
BOWEN ISLAND INFORMATION SYSTEM

PROJECT REPORT

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Bowen Island Sustainability Project

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EXECUTIVE SUMMARY

The Bowen Island Sustainability Project (BISP) was initiated in June 2000 as an extension of work conducted in the Spring 200 by the Capilano College Environmental Science Program. BISP proceeded with direct funding by the Real Estate Foundation, and through partnerships with Bowen Island Municipality, the Geological Survey of Canada and Capilano College. The deliverables from this project are two-fold: a) State of Bowen Island (SoBI) report and b) Bowen Island Information System. The Bowen Island Information System includes four sub-deliverables: database catalogue, Geographic Information System (GIS) atlas, maps & spatial data for SoBI report, and this information system summary report. These sub deliverables are included in the compact disc (CD) in the back pocket of this report. Through the deliverables, the Bowen Island Sustainability Project will assist the community, the municipality, and any future initiatives in evaluating and facilitating the decision making processes that leads to more sustainable communities.

The Bowen Island Information System also supports the process of creating SoBI report by increasing work efficiencies and information understanding. In addition, the information system promotes awareness and accessibility of information to the community. This process attempts to centralize the scattered but vital information on Bowen Island. We have succeeded in organizing and compiling all the data into a CD, but the maintenance of the Information System is critical to ensure the utilization of the system and its maximum potential and benefit by the community.

Significant amount of time and work were put into advancing the information system of Bowen Island and creating a database catalogue, GIS atlas, and maps & spatial data. The process of creating these deliverables includes assessing the current conditions and requirements, work planning, data collection, modification and organization of data, designing the final products, and quality control & assurance of the products. Throughout the course of the project, the BISP team has consulted with the Steering Committee, supervisors, specialists, and the island residents for their guidance and knowledge. The help and support from the municipality, many organizations, and the community brought a considerable progress to the project and the information system.

The final product, the Bowen Island Information System CD, contains about 65Mb of information, including 165 entries for the database catalogue, 50 working layers compiled into the GIS Atlas, 16 maps & 25 tables of spatially analyzed data, and this report with 12 appendices. Documents and tables are presented in multiple formats (i.e. Microsoft Word 6.0/95, PDF format, Microsoft Excel, EndNote Software by Niles Software Inc.) to increase the usability of the CD. Extensive reference information (i.e. metadata) is also included to support the information system.

This information system, initiated by the Bowen Island Sustainability Project contains crucial information that will benefit the community in many ways, supporting community learning & inquiry, increasing the level of community understanding, providing better access to information, and leading toward a more sustainable decision making processes. To achieve this potential, continuous improvement and update of the information system is recommended. A centralized system with a custodian (i.e. a community group) updating / maintaining the information will likely enhance the information system capability and accessibility. This, along with keeping metadata, will lead to better information organization on Bowen Island and reserve resources of the community and that of any future initiatives.

PROJECT TEAM

The Bowen Island Sustainability Project Team has five members, Miki Shoji, Stephanie Lemmon, Clay Carl, Maggie Julian, and Jim Bailey. David Bernard, Bowen Island resident and coordinator of the Environmental Science Program at Capilano College is the project manager.

The Geographic Information System (GIS) mapping and the spatial components were lead by Miki Shoji and Stephanie Lemmon. Miki and Stephanie handled the data collection and organization for all digital spatial information that exists for Bowen Island in keeping with responsible for the GIS Atlas, the maps and spatial data within the 'State of Bowen Island' (SoBI) Report. Supervision for spatial data was provided by Murray Journey, Bowen Island resident and research scientists with the Geological Survey of Canada (GSC). Metadata analysis was completed with the aid of both Murray Journey and Julian Dunster of the Bowen Island Forest & Water Management Society (BIFWMS).

The database catalogue system was developed by Miki Shoji and Clay Carl. Clay also was part of the data collection team for documents, reports, and information that was compiled into the database system in collaboration with Maggie Julian and Jim Bailey. Maggie and Jim lead the State of Bowen Island report development.

Miki Shoji is the Information System Developer / GIS Analyst for the Bowen Island Sustainability Project. She has a Bachelor of Science in Environmental Science – Pollutant Transport Modeling from the Simon Fraser University in British Columbia. In addition, this project represents the practicum for her Post-Baccalaureate diploma in Environmental Science from Capilano College in North Vancouver, B.C. Her experiences include GIS mapping of Penticton / Osoyous Area for Trans Canada Trails and database management for the Coastal Community Network. As well, she has performed various project development and facilitation tasks in Canada and Japan.

Stephanie Lemmon is a GIS technician for the Bowen Island Sustainability Project and has been working on Bowen Island for the last year, completing a Sensitive Habitat Inventory and Mapping (SHIM) project on Bowen Brook and some of its tributaries. Before this work, she contributed to a biophysical assessment of the Island's Crown lands, and the review of a Protected Areas Educational Guide for BC Parks. In addition to an Honours Bachelor of Science in Environmental Sciences at the University of Guelph in Guelph, Ontario, she has completed the Post-Baccalaureate Program in Environmental Science at Capilano College in North Vancouver, B.C. She is a R.I.C. certified GPS Project Manager for resource mapping, and is well experienced with GIS.

Clay Carl is a Research Analyst with the Bowen Island Sustainability Project and is working on this initiative as part of his practicum for the Capilano College Post-graduate Environmental Science and holds an Honours Bachelor Degree in Environmental Earth Science. This varied background helps a lot in thinking about the complicated Earth system that is Bowen Island.

Maggie Julian is a Report Author and Research Analyst on the Bowen Island Sustainability Project and has a background in sustainable community development and ecological economics. Maggie has a B.Sc. in Biology and Environmental Science from Trent

University. She is nearing completion of her Masters Degree at UBC in the School of Community and Regional Planning.

Jim Bailey is a Report Author and a Research Analyst on the Bowen Island Sustainability Project and has a background in economic geography, resource planning, and ecological economics. He has a Geography degree from Simon Fraser University and is nearing completion of his Masters degree at the School of Community and Regional Planning at UBC.

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INTRODUCTION

The Bowen Island Sustainability Project

The Bowen Island Sustainability Project (BISP) is based on the work initiated by the Environmental Science Program at Capilano College, who conducted a four-month intensive study of sustainability on Bowen Island. This study was part of a regular, spring-term course on Ecosystem Sustainability implemented from January of 2000. After months of research and analysis of the Official Community Plan, as well as several community consultations, students held a community conference on Bowen Island. The class project demonstrated to the residents and municipal officials of Bowen Island the potential for harnessing new technologies and approaches to evaluating stakeholders' interests and consequences of alternative policies for land use, transportation patterns, and other issues using simulation models and hypothetical scenarios drawn from existing data.

Bowen Island is facing challenges with a variety of issues. The Island is located in the entrance to Howe Sound, just a twenty-minute ferry ride from Horseshoe Bay. With just over 3000 permanent residents on the Island, Bowen has approximately 50 square kilometers of forested landscape and a more natural, less urban environment than that in the Lower Mainland of British Columbia. Seen as a natural retreat within commuting distance to downtown Vancouver, Bowen Island has been facing increasing development pressures over the past several years. Having just become a municipality, the new council and the community members are wrestling with ideas of sustainability and development on the Island.

Following the study by Capilano College Environmental Science Program, the second phase of the Sustainability Project began in the middle of June. This phase of the Sustainability Project involved a large research and data collection component, and included the creation of several deliverables. The main project team is comprised of five individuals: a data collection and research specialist, two report writers/analysts, and two database system and geographic information system (GIS) specialists. Funding and support for the project has come from the Real Estate Foundation, Capilano College, the Geological Survey of Canada (GSC) and the Bowen Island Municipality. Supervision has been provided by David Bernard, the instructor of Ecosystem Sustainability at Capilano College, Dr. Murray Journeay from the GSC, Julian Dunster from Bowen Island Forest and Water Management Society (BIFWMS), Cristina Rucci, Planner for Bowen Island Municipality, and Dr. Bob Turner, Bowen Island municipal councilor and GSC scientist.

Collectively, the BISP team has spent several months collecting data, interviewing and meeting with members of the community, counseling with a community-based steering committee, and developing several final deliverables for the project. Bowen Island Sustainability Project will have three deliverables:

- A "State of Bowen Island" (SoBI) report that outlines current conditions and past trends in the social, environmental cultural, economic and governance sectors, whose framework can expand into a decision-support, systems-analysis within which community leaders and island residents can discuss and consider various initiatives
- A digital catalogue that provides references and descriptions for Bowen Island knowledge and data-based information (books, reports, data, maps and studies) vital to increasing level of community understanding for both citizens and government officials

- A GIS Atlas, that collects essential and most currently available 'digital spatial files' (i.e. collection of electronic maps) for the Island to support community-based inquiry, learning and understanding

The catalogue system and the GIS atlas will be contained in a compact disc (CD) along with the maps and spatial data generated for the SoBI report and a digital version of this report which summarizes the steps taken to create the CD and the current status of the information system. The CD, referred as "Bowen Island Information System," is included in the back pocket of this report. The information system and this report will be accompanied by the State of Bowen Island report, planned to be released in December 2000.

Purpose

The purpose of developing the information system as part of the Bowen Island Sustainability Project is to support and provide critical information about Bowen Island for the 'State of Bowen Island' report. It also facilitates the use of information, both spatial and non-spatial, on Bowen Island in future initiatives, by compiling a vital information catalogue and a collection of GIS data for the community.

Objectives

As a part of the Bowen Island Sustainability Project, a substantial amount of data was collected to support the project's final report, "State of Bowen Island". Several objectives were developed prior to commencing the data collection:

- Find supporting data that aids the State of Bowen Island report, covering critical topics in three main areas: environmental, economic, and social
- Copy key data and centralize it in one location: the BISP office on Bowen Island
- Catalogue all information gathered into a format that provide a basis for searchable database system
- Provide information in a format that assists the "State of Bowen Island" report writers to easily reference their resources

Along with the research components of the project, a complementary set of objectives for the spatial components was also established:

- Collect critical GIS data for Bowen Island, and sort this data into a "working collection" and an "archival collection"
- Update GIS themes and decode attribute tables required by data analysis for the State of Bowen Island report
- Create GIS atlas by aggregating the most recent, most accurate version of spatial data available and by including a GIS software for data accessibility
- Analyze the GIS data to support the SoBI report and present it in a variety of maps and spatial data

BACKGROUND

Database Catalogue

Organizing and tracking data collected in this phase of the project was a crucial step. A catalogue can organize data into a standard format, and supports the building of Bowen Island information database system for reports, documents, maps, studies, and other available information and reference materials. Furthermore, a catalogue would allow users to search for data using a variety of access points, such as author, report name, year of publication, keywords, and many others. An abstract is available for each reference, allowing the user to assess whether this data would be useful to them, as well as its availability. With this objective in mind, all relevant research uncovered by the data collection team was catalogued into an orderly and descriptive system using software called Endnotes, created by Niles Software Inc., now owned by ISI ResearchSoft.

The EndNote software was used to build a catalogue that references the large dataset researched and compiled by the data collection team. This program is designed to allow a writer to enter citation information relevant to a work and allows this citation to easily be recalled when information is used in the creation of the report. This feature was of great use to the report writing team, as they could quickly yet accurately source information throughout the report writing phase. An additional benefit of EndNote is that it can be converted to a database in the future when funding permits the construction of a database catalog. Since this data will be used for more than citation, a few fields in the data were modified or added to complete the information needed for the cataloging system. These customized fields included fields describing who owned the data, who to contact to acquire the data and keywords to help look for this particular data. For more information on the EndNote program, please refer to EndNote homepage at <http://www.endnote.com/Eninfo.htm>.

Geographic Information Systems (GIS) and the GIS Atlas

The spatial component of this project was based on collecting all the critical digital/spatial data for the island and organizing them onto a compact disc to be utilized in generating maps and data for the State of Bowen Island Report.

A Geographic Information System (GIS) is defined as:

“A computer system for capturing, storing, checking, integrating, manipulating, analyzing and displaying data related to positions on the Earth’s surface.”
(source: Association for Geographic Information 1999 (<http://www.agi.org.uk/index.htm>))

The GIS software to be used on the Island is ArcView 3.1, a desktop GIS by Environmental Systems Research Institute (ESRI). This software has an easy to use graphical user interface that lets the user easily load spatial and tabular data, which can then be presented in the form of maps, tables, and charts. Tools are provided to query the data and perform analyses, and to make presentation-quality maps that can be printed or plotted (ESRI, 1998).

The GIS atlas organizes existing GIS data, which reveals the currently available information and its status, as well as information gaps that Bowen Island faces. It also brings together a collection of critical GIS data available for the Island. Its ability to be share data and information among individuals and user groups benefits the community and future initiatives. Due to the

limited time frame of this project, some themes were not updated to the newest versions available or refined for accuracy. The priority was put on to the critical information that required to assess the current state of Bowen Island. Themes that may have more current versions available or include known errors have been noted with contact information. Understanding GIS availability and the mapping capability for Bowen Island, mapping can be further developed when more resources are available. Users also benefit by now being able to see the relevant metadata (Information regarding the data – i.e. source information, projections, authors, years, methods, modifications etc.) for the GIS themes. In most cases, this information was not readily available prior to this project.

Through the process of compiling the GIS atlas, all GIS themes for the Island have been sorted, organized, and placed into either an archival collection or on the CD ROM as a collection of “working maps”. This process has numerous long-term benefits:

- With duplication and outdated data filed into archives, it is more apparent which GIS themes exist, which need updating, and which need to be collected
- It is easier to track new data as it is collected and added to the GIS atlas
- Data with metadata can be used with greater levels of confidence
- More groups can have access to this data, and may have the opportunity to learn and apply this technology
- This atlas may lead to the development of increased GIS use in land-use planning and sustainable development on Bowen Island.

Previous State of Data: Information Distribution on Bowen Island

Preceding this endeavour, there was no centralized collection of all the critical information pertaining to Bowen Island. The data and many reports and studies that were created in relation to Bowen Island only existed in scattered places around the island and off the island. Some of this information was hard to find and is not accessible to the general public or community members. Some information that was collected could only be accessed through the help of the Municipality of Bowen Island. Information that was housed within organizations such as North Shore Health, Islands Trust, and Environment Canada could not be accessed without a facilitating letter from the Municipality of Bowen Island.

Also, on Bowen Island, members of the community and on-island resources are a rich source of information. There is a substantial source of information, both historical and current, which is kept by the community and its members. However, since the community is made up of thousands of people, who are spread throughout the island, the shared knowledge is also spread throughout the island. The process of tracking down inaccessible information and personal knowledge is very labour intensive and is not commonly feasible for the general public. Also, the information contained in private collections is often the only copy in existence and needs to be safeguarded. Thanks to the support from the Municipality, various interest groups, and many island residents, the Bowen Island Sustainability Project has received a great deal of assistance and information from the community and its members. The information was copied and then returned to the original owners.

For years, the GIS data for the Island has also been scattered among organizations and the Islands Trust, who manage the data. The Islands Trust began using GIS and ArcView around 1993. A report had been completed by some students from BCIT that discussed how GIS

could be used on Bowen Island (Dixon and Kemble, 1993). Additionally, numerous themes of data had been digitized, and represented the first GIS work on Bowen Island.

The involvement of the community between 1993 and 1995 in creating an Official Community Plan (OCP) played a role in further digitizing of data and creation of OCP maps by Murray Journey. When completed, the GIS themes generated for the OCP were given to the Islands Trust. Since that time, the Islands Trust's GIS technicians have periodically updated the GIS themes for the island as new data became available. In the summer of 1999, the Trimble Corporation donated a Global Positioning System (GPS) to the Bowen Island Forest and Water Management Society (BIFWMS). This donation, coupled with the donation of ArcView GIS software from ESRI, accelerated the Society's involvement in the collection of spatial data and creation of maps.

As new data has been collected, some problems have become apparent:

- Multiple data collections are in use, with varying versions of GIS data: One group or individual may have an older version of data, while another may have similar data in a newer version.
- Lack of system describing GIS files and relevant metadata: Many GIS files exist that lack information describing their history (metadata) and how current (what version) they are.
- Lack of a system to track new data as it is collected, and what version exists in GIS collection: As new GIS data is being collected, old versions of data are not being archived and separated from current GIS themes.
- Data not being kept in consistent format: Different GIS collections are being maintained in different projections or formats, which can cause errors in overlays if no format/projection metadata is specified.

As a result of these problems, significant duplication in GIS files can be found in existing GIS collections. Older versions or incomplete versions of data are still in use/circulation, and it is often time consuming to establish which data set is the most current or accurate.

Project Rationale

A centralized information system that can be accessed easily by those involved in sustainable community initiatives would increase the efficiency of the sustainability and community projects significantly. Furthermore, the searchable database catalog can provide the baseline for the Community Library. This will allow interest parties and residents to browse the information system that holds various types of reference media by categories, keywords, authors, and many other functions.

Resources and support for the Bowen Island Sustainability Project enable the team to conduct broad research and organization of information, data, and knowledge on the island. In addition, the database system increases the efficiency of the project further by providing guidelines for the research by identifying the areas where data is collected and missing, by increasing understanding of existing data and its status for determining the tasks and steps required, and by providing references and formatted bibliographies.

In spatial data, a consistent data format and projection can make data sharing easier among different groups of people, organizations and government agencies. Organized best available sets of GIS layers with metadata will also benefit the community and future initiatives. The spatial component of the Bowen Island Sustainability Project will make this possible, through the creation of the GIS atlas and this accompanying report. Furthermore, the maps and spatial data generated will positively support the analysis that will be made in the State of Bowen Island Report, as the source information and accuracy will be presented.

By defining, in this report, the processes the BISP team has taken through this phase of the project, the team is hoping to lay the foundation for future sustainability initiatives and for sustainable community development. As well, presenting our knowledge on the current condition of the Bowen Island information system would provide a jump-start to the community and the initiatives.

CATALOGUE CREATION

Determining the Metadata Requirement

The metadata requirement for the catalogue system had to be determined prior to the data collection. Metadata is commonly described as data about data and usage of data, which include the critical facts that have to be noted (author, year, original source etc.) about each data source (books, knowledge, report, maps etc.), to describe it uniquely and unambiguously. To meet the objectives, the metadata requirement for the database catalogue system had to support the followings:

- Different types of information (i.e. maps, report, knowledge);
- Entries required by citations for SoBI report, and able to distinguish all possible information collected;
- Metadata compatible to widely used standard (esp. for spatial data, i.e. GCMD, USGS, FGDC, MELP standard);
- Information that allows the authors and other users to search by topic;
- Original source of information and accuracy;
- Information to track down where the document was obtained/stored;
- Contact information if someone want to get a hold of the data;
- State of which the information is in;
- Abstract to give summary of the information;
- Date when the data was entered into the database (when the information was obtained); and
- Additional notes for this project and/or future users

With guidance from Sonia Talwar, a GIS database specialist from the Geological Survey of Canada, the metadata requirement for each reference type was determined. Appendix 1 shows the modified reference table for various types of information used for this project. The modification was made to pre-existing standard format of EndNote Software to meet the specific needs for this project.

Data Collection Strategy

The strategy for data collection started with a focus on key sources of information known to the team. Some of the data sources include the planners for the Island (Cristina Rucci and Felicity Adams), the public library, the Islands Trust, North Shore Health, the Municipality of Bowen Island, and numerous private collections including information from Julian Dunster, Peter Frinton, Anne Franc-de-Ferriere Chollat. After these sources were exhausted, research was split into specific categories defined in the table of contents for the State of Bowen Island report. These categories included critical themes to describe the current conditions and past trend of Bowen Island such as water resources, vegetation, wildlife, human health issues, population demographics, the arts community, business and economy, and transportation. For complete list of the categories, see appendix 2 for the Primary Table of Contents for SoBI report. These categories were divided among the team members for data collection. The BISP team has consulted for guidance with the steering committee, comprised of community members from various interest groups, to determine where information could be found prior to the data collection on the categories. From there on, the leads for one information led to other contacts and information sources.

Some of the data was on very strict loan from private collections. In many cases, these data sets were not widely available and therefore valuable to both the data collector and the community at large. Duplicates of the documents were made for future references and use, and the originals were returned to the owners.

Some information was not available to the public, due to its nature or the nature of the organization within which it was held. In order to acquire this information, the help of the Municipality of Bowen Island, who supported our project, was necessary. Also, some information from the Islands Trust was obtained under authority of the Municipality of Bowen Island and was graciously loaned to us for our interpretation and copying.

Database Design and Input

After the EndNote Software was installed on computer stations to utilize built-in capability to interact with Microsoft Word 97, alterations to data fields were made to accompany the metadata requirement for this project. A tutorial session was given to the team along with a document summarizing how to use the EndNote software for this project (Appendix 3), citing information from EndNote user reference guide (Niles Software Inc. 1998).

Data was entered into the database by all members of the team. Constant monitoring and review of the databases were performed to eliminate the inconsistencies in input methods due to multiple users. All information gathered was entered regardless of potential use in the SoBI report, as the detail contents of the report were not clearly defined when the data collection took place. Furthermore, the information could be useful in the future phases and projects. The database was updated constantly throughout the research phase of the project, as the database provides the overview of the information gathered and defines the information gaps in any given time. Moreover, it enabled the team members to organize and to obtain the necessary information more efficiently.

Database Data Quality Control & Assurance

At the end of September, the working progress database was tested for quality control and assurance. Each field and field entries were checked for spelling and tested for various exporting methods (i.e. to ensure the exporting information into other database system will be directly possible). Inconsistencies, mistakes in columns entered, invalid key input (i.e. semi-colons and enter keys), invalid date entries, misspelling of proper names were also fixed, as well, critical missing information was added. Furthermore, the spatial entries had been modified by this time, and to reflect the changes made and to represent the current conditions, a new set of spatial database catalogue was created. Currently, the database contains 115 non-spatial entries and 50 spatial entries.

Creation of Searchable Excel Tables

Microsoft Excel is a widely used software, and allows general users to easily search the tables for what they are looking for by using built-in functions such as 'find,' 'sort,' or 'filter.' To make the database system widely available and accessible, Bowen Island Sustainability Project has

created searchable Excel tables along with the EndNote database. The Excel tables contain the same information as the EndNote databases, but in a different format. The information collected in the EndNote database was exported as tab delimited text file (refer to EndNote user guide: 'Style – Export – Tab – extension .txt'). The export file was then opened in Microsoft Excel to form a table. Format and sorting of the Excel table was performed to create more user-friendly database. The exportation of information had to be performed separately, for each reference type, as columns of the database contain different information for different reference type due to distinctive metadata requirements. The latest version of Excel table for non-spatial entries (reports, books, newspaper articles, and conference proceedings) is printed in Appendix 4. The Excel table in Appendix 5 includes the latest set of spatial entries (maps, coverages, and spatial information).

Additional Data Acquisition

The population of the database catalogue systems continues. The research by the authors of the State of Bowen Island report is not yet finished. They will continue researching to fill the critical information gaps as much as possible while the resource allows. Moreover, the Sustainability Project will evolve into subsequent phases and other initiatives, and research and data collection is an on-going process. This report and the State of Bowen Island report will define the data gaps the project has faced, and these areas may provide the starting point for the additional data acquisition in the future.

As we used the information system through the project as a tool to effectively manage the vast amount of information in an organized way and to increase the efficiency of the project, it is suggested that the information system database should be continually updated and revised. This will also allow the future initiatives to use the database catalogue as a basis for a community digital library.

ATLAS CREATION

Collect/Compile Accessible Existing GIS Data

There are two known sources of Geographic Information System (GIS) data on Bowen Island. The Islands Trust data includes layers digitized by BCIT students (Dixon and Kemble, 1993) and coverages modified by ESRI or updated by the Island Trust technicians (e.g. cadastre). The other source of GIS layers is Bowen Island Forest and Water Management Society (BIFWMS). Their collections include a set of Islands Trust data, Bowen Island Official Community Plan coverages, and BIFWMS streams and wetland data obtained through Global Positioning System (GPS) mapping projects. They also possess several older BIFWMS data, BIFWMS water survey data, BCIT students' data, and miscellaneous data/files generated over the past 8 years.

The first phase of the atlas creation began with data sorting of these two major GIS collections, which was more than 100 layers collectively, to determine the actual resources already available. Data was sorted into two folders: BISP folder to contain the "working collection" of maps – those that are most current and/or accurate among the collection, and Archives folder to contain the "archival collection" – older files that have been superseded by more recent / complete data. Exact duplicates were physically deleted from the collection. Both BISP and Archives were further subdivided into two sub-folders, BIFWMS folder and Islands Trust folder, divided by the originator and/or custodian of the data. The sorting process was completed by comparing themes and attribute tables, by checking for metadata (ArcInfo Log files), as well as by obtaining information from the data sources and custodians (i.e. Murray Journeay and Julian Dunster of BIFWMS).

During this process, the metadata was also entered in EndNote for each of 'working collection' of maps. Metadata for those layers were gathered from the custodians, GIS technicians, and reference documents. The state which the layers were in was also determined and entered into the database. This information made planning of subsequent tasks and reference / identification of the layers in the large collection more efficient throughout the project. The sorting process was extremely time consuming and labour intensive as there was no metadata associated with most of the themes, and existence of numerous duplicate layers. Contours, roads, and lakes were few of the layers that were difficult to sort out the most current / complete layer from the multiple duplicates in the existing collections.

Data Assessment and GAP Analysis

Subsequently, the review and examination of all the working collection of GIS data was performed. This process assessed the current usability of each theme by looking at attribute data, metadata, and the format the data. The current conditions were also used to determine the amount of work required to modify the layers to meet the specific need of the State of Bowen Island (SoBI) report.

An information gap analysis was also performed to determine the missing themes that need to be obtained/updated, by comparing the existing dataset to the outline of SoBI report (Appendix 2) and its indicators. From the priority of the sections in the SoBI report, the tasks to seek out and obtain the missing data, more current data, or additional information were prioritized. The availability of the themes and the amount of work involved in obtaining or creating the layers

were also factored in the work plan determination. Themes that can be updated and obtained were noted in the database with contact information.

For attribute tables, the need for obtaining additional information, the accuracy of the information, necessity of decoding were determined, as well as where decoding can be obtained. This process was also based on the requirements by the SoBI report for map & spatial data generations.

Additional Data Acquisition

After prioritizing the specific needs through the gap analysis, additional data was obtained. New themes such as bedrock geology, enumeration areas, current land use, and forest cover were obtained from BC Ministries and other organizations. Updated versions for bylaw maps, such as OCP land use designations, zoning bylaw maps, and cadastre (property boundaries) were obtained from the Island Trust.

There are other themes that were determined critical, but not acquired due to the existing organizational structures, lack of resources, or the data simply does not currently exist. Such layers include fish and wildlife habitats, social facilities, historical sites, storm water, and septic tank locations.

Re-projections into Standard Framework

To be able to overlay and create maps, all the GIS layers have to be in the same projections. Thus, it was essential to re-project the layers into a standard framework, as several different projection types existed in the working collection. Many of the older BIFWMS data was in UTM (Universal Trans Mercator), NAD27 (North American Datum 1927). Newer GPS data from BIFWMS were in UTM, NAD83 (North American Datum 1983). Islands Trust data was a mixed collection of Decimal Degrees (geographic projection), NAD27, and NAD83. Data obtained from the BC Ministries (forest cover, biogeoclimatic zone etc.) were in Albers. Since most layers were not associated with metadata or a projection file, the projection of each layer had to be confirmed by overlaying with known projections. All of the layers were re-projected into the current provincial standard of UTM NAD 83.

Formats of layers also varied between ArcView shape files and ArcInfo coverages. In an effort to obtain and maintain the metadata, themes were collected in ArcInfo coverages where possible, as they are associated with descriptive log files. However, the ArcInfo software failed to recognize many of the existing ArcInfo files, as the workspaces were missing the 'Info' files. This error is probably due to the previous conversion of layers from different format (tapes or export files such as .e00 files), using non-ArcInfo software. Since some of these files were still recoverable using ArcView, the layers were converted once into shape files using ArcView and then returned into ArcInfo format for re-projection and further modifications. ArcInfo 8 was used to convert ArcView shape files to coverages (ShapeArc command), and then all the data was transformed into UTM, zone 10, NAD 83, Spheroid Clarke 1866.

An orthophoto was acquired, with the intention of using it to register and rectify the existing layers, and to verify the spatial accuracy of many GIS themes. Unfortunately, the most recent orthophoto (MELP 1999, 0.5m pixels – colour) that was borrowed from Ministry of Environment

Land and Parks was determined to still contain registration errors. The differences between the layers and the orthophoto was up to 25 meters. Since this offset is likely to be due to both the orthophoto and the coverages, the orthophoto could therefore only serve as a backdrop (background) and not for geo-referencing or determination of spatial accuracy of GIS data.

Quality Control and Assurance

Many of the layers in the working collection required quality control and assurance. The layers which we had access to the hard copy was tested for accuracy. Those layers include the layers digitized from the report by J. Block (1978) (aquatic analysis, outdoor recreation analysis, terrain analysis: basedata, terrain analysis: interpretive, and vegetation analysis) and coverages used for Bowen Island Official Community Plan 1995 (agricultural land; parks, crown land and ecological reserve; OCP land use designations; proposed parks & trails; water districts; development areas – slope > 25 degrees; and watershed development permit area). The bylaw layers (zoning bylaw and subdivision bylaw) require further quality control and assurance due to the nature of the maps (used for official planning). More detailed review sessions for these layers are planned by BISP team before the release of the State of Bowen Island.

The layers digitized from J. Block (1978) contain crucial and comprehensive information about the environment of Bowen Island. However, many errors have been detected for these layers, and re-entering of attribute data from the hard copy was necessary as random quality check for 10 polygons defined to have more than 50% errors in some layers and no alternative layers were available. After the time-consuming process of re-entering the data into the coverages and recreating the polygon boundaries, quality check for random 10 polygons were again performed. This time, the test showed 100% accuracy of the data. Some bylaw and OCP coverages have been defined as incomplete. OCP land use designation layer was completed by adding few polygons and re-entering the accurate attributes where error was detected. For the bylaw layers, further reviews and more resources are required to complete the layers.

Modifications of layers

The Bowen Island Sustainability Project undertook some modifications of GIS layers in order to create the maps and to generate the spatial data. The modifications were performed using ESRI's (Environmental System Research Institute Inc.) ArcInfo 8 provided by the Geological Survey of Canada. Several stream layers and several lake layers were combined to create a more complete coverage, since the layers newly obtained by BIFWMS using the Global Positioning System (GPS) were not compiled together. The forest layer was created through edge-match and map-join processes, as Bowen Island was a part of three maps. The layer was then clipped to only show Bowen Island. Clipping was also performed to geology layer and biogeoclimatic zone layer.

The coastline had to be updated for some of the old Islands Trust coverages, which were created by BCIT students (i.e. layers from Block report, road suitability analysis, and bylaws). Also the layers obtained from ministries and other organizations tend to be in large scale (low resolution/more general) and have less detailed shoreline. Therefore, the old shorelines which did not overlay properly, were replaced with the latest & the most detailed shoreline layer available in the collection. The layers were cleaned and re-build after extending and adjusting the new intersections.

Another area that required replacement was the outlines of the lakes. Many of the coverages contained the old lake outlines which made overlaying and creation of map difficult. Moreover, some of the layers contained multiple lake outlines, which make the spatial queries difficult. All the layers that included old lake outlines were replaced with the most current lake outlines (BIFWMS lake which includes accurately digitized lake outlines using GPS). The additional lakes were not added to the layers where no lakes have been included in the original layer; it was simply replaced.

The only layer that had not been modified to the latest version in terms of shoreline and lakes is cadastre. The cadastre layer include many inconsistencies and errors such as existence of small slits and undefined roads polygons. Thus, the alteration of shores and lakes would have been time consuming and inefficient. The cadastre layers are updated every year by Islands Trust, and it is recommended that some corrections would be made to make cadastre spatially analyzable.

Addition of attribute data

Through the information gap analysis, the team has determined the necessity of decoding and updating of attribute data for many layers. Many attributes only included “key codes” which had no or very little meaning to the team or to the general public. First, the team collected the relevant background documents that were used to digitized the layers (i.e. with Block report, OCP) or contacting relevant parties such as BC Ministry of Forests, in order to understand what the “key codes” represent. The additional information about the key code and other reference information were then entered into separate spreadsheet tables. These tables and the attributes were joined using ArcView 3.1 and added to the existing GIS themes. Some metadata was also compiled into additional text files to accompany the GIS files.

Furthermore, some attribute tables were modified in order to exhibit simple, but meaningful information on the maps for SoBI report. Additional attribute modifications were made in order to calculate the critical spatial data for SoBI report.

All the above modifications made by the BISP team are noted in the information database for each of the spatial entries (Appendix 5).

Creation of Information Compact Disk

The latest version of the database catalogue, GIS Atlas, maps and spatial data generated for the State of Bowen Island report, and this report created by Bowen Island Sustainability Project were compiled into one compact disc (CD). The content of the information system CD will be discussed in more detail in the subsequent section called “Current State of Data.”

For this process, we have acquired ArcExplorer software, which allows users to view the GIS layers included in the CD (ArcInfo 8 format or ArcView 3.1 – shape file) from ESRI. The copyright of this program allows us to distribute the software as a viewing tool for our deliverables. For more information, please refer to ESRI website, <http://www.esri.com>.

The document files, tables, and maps were converted into portable document format (PDF) files for more accessibility across various computer platforms and printability. PDF files require Adobe Acrobat reader available from <http://www.adobe.com>.

GENERATION OF MAPS AND SPATIAL DATA

One of the main objectives of the information system was to provide critical maps and spatial data for the State of Bowen Island report. The process of creating the database catalogue and GIS atlas has also supported this phase of the project.

Creation of Potential List of Maps

To determine the map and spatial data requirement of the SoBI report, the BISP team has created potential list of maps in several stages. The list includes maps that can be generated from the collection we have gathered and organized, and work required to generate more complicated or not easily available layers (Appendix 6). After assessing the need for SoBI report and the resources available, the list was shortened into 25 maps (Appendix 7), and those maps were primarily created. The wildlife and fish habitat map could not be obtained from MELP, and Environmentally Sensitive Area map could not be re-printed for this project due to its copyright agreement.

Creation of Maps

The primary version of the maps were created on 11x17" paper in black and white. This decision was made due to the cost efficiency for the reprinting of SoBI report and to capture the most information in the largest possible format with the resource allowable. The maps were created from the latest set of the working maps in the GIS atlas, which the BISP team has already modified to fit the need of SoBI report. Title, description, scales, legend, minimal metadata (i.e. projections), the North arrow, UTM grid, labels, and the reference to the State of Bowen Island report were inserted into the maps.

For each map, the layers used, other information used, and the map composition were defined. For each layer used, the title of the layer, author, year, file name, modification made, original source, custodian, abstract, and accuracy were cited from the information database catalogue previously created. This information is listed in Appendix 8, as it could not be satisfactorily represented in the actual map.

Revisions of Maps

BISP team and Bowen residents performed several revisions of the maps. First, the usability of the maps in the SoBI report was determined, and several maps were discarded from the collection. The format of each map including simplicity, readability, and size of maps were re-examined. For clarity, labels, information, detailed legend, and symbols were added and/or adjusted. It was also edited for spelling errors and consistency. There are 16 maps of Bowen Island (13 maps in 8x11" and 3 maps in 11x17") in the revised format (still in draft form) is available in Appendix 9.

To assure the better accuracy of the content, further revisions are required. Some layers in the collection are not completely accurate, and it is noted in the catalogue and the map metadata. Even though this is the latest version of the currently available collection on Bowen Island, the information still require significant amount of update and evaluation. This process will be carried on by the BISP team until the release of the State of Bowen Island report, but it will still require continuous revisions and updates. Errors and missing information are more apparent in

some themes than the others, and those may be the ones that require immediate revisions (i.e. Roads, Zoning Bylaw, and Water Districts) for the use in the SoBI report.

Spatial Data Generation

Spatial data was generated from the latest “working collection” of layers. Initially, more than 50 spatial analysis were performed from the available layers (list in Appendix 10). The requirements for SoBI report was used to determine the usefulness of these spatial data, and reduced to 23 data tables. Each table was then re-created using ArcView 3.1, annotated for clarity, defined sources of data, formatted, and calculated for the total and the percentages. These tables are included in Appendix 11, and more detailed metadata for each layers can be obtained from the spatial database catalogue (Appendix 5), by referring to the filename noted. Water licence data was also analyzed, and summary tables can be found in Appendix 12, along with its metadata.

FINAL STATE OF DATA

Contents of CD

The compact disc (CD) in the back pocket of this report holds the information system Bowen Island Sustainability Project (BISP) has developed, since the project began in the middle of June, 2000. This CD is one of the three products along with this report and the State of Bowen Island Report, which will be released in December of 2000.

The CD is titled "Bowen Island Information System; Version 2: November 17, 2000," created by Bowen Island Sustainability Project. This CD was prepared by Miki Shoji, Stephanie Lemmon, and Murray Journeay. It is a revised version since the first version of CD only contained the GIS Atlas (titled "Bowen Island GIS Atlas: Preliminary Draft Version 1.0: October 12, 2000"). Instead, this version includes the entire Information System developed by BISP. There are four major folders in the CD containing four components of the information system: Database Catalogue, GIS Atlas, Maps and Spatial Data, and Bowen Island Information System Report.

The final product, the Bowen Island Information System CD, contains about 65Mb of information, including 165 entries for the database catalogue, 50 working layers compiled into GIS Atlas, 16 maps & 25 tables of spatially analyzed data, and this report with 12 appendices. Documents and tables are presented in multiple formats (i.e. Microsoft Word 6.0/95, PDF format, Microsoft Excel, EndNote Software by Niles Software Inc.) to increase the usability of the CD. Extensive reference information (i.e. metadata) is also included to support the information system.

Database Catalogue

This folder contains 2 sub-folders for different types of databases: EndNote databases and Excel Searchable Tables. Each type of databases contain 2 or 3 files:

- 1) Spatial – which include the reference entries categorized under "Maps", usually GIS coverage.
- 2) Non-spatial – which include the reference entries that is not "Maps" (i.e. reports, books, conference proceedings, newspaper articles etc.); and
- 3) BISP collection – which include both spatial and non-spatial components, where applicable.

EndNote folder includes the databases in EndNote software format. The software is required in order to use this format. Trial version of the software is also available at <http://www.endnote.com/Eninfo.htm>. This is the format that is used by SoBI report for citations references.

The Excel Searchable Table includes the all information, which EndNote database contains, in a different format. Excel tables allow user to search the database easily by using built-in functions such as 'find,' 'sort,' or 'filter.' Tables are also saved in PDF format for viewing and printing of the database without the Microsoft Excel Software. The PDF files are formatted for 11x17" landscape paper.

It should again be noted that this database system is only a “work in progress”. The BISP team will add entries to the database until the end of the project. As well, it is recommended for future initiatives to input additional entries into the BISP catalogue system to utilize and enhance the existing information system.

GIS Atlas

GIS Atlas folder contains 3 sub folders: ArcExplorer, GIS Coverages, and Metadata. ArcExplorer folder contains executable file named ArcExplorer.exe, which will install the ArcExplorer software created by ESRI into your computer. ArcExplorer will allow you to view the GIS coverages contained in this CD, which is in ArcInfo 8 or in ArcView 3.1 shape file format. The ArcExplorer folder also contains the PDF format user guide for ArcExplorer software.

Folder named GIS Coverages contains the available GIS layers, which are divided into 2 sub-folders depending on its condition. The Working Collection includes the latest and most complete data that is available on Bowen Island. Metadata for those layers are defined and contained in Metadata folder. The format for the files that is in Working Collection is Projection UTM; Zone 10; Datum NAD83; Spheroid Clarke 1866, and in ArcInfo 8 format. It should be noted that the working collections still require updating and correction for accuracy; it is just the best available set at the given time. For a list of themes still requiring updates, refer to ‘future options’ in the corresponding metadata. The second folder named “Sub collection” contains themes that is likely to be useful in future GIS work but require further GIS technical work before meeting the standard of working collections. The text file enclosed in the folder describes the work required for those layers. Detail information about layers included in this collection is also given in the ‘Metadata’ folder. The archival collection of the GIS themes (file size 262Mb), which contains the rest of the layers that are outdated or superceded by another layer in the working folder, were not included in the CD as it is highly likely to be of little use for the general audiences. For technical audiences who would like to refer back to the older versions or incomplete versions, please contact BIFWMS for more information on the archival collections.

The third component contained in GIS Atlas folder is the Metadata folder. It contains metadata for the layers in the working collection and the sub collection. The entries are alphabetically organized by file names for easy references. ‘Other Txt File’ folder contains additional metadata files that originally came with the GIS layers we have obtained from other organizations, or text files for the layers which require additional explanation, decoding, or metadata.

Maps and Spatial Data

This section holds 3 subfolders: Map Print Files, Spatial Data, and Map Metadata. Sixteen maps created for the SoBI report are in PDF format and contained in Map Print Files folder. The maps are still in Draft format, and revisions are required and scheduled prior to the release of the SoBI report. Spatial Data folder contains Excel 6.0/95 tables with the results of spatial analysis. The analysis was performed using the layers in the working folder. The tables are also saved in PDF format. The additional metadata of the layers used for the analysis can be obtained from CD:\GIS Atlas\Metadata\ by referring to the filenames. Map Metadata folder

contains 31 pages of detailed reference information for the 16 maps included in the Map Print Files that will be cited in the State of Bowen Island Report. This Metadata is for the draft version of the map, and changes should be made when revisions of maps take place. It should be noted again that these maps and spatial data include errors, and should not be used for planning, recreational, or personal use. The purpose of these maps and data are to give broad perspectives about Bowen Island, and further refinements are required to be used directly in decision making processes.

Bowen Island Information System Report

This report is also contained in the CD under the folder named 'Bowen Island Information System Report.' The body of the report and the appendices are contained in separate folders. Each section is served in Word 6.0/95, Excel 6.0/95, and/or PDF format.

Data Gaps

As the information system provides a quick overview of the available information, a data gap analysis becomes easy. Moreover, as the team spend much time and work into figuring out the critical information required for the State of Bowen Island report, the data gaps became apparent. The BISP team is still continuously collecting non-spatial data to fill these gaps, and the State of Bowen Island will point out the data gaps we are facing. Thus, this section will only focus on the spatial data gaps.

Throughout this project, it was discovered that many GIS themes and spatial information that can be very useful for data analysis are still lacking from the collection. Fish and wildlife habitat and presence, groundwater data / location of aquifers, and location of septic fields are not currently available. These layers are important environmental factors that may be required to determine the health of ecosystems. Other critical environmental information that has spatial components is the area and location of impermeable surfaces (paved surfaces – roads and parking lots), water quality and quantity across the island, actual green space, and air quality data. Surface water layers such as streams and wetlands are critical for decision making processes regarding water resource and development, and more accurate mapping of these layers are encouraged. Detailed current conditions of farms (i.e. with attribute data including crop type, soil type etc.), or wind speed measured on island will also be useful if obtained (i.e. for determining wind power generation potential).

Another data gap of the GIS collection exist in demographics. Currently, cadastral layer () which include property information is not spatially analyzable due to errors and inconsistencies. However, having cleaned cadastral theme joined to the assessment role will be very beneficial since it allows spatial analysis on lots sizes and density, owners, and the use of the properties on the island. Cultural and social layers such as historical sites and social facilities can also be made from the cadastral layer. Location of the housing units and addresses, along with accurate roads and trail maps with proper names will also be valuable in terms of emergency preparedness of the residences and rescuers.

RECOMMENDATIONS

Database Catalogue

Currently, the database catalogue contains only the crucial information required by the State of Bowen Island Report, which covers a wide range of essential issues on Bowen Island. However, the wealth of information and knowledge on Bowen Island is immensely more than any one project can gather. By utilizing the database system throughout the project, we have recognized the importance of organization and the efficiencies that the catalogue system can provide. The use of database system is recommended for the community and future initiatives.

Maintaining one centralized community database is also recommended. The database should be accessible to the residents and government officials for research, inquiry, and learning as well as for increasing awareness. Also, community input should to be entered into the database to broaden the collection and to enhance the usability. A web-based information system may be a way to increase accessibility of the information. Expansion of the database into standard format that accommodates existing database may also enhance the information system capability. Funding is required for the maintenance of the information system, in order to keep the system quality controlled and updated.

GIS Atlas

In this project, a large amount of team's effort and resources were spent organizing the existing GIS data. To avoid the mis-organization and duplication of GIS data, one group or organization should ideally oversee the data collection and management. A community group such as BIFWIMS who is dedicated in collection new GIS data would make a great custodian. On the other hand, since Bowen Island is a municipality within the Islands Trust, the Islands Trust GIS department would remain the ultimate custodian of the GIS collection. In this case, a help from island community groups for data collection and data management on the island is required, as well as a system which allows better data sharing and exchange between the Islands Trust and the community groups.

The data sharing among individuals, organizations and government agencies is also suggested to efficiently increase the collective wealth of information on the island. Furthermore, the copy of data should be more accessible to community and interested parties, to increase community learning and awareness.

Digitization of maps that exist only in hardcopy is also encouraged to increase the spatial analysis capability. When the data is digitized, the new maps should include all relevant data in their attribute tables to make it more easily decipherable to future users. Efforts to provide new GIS spatial data (i.e. through GPS work) should also be encouraged and supported. The value of accurate mapping should be communicated to the residents of Bowen Island. Funding should be found, that would support the collection and the mapping of new data, and the overall management of the Island's GIS data. Other options on future updates for the specific layers are defined in the spatial database catalogue (Appendix 5).

Moreover, metadata is an important part of the GIS and should be kept all the time. The version of the data, sources of data, modification made, and projection and format of data, as

well as problems encountered and accuracy of the data should be noted and updated periodically. Using the information system is one possible way to keep track of metadata.

Maps and Spatial Data

The maps and spatial data require community revisions. When it is revised, metadata should be kept for the changes made and its data source. The community revision process will increase the accuracy of the map, awareness of the information, and increase the acceptability of the map among the community when released. Field assessments are also recommended to increase the accuracy of the maps and spatial data. Layers such as roads, existing trails, streams, and wetlands are few layers that would benefit from the field assessment and/or a use of GPS (Global Positioning System). In addition, point features such as well locations and weather station locations should be assessed by overlaying the layers with cadastre. The cadastre requires some adjustment before it is spatially analyzed (i.e. delete non-existing polygons (slits), and distinguish roads / private lots / public properties etc.), but the layer joined with assessment role will provide a very powerful tool for land use planning, social planning, environmental planning, and many other decision making processes.

The maps and spatial data contain errors. It is useful to describe Bowen Island in a general manner, but it may not be suitable for other purposes such as personal planning or recreational use. The official institutions should be contacted for such requirements. The accuracy of the maps and spatial data can be increased, but for now, it remains as an approximate representation of the accrual structure.

CONCLUSIONS

Bowen Island Sustainability Project has created an information system for Bowen Island. The system includes a database catalogue, GIS atlas, maps & spatial data, and this summary report. With a generous support from the sponsors (Real Estate Foundation, Bowen Island Municipality, Geological Survey of Canada, and Capilano College), the community, and other interest groups, we were able to move towards 'sustainability' by making the available information more useable and accessible.

The first deliverable of Bowen Sustainability Project is this report and the CD containing the information system developed, which will be accompanied by the 'State of Bowen Island' report. This project has compiled 165 critical references into database catalogue, 50 working GIS layers, 16 maps & 25 tables of spatially analyzed data, and this guiding report with 12 appendices. This extensive information resource is now available to the Bowen Island community members, government officials, and interest groups, which represents a strong starting point for future sustainability initiatives and the community decision-making processes.

Significant amount of effort, resource, time, information, knowledge, and cooperation has put into this project, and the product has a great potential to support the Municipality of Bowen Island, local businesses and residents, community groups and other relevant government agencies in evaluating, embracing and implementing activities leading toward a more healthy, sustainable local community on Bowen Island. The project team hopes to pass this great opportunity and the knowledge gained through the project, to the future initiatives.

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Appendix 1

Table of Reference Types for BISP Database using EndNote

The table shows the types of database entries used to organize the reference materials in Bowen Island Sustainability Project (BISP) – Database Catalogue within the Bowen Island Information System. The Reference Types of the EndNote Database was modified by BISP, to meet the need for the various types of materials and the use in the project. The original Reference type was built-in to the EndNote software (created by Niles Software Inc., now owned by ISI ResearchSoft).

2 pages

Table of Reference Types for BISP Database using EndNote

Modified on Oct 14, 2000

Version 4

GENERIC	Rows updated	REFER CODE	JOURNAL ARTICLE	BOOK	BOOK SECTION	EDITED BOOK	MAGAZINE ARTICLE	NEWSPAPER ARTICLE	CONFERENCE PROCEEDINGS
Author		%A	Author	Author	Author	Editor	Author	Reporter	Author
Year		%D	Year	Year	Year	Year	Year	Year	Year of Conf.
Title		%T	Title	Title	Title	Title	Title	Title	Title
Secondary Author	Modified by	%E		Series Editor	Editor	Series Editor			Editor
Secondary Title	Filename.ext	%B	Journal	Series Title	Book Title	Series Title	Magazine	Newspaper	Conf. Name
Place Published		%C		City	City	City		City	Conf. Location
Publisher		%I		Publisher	Publisher	Publisher			Publisher
Volume		%V	Volume	Volume	Volume	Volume	Volume		Volume
Number of Volumes		%6 *		Number of Volumes	Number of Volumes	Number of Volumes			Number of Volumes
Number		%N	Issue				Issue Number		
Pages	Software / Version	%P	Pages	Number of Pages	Pages	Number of Pages	Pages	Pages	Pages
Tertiary Author		%Y			Series Editor				Series Editor
Tertiary Title	Resolution	%S			Series Title				Series Title
Edition		%7 *		Edition	Edition	Edition			Edition
Date		%8 *					Date	Issue Date	Date
Type of Work		%9 *							
Subsidiary Author		%? *		Translator	Translator				
Alternate Title	Future Options	%J	Alternate Journal						
ISBN/ISSN	Accuracy	%@ *							
Call Number		%L	Call Number	Call Number	Call Number				Call Number
Accession Number	Scale	%M							
Custom 1	Original Source	%1 *							
Custom 2	Custodian	%2 *	Custodian	Custodian	Custodian	Custodian	Custodian	Custodian	Custodian
Custom 3	Contact Person	%3 *	Contact Person	Contact Person	Contact Person	Contact Person	Contact Person	Contact Person	Contact Person
Custom 4	Date Entered	%4 *	Date Entered	Date Entered	Date Entered	Date Entered	Date Entered	Date Entered	Date Entered
Label	Projection	%F							
Keywords		%K	Keywords	Keywords	Keywords	Keywords	Keywords	Keywords	Keywords
Abstract		%X	Abstract	Abstract	Abstract	Abstract	Abstract	Abstract	Abstract
Notes		%O	Notes	Notes	Notes	Notes	Notes	Notes	Notes
URL		%U	URL	URL	URL	URL	URL	URL	URL

***Cells Modified from predefined fields

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Appendix 2

Primary Table of Contents for the State of Bowen Island Report

This appendix includes a table of contents for the State of Bowen Island Report, primarily created at the beginning of the project on July 25, 2000 by Bowen Island Sustainability Project. This list was used to build the research strategy and prioritize the specific needs of the project. The content has been modified since. The categories with asterisk * have priorities in data collection.

5 pages

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Appendix 3

BISP – Reference Database Management: How to Fill in the Reference Fields using EndNote

This document includes a brief direction for using EndNote database set-up by the Bowen Island Sustainability Team. Tutorial for how to use the software was given to the users (i.e. BISP team members), and the EndNote reference guide book was also available for the team. The information was cited from EndNote guidebook:

Niles Software Inc. 1998. *EndNote: Bibliography Made Easy*. Niles Software Inc. EndNote Company: California.

More information also available online at <http://www.endnote.com/Eninfo.htm>.

3 pages

How to Fill in the Reference Fields using EndNote

1. Start EndNote – It should start with default library folder which is set to BISP
2. When you are adding reference, Click **References** from the tool bar
3. Click **New** – this would give you a pop up window which you can enter the data
4. Choose Reference Type from **pull down menu** in new reference window
5. Fill in each field where applicable
6. **** DO NOT CLICK ENTER**, except in the **AUTHOR** field with multiple authors– if there is more than one entry, separate them with **semicolon “;”**

Author & Editor Names:

- Name must be entered **one per line**
- Click **Enter** at the end of each names to go to next line to enter another name
- If name is long to fit on a single line, just let it wrap to the next line as you type it
- Enter the name with the **last name followed by a comma and the first name:**
i.e. Lastname, First Middle
Smith, Johanna Matera
- Corporate authors – put **comma** after the name
i.e. Geological Survey of Canada,
Apple Computer Inc.,
- Name with titles – Last name, First name, title
Smith, Alfred, Jr.
- A **period** after Initials are required

Year:

- Type publication year if applicable, as in *1994*
- When appropriate type *in press*, or *in preparation*, or some other notation

Titles:

- Enter **without any period** or any other punctuation at the end
- **Do not type Enter** if long – let it wrap to the next line
- **Capitalize** the first letter of each words except prepositions (*in, at, of* etc.)

Pages:

- Enter **complete range** (1442-1449) or **abbreviated** (1442-9) ranges
- **Do not enter commas** for thousands
- “number of pages” ask for the **total page** number of the document

Date:

- Type as you would like to see in your reference
- Or **month date, year** --- *July 24, 2000*

Filename.ext

- If the material is digital specify the filename and its extension. (i.e. streams.e00; BISP.doc; Money.xls)
- If there are more than one files that make up the material you are referring, separate them using **semicolon ‘;’**

Original Source:

- **Original source** for the map, communication, image or software need to be defined if it came from a source other than the physical item being described (i.e. it is derived product or value-added product)
- Enter **Author, Title, Year; Author, Title, Year** (2nd source); etc...
- Give more detailed description in **Notes**
- Or refer to **another entry** in the library

Custodian:

- Custodian is a group, organization, or individual responsible for **maintenance of the material**.

Contact Person:

- Contact Person is the person or group who has the **physical copy of the material**
- Make sure the contact person's **contact information** is in the **Time & Chaos** BISP file, every time you enter the new contact name --- these two files will be connected at the end.

Date Entered:

- Type the day you enter the reference information by **Month Day, Year** (i.e. *July 26, 2000*).

Projection:

- Enter the complete projection (i.e. UTM, NAD 83, Zone 10) of the FINAL PRODUCT (not the original). Original Projection can be entered in Notes or keep it with other logs & metadata (i.e with ArcInfo or Shape files)

Scale:

- Type Scale DENOMINATOR or the material (e.g. 1:10,000 scale map would contain 10000 here)

Type of Medium:

- The Electronic Source Requires the field called Type of Medium. Type what form the electronic source is in (i.e. CD-Rom, Internet Discussion Group, etc.)

Keywords:

- Select keyword from **TITLE** and **DESCRIPTION** (you will type this in next raw called abstract) or look in **abstract & table of content** of the document

- Enter keywords that describes the **subject areas** that are covered by the material
- Also enter keywords to describe the **area the material cover** if the material covers larger or smaller context than the entire Bowen Island.
- Also, select the **section from SoBI report outline** where the material will be referenced
- **DO NOT CLICK ENTER**, separate each keywords by **semicolon ‘;’**

Abstract:

- If the material includes abstract, **photocopy the abstract**. Write the **reference number** on it and **file** it in the abstract binder
- Type **few-sentence descriptions** of the material, rather than typing entire abstract
- Describe what it is (specify if Database)
- Specify **Software and its version** if the material is in digital form
- Describe **what the material is useful for**, and **how it can be used**

Notes:

- Type **anything that does not fit in given fields**, which may be important to track
- Give detail **description of the original source** if not referenced to another entry
- You can also use this field to track any **logistics or day-to-day operational notes**

Appendix 4

Searchable Excel Table for Non-Spatial Entries (Reports, Books, Newspaper Articles, and Conference Proceedings)

This table shows the database catalogue for all the Non-spatial (no maps) reference materials, created by Bowen Island Sustainability Project. The table is created in Microsoft Excel for broad audiences & its searchability. There are 115 entries at this time.

4 pages (11x17")

#	Ref	Author	Year	Title	Editor	City	Organization	Volume	Number of Pages	Version	Date	Type	Alternate Title	Report #	Call #	Custodian	Contact Person	Date Entered	Keywords	Abstract	Notes
106	Report	A.J. Whitehead and Associates;Dayton & Knight Ltd.	1998	Cove Bay Water System Long Range Plan (1997)							Mar-98					Islands Trust Library	Brodie Porter	22-Sep-00	Cove Bay; Water; Human land use planning		
115	Report	A.J. Whitehead and Associates Ltd.; Dayton and Knight Ltd.	1998	Cove Bay Water System Long Range Plan (1997)			Greater Vancouver Regional District			Draft	Feb-98						Sandi Laudrum	Sep-00	water, supply, storage, hydrology, environment, quality	This extensive and comprehensive plan provides an inventory and description of the water resources used by Cowan Point. The report defines the characteristics of the water system, reviews the water supply requirements of the area, provides a description of Grafton Lake hydrology and storage requirements, notes the environmental impacts of storage requirements, discusses several issues related to water quality, discusses water use efficiency in the area, and introduces a plan for water use.	
29	Report	James A. Alley; Alan J. Ferguson	1976	Recreational Boating in Howe Sound: A Data Base for Regional Planning	The Islands Trust; Ministry of Municipal Affairs and Housing	Victoria			83		Dec-76					Bowen Island Municipality (Cristina Rucci)	Bowen Island Municipality (Cristina Rucci)	10-Aug-00	Recreation; Boating; Howe Sound	A good guide to the water ways of Howe Sound and the hazards of the water and wildlife.	
47	Generic	Anonymous		Snug Cove Task Force Material Distributed												Sue Ellen Fast	Sue Ellen Fast	18-Sep-00	teaching aid; children; education	A compilation of studies and initiatives that deal with Snug Cove. A MUST GO THROUGH for the report.	
72	Report	Anonymous		IRB Integrated Resource Package for Bowen Island												Sue Ellen Fast	Sue Ellen Fast	18-Sep-00	teaching aid; children; education	A good teaching aid for young school groups or bas knowledge	
113	Report	Anonymous		Beware and Prepare Community Planner; working toward a Fire Safe Community							1995					Islands Trust Library	Brodie Porter	22-Sep-00	fire; fire safety; human landuse planning	This document is designed to help communities towards being fire safe.	
116	Report	Anonymous	1978	Snug Cove Plan					18		Oct-78							25-Sep-00	Snug Cove, land use, landscape, policies, implementation	This report provides an inventory of Snug Cove including an analysis of the physical landscape, general policies regarding development, land use policies, and implementation. Discussed in the plan is the relationship of this plan to the Official Community Plan. The document provides an overview of many of the environmental and socio-economic issues facing the Snug Cove area.	
114	Report	Anonymous	1990	Report on Bowen Island Growth							22-May-90					Islands trust Library	Brodie Porter	25-Sep-00	growth; Statistics		
83	Report	Anonymous	1992	Bowen OCP Public Hearing Binder B Vol. 1 Trust Office					1		26-Sep-92					Islands Trust Library	Brodie Porter	21-Sep-00	OCP; OCP Steering Committee; Task Force;	Contains task force reports on parks and rec, transportation, forestry, water/waste, residential, commercial/industrial, agriculture, community services and facilities, environment, heritage	
81	Report	Anonymous	1993	Background Information to Initial Draft OCP: Binder B					2		March-May 1993					Islands Trust Library	Brodie Porter	21-Sep-00	OCP; background; public submissions; OCP steering committee; APC		
80	Report	Anonymous	1995	Binder Containing Bowen Island OCP Original Agency & Public submissions in reference to Bylaw no. 139 & Draft 2- April/95		Bowen Island					Apr-95					Islands Trust Library	Brodie Porter	21-Sep-00	OCP; Bowen Island	A compilation of Public submissions in relation to OCP issues, Bylaw no. 139 Draft 2 April/ 95	
82	Report	Anonymous	1995	Bowen Island Public Hearing Bowen Island Local Trust Committee proposed Bylaw no. 139 Relevant Background Information Reference Binder A							2-Dec-95		Binder A			Islands Trust Library	Brodie Porter	21-Sep-00	Bylaw 139; Binder A	Contains Proposed Bylaw 139, referral agency responses, Public submissions and Background information to initial Draft OCP.	
117	Report	Anonymous	1997	Development Proposal. Cates Hill					16		30-Sep-97							25-Sep-00	development, Cates Hill, site, official community plan	This report is a basic feasibility study of different land use proposals in the Cates Hill area. The report builds upon previous studies and provides different scenarios for development on Cates Hill.	
48	Report	Anonymous	1999	Overview of Local Community Park Management on Bowen Island		Burnaby, BC	Greater Vancouver Regional District		file 811		14-Jun-99							26-Jul-00	GVRD; Bowen Island Parks; parks; Crippen; bylaw 905, 1998	This report outline the agreement between Bowen Island and GVRD in park Management including bylaws and budgets.	
69	Report	Archaeological Branch Ministry of Municipal Affairs	1990	Archaeological Sites on Bowen Island	Ministry of Municipal Affairs		Archaeological Branch Ministry of Municipal Affairs		6		5-Mar-90					Sue Ellen Fast	Sue Ellen Fast	18-Sep-00	Archaeology; Squamish; Native	A listing of sites and what is found at the sites and an accompanying map	
49	Book	Doreen Armitage	1997	Around the Sound; A History of Howe Sound-Whistler			Harbour Publishing									Friends of the library?	Librarian	27-Jul-00	history; settlers; Howe Sound; Early Settlement	A good historical account of the settlement history of Bowen and the rest of Howe Sound.	
78	Report	Arthur Erickson Architects Inc.	1989	Cowan Point Resort Master Plan		Vancouver					Dec-89					Islands Trust Library	Brodie Porter	21-Sep-00	Cowan Point; Land use planning; development	This Master Plan Report documents the background, rationale and overall planning for the proposed Cowan Point Resort on Bowen Island, not far from the City of Vancouver.	
39	Report	Allan F.J. Antibise; Jessie Hill	1993	Governance and sustainability in the Georgia Basin							Apr-93					Bowen Island Municipality (Cristina Rucci)	Bowen Island Municipality (Cristina Rucci)	10-Aug-00	Georgia Basin; Sustainability		
118	Report	Jim Bailey	2000	Directed Studies: Considering Sustainability and the Use of Indicators			School of Community and Regional Planning, UBC Stanley Associates Engineering Ltd.		25		Jul-00	directed study					Jim Bailey	Sep-00	indicators, sustainability	This paper is in support of Jim's planning project at SCARP. It draws on many useful sources related to sustainability indicators that could be applied to Bowen Island. The paper will discuss the concept of sustainability within a context of economic restructuring. At the heart of this discussion are several key components: 1. Sustainability is difficult to define (like truth and justice), and discussion and community input are essential in order to move towards a "more sustainable future." The community in question needs to define sustainability according to their own values. It is the contention of this paper that policies that support the concept of "strong sustainability" are more desirable in the long run for healthy communities. 2. There needs to be a mechanism to determine how well communities are achieving the move towards a more sustainable future. Ecological and socio-economic indicators can be applied to track progress towards sustainability. This paper will provide a basic typology of indicators that a community could use to gauge	
88	Report	R. Barth; J. Hodgson	1991	Cowan Point Hydrology Study Bowen Island							May-91					Islands Trust Library	Brodie Porter	21-Sep-00	Water; Cowan Point; Hydrology		
46	Report	BC Ferries	1995	Identification of issues and Establishment of Advisory Committee for Regional Strategic Planning							4-Mar-95					Bowen Island Municipality (Cristina Rucci)	Bowen Island Municipality (Cristina Rucci)	10-Aug-00	Ferries; Transportation;		
140	Book	Simon Bell; Stephen Morse	1999	Sustainability Indicators - Measuring the Immeasurable			Earth scan		175	1				1-85383-498-X	GE 140 B45 1999			Sep-00	sustainability, indicators, development, system quality, application	This book tackles the idea of sustainability, introducing the different ideas and values associated with the commonly used term. The book addresses how sustainability can be measured via the review of the development and value of different indicators. The authors discuss the advantages of taking a holistic and more qualitative approach rather than focusing on strictly quantitative measures which may be inappropriate.	
90	Report	D.R. Benn	1975	Summary Report Natural Areas Inventory Islands of the Strait of Georgia, Howe Sound and Haro Strait, British Columbia			Nature Conservancy of Canada- Islands Trust		20		Dec-75					Islands Trust Library	Brodie Porter	22-Sep-00	Vegetation, natural areas, biology	This is a collaboration of Natural area inventory for all the Islands	
30	Report	D.R. Benn; L. Jones	1978	Outdoor Recreation Features Mapping	The Islands Trust		The Islands Trust		58		Dec-78					Cristina Rucci	Cristina Rucci	10-Aug-00	Outdoor; Recreation; Maps; mapping	Good little maps of the islands and the natural recreation	
99	Report	Iain T. Benson; John Pearce; Rose Marie Shatwell	1992	Home Occupations on Bowen Island Bowen Island Advisory Planning Commission Sub-Committee report on Home Occupation Regulations			Advisory Planning Commission		17							Islands Trust Library	Brodie Porter	22-Sep-00	Home Occupation; APC; Advisory Planning Commission; regulations	This report is a critical analysis of the Bylaws controlling Home Occupation.	
83	Report	D.G. Blair-Whitehead; Will Husby	1995	The Howe Sound Watershed Stewardship Manual	Emily McCullum Cynthia Nicholson	Bowen Island				Pilot Edition	May-95					Islands Trust Library	Brodie Porter	22-Sep-00	Watershed; issues; stewardship; wetlands; forests; watershed stewardship; zoning; conservation; fisheries act; water act; waste management act; pesticide control act; Health act; integrated Planning	This is a good compilation of addressing issues that are present in watersheds used for water consumption	
50	Report	John Block	1978	Bowen Island: A Resource Analysis for Land Use Planning		Victoria	The Island Trust; Ministry of Municipal Affairs and Housing	Volume One - Summary of Findings	97		April	Published Report	Block Report			Island Trust	Brodie Porter	21-Jul-00	Landuse; Train; Vegetation; Aquatics; Wildlife; Recreation; Visual Analysis	The overall study provides information which may be used in formulating general landuse concepts and policies. Gives Excellent overview of biophysical & landuse of Bowen Island.	Volume One is more readable & understandable to general public while Volume Two contains the technical data which Volume One is based on.
51	Report	John Block	1978	Bowen Island: A Resource Analysis for Land Use Planning		Victoria	The Island Trust; Ministry of Municipal Affairs and Housing	Volume Two - Supporting Data	127		April	Published Report	Block Report 2			Island Trust	Brodie Porter	21-Jul-00	Landuse;Terrain;Vegetation;Aquatics;Wildlife;Recreation;Visual Analysis	The overall study provides information which may be used in formulating general landuse concepts and policies. Gives Excellent overview of biophysical & landuse of Bowen Island.	Volume One is more readable & understandable to general public while Volume Two contains the technical data which Volume One is based on.
119	Report	Bowen Community Forum	1992	Bowen Community Forum			Bowen Community Forum		8		Mar-92							25-Sep-00	community, values, objectives, environment, growth	This report, provided in brochure format, outlines the ideas and mandate of the Bowen Community Forum. The forum, concerned with development pressures on Bowen, was founded to actively plan, assist, and participate in building a vibrant and unique community on Bowen Island. The forum is charged with initiating action to address current concerns and promote community involvement in long range planning. They list "actions" for addressing various concerns on the Island.	
87	Report	Bowen Island Advisory Planning Commission	1995	Report On The Draft Official Community Plan		Bowen Island					Jan-95					Islands Trust Library	Brodie Porter	September 21 2000	OCP; APC; Advisory Planning Commission		
120	Newsape r Article	Bowen Island Alliance Association	1993	Election Issue		Bowen Island			4		Nov-93							25-Sep-00	election, municipality, power	This newspaper outlines many of the issues important to Bowen Island. Of particular use is page three that outlines the various powers of different agencies on Bowen Island, including the duties of the GVRD, Bowen Island Trust Council, and local bodies. This paper is useful in terms of providing a glimpse of how governance has evolved in recent history.	
121	Report	British Columbia Round Table on the Environment and the Economy	1993	Strategic Directions For Community Sustainability					160		Jun-93							Sep-00	sustainability, strategic planning, community, environment	Strategic Directions for Community Sustainability is one element of the sustainability strategy for BC developed by the roundtable. The report recognizes that the transformation to a more sustainable future must occur at the local level, with the personal involvement of all British Columbians. The report argues that a balance needs to exist between economic viability, social equity, and ecological health in order to achieve a more sustainable future. The report makes recommendations on how to best achieve this balance.	

#	Ref	Author	Year	Title	Editor	City	Organization	Volume	Number of Pages	Version	Date	Type	Alternate Title	Report #	Call #	Custodian	Contact Person	Date Entered	Keywords	Abstract	Notes	
105	Report	Bob Burgess	1988	A Program for the preparation of a Village Plan for Snug Cove						Final Report	28-Mar-88					Islands Trust Library	Brodie Porter	22-Sep-00	human landuse planning; Snug Cove;			
104	Report	Bob Burgess	1990	Snug Cove Plan Background Report		Bowen Island	Comain Management Limited,		25	Draft #1	13-Aug-90					Islands Trust Library	Brodie Porter	22-Sep-00	population; ferry usage; commercial space; planning	This report includes estimates of Island Population growth, ferry usage and visitors to Bowen Island; Existing commercial space; space requirements for Snug Cove Village Planning; Analysis of Existing Residential Areas in Snug Cove Village Planning Area		
109	Report	Bob Burgess	1991	A House Numbering System For Bowen Island							Aug-91					Islands Trust Library	Brodie Porter	22-Sep-00	house numbering; human landuse planning	This study has been undertaken to examine alternative numbering systems; select one appropriate to the particular needs of Bowen Island; outline how it could be set up and administered, and provide preliminary estimates of the time and costs involved.		
52	Report	Busby Bridger Architects	1991	The development of Cape Roger Curtis: A Design with Nature							Aug-91					Julian Dunster	Julian Dunster	26-Jul-00	Cape Roger Curtis; development; maps	This describes bothe present physical aspects and how they could be used to develop the area.		
79	Report	Busby Bridger Architects	1991	The Development of Cape Roger Curtis A design with Nature							Sep-91					Islands Trust Library	Brodie Porter	21-Sep-00	Cape Roger Curtis; development; Land use plan	This report was prepared by Busby Bridger Architects, overall site planning consultants for the project, on behalf of the Burke and Frith families, owners of District Lot 1548, and Plan 19050, Lot 156, District Lot 492. The proposed development plan outlined in this report accurately reflects the philosophy and intentions of the owners, and is the product of a close collaboration between their representatives ad the consultant team.		
76	Report	Busby Bridger Architects	1992	The Development of Cape Roger Curtis: A design with Nature					47		Jan-92					Islands Trust Library	Brodie Porter	21-Sep-00	Cape Roger Curtis; development; land use planning	This report was prepared by Busby Bridger Architects, overall site planning consultants for the project, on behalf of the Burke and Frith families, owners of District Lot 1548, and Plan 19050, Lot 156, District Lot 492. The proposed development plan outlined in this report accurately reflects the philosophy and intentions of the owners, and is the product of a close collaboration between their representatives ad the consultant team. (3 copies)		
77	Report	Busby Bridger Architects Ltd.	1991	Appendix to: The Development of Cape Roger Curtis A Design with Nature					83		Sep-91					Islands Trust Library	Brodie Porter	21-Sep-00	Cape Roger Curtis; Development	This contains resource and background information which form, in part, the basis for the Cape Roger Curtis Development Plan. (2 copies)		
123	Newspape r Article	Ross Carter	1994	Joe Malkin - Bowen Pioneer Activist		Bowen Island			1		Summer 1994							Sep-00	history, planning, parks, Crippen Park	This article provides a glimpse of Joe Malkin, a pioneer activist on Bowen Island. The article provides an interesting historical glimpse into planning process and action during Bowen's early days. It provides a basic assessment of how many of Bowen's parks came to be.		
45	Report	Catherine Berris Associates Inc	1987	Biophysical Review: Snug cove Area of Crippen Regional Park												Bowen Island Municipality (Cristina Rucci)	Bowen Island Municipality (Cristina Rucci)	10-Aug-00				
37	Report	Catherine Berris Associates Inc.	1999	Comprehensive Development Plan Environmental Review Bowen Island							Aug-99					Bowen Island Municipality (Cristina Rucci)	Bowen Island Municipality (Cristina Rucci)	10-Aug-00	Development plan; Environmental review;			
124	Report	Terrestrial Resources - Enviro Pacific Consulting and Aquatic Biology Resources - Dillon Consulting Limited Catherine Berris Associates Inc.	1999	Cowan Point Lands Comprehensive Development Plan Correspondence, L. Clarkson, Public Health Inspector to R. Rich, chairman, Islands Trust, November 10, 1982; Correspondence, James G. Lugsdin, Director and Medical Health Officer, Coast-Garibaldi Health Unit, October 10, 1985					62		Aug-99							Sep-00	environment, terrestrial resources, aquatic resources, visual resources	This report provides an extensive inventory of the terrestrial, aquatic, and visual resources in the Cowan Point region. The report's purpose is to undertake an environmental review of the proposed project on the resources of Cowan Point.		
95	Report	L. Clarkson; James G. Lugsdin	1982; 1985	Correspondence, L. Clarkson, Public Health Inspector to R. Rich, chairman, Islands Trust, November 10, 1982; Correspondence, James G. Lugsdin, Director and Medical Health Officer, Coast-Garibaldi Health Unit, October 10, 1985							November 10, 1982; October 10, 1985					Islands Trust Library	Brodie Porter	22-Sep-00	Sewage; Snug Cove	Contains (in this package) a contour map of Snug Cove, Soils of Bowen Island, Rainfall data, temperature and precipitation data from 1941-1970, Soil Temperature from Block, foundation materials and drainage, Solution to Buoyant discharge problems with ambient currents and vertical gradients for 30M deep outfall (Q=100M3/d).		
101	Report	Bowen Island Special Committee	1986	Report of the Bowen Island Special Committee							Nov-86					Islands Trust Library	Brodie Porter	22-Sep-00	Special Committee; governance; Bowen Island; GVRD	This is a review of the local government on Bowen Island		
53	Report	Michael Copland; Trish MacKay; Jamie Fennell	1990	Bowen Island: Options for Use and Associated Impacts on the Provincial Forest (Crown) Lands		Bowen Island	Students of the Natural Resource Management Class 1989-1990, British Columbia Institute of Technology		192		1-May-90					Julian Dunster; Islands Trust Library	Julian Dunster; Brodie Porter	26-Jul-00	Crown Land; forest; forest uses; Bowen Island; timber management; recreation; watershed; watershed reserve	This Report critically assesses the crown forests of Bowen Island and the most environmentally friendly way to use them.		
42	Report	Dayton and Knight LTD	1992	Snug Cove Village Liquid Waste Management Plan		west Vancouver					Nov-92					Bowen Island Municipality (Cristina Rucci)	Bowen Island Municipality (Cristina Rucci)	10-Aug-00	Waste			
84	Report	Dayton and Knight Ltd.	1992	Greater Vancouver Regional District Snug Cove Village Liquid Waste Management Plan		West Vancouver		Draft 2		Draft 2	Nov-92					Islands Trust Library	Brodie Porter	21-Sep-00	Waste Management; Snug Cove; GVRD;			
73	Map	Dayton Knight Associates		Distribution of Bowen Island Lots and Population												Sue Ellen Fast	Sue Ellen Fast	18-Sep-00	population growth			
43	Report	Dayton Knight LTD	1993	Snug Cove sewage Management Committee		West Vancouver					Dec-93					Bowen Island Municipality (Cristina Rucci)	Bowen Island Municipality (Cristina Rucci)	10-Aug-00	Sewage; waste			
54	Report	Craig Dixon; Chris Kemble	1993	A Community GIS for land use planning and environmental decision making on Bowen Island		Bowen Island			40		23-May-93					Julian Dunster	Julian Dunster	26-Jul-00	GIS; Bowen Island; Map; contour map; terrain; vegetation; aquatic; gravel; glacial	This report is a first stage in the GIS implementation process and forms a set of data and tools and recommendations which will allow exploration and familiarization with GIS.		
112	Report	Environment Canada	1992	Howe Sound Watershed Environmental Science Workshops and Public Meetings							Feb-92					Islands Trust Library	Brodie Porter	22-Sep-00	Watershed Management; water quality			
92	Report	Environment Task Force	1993	Toward Harmony with our Environment Report of the Environmental Task Force			Environmental Task Force				7-Jul-93					Islands Trust Library	Brodie Porter	22-Sep-00	Environment; OCP;	This Report presents the findings and recommendations of the Environmental Task Force for the review of the Bowen Island Official Community Plan (OCP). This task force was given the mandate to review the current OCP and recommend changes to the goals, objectives and policies with respect to the environment.		
125	Report	Fraser Basin Council	1997	Charter for Sustainability		Vancouver	Fraser Basin Council		24		27-Feb-97						Malcolm Smith (Fraser Basin Council)		Sep-00	sustainability, ecosystems, communities, decision making	The charter is a good faith agreement among Fraser Basin residents and organizations seeking to work towards social, economic, and environmental sustainability. The charter outlines principles and goals that will lead to a better future. It is not a legally binding document, rather, it serves a common vision for a more sustainable future.	
126	Report	Fraser Basin Council	2000	A Preliminary Framework for the Development of Sustainability Indicators for the Fraser Basin			Fraser Basin Council		21		12-Jun-00						Malcolm Smith		Sep-00	data sources, indicators, sustainability	This report is an initial step towards selecting indicators and setting benchmarks that address the direction and goals outlined in the Charter for Sustainability. The indicators are examples used to stimulate further discussion on the topic of sustainability. The report outlines key data sources needed to support indicators and contains a list of relevant sources about indicators and indicator programs.	
55	Report	G.E. Briggs and Associates Inc.	1998	Islands Trust Forest Sector Profile Summary Report		Victoria, BC	Islands Trust, Trust Area Services				Mar-98		Profile of Forest Sector Activity in the Trust Area Including Value- Added Opportunities and Implementati on Plan			Julian Dunster	Julian Dunster	26-Jul-00	Forest; Forest Renewal; Management; Land species; age class; ownership	This report breaks down the forestry sector in terms of individual islands		
98	Report	Martin B. Gebauer	1994	Bald Eagle (Haliaeetus leucocephalus) nest site locations in the Howe Sound/ Whistler, Sunshine Coast and Powell River areas in 1993: Steps towards a conservation strategy.					64	Draft	Jan-94					Islands Trust Library	Brodie Porter	22-Sep-00	Bald Eagle; nesting; birds; conservation; biology	This report includes data on the status and nest site location of bald eagles (Haliaeetus leucocephalus) in the Howe Sound/ Whistler, sunshine Coast and Powell River areas of the Lower Mainland Region of British Columbia.		
107	Report	Eric Sherlock Gilles Cyrenne	1990	ALR Sub-Committee Report to Bowen Island A.P.R.												Islands Trust Library	Brodie Porter	22-Sep-00	ALR; APC; agriculture	The sub-committee's mandate is to do an initial assessment of the Agricultural Land Reserve on Bowen Island and to solicit information from residents and land owners affected by ALR designation.		
33	Report	Greater Vancouver Regional District	1986	Report of the Bowen Island Special committee					13		Nov-86					Bowen Island Municipality (Cristina Rucci)	Bowen Island Municipality (Cristina Rucci)	10-Aug-00	Snug Cove			
127	Conference Proceedings	Greater Vancouver Regional District	1992	Shaping Our Communities: Critical Choices	GVRD Development Services Department	Richmond	GVRD		57		28-Nov-92								Sep-00	future, green zone, transportation, social needs, community	This report outlines the considerations and assumptions about the Greater Vancouver Regional District and the appropriate planning mechanism to deal with that future. The report discusses the challenges faced by the region as population grows. Key considerations are the linkages between land use and transportation and the social needs and values of people in the region. The paper discusses a growth management approach to addressing change in the region.	
56	Conference Proceedings	Greater Vancouver Regional District	1997	The Green Zone Priorities for Tomorrow Conference Workbook 1997					94							Municipality of Bowen Island	Cathy Lalonde	1-Aug-00	Green Zone; history; Farming; contacts	Good Green Zone Background and base info.		

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57	Report	Greater Vancouver Regional District	1997	The Green Zone Priorities for Tomorrow Conference Compendium of Green Zone Initiatives	Greater Vancouver Regional District				153		1997					Municipality of Bowen Island	Cathy Lalonde	1-Aug-00	GVRD; Green Zone	This a good summary of past initiatives performed by the Green Zone.	
75	Report	Hancock Nicolson Tamaki Architects Inc.; Pacific Landplan Landscape Architects; Topflyte Golf course Design; Brown Erdman & Associates Ltd; Dayton Knight Civil Engineers	1989	Rezoning Application for the Comprehensive Development of D.L. 489, Cates Hill, Bowen Island British Columbia				2			10-May-89					Islands Trust Library	Brodie Porter	21-Sep-00	zoning; golf course; pictures;	A study done in the rezoning application for a golf course	
70	Report	Valerie Hignett; Don Benn	1992	Chilliwack District Recreation Inventory Update recreation Inventory and Preliminary Landscape Assessment for: Bowen Island Harrison Lake Drainage Assessment for: Bowen Island Harrison Lake Drainage Chelhalis River Drainage Lower East Stave River Drainage	Juan de Fuca Environmental Consultants		Ministry of Forests Chilliwack Forest District				Jan-92					Sue Ellen Fast	Sue Ellen Fast	18-Sep-00	Chilliwack; recreation		
58	Report	H.E. Hirvonen	1976	Bowen Island A Landscape Analysis	Canadian Forestry Service	Victoria British Columbia	Department of the Environment		29		Mar-76					Bowen Island Municipality (Cristina Rucci)	Bowen Island Municipality (Cristina Rucci)	26-Jul-00	Hirvonen; Landscape Units; Watershed; coastline; vegetation; physiography and soils	This report describes all the natural features of the island, animal, geological and plant features are all included.	
59	Book	Irene Howard	1973	Bowen Island 1872-1972		Victoria BC	Morris Printing									Library	Librarian, Bowen Island Library	27-Jul-00	history; Settlement Bowen Island; Present; Historic maps; maps	This book gives us a good history and lead into the present (1972) situation.	
128	Report	Howe Sound Round Table	1995	Towards New Forms of Water Resources and Aquatic Habitat Management					35		Mar-95							Sep-00	sustainability, water management, stakeholders, resource management, partnerships	The report discusses the concept of sustainability, how it relates to the Howe Sound bioregion, and the implications for management at a regional level. The report outlines the state of aquatic resources in the Sound and then makes several management recommendations to support the environmental health of the area. Recommendations focus on building knowledge in the region and developing the appropriate institutional partnerships to move towards a more sustainable future.	
129	Report	Howe Sound Round Table	1996	Howe Sound 20/20 Issues and Initiatives in Growth and Sustainability for Howe Sound: A Watershed-Wide Perspective					73		Feb-96							Sep-00	growth, sustainability, action, research	This report is intended to identify and outline the issues in the Howe Sound Region and generate discussion and develop the basis for future actions. The report draws on a wide variety of sources (via local interviews) to discuss the direction for future action in the region. The report sets the context for considering issues and trends (historical overview), provides an overview of the Sound's jurisdictional frameworks and governance systems, examines the issues in the context of several categories, summarizes research findings and reveals three emerging concerns, and makes policy recommendations.	
130	Report	Islands Trust	1978	Land of the Trust Islands - A Review of Subdivision, Housing, and Ownership					36		Apr-78							25-Sep-00	development, parcel size, ownership, residents, seasonal dwellings	This study was designed to examine the pattern of land use and ownership emerging in the various islands in the Islands Trust jurisdiction. The study attempts to pinpoint the differences and similarities among the different islands and provides a basis for monitoring the impact of government programs and policies on land use.	
131	Report	Islands Trust	1990	Snug Cove Village Plan					43 and appendix		August, 1990							25-Sep-00	planning, land-use, policy, implementation, official community plan	This report is part four of the Bowen Island Official Community Plan Bylaw #14 for the Snug Cove Village Plan. This paper discusses the challenges facing the Snug Cove region and the strategies and policies designed to address those challenges. The report characterizes the manner in which implementation should proceed and supports the written text with a wide variety of maps.	
132	Report	Islands Trust	1992	Hornby Island Official Community Plan					57		May-92	Official Community Plan						25-Sep-00	planning, land use, sustainability, environment, economy, community, planning objectives	This plan outlines the role and responsibilities of different governmental entities in creating the process and product of the plan. The report discusses the history and broad community objectives of Hornby Island and then lists the objectives and policies for land use and development. A key component of the plan is a discussion of the objectives and policies for community services and natural resources. Maps augment the text.	
133	Report	Islands Trust Council	1993	Islands Trust Policy Statement			Islands Trust		23		1993							25-Sep-00	policy statement, roles and responsibilities, ecosystem, preservation, human activity, sustainability	This report supports an amendment to bylaw #17, a policy statement for the area. This report provides a background of the Islands Trust and its mandate, provides a policy statement, and a schedule for implementing that policy statement. The report outlines the Trust's legislated object, provides an interpretation of that object, and defines the principles by which that object will be worked towards. The goals and policy portion of the report focuses on ecosystem preservation and protection, the stewardship of resources, and sustainable communities.	
134	Report	D. Johanson; Alen Kohut	1998	Assessment of Groundwater Availability and Quality, Galiano Island, British Columbia			Groundwater Section, Water Management Branch, Environment and Resource Management Department, MELP		3								Alan Kohut	Sep-00	groundwater recharge, precipitation, bedrock, uncertainty	This report draws on studies from Galiano Island, other Gulf Islands, and eastern Vancouver Island to make estimations regarding the amount of available groundwater in these areas. The article notes that the availability of groundwater on Galiano Island is dictated primarily by the geographic (area and topography of land surface) and hydrological characteristics (permeability and storage coefficient) of the bedrock formations and rate of groundwater recharge from infiltration of precipitation and surface runoff. The article provides a useful analytical framework for assessing groundwater availability that could be applied to Bowen Island.	
91	Report	Kerr Wood Leidal Associates Ltd.	1977	Bowen Island Crown Marsh Storage Reservoir Proposed Water Supply to District Lot 1548		North Vancouver					1977					Islands Trust Library	Brodie Porter	22-Sep-00	Rainfall; Water Quality; Water Demands; reservoir; marsh	This document contains rainfall records from 1961-1977 and water quality guidelines from Health branch and water testing records	
97	Report	Kerr Wood Leidal Associates Ltd.	1999	Cowan Point Lands: Water Supply and Liquid Waste Management												www.islandstrust.bc.ca	Cowan Point; Water Supply; Liquid Waste Management; Water Treatment; Stormwater Management; Water Quality;		Cowan Point; Water Supply; Liquid Waste Management; Water Treatment; Stormwater Management; Water Quality;	Consultants report for Cowan Point lands outlining water demands, water supply, water treatment, wastewater treatment, stormwater	
36	Report	Kerr Wood Leidal Associates LTD	1999	Cowan Point Lands Water Supply and Liquid Waste Management		North Vancouver BC					Aug-99					Bowen Island Municipality (Cristina Rucci)	Bowen Island Municipality (Cristina Rucci)	10-Aug-00	Cowan Point; Water; Water Supply; Waste		
103	Report	Bill Linn; Neil Gray		Task Force on Recreation and Leisure Activities Report and Recommendations												Islands Trust Library	Brodie Porter	22-Sep-00	Recreation; task force; leisure	The objective of this task force was to establish whether Bowen Island's present and future requirements for recreation and leisure services can be met under the existing arrangements and, if not, to recommend appropriate improvements	
60	Report	Del Meidinger; Jim Pojar	1991	Ecosystems of British Columbia	BC Ministry of Forests	Victoria, BC	BC Ministry of Forests				Feb-91					Julian Dunster	Julian Dunster	26-Jul-00	Resource Values; Coastal Douglas-fir Zone; Coastal Western Hemlock Zone; Mountain Hemlock Zone; Bunchgrass Zone; Ponderosa Pine Zone; Interior Douglas-fir Zone; Interior Cedar-Hemlock Zone; Montane Spruce Zone; Sub-Boreal pine-Spruce Zone; Sub-Boreal Spruce Zone; Engelmann Spruce- Subalpine Fir Zone; Boreal White and Black Spruce Zone; Spruce-Willow-Birch Zone; Alpine Tundra Zone; Non tidal wetlands	Has all the ecosystems and their descriptions for BC	
94	Report	D.W. Miller	1985	RE: EAGLE CLIFF IMPROVEMENT DISTRICT							20-Sep-85					Islands Trust Library	Brodie Porter	22-Sep-00	Eagle Cliff; reservoir; water consumption; water quality	This is a report to Ministry of Municipal Affairs from D.W. Miller (Engineer) on the present situation of the eagle cliff reservoir and the future demands that will be place on this system and the repercussions of these demands.	
40	Report	Ministry of Environment		Guidelines for Watershed Management of Crown lands used as Community Water Supplies												Bowen Island Municipality (Cristina Rucci)	Bowen Island Municipality (Cristina Rucci)	10-Aug-00	water		
135	Report	Lands Ministry of Environment, and Parks and Environment Canada	1992	State of the Environment for the Lower Fraser River Basin														Sep-00	environment, air, water, land, resources, impact, population	The report looks at how much growth can be accommodated for in the Fraser River Basin without altering the quality of the natural environment. More specifically, the report assesses the state of the environment at present (1992) and addresses the prospects for ensuring environmental health in the region. The report provides an overview of the physical, social, biological, and land use trends affecting air, water, land, and fish and wildlife resources. The report was compiled by Quadra Planning Consultants Ltd. and supported by significant governmental initiatives.	
136	Report	Lands Ministry of Environment, and Parks	1993	State of the Environment Report for British Columbia			Province of British Columbia (MELP)		127		1993							Sep-00	population growth, waste, energy, climate change, water, diversity, land, fish, forests	This report has been developed to increase the understanding of the ecological consequences of human activity. With increased understanding, society can make more informed and suitable choices. The report looks at several components of the environment of BC - population growth, waste generation, energy consumption, global climate change, ozone depletion, acidic deposition, air quality, water supply, water quality, contaminants in ecosystems, biological diversity, habitat protection, protected areas, fish, forests and agricultural land.	
137	Report	Lands Ministry of Environment, and Parks,	1996	British Columbia Water Quality Status Report			BC MELP, Environmental Protection Department		179		Apr-96						Malcolm Smith (Fraser Basin Council)	Sep-00	water, ecosystem, protection, habitat, water quality	This report develops a water quality index to assess water quality in several British Columbia locales. This document has been developed to share water information with the public, explaining actions needed to improve water quality.	

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138	Report	Lands Ministry of Environment, and Parks,	2000	Environmental Trends in British Columbia 2000			Province of British Columbia		54									Sep-00	indicators, sustainability, environment, economy, governance	This report recognizes the importance of having statistical measures to quantify the state of the environment and its relationship with social and economic systems. The MELP recognizes that indicators are becoming increasingly important in environmental decision making.		
139	Report	Parks and Housing and the Greater Vancouver Regional District Ministry of Lands	1981	Bowen Island Study					24		1981							25-Sep-00	parks, planning, feasibility, management, technical review	This report represents the technical review for a parks review on Bowen Island. This report assesses the potential for parks on Bowen Island via a technical review of all park proposals, a policy review of all recommendations, and a decision making process arising out of the policy review.		
31	Report	Parks and Housing Ministry of Lands	1983	Apodaca Provincial Park Master Plan	parks and Housing Ministry of lands				25		Nov-83						Bowen Island Municipality (Cristina Rucci)	Bowen Island Municipality (Cristina Rucci)	10-Aug-00	Parks; Planning; recreation; Land tenures; jurisdictions; mineral claims; facilities; natural resources; cultural resources visual resources	A good background of the land; natural species and physical features	
34	Report	Greater Vancouver Regional District Ministry of lands parks and housing	1981	Bowen Island Study							1981						Bowen Island Municipality (Cristina Rucci)	Bowen Island Municipality (Cristina Rucci)	10-Aug-00	Bowen Island; planning	Good start to read up on Bowen Island	
74	Report	N. D. Lea Consultants LTD	1989	Cowan Point Resort: Transportation Analysis		Victoria			8		1989						Islands Trust Library	Brodie Porter	21-Sep-00	transportation, Cowan point	A good compilation of ferry traffic data and other data charts	
96	Report	N.D. Lea Consultant Ltd.	1999	Cowan Point Lands, Bowen Island: Comprehensive Development Plan: Transportation Review					23 pages									Available at www.islandstrust.bc.ca	22-Sep-00	Cowan Point Lands; Transportation; Land Use; Population and Employment	Transportation review conducted by a consultant for the Cowan Point Lands. Includes description of current land use, population and future projections for land use, travel patterns and transportation infrastructure and services.	
141	Report	Nemtin Consultants Limited	1990	Bowen Island Commercial Floor space Demand Analysis		Bowen Island			6	1	11-Jun-90								25-Sep-00	floor space, disposable income, trading area population, shopping patterns, space use	The purpose of this analysis is to determine the amount of commercial floor space that will be required to serve the day to day shopping needs of Bowen Island residents and visitors. Three alternatives are analyzed based on three different levels of population.	
68	Report	Norecol Environmental Consultants LTD.	1989	Crippen Regional Park Killamey Lake Area Environmental Inventory and Assessment For Recreational Use	Norecol Environmental Consultants LTD	Vancouver					Oct-89			1-237-01.01			Sue Ellen Fast	Sue Ellen Fast	18-Sep-00	Crippen; Killamey; park; recreation	This is a good inventory of recreational and environmental areas in the two parks	
38	Report	Planistics Management Inc	1999	Cowan Point Lands Comprehensive Development Plan Social Review Bowen Island							Aug-99						Bowen Island Municipality (Cristina Rucci)	Bowen Island Municipality (Cristina Rucci)	10-Aug-00	Cowan Point; Social		
142	Report	Planistics Management Inc.	1999	Cowan Point Lands Comprehensive Development Plan Social Impact Review			Prepared for Bowen Island Local Trust Committee				Aug-99								Sep-00	social impact assessment, housing, services, housing, economic activity	A development plan for the Cowan Point area has been proposed. Before this plan proceeds, it needs to be considered from a variety of perspectives, including a social perspective. The project assesses how the development of Cowan Point will affect the following: the Bowen Island community in general, the provision of soft services (schools, fire protection, for example), the need for special and affordable housing, and the costs and benefits of the project in terms of economic activity and employment. Finally, the report provides a set of observations and recommendations concerning the social implications of implementing the Cowan Point comprehensive development plan.	
35	Report	Praxis Group Limited	1990	Cowan Point Master Plan							Sep-90						Bowen Island Municipality (Cristina Rucci)	Bowen Island Municipality (Cristina Rucci)	10-Aug-00			
108	Report	Professional Environmental Recreation Consultants Ltd.	1994	Bowen Island A Parks Plan							21-Nov-94						Islands Trust Library	Brodie Porter	22-Sep-00	Parks; Human Land use planning		
143	Report	Province of British Columbia	1999	Order of the Lieutenant Governor in Council					41		2-Sep-99								25-Sep-00	municipality, council, election, Municipal Act	This order outlines the terms for Bowen Island becoming a municipality. The powers, duties, and responsibilities of Bowen are outlined in this document, including the transferring schedule of different services.	
61	Report	Reid Crowther & Partners Ltd.	1999	Bowen Island Road Strategy Planning Study	Reid Crowther & Partners Ltd.	Burnaby BC					18-Feb-99			project No. 3432000			Municipality of Bowen Island	Cathy Lalonde	1-Aug-00	Road Planning; Transportation; road safety; travel demand; pedestrian; commuter studies; bicycle; equestrian	This study outlines the present situation of transportation on Bowen Island and the problems that were identified.	
89	Report	Sandwell Inc.	1990	High Speed Passenger Ferries Feasibility Study		Vancouver					Jun-90						Islands Trust Library	Brodie Porter	21-Sep-00	Ferries; ferries study; transportation; ferry expansion	This study proposes a few choices for ferry expansion and studies the present ferry traffic situation	
62	Report	Gary F. Searing; David E. Nowell; Karl K. English; Aaron D. Sekerak; Jill Peterson; Michael Goldstein	1989	Environmental and Social Impact Assessment of the Proposed Cowan Point Resort, Bowen Island, British Columbia	LGL Ltd. Environmental Research Associates	West Vancouver, British Columbia	Praxis Group Ltd.		62		Dec-89						Julian Dunster	Julian Dunster	26-Jul-00	Cowan Point Resort; EIA; Environmental Assessment; Soils; Social Assessment; Culvert Guidelines; Land Development Guidelines	This report defines the hazards and benefits of a proposed development on Cowan Point. It describes the natural entities present on the site.	
144	Report	Eric Sherlock	1999	Greening Our Island Economy: Sustainability for Bowen Island					20		11-May-99								Sep-00	land use, transformation, island-centered economy, vision, social fabric	This report insightfully addresses the role of the community and its institutions in addressing the localized effects of a global ecological crisis. The piece focuses on the opportunities for developing a green economy and a green society on Bowen within the jurisdiction of relevant planning authorities. The report discusses the importance of defining and maintaining the unique character of Bowen through various community initiatives.	
102	Report	Doug Sinkinson; Pat McGuire	1990	Bowen Island Transportation Task Force							12-May-90						Islands Trust Library	Brodie Porter	22-Sep-00	transportation; task force	The object of this report is to establish whether Bowen's immediate and future transportation needs can be improved with existing vessels operated by B.C. Ferries and, if not, to recommend appropriate improvements with other crafts such as high-speed marine vessels. To bring together all other transportation needs and ideas relating to Bowen.	
110	Report	Sussex Consultants Ltd.	1991	1991 Bowen Island Restructure Study							Jul-91						Islands Trust Library	Brodie Porter	22-Sep-00	governance; restructure;		
63	Report	Sussex Consultants Ltd.	1998	Bowen Island Governance Information/ Consultation Process					43		1-Mar-98						Municipality of Bowen Island	Cathy Lalonde	1-Aug-00	Governance; Decision Making; Provision of Services; Demography; tax base	This report identifies the breakdown of taxes and what services are provided by who and who has decision making power. Good for the governance part of the report	
64	Report	Sussex Consultants Ltd.	1999	1999 Bowen Island Restructure Study	Sussex Consultants Ltd.				92		Apr-99						Municipality of Bowen Island	Cathy Lalonde	1-Aug-00	Bowen Island; Restructure; Governance	This study outlines what the governing bodies of Bowen Island are in charge of and would be useful in the governance and government sections of the report	
65	Book	Arthur Fielding Sweet	1988	Islands in Trust		Lantzville BC	Oolichan Books										Bowen Island Library	Librarian	27-Jul-00	Islands Trust; history	This book is a political and social history up to the present of the Islands trust with a section on Bowen Island	
85	Report	The APC Open Space and Recreation Committee	1992	Direction for a Livable Bowen Island		Bowen Island		Draft 2		Draft 2	Oct-92						Islands Trust Library	Brodie Porter	21-Sep-00	APC; recreation; demographics; parks; community	A good source of demographics and recreation maps and information.	
44	Report	The Bowen Island Community Care Society		Proposal for a Multi-level Care Facility on Bowen Island													Bowen Island Municipality (Cristina Rucci)	Bowen Island Municipality (Cristina Rucci)	10-Aug-00	Senior care; health care		
111	Report	The Bowen Island Community Care Society		Proposal for a Multi-Level Care Facility on Bowen Island													The Islands Trust Library	Brodie Porter	22-Sep-00	Health; Care facility;	A study to promote the creation of a facility that will meet all the needs of the community's long-term care clients.	
71	Report	The Bowen Island Forest and Water Management Society	1994	Bowen Island Water Survey Report on Phase One: Data Acquisition and Database Development (Preliminary Draft)		Bowen Island					Feb-94						Sue Ellen Fast	Sue Ellen Fast	18-Sep-00	water survey; BIFWMS		
66	Report	The Bowen Island Green Zone Technical Sub-Committee; Berni Claus; Julian Dunster; Will Hushby; Bob Turner; Michael Dunn; Kathy Dunster; Jean Jamieson	1992	Bowen Island Green Zone Report		Bowen Island, BC					1992						Julian Dunster	Julian Dunster	26-Jul-00	Green Zone Report; Sustainability; biodiversity; water supply; ecologically important lands; habitat	This report is good as it describes Bowen Islands natural aspects and their relative importance.	
32	Report	The Islands Trust; Ministry of Municipal Affairs and Housing	1978	Bowen Island: A resource analysis for land use planning	The Islands Trust	Victoria BC		1	97		Apr-78						Bowen Island Municipality (Cristina Rucci)	Bowen Island Municipality (Cristina Rucci)	10-Aug-00	land planning; Terrain inventory; vegetation inventory; aquatic inventory; wildlife resource; outdoor recreation; visual analysis	Good all around document for natural research	
67	Report	The Islands Trust	1998	Islands Trust Reference Guide			The Islands Trust				4-Mar-98						Municipality of Bowen Island	Cathy Lalonde	1-Aug-00	Reference; Islands Trust	This Reference Guide is the who's who and what's what of the Islands Trust. Good for any question about the islands trust.	
100	Report	The Parks and Recreation Task Force	1993	Direction For a Livable Bowen Island: A Report on Parks and Recreation To The Bowen Island OCP Steering Committee by The Parks And Recreation Task Force													Islands Trust Library	Brodie Porter	22-Sep-00	parks; recreation; OCP;	This Task Force's report provides 58 very specific recommendations for the planning and development of open space, trail and recreation facilities for the next 15 years. These recommendations include Island wide policies and actions as well as neighbourhood specific programs and facilities.	
86	Report	Michael Waldichuk	1984	Sewage Pollution in British Columbia in Perspective		West Vancouver	West Vancouver Laboratory				14-15 February 1984						Islands Trust Library	Brodie Porter	21-Sep-00	Sewage; waste disposal; Marine;	Presented at the workshop on Municipal Marine Discharge	

Appendix 5

Searchable Excel Table for Spatial Entries (Maps, Coverages, and Spatial Information)

This table shows the database catalogue for all the spatial (i.e. Maps) reference materials, created by Bowen Island Sustainability Project. The table is created in Microsoft Excel for broad audiences & its searchability. This database include all the coverages included in “working collections” and “sub collections” in the CD - Bowen Island Information System, Version 2: November 17, 2000 / GIS Atlas/ GIC Coverages folder. There are currently 50 entries.

2 pages (11x17”)

#	Ref	Author	Year	Title	Modified by	Filename.ext	Location	Organization	Software Version	Resolution	Edition	Last Updated	Type	Future Options	Accuracy	Scale	Original Source	Custodian	Contact Person	Date Entered	Projection	Keywords	Abstract	Notes	URL
119	Map	Islands Trust	1995	Agriculture land - Bowen Island	BISP (2000) - Converted from shape file to ArcInfo file; Attribute data Decoded;	Ag_land folder (Currently in ArcInfo 8 Format)	Bowen Island	Islands Trust	Arc/Info 8			16-Feb-95	Digital; Polygon				MOE 1:50000 map for Agricultural Land Reserves; Bowen Island Official Community Plan (1995)	Islands Trust		14-Oct-00	UTM; NAD83; Zone 10; Spheroid Clarke 1866;	Agriculture Land; Agricultural Land Reserve; Food Production	Coverage of Agriculture lands on Bowen Island; Attribute includes Designations' ALR - Agricultural Land Reserve, AG, Perm - Agriculture Land	It seems to be missing a polygon in the middle (compared to map in OCP); Used for OCP as "Agriculture" on Schedule B-2; may require to track down original.	Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Sub_Collection
107	Map	J. Block	1978	Aquatic Analysis: Interpretive - Bowen Island	BISP (2000) - Converted from shape file to ArcInfo file; Reprojected from NAD27 to NAD83; Shoreline changed to the latest shoreline at year 2000 (Same as Bowsh (polygon) shoreline); Existing Lake outlines have been renewed to latest (2000) version of Lakes (Honeymoon, Mud Lake, Small pond in NE of Island, Bowen Br. Headwaters, Josephine, Little Josephine, Grafton, and Killarney; also, Lagoon was left as a polygo	Aqualex folder (Currently in ArcInfo 8 Format)	Bowen Island		Arc/Info 8			28-Apr-95	Digital; Point; TIN;	All existing lakes should be added to the layer; Wetland information should be compiled with other wetland layers and field checked;			Digitized by Dixon, C. and Kemble, C. (BCIT Student - 1993) from BC Mapping and Surveys (via Islands Trust) thematic maps at 1:10K scale; Block (1978)	BIFWMS		14-Oct-00	UTM; NAD83; Zone 10; Spheroid Clarke 1866;	Aquatic Analysis; Aquatic Interpretation; Flooding; Buffers; Settlement design sensitivity; hydrology; fish habitat;	Coverage used to make a map "Aquatic analysis: Interpretive". Block (1978) - Block Report; describes flooding, buffers, settlement design sensitivity, hydrology, and fish habitat;	References: Block, J. (1978); Dixon, C. and Kemble, C. (1993)	Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection
126	Map	Bowen Island Forest & Water Management	1994	Digital Elevation Model - Bowen Island	NAD83; BISP (2000) - Converted from shape file to ArcInfo file; Reprojected from Decimal Degrees to UTM	bowendem folder (Currently in ArcInfo 8 Format)	Bowen Island	Islands Trust	Arc/Info 8				Digital; Point;			10000	Constructed from 1:10000 topo base - BC Surveys and Mapping, for the use in hydrologic analysis carried out by BIFWMS as part of water survey project.	BIFWMS	Journey, Murray	14-Oct-00	UTM; NAD83; Zone 10; Spheroid Clarke 1866;	DEM; Digital Elevation Model; Contours; Elevation;	1: 10000 DEM for Bowen Island	Elevation given in meters in Attribute table;	Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection
124	Map	BC Ministry of Forests	1999	Forest - Bowen Island	NAD83; BISP (2000) - Converted from shape file to ArcInfo file; Reprojected from Decimal Degrees to UTM	bowenforest folder (Currently in ArcInfo 8 Format)	Bowen Island	Ministry of Forests	Arc/Info 8		0.01	29-Sep-00	Digital; Poly	All existing lakes should be added to the layer;	Accuracy 1m		Ministry of Forest - 3 files (forest33, forest34, and forest 44) - f_fc33, f_fc34, f_fc44	Ministry of Forests	Meagher, Holly - Chilliwack Forest District	14-Oct-00	UTM; NAD83; Zone 10; Spheroid Clarke 1866;	Forest type; Forest cover; Vegetation	Coverage showing forest types on Bowen Island; Attribute table is complete and partially decoded.	3 files were combined and clipped to focus on Bowen Island.	Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Sub_Collection
113	Map	Islands Trust	1994	Reginal Overview - Surrounding area of Bowen Island	NAD83; BISP (2000) - Converted from shape file to ArcInfo file; Reprojected from Decimal Degrees to UTM	Bowenmask folder (Currently in ArcInfo 8 Format)	Bowen Island	Islands Trust	Arc/Info 8		?		Digital; Polygon				Island Trust	Islands Trust		14-Oct-00	UTM; NAD83; Zone 10; Spheroid Clarke 1866;	Regional Overview; Surrounding area; Gambier Island; West Vancouver; Sea to Sky corridor; Sunshine Coast;	Coverage showing Surroundind Area of Bowen Island; Used for Cartographic purposes; Map include Gambier Island; West Vancouver; Sea to Sky corridor; Sunshine Coast;	No attribute associated with data; field called 'i_island has true or false;	Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection
101	Map	Bowen Island Forest & Water Management Society	1993	Shoreline and the Island Polygons - Bowen Island	BISP (2000) - Converted from shape file to ArcInfo file; Reprojected from NAD27 to NAD83;	Bowsh folder (Currently in ArcInfo 8 Format)	Bowen Island	BIFWMS	Arc/Info 8				Digital; Polygon			10000	Shoreline digitized by Dixon, C. and Kemble, C. (BCIT Student - 1993) from BC Mapping and Surveys (via Islands Trust) thematic maps at 1:10K scale;	BIFWMS	Journey, Murray	14-Oct-00	UTM; NAD83; Zone 10; Spheroid Clarke 1866;	Island; background polygon; Coast; land	Coverage of coastline and island polygon on Bowen Island; Appears as solid island polygon; For Cartographic purposes	There are 49 polygons created from more detailed shoreline than that of ocean.shp file, no attribute data attached.	Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection
116	Map	Islands Trust	1995	Coast Buffer (Line) - Bowen Island	BISP (2000) - Converted from shape file to ArcInfo file; Reprojected from Decimal Degrees to UTM	Bufoast folder (Currently in ArcInfo 8 Format)	Bowen Island	Islands Trust	Arc/Info 8			2-Nov-95	Digital; Line			20000	Shoreline and Lakes need to be renewed to latest (2000) version; All existing lakes should be added to the layer; need to be cleaned and build (inconsistency with small lots, roads, slits, etc.);	Islands Trust		14-Oct-00	UTM; NAD83; Zone 10; Spheroid Clarke 1866;	Coast Buffer; Development zone; 300m;	Coverage showing 300m coast buffer outline on Bowen Island; Purpose of buffer is for development permit area	No attribute data associated;	Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection
121	Map	Islands Trust	2000	Cadastral - Bowen Island	NAD83; BISP (2000) - Converted from shape file to ArcInfo file; Reprojected from Decimal Degrees to UTM	Cadaestre folder (Currently in ArcInfo 8 Format)	Bowen Island	Islands Trust	Arc/Info 8			2000	Digital; Polygon			10000	LUCCO (Land Use Commission Office)	Islands Trust		14-Oct-00	UTM; NAD83; Zone 10; Spheroid Clarke 1866;	Cadastral; land use; Property Boundary; Parcel Boundary	Coverage showing most recent version (at year 2000) of Cadastral for Bowen Island; Attribute includes district lots, plan, lots, block and legal notes	the attribute data is associated with assessment role to identify the lot owners;	Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection
123	Map	BC Ministry of Forests	1995	Biogeoclimatic Zones Bowen Island	NAD83; BISP (2000) - Converted from shape file to ArcInfo file; Reprojected from Decimal Degrees to UTM	Climate folder (Currently in ArcInfo 8 Format)	Bowen Island	Ministry of Forests,	Arc/Info 8	250K	Version 3	29-Sep-00	Digital; Polygon			250000	Obec:e00; Ministry of Forests - Biogeoclimatic Ecosystem Classification with Coastlines - More Info at http://www.res.for.gov.bc.ca/projects/bec_d oc.html	Ministry of Forests	Chilliwack Forest District - Ministry of Forests	14-Oct-00	UTM; NAD83; Zone 10; Spheroid Clarke 1866;	biogeoclimatic zones, climate, vegetation	Coverage showing biogeoclimatic zones. Not ground truthed and known to have errors, as it was created at a scale of 1:250,000, whereas differences are noted at a scale of 1:10,000. Zone for Bowen is Coastal Western Hemlock (CWH) and there are three subzones (ldm, vml2, xml1).	File came from Ministry of Forests as Obec:e00, it was then clipped to only show Bowen Island, and decoded by BISP 2000.	Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection
139	Map	Bowen Island Sustainability Project	2000	Clip Coverage - Bowen Island	BISP (2000) - Converted from shape file to ArcInfo file; Reprojected from Decimal Degrees to UTM	Clipcov folder (Currently in ArcInfo 8 Format)	Bowen Island	Bowen Island Sustainability Project	Arc/Info 8			Nov-00	Digital; Polygon;				Created to be used for Layer Clipping to show only Bowen Island			7-Nov-00	UTM; NAD83; Zone 10; Spheroid Clarke 1866;	Clip; Clip coverage; Map creation;	Coverage used for clipping Bowen Island from surrounding area; It is one solid polygon that is slightly larger than Bowen Island;	Elevation given in meters in Attribute table; also field called Agency and Clu; need to figure out what they mean; Agency - 2 = contours, 0= coastline; 10m interval contour map was digitized by Dixon,C. and Kemble, C. (BCIT Student - 1993) from BC Mapping and Surveys (via Islands Trust) thematic maps at 1:10K scale - according to their report, however, it is not in the current Bowen GIS Atlas collection, when it is found accuracy and detail should be compared;	Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection
112	Map	Islands Trust	1994	Contours - Bowen Island	BISP (2000) - Converted from shape file to ArcInfo file; Reprojected from NAD27 to NAD83;	Contours folder (Currently in ArcInfo 8 Format)	Bowen Island	Islands Trust	Arc/Info 8			3-Nov-95	Digital; Line	10m interval contour map was digitized by Dixon,C. and Kemble, C. (BCIT Student - 1993) from BC Mapping and Surveys (via Islands Trust) thematic maps at 1:10K scale - according to their report, however, it is not in the current Bowen GIS Atlas collection, when it is found accuracy and detail should be compared;		10000	BC TRIM - modified by BIFWMS to fit the latest (at 2000) shoreline.			14-Oct-00	UTM; NAD83; Zone 10; Spheroid Clarke 1866;	Contours; Elevation;	Coverage showing registered and non-registered deep wells (179) on Bowen Island; Deep wells are drilled wells;	Refer to Anne Chollat's Water Survey Report ; Attribute table (DBF file) existed, but not connected to this file (include drilled date, company, Maximum water intake allowable (if registered), well depth/diameter, water/bedrock depth, but not complete or missing data); the DBF file require decoding	Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection
95	Map	Bowen Island Forest & Water Management Society	1994	Deep Wells - Bowen Island	BISP (2000) - Converted from shape file to ArcInfo file; Reprojected from NAD27 to NAD83;	Dwell folder (Currently in ArcInfo 8 Format)	Bowen Island		Arc/Info 8			3-Mar-94	Digital; Point				BIFWMS Water Survey - Conducted by Anne Chollat (SCI, Bowen CD)	BIFWMS	Franc de Ferriere - Chollat, Anne	14-Oct-00	UTM; NAD83; Zone 10; Spheroid Clarke 1866;	Deep Wells; Drilled Wells; water intake; water use; Groundwater	Coverage showing registered and non-registered deep wells (179) on Bowen Island; Deep wells are drilled wells;	Refer to Anne Chollat's Water Survey Report ; Attribute table (DBF file) existed, but not connected to this file (include drilled date, company, Maximum water intake allowable (if registered), well depth/diameter, water/bedrock depth, but not complete or missing data); the DBF file require decoding	Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection
125	Map	Statistics Canada	1996	Enumeration Areas - Bowen Island	BISP (2000) - Converted from shape file to ArcInfo file; Clipped to show only Bowen Island; Shoreline changed to the latest shoreline at year 2000 (Same as Bowsh	Ea96 folder (Currently in ArcInfo 8 Format)	Bowen Island	Stats Canada	Arc/Info 8			29-Sep-00	Digital; Polygon				Stats Canada - Enumeration Areas for BC	Stats Canada	Wong, Dennis	14-Oct-00	UTM; NAD83; Zone 10; Spheroid Clarke 1866;	Enumeration, population, statistics, employment, income, demographics	Coverage showing enumeration areas on Bowen Island. Attribute data includes detailed statistical demographics for the Island.	Acquired from SDRI (Sustainable Development Research Institute), Area 405 and 407 lack data - due to less than 40 people in these areas (40 is minimum to show data).	Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection
108	Map	Geological Survey of Canada	1996	Geology - Bowen Island	BISP (2000) - Converted from shape file to ArcInfo file; Shoreline changed to the latest shoreline at year 2000 (Same as Bowsh (polygon) shoreline); Existing Lake outlines have been renewed to latest (2000) version of Lakes (Josephine, Grafton, and Killarney);	Geology folder (Currently in ArcInfo 8 Format)	Bowen Island	Geological Survey of Canada	Arc/Info 8	250K	GSC Open File 3276	29-Sep-00	Digital; Polygon	All existing lakes should be added to the layer;		250000	Monger, J.W.H. (1985-1993) - Geological Survey of Canada paper 93-1A	Geological Survey of Canada	Journey, Murray - Geological Survey of Canada	14-Oct-00	UTM; NAD83; Zone 10; Spheroid Clarke 1866;	geology, bedrock, rock, sedimentary, volcanic, plutonic, tectonic	This coverage shows the geology for Bowen Island (Bowen Island Group). Attribute table is complete with rock class, description, type, era/epoch, attribute	Clipped to only show Bowen Island. Shoreline and lakes have been updated.	Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection
131	Map	The Grater Vancouver Regional District	1996	GVRD Land Use Areas - Bowen Island	BISP (2000) - Converted from shape file to ArcInfo file; Existing Lake outlines have been renewed to latest (2000) version of Lakes; Attribute data Decoded;	gvrd landuse.shp (Currently in shape file - ArcView 3.1)	Bowen Island	GVRD	ArcView 3.1			29-Sep-00	Digital; Polygon	Shoreline and Lakes need to be renewed to latest (2000) version; need to be converted to ArcInfo file; All existing lakes should be added to the layer;			GVRD created the layer from Arial Photo (1996), and reviewed with municipalities zoning/ocp	GVRD	Bell, Pat - GVRD	14-Oct-00	UTM; NAD83; Zone 10; Spheroid Clarke 1866;	Land use, commercial, residential, rural, agricultural, industrial, recreation, institutional, protected areas	Coverage showing land use areas according to GVRD.	Acquired from SDRI (Sustainable Development Research Institute). May not be up to date	Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Sub_Collection
130	Map	Bowen Island Forest & Water Management Society	1995	Hydropole - Bowen Island	BISP (2000) - Converted from shape file to ArcInfo file; Reprojected from NAD27 to NAD83;	Hydro2 folder (Currently in ArcInfo 8 Format)	Bowen Island	BIFWMS	Arc/Info 8				Digital; Point	The latest version should be obtained from BC Hydro;			BC Surveys & Mapping	BIFWMS	BC Hydro (?)	14-Oct-00	UTM; NAD83; Zone 10; Spheroid Clarke 1866;	Hydro Pole	Coverage showing Hydro pole map of Bowen Island; Attribute include hydro pole numbers;	Intended to be used for emergency response. However, this coverage is incomplete in its current state and needs to be updated completely (BC Hydro)	Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Sub_Collection
99	Map	Bowen Island Forest & Water Management Society	2000	Lakes - Bowen Island	BISP (2000) - Converted from shape file to ArcInfo file; Several Layers were combined to create this complete layer	Lakes folder (Currently in ArcInfo 8 Format)	Bowen Island		Arc/Info 8			22-Aug-00	Digital; Polygon				BIFWMS - Some of the lakes are GPS'd and Digitized (2000) for SHIM project; Combined to create complete layer by BISP (2000)	BIFWMS	Dunster, Julian	14-Oct-00	UTM; NAD83; Zone 10; Spheroid Clarke 1866;	Lakes; Water; Water use; Supply; intake	Coverage showing Lakes on Bowen Island; Some of the lakes were GPS'd by BIFWMS through SHIM project; attribute include Name of the lakes and GPS'd date.	BC GPS'd Lakes were in different layers, and small lakes that were left from OCP was added to create complete one layer by BISP; This is most current and complete data sets @ Aug. 2000.	Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection
122	Map	Land and Parks BC Ministry of Environment	1995	Present Land Use Mapping - Bowen Island	BISP (2000) - Converted from shape file to ArcInfo file; Projection Error was fixed using NAD83 to NAD27 Transformation; Clipped to show only Bowen Island; Shoreline changed to	Lup2G folder (Currently in ArcInfo 8 Format)	Bowen Island	MELP	Arc/Info 8	250K		29-Sep-00	Digital; Polygon	All existing lakes should be added to the layer; Differences need to be determined among all the other landuse layers;		250000	BC Specifications and Guidelines for Geomatics, Content Series Vol. 6, Part 1, Baseline Thematic Mapping, Present Land Use Mapping at 1:250,000 - MELP	MELP	MELP	14-Oct-00	UTM; NAD83; Zone 10; Spheroid Clarke 1866;	Land use, baseline thematic mapping, agriculture, old forest, young forest, logged forest, urban	Coverage showing present land use mapping for Bowen Island. May not be the most accurate land use mapping, as it is from 1995. Attribute table is complete and decoded;	Acquired from SDRI (Sustainable Development Research Institute). Shows land use type, slope, percentage of area exposed to each aspect (north, south, east, west)	Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection
84	Map	BC Ministry of Environment	?	MOE Community Watersheds (polygon) - Bowen Island	BISP (2000) - Reprojected from NAD27 to NAD83;	Mashed folder (Currently in ArcInfo 8 Format)	Bowen Island	MOE	Arc/Info 8			3-Mar-94	Digital; Polygon			50000	Ministry of Environment; (Detail not known)	MOE	Kreye, Ross	14-Oct-00	UTM; NAD83; Zone 10; Spheroid Clarke 1866;	Community Watersheds; Watershed; Water Use Community; Water Improvement Districts	Coverage showing Community Watersheds on Bowen Island as determined by MOE. The 14 watersheds are shown as polygons, with attributes included such as water source, type of water use, map sheet numbers, Licensee and water quantity allowed (gallons/day).	Watershed boundaries (circa 1978) do not reflect true boundaries (topography), but are based on water intake locations.	Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection
118	Map	Islands Trust	1995	OCPLand Use Designations - Bowen Island	Grafton BISP (2000) - Converted from shape file to ArcInfo file; Existing Lake outlines have been renewed to latest (2000) version of Lakes (Honeymoon, and Killarney); Attribute data Decoded;	ocplanduse folder (Currently in ArcInfo 8 Format)	Bowen Island	Islands Trust	Arc/Info 8			3-Mar-95	Digital; Polygon	All existing lakes should be added to the layer;		20000	Bowen Island Official Community Plan (1995)	Islands Trust		14-Oct-00	UTM; NAD83; Zone 10; Spheroid Clarke 1866;	Land use designations; Agriculture Land Reserve; Rural; Residential; Snug Cove; Coastal Area; Coast Buffer; Development zone;	Coverage showing Land use designations and 300m coast buffer polygon for Bowen Island; Attribute includes Res_Land_U_ which classifies the polygons as ALR - Agriculture Land Reserve, R - Rural (4 hectare); R1 - Rural 1 (2 hectare), RS- Rural residential (1 hectare), RS(e)- Rural residential (0.4 hectare), SC - Snug Cove; CS Coastal Area; Also field called 'water' existed and filename 'water/land_inuse/floor_plan.sh' is filed in the column for the island polygons	Used to make map "Map Designations (OCP Schedule B)";	Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection
115	Map	Islands Trust	1995	Crown land and Parks - Bowen Island	BISP (2000) - Names of Parks has been added	Park_res folder (Currently in ArcInfo 8 Format)	Bowen Island	Islands Trust	Arc/Info 8			3-Nov-95	Digital; Polygon	Maybe required to quality check with Julian Dunster (Crown Land Report); Lake outlines need to be updated; Polygons need to be merged;	Not all Community Parks are digitized	20000	Digitized by Dixon, C. and Kemble, C. (BCIT Student - 1993) from BC Mapping and Surveys (via Islands Trust) thematic maps at 1:10K scale;	BIFWMS		14-Oct-00	UTM; NAD83; Zone 10; Spheroid Clarke 1866;	Parks; Crown land; Crippen Regional Park; Apodaca Provincial Park; Green Spaces; Recreation; Ecological Reserve #48;	Coverage showing parks and crown land on Bowen Island; 107 polygons, 5 designations - community park, crown lands, ecological reserve, provincial park, regional park	Crown land component may require updating; used to make map "Parks and Trails (OCP Schedule C)" parks etc are broken up to many polygons (i.e. only one regional park (Crippen) but 7 polygons to show the park) ;	Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection
94	Map	Bowen Island Forest & Water Management Society	1994	Proposed Park - Bowen Island	NAD83; BISP (2000) - Converted from shape file to ArcInfo file; Reprojected from Decimal Degrees to UTM	Propark folder (Currently in ArcInfo 8 Format)	Bowen Island	BIFWMS	Arc/Info 8			1994	Digital; Polygon				OCP	BIFWMS	Dunster, Julian	14-Oct-00	UTM; NAD83; Zone 10; Spheroid Clarke 1866;	Parks; Proposed Parks; Future Land use; Green Area	Coverage showing proposed area for future parks on Bowen Island;	No attribute data associated. OCP Committee (parks & Rec) probably determined - need to track source	Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection
106	Map	J. Block	1978	Outdoor Recreation Features Analysis- Bowen Island	BISP (2000) - Converted from shape file to ArcInfo file; Reprojected from NAD27 to NAD83; Shoreline changed to the latest shoreline at year 2000 (Same as Bowsh (polygon) shoreline); Existing Lake outlines have been renewed to latest (2000) version of Lakes (Honeymoon, Mud Lake, Small pond in NE of Island, Bowen Brook Headwaters, Josephine, Little Josephine, Grafton, and Killarney; also, Lagoon was left as a poly	Recreat folder (Currently in ArcInfo 8 Format)	Bowen Island		Arc/Info 8			28-Apr-95	Digital; Polygon	All existing lakes should be added to the layer; Wetland information should be compiled with other wetland layers and field checked;			Digitized by Dixon, C. and Kemble, C. (BCIT Student - 1993) from BC Mapping and Surveys (via Islands Trust) thematic maps at 1:10K scale; Block (1978)	BIFWMS		14-Oct-00	UTM; NAD83; Zone 10; Spheroid Clarke 1866;	Recreation; Outdoor;	Coverage used to make a map "Outdoor Recreation Features Analysis". Block (1978) - Block Report; describes types of recreation and its suitability	References: Block, J. (1978); Dixon, C. and Kemble, C. (1993)	Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection
137	Map	Bowen Island Forest & Water Management Society	1993	Lake Reservoir Bathymetry - Bowen Island	BISP (2000) - Converted from shape file to ArcInfo file; Reprojected from NAD27 to NAD83; Shoreline changed to the latest shoreline at year 2000 (Same as Bowsh (polygon) shoreline); Existing Lake outlines have been renewed to latest (2000) version of Lakes (Honeymoon, Mud Lake, Small pond in NE of Island, Bowen Brook Headwaters, Josephine, Little Josephine, Grafton, and Killarney; also, Lagoon was left as a poly	rescovr.shp (Currently in shape file - ArcView 3.1)	Bowen Island		ArcView 3.1			23-Nov-93	Digital; Line				BIFWMS has digitized, but the hard copy of original source map is still unknown	BIFWMS	Journey, Murray	15-Aug-00	UTM; NAD83; Zone 10; Spheroid Clarke 1866;	Lakes; depth; volume; water;	Coverage showing bathymetry of three lakes (Killarney, Josephine and Grafton) on Bowen Island; No attribute associated and each line have no depth associated	Depth need to be integrated; original source need to be tracked	Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Sub_Collection
102	Map	Islands Trust	1993	Roads Suitability Analysis - Bowen Island	BISP (2000) - Converted from shape file to ArcInfo file; Reprojected from NAD27 to NAD83; Shoreline changed to the latest shoreline at year 2000 (Same as Bowsh (polygon) shoreline); Existing Lake outlines have been renewed to latest (2000) version of Lakes (Honeymoon, Mud Lake, Small pond in NE of Island, Bowen Brook Headwaters, Josephine, Little Josephine, Grafton, and Killarney; also, Lagoon was left as a poly	Roads folder (Currently in ArcInfo 8 Format)	Bowen Island	BIFWMS	Arc/Info 8			?	Digital; Polygon	All existing lakes should be added to the layer;			Digitized by Dixon, C. and Kemble, C. (BCIT Student - 1993) from BC Mapping and Surveys (via Islands Trust) thematic maps at 1:10K scale;	BIFWMS	Journey, Murray	14-Oct-00	UTM; NAD83; Zone 10; Spheroid Clarke 1866;	Roads; Road Suitability Analysis;	Coverage showing Road Suitability of Bowen Island; classifies into 4 classes - Caution, Ideal, unsuitable, and water - field called "Roads"	Created by BCIT Students at the request of the Island Trust; Analysis used guidelines supplied by Brodie Porter (slope, surface materials, etc.) to determine areas on Bowen where new road networks might be feasible; References: Dixon, C. and Kemble, C. (1993)	Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection
127	Map	Islands Trust	1993	Road Network - Bowen Island	BISP (2000) - Converted from shape file to ArcInfo file; Reprojected from NAD27 to NAD83;	Roadsall folder (Currently in ArcInfo 8 Format)	Bowen Island	BIFWMS	Arc/Info 8			11-Nov-95	Digital; Line	Quality control is required (Errors has been identified); overlaying with orthophoto, additional GPS, and field survey is required to complete the layer;	Several non-existing roads has been included in the layer; Not all the roads are digitized - require review	20000	BC TRIM - Roads Network; Digitized by Dixon, C. and Kemble, C. (BCIT Student - 1993) from TRIM at 1:20K scale; Modified by BIFWMS;	Islands Trust		14-Oct-00	UTM; NAD83; Zone 10; Spheroid Clarke 1866;	Roads; Road network; Transportation	Coverage showing Road network for Bowen Island; showing most detailed road network;	Attribute include Designation (i.e. Main Rural, Minor Rural, and Residential Rural/Local) and Heritage (Y or Null), and Class which combines Designation and heritage. It is the most complete roads coverages, but errors has been identified;	Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection
110	Map	Habitat Conservation Trust Fund/Environment Canada/BC Ministry of Land and Parks	1999	Sensitive Ecosystem Inventory: Bowen Island/Gambier Trust Areas	NAD83; BISP (2000) - Converted from shape file to ArcInfo file; Reprojected from Decimal Degrees to UTM	sei_bowen folder (Currently in ArcInfo 8 Format)	Bowen Island	Habitat Conservation Trust Fund; Environment Canada, BC Ministry of Land and Parks	Arc/Info 8			1999	Digital; Polygon	Shoreline and Lakes need to be renewed to latest (2000) version; All existing lakes should be added to the layer; Decoding maybe required;			Shoreline digitized by Dixon, C. and Kemble, C. (BCIT Student - 1993) from BC Mapping and Surveys (via Islands Trust) thematic maps at 1:10K scale;	BC Conservatio n Data Center		14-Oct-00	UTM; NAD83; Zone 10; Spheroid Clarke 1866;	Sensitive Ecosystems; Environmentally Sensitive Areas; SEA; SEI; Old growth; wetland; Coastal bluff; Terrestrial Harbacious; Riparian;	Coverage showing sensitive ecosystem polygons on Bowen Island; Attribute includes 'code' - type of sensitive Ecosystem, 'air photo' map sheet 'location'		Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection
100	Map	Bowen Island Forest & Water Management Society	1993	Shoreline and Ocean (polygon)- Bowen Island	BISP (2000) - Converted from shape file to ArcInfo file; Reprojected from NAD27 to NAD83;	Shore2 folder (Currently in ArcInfo 8 Format)	Bowen Island	BIFWMS	Arc/Info 8				Digital; Polygon			10000	Shoreline digitized by Dixon, C. and Kemble, C. (BCIT Student - 1993) from BC Mapping and Surveys (via Islands Trust) thematic maps at 1:10K scale;	BIFWMS	Journey, Murray	14-Oct-00	UTM; NAD83; Zone 10; Spheroid Clarke 1866;	Ocean; Coastline; Shore; Shoreline	Coverage of coastline and DEM boundary on Bowen Island; Appears as solid square polygon with the Island's coastline inside; Used for Cartographic purposes	Ocean is one polygon, the main island and the other smaller islands (Hutt Island, Finistere Island, etc.) are shown as the others; Snugcove area is accurately mapped (updated from file called ocean.shp); Attribute table has 'shore2_id' Field that distinguishes ocean (0) and land (1);	Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection

#	Ref	Author	Year	Title	Modified by	Filename.ext	Location	Organization	Software Version	Resolution	Edition	Last Updated	Type	Future Options	Accuracy	Scale	Original Source	Custodian	Contact Person	Date Entered	Projection	Keywords	Abstract	Notes	URL	
92	Map	Bowen Island Forest & Water Management Society	1994	Shallow (Surface Wells) - Bowen Island	BISP (2000) - Converted from shape file to Arc/Info file; Reprojected from NAD27 to NAD83;	shwell folder (Currently in Arc/Info 8 Format)	Bowen Island		Arc/Info 8			3-Mar-94	Digital; Point	DBF should be connected to the file (DBF references to Assessment role (1992) and have to be georeference using cadastre); locations of wells need to be checked (Field or overlay with cadastre); More recent data may be obtainable from North Shore Health;			BIFWMS Water Survey - Conducted by Anne Chollat (SCI, Bowen CD)	BIFWMS	Francois de Ferriere - Chollat, Anne	14-Oct-00	UTM; NAD83; Zone 10; Spheroid Clarke 1866;	Shallow Wells; Surface Wells; Stream water intake; Wells dug-out	Coverage showing registered and non-registered (58) wells on Bowen Island; Shallow wells include water intake from streams and dug-out wells;	Refer to Anne Chollat's Water Survey Report ; Attribute table (DBF file) existed, but not connected to this file; the DBF file require decoding	Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection	
117	Map	Islands Trust	1995	Slopes grater than 25 % - Bowen Island	BISP (2000) - Reprojected from NAD27 to NAD83;	slope_25 folder (Currently in Arc/Info 8 Format)	Bowen Island	Islands Trust	Arc/Info 8			3-Nov-95	Polygon	Find out what those 1 & 2 means in the attribute table (slope code)		10000	Derived from 1:10000 DEM for land use planning purpose;	Islands Trust	Rucci, Cristina	14-Oct-00	UTM; NAD83; Zone 10; Spheroid Clarke 1866;	Slope; 25 degree; landslide; hazard; Development; Contours; Elevation; DEM;	Coverage showing regions (polygons) where slope exceed 25% grade; derived from 1:10K DEM, Schedule E (map 2) in OCP, "Development Permit Area, Slope Area >25 degrees"	Useful for landslide hazard analysis and for land development & planning; Attribute called "slope code" which include value 0 or 2	Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection	
96	Map	Bowen Island Forest & Water Management Society	1999	Springs - Bowen Island	BISP (2000) - Converted from shape file to Arc/Info file;	springs folder (Currently in Arc/Info 8 Format)	Bowen Island	BIFWMS	Arc/Info 8			Aug. 1999	Digital; point				Digitized by BIFWMS from water licence map (MELP)	BIFWMS		14-Oct-00	UTM; NAD83; Zone 10; Spheroid Clarke 1866;	Springs; water; water use; Supply; intake;	Coverage of springs on Bowen Island;	Created for Water Licence Map by Dunster & Associates; Names are included in Attribute data	Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection	
86	Map	Bowen Island Forest & Water Management Society	1994	Hypothetical Surface Streams (High Threshold) - Bowen Island	BISP (2000) - Converted from shape file to Arc/Info file;	Stmh200 folder (Currently in Arc/Info 8 Format)	Bowen Island		Arc/Info 8			10-Apr-94	Line			10000	BIFWMS hydrological modeling analysis	BIFWMS	Journey, Murray	14-Oct-00	UTM; NAD83; Zone 10; Spheroid Clarke 1866;	Water Drainage; Hydrology; Streams; Surface Drainage	Coverage showing Potential Surface Stream Network of Bowen Island from Hydrological Modeling Analysis according to 1:10K base;	The drainage network shown is hypothetical driven from topological information; Stream Courses were later field checked by surveys conducted by Anne Chollat	Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection	
87	Map	Bowen Island Forest & Water Management Society	1994	Hypothetical Surface Drainage (Low Threshold) - Bowen Island	BISP (2000) - Converted from shape file to Arc/Info file;	Stmlow70 folder (Currently in Arc/Info 8 Format)	Bowen Island		Arc/Info 8			3-Mar-94	Line			10000	BIFWMS hydrological modeling analysis	BIFWMS	Journey, Murray	14-Oct-00	UTM; NAD83; Zone 10; Spheroid Clarke 1866;	Water Drainage; Hydrology; Streams; Surface Drainage	Coverage showing Potential Surface Drainage Network of Bowen Island from Hydrological Modeling Analysis according to 1:10K base;	The drainage network shown is hypothetical driven from topological information; Stream Courses were later field checked by surveys conducted by Anne Chollat	Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection	
138	Map	Bowen Island Sustainability Project	2000	Steep Stream (that lies in the area >25 degree slope) - Bowen Island	BISP (2000) - Converted from shape file to Arc/Info file;	stream25_intersect.shp (Currently in shape file - Arc/View 3.1)	Bowen Island	Bowen Island Sustainability Project	Arc/Info 8			Nov-00	Arc;					Layers named "streams" by BIFWMS was intersected by "slope_25" layer to obtain the streams that lies in the area >25 degree slope	BIFWMS		7-Nov-00	UTM; NAD83; Zone 10; Spheroid Clarke 1866;	Streams; Water use; Creeks; slope; 25 degree; steep;	Coverage showing potion of the Stream Network which lies within the area >25 degree slopes on Bowen Island (i.e. steep streams);	Metadata in the Attribute table is well explained; GPS'd streams were in different layers, which was compiled into one layer by BISP; This is most current and complete data sets @ 2000.	Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Sub_Collection
98	Map	Bowen Island Forest & Water Management Society	2000	Stream Network - Bowen Island	BISP (2000) - Converted from shape file to Arc/Info file; Several Layers were combined to create this complete layer;	streams folder (Currently in Arc/Info 8 Format)	Bowen Island		Arc/Info 8			22-Aug-00	Digital; Arc;					BIFWMS - Some of the streams GPS'd and Digitized (2000) for SHIM project. Combined to create complete layer by BISP (2000)	BIFWMS	Dunster, Julian	14-Oct-00	UTM; NAD83; Zone 10; Spheroid Clarke 1866;	Streams; Water use; Creeks;	Coverage showing Stream Network on Bowen Island; Some of the streams were GPS'd by BIFWMS through SHIM project; attributes include name of the streams, sources, and GPS'd date;	Metadata in the Attribute table is well explained; GPS'd streams were in different layers, which was compiled into one layer by BISP; This is most current and complete data sets @ 2000.	Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection
97	Map	Bowen Island Forest & Water Management Society	2000	Stream Network with Annotation - Bowen Island	BISP (2000) - Annotation layer was build from Streams (Arc layer); Several Layers were combined to create this complete layer;	Stream folder (Currently in Arc/Info 8 Format)	Bowen Island		Arc/Info 8			22-Aug-00	Digital; Arc;					BIFWMS - Some of the streams GPS'd and Digitized (2000) for SHIM project. Combined to create complete layer by BISP (2000)	BIFWMS	Dunster, Julian	14-Oct-00	UTM; NAD83; Zone 10; Spheroid Clarke 1866;	Streams; Water use; Creeks;	Coverage showing Stream Network on Bowen Island; Some of the streams were GPS'd by BIFWMS through SHIM project; attribute include Name of the streams, sources, and GPS'd date;	Metadata in the Attribute table is well explained; GPS'd streams were in different layers, which was compiled into one layer by BISP; This is most current and complete data sets @ 2000.	Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection
91	Map	Islands Trust	1993	Subdivisions- Bowen Island	BISP (2000) - Converted from shape file to Arc/Info file; Reprojected from NAD27 to NAD83; Shoreline changed to the latest shoreline at year 2000 (Same as Bowsh (polygon) shoreline); Existing Lake outlines have been renewed to latest (2000) version of Lakes (Grafton and Kilarney); Attribute data Decoded;	Subdiv folder (Currently in Arc/Info 8 Format)	Bowen Island		Arc/Info 8			9-Feb-94	Polygon	All existing lakes should be added to the layer; Snug Cove area (insert) need to be digitized and added to the map (it is currently incomplete);		10000	Digitized by Dixon, C. and Kemble, C. (BCIT Student - 1993) from BC Mapping and Surveys (via Islands Trust) thematic maps at 1:10K scale; Bowen Island Subdivision Bylaw No. 270;	Islands Trust		14-Oct-00	UTM; NAD83; Zone 10; Spheroid Clarke 1866;	Subdivisions; Bylaw	Coverage showing subdivisions of Bowen Island according to Bowen Island Subdivision Bylaw No. 270;	Incomplete - missing Snug Cove Area; Reference: Bowen Island Subdivision Bylaw No. 270;	Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection	
104	Map	J. Block	1978	Terrain Analysis: Base Data- Bowen Island	BISP (2000) - Converted from shape file to Arc/Info file; Reprojected from NAD27 to NAD83; Shoreline changed to the latest shoreline at year 2000 (Same as Bowsh (polygon) shoreline); Existing Lake outlines have been renewed to latest (2000) version of Lakes (Honeymoon, Mud Lake, Small pond in NE of Island, Bowen Brook Headwaters, Josephine, Grafton, and Kilarney, also, Lagoon polygon was deleted); Attribute data Decoded;	Terrex folder (Currently in Arc/Info 8 Format)	Bowen Island		Arc/Info 8			28-Apr-95	Polygon	All existing lakes should be added to the layer;			Digitized by Dixon, C. and Kemble, C. (BCIT Student - 1993) from BC Mapping and Surveys (via Islands Trust) thematic maps at 1:10K scale; Block (1978)	BIFWMS		14-Oct-00	UTM; NAD83; Zone 10; Spheroid Clarke 1866;	Terrain analysis; Base data; Texture; Genetic Materials; Surface Expression; Modifying processes; Soils;	Coverage used to make a map "Terrain Analysis: Base Data", Block (1978) - Block Report; describes Soil and Surface Materials, Texture, Genetic Materials, Surface Expression, Modifying processes;	References: Block, J. (1978); Dixon, C. and Kemble, C. (1993)	Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection	
105	Map	J. Block	1978	Terrain Analysis: Interpretive- Bowen Island	BISP (2000) - Converted from shape file to Arc/Info file; Reprojected from NAD27 to NAD83; Shoreline changed to the latest shoreline at year 2000 (Same as Bowsh (polygon) shoreline); Existing Lake outlines have been renewed to latest (2000) version of Lakes (Honeymoon, Mud Lake, Bowen Brook Headwaters, Josephine, Grafton, and Kilarney, also, Lagoon polygon was deleted); Attribute data Decoded using Block Report	Terrex folder (Currently in Arc/Info 8 Format)	Bowen Island		Arc/Info 8			28-Apr-95	Polygon	All existing lakes should be added to the layer; More Attribute can be added (i.e. create table and link);			Digitized by Dixon, C. and Kemble, C. (BCIT Student - 1993) from BC Mapping and Surveys (via Islands Trust) thematic maps at 1:10K scale; Block (1978)	BIFWMS		14-Oct-00	UTM; NAD83; Zone 10; Spheroid Clarke 1866;	Terrain Classification; Terrain Analysis; Terrain Interpretation; Slope; Rockiness; Surface and Stoniness; Drainage; Unified Texture; Depth to bedrock; Depth to water table; flood frequency; Degree of compactness; Foundation for low buildings; septic tank filter field; shallow excavation;	Coverage used to make a map "Terrain Analysis: Interpretive", Block (1978) - Block Report; describes Terrain Classification, Slope, Rockiness, Surface and Stoniness, Drainage, Unified Texture, Depth to bedrock, Depth to water table, flood frequency, Degree of compactness, Foundation for low buildings, septic tank filter field, shallow excavation;	References: Block, J. (1978); Dixon, C. and Kemble, C. (1993)	Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection	
120	Map	Islands Trust	1995	Proposed Trail Plan- Bowen Island	BISP (2000) - Converted from shape file to Arc/Info file; Reprojected from NAD27 to NAD83; Shoreline changed to the latest shoreline at year 2000 (Same as Bowsh (polygon) shoreline); Existing Lake outlines have been renewed to latest (2000) version of Lakes (Honeymoon, Josephine, Grafton, and Kilarney, also, Lagoon polygon was deleted); Attribute data Decoded using Block Report (1978) Map Accutates; Attribute Dat	Trails folder (Currently in Arc/Info 8 Format)	Bowen Island	Islands Trust	Arc/Info 8			3-Mar-95	Polygon	Existing Trails require field check and/or re-mapping with GPS;	No distinction between existing trails and planned trails	10000	Compiled by OCP trails committee, digitized by BIFWMS for use in OCP	Islands Trust		14-Oct-00	UTM; NAD83; Zone 10; Spheroid Clarke 1866;	Trails; Recreation; Hiking; Paths; trail network	Coverage Showing proposed trail plan by Official Community Plan	Used to make map "Parks and Trails (OCP Schedule C)"; need to be field checked and/or renamed with GPS, no Attribute data associated with the coverage;	Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection	
103	Map	J. Block	1978	Vegetation Analysis- Bowen Island	BISP (2000) - Converted from shape file to Arc/Info file; Reprojected from NAD27 to NAD83; Shoreline changed to the latest shoreline at year 2000 (Same as Bowsh (polygon) shoreline); Existing Lake outlines have been renewed to latest (2000) version of Lakes (Honeymoon, Josephine, Grafton, and Kilarney, also, Lagoon polygon was deleted); Attribute data Decoded using Block Report (1978) Map Accutates; Attribute Dat	Vegetatshw folder (Currently in Arc/Info 8 Format)	Bowen Island		Arc/Info 8			28-Apr-95	Polygon	All existing lakes should be added to the layer; More Attribute can be added (i.e. create table and link);			Digitized by Dixon, C. and Kemble, C. (BCIT Student - 1993) from BC Mapping and Surveys (via Islands Trust) thematic maps at 1:10K scale; Block (1978)	BIFWMS		14-Oct-00	UTM; NAD83; Zone 10; Spheroid Clarke 1866;	Vegetation; Wind Hazard; fire hazard; Trafficability, Nature interpretation Value; Sound absorption potential, Visual Screening Potential; Browse Potential; Landscaping Potential; Habitat Manipulation and Habitat Manipulation Suitability;	Coverage used to make a map "Vegetation Analysis", Block (1978) - Block Report; describes Vegetation, Wind Hazard, Fire hazard, Trafficability, Nature interpretation Value, Sound absorption potential, Visual Screening Potential, Browse Potential, Landscaping Potential and Habitat Manipulation Suitability;	References: Block, J. (1978); Dixon, C. and Kemble, C. (1993)	Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection	
134	Map	Bowen Island Forest & Water Management Society	1994	Registered Surface Water Intake Point - Bowen Island	BISP (2000) - Converted from shape file to Arc/Info file; Reprojected from NAD27 to NAD83; Shoreline changed to the latest shoreline at year 2000 (Same as Bowsh (polygon) shoreline); Name of the district has been added as attribute; Valhalla Ridge has been incorporated into Bowey Bay Improvement District; Bowen Bay Holdings has been added;	Wat_lic folder (Currently in Arc/Info 8 Format)	Bowen Island		Arc/Info 8				Digital; Point	locations of wells need to be checked (Field or overlay with cadastre); More recent data may be obtainable from North Shore Health;			Valhalla Ridge has been incorporated into Bowen Bay Improvement District, and Current Bowen Bay Improvement District may have extended further; Snug Cove Sewer Improvement District has been extended - no current data available; All water districts boundary require revisions	BIFWMS	Francois de Ferriere - Chollat, Anne	14-Oct-00	UTM; NAD83; Zone 10; Spheroid Clarke 1866;	Registered Wells; Drilled wells; Water intake; Water use; Drinking water; Ground water;	Coverage showing registered surface water intake points (Point of Diversion) on Bowen Island - Licenses are associated with each Point of Diversions and Registration numbers	Refer to MELP - water license query - http://www.etp.gov.bc.ca:8000/wat/wms/query/licences/help/all.htm	Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection	
111	Map	Islands Trust	1994	Water Districts- Bowen Island	BISP (2000) - Converted from shape file to Arc/Info file; Reprojected from NAD27 to NAD83; Shoreline changed to the latest shoreline at year 2000 (Same as Bowsh (polygon) shoreline); Name of the district has been added as attribute; Valhalla Ridge has been incorporated into Bowey Bay Improvement District; Bowen Bay Holdings has been added;	Watersys folder (Currently in Arc/Info 8 Format)	Bowen Island	Islands Trust	Arc/Info 8			3-Nov-95	Polygon				BIFWMS	Islands Trust		14-Oct-00	UTM; NAD83; Zone 10; Spheroid Clarke 1866;	Water Districts; Water use; Water system;	Coverge showing water districts on Bowen Island; Attribute fields are 'district' - 7 Improvement districts, 'private' - 11 private water distribution, and 'sewers' - 2 sewer improvement districts	Used to make map "Community Water Systems and Utility Areas (OCP Schedule F)";	Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection	
85	Map	Bowen Island Forest & Water Management Society	1994	Wetlands - Bowen Island	BISP (2000) - Reprojected from NAD27 to NAD83;	Wetlands2 folder (Currently in Arc/Info 8 Format)	Bowen Island	BIFWMS	Arc/Info 8			18-Apr-94	Polygon	Need to be combined with SEI and Block's wetlands; further mapping and digitizing using GPS is required (i.e. Wetland Mapping Project - BIFWMS); Review using orthophoto may also be valuable;	Not all wetlands are digitized;		BIFWMS Field Surveys	BIFWMS	Journey, Murray	14-Oct-00	UTM; NAD83; Zone 10; Spheroid Clarke 1866;	Wetlands	Coverage of Wetlands on Bowen Island; Shows wetland areas and buffers;	Riparian Management Area (RMA) is 15m, probably added to the wetland itself; 11 wetlands digitized; Wetlands are rough approximations from field surveys prior to GPS;	Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection	
128	Map	Islands Trust	1995	Development Permit Areas and Watershed - Bowen Island	BISP (2000) - Reprojected from NAD27 to NAD83;	Wshed_areas folder (Currently in Arc/Info 8 Format)	Bowen Island	Islands Trust	Arc/Info 8			17-Apr-95	Polygon	DP1 and DP2 should be decoded using bylaw;			Islands Trust - Steam buffer zone (15m) (filename: buffstream.shp) and watershed coverage (filename: Wshednew.shp) were overlaid to create this cover	Islands Trust		14-Oct-00	UTM; NAD83; Zone 10; Spheroid Clarke 1866;	Development Permit Areas; Watershed; water; groundwater recharge; Stream Buffers	Coverage of Development Permit areas on Bowen Island; Created from Steam buffer zone (15m) (filename: buffstream.shp) and watershed coverage (filename: Wshednew.shp) overlay; Attribute include - 'designations' DP1, DP2, and null, and 'inside' 0 or 100	Used to make map called "Development Permit Areas: Protection of the Natural Environment and Protection of Development From Hazardous conditions" on OCP Schedule E (Map 1)	Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection	
133	Map	Bowen Island Forest & Water Management Society	2000	Watershed Interpreted - Bowen Island	BISP (2000) - Converted from shape file to Arc/Info file; Reprojected from NAD27 to NAD83; New watershed boundaries were interpreted from topology by integrating Islands Trust's "Wshed.it", which was missing some critical boundaries and coastal watershed, and BIFWMS' "Wshedat", which had non-existing small watershed that was defined from topology (Interpretation performed by M. Journey (Research Scientist at Geological Survey o	wshed_interp.shp (Currently in shape file - Arc/View 3.1)	Bowen Island		Arc/View 3.1			Oct-00	Polygon				Journey, M send Watershed areas defined by topology (filename: Wshedat.shp) to Islands Trust, and Islands Trust choose the given layer by deleting small, non-existing watersheds (filename: Wshed.it)	BIFWMS	Journey, Murray	7-Nov-00	UTM; NAD83; Zone 10; Spheroid Clarke 1866;	Watershed; water; groundwater recharge;	Coverage of Interpreted Watershed areas on Bowen Island;	No attribute data associated; Need to be cleaned and re-build	Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Sub_Collection	
129	Map	Islands Trust	1995	Watershed (newly defined from topology) - Bowen Island	BISP (2000) - Converted from shape file to Arc/Info file; Reprojected from NAD27 to NAD83;	Wshed_it folder (Currently in Arc/Info 8 Format)	Bowen Island	Islands Trust	Arc/Info 8			5-Apr-95	Line				Journey, M send Watershed areas defined by topology (filename: Wshedat.shp) to Islands Trust, and Islands Trust choose the given layer by deleting small, non-existing watersheds	BIFWMS	Journey, Murray	14-Oct-00	UTM; NAD83; Zone 10; Spheroid Clarke 1866;	Watershed; water; groundwater recharge;	Coverage of Watershed areas on Bowen Island;	No attribute data associated; need to overlay with coastline and make it to polygons;	Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Sub_Collection	
136	Map	Bowen Island Forest & Water Management Society	1993	Watershed (derived from hydrologic analysis) - Bowen Island	BISP (2000) - Reprojected from NAD27 to NAD83;	Wshedat1 folder (Currently in Arc/Info 8 Format)	Bowen Island		Arc/Info 8			5-Apr-95	Polygon			10000	The watershed regions determined by hydrologic analysis (based on 1:10K topographic map) carried out as part of BIFWMS study	BIFWMS	Journey, Murray	14-Oct-00	UTM; NAD83; Zone 10; Spheroid Clarke 1866;	Watershed; water; groundwater recharge; hydrologic analysis; watershed boundaries;	Coverage of Watershed boundaries based on hydrologic analysis on Bowen Island; watershed boundaries are defined by height of land;	No attribute data associated; according to topology, so that very small watersheds are determined near the coast line; Islands Trust have updated the watershed from this coverage (filename: wshednew.shp);	Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Sub_Collection	
90	Map	Bowen Island Forest & Water Management Society	1994	Weather Stations - Bowen Island	BISP (2000) - Converted from shape file to Arc/Info file; Reprojected from NAD27 to NAD83;	Wstat folder (Currently in Arc/Info 8 Format)	Bowen Island		Arc/Info 8			3-Mar-94	Point	Maybe quality controlled (location) by overlaying with cadastre; Ones that report to Environment Canada should be identified (i.e. within Attribute data)			BIFWMS Water Survey - Conducted by Anne Chollat	BIFWMS	Francois de Ferriere - Chollat, Anne	14-Oct-00	UTM; NAD83; Zone 10; Spheroid Clarke 1866;	Weather Station; Weather Data; Rain; Precipitation; Climate; Climatology	Coverage showing 18 Weather Stations on Bowen Island; include name of the station and date that have been in use	Refer to Anne Chollat's Report to determine which stations report back to Environment Canada (6), and others report back to BIFWMS. Data is associated with database (disks) Anne possesses;	Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection	
89	Map	Islands Trust	1993	Land Use Zones - Bowen Island	BISP (2000) - Converted from shape file to Arc/Info file; Reprojected from NAD27 to NAD83; Shoreline changed to the latest shoreline at year 2000 (Same as Bowsh (polygon) shoreline); Attribute data Decoded;	Zones folder (Currently in Arc/Info 8 Format)	Bowen Island		Arc/Info 8			9-Feb-94	Digital; Polygon	Snug Cove and the surrounding area (including Bowen Bay, Cates Hill) is missing detailed data. - have not been digitized - refer to paper copy of Bylaw Map (Available at Bowen Island Municipality). Data relied on by Islands Trust planners to within 50m;		10000	Digitized by Dixon, C. and Kemble, C. (BCIT Student - 1993) from BC Mapping and Surveys (via Islands Trust) thematic maps at 1:10K scale; Bowen Island Zoning Bylaw No. 36;	Islands Trust		14-Oct-00	UTM; NAD83; Zone 10; Spheroid Clarke 1866;	Zones; Land Use; Bylaw;	Coverage of Land Use Zones of Bowen Island; Shows Land Use Zoning defined by Bowen Island Zoning Bylaw No. 36;	Incomplete - missing Snug Cove area; Attribute field called "Zone Key" include variables such as SR, R, PR, CWSP, RC-1, L-1, SCR, M-2, CWSC-1; Reference: Bowen Island Zoning Bylaw No. 36;	Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection	

Appendix 6

List of Maps for SoBI Report – Version 2

This table contains the list of possible maps to be created for the State of Bowen Island report. Maps are classified depending on the amount of work required to create the maps (i.e making maps from the layers already exist, from new layers to be obtained, or from non-digital format). The team used the usability on SoBI report and the resources availability as criteria for elimination. This was prepared on July 26th, 2000.

5 pages

List of Maps for SoBI Report - Version 2

The Map # refer to the primary Folio of maps

May be low priority

Maps we can produce from layers we already have

Map #	Map	Layers	Note
1	General Island Map	Contours Labels Roads Lakes Streams Shoreline	Steph already created general island map in the past, but label layer have to be updated
3	Weather Information	Weather Station	Layer already exist, but weather info have to be obtained from Anne Challot
6	Ground water	Deepwells	Other info on Groundwater is not available, so deepwell itself may not have significant importance. Deepwell can be combined with other wells - water use
7	Surface Water	Sterams Lakes Springs Watershed	Watershed - the updated Island Trust Version would be appropriate (metadata required). Wetland will be included in Sensitive areas
12	Environmentally Sensitive Areas	Buffers Wetland Old growth Rare Plant	Buffers may require update to 30m (?), location of wetland may be compared to other layers existed
13	Hazardous Areas	Slopes Fire Hazard Wind Hazard	Slope may require re-classification (25 or 30%?). They are coverage files - require separate maps
14	Soils	Soil Classification Drainage Classification	Block has soil info in Terrain interpretation layer, but also ask Murray
15	Forest	Forest Age Disturbance	File from MoF has the info, but we have to import .e00 file to see
16	Vegetation Classification	Plant type	Block has the Plant info
27	Water Licences	Licences	Steph got it, but is it really necessary for the report to know the location of all licences?
38	Water Use	Deepwells shallow wells Registered, unregistered Community water systems	wells may not be complete, have to read Anne Shallot's report. Water system is in OCP

42 Development Restriction

Cadastre
Buffers
Slope

Buffers may require re-defining to meet current regulation (30m?), but relevance of the map to the report is unknown

List of Maps for SoBI Report - Version 2

The Map # refer to the primary Folio of maps

May be low priority

Maps which include layers that need to be obtained in digital format from other organizations

Map #	Map	Layers	Note
4	Geology & Geomorphology	Bedrock Geomorph Classification	Obtain from Murray
5	Lake Bathmetry	Lakes Bathmetry	Obtain from Murray, but there is high & low season... maybe more appropriate as discussion
21	Agriculture land & ALR	Active Agriculture Land ALR	OCP has the info, but require update and metadata. Assessment Roll or Farming Assoc. may have data
26	Regional Context Map of BI	Areas around BI (I.e. Howe Sound)	Ask Murray where we can find it

List of Maps for SoBI Report - Version 2

The Map # refer to the primary Folio of maps

May be low priority

Maps we need to create from non-digital format

Map #	Map	Layers	Note
2	Biogeoclimate Zone	Biogeoclimate Classification	Maps may exist in digital form, which shows 2 zones. Maybe more appropriate as discussion
17	Wildlife	Wildlife Corridor Habitat Wildlife Sighting	Create from Greenzone, or MELP may have it in Digital form(?), may be more for discussion
18	Birds	Habitat Herons nesting area	Create from Data, or MELP may have it in Digital (?), may be more for discussion
19	Fish	Fish Capacity Sighting Hatchery Fishing areas	We do not have the digital form of fish information from Block. MELP or DFO may have the digital form, but lots of revising expected. Fishing area - fish & wildlife Club or Marina
20	Population Density	Regional Zones Population	layer need to be created to classify Regions, population data may be aquired from Assessment Roll or StatsCan, but discussion may be more appropriate
22	Zoning Map	Residential Commercial Industrial Crown / Private Land	OCP catagorizes zones in residential, minor rural, and rural. Commercial & industrial need to be obtained (assessment roll or Chamber of Commerce)
25	Tourism Sites	Attractions B&B	Info from Chamber of Commerce or Assessment Roll
28	Social Facilities & Neighbourhood	Schools Social & health services Emergency services Neighbourhood	Have to create from Assessment Roll. Neighbourhood layer also have to be created
29	Green spaces & Recreational Areas	Parks Ecological Reserves Crown Land Trails Recreational Fields Recreation Centre	Recreation Centre and Field have to be created from Assessment Roll. Other Layers already exists.
34	Historical Sites	Historical & Cultural Sites	Nothing is in Digital format, create from Assessment roll or GreenZone, data also have to be collected

35 Transportation Infrastructure	Parking Lots Roads Bus Routes	Neither Parking Lots or Bus Routes exist in digital format - have to create (GPS may also required to capture parking lots)
36 Energy	Energy Production on Island Hydro Poles	Have to GPS production location, hydro pole location may not tell much story
37 Stormwater	Storm water	Data does not exist???
38 Liquid waste	Septic Tanks	Northshore Health has hand drawn maps. Need to digitize and connect to assessment roll

Appendix 7

List of Maps for SoBI Report – Version 3

This table contains the refined version of list of maps to be created for the State of Bowen Island report. The first draft of maps were created according to this list, where possible. (maps which were unable to create: Wildlife and Fish habitat layer was not available. Environmentally sensitive areas map had a problem with copyrights.) The review of draft maps by the team eliminated maps further to meet the need of SoBI report. This list was prepared on September 6th, 2000.

2 pages

List of Maps for SoBI Report - Version 3

Map #	Map	Layers	Fileneme	Note
1	General Island Map	Contours Labels Roads Lakes Streams Shoreline	Contours Need to create roadsall lakes streams bowsh or from ortho	Create a label layer which shows roads name, lakes, bays etc. Shore may need to be updated using orthophoto
2	Biogeoclimate Zone	Biogeoclimate Classification	qbec	qbec need to be clipped, overlayed with shore
3	Weather Information	Weather Station	wstat	weather info need to be added as bar charts
4	Geology	Bedrock Deepwell	geology dwell	need to be clipped, overlayed with shore
5	Ground water - Blank Map	Shore Lakes Stream	bowsh or from ortho lakes streams	Other info on Groundwater is not available, so research team will add potential area into the blank map
6	Surface Water	Sterams Lakes Springs Wetlands Watershed	streams lakes springs wetland - need to overlay wshed - need to refine	wetland and watershed layer need to be refined
7	Environmentally Sensitive Areas	Sensitive Ecosystems Inventory	sei_bowen	May use sei map or create from layers such as forest cover, wetland, buffer, and sei
8	Slope Hazard	Slopes > 25% Cadastre	slope_25 cadastre	overlay slope >25 and cadastre for areas of development
9	Fire Hazard	Fire Hazard	Vegetatx	shows M, L or H
10	Forest	Forest Age Disturbance	get from MoF get from MoF	File from MoF will be obtained Sep 8th
11	Vegetation Classification	Plant type	Vegetatx	shows different association
12	Wildlife	Wildlife Habtat	get from MELP	Need to talk to Rob Knight
13	Fish	Fish habitat	get from MELP	Need to talk to Rob Knight
14	Lots Density	lots	Cadastre - calculate density and make dot map	Calculate # of percels per district lots, also calculate average lots size
15	Agriculture land & ALR	Active Agriculture Land / ALR	Ag_Land	Jim is following up with Farming association
16	OCP Zoning Designations	OCP zones	ocp	obtain insert of Snug Cove from Island Trust
17	Bylaw Zoning	Bylaw zones	zones	obtain insert of Snug Cove from Island Trust
18	Water Licences	Licences	have to create	Licence location, but other info may be more critical (I.e. amount of water)
19	Green spaces	Parks Ecological Reserves Crown Land	Park_res	Areas may need to be calculated
20	Recreational areas	Recreation significance Trails	recreat trails	block - recreation, need to figure out what is the most effective way of display
21	Transportation Infrastructure	Bus Routes	have to create	we have to add column to roads

Map #	Map	Layers	Fileneme	Note
		Roads	roadsall	which are used for bus route
22	Water use	Deepwell Shallow well Registered well Drainage	dwell shwell rwell terrtext	need to determine the difference between wells - Jim
23	Water district	Streams Lakes water district	streams lakes watersys	Discription of each water system will be added in the report
24	Landuse	Landuse	get from SDR1	TRIM based landuse - need to clip
25	Snug Cove Area	Shore Road	bowsh or ortho roadsall	Zoom into snug cove area - Research team will add facilities

Appendix 8

Detailed Metadata for Maps Cited in the State of Bowen Island Report

This document contains detailed metadata (information about each maps, i.e. authors, sources, projections, accuracy etc.), which were not able to satisfactory represented in the actual map due to the limited space. For each map, the layers used, other information used and the map composition was defined. Information on layers were cited from spatial database entries (refer to Appendix 5).

31 pages

Map 1) General Map of Bowen Island

Layers Used:

Road Network - Bowen Island

Created by: Islands Trust (1993)

File Name: "Roadsall" folder (Currently in Arc/Info 8 Format) in Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection

Modified by: BISP (2000) - Converted from shape file to Arc/Info file; Reprojected from NAD27 to NAD83;

Source: BC TRIM - Roads Network; Digitized by Dixon, C. and Kemble, C. (BCIT Student - 1993) from TRIM at 1:20K scale; Modified by BIFWMS;

Custodian: Islands Trust

Abstract: Coverage showing Road network for Bowen Island; showing most detailed road network;

Accuracy: Several non-existing roads has been included in the layer; Not all the roads are digitized - require review

Stream Network - Bowen Island

Created by: Bowen Island Forest & Water Management Society (2000)

File Name: "streams" folder (Currently in Arc/Info 8 Format) in Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection

Modified by: BISP (2000) - Converted from shape file to Arc/Info file; Several Layers were combined to create this complete layer;

Source: BIFWMS - Some of the streams GPS'd and Digitized (2000) for SHIM project, Combined to create complete layer by BISP (2000)

Custodian: BIFWMS

Abstract: Coverage showing Stream Network on Bowen Island; Some of the streams were GPS'd by BIFWMS through SHIM project; attributes include name of the streams, sources, and GPS'd date;

Lakes - Bowen Island

Created by: Bowen Island Forest & Water Management Society (2000)

File Name: "Lakes" folder (Currently in Arc/Info 8 Format) in Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection

Modified by: BISP (2000) - Converted from shape file to Arc/Info file; Several Layers were combined to create this complete layer;

Source: BIFWMS - Some of the lakes are GPS'd and Digitized (2000) for SHIM project; Combined to create complete layer by BISP (2000)

Custodian: BIFWMS

Abstract: Coverage showing Lakes on Bowen Island; Some of the lakes were GPS'd by BIFWMS through SHIM project; attribute include Name of the lakes and GPS'd date;

Contours - Bowen Island

Created by: Islands Trust (1994)

File Name: "Contours" folder (Currently in Arc/Info 8 Format) in Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection

Modified by: BISP (2000) - Converted from shape file to Arc/Info file; Reprojected from NAD27 to NAD83;

Source: BC TRIM - modified by BIFWMS to fit the latest (at 2000) shoreline;

Abstract: 1: 10000 TRIM Contours for Bowen Island at 20m interval

Shoreline and the Island Polygons - Bowen Island

Created by: Bowen Island Forest & Water Management Society (1993)

File Name: "Bowsh" folder (Currently in Arc/Info 8 Format) in Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection

Modified by: BISP (2000) - Converted from shape file to Arc/Info file; Reprojected from NAD27 to NAD83;

Source: Shoreline digitized by Dixon, C. and Kemble, C. (BCIT Student - 1993) from BC Mapping and Surveys (via Islands Trust) thematic maps at 1:10K scale;

Custodian: BIFWMS

Abstract: Coverage of coastline and island polygon on Bowen Island; Appears as solid Island polygon; For Cartographic purposes

Other Information Used:

Index – Satellite Image of Greater Vancouver Regional District including Bowen Island.

Height of Mount Gardner and Mount Collins – Obtained from H.E. Hirvonen (1976) and converted into Meters.

Hirvonen, H.E. (1976). *Bowen Island: A Landscape Analysis*. Ed. Canadian Forestry Service. Department of the Environment: Victoria British Columbia. p. 29.

Map Compositions:

Printed on: 8x11 inches – Black and White (Gray Scale)

Created by: Bowen Island Sustainability Project – Miki Shoji, Stephanie Lemmon and Murray Journeay

Created for: State of Bowen Island Report (2000)

Map Scale: 1:50,000

Contour Interval: 20m (Height of Land defined in Meters)

Projection: UTM, NAD83, Zone10, Clarke 1866

Map 2) BOWEN ISLAND: Biogeoclimatic Zone and Total Precipitation

Layers Used:

Biogeoclimatic Zones- Bowen Island

Created by: BC Ministry of Forests (1995)

File Name: "Climate" folder (Currently in Arc/Info 8 Format) in Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection

Modified by: NAD83 BISP (2000) - Converted from .e00 file to Arc/Info file; Reprojected from ALBERS, GRS1980, Parameters (50,0,0; 58,30,0; -126,0,0; 45,0,0; 1000000; 0) to UTM, NAD83, Zone 10, Clarke 1866; Projection Error was fixed using NAD83 to NAD27 Transformation; Clipped to show only Bowen Island; Shoreline changed to the latest shoreline at year 2

Source: Qbec.e00; Ministry of Forests - Biogeoclimatic Ecosystem Classification with Coastlines - More Info at http://www.res.for.gov.bc.ca/projects/bec_doc.html

Custodian: Ministry of Forests

Abstract: Coverage showing biogeoclimatic zones. Not ground truthed and known to have errors, as it was created at a scale of 1:250,000, whereas differences are noted at a scale of 1:10,000. Zone for Bowen is Coastal Western Hemlock (CWH) and there are three subzones (dm, vm2, xm1).

Weather Stations - Bowen Island

Created by: Bowen Island Forest & Water Management Society (1994)

File Name: "Wstat" folder (Currently in Arc/Info 8 Format) in Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection

Modified by: BISP (2000) - Converted from shape file to Arc/Info file; Reprojected from NAD27 to NAD83;

Source: BIFWMS Water Survey - Conducted by Anne Chollat

Custodian: BIFWMS

Abstract: Coverage showing 18 Weather Stations on Bowen Island; include name of the station and date that have been in use

Lakes - Bowen Island

Created by: Bowen Island Forest & Water Management Society (2000)

File Name: "Lakes" folder (Currently in Arc/Info 8 Format) in Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection

Modified by: BISP (2000) - Converted from shape file to Arc/Info file; Several Layers were combined to create this complete layer;

Source: BIFWMS - Some of the lakes are GPS'd and Digitized (2000) for SHIM project; Combined to create complete layer by BISP (2000)

Custodian: BIFWMS

Abstract: Coverage showing Lakes on Bowen Island; Some of the lakes were GPS'd by BIFWMS through SHIM project; attribute include Name of the lakes and GPS'd date;

Contours - Bowen Island

Created by: Islands Trust (1994)

File Name: "Contours" folder (Currently in Arc/Info 8 Format) in Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection

Modified by: BISP (2000) - Converted from shape file to Arc/Info file; Reprojected from NAD27 to NAD83;

Source: BC TRIM - modified by BIFWMS to fit the latest (at 2000) shoreline;

Abstract: 1: 10000 TRIM Contours for Bowen Island at 20m interval

Shoreline and the Island Polygons - Bowen Island

Created by: Bowen Island Forest & Water Management Society (1993)

File Name: "Bowsh" folder (Currently in Arc/Info 8 Format) in Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection

Modified by: BISP (2000) - Converted from shape file to Arc/Info file; Reprojected from NAD27 to NAD83;

Source: Shoreline digitized by Dixon, C. and Kemble, C. (BCIT Student - 1993) from BC Mapping and Surveys (via Islands Trust) thematic maps at 1:10K scale;

Custodian: BIFWMS

Abstract: Coverage of coastline and island polygon on Bowen Island; Appears as solid Island polygon; For Cartographic purposes

Other Information Used:

Precipitation Graphs – Data obtained from Environment Canada (Monthly CD for quality –controlled data 1992 to early to mid 1999. Filename: MARG2.xls. (provided by Stan Stobbe, Climate Services)
The data was analyzed by Bowen Island Sustainability Project (BISP) 2000 for monthly sverage of total precipitation (snow and rain) over the period when the data is available. The Annual Average of Total Precipitation was calculated as a Sum of Monthly Average of Total Precipitation.

Description of Biogeoclimatic Zones – Information obtained from British Columbia Ministry of Forests.
BC Ministry of Forests. (1991). *Ecosystem of British Columbia*. Meidinger, D. and Pojar, J. Eds. Special Report Series 6. Province of British Columbia, Research Branch: Victoria. ISSN 0843-6452, February 1991. <http://www.for.gov.bc.ca/hfd/pubs/docs/Srs/SRseries.htm>

Map Compositions:

Printed on: 11 x 17 inches – Black and White (Gray Scale)

Created by: Bowen Island Sustainability Project – Miki Shoji, Stephanie Lemmon and Murray Journeay

Created for: State of Bowen Island Report (2000)

Map Scale: 1:37,500

Contour Interval: 20m (Height of Land defined in Meters)

Projection: UTM, NAD83, Zone10, Clarke 1866

Map 3) BOWEN ISLAND : Bedrock Geology

Layers Used:

Geology - Bowen Island

Created by: Geological Survey of Canada (1996)

File Name: "Geology" folder (Currently in Arc/Info 8 Format) in Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection

Modified by: BISP (2000) - Converted from shape file to Arc/Info file; Shoreline changed to the latest shoreline at year 2000 (Same as Bowsh (polygon) shoreline); Existing Lake outlines have been renewed to latest (2000) version of Lakes (Josephine, Grafton, and Killarney);

Source: Monger, J.W.H. (1985-1993) - Geological Survey of Canada paper 93-1A

Custodian: Geological Survey of Canada

Abstract: This coverage shows the geology for Bowen Island (Bowen Island Group). Attribute table is complete with rock class, description, type, era/epoch, age

Deep Wells - Bowen Island

Created by: Bowen Island Forest & Water Management Society (1994)

File Name: "Dwell" folder (Currently in Arc/Info 8 Format) in Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection

Modified by: BISP (2000) - Converted from shape file to Arc/Info file; Reprojected from NAD27 to NAD83;

Source: BIFWMS Water Survey - Conducted by Anne Chollat (SCI_Bowen CD)

Custodian: BIFWMS

Abstract: Coverage showing registered and non-registered deep wells (179) on Bowen Island; Deep wells are drilled wells;

Lakes - Bowen Island

Created by: Bowen Island Forest & Water Management Society (2000)

File Name: "Lakes" folder (Currently in Arc/Info 8 Format) in Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection

Modified by: BISP (2000) - Converted from shape file to Arc/Info file; Several Layers were combined to create this complete layer;

Source: BIFWMS - Some of the lakes are GPS'd and Digitized (2000) for SHIM project; Combined to create complete layer by BISP (2000)

Custodian: BIFWMS

Abstract: Coverage showing Lakes on Bowen Island; Some of the lakes were GPS'd by BIFWMS through SHIM project; attribute include Name of the lakes and GPS'd date;

Contours - Bowen Island

Created by: Islands Trust (1994)

File Name: "Contours" folder (Currently in Arc/Info 8 Format) in Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection

Modified by: BISP (2000) - Converted from shape file to Arc/Info file; Reprojected from NAD27 to NAD83;

Source: BC TRIM - modified by BIFWMS to fit the latest (at 2000) shoreline;

Abstract: 1: 10000 TRIM Contours for Bowen Island at 20m interval

Shoreline and the Island Polygons - Bowen Island

Created by: Bowen Island Forest & Water Management Society (1993)

File Name: "Bowsh" folder (Currently in Arc/Info 8 Format) in Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection

Modified by: BISP (2000) - Converted from shape file to Arc/Info file; Reprojected from NAD27 to NAD83;

Source: Shoreline digitized by Dixon, C. and Kemble, C. (BCIT Student - 1993) from BC Mapping and Surveys (via Islands Trust) thematic maps at 1:10K scale;

Custodian: BIFWMS

Abstract: Coverage of coastline and island polygon on Bowen Island; Appears as solid Island polygon; For Cartographic purposes

Map Compositions:

Printed on: 8x11 inches – Black and White (Gray Scale)

Created by: Bowen Island Sustainability Project – Miki Shoji, Stephanie Lemmon and Murray Journeay

Created for: State of Bowen Island Report (2000)

Map Scale: 1:50,000

Contour Interval: 20m (Height of Land defined in Meters)

Projection: UTM, NAD83, Zone10, Clarke 1866

Map 3) BOWEN ISLAND : Surface Geology

Layers Used:

Terrain Analysis: Base Data- Bowen Island

Created by: Block (1978)

File Name: "Terrex" folder (Currently in Arc/Info 8 Format) in Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection

Modified by: BISP (2000) - Converted from shape file to Arc/Info file; Reprojected from NAD27 to NAD83; Shoreline changed to the latest shoreline at year 2000 (Same as Bowsh (polygon) shoreline); Existing Lake outlines have been renewed to latest (2000) version of Lakes (Honeymoon, Mud Lake, Small pond in NE of Island, Bowen Brook Headwaters, Josephine, Grafton, and Killarney, also, Lagoon polygon was deleted); Attribute data

Source: Digitized by Dixon, C. and Kemble, C. (BCIT Student - 1993) from BC Mapping and Surveys (via Islands Trust) thematic maps at 1:10K scale; Block (1978)

Custodian: BIFWMS

Abstract: Coverage used to make a map "Terrain Analysis: Base Data", Block (1978) - Block Report; describes Soil and Surface Materials, Texture, Genetic Materials, Surface Expression, Modifying processes;

Lakes - Bowen Island

Created by: Bowen Island Forest & Water Management Society (2000)

File Name: "Lakes" folder (Currently in Arc/Info 8 Format) in Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection

Modified by: BISP (2000) - Converted from shape file to Arc/Info file; Several Layers were combined to create this complete layer;

Source: BIFWMS - Some of the lakes are GPS'd and Digitized (2000) for SHIM project; Combined to create complete layer by BISP (2000)

Custodian: BIFWMS

Abstract: Coverage showing Lakes on Bowen Island; Some of the lakes were GPS'd by BIFWMS through SHIM project; attribute include Name of the lakes and GPS'd date;

Shoreline and the Island Polygons - Bowen Island

Created by: Bowen Island Forest & Water Management Society (1993)

File Name: "Bowsh" folder (Currently in Arc/Info 8 Format) in Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection

Modified by: BISP (2000) - Converted from shape file to Arc/Info file; Reprojected from NAD27 to NAD83;

Source: Shoreline digitized by Dixon, C. and Kemble, C. (BCIT Student - 1993) from BC Mapping and Surveys (via Islands Trust) thematic maps at 1:10K scale;

Custodian: BIFWMS

Abstract: Coverage of coastline and island polygon on Bowen Island; Appears as solid Island polygon; For Cartographic purposes

Map Compositions:

Printed on: 8x11 inches – Black and White (Gray Scale)

Created by: Bowen Island Sustainability Project – Miki Shoji, Stephanie Lemmon and Murray Journeay

Created for: State of Bowen Island Report (2000)

Map Scale: 1:50,000

Projection: UTM, NAD83, Zone10, Clarke 1866

Map 5) BOWEN ISLAND : Surface Water

Layers Used:

Springs - Bowen Island

Created by: Bowen Island Forest & Water Management Society (1999)

File Name: "springs" folder (Currently in Arc/Info 8 Format) in Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection

Modified by: BISP (2000) - Converted from shape file to Arc/Info file;

Source: Digitized by BIFWMS from water licence map (MELP)

Custodian: BIFWMS

Abstract: Coverage of springs on Bowen Island;

Stream Network - Bowen Island

Created by: Bowen Island Forest & Water Management Society (2000)

File Name: "streams" folder (Currently in Arc/Info 8 Format) in Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection

Modified by: BISP (2000) - Converted from shape file to Arc/Info file; Several Layers were combined to create this complete layer;

Source: BIFWMS - Some of the streams GPS'd and Digitized (2000) for SHIM project, Combined to create complete layer by BISP (2000)

Custodian: BIFWMS

Abstract: Coverage showing Stream Network on Bowen Island; Some of the streams were GPS'd by BIFWMS through SHIM project; attributes include name of the streams, sources, and GPS'd date;

Wetlands - Bowen Island

Created by: Bowen Island Forest & Water Management Society (1994)

File Name: "Wetlands2" folder (Currently in Arc/Info 8 Format) in Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection

Modified by: BISP (2000) - Reprojected from NAD27 to NAD83;

Source: BIFWMS Field Surveys

Custodian: BIFWMS

Abstract: Coverage of Wetlands on Bowen Island; Shows wetland areas and buffers;

Accuracy: Not all wetlands are digitized;

Lakes - Bowen Island

Created by: Bowen Island Forest & Water Management Society (2000)

File Name: "Lakes" folder (Currently in Arc/Info 8 Format) in Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection

Modified by: BISP (2000) - Converted from shape file to Arc/Info file; Several Layers were combined to create this complete layer;

Source: BIFWMS - Some of the lakes are GPS'd and Digitized (2000) for SHIM project; Combined to create complete layer by BISP (2000)

Custodian: BIFWMS

Abstract: Coverage showing Lakes on Bowen Island; Some of the lakes were GPS'd by BIFWMS through SHIM project; attribute include Name of the lakes and GPS'd date;

Watershed Interpreted - Bowen Island

Created by: Bowen Island Forest & Water Management Society (2000)

File Name: wshed_interp.shp (Currently in shape file - ArcView 3.1) in Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Sub_Collection

Modified by: BISP (2000) - Converted from shape file to Arc/Info file; Reprojected from NAD27 to NAD83; New watershed boundaries were interpreted from topology by integrating Islands Trust's "Wshed_it," which was missing some critical boundaries and coastal watershed, and BIFWMS' "Wshedall," which had non-existing small watershed that was defined from topology (Interpretation performed by M. Journeay (Research Scientist at Geological Survey o

Source: Journeay, M send Watershed areas defined by topology (filename: Wshedall.shp) to Islands Trust, and Islands Trust choose the given layer by deleting small, non-existing watersheds (filename: Wshed_it)

Custodian: BIFWMS

Abstract: Coverage of Interpreted Watershed areas on Bowen Island;

Contours - Bowen Island

Created by: Islands Trust (1994)

File Name: "Contours" folder (Currently in Arc/Info 8 Format) in Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection

Modified by: BISP (2000) - Converted from shape file to Arc/Info file; Reprojected from NAD27 to NAD83;

Source: BC TRIM - modified by BIFWMS to fit the latest (at 2000) shoreline;

Abstract: 1: 10000 TRIM Contours for Bowen Island at 20m interval

Shoreline and the Island Polygons - Bowen Island

Created by: Bowen Island Forest & Water Management Society (1993)

File Name: "Bowsh" folder (Currently in Arc/Info 8 Format) in Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection

Modified by: BISP (2000) - Converted from shape file to Arc/Info file; Reprojected from NAD27 to NAD83;

Source: Shoreline digitized by Dixon, C. and Kemble, C. (BCIT Student - 1993) from BC Mapping and Surveys (via Islands Trust) thematic maps at 1:10K scale;

Custodian: BIFWMS

Abstract: Coverage of coastline and island polygon on Bowen Island; Appears as solid Island polygon; For Cartographic purposes

Map Compositions:

Printed on: 8x11 inches – Black and White (Gray Scale)

Created by: Bowen Island Sustainability Project – Miki Shoji, Stephanie Lemmon and Murray Journeay

Created for: State of Bowen Island Report (2000)

Map Scale: 1:50,000

Contour Interval: 20m (Height of Land defined in Meters)

Projection: UTM, NAD83, Zone10, Clarke 1866

Map 6) BOWEN ISLAND : Streams and Slope Area >25 Degrees

Layers Used:

Slopes grater than 25 % - Bowen Island

Created by: Islands Trust (1995)

File Name: "slope_25" folder (Currently in Arc/Info 8 Format) in Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection

Modified by: BISP (2000) - Reprojected from NAD27 to NAD83;

Source: Derived from 1:10000 DEM for land use planing purpose;

Custodian: Islands Trust

Abstract: Coverage showing regions (polygons) where slope exceed 25% grade; derived from 1:10K DEM. Schedule E (map 2) in OCP, "Development Permit Area, Slope Area >25 degrees"

Stream Network - Bowen Island

Created by: Bowen Island Forest & Water Management Society (2000)

File Name: "streams" folder (Currently in Arc/Info 8 Format) in Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection

Modified by: BISP (2000) - Converted from shape file to Arc/Info file; Several Layers were combined to create this complete layer;

Source: BIFWMS - Some of the streams GPS'd and Digitized (2000) for SHIM project, Combined to create complete layer by BISP (2000)

Custodian: BIFWMS

Abstract: Coverage showing Stream Network on Bowen Island; Some of the streams were GPS'd by BIFWMS through SHIM project; attributes include name of the streams, sources, and GPS'd date;

Lakes - Bowen Island

Created by: Bowen Island Forest & Water Management Society (2000)

File Name: "Lakes" folder (Currently in Arc/Info 8 Format) in Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection

Modified by: BISP (2000) - Converted from shape file to Arc/Info file; Several Layers were combined to create this complete layer;

Source: BIFWMS - Some of the lakes are GPS'd and Digitized (2000) for SHIM project; Combined to create complete layer by BISP (2000)

Custodian: BIFWMS

Abstract: Coverage showing Lakes on Bowen Island; Some of the lakes were GPS'd by BIFWMS through SHIM project; attribute include Name of the lakes and GPS'd date;

Contours - Bowen Island

Created by: Islands Trust (1994)

File Name: "Contours" folder (Currently in Arc/Info 8 Format) in Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection

Modified by: BISP (2000) - Converted from shape file to Arc/Info file; Reprojected from NAD27 to NAD83;

Source: BC TRIM - modified by BIFWMS to fit the latest (at 2000) shoreline;

Abstract: 1: 10000 TRIM Contours for Bowen Island at 20m interval

Shoreline and the Island Polygons - Bowen Island

Created by: Bowen Island Forest & Water Management Society (1993)

File Name: "Bowsh" folder (Currently in Arc/Info 8 Format) in Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection

Modified by: BISP (2000) - Converted from shape file to Arc/Info file; Reprojected from NAD27 to NAD83;

Source: Shoreline digitized by Dixon, C. and Kemble, C. (BCIT Student - 1993) from BC Mapping and Surveys (via Islands Trust) thematic maps at 1:10K scale;

Custodian: BIFWMS

Abstract: Coverage of coastline and island polygon on Bowen Island; Appears as solid Island polygon; For Cartographic purposes

Map Compositions:

Printed on: 8x11 inches – Black and White (Gray Scale)

Created by: Bowen Island Sustainability Project – Miki Shoji, Stephanie Lemmon and Murray Journeay

Created for: State of Bowen Island Report (2000)

Map Scale: 1:50,000

Contour Interval: 20m (Height of Land defined in Meters)

Projection: UTM, NAD83, Zone10, Clarke 1866

Map 7) BOWEN ISLAND : Development Permit Area for Slope >25 Degrees

Layers Used:

Slopes grater than 25 % - Bowen Island

Created by: Islands Trust (1995)

File Name: "slope_25" folder (Currently in Arc/Info 8 Format) in Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection

Modified by: BISP (2000) - Reprojected from NAD27 to NAD83;

Source: Derived from 1:10000 DEM for land use planing purpose;

Custodian: Islands Trust

Abstract: Coverage showing regions (polygons) where slope exceed 25% grade; derived from 1:10K DEM. Schedule E (map 2) in OCP, "Development Permit Area, Slope Area >25 degrees"

Cadastral - Bowen Island

Created by: Islands Trust (2000)

File Name: "Cadastre" folder (Currently in Arc/Info 8 Format) in Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection

Modified by: NAD83; BISP (2000) - Converted from shape file to Arc/Info file; Reprojected from Decimal Degrees to UTM

Source: LUCO (Land Use Commission Office)

Custodian: Islands Trust

Abstract: Coverage showing most recent version (at year 2000) of Cadastral for Bowen Island; Attribute includes district lots, plan, lots, block and legal notes

Lakes - Bowen Island

Created by: Bowen Island Forest & Water Management Society (2000)

File Name: "Lakes" folder (Currently in Arc/Info 8 Format) in Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection

Modified by: BISP (2000) - Converted from shape file to Arc/Info file; Several Layers were combined to create this complete layer;

Source: BIFWMS - Some of the lakes are GPS'd and Digitized (2000) for SHIM project; Combined to create complete layer by BISP (2000)

Custodian: BIFWMS

Abstract: Coverage showing Lakes on Bowen Island; Some of the lakes were GPS'd by BIFWMS through SHIM project; attribute include Name of the lakes and GPS'd date;

Contours - Bowen Island

Created by: Islands Trust (1994)

File Name: "Contours" folder (Currently in Arc/Info 8 Format) in Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection

Modified by: BISP (2000) - Converted from shape file to Arc/Info file; Reprojected from NAD27 to NAD83;

Source: BC TRIM - modified by BIFWMS to fit the latest (at 2000) shoreline;

Abstract: 1: 10000 TRIM Contours for Bowen Island at 20m interval

Shoreline and the Island Polygons - Bowen Island

Created by: Bowen Island Forest & Water Management Society (1993)

File Name: "Bowsh" folder (Currently in Arc/Info 8 Format) in Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection

Modified by: BISP (2000) - Converted from shape file to Arc/Info file; Reprojected from NAD27 to NAD83;

Source: Shoreline digitized by Dixon, C. and Kemble, C. (BCIT Student - 1993) from BC Mapping and Surveys (via Islands Trust) thematic maps at 1:10K scale;

Custodian: BIFWMS

Abstract: Coverage of coastline and island polygon on Bowen Island; Appears as solid Island polygon; For Cartographic purposes

Map Compositions:

Printed on: 8x11 inches – Black and White (Gray Scale)

Created by: Bowen Island Sustainability Project – Miki Shoji, Stephanie Lemmon and Murray Journeay

Created for: State of Bowen Island Report (2000)

Map Scale: 1:50,000

Contour Interval: 20m (Height of Land defined in Meters)

Projection: UTM, NAD83, Zone10, Clarke 1866

Map 8) BOWEN ISLAND : Vegetation Associations

Layers Used:

Vegetation Analysis- Bowen Island

Created by: Block (1978)

File Name: "Vegetatnew" folder (Currently in Arc/Info 8 Format) in Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection

Modified by: BISP (2000) - Converted from shape file to Arc/Info file; Reprojected from NAD27 to NAD83; Shoreline changed to the latest shoreline at year 2000 (Same as Bowsh (polygon) shoreline); Existing Lake outlines have been renewed to latest (2000) version of Lakes (Honeymoon, Josephine, Grafton, and Killarney, also, Lagoon polygon was deleted); Attribute data Decoded using Block Report (1978) Map Acetates; Attribute Dat

Source: Digitized by Dixon, C. and Kemble, C. (BCIT Student - 1993) from BC Mapping and Surveys (via Islands Trust) thematic maps at 1:10K scale; Block (1978)

Custodian: BIFWMS

Abstract: Coverage used to make a map "Vegetation Analysis", Block (1978) - Block Report; describes Vegetation, Wind Hazard, Fire hazard, Trafficability, Nature interpretation Value, Sound absorption potential, Visual Screening Potential, Browse Potential, Landscaping Potential and Habitat Manipulation Suitability;

Lakes - Bowen Island

Created by: Bowen Island Forest & Water Management Society (2000)

File Name: "Lakes" folder (Currently in Arc/Info 8 Format) in Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection

Modified by: BISP (2000) - Converted from shape file to Arc/Info file; Several Layers were combined to create this complete layer;

Source: BIFWMS - Some of the lakes are GPS'd and Digitized (2000) for SHIM project; Combined to create complete layer by BISP (2000)

Custodian: BIFWMS

Abstract: Coverage showing Lakes on Bowen Island; Some of the lakes were GPS'd by BIFWMS through SHIM project; attribute include Name of the lakes and GPS'd date;

Shoreline and the Island Polygons - Bowen Island

Created by: Bowen Island Forest & Water Management Society (1993)

File Name: "Bowsh" folder (Currently in Arc/Info 8 Format) in Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection

Modified by: BISP (2000) - Converted from shape file to Arc/Info file; Reprojected from NAD27 to NAD83;

Source: Shoreline digitized by Dixon, C. and Kemble, C. (BCIT Student - 1993) from BC Mapping and Surveys (via Islands Trust) thematic maps at 1:10K scale;

Custodian: BIFWMS

Abstract: Coverage of coastline and island polygon on Bowen Island; Appears as solid Island polygon; For Cartographic purposes

Other Information Used:

Vegetation Associations – The vegetation types shown on the map were only the “most major” type (Attribute Column ‘MajorUnit1’) that occurs in each area. Some areas have multiple major vegetation types and multiple minor types – Defined by J. Block (1978).

Block, J. (1978). *Bowen Island: A Resource Analysis for Land Use Planning: Volume 2 - Supporting Data.* (Also Maps and Map acetates were used). Islands Trust; Ministry of Municipal Affairs and Housing.; Victoria. p. 127.

Map Compositions:

Printed on: 8x11 inches – Black and White (Gray Scale)

Created by: Bowen Island Sustainability Project – Miki Shoji, Stephanie Lemmon and Murray Journeay

Created for: State of Bowen Island Report (2000)

Map Scale: 1:50,000

Projection: UTM, NAD83, Zone10, Clarke 1866

Map 9) BOWEN ISLAND : OCP Land Use Designations

Layers Used:

OCP Land Use Designations - Bowen Island

Created by: Islands Trust (1995)

File Name: "ocplanduse" folder (Currently in Arc/Info 8 Format) in Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection

Modified by: Grafton BISP (2000) - Converted from shape file to Arc/Info file; Existing Lake outlines have been renewed to latest (2000) version of Lakes (Honeymoon, and Killarney); Attribute data Decoded;

Source: Bowen Island Official Community Plan (1995)

Custodian: Islands Trust

Abstract: Coverage showing Land use designations and 300m coast buffer polygon for Bowen Island; Attribute includes 'Res_Land_u', which classifies the polygons as ALR - Agriculture Land Reserve, R - Rural (4 hectare); R1 - Rural 1 (2 hectare), RS- Rural residential (1 hectare), RS(e)- Rural residential (0.4 hectare), SC - Snug Cove; CS - Cpastal Area; Also field called Image existed and filename "/eor1/island_trust/floor_plan.tif" is filled in the column for the island polygons

Cadastral - Bowen Island

Created by: Islands Trust (2000)

File Name: "Cadastrre" folder (Currently in Arc/Info 8 Format) in Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection

Modified by: NAD83; BISP (2000) - Converted from shape file to Arc/Info file; Reprojected from Decimal Degrees to UTM

Source: LUCO (Land Use Commission Office)

Custodian: Islands Trust

Abstract: Coverage showing most recent version (at year 2000) of Cadastral for Bowen Island; Attribute includes district lots, plan, lots, block and legal notes

Lakes - Bowen Island

Created by: Bowen Island Forest & Water Management Society (2000)

File Name: "Lakes" folder (Currently in Arc/Info 8 Format) in Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection

Modified by: BISP (2000) - Converted from shape file to Arc/Info file; Several Layers were combined to create this complete layer;

Source: BIFWMS - Some of the lakes are GPS'd and Digitized (2000) for SHIM project; Combined to create complete layer by BISP (2000)

Custodian: BIFWMS

Abstract: Coverage showing Lakes on Bowen Island; Some of the lakes were GPS'd by BIFWMS through SHIM project; attribute include Name of the lakes and GPS'd date;

Shoreline and the Island Polygons - Bowen Island

Created by: Bowen Island Forest & Water Management Society (1993)

File Name: "Bowsh" folder (Currently in Arc/Info 8 Format) in Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection

Modified by: BISP (2000) - Converted from shape file to Arc/Info file; Reprojected from NAD27 to NAD83;

Source: Shoreline digitized by Dixon, C. and Kemble, C. (BCIT Student - 1993) from BC Mapping and Surveys (via Islands Trust) thematic maps at 1:10K scale;

Custodian: BIFWMS

Abstract: Coverage of coastline and island polygon on Bowen Island; Appears as solid Island polygon; For Cartographic purposes

Other Information Used:

Bowen Island Official Community Plan (OCP) Bylaw No. 139, 1995. – Used for decoding of legends and Quality Assurance & Control for Spatial Data. (Schedule B – Map Designations)

Map Compositions:

Printed on: 8x11 inches – Black and White (Gray Scale)

Created by: Bowen Island Sustainability Project – Miki Shoji, Stephanie Lemmon and Murray Journeay

Created for: State of Bowen Island Report (2000)

Map Scale: 1:50,000

Projection: UTM, NAD83, Zone10, Clarke 1866

Map 10) BOWEN ISLAND : Zoning Bylaw

Layers Used:

Land Use Zones - Bowen Island

Created by: Islands Trust (1993)

File Name: "Zones" folder (Currently in Arc/Info 8 Format) in Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection

Modified by: BISP (2000) - Converted from shape file to Arc/Info file; Reprojected from NAD27 to NAD83; Shoreline changed to the latest shoreline at year 2000 (Same as Bowsh (polygon) shoreline); Attribute data Decoded;

Source: Digitized by Dixon, C. and Kemble, C. (BCIT Student - 1993) from BC Mapping and Surveys (via Islands Trust) thematic maps at 1:10K scale; Bowen Island Zoning Bylaw No. 36;

Custodian: Islands Trust

Abstract: Coverage of Land Use Zones of Bowen Island; Shows Land Use Zoning defined by Bowen Island Zoning Bylaw No. 36;

Accuracy: Snug Cove and the surrounding area (including Bowen Bay, Cates Hill) is missing detailed data. - have not been digitized - refer to paper copy of Bylaw Map (Available at Bowen Island Municipality).

Data relied on by Islands Trust planners to within 50m;

Cadastral - Bowen Island

Created by: Islands Trust (2000)

File Name: "Cadastre" folder (Currently in Arc/Info 8 Format) in Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection

Modified by: NAD83; BISP (2000) - Converted from shape file to Arc/Info file; Reprojected from Decimal Degrees to UTM

Source: LUCO (Land Use Commission Office)

Custodian: Islands Trust

Abstract: Coverage showing most recent version (at year 2000) of Cadastral for Bowen Island; Attribute includes district lots, plan, lots, block and legal notes

Lakes - Bowen Island

Created by: Bowen Island Forest & Water Management Society (2000)

File Name: "Lakes" folder (Currently in Arc/Info 8 Format) in Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection

Modified by: BISP (2000) - Converted from shape file to Arc/Info file; Several Layers were combined to create this complete layer;

Source: BIFWMS - Some of the lakes are GPS'd and Digitized (2000) for SHIM project; Combined to create complete layer by BISP (2000)

Custodian: BIFWMS

Abstract: Coverage showing Lakes on Bowen Island; Some of the lakes were GPS'd by BIFWMS through SHIM project; attribute include Name of the lakes and GPS'd date;

Shoreline and the Island Polygons - Bowen Island

Created by: Bowen Island Forest & Water Management Society (1993)

File Name: "Bowsh" folder (Currently in Arc/Info 8 Format) in Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection

Modified by: BISP (2000) - Converted from shape file to Arc/Info file; Reprojected from NAD27 to NAD83;

Source: Shoreline digitized by Dixon, C. and Kemble, C. (BCIT Student - 1993) from BC Mapping and Surveys (via Islands Trust) thematic maps at 1:10K scale;

Custodian: BIFWMS

Abstract: Coverage of coastline and island polygon on Bowen Island; Appears as solid Island polygon; For Cartographic purposes

Other Information Used:

Bowen Island Zoning Bylaw No. 36. – Used for decoding of legends and Quality Assurance & Control for Spatial Data.

Map Compositions:

Printed on: 8x11 inches – Black and White (Gray Scale)

Created by: Bowen Island Sustainability Project – Miki Shoji, Stephanie Lemmon and Murray Journey

Created for: State of Bowen Island Report (2000)

Map Scale: 1:50,000

Projection: UTM, NAD83, Zone10, Clarke 1866

Map 11) BOWEN ISLAND : Subdivisions

Layers Used:

Subdivisions- Bowen Island

Created by: Islands Trust (1993)

File Name: "Subdiv" folder (Currently in Arc/Info 8 Format) in Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection

Modified by: BISP (2000) - Converted from shape file to Arc/Info file; Reprojected from NAD27 to NAD83; Shoreline changed to the latest shoreline at year 2000 (Same as Bowsh (polygon) shoreline); Existing Lake outlines have been renewed to latest (2000) version of Lakes (Grafton and Killarney); Attribute data Decoded;

Source: Digitized by Dixon, C. and Kemble, C. (BCIT Student - 1993) from BC Mapping and Surveys (via Islands Trust) thematic maps at 1:10K scale; Bowen Island Subdivision Bylaw No. 270;

Custodian: Islands Trust

Abstract: Coverage showing subdivisions of Bowen Island according to Bowen Island Subdivision Bylaw No. 270;

Accuracy: Relied on by Islands Trust planners to within 50m;

Cadastral - Bowen Island

Created by: Islands Trust (2000)

File Name: "Cadastral" folder (Currently in Arc/Info 8 Format) in Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection

Modified by: NAD83; BISP (2000) - Converted from shape file to Arc/Info file; Reprojected from Decimal Degrees to UTM

Source: LUCO (Land Use Commission Office)

Custodian: Islands Trust

Abstract: Coverage showing most recent version (at year 2000) of Cadastral for Bowen Island; Attribute includes district lots, plan, lots, block and legal notes

Lakes - Bowen Island

Created by: Bowen Island Forest & Water Management Society (2000)

File Name: "Lakes" folder (Currently in Arc/Info 8 Format) in Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection

Modified by: BISP (2000) - Converted from shape file to Arc/Info file; Several Layers were combined to create this complete layer;

Source: BIFWMS - Some of the lakes are GPS'd and Digitized (2000) for SHIM project; Combined to create complete layer by BISP (2000)

Custodian: BIFWMS

Abstract: Coverage showing Lakes on Bowen Island; Some of the lakes were GPS'd by BIFWMS through SHIM project; attribute include Name of the lakes and GPS'd date;

Shoreline and the Island Polygons - Bowen Island

Created by: Bowen Island Forest & Water Management Society (1993)

File Name: "Bowsh" folder (Currently in Arc/Info 8 Format) in Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection

Modified by: BISP (2000) - Converted from shape file to Arc/Info file; Reprojected from NAD27 to NAD83;

Source: Shoreline digitized by Dixon, C. and Kemble, C. (BCIT Student - 1993) from BC Mapping and Surveys (via Islands Trust) thematic maps at 1:10K scale;

Custodian: BIFWMS

Abstract: Coverage of coastline and island polygon on Bowen Island; Appears as solid Island polygon; For Cartographic purposes

Other Information Used:

Bowen Island Subdivision Bylaw No. 270. – Used for decoding of legends and Quality Assurance & Control for Spatial Data.

Map Compositions:

Printed on: 8x11 inches – Black and White (Gray Scale)

Created by: Bowen Island Sustainability Project – Miki Shoji, Stephanie Lemmon and Murray Journey

Created for: State of Bowen Island Report (2000)

Map Scale: 1:50,000

Projection: UTM, NAD83, Zone10, Clarke 1866

Map 12) BOWEN ISLAND : Water Districts and Location of Water Intake

Layers Used:

Deep Wells - Bowen Island

Created by: Bowen Island Forest & Water Management Society (1994)

File Name: "Dwell" folder (Currently in Arc/Info 8 Format) in Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection

Modified by: BISP (2000) - Converted from shape file to Arc/Info file; Reprojected from NAD27 to NAD83;

Source: BIFWMS Water Survey - Conducted by Anne Chollat (SCI_Bowen CD)

Custodian: BIFWMS

Abstract: Coverage showing registered and non-registered deep wells (179) on Bowen Island; Deep wells are drilled wells;

Shallow (Surface Wells) - Bowen Island

Created by: Bowen Island Forest & Water Management Society (1994)

File Name: "shwell" folder (Currently in Arc/Info 8 Format) in Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection

Modified by: BISP (2000) - Converted from shape file to Arc/Info file; Reprojected from NAD27 to NAD83;

Source: BIFWMS Water Survey - Conducted by Anne Chollat (SCI_Bowen CD)

Custodian: BIFWMS

Abstract: Coverage showing registered and non-registered (58) wells on Bowen Island; Shallow wells include water intake from streams and dug-out wells;

Registered Surface Water Intake Point - Bowen Island

Created by: Bowen Island Forest & Water Management Society (1994)

File Name: "Wat_lic" folder (Currently in Arc/Info 8 Format) in Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection

Source: MELP - Water License Information Database; BIFWMS (1999) has modified locations to overlay with locations of streams and lakes;

Custodian: BIFWMS

Abstract: Coverage showing registered surface water intake points (Point of Diversion) on Bowen Island - Licenses are associated with each Point of Diversions and Registration numbers

Water Districts- Bowen Island

Created by: Islands Trust (1994)

File Name: "Watersys" folder (Currently in Arc/Info 8 Format) in Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection

Modified by: BISP (2000) - Converted from shape file to Arc/Info file; Shoreline changed to the latest shoreline at year 2000 (Same as Bowsh (polygon) shoreline); Name of the district has been added as attribute; Valhalla Ridge has been incorporated into Bowey Bay Improvement District; Bowen Bay Holdings has been added;

Source: BIFWMS

Custodian: Islands Trust

Abstract: Coverage showing water districts on Bowen Island; Attribute fields are 'district' - 7 Improvement districts, 'private' - 11 private water distribution, and 'sewers' - 2 sewer improvement districts

Accuracy: Valhalla Ridge has been incorporated into Bowen Bay Improvement District, and Current Bowen Bay Improvement District may have extended further; Snug Cove Sewer Improvement District has been extended - no current data available; All water districts boundary require revisions

Note: Snug Cove Sewer Improvement District (name has also changed) is not shown on the map as the boundary of current area is not digitally defined. Fire Station is not shown on the map.

Stream Network - Bowen Island

Created by: Bowen Island Forest & Water Management Society (2000)

File Name: "streams" folder (Currently in Arc/Info 8 Format) in Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection

Modified by: BISP (2000) - Converted from shape file to Arc/Info file; Several Layers were combined to create this complete layer;

Source: BIFWMS - Some of the streams GPS'd and Digitized (2000) for SHIM project, Combined to create complete layer by BISP (2000)

Custodian: BIFWMS

Abstract: Coverage showing Stream Network on Bowen Island; Some of the streams were GPS'd by BIFWMS through SHIM project; attributes include name of the streams, sources, and GPS'd date;

Cadastral - Bowen Island

Created by: Islands Trust (2000)

File Name: "Cadastre" folder (Currently in Arc/Info 8 Format) in Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection

Modified by: NAD83; BISP (2000) - Converted from shape file to Arc/Info file; Reprojected from Decimal Degrees to UTM

Source: LUCO (Land Use Commission Office)

Custodian: Islands Trust

Abstract: Coverage showing most recent version (at year 2000) of Cadastral for Bowen Island; Attribute includes district lots, plan, lots, block and legal notes

Lakes - Bowen Island

Created by: Bowen Island Forest & Water Management Society (2000)

File Name: "Lakes" folder (Currently in Arc/Info 8 Format) in Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection

Modified by: BISP (2000) - Converted from shape file to Arc/Info file; Several Layers were combined to create this complete layer;

Source: BIFWMS - Some of the lakes are GPS'd and Digitized (2000) for SHIM project; Combined to create complete layer by BISP (2000)

Custodian: BIFWMS

Abstract: Coverage showing Lakes on Bowen Island; Some of the lakes were GPS'd by BIFWMS through SHIM project; attribute include Name of the lakes and GPS'd date;

Shoreline and the Island Polygons - Bowen Island

Created by: Bowen Island Forest & Water Management Society (1993)

File Name: "Bowsh" folder (Currently in Arc/Info 8 Format) in Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection

Modified by: BISP (2000) - Converted from shape file to Arc/Info file; Reprojected from NAD27 to NAD83;

Source: Shoreline digitized by Dixon, C. and Kemble, C. (BCIT Student - 1993) from BC Mapping and Surveys (via Islands Trust) thematic maps at 1:10K scale;

Custodian: BIFWMS

Abstract: Coverage of coastline and island polygon on Bowen Island; Appears as solid Island polygon; For Cartographic purposes

Other Information Used:

BIFWMS Water Survey Project – Report used to understand different types of wells and survey methods.

Bowen Island Forest and Water Management Society. (1994). *Bowen Island Water Survey Report on Phase One: Data Acquisition and Database Development (Preliminary Draft)*.
BIFWMS: Bowen Island.

Bowen Island Official Community Plan (OCP) Bylaw No. 139, 1995. – Used for decoding of legends for water districts and Quality Assurance & Control for Spatial Data. (Schedule F – Community Water Systems and Utility Areas)

Map Compositions:

Printed on: 11x17 inches – Black and White (Gray Scale)

Created by: Bowen Island Sustainability Project – Miki Shoji, Stephanie Lemmon and Murray Journeay

Created for: State of Bowen Island Report (2000)

Map Scale: 1:37,500

Projection: UTM, NAD83, Zone10, Clarke 1866

Map 13) BOWEN ISLAND : Parks, Ecological Reserve and Crown Land

Layers Used:

Crown land and Parks- Bowen Island

Created by: Islands Trust (1995)

File Name: "Park_res" folder (Currently in Arc/Info 8 Format) in Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection

Modified by: BISP (2000) - Names of Parks has been added

Source: Digitized by Dixon, C. and Kemble, C. (BCIT Student - 1993) from BC Mapping and Surveys (via Islands Trust) thematic maps at 1:10K scale;

Custodian: BIFWMS

Abstract: Coverage showing parks and crown land on Bowen Island; 107 polygons, 5 designations - community park, crown lands, ecological reserve, provincial park, regional park

Accuracy: Not all Community Parks are digitized

Cadastral - Bowen Island

Created by: Islands Trust (2000)

File Name: "Cadastral" folder (Currently in Arc/Info 8 Format) in Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection

Modified by: NAD83; BISP (2000) - Converted from shape file to Arc/Info file; Reprojected from Decimal Degrees to UTM

Source: LUCO (Land Use Commission Office)

Custodian: Islands Trust

Abstract: Coverage showing most recent version (at year 2000) of Cadastral for Bowen Island; Attribute includes district lots, plan, lots, block and legal notes

Lakes - Bowen Island

Created by: Bowen Island Forest & Water Management Society (2000)

File Name: "Lakes" folder (Currently in Arc/Info 8 Format) in Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection

Modified by: BISP (2000) - Converted from shape file to Arc/Info file; Several Layers were combined to create this complete layer;

Source: BIFWMS - Some of the lakes are GPS'd and Digitized (2000) for SHIM project; Combined to create complete layer by BISP (2000)

Custodian: BIFWMS

Abstract: Coverage showing Lakes on Bowen Island; Some of the lakes were GPS'd by BIFWMS through SHIM project; attribute include Name of the lakes and GPS'd date;

Shoreline and the Island Polygons - Bowen Island

Created by: Bowen Island Forest & Water Management Society (1993)

File Name: "Bowsh" folder (Currently in Arc/Info 8 Format) in Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection

Modified by: BISP (2000) - Converted from shape file to Arc/Info file; Reprojected from NAD27 to NAD83;

Source: Shoreline digitized by Dixon, C. and Kemble, C. (BCIT Student - 1993) from BC Mapping and Surveys (via Islands Trust) thematic maps at 1:10K scale;

Custodian: BIFWMS

Abstract: Coverage of coastline and island polygon on Bowen Island; Appears as solid Island polygon; For Cartographic purposes

Other Information Used:

Bowen Island Official Community Plan (OCP) Bylaw No. 139, 1995. – Used for decoding of legends and Quality Assurance & Control for Spatial Data. (Schedule C – Parks and Trails)

Map Compositions:

Printed on: 8x11 inches – Black and White (Gray Scale)

Created by: Bowen Island Sustainability Project – Miki Shoji, Stephanie Lemmon and Murray Journeay

Created for: State of Bowen Island Report (2000)

Map Scale: 1:50,000

Projection: UTM, NAD83, Zone10, Clarke 1866

Map 14) BOWEN ISLAND : Coastal Foreshore and Proposed Trail Plan

Layers Used:

Outdoor Recreation Features Analysis- Bowen Island

Created by: Block (1978)

File Name: "Recrct" folder (Currently in Arc/Info 8 Format) in Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection

Modified by: BISP (2000) - Converted from shape file to Arc/Info file; Reprojected from NAD27 to NAD83; Shoreline changed to the latest shoreline at year 2000 (Same as Bowsh (polygon) shoreline); Existing Lake outlines have been renewed to latest (2000) version of Lakes (Honeymoon, Mud Lake, Small pond in NE of Island, Bowen Brook Headwaters, Josephine, Little Josephine, Grafton, and Killarney, also, Lagoon was left as a poly

Source: Digitized by Dixon, C. and Kemble, C. (BCIT Student - 1993) from BC Mapping and Surveys (via Islands Trust) thematic maps at 1:10K scale; Block (1978)

Custodian: BIFWMS

Abstract: Coverage used to make a map "Outdoor Recreation Features Analysis", Block (1978) - Block Report; describes types of recreation and its suitability

Accuracy: 3 forshore polygons - data was not defined by J. Block (1978); 2 polygons were defined under 2 forshore types - field check is required;

Proposed Trail Plan- Bowen Island

Created by: Islands Trust (1995)

File Name: "Trails" folder (Currently in Arc/Info 8 Format) in Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection

Source: Compiled by OCP trails committee, digitized by BIFWMS for use in OCP

Custodian: Islands Trust

Abstract: Coverage Showing proposed trail plan by Official Community Plan

Accuracy: No distinction between existing trails and planned trails

Cadastral - Bowen Island

Created by: Islands Trust (2000)

File Name: "Cadastre" folder (Currently in Arc/Info 8 Format) in Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection

Modified by: NAD83; BISP (2000) - Converted from shape file to Arc/Info file; Reprojected from Decimal Degrees to UTM

Source: LUCO (Land Use Commission Office)

Custodian: Islands Trust

Abstract: Coverage showing most recent version (at year 2000) of Cadastral for Bowen Island; Attribute includes district lots, plan, lots, block and legal notes

Lakes - Bowen Island

Created by: Bowen Island Forest & Water Management Society (2000)

File Name: "Lakes" folder (Currently in Arc/Info 8 Format) in Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection

Modified by: BISP (2000) - Converted from shape file to Arc/Info file; Several Layers were combined to create this complete layer;

Source: BIFWMS - Some of the lakes are GPS'd and Digitized (2000) for SHIM project; Combined to create complete layer by BISP (2000)

Custodian: BIFWMS

Abstract: Coverage showing Lakes on Bowen Island; Some of the lakes were GPS'd by BIFWMS through SHIM project; attribute include Name of the lakes and GPS'd date;

Shoreline and the Island Polygons - Bowen Island

Created by: Bowen Island Forest & Water Management Society (1993)

File Name: "Bowsh" folder (Currently in Arc/Info 8 Format) in Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection

Modified by: BISP (2000) - Converted from shape file to Arc/Info file; Reprojected from NAD27 to NAD83;

Source: Shoreline digitized by Dixon, C. and Kemble, C. (BCIT Student - 1993) from BC Mapping and Surveys (via Islands Trust) thematic maps at 1:10K scale;

Custodian: BIFWMS

Abstract: Coverage of coastline and island polygon on Bowen Island; Appears as solid Island polygon; For Cartographic purposes

Other Information Used:

Bowen Island Official Community Plan (OCP) Bylaw No. 139, 1995. – Used for decoding of legends and Quality Assurance & Control for Spatial Data. (Schedule C – Parks and Trails)

Foreshore Type – Only Foreshore Type is shown on the map (Attribute columns used: 'SandSilt', 'Gravel', 'GentlySlopeRock', and 'SteeplySlopeRock'). Some areas have multiple Foreshore type defined, and in other area, Foreshore type was not defined – by J. Block (1978).

Block, J. (1978). *Bowen Island: A Resource Analysis for Land Use Planning: Volume 2 - Supporting Data.* (Also Maps and Map acetates were used). Islands Trust; Ministry of Municipal Affairs and Housing.: Victoria. p. 127.

Map Compositions:

Printed on: 8x11 inches – Black and White (Gray Scale)

Created by: Bowen Island Sustainability Project – Miki Shoji, Stephanie Lemmon and Murray Journeay

Created for: State of Bowen Island Report (2000)

Map Scale: 1:50,000

Projection: UTM, NAD83, Zone10, Clarke 1866

Map 15) BOWEN ISLAND : Roads

Layers Used:

Road Network - Bowen Island

Created by: Islands Trust (1993)

File Name: "Roadsall" folder (Currently in Arc/Info 8 Format) in Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection

Modified by: BISP (2000) - Converted from shape file to Arc/Info file; Reprojected from NAD27 to NAD83;

Source: BC TRIM - Roads Network; Digitized by Dixon, C. and Kemble, C. (BCIT Student - 1993) from TRIM at 1:20K scale; Modified by BIFWMS;

Custodian: Islands Trust

Abstract: Coverage showing Road network for Bowen Island; showing most detailed road network;

Accuracy: Several non-existing roads has been included in the layer; Not all the roads are digitized - require review

Cadastral - Bowen Island

Created by: Islands Trust (2000)

File Name: "Cadastral" folder (Currently in Arc/Info 8 Format) in Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection

Modified by: NAD83; BISP (2000) - Converted from shape file to Arc/Info file; Reprojected from Decimal Degrees to UTM

Source: LUCO (Land Use Commission Office)

Custodian: Islands Trust

Abstract: Coverage showing most recent version (at year 2000) of Cadastral for Bowen Island; Attribute includes district lots, plan, lots, block and legal notes

Lakes - Bowen Island

Created by: Bowen Island Forest & Water Management Society (2000)

File Name: "Lakes" folder (Currently in Arc/Info 8 Format) in Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection

Modified by: BISP (2000) - Converted from shape file to Arc/Info file; Several Layers were combined to create this complete layer;

Source: BIFWMS - Some of the lakes are GPS'd and Digitized (2000) for SHIM project; Combined to create complete layer by BISP (2000)

Custodian: BIFWMS

Abstract: Coverage showing Lakes on Bowen Island; Some of the lakes were GPS'd by BIFWMS through SHIM project; attribute include Name of the lakes and GPS'd date;

Shoreline and the Island Polygons - Bowen Island

Created by: Bowen Island Forest & Water Management Society (1993)

File Name: "Bowsh" folder (Currently in Arc/Info 8 Format) in Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection

Modified by: BISP (2000) - Converted from shape file to Arc/Info file; Reprojected from NAD27 to NAD83;

Source: Shoreline digitized by Dixon, C. and Kemble, C. (BCIT Student - 1993) from BC Mapping and Surveys (via Islands Trust) thematic maps at 1:10K scale;

Custodian: BIFWMS

Abstract: Coverage of coastline and island polygon on Bowen Island; Appears as solid Island polygon; For Cartographic purposes

Other Information Used:

Names of Community / Neighborhood – Cited from Map in Gold Pages almanac 2000: Bowen Island.

Bowen Island Chamber of Commerce. (2000). Gold Pages Almanac 2000: Bowen Island.
Wiltshire House Publishing: Bowen Island.

Map Compositions:

Printed on: 8x11 inches – Black and White (Gray Scale)

Created by: Bowen Island Sustainability Project – Miki Shoji, Stephanie Lemmon and Murray Journeay

Created for: State of Bowen Island Report (2000)

Map Scale: 1:50,000

Projection: UTM, NAD83, Zone10, Clarke 1866

Map 16) BOWEN ISLAND : Orthophoto of Snug Cove Area

Layers Used:

Cadastral - Bowen Island

Created by: Islands Trust (2000)

File Name: "Cadastre" folder (Currently in Arc/Info 8 Format) in Compact Disc - Bowen Island Information System, Version2: November 17, 2000 \ GIS Atlas \ GIS Coverages \ Working_Collection

Modified by: NAD83; BISP (2000) - Converted from shape file to Arc/Info file; Reprojected from Decimal Degrees to UTM

Source: LUCO (Land Use Commission Office)

Custodian: Islands Trust

Abstract: Coverage showing most recent version (at year 2000) of Cadastral for Bowen Island; Attribute includes district lots, plan, lots, block and legal notes

Other Information Used:

Orthophoto – The orthophoto used was loaned from Ministry of Environment, Land and Parks (MELP) for the Bowen Island Sustainability Project to BIFWMS.

Ministry of Environment, Land and Parks. (1999). *1999 Ortho Data*. 0.5m Colour. Selected TIFF and World Files for Bowen Island. E4680 – E4760, N54635-N54735.

Map Compositions:

Printed on: 11x 17 inches (Landscape) – Black and White (Gray Scale)

Created by: Bowen Island Sustainability Project – Miki Shoji, Stephanie Lemmon and Murray Journeay

Created for: State of Bowen Island Report (2000)

Map Scale: 1:8,000

Projection: UTM, NAD83, Zone10, Clarke 1866

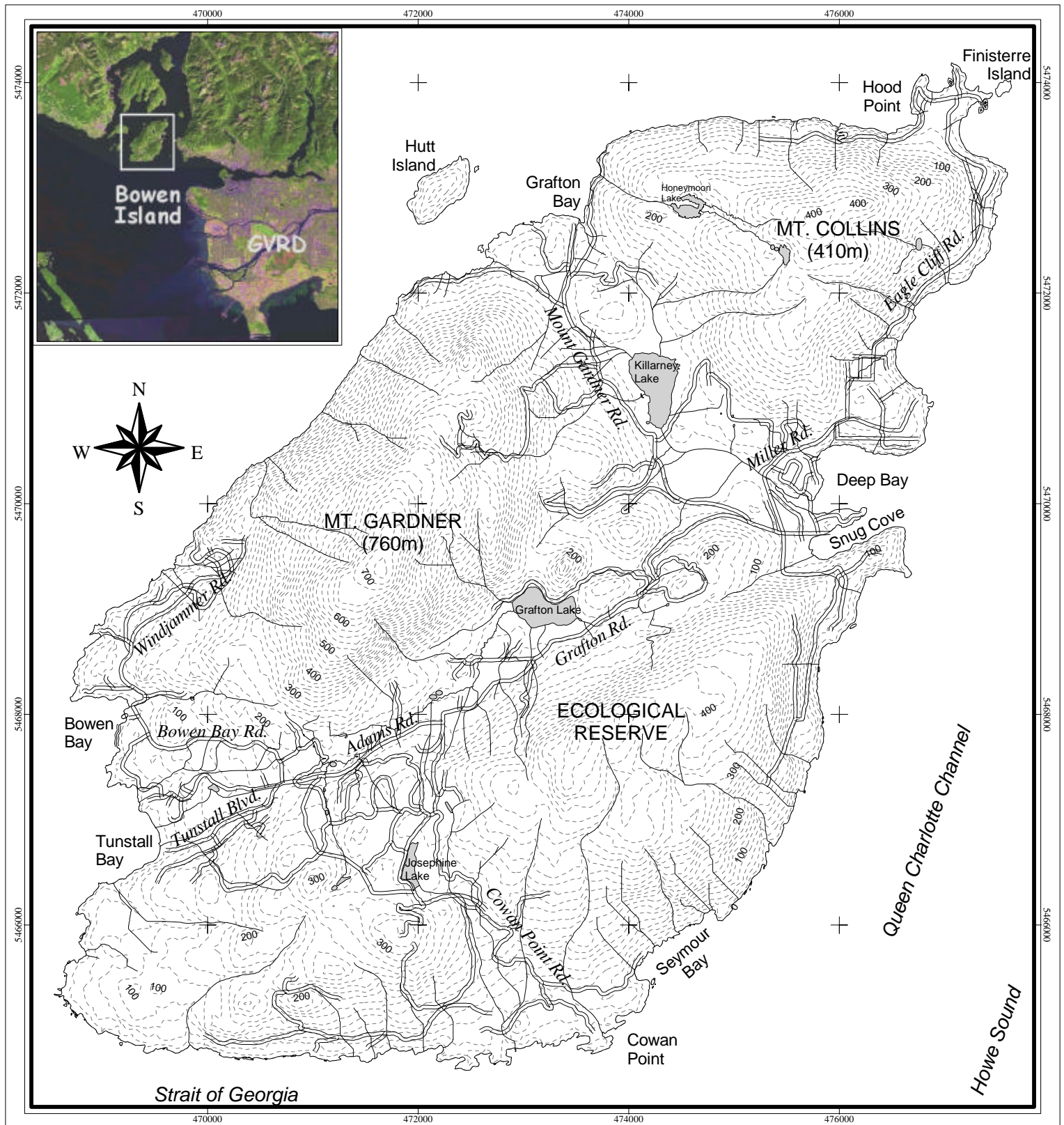
Appendix 9

Draft Maps of Bowen Island, Created for the State of Bowen Island Report





Sixteen draft maps are included in this appendix. Those maps are created for the use in the State of Bowen Island (SoBI) Report, which will be released in December 2000. Further revisions are planned for these maps by Bowen Island Sustainability Project prior to the release of SoBI report. Those maps may contain errors, and should not be used for planning or recreational purposes.

16 pages (13 maps - 8x11" & 3 maps - 11x17")

Map 1) General Map of Bowen Island



LEGEND

-  Roads
-  Streams
-  Lakes
-  Contours [m]

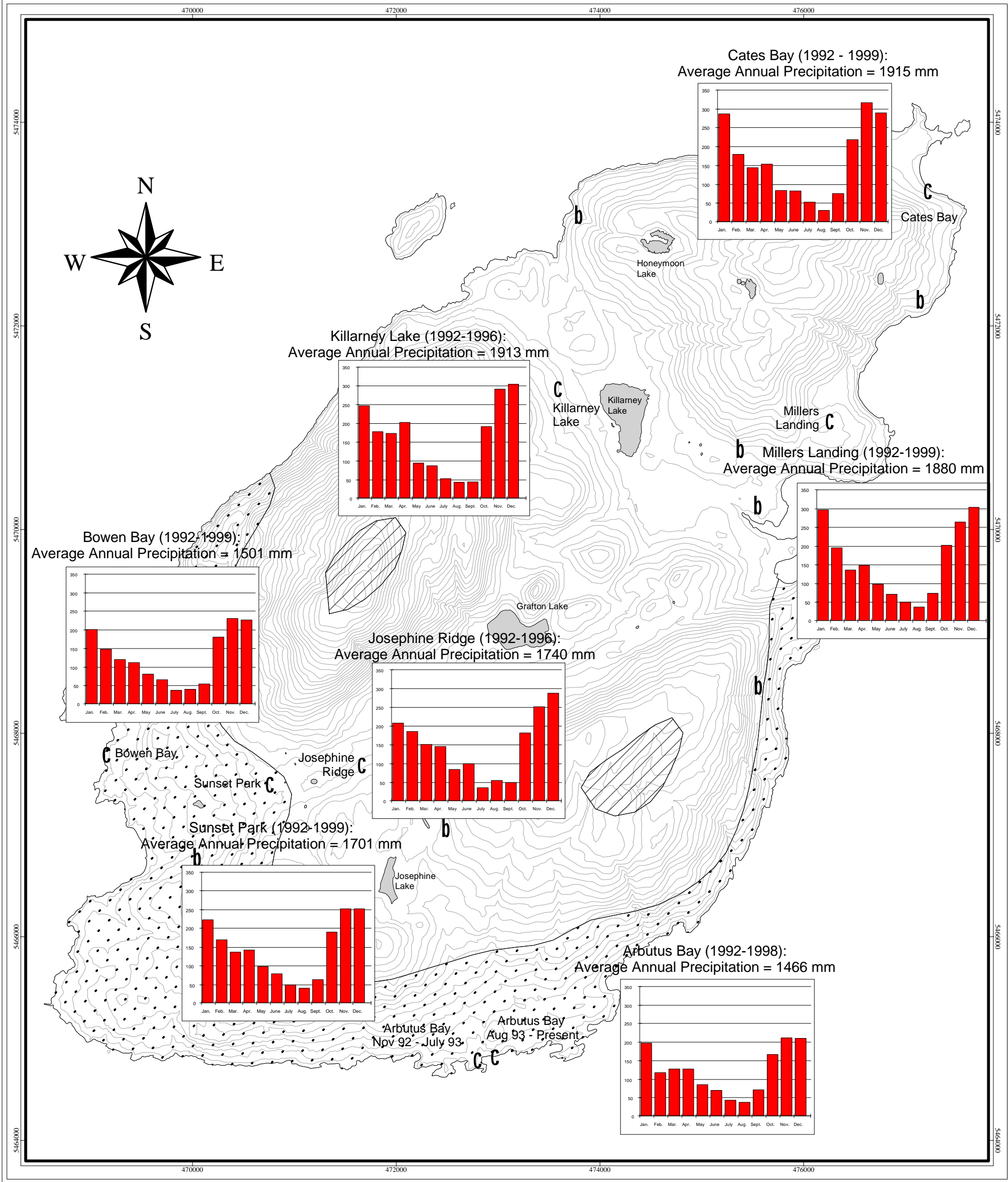
This map shows Bowen Island, British Columbia. The indexed satellite image (top left) shows the relative location of Bowen Island in the Greater Vancouver Regional District (GVRD). Heights of land are defined in meters.

1 0 1 2 3 Kilometers

Scale = 1:50,000; Contour Intervals = 20m;
Projection UTM; Zone 10; Datum NAD83; Spheroid Clarke 1866;

For detailed sources of information upon which the map is based, please refer to Appendix of State of Bowen Island Report (2000)

Map 2) BOWEN ISLAND: Biogeoclimatic Zones and Total Precipitation



LEGEND

- Lakes
- Weather Stations - Precipitation Data Shown
- Weather Stations - No Data Shown (Data may be reported back to Bowen Island Forest and Water Management Society, or Closed prior to 1992)
- Contours

Biogeoclimatic Zones

- CWH dm - Coastal Western Hemlock Zone, Dry Maritime Subzone
- CWH vm 2 - Coastal Western Hemlock Zone, Very Wet Maritime Subzone: Montane Variation
- CWH xm 1 - Coastal Western Hemlock Zone, Very Dry Maritime Subzone: Eastern Variation

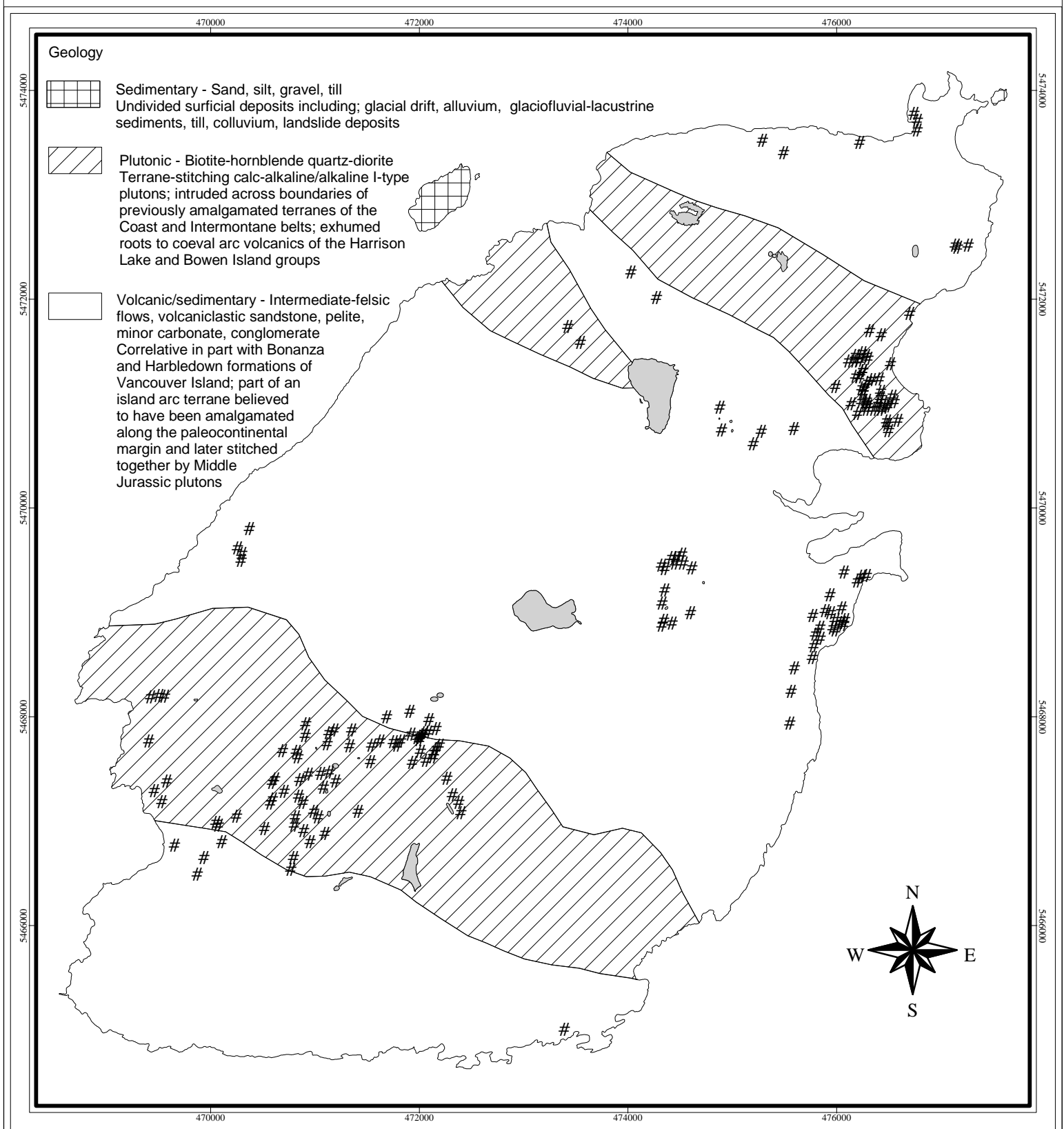
This map shows the Biogeoclimatic Zones of Bowen Island defined by BC Ministry of Forest. Inserted graphs shows monthly average of total precipitation (rain and snow) recorded at various weather stations over the period of 1991 - 1999 (Some station has stoped collecting data prior to 1999). The precipitation data was obtained from Environment Canada.



Scale = 1:37,500; Contour Intervals = 20m;
Projection UTM; Zone 10; Datum NAD83; Spheroid Clarke 1866;

For detailed sources of information upon which the map is based, please refer to Appendix of State of Bowen Island Report (2000)

Map 3) BOWEN ISLAND : Bedrock Geology



LEGEND

- # Deep Wells
- Lakes

This map shows the bedrock geology of Bowen Island. Location of deep wells (drilled wells) are also shown on the map.

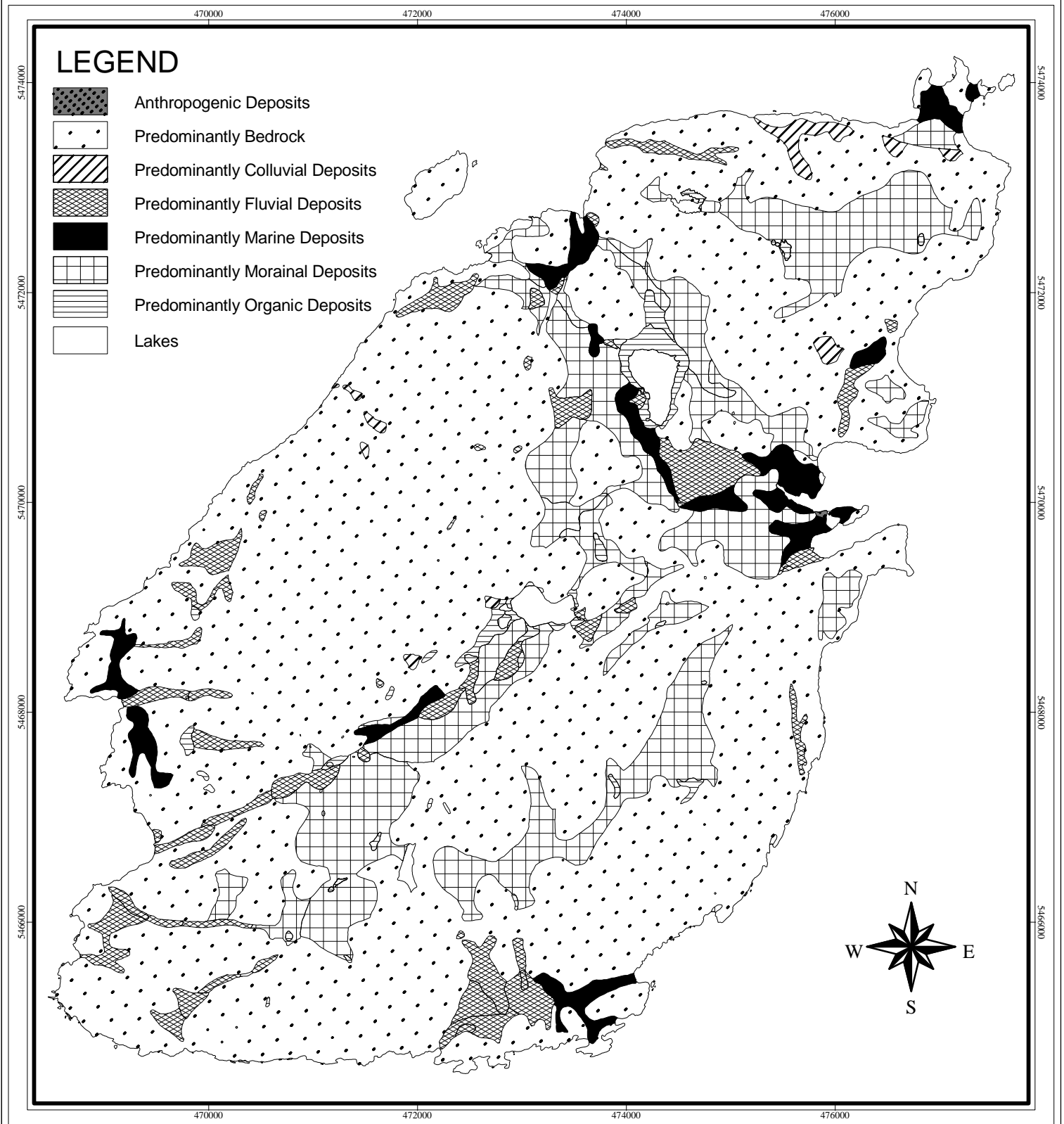
1 0 1 2 3 Kilometers

Scale = 1:50,000

Projection UTM; Zone 10; Datum NAD83; Spheroid Clarke 1866;

For detailed sources of information upon which the map is based, please refer to Appendix of State of Bowen Island Report (2000)

Map 4) BOWEN ISLAND: Surface Geology



This map shows the surface geology of Bowen Island. The surface materials were classified by an analysis of predominant substances in each area by J. Block (1978).

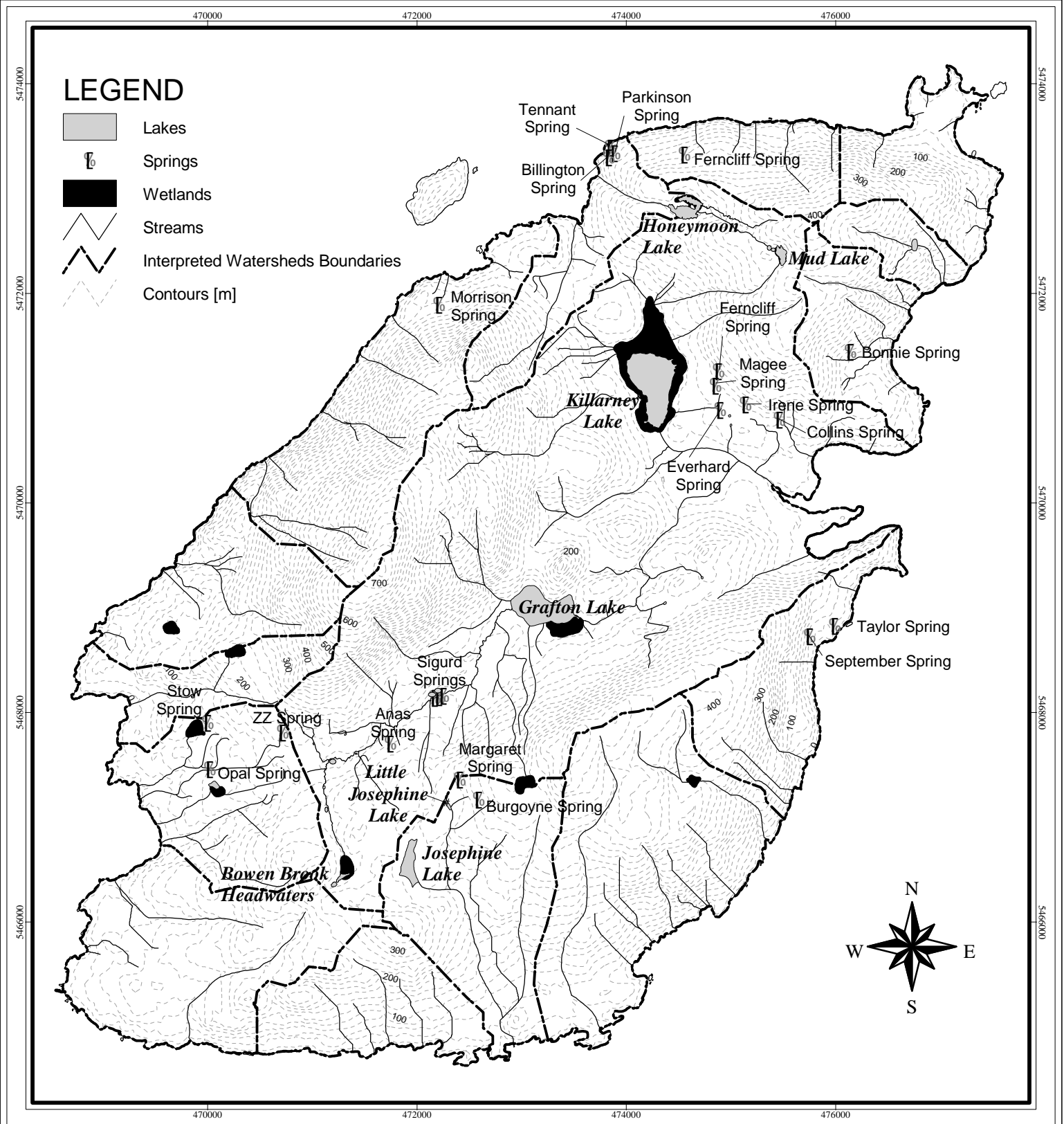
1 0 1 2 3 4 Kilometers

Scale = 1:50,000

Projection UTM; Zone 10; Datum NAD83; Spheroid Clarke 1866;

For detailed sources of information upon which the map is based, please refer to Appendix of State of Bowen Island Report (2000)

Map 5) BOWEN ISLAND: Surface Water



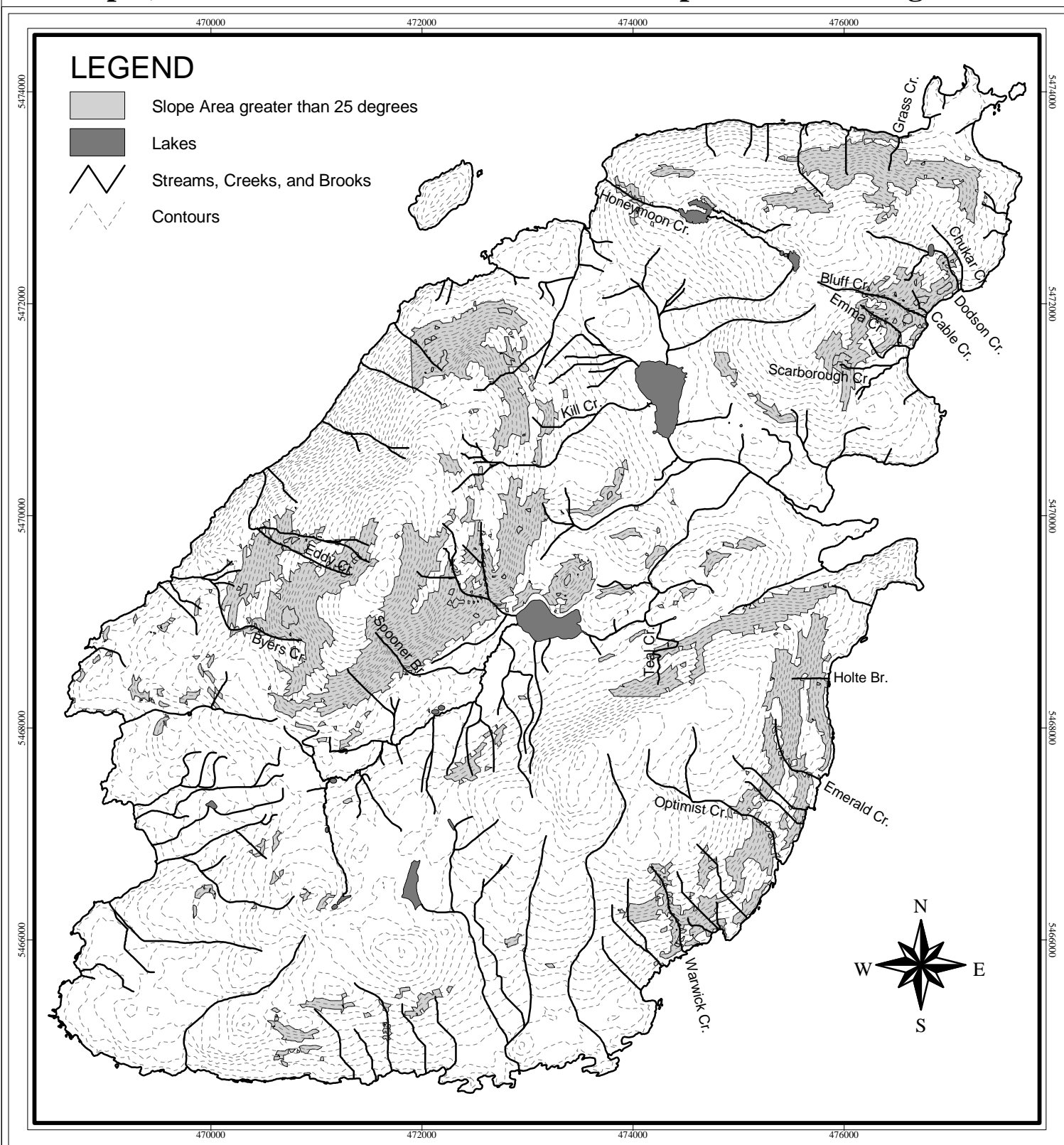
Distribution of surface water on Bowen Island is shown on this map. The surface water include lakes, springs, wetlands, and streams. The watershed boundaries were Interpreted from height of lands.

1 0 1 2 3 4 Kilometers

Scale = 1:50,000; Contour Intervals = 20m;
Projection UTM; Zone 10; Datum NAD83; Spheroid Clarke 1866;

For detailed sources of information upon which the map is based, please refer to Appendix of State of Bowen Island Report (2000)

Map 6) BOWEN ISLAND: Streams and Slope Area > 25 Degrees



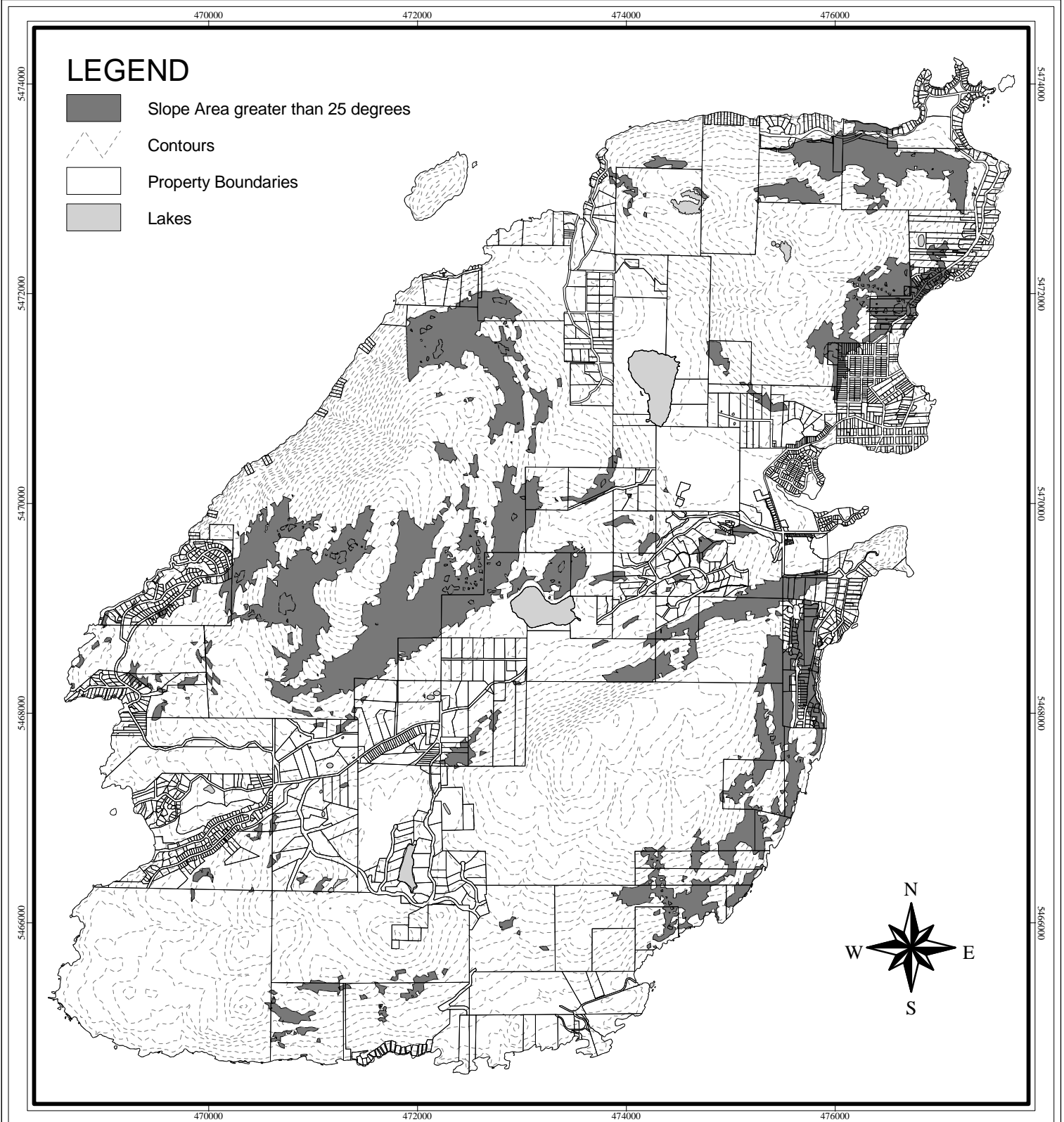
Areas that have slope greater than 25 degrees are shown on this map. Some streams flow through those steep areas on Bowen Island. Those areas are defined by Bowen Island Official Community Plan Bylaw No. 139 (1995) as Development Permit Area for protection of development from hazardous conditions (Schedule E (Map 2)).

1 0 1 2 3 4 Kilometers

Scale = 1:50,000; Contour Intervals = 20m;
Projection UTM; Zone 10; Datum NAD83; Spheroid Clarke 1866;

For detailed sources of information upon which the map is based, please refer to Appendix of State of Bowen Island Report (2000)

Map 7) BOWEN ISLAND: Development Permit Area for Slope > 25 Degrees



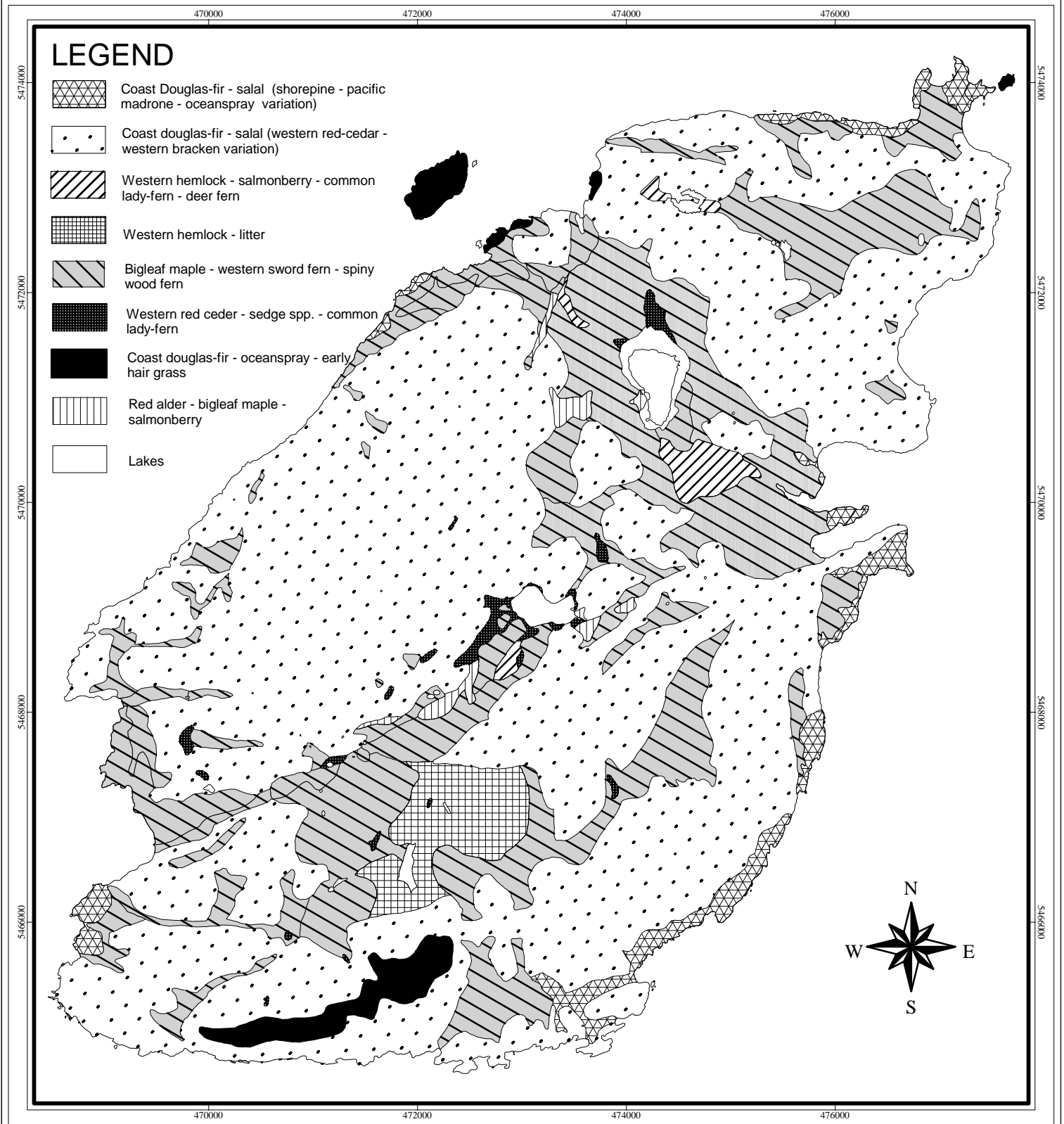
Areas that have slope greater than 25 degrees are shown on this map. Those areas require a development permit. Those areas are defined by Bowen Island Official Community Plan Bylaw No. 139 (1995) as Development Permit Area for protection of development from hazardous conditions (Schedule E (Map 2)).

1 0 1 2 3 4 Kilometers

Scale = 1:50,000; Contour Intervals = 20m;
Projection UTM; Zone 10; Datum NAD83; Spheroid Clarke 1866;

For detailed sources of information upon which
the map is based, please refer to Appendix
of State of Bowen Island Report (2000)

Map 8) BOWEN ISLAND: Vegetation Associations



This map shows the distribution of vegetation associations on Bowen Island. The vegetation groups shown were determined to be the major associations in each area by J. Block (1978).

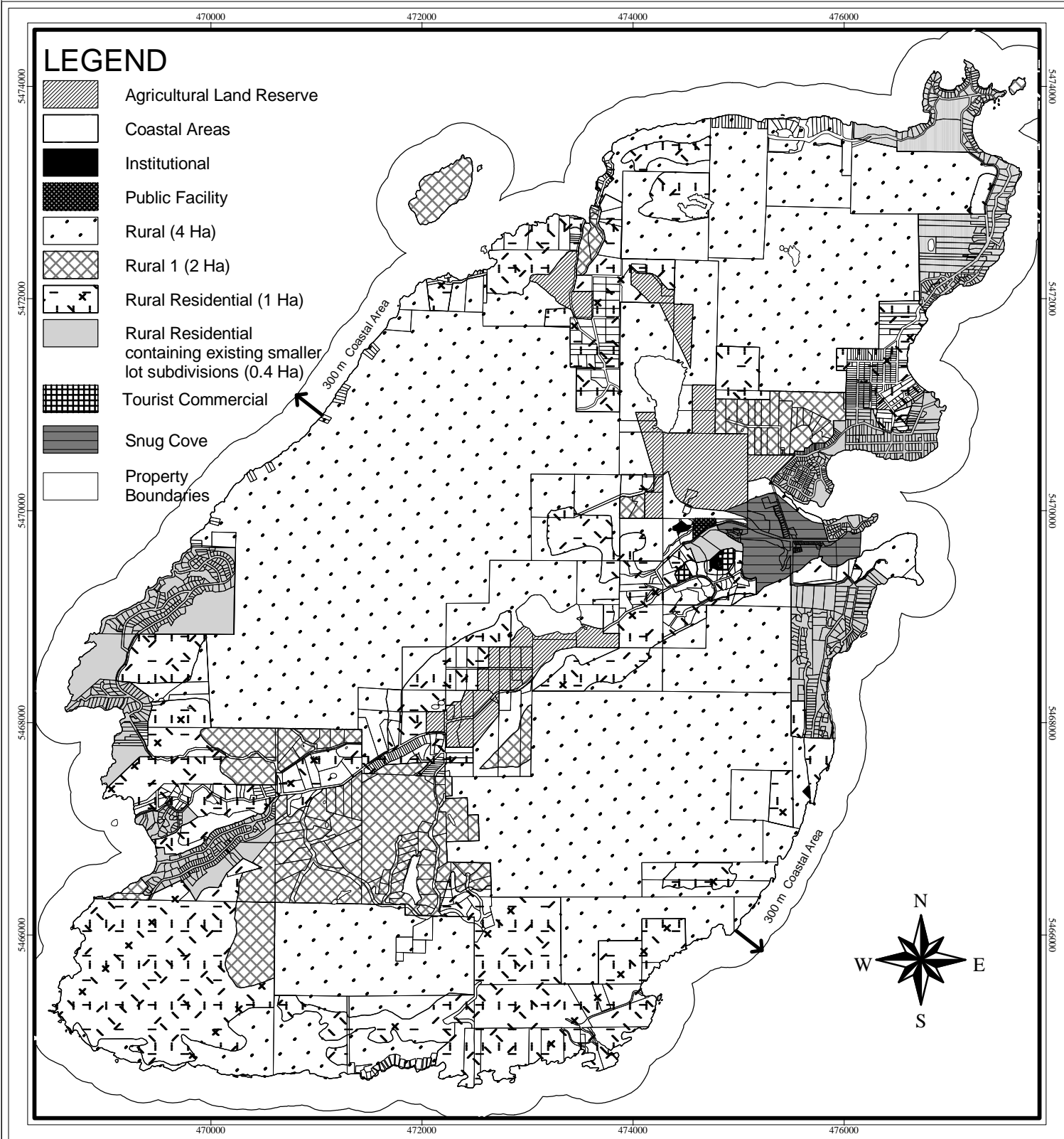
1 0 1 2 3 4 Kilometers

Scale = 1:50,000

Projection UTM; Zone 10; Datum NAD83; Spheroid Clarke 1866;

For detailed sources of information upon which the map is based, please refer to Appendix of State of Bowen Island Report (2000)

Map 9) BOWEN ISLAND: OCP Land Use Designations



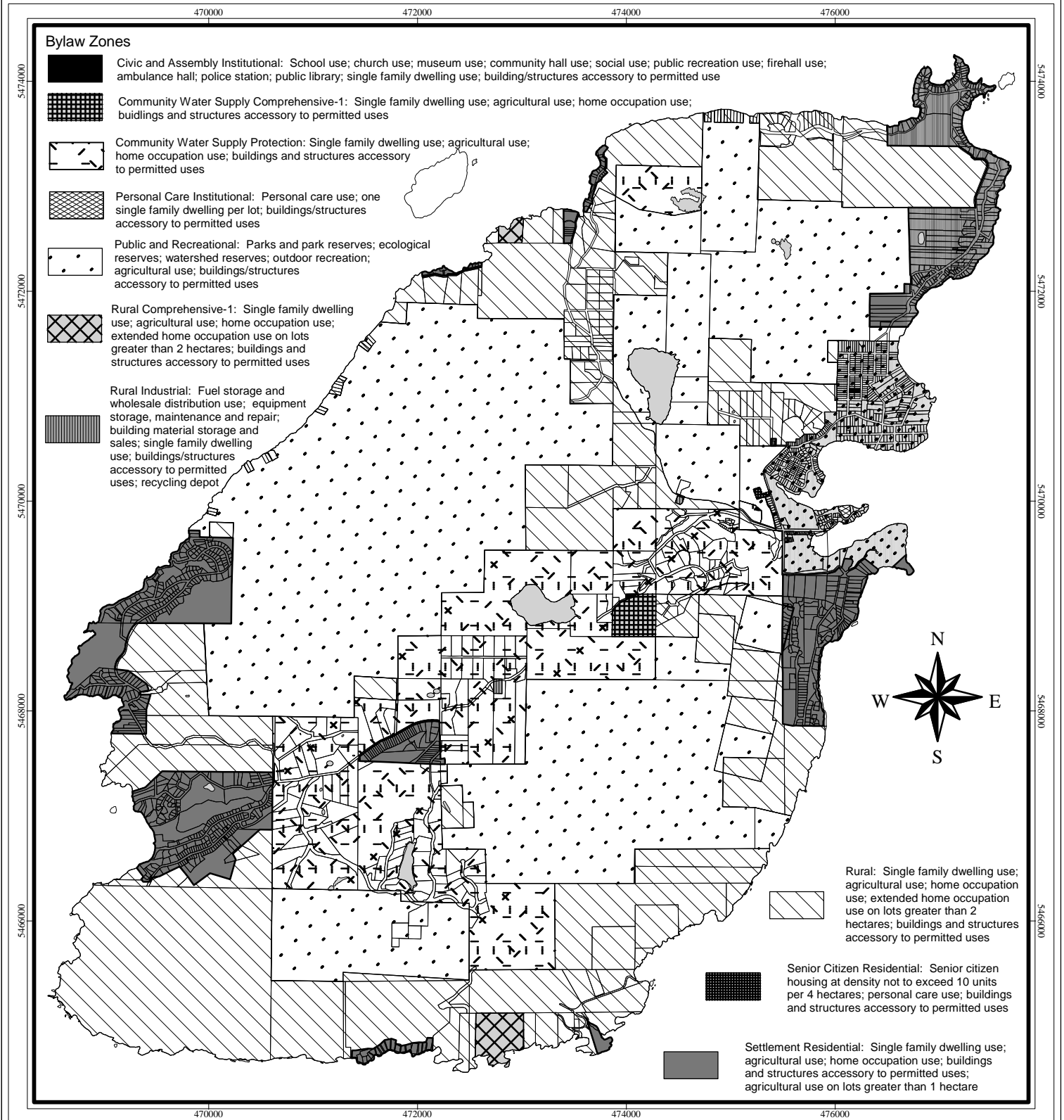
This map describes the land use designations defined by Bowen Island Official Community Plan Bylaw No. 139 (1995). The average lot size allowed for the area is given within brackets () in the legend.

1 0 1 2 3 4 Kilometers

Scale = 1:50,000
Projection UTM; Zone 10; Datum NAD83; Spheroid Clarke 1866;

For detailed sources of information upon which the map is based, please refer to Appendix of State of Bowen Island Report (2000)

Map 10) BOWEN ISLAND: Zoning Bylaw



LEGEND

- Snug Cove Area - Data Not Available
- Property Boundaries
- Lakes

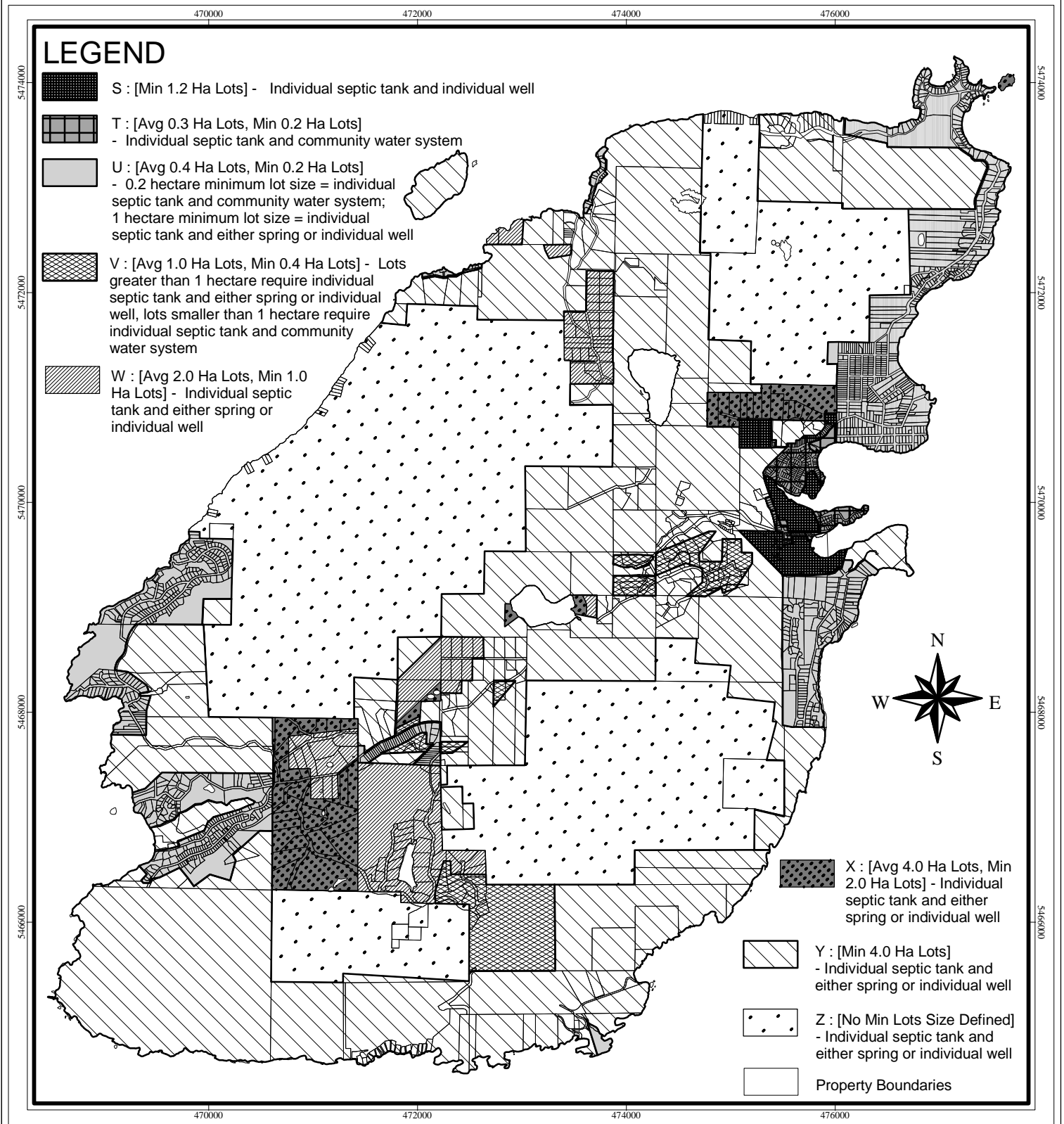
This map shows the zoning bylaw in effect, defined by Bowen Island Zoning Bylaw No. 36. Accurately digitized zoning bylaw information is not available for Snug Cove and surrounding area (including Bowen Bay and Cates Hill).

1 0 1 2 3 Kilometers

Scale = 1:50,000;
 Projection UTM; Zone 10; Datum NAD83; Spheroid Clarke 1866;

For detailed sources of information upon which the map is based, please refer to Appendix of State of Bowen Island Report (2000)

Map 11) BOWEN ISLAND: Subdivisions

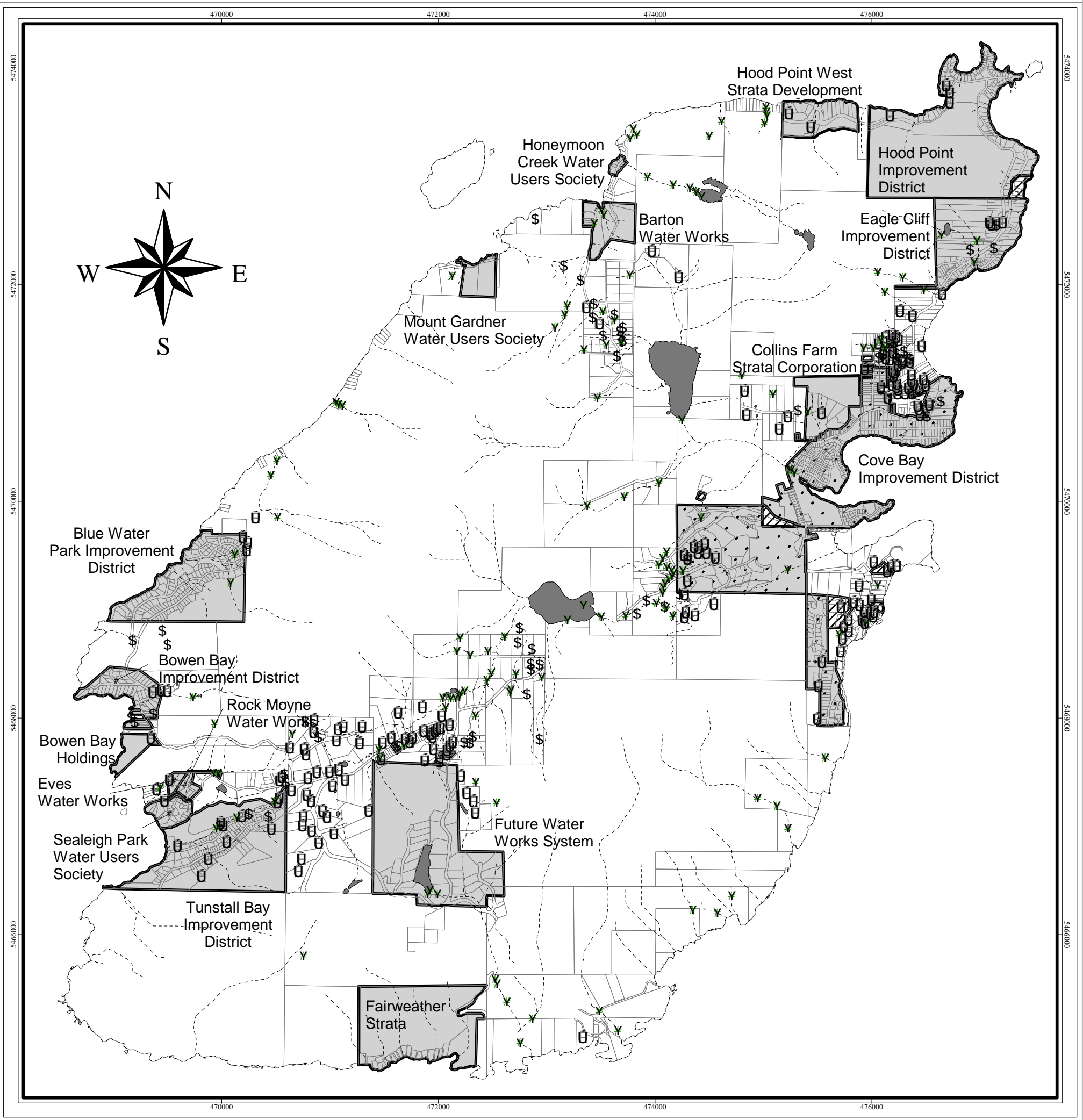


This map describes the subdivision bylaw in effect, defined by Bowen Island Subdivision Bylaw No. 270. The minimum and average lot sizes allowed for the zone is given within brackets [] in the legend.

1 0 1 2 3 4 Kilometers

For detailed sources of information upon which the map is based, please refer to Appendix of State of Bowen Island Report (2000)

Map 12) BOWEN ISLAND: Water Districts and Location of Water Intake



This map shows the water districts of Bowen Island. Locations for various methods of water intake (registered surface water intake, shallow wells, and deep wells) are also shown. Note that the District boundaries are approximate, and current extension of Cove Bay Improvement District is not shown on this map.

LEGEND

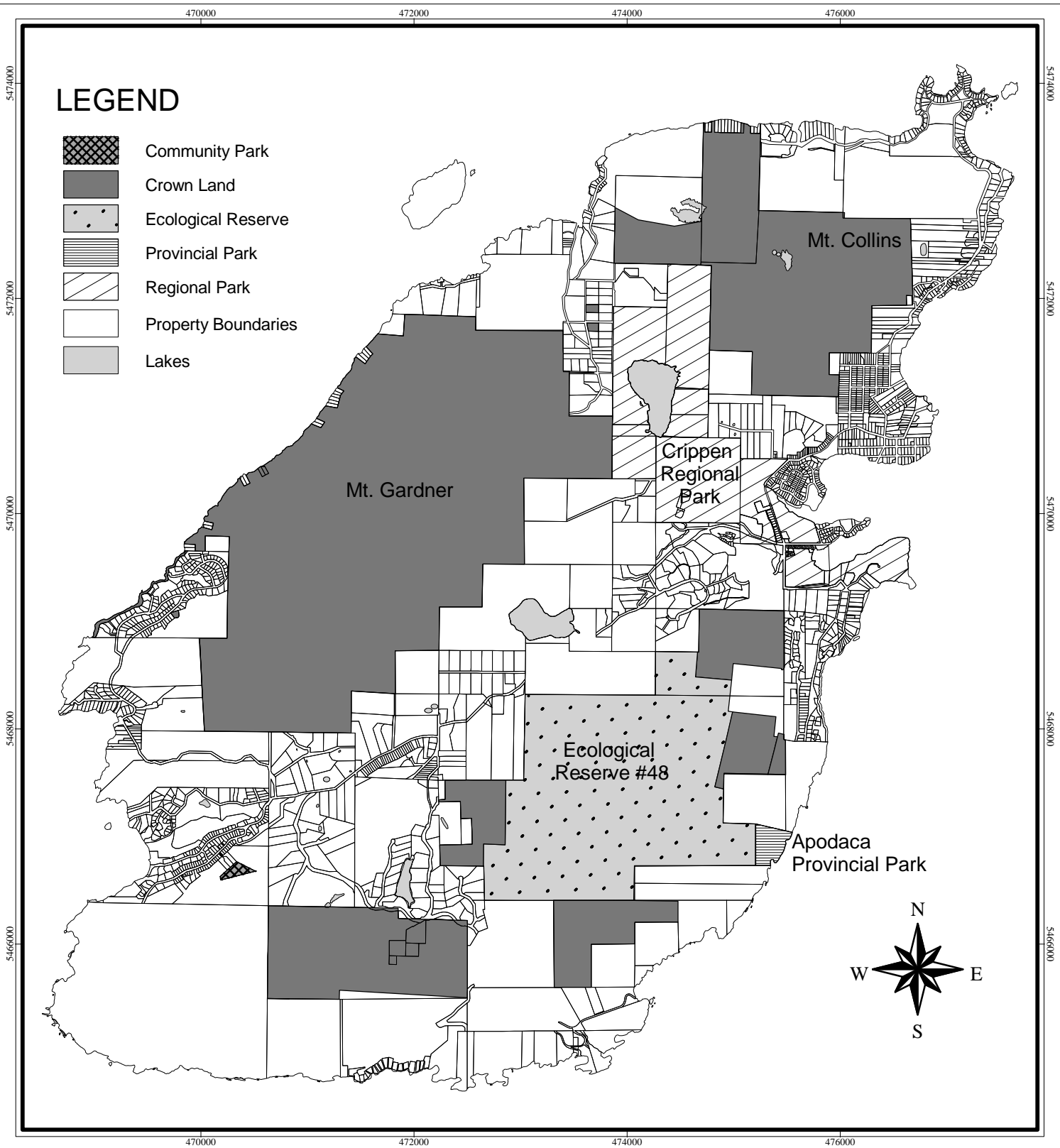
- Registered Surface Water Intake Point (Point of Diversion) - Licenses are associated with each intake point.
- Shallow Wells - Wells and intake points that were dug shallow into surface materials
- Deep Wells - Wells that were drilled deep into bedrock
- Lakes
- Streams
- Property Boundaries
- Water Improvement Districts and Private Water Distribution
- Cove Bay Improvement District
- Other Private Water Distribution

1 0 1 2 3 Kilometers

Scale = 1:37,500
Projection UTM; Zone 10; Datum NAD83; Spheroid Clarke 1866;

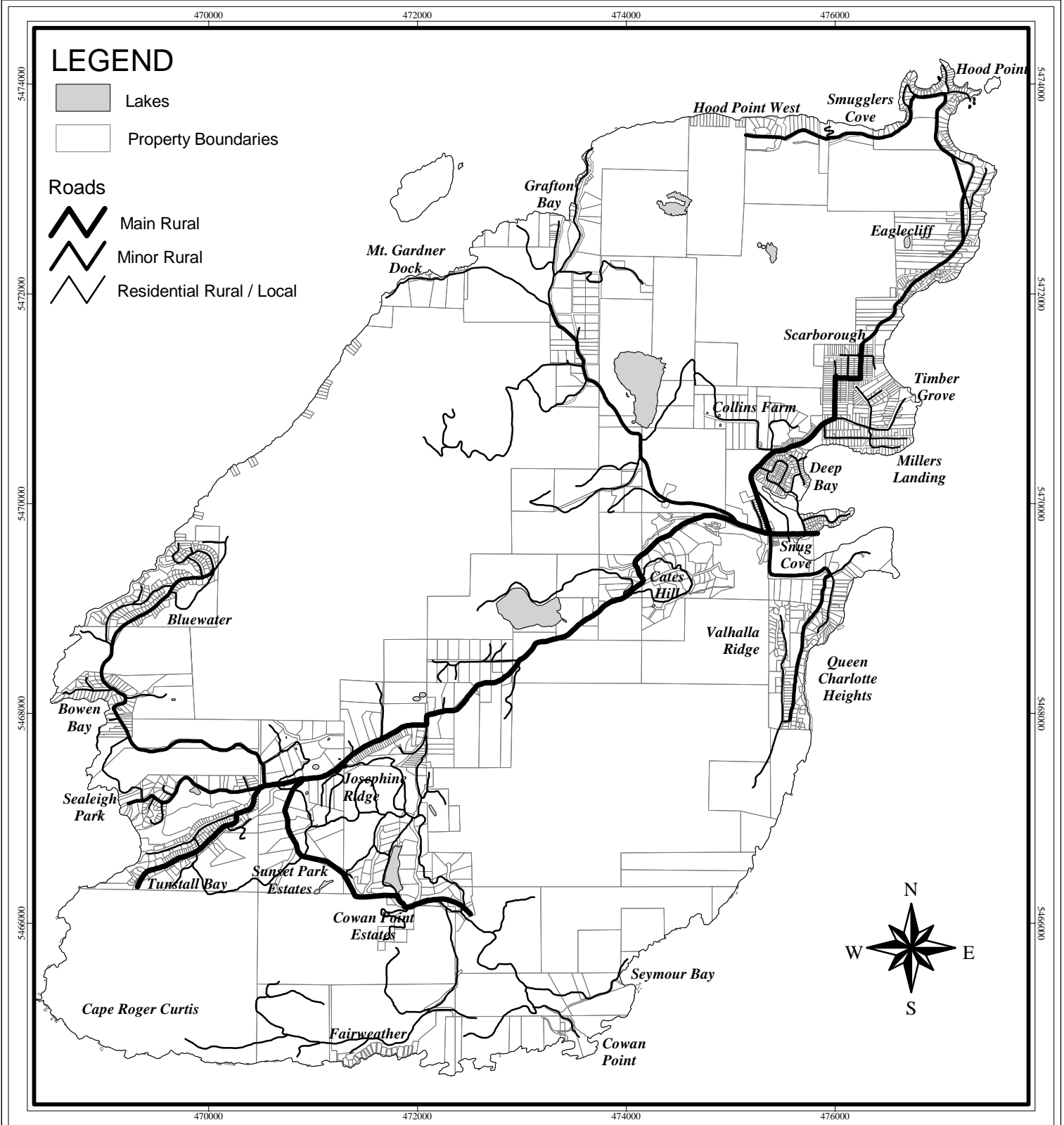
For detailed sources of information upon which the map is based, please refer to Appendix of State of Bowen Island Report (2000)

Map 13) BOWEN ISLAND: Parks, Ecological Reserve and Crown Land



Parks, Ecological Reserve and Crown Land on Bowen Island is shown on this map. Those areas are defined by Bowen Island Official Community Plan Bylaw No. 139 (1995). Not all the existing parks are shown on this map.

Map 15) BOWEN ISLAND: Roads



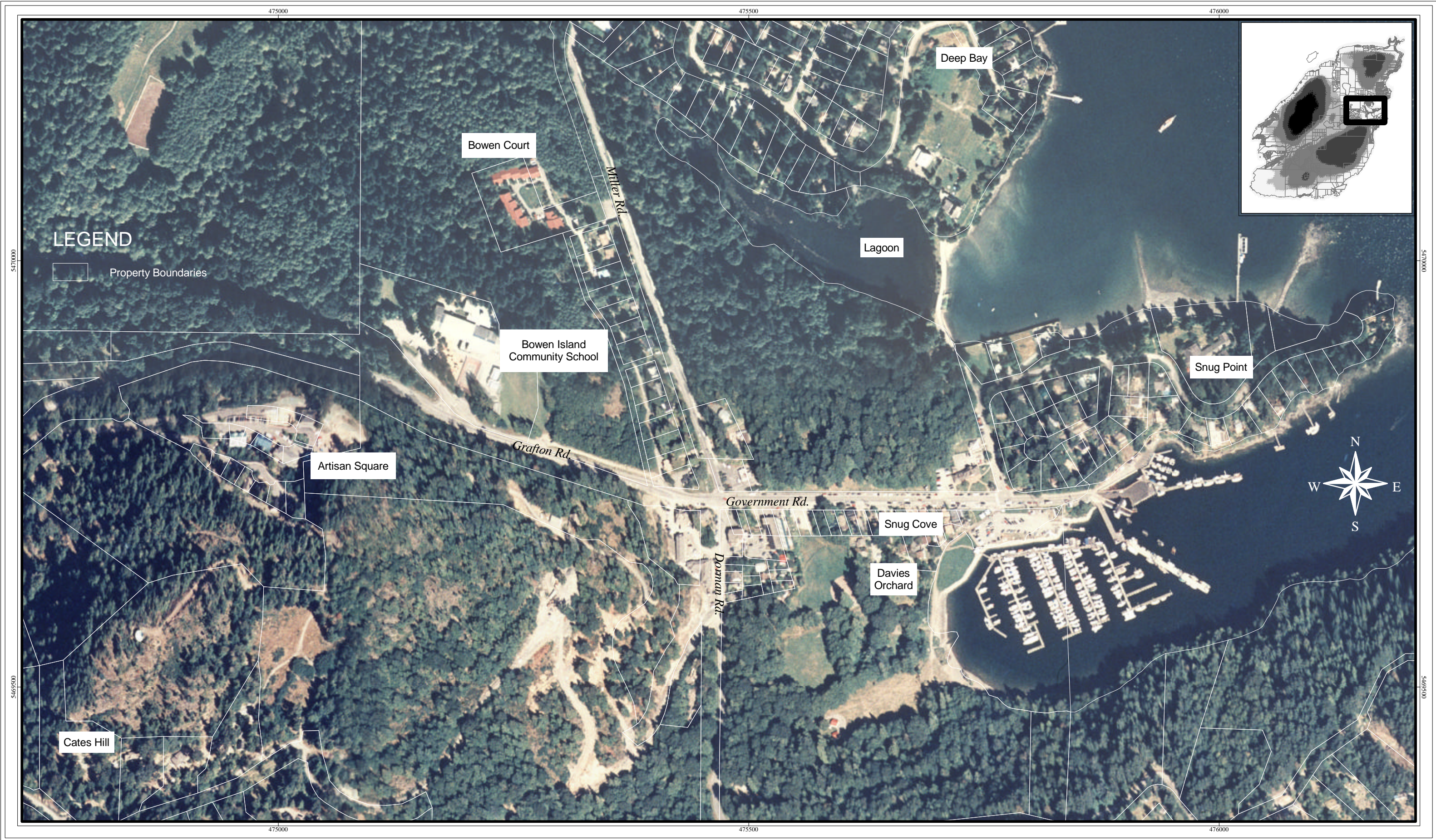
The map shows roads on Bowen Island. Some digitized road data shown here is inaccurate. Also not all the roads are shown on this map.

1 0 1 2 3 4 Kilometers

Scale = 1:50,000
Projection UTM; Zone 10; Datum NAD83; Spheroid Clarke 1866;

For detailed sources of information upon which the map is based, please refer to Appendix of State of Bowen Island Report (2000)

Map 16) BOWEN ISLAND: Orthophoto of Snug Cove Area



This orthophoto was taken by Ministry of Environment, Land and Parks in 1999. The insert map represents Bowen Island and the location of Snug Cove (Photo Area) is defined by the rectangle.



Scale = 1:8,000; 0.5m Colour Ortho Photo (1999)
Projection UTM; Zone 10: Datum NAD83; Spheroid Clarke 1866;
Source: Ministry of Environment, Land and Parks;

For detailed sources of information upon which the map is based, please refer to Appendix of State of Bowen Island Report (2000)

Appendix 10

Bowen Island GIS Atlas and Spatial Data

This table was used to determine the layers that should be included in the 'Working Collection' of GIS Atlas for Bowen Island. From the list of working coverages, the possible list of spatial data was determined. From this list, Bowen Island Sustainability Team determined the critical spatial information required for use in the State of Bowen Island Report.

1 page

Bowen Island GIS Atlas and Spatial Data			
Map #	Theme Name	Description	Analysis/ Spatial Data
1	Ag-land	Agricultural Land	area, percent of Agriculture land and ALR
2	Aquaix	Block aquatic analysis	areas of H/M/L environmental buffer zone & sensitivity - Salmonid, debries, floodplain; also area of different runoff porcess & hydrology
3	Bowendem	Digital Elevation Model for Bowen	
4	Bowenmask	Regional overview showing surrounding area	
5	Bowsh	Solid ISLAND polygon (background for cartographic purposes)	Area of Island, length of shoreline
6	Bufcoast	300 m development permit buffer (line) around island	Area of Buffer Zone, ratio to the island itself
7	Cadastre	Latest version of cadastral (2000)	density of lots/district lot; density of lots/homes across island; comparison of lot size (area) across island.
8	Contours	1:10 K TRIM contours @ 20m interval	elevations, average elavations, average slope
9	Dwell	Deep well locations	# of wells in each water districts, outside districts
10	Forest Cover	MoF Forest Cover	area, percent of certain types/ages of forest
11	Geology	GSC	areas, ratio of bedrock, rock types
13	Lakes	final lakes	areas of each lakes, surface water ratio to land
14	Moeshed	Community watersheds - polygons	area, percent of each watersheds
15	OCP	OCP land use designations	areas, percent of land designated for certain use
16	Park_res	Parks, Crown, Ecological Reserve	areas, percent of each, total greenspace ratio to entire island
17	Proppark	Park locations proposed in OCP	# of proposed parks
18	Climate	Biogeoclimatic Zones	areas, percent of each climate zones
19	Recret	BLOCK outdoor recreation analysis	areas having primary & secondary outdoor significance, length & percent of coastal zone (sand beach, rock beach)
20	Roads	Road Suitability	area & percent unsuit, caution, and suited area for roadbuilding, length & percent of roads that are build within the each category
21	Roadsall	Complete Road network	length of road, percent of rural, residential and main roads, length per person can be calculated, bus route may be possible to calculate
22	Rwell	Registered wells	# of wells in each water districts, outside districts
23	SEI_bowen	Sensitive Ecosystems	areas and % of each sisnsitive areas
24	Shore2	Solid square polygon with island contour	
25	Shwell	Shallow wells	# of wells in each water districts, outside districts
26	Slope_25	Slopes >25% hazardous for development (need permit)	areas, percent of land >25% slope, # and % of private lots that are >25%
27	Springs	Springs	# of springs
28	Streams	All streams	total lengths of stream, percent stream surface cover if we can get average width
29	Strmlbl	Stream labels (names)	
30	Subdiv	Zones from Subdivision Bylaw	areas, percent of land zoned for a specific purpose
31	Terrex	BLOCK Terrain Analysis: Base data	areas, percent of diffenret terrain groups, areas, percent of predominat deposit
32	Terrtex	BLOCK Terrain Analysis: Interpretive	area, percent of each - rockiness degree, surface stoniness, drainage, uified texture, depth of bedrock or impervious layer, flood frequency, degree of compactiness, (can be added: depth of water table, septic tank filter field suitability potential)
33	Trails	Trail network	lengths of trails, length per person can be calculated
34	Vegetat	BLOCK Vegetation Analysis	areas & percent of each - vegetation type, wind hazard, fire hazard, trafficability, nature interpretation value, sound absorption potential, visual screening potential, deer browsing potential, langdcaping potential, landscaping design (can be added: habitat manipulation suitability and description for all the other)
35	Watersys	Water districts/systems	areas, density of lots in each district, # of wells in each districts
36	Wetlands	Wetlands (BIFWMS field surveys, SEI wetlands)	total area of wetland, surface water land ratio
37	Wshed_areas	Development Permit areas (around streams/watersheds)	areas require different development permit
38	Wshednew	Watersheds boundaries based on height of land, determined	areas and % of each watershed
39	Wstat	Weather stations	generate barchart for weather data
40	Zones	Land Use Zones (from Zoning Bylaw) by Islands Trust from original map from BIFWMS	areas, percent of land designated for certain use
41	EA96	Enumalation area for Census 96	Population, density, income, workforce etc...all that is associated with census data for each enumalation area
42	GVRD landuse	landuse areas determined by GVRD	areas, percent of each landuse areas
43	lup92	Landuse from Baseline Thematic mapping	areas, percent of each landuse areas

Appendix 11

Spatial Data Analysis: Summary Tables

This appendix contains 22 tables of Spatial Data generated by Bowen Island Sustainability Project. Spatial analysis was performed using ArcView 3.1 from the layers from GIS Atlas, 'working collections'. The detail metadata for those layers which the data was generated can be obtained from spatial database catalogue (Appendix 5) by referencing the file names (top left, first word on each table).

22 pages

Aquatic Analysis: Interpretive - J. Block (1978)					
Generalized Terrain description	# of Sites	Average Area [m]	Area Sum [m]	Area [km2]	% Area [of whole Island]
Bedrock covered by veneers and pockets of deeper colluvial and morainal deposits on slopes and uplands.	39	974364.9235	38000232.0156	38.0	75.53%
Coastal benches of fluvial and marine origin. Thick fluvial gravels overlying marine sediments or till.	11	41673.1342	458404.4766	0.5	0.91%
Fluvial benches along present day streams. Deposits have varying textures and thicknesses.	35	32285.8795	1130005.7813	1.1	2.25%
Permanent Lakes	4	144088.9512	576355.8047	0.6	1.15%
Permanent Wetlands	37	9635.7956	356524.4375	0.4	0.71%
Sandy marine sediments overlying compact till on coastal and interior valley benches.	24	53811.2855	1291470.8516	1.3	2.57%
Silty and clayey marine sediments overlying compact till on coastal and interior valley benches	4	107848.9551	431395.8203	0.4	0.86%
Small inactive fluvial fans and pockets of fluvial materials deposited on slopes and in depressions around the base of slopes.	11	9793.5199	107728.7188	0.1	0.21%
Thick colluvial deposits (fan and blankets) on steep slopes (in depressions and at the base of gullies).	10	18940.7539	189407.5391	0.2	0.38%
Thick lowland till deposits, on lower slopes and benches of valleys.	14	195622.8259	2738719.5625	2.7	5.44%
Thick till deposits on slopes and uplands, underlain at depth by bedrock.	13	185417.9087	2410432.8125	2.4	4.79%
Others	109	24028.6122	2619118.7266	2.6	5.21%
			Total Area of Island	50.3	100.00%

	Aquatic Analysis: Interpretive - J. Block (1978)					
UNIT	Runoff Process and Hydrology	# of Sites	AVE_AREA	SUM_AREA	Area [km2]	% Area [of whole Island]
17	The fluvial materials are shallow but highly permeable, with rapid rainfall percolation; the impermeable underlying materials cause the formation of a perched local groundwater table. Seepage springs may occur at the base of the unit. The slope above	11	9793.5199	107728.7188	0.1	0.21%
18	Generally similar to unit 17. Deeper and larger pockets along Terminal Creek valley may contain more substantial aquifers	35	32285.8795	1130005.7813	1.1	2.25%
19	The fluvial materials are highly permeable, resulting in rapid rainfall percolation. The underlying marine deposits or till are generally impervious, resulting in formation of a groundwater table, or subsurface seepage at the base of the fluvial strata	11	41673.1342	458404.4766	0.5	0.91%
20	Generally similar to unit 19.	24	53811.2855	1291470.8516	1.3	2.57%
21	This unit has slow natural drainage, generally as subsurface seepage along the till or unweathered marine strata. Surface ponding which is not connected to surface channels is characteristic of this unit.	4	107848.9551	431395.8203	0.4	0.86%
22	The surface capping of coarse textured fluvial or marine materials, or weathered or reworked till is highly permeable. Subsurface flow occurs in the underlying impermeable till, and surface ponding may occur in local depressions.	14	195622.8259	2738719.5625	2.7	5.44%
23	Surface is highly permeable, with rapid rainfall percolation. This unit characteristically has subsurface flow or a perched groundwater table along the contact with underlying impermeable bedrock.	10	18940.7539	189407.5391	0.2	0.38%
24	The surface capping of weathered or reworked materials is highly permeable. Subsurface flow occurs on the underlying impermeable till; surface ponding may occur locally in depressions.	13	185417.9087	2410432.8125	2.4	4.79%
25	The surface capping is generally highly permeable. Subsurface flow occurs on the underlying impermeable bedrock. Surface ponding may occur locally in depressions, and some groundwater percolation occurs in joints and faults in the bedrock.	39	974364.9235	38000232.0156	38.0	75.53%
	Others	150	23679.9931	3551998.9688	3.6	7.06%
				Total Area of Island	50.3	100.00%

	Aquatic Analysis: Interpretive - J. Block (1978)					
Unit	Settlement Design Sensistivity	# of Sites	AVE_AREA	SUM_AREA	Area [km2]	% Area [of whole Island]
17	Sensitive to : impermeable surface area changes and sewage disposal. The groundwater supply may be sensitive to changes in surface permeability (asphalt, roofs, etc.) if the majour groundwater source is therought sourface infiltration. Changes in watequality may occur if sewage is by means of septic tanks	11	9793.5199	107728.7188	0.1	0.21%
18, 19, 20	Sensitivities similar to unit 17	70	41141.1587	2879881.1094	2.9	5.72%
21	Sensitive to: Drainage ditches and surface disturbance associated with development. Runoff process is speeded up by drainage ditches. This unit has hight siltation potentila for may adjacent stream channels from surface disturbance.	4	107848.9551	431395.8203	0.4	0.86%
22	Sensitive to: Drainage ditches associated with development. Runoff proces is speeded up by the drainage ditches.	14	195622.8259	2738719.5625	2.7	5.44%
23	Sensitivity similar to unit 17: the major effect on the runoff process occurs from changes in impermeable surface are: the groundwater supply or subsurface flow is only affected if infiltration from the surface of the unit is the main source.	10	18940.7539	189407.5391	0.2	0.38%
24	Sensitive to: roads and associated drainage ditches. A major effect on the runoff process occurs from interception of the subsurface flow along roads.	13	185417.9087	2410432.8125	2.4	4.79%
25	Sensitive to: roads and associated drainage ditches. Similar to unit 24.	39	974364.9235	38000232.0156	38.0	75.53%
	Others	150	23679.9931	3551998.9688	3.6	7.06%
				Total Area of Island	50.3	100.00%

Biogeoclimate Zone - Ministry of Forest					
Biogeoclimate Zone Type	# of Sites	AVE_AREA	SUM_AREA	Area [km2]	% Area [of whole Island]
CWH dm	4	9246895.6992	36987582.7969	37.0	73.52%
CWH vm 2	2	486441.1406	972882.2813	1.0	1.93%
CWH xm 1	1	12349313.0000	12349313.0000	12.3	24.55%
			Total Area of Island	50.3	100.00%

Geology - J.M. Jouneay (1996), GSC Open File 3276											
ROCK_CLASS	COUNT	AVE_AREA	SUM_AREA	Area [km2]	% Area [of whole Island]	TEC_ENV	ROCK_TYPE	COMMENTS	ERA_EPOCH	AGE_MAX	AGE_MIN
plutonic	3	4685482.6667	14056448.0000	14.1	27.94%	arc-related plutons	biotite-hornblende quartz-diorite	terrane-stitching calc-alkaline/alkaline I-type plutons; intruded across boundaries of previously amalgamated terranes of the Coast and Intermontane belts; exhumed roots to coeval arc volcanics of the Harrison Lake and Bowen Island groups	Early Middle Jurassic-Late Jurassic	187.0000	145.0000
sedimentary	3	75712.1536	227136.4609	0.2	0.45%	glacial/fluvial/lacustrine	sand, silt, gravel, till	undivided surficial deposits including; glacial drift, alluvium, glaciofluvial-lacustrine sediments, till, colluvium, landslide deposits	Pleistocene and Recent	1.6000	0.0000
volcanic/sedimentary	3	11875841.5000	35627524.5000	35.6	70.82%	island arc	intermediate-felsic flows, volcanoclastic sandstone, pelite, minor carbonate, conglomerate	correlative in part with Bonanza and Harbledown formations of Vancouver Island; part of an island arc terrane believed to have been amalgamated along the paleocontinental margin and later stitched together by Middle Jurassic plutons	Lower-Middle Jurassic	208.0000	156.0000
	3	132891.3750	398674.1250	0.4	0.79%					0.0000	0.0000
			Total Area of Island	50.3	100.00%						

Lakes - BIFWMS Water Survey						
NAME of Lakes	COUNT	AVE_AREA	SUM_AREA	Area [m2]	% Area [of Total Lake Area]	% Area [of whole Island]
Bowen Brook Headwaters	2	2861.7813	5723.5625	5724	1.19%	0.02%
Grafton Lake	1	150886.1875	150886.1875	150886	31.41%	0.62%
Honeymoon Lake	1	37198.2031	37198.2031	37198	7.74%	0.15%
Josephine Lake	1	41530.4375	41530.4375	41530	8.65%	0.17%
Killarney Lake	1	206256.7500	206256.7500	206257	42.94%	0.85%
Little Josephine Lake	1	2701.4297	2701.4297	2701	0.56%	0.01%
Mud Lake	1	12127.0859	12127.0859	12127	2.52%	0.05%
Small ponds	20	1196.1762	23923.5234	23924	4.98%	0.10%
Total # of Lakes digitized	28			480347		
		Total Surface Area of 28 Lakes [km2]		0.48	100.00%	
		Total Area of Bowen Island (inc. small islands around) [km2]		50.31		1.99%
		Total Lake Surface Water Ratio to Land		0.00954779		
		% Surface Water		1%		

OCP Landuse Designations: Bylaw No. 139; Schedule B - Map Designations						
OCP Landuse Designations	# of Sites	AVE_AREA	SUM_AREA	Area [km2]	% Area [of Total Plan Area]	% Area [of whole Island]
Agricultural Land Reserve	4	442888.2305	1771552.9219	1.77	2.82%	3.51%
Coast	18	688077.9379	12385402.8828	12.39	19.72%	
Institutional	2	11716.0469	23432.0938	0.02	0.04%	0.05%
Public Facility	1	25127.1797	25127.1797	0.03	0.04%	0.05%
Rural	10	2727667.9484	27276679.4844	27.28	43.44%	54.11%
Rural 1	10	399948.4086	3999484.0859	4.00	6.37%	7.93%
Rural Residential	24	491370.0228	11792880.5469	11.79	18.78%	23.39%
Rural Residential containing existing smaller lot subdivisions	8	552171.8164	4417374.5313	4.42	7.03%	8.76%
Snug Cove	3	202744.8125	608234.4375	0.61	0.97%	1.21%
Tourist Commercial	2	19528.7969	39057.5938	0.04	0.06%	0.08%
	66	6943.1226	458246.0938	0.46	0.73%	0.91%
		Total Planning Area [km2]		62.8	100%	
		Total Area of Bowen Island (inc. small islands around) [km2]		50.4		100%

Parks, Crown Land and Ecological Reserves - Islands Trust (BCIT Students)				
DESIGNATION	SUM_AREA	Area [km2]	% Area [of Parks Total]	% Area [of whole Island]
COMMUNITY PARK	24241.4141	0.02	0.11%	0.05%
CROWN LAND	15193650.8750	15.19	68.81%	30.20%
ECOLOGICAL RESERVE	3917344.5000	3.92	17.74%	7.79%
PROVINCIAL PARK	92652.1172	0.09	0.42%	0.18%
REGIONAL PARK	2417266.0703	2.42	10.95%	4.80%
Others	435705.6484	0.44	1.97%	0.87%
	Total area of Parks, Crown Land and Ecological Reserve	22.08	100.00%	
	Total Area of Bowen Island (inc. small islands around) [km2]	50.31		43.89%
	Total Park Area to Land Ratio	0.438897949		
	% Park Area	44%		

Coastal Recreational Area - J. Block (1978): Outdoor Recreation Feature Analysis						
Foreshore Type	# of Sites	AVE_AREA	SUM_AREA	Area [km2]	% Area [of Total Coastal Area]	% Area [of whole Island]
SAND_SILT	2	32684.9063	65369.8125	0.24	6.98%	0.48%
GRAVEL	29	43435.0467	573580.6250	0.57	16.43%	1.14%
GENTLY_SLO	7	121464.5299	401725.5781	0.40	11.50%	0.80%
STEEPLY_SL	38	60070.0535	2282662.0313	2.28	65.37%	4.54%
Data Not Defined	3	81293.7578	243881.2734	0.24	6.98%	0.48%
Coast (total)	77	45350.9844	3492025.7969	3.49	107.27%	6.94%
Total Area of Bowen Island (inc. small islands around) [km2]				50.31		
Total Coastal Area (defined by J. Block (1978)) [km2]				3.49		

Sensitive Ecosystems Inventory - Habitat Conservation Trust Fund, Environment Canada, BC Ministry of Environment, Land and Parks (1999)						
Sensitive Ecosystems Inventory	Key	Description	# of Sites	Area Sum [km]	% Area [of SEI Total]	% Area [of whole Island]
Coastal Bluff	CB	Vegetated rocky islets, shorelines and coastal cliffs	33	0.50	1.75%	0.99%
Seasonally flooded agricultural field	FS	fields that flooded in winter and may at one time have supported a number of moist forested and non-forested ecosystems including some wetland ecosystems	0	0	0.00%	0.00%
Terrestrial herbaceous	HT	mosaics of coastal grassland meadows and moss covered rock outcrops	23	0.77	2.70%	1.53%
Older forest	OF	forests older than 100 years, dominated by conifers	7	1.68	5.89%	3.34%
Riparian	RI	vegetated floodplains, stream and lake shores and gullies	14	0.96	3.37%	1.91%
Older second growth forest	SG	large stands of conifers 60-100 years old	11	24.05	84.33%	47.80%
Sparsely vegetated	SV	dunes, spits and inland cliffs	1	0.02	0.07%	0.04%
Woodland	WD	open forests dominated by deciduous trees with canopy cover generally less than 50%	6	0.11	0.39%	0.22%
Wetland	WN	marshes, fens, bogs, swamps, shallow water, and wet meadows	14	0.43	1.51%	0.85%
		Total area of Sensitive Ecosystems Inventory [km ²]		28.52	100.00%	
		Total Area of Bowen Island (inc. small islands around) [km ²]		50.31		56.69%
		Total SEI Area to Land Ratio		0.566887755		
		% SEI Area		57%		

Shoreline				
NAME	RPOLY_	COUNT	SUM_LENGTH [m]	Shore Line Length [km]
Bowen Island Shoreline	2	20	45250.3483	45.3
Island beside Hood Point	3	1	531.4268	0.5
Hut Island Shoreline	7	1	2029.6694	2.0
Island beside Hutt Island	8	1	178.4124	0.2

slope_25_areasum

Spatial Analysis Data.xls

Slope Area Greater than 25 Degrees - OCP				
SLOPE_COD	COUNT	AVE_AREA	SUM_AREA	Area [km2]
0	118	1267.4507	149559.1865	0.15
2	186	35755.4127	6650506.7652	6.65
		Total Slope Area >25 degrees [km2]		6.80
		Total Area of Bowen Island (inc. small islands around) [km2]		50.31
		Total SEI Area to Land Ratio		0.135163889
			% SEI Area	14%

Subdivision Bylaw - Bowen Island Municipality Bylaw No. 270								
Subdivision Key	# of Sites	AVG LOT Size [Ha]	MIN LOT Size [Ha]	Water System	AVE_AREA	SUM_AREA	Area [km2]	% Area [of whole Island]
S	5	0.0000	1.2000	Individual septic tank and individual well	91837.8578	459189.2891	0.5	0.91%
T	5	0.3000	0.2000	Individual septic tank and community water system	66929.1094	334645.5469	0.3	0.67%
U	8	0.4000	0.2000	0.2 hectare minimum lot size = individual septic tank and community water system; 1 hectare minimum lot size = individual septic tank and either spring or individual well	621276.8428	4970214.7422	5.0	9.88%
V	8	1.0000	0.4000	Lots greater than 1 hectare require individual septic tank and either spring or individual well, lots smaller than 1 hectare require individual septic tank and community water system	156850.3965	1254803.1719	1.3	2.49%
W	7	2.0000	1.0000	Individual septic tank and either spring or individual well	312797.7165	2189584.0156	2.2	4.35%
X	6	4.0000	2.0000	Individual septic tank and either spring or individual well	245424.8268	1472548.9609	1.5	2.93%
Y	13	0.0000	4.0000	Individual septic tank and either spring or individual well	1628163.0919	21166120.1953	21.2	42.07%
Z	4	0.0000	16.0000	Individual septic tank and either spring or individual well	4526012.0625	18104048.2500	18.1	35.99%
Others	2	0.0000	0.0000	Lake	178569.2344	357138.4688	0.4	0.71%
				Total Area of Bowen Island (inc. small islands around) [km2]			50.3	100%

Terrain Analysis: Base Data - J. Block (1978)							
MAP_GROUP	# of sites	TERRAIN Descriptions	AVE_AREA	SUM_AREA	Area [km2]	% Area [of whole Island]	
0	6		108137.1602	648822.9609	0.6	1.29%	
1	1	Landfill of unknown genetic origin used to create a level area along the shoreline for dwelling foundations. Apparently well drained.	5628.5938	5628.5938	0.0	0.01%	
2	11	Rubbly mass wastage material from adjacent steep bedrock slopes. Included in this unit may be some blocky material commonly greater than 1m in diameter. Colluvial fans generally occur at the base of steep gullies whereas colluvial blankets are found in	27936.8807	307305.6875	0.3	0.61%	
3	12	Rock hillsides which have a slope greater than 35 degrees (70 %) and are drained by steep V-shaped gullies. Most slopes greater than 60 degrees are bare whereas those between 35 degrees and 60 degrees may have a rubbly colluvial veneer and associated so	1009247.7461	12110972.9531	12.1	24.07%	
4	36	These terrain units are abundant throughout the island and are composed mainly of hummocky bedrock knolls or areas of very shallow soil over bedrock. Minor areas of rubbly colluvial veneer may accumulate along steeper slopes. Some of these side slopes	535447.2496	19276100.9844	19.3	38.31%	
5	2	This terrain unit is similar to those included in map group 4. The main difference is that a significant portion of the unit is covered by a deeper blanket of moraine. Generally this compact, sandy, silty, till has infilled depressions in the bedrock	1377577.7500	2755155.5000	2.8	5.48%	
6	1	this unit occupies a hummocky depressional valley leading down to the sea level. Sandy, silty till occurs in depressions between bedrock knolls and is overlain by fine marine sediments. A fine gravelly veneer of shallow marine or well sorted beach sand	258584.5781	258584.5781	0.3	0.51%	
7	9	These units are represented in areas of low hummocky bedrock along the coast. Bare or moss covered rock outcrops are common and soil cover is minimal. Sandy, silty till has been deposited against depressional surfaces of the bedrock. Coarse, well drain	209017.7057	1881159.3516	1.9	3.74%	
8	21	This map group includes fluvial gravels deposited in depressional areas at the base of, or along slopes underlain by bedrock or impermeable basal till. Most of the gravels were probably deposited during immediate postglacial time and represent local out	54413.5629	1142684.8203	1.1	2.27%	
9	16	Localized gravelly fluvial fans which were likely deposited as glacial meltwater flowed into standing water during the immediate postglacial period. Topset and foreset gravel beds consisting of numerous layers of pebbly gravel, sandy gravel, sand with o	18531.3022	296500.8359	0.3	0.59%	
10	4	Present-day gravelly floodplains and floodplain deltas overlying fine marine sediments associated with lowland, gently sloping terrain. These units are restricted to narrow areas adjacent to small creeks with low gradients. Present stream channels are	23803.4316	95213.7266	0.1	0.19%	
11	2	This unit represents the present floodplain deltas of small streams draining into Killarney Lake. The groundwater table in the coarse, gravelly material is very near the surface. These small areas are subject to flooding during high stream discharge.	11175.6289	22351.2578	0.0	0.04%	
12	1	This unit represents the large, flat floodplain of Killarney Creek and lower Terminal Creek. Silty organic soils are developed on alluvial silt and fine sand which overlie fine marine sediments at depth. The floodplain material is coarser near where Te	336243.7813	336243.7813	0.3	0.67%	
13	3	Limited gravel deposits consisting primarily of sand and pebble size material which were probably deposited during deglaciation in the westerly trending valleys draining into Bowen and Tunstall Bays. Interlayered sand and pebbly sand beds dip down3nslope	44870.4115	134611.2344	0.1	0.27%	
14	1	The unit represents postglacial sediments that infilled the lower valley leading down to Tunstall Bay which is presently occupied by the well entrenched Explosives Creek. Greater than 2m of fine gravelly material interlayered as deltaic foreset beds ove	47649.2734	47649.2734	0.0	0.09%	
15	1	This unit occupies a flat, depressional area in the Terminal Creek valley, immediately south of Grafton Lake and probably represents part of the old floodplain. Soils, characterized by a surface organic layer, are developed on alluvial silts and fine sa	50353.5625	50353.5625	0.1	0.10%	
17	2	A fluvioglacial ridge of considerable thickness containing a variety of materials, including a boulder clay flow till, cobble gravel and finely laminated silt of limited vertical and horizontal extent. The till is seen overlying well sorted, cross-bedde	47177.9414	94355.8828	0.1	0.19%	
18	5	This group is representative of much of the better drained, flat lowland areas on the island. Postglacial meltwater flowing off the adjacent slopes deposited gravels in subdued coastal areas. Thickness of the gravel varies but is generally greater than	88326.9391	441634.6953	0.4	0.88%	
19	11	This map group, along with group 4 is the most commonly occurring group on Bowen Island. The overall topography is hummocky, consisting of a complex of deep soils over till broken by bare rock outcrops and areas shallow till over steeper bedrock slopes	192706.0533	2119766.5859	2.1	4.21%	
20	11	The group encompasses those lowland areas characterized by thick morainial deposits which, for the most part, mask, or at least subdue, the underlying topography. Overall, the topography for this group is gently sloping to moderately sloping to undulatio	74821.1974	823033.1719	0.8	1.64%	
21	6	This group includes terrain units found in depressional areas adjacent lower slopes in which postglacial outwash gravels and minor marine sediments have been laid down over thick morainial deposits. Sandy silty till infilled confined lowland areas and,	199699.6237	1198197.7422	1.2	2.38%	
22	5	The group encompasses those large areas of deep 91-2m) upland till which has subdued the terrain along the broad hummocky bedrock ridges. Fairly thick, coarse textured, well drained, podzolic soils are developed over moraine. Seepage along the surface o	876420.5844	4382102.9219	4.4	8.71%	
23	39	This group includes areas of accumulation of organic material, including: (1) swamps and bogs formed in depressions in hummocky terrain; (2) fens along the shallow shoreline of Grafton and Killarney Lakes; and (3) swampy wetland over the present floodpla	9966.6895	388700.8906	0.4	0.77%	
24	7	Fine grained marine sediments consisting of stony clayey silts (possibly glaciomarine), silt, silty clay and clay deposited in depressional areas in the pre-existing topography. Thicknesses vary from a thin veneer (less than .5m) to greater than 2m at	94632.1741	662425.2188	0.7	1.32%	
25	5	Sandy and silty marine sediments overlie compact basal till at varying depths. In places the marine material is poorly sorted, resembling the till matrix and may be reworked moraine. This is more common on the moderately steep slopes. Soils developed	89635.9719	448179.8594	0.4	0.89%	
26	4	Well sorted, massive, medium grained, marine sand deposited in coastal lowland depressions. Soil cover developed over the sand is generally thin (less than 1m) medium to coarse textured and well drained. Drainage through the sands is good, however, se	95561.2969	382245.1875	0.4	0.76%	
				Total Area of Island	50.3	100%	

Terrain Analysis: Base Data - J. Block (1978)					
DEPOSIT_TYPE	# of Site	AVE_AREA	SUM_AREA	Area [km2]	% Area [of whole Island]
Anthropogenic Deposits	1	5628.5938	5628.5938	0.0	0.01%
Predominantly Bedrock	61	595286.8828	36312499.8516	36.3	72.18%
Predominantly Colluvial Deposits	11	27936.8807	307305.6875	0.3	0.61%
Predominantly Fluvial Deposits	56	47528.5548	2661599.0703	2.7	5.29%
Predominantly Marine Deposits	16	93303.1416	1492850.2656	1.5	2.97%
Predominantly Morainal Deposits	33	258275.7704	8523100.4219	8.5	16.94%
Predominantly Organic Deposits	40	14576.3332	583053.3281	0.6	1.16%
Others (Lakes)	4	105986.0098	423944.0391	0.4	0.84%
			Total Area of Island	50.3	100%

Terrain Analysis: Interpretive - J. Block (1978)															
UNIT	COUNT	Slope Min. [%]	Slope Max [%]	Drainage	Min. Depth of Bedrock or Impervious Layer [m]	Max. Depth of Bedrock or Impervious Layer [m]	Surface Stoniness	Rockiness	Flood Frequency	Degree of Compactness or Cementation	General Description of Terrain Units	AVE AREA	SUM AREA	Area [km2]	% Area [of whole Island]
0	5	0.0000	0.0000		0.0000	0.0000	Stone Free	No Rock Exposures				123576.4156	617882.0781	0.62	1.23%
1	1	0.0000	2.0000	WELL	1.5000	0.0000	Stone Free	No Rock Exposures	None	No data	Landfill of unknown genetic origin.	5496.0391	5496.0391	0.01	0.01%
2	11	30.0000	70.0000	RAPID	1.5000	0.0000	Moderately Stony	No Rock Exposures	None	Low	Deep colluvial material over steep bedrock slopes; usually associated with gullies or depressional areas in the slope; colluvial fans at the base of steep gullies.	28260.6626	310867.2891	0.31	0.62%
3	11	70.0000	0.0000	RAPID	0.0000	0.5000	Slightly Stony	Exceedingly Rocky	None	No data	Steep rock hillsides with minor areas covered by shallow colluvium; deeper colluvium exists in the steep gullies and along the base of the slopes.	996428.0043	10960708.0469	10.96	21.79%
4	34	9.0000	60.0000	WELL	0.5000	1.0000	Slightly Stony	Exceedingly Rocky	None	Till - high; Sand and Gravel - low	Hummocky terrain consisting mainly of bedrock knolls with shallow till covering the lower slopes and depressional areas; shallow colluvial deposits may accumulate along steeper till.	600771.9504	20426246.3125	20.43	40.60%
5	2	9.0000	60.0000	WELL	0.5000	1.5000	Slightly Stony	Exceedingly Rocky	None	Till - high; Sand and Gravel - low	Hummocky terrain consisting of bedrock knolls or shallow till plastered onto bedrock. Depressions between the hillocks are infilled with deeper till.	1379845.5000	2759691.0000	2.76	5.49%
6	1	5.0000	60.0000	WELL	0.5000	1.0000	Slightly Stony	Exceedingly Rocky	None	Clayey; Silt - moderate	Hummocky depressional valley consisting of rock knolls and thin, coarse marine sediments over bedrock with fine marine or glacio-marine material over till in the depressions between hillocks.	268328.9688	268328.9688	0.27	0.53%
7	7	5.0000	60.0000	WELL	0.0000	1.0000	Slightly Stony	Exceedingly Rocky	None	Till - high; Sand and Gravel - low	Low hummocky bedrock terrain along the coastline; minor depressional areas are infilled with thin till, marine sand, or fluvial gravel.	265269.7924	1856888.5469	1.86	3.69%
8	22	5.0000	30.0000	WELL	1.0000	1.5000	Stone Free	No Rock Exposures	None	Low	Fluvial gravels deposited in depressional areas at the base of or along slopes underlain by bedrock or till.	66144.6293	1455181.8438	1.46	2.89%
9	15	5.0000	20.0000	WELL	1.5000	0.0000	Stone Free	No Rock Exposures	None	Low	Small fluvial gravel fans deposited over a variety of genetic materials which are generally of low permeability; gravels usually exceed 1.5 m thickness.	18878.1266	283171.8984	0.28	0.56%
10	4	0.0000	8.0000	IMP	1.0000	1.5000	Stone Free	No Rock Exposures	Occasional	Low	Present gravel floodplains and floodplain deltas overlaying fine grained, low permeability marine sediments associated with lowland gently sloping terrain.	23305.0410	93220.1641	0.09	0.19%
11	2	0.0000	5.0000	POOR	1.5000	0.0000	Stone Free	No Rock Exposures	Frequent	Low	Pebbly sand floodplain deltas of streams flowing into Killamey lake.	11363.5625	22727.1250	0.02	0.05%
12	1	0.0000	5.0000	IMP	1.5000	0.0000	Stone Free	No Rock Exposures	Rare	Low	Large floodplain of Killamey and Terminal Creeks consisting of fine sands and silts over gravels overlying fine marine sediments at depth.	334552.7813	334552.7813	0.33	0.66%
13	3	8.0000	15.0000	WELL	1.0000	1.5000	Stone Free	No Rock Exposures	None	Gravel - low; Silt - Moderate	Limited thickness of fluvial gravels overlie fine grained, impermeable marine sediment; present stream channels are entrenched in these units.	41772.4714	125317.4141	0.13	0.25%
14	1	8.0000	15.0000	WELL	1.5000	0.0000	Stone Free	No Rock Exposures	None	Low	Thick deltaic fluvial gravels overlie massive medium-grained, marine sands. Explosives Creek is entrenched in this unit.	49658.5313	49658.5313	0.05	0.10%
15	1	0.0000	5.0000	MODWELL	1.5000	0.0000	Stone Free	No Rock Exposures	None	Low	Fluvial silty sands occupying a depressional area near Grafton Lake; old floodplain deposits.	52841.6563	52841.6563	0.05	0.11%
16	1	0.0000	3.0000	POOR	1.5000	0.0000	Stone Free	No Rock Exposures	Frequent	Low	Present silty sandy floodplain of Terminal Creek above Grafton Lake.	36483.8594	36483.8594	0.04	0.07%
17	1	9.0000	15.0000	WELL	1.0000	1.5000	Slightly Stony	No Rock Exposures	None	Till - high; Silt - moderate; Sand and Gravel - low	Glaciofluvial ridge consisting of interlayered boulder clay flow till, well sorted, medium-grained sand, cobble gravel and finely laminated silt.	61114.4766	61114.4766	0.06	0.12%
18	2	0.0000	8.0000	WELL	1.5000	0.0000	Slightly Stony	No Rock Exposures	None	Low	Well drained, flat, lowland areas underlain by thick fluvial gravels over subdued till or marine terrain.	76916.5898	153833.1797	0.15	0.31%
19	9	5.0000	60.0000	WELL	0.5000	1.5000	Slightly Stony	Very Rocky	None	High	Thick silty sandy basal till along with till mantled bedrock slopes and bedrock knolls; at lower elevations the till may be mantled by a thin veneer of lag gravel.	235072.2526	2115650.2734	2.12	4.21%
20	11	9.0000	15.0000	WELL	1.5000	0.0000	Slightly Stony	No Rock Exposures	None	High	Thick till deposits consisting of gently to moderately sloping or subdued terrain in lowland areas; thin veneer of lag gravels may mantle the till at lower elevations.	76738.6911	844125.6016	0.84	1.68%
21	4	5.0000	20.0000	WELL	1.0000	1.5000	Slightly Stony	No Rock Exposures	None	High	thick till deposits in depressional areas and adjacent lower slopes; in places a thin veneer of fluvial gravels overlie the sloping till surface and thin marine silts infill depressions in the till surface.	296842.4004	1187369.6016	1.19	2.36%
22	5	5.0000	40.0000	WELL	0.5000	1.5000	Slightly Stony	Moderately Rocky	None	High	Areas of deep upland till which has infilled and subdued the hummocky terrain along broad bedrock ridges.	884895.0313	4424475.1563	4.42	8.79%
23	33	0.0000	5.0000	VPOOR	1.0000	0.0000	Stone Free	No Rock Exposures	Frequent	Low	Areas of accumulation of organic material including seepage depressions, like fens and swampy floodplains.	11689.6861	385759.6406	0.39	0.77%
24	7	0.0000	8.0000	POOR	0.5000	1.0000	Stone Free	No Rock Exposures	None	Moderate	fine-grained marine sediments consisting of stony clay which have infilled depressional areas in the pre-existing topography.	92848.8337	649941.8359	0.65	1.29%
25	5	8.0000	15.0000	IMP	1.0000	1.5000	Stone Free	No Rock Exposures	None	Moderate	Sandy and silty marine sediments overlying compact basal till at varying depths.	89170.2422	445851.2109	0.45	0.89%
26	4	0.0000	8.0000	MODWELL	1.0000	1.5000	Stone Free	No Rock Exposures	None	Moderate	Well sorted, massive, medium-grained marine sands deposited in coastal lowlands over compact basal till	95596.2012	382384.8047	0.38	0.76%
													Total Area of Island	50.3	100%

Vegetation Analysis - J. Block (1978)															
MAJORU NIT1	COUNT	Windthrow Hazard	Fire Hazard	Trafficability	Nature Interpretatio n Value	Visual Screening Potential	Sound Absorption Potential	Deer Browse Potential	Landscaping Potential	Landscape design	Vegetation Type	AVE_AREA	SUM_AREA	Area [km2]	% Area [of whole Island]
00	6											105945.9128	635675.4766	0.64	1.26%
01	22	M	L	L	H	L	L	L	L	H	Western red cedar - sedge spp. - common lady-fern vegetation type	14517.1147	319376.5234	0.32	0.63%
04	5	H	H	L	M	M	L	H	L	H	Coast Douglas-fir - oceanspray - early hair grass vegetation type	189874.9266	949374.6328	0.95	1.89%
05	48	M	L	M	M	L	M	L	H	H	Bigleaf maple - western sword fern - spiny wood fern vegetation type	273754.8612	13140233.3359	13.14	26.12%
08	8	L	M	H	M	H	H	H	H	H	Red alder - bigleaf maple - salmonberry vegetation type	37876.4609	303011.6875	0.30	0.60%
09	5	L	L	M	L	M	L	M	M	H	Western hemlock - salmonberry - common lady- fern - deer fern vegetation type	95215.4516	476077.2578	0.48	0.95%
10	1	M	L	M	L	M	L	M	M	M	Western hemlock - litter vegetation type	1229234.0000	1229234.0000	1.23	2.44%
2A	36	M	M	M	L	M	M	H	L	M	Coast Douglas-fir - salal vegetation type, western red- cedar - western bracken variation	886911.3735	31928809.4453	31.93	63.46%
2B	14	L	M	H	M	L	L	M	M	H	Coast Douglas-fir - salal vegetation type, shorepine - Pacific madrone - oceanspray variation	94854.3544	1327960.9609	1.33	2.64%
													Total Area of Island	50.3	100%

Development Permit Areas -OCP					
Development Permit	COUNT	AVE_AREA	SUM_AREA	Area [km2]	% Area [of whole Island]
DP1	1	3026156.7500	3026156.7500	3.03	10.93%
DP2	51	442862.6881	22585997.0938	22.59	81.58%
	32	64787.9888	2073215.6406	2.07	7.49%
				27.7	100%

Zoning Bylaw - Bowen Island Zoning Bylaw No. 36								
ZONE_TYPE	COUNT	Zone Key	Uses Permitted	Uses Conditions	AVE_AREA	SUM_AREA	Area [km2]	% Area [of whole Island]
Civic and Assembly Institutional	3	I-1	School use; Church use; Museum use; Community hall use; Social use; Public recreation use; Firehall use; Ambulance hall; Police station; Public library; Single family dwelling use; building/structures accessory to permitted use	No building or structure within 7.5m of a front lot line, or within 3m of any other lot line; No building/structure to exceed height of 9m; Lot coverage not to exceed 40%	2685.6927	8057.0781	0.01	0.02%
Community Water Supply Comprehensive-1	1	CWSC-1	Single family dwelling use; agricultural use; home occupation use; buidlings and structures accessory to permitted uses	No building/structure within 50m of high water mark of any stream, creek or lake, or within 7.5m of lot lines; No storage/repair of agricultural machinery within 50m of high water mark of stream, creek or lake; no structure to exceed 9m in height; lot co	149227.5000	149227.5000	0.15	0.30%
Community Water Supply Protection	3	CWSP	Single family dwelling use; agricultural use; home occupation use; buidlings and structures accessory to permitted uses	No building/structure within 50m of high water mark of any stream, creek or lake, or within 7.5m of lot lines; No storage/repair of agricultural machinery within 50m of high water mark of stream, creek or lake; no structure to exceed 9m in height; lot co	2601857.2995	7805571.8984	7.81	15.59%
Personal Care Institutional	1	I-2	Personal care use; One single family dwelling per lot; buildings/structures accessory to permitted uses	No building or structure within 7.5m of a front lot line, or within 3m of any other lot line; No building/structure to exceed height of 7.5m; Lot coverage not to exceed 40%	10299.2656	10299.2656	0.01	0.02%
Public and Recreational	6	PR	Parks and park reserves; Ecological reserves; Watershed reserves; Outdoor recreation; Agricultural use; buildings/structures accessory to permitted uses	No structure within 7.5m of any lot line; no structure greater than 9m in height;	3351942.0625	20111652.3750	20.11	40.16%
Rural	26	R	Single family dwelling use; agricultural use; home occupation use; extended home occupation use on lots greater than 2 hectares; buidlings and structures accessory to permitted uses	No structure within 7.5m of any lot line; no structure greater than 9m in height; lot coverage not to exceed 10%	602642.8813	15668714.9141	15.67	31.29%
Rural Comprehensive-1	2	RC-1	Single family dwelling use; agricultural use; home occupation use; extended home occupation use on lots greater than 2 hectares; buidlings and structures accessory to permitted uses	No structure within 7.5m of any lot line; no structure greater than 9m in height; lot coverage not to exceed 10%	114679.1289	229358.2578	0.23	0.46%
Rural Industrial	2	M-2	Fuel storage and wholesale distribution use; equipment storage, maintenance and repair; building material storage and sales; single family dwelling use; buildings/structures accessory to permitted uses; recycling depot	Lots shall be minimum of 0.8 hectares in size; No building or structure within 7.5m of any lot line; No building/structure to exceed height of 9m; Lot coverage not to exceed 33%	7651.8672	15303.7344	0.02	0.03%
Senior Citizen Residential	1	SCR	Senior citizen housing at density not to exceed 10 units per 4 hectare; personal care use; buildings and structures accessory to permitted uses	No building or structure within 7.5m of a front lot line, or within 3m of any other lot line; No building/structure to exceed height of 8m; Lot coverage not to exceed 25%	8506.9375	8506.9375	0.01	0.02%
Settlement Residential	13	SR	Single family dwelling use; agricultural use; home occupation use; buidlings and structures accessory to permitted uses; agricultural use on lots greater than 1 hectare	No building/structure within 7.5m of a front, rear or exterior side lot line, or 3m of an interior lot line; keeping of livestock or poultry not permitted for other than personal use; nu structure to exceed a height of 7.5m; lot coverage not to exceed 33	349776.6923	4547097.0000	4.55	9.08%
Snug Cove area - Data Not Available	1				1528855.5000	1528855.5000	1.53	3.05%
							50.1	100%
NOTE: The Spatial Data contain significant Errors, as Snug Cove, Bowen Bay, Cates Hill and its surrounding area is not correctly digitized.								

NOTE: The Spatial Data contain significant Errors, as Snug Cove, Bowen Bay, Cates Hill and its surrounding area is not correctly digitized.

Bowen Island Areas	
	Area [km2]
Total Area of Bowen Island Municipality (inc. small islands around)	50.32
Bowen Island only (no small islands included)	50.08

streams_LengthSum

Spatial Analysis Data.xls

Streams - BIFWMS Water Survey, SHIM Project			
	COUNT	SUM_LENGTH [m]	Total Length [km]
Streams	436	117863.1412	118
Streams lies within >25 degree Slope Area	135	77852.0850	78
% Streams lies within >25 degree Slope Area			66%

Wetland2_AreaStat

Spatial Analysis Data.xls

Wetland Areas	
	Area [km2]
Total Wetland Areas Digitized (in Wetland theme only - 11 wetlands)	0.69
Average size of 11 wetlands	0.063

Appendix 12

Water Licence Data Analysis: Summary Tables

This appendix contains 3 tables of water licence data calculated by Bowen Island Sustainability Project. Data analysis was performed on the water licence database obtained from BC Ministry of Environment, Land and Parks. The detail metadata of data is included in the first page of this appendix.

5 pages

Water Licence Query Database - Data obtained from BC Ministry of Environment, Lands and Parks.

Water Licence Query and help available online @ <http://www.elp.gov.bc.ca:8000/wat/wrs/query/licences/help/all.htm>

Obtained by: Julian Dunster (BIFWMS) -1999

The data was collected based on a water licence applicant's proposal, a licence will issue authorizing a maximum quantity and use. From time to time, the water use will be monitored and reviewed by Water Management field staff to ensure compliance with the terms and conditions of the licence.

Modifications:

BIFWMS (1999) - organized for large format printout.

BISP (2000) - information was divided into two tables; water licensee information and water pod information for more clarity. Also, all pod quantity allowable was calculated (unit conversion) into Gallons per day.

Unit used in this database		Conversion factor used to multiply to obtain the quantity in Gallon per Day
AF	acre-feet per annum	325900/365
CS	Cubic feet per second	646317
GD	Gallons per day	1
GY	gallons per year	1/365
TF	Total Flow - a unit shown against non-consumptive purposes for which the total flow of the source is authorized to pass through the licensed works (eg. Ditch, pond, fish ladder etc.)	NA

For more information contact:

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Water Licence Information Systems

Water Management Branch

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mailto: maureen.moor@gems7.gov.bc.ca

Water Licence Query Database - Data obtained from MELP(1999)				
Purpose (Use of water authorized by licence)	# of Licence	Average POD quantity allowable [Gallons per day]	Total POD quantity allowable for the specific purpose [gallons per day]	% quantity used for the specific purpose
CONSERV.-CONSTRUCT.WORKS	3	323159	969476	22.9%
CONSERV.-USE OF WATER	1	646317	646317	15.3%
DOMESTIC	240	1803	432700	10.2%
ENTERPRISE	1	500	500	0.01%
IRRIGATION	10	1841	18412	0.4%
LAND IMPROVE	9	1444	13000	0.3%
POWER-RESIDENTIAL	1	646317	646317	15.3%
STOCKWATERING	4	313	1250	0.03%
STORAGE	111	7795	865226	20.5%
WATERWORKS (OTHER)	6	38000	228000	5.4%
WATERWORKS LOCAL AUTH	85	4790	407166	9.6%
Not defined	1			
Total # of Water licence on island	472			
		Total POD quantity allowed on island	4228364	100.0%

Water Licence Query Database - Data obtained from MELP(1999)				
LICENSEE	# of Licence	Average POD quantity allowable over the licences [Gallons per day]	Total POD quantity allowable for the specific licencee [gallons per day]	% quantity allowable
352745 BC LTD	1	17000	17000	0.40%
418275 BC LTD	1	500	500	0.01%
ADAMS BARRY F	4	250	1000	0.02%
ADAMS MARY & LILLIAN	1	500	500	0.01%
ADAMS ROBERT B	1	500	500	0.01%
ALLEN SARAH E	1	500	500	0.01%
ARNOTT RANDY T	1	500	500	0.01%
BAKKER JAN B J C & JACQUELINE M M I	2	500	1000	0.02%
BALLY MARCEL	1	500	500	0.01%
BARRON JOSE C & AYLESTOCK FRANCOIS	1	500	500	0.01%
BC CAMPING GUILD FOR CHRISTIAN SCIENTIST	2	3500	7000	0.17%
BEACH MARY & ALAN	1	500	500	0.01%
BEATY ROSS J & PATRICIA L	1	750	750	0.02%
BLAKE IAN S & VIVIAN M	2	450	900	0.02%
BLUE WATER PARK IMPROVEMENT DISTRICT	2	6000	12000	0.28%
BOLTON ERNEST R	1	1000	1000	0.02%
BOWEN BAY HOLDINGS LTD	1	6000	6000	0.14%
BOWEN BAY IMPROVEMENT DISTRICT	2	14255	28509	0.67%
BOWEN ISLAND FIRE PROTECTION DISTRICT	1	500	500	0.01%
BRADSHAW PETER	1	500	500	0.01%
BRINSON ROBERT K & MERYDIE	4	250	1000	0.02%
BUCHANAN ARCHIBALD M	4	500	2000	0.05%
BURGESS ANDREW G	2	1640	3279	0.08%
BURKE STANLEY ESTATE OF	2	216966	433932	10.26%
BURROWS RONALD & CYNTHIA	1	500	500	0.01%
CAMERON GWENETH	1	500	500	0.01%
CANNEM GORDON E & KAREN F	2	324	648	0.02%
CATTON DAVID S & MARGARET J	2	500	1000	0.02%
CHRISTY DALE ELIZABETH	1	500	500	0.01%
CHURCHLAND LESLIE M	4	438	1750	0.04%
CLAUS BERNHARD R	2	375	750	0.02%
COWAN POINT HOLDINGS LTD	5	114152	570759	13.50%
COWPER KAREN L	3	500	1500	0.04%
CRESWICK BRIAN EDWARD & PAMELA	1	500	500	0.01%
CROWLEY CHRISTOPHER F	3	333	1000	0.02%
CUMMING M I & JOHNSTONE M J & MCGEER I P	25	995	24876	0.59%
CURRIE JAMES & MARY R	1	500	500	0.01%
DALLAS D GEORGE	1	2500	2500	0.06%
DALLAS GEORGE D	4	16250	65000	1.54%
DAVIDSON IAN	1	250	250	0.01%
DAVIES DOROTHY L	4	1527	6108	0.14%
DAVIES NANCY	1	500	500	0.01%
DE LISLE SARA C B	1	500	500	0.01%
DIPIETRANTONIO ROMEO & GAIL	1	500	500	0.01%
DIXON ELSPEETH D	1	500	500	0.01%
DOMMEL HERMANN W & IRMGARD I	1	500	500	0.01%
DORMAN ELLEN	1	500	500	0.01%
DORMAN JAMES D	1	500	500	0.01%
DORMAN PERCY C ESTATE OF	1	500	500	0.01%
DOUGLAS DEBORAH M	2	500	1000	0.02%
DOWREY JEAN M	1	1000	1000	0.02%
EAGLE CLIFF IMPROVEMENT DISTRICT	1	30000	30000	0.71%
EAGLE TREE HOLDINGS OWNERS ASSOCIATION	2	1750	3500	0.08%
EASTWOOD PETER B & RUBY R	2	500	1000	0.02%
ELLIS PETER	1	500	500	0.01%
ENGLISH JOHN G & DIANA J	1	500	500	0.01%
FAIRWEATHER HOLDINGS LTD	1	1000	1000	0.02%
FARGHER JEFFRAY	2	768	1536	0.04%
FERGUSON GARY W & MARTHA L	1	500	500	0.01%
FERNIE CAROLE R M	2	648	1296	0.03%
FERNSTROM GORAN	1	500	500	0.01%
FIR STREET HOLDING COMPANY LTD	1	500	500	0.01%
FISHERIES & OCEANS CANADA	4	403948	1615793	38.21%
FLEMING RALPH J	1	500	500	0.01%
FORD ROBERT P	1	500	500	0.01%
FORSYTH DEBORAH L	1	500	500	0.01%
FRINTON PETER A J	1	500	500	0.01%
FRULLING MARGARET M	1	500	500	0.01%
GALLANDER GAIL J	1	500	500	0.01%
GARDINER ELIZABETH A	1	500	500	0.01%
GOTH BRIAN RICHARD & LINDA DIANE	1	500	500	0.01%
GOUMENIOUK ALEXANDER	1	1000	1000	0.02%
GOURLAY ANDREW W & MARY E	1	500	500	0.01%
GREATER VANCOUVER REG DIST - ELEC. AREAS	5	99858	499291	11.81%
GREATER VANCOUVER REG DIST - PARKS DEPT	1	0	0	0.00%
GRESOE PAUL A & AUDREY L	1	500	500	0.01%
GRIFFIN SUSAN J	2	500	1000	0.02%
GRITZNER STEGRIED & JOLYNE	1	500	500	0.01%
HALISCHUK LINDA	1	500	500	0.01%
HARDING LLOYD & DALE	1	1000	1000	0.02%
HEAL DAVID G & SUSAN E	1	500	500	0.01%
HENDERSON JENNIFER H & MICHAEL R	1	500	500	0.01%
HILL WILLIAM M	1	500	500	0.01%
HIRSCH EDITH I	4	250	1000	0.02%
HONEYMOON CREEK WUC	1	1777	1777	0.04%
HONZIK GEORGINA	1	500	500	0.01%
HOOD POINT IMPROVEMENT DISTRICT	157	597	93714	2.22%
HUNTINGFORD KEN & NANCY	1	500	500	0.01%

INDRA HENRY L & SHIRLEY A	1	300	300	0.01%
ISLAND GARDEN ESTATES LTD	1	500	500	0.01%
JACQUET FRANCIS M	1	500	500	0.01%
JAMIESON STUART M	1	500	500	0.01%
JOHNSTONE BRUCE T C	6	697	4179	0.10%
JOHNSTONE MARY J	1	1000	1000	0.02%
KEIL DAVID R M & COLLEEN G	1	1000	1000	0.02%
LAGEMAAT ANTHONY J & NICOLE P	2	375	750	0.02%
LANZL TONY	1	250	250	0.01%
LECKY JOHN C	1	0	0	0.00%
LEONARD NANCY L	1	500	500	0.01%
LIGHTHEART ROBERT & TERRY	1	500	500	0.01%
M MEAL CO LTD	1	1000	1000	0.02%
MAGEE GEORGE R & MABLE D	1	500	500	0.01%
MAGEE GEORGE R W	1	500	500	0.01%
MAGEE WESLEY A	1	500	500	0.01%
MAIDMENT ROGER D	1	500	500	0.01%
MALKIN PETER & DAVID & JAMES & WILLIAM	1	500	500	0.01%
MALKIN URSULA E	3	1000	3000	0.07%
MATHER EARL E	1	500	500	0.01%
MAY MELANIE J	1	500	500	0.01%
MCINTOSH NICOLETTE E	1	1500	1500	0.04%
MCINTYRE IONE E	1	500	500	0.01%
MCINTYRE IONE E & JAMIESON JEAN I	1	500	500	0.01%
MCKENZIE HEATHER J	1	500	500	0.01%
MCLAREN LOIS A	4	500	2000	0.05%
MCLEOD JOHN W & ELAINE M	1	500	500	0.01%
MCNEILL ISABELLE F	1	500	500	0.01%
MEAKIN DENYS & GILLIAN	1	500	500	0.01%
MEAL MICHAEL & DIANE	1	500	500	0.01%
MITCHELL MIEKE E	1	500	500	0.01%
MITTS ROGER A & PATRICIA M	2	750	1500	0.04%
MOORCROFT D JOHN	2	500	1000	0.02%
MOORE JOHN J & MARION I	1	500	500	0.01%
MORGAN RICHARD D	1	500	500	0.01%
NEIMERS ANDRIS & INARA	1	500	500	0.01%
OPENSHAW WILLIAM A & RUTH I	4	500	2000	0.05%
PARKER JOHN E	1	500	500	0.01%
PARKES WILLIAM M	1	250	250	0.01%
PATRICK HARRY R	1	500	500	0.01%
PATTERSON ROSS J & CATHERINE H	1	500	500	0.01%
PEARL TAMARA	1	250	250	0.01%
PEDERSEN THOMAS	4	225	900	0.02%
PERREAULT GREGORY ET AL	2	2000	4000	0.09%
PETRIE DEREK & DARLENE	1	500	500	0.01%
PETTY JAMES R	2	450	900	0.02%
PRETIOUS HERBERT S & ROBIN R	1	500	500	0.01%
PRETIOUS WILLIAM & ROBIN	1	250	250	0.01%
REID NEIL B & JOAN	1	1000	1000	0.02%
RILEY DAWN M	1	1000	1000	0.02%
RILEY JOSEPHINE A	1	4464	4464	0.11%
ROBINSON DOUGLAS F & PRATCHETT MARINA A	6	333	2000	0.05%
ROCKSHORE INVESTMENTS LTD	2	384	768	0.02%
ROGERS GWYNNE	4	768	3072	0.07%
ROSE KEVIN B & KATRINA	1	500	500	0.01%
ROUECHE JACOB F & ANNE A	1	1500	1500	0.04%
RÜLOFF LAURA M	4	634	2536	0.06%
SABATHIL SIGURD J	4	2000	8000	0.19%
SANDERSON W SAMANTHA	1	500	500	0.01%
SEED LISA J	8	250	2000	0.05%
SHAW JAMES K	2	750	1500	0.04%
SHAW KENNETH W	1	500	500	0.01%
SHAW MARGARET P	1	500	500	0.01%
SHERLOCK ERIC	1	500	500	0.01%
SIMMS RICHARD J & LINA P	1	500	500	0.01%
SIMS DOUGLAS A & MARYLYN	2	250	500	0.01%
SMITH DONALD S & GAYLE E	2	500	1000	0.02%
SMITH THOMAS E & DENISE E	2	500	1000	0.02%
SMITH WILLIAM B	2	323409	646817	15.30%
SNUG COVE ENTERPRISES LTD	1	500	500	0.01%
STORY MARGARET I	1	1000	1000	0.02%
STRATA PLAN VR 1300	1	500	500	0.01%
STRATA PLAN VR 704 OWNERS OF	3	6571	19714	0.47%
SWAN MARTIN A	1	500	500	0.01%
TENNANT JOHN M & JOAN V	7	492	3446	0.08%
TOLSON KATHRINE D	2	250	500	0.01%
TUNSTALL BAY WATERWORKS LTD	1	6000	6000	0.14%
TURNER LAWRENCE J	1	400	400	0.01%
TWIGGER JEAN & EVANS GUDRUN	4	250	1000	0.02%
VAN STRIEN CLEMENT & JOHANNA G	1	500	500	0.01%
VANKERVEL REIDUN M	1	500	500	0.01%
WALKER BRENT D & CAROLINE H	2	400	800	0.02%
WALKER JAMES M & DOREEN A	1	500	500	0.01%
WALSH DAVID G	1	500	500	0.01%
WELSH GEORGE F & JANET T	2	500	1000	0.02%
WHITTALL JOHN C & ANNE E	1	400	400	0.01%
WHYTE ARTHUR D & EMILIA Y	1	500	500	0.01%
WICKS VINCENT R & LORI L	1	500	500	0.01%
WOLFE GLENN	1	500	500	0.01%
Total amount of water allowable [GD]			4228364	100.0%

Water Licence Query Database - Data obtained from MELP(1999)				
Source Gazetted	# of Licence	Average POD quantity allowable over the licences [Gallons per day]	Total POD quantity allowable for the specific source [gallons per day]	% quantity allowable
Anas Spring	1	500	500	0.01%
Billington Spring	1	500	500	0.01%
Blue Brook	9	500	4500	0.11%
Bluff Creek	9	367	3300	0.08%
Bolton Brook	3	833	2500	0.06%
Bonnie Spring	1	500	500	0.01%
Bowen Brook	10	828	8279	0.20%
Brooton Creek	4	375	1500	0.04%
Burgoyne Spring	1	500	500	0.01%
Byers Creek	1	2000	2000	0.05%
Carkner Brook	1	30000	30000	0.71%
Chukar Creek	1	500	500	0.01%
Cliffe Brook	1	500	500	0.01%
Collins Spring	1	500	500	0.01%
Conolly Creek	1	500	500	0.01%
Crown Marsh	2	216966	433932	10.26%
Davies Creek	2	500	1000	0.02%
Dodson Creek	1	500	500	0.01%
Donaghy Brook	3	367	1100	0.03%
Dorman Brook	10	500	5000	0.12%
Dorothy Creek	1	500	500	0.01%
Eddy Creek	3	3583	10750	0.25%
Emerald Creek	1	2500	2500	0.06%
Emma Creek	1	500	500	0.01%
Explosives Creek	3	2333	7000	0.17%
Ferncliff Spring	1	500	500	0.01%
Grafton Creek	19	737	14000	0.33%
Grafton Lake	7	71475	500327	11.83%
Guild Creek	3	2500	7500	0.18%
Harding Brook	3	500	1500	0.04%
Henderson Brook	2	500	1000	0.02%
Honeymoon Creek	184	435	80069	1.89%
Honeymoon Lake	23	1377	31666	0.75%
Irene Spring	5	500	2500	0.06%
Josephine Creek	33	7805	257559	6.09%
Josephine Lake	17	21758	369881	8.75%
Kendon Creek	4	4625	18500	0.44%
Kill Creek	1	500	500	0.01%
Killarney Creek	4	242369	969476	22.93%
Kindy Creek	1	1000	1000	0.02%
Krutch Creek	1	500	500	0.01%
Lee Creek	7	1071	7500	0.18%
Lister Brook	4	500	2000	0.05%
Magee Spring	3	500	1500	0.04%
Malkin Creek	2	14255	28509	0.67%
Mallard Creek	1	0	0	0.00%
Margaret Spring	1	1500	1500	0.04%
Morrison Creek	3	215939	647817	15.32%
Napolean Creek	1	1000	1000	0.02%
Opal Spring	9	500	4500	0.11%
Optimist Creek	7	9500	66500	1.57%
Parkinson Spring	3	667	2000	0.05%
Proudlock Brook	2	500	1000	0.02%
Robb Creek	1	500	500	0.01%
Scarborough Creek	7	500	3500	0.08%
September Spring	1	500	500	0.01%
Sigurd Springs	3	2500	7500	0.18%
Spooner Brook	3	300	900	0.02%
Stow Spring	1	6000	6000	0.14%
Taylor Spring	1	500	500	0.01%
Teal Creek	2	2536	5072	0.12%
Tennant Spring	4	487	1946	0.05%
Terminal Creek	17	38475	654067	15.47%
Thomas Creek	2	500	1000	0.02%
Tunstall Brook	1	750	750	0.02%
Warwick Creek	2	750	1500	0.04%
Windjammer Creek	1	500	500	0.01%
ZZ Creek (67454)	1	500	500	0.01%
ZZ Spring (68617)	1	4464	4464	0.11%
Total amount of water allowable [GD]			4228364	100%