form to an e-mail, which states your support of the terms and conditions contained in this form. Include the Steward Organization Director and the two contacts listed in the body of the form as carbon-copy recipients to the e-mail. Send the e-mail to the Corporate Resource Information Office. The e-mail will be deemed to be equivalent to signing consent of these terms.