http://members.tripod.com/oliver_kilian/papers/datamgmt/dataplan.htm

An Information Management Plan for the Thousand Islands Ecosystem

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Table of Contents

"A Place For Everything, and Everything In Its Place!"

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1.0 INTRODUCTION

In 1995, during the ecosystem conservation planning process, St. Lawrence Islands National Park's (SLINP's) database was identified as an issue that would require management attention. It was decided that an information management plan would be developed to direct SLINP in achieving the information management goals identified in the ecosystem conservation plan (See pages 4-10 thru 4-11 in the plan).

1.1 Ecosystem Management Planning

The process of ecosystem management planning was borne out of the recognition that individual protected areas, such national parks, are limited spatially in their capacity to meet their protection mandates. Areas abutting park properties, and areas further on, are not subject to the same protection mandates. The application of ecosystem concepts is accompanied by a more holistic approach to the protection of natural and cultural landscapes, and implicitly recognizes that a given protected area is part of a larger spatial community. Thus, SLINP is viewed as representing a core protected area that can meet its

protection goals better when some elements of conservation are applied to surrounding areas as well. This has led to an attempt to bring outside agencies and landowners into the conservation fold under the auspices of fostering stewardship, developing contiguous landscape networks and corridors, forging partnerships, and creating new protection vehicles.

1.2 Information Management Planning

In and of itself, information management planning at SLINP shares the same principles of data management as GIS. That is, it essentially attempts to address the main activities that data are subject to: acquisition, storage/filing, retrieval, manipulation, and dissemination. The management of information, and planning for its long-term care and future uses, requires one to take additional issues into consideration: issues such as data integrity, safe storage/archiving, storage media, obsolescence, access, usefulness, and formats. This plan will address all of these activities and issues. It will also provide a complete management system template (software solutions with examples, guidelines, protocols, and metadata) so that the gargantuan task of integrating SLINP's large and diverse collection of information media into a comprehensive "superdatabase" can begin (without much preparation) as soon as time and resources permit.

1.3 Current Data Management

In an effort to provide a measure of context to this plan, the data management activities of other entities within the federal parks system will be related briefly. It should be stressed, however, that while other parks and their supporting regional departments have also been wrestling with the development of more comprehensive data management strategies, the emphasis in this plan has been placed on meeting the more specific and unique needs of SLINP's own ecosystem information resources.

1.3.1 Parks Canada & Ontario Region

As part of the ecosystem management planning process, numerous parks and sites across the national parks system have been developing strategies for managing their information databases. The superordinate goal is essentially the same: to develop a comprehensive set of standards that will facilitate the gathering, storage, retrieval, analysis, and dissemination of the vast amounts of data that have accumulated at various parks over the years. Similarly, information management professionals have been working to develop a national standard for park databases. This would permit comparative analyses of some common types of data collected at more than one site (eg. species populations). One such proposed standard has been developed at Cornwall using Microsoft Access.

While a national standard is admittedly necessary, it may not be the solution for harmonizing most existing databases at various parks/sites across the system. These databases have been built under various operating system formats, use differing software (eg. Lotus, dBASE), and employ a diverse array of methodologies for collection, tabulation, and analysis. This variegated mosaic of databases is not merely the result of

staff expertise (different people with different ideas) or available hardware/software resources at a given park at a given time. Methodologies vary because of biogeographical differences across the nation and because individual research projects often have specific goals or objectives requiring customized approaches to data-gathering. The value of an existing database for any given project may well be lost or diminished if it is modified to conform to some overriding national standard.

A set of national standards will doubtless help park ecologists identify large-scale trends and shifts in ecological processes. Once such a protocol has been finalized and adopted, new research projects should endeavour to conform to its stipulations.

1.3.2 St. Lawrence Islands National Park

SLINP is one of the oldest national parks in the system and has consequently had more time to amass a rich collection of information about the 1000 Islands ecosystem. In addition to staff reports going back several decades, there are a number of species' monitoring studies who's databases represent years of work. SLINP's information files also include texts, vertical files, inhouse reports, photos, maps, and videos (See complete list of data types in Table 1). Like other parks, SLINP's collection is unique and local needs in terms of information management will have to be addressed before any attempts are made to incorporate these data into any national database structure.

1.4 Evolving Trends

In any planning exercise it is useful to understand the larger context within which the plan will operate. There are a number of current trends in technology and management that have direct implications for information management planning at St. Lawrence Islands National Park.

1.4.1 Analog vs. Digital

As computer technology has evolved over the past decade, so has the potential for digital applications. Many traditional analog media are now being supplanted by digital counterparts (eg. phono album vs. compact disk (CD), videotape vs. laserdisc, emulsion film vs. digital photos, audiotape vs. digital audiotape (DAT), radio and television broadcasting). In some instances, newer, more efficient digital storage media are already replacing earlier products (eg. Laserdisc vs. digital versatile/video disk (DVD)). This trend is not surprising given some the attractive advantages that digital technology offers over its analogue counterparts:

- *a significantly slower decay rate (all analogue media deteriorate with use)*
- *perfect reproduction (an analogue copy of an analogue master is always inferior)*
- *rapid and inexpensive dissemination (analogue files usually require physical storage and transportation)*

In the coming years, digital media will doubtless continue to proliferate and overshadow its analogue predecessors. The technology, particularly within the computer market, is advancing at a pace so exponential that even annual budgets and upgrade plans risk being outdated. Many aspects of SLINP's existing information management have relied on analogue approaches to sorting and storing data and manual searching and retrieval. An example of SLINP incorporating digital technology was the development of the Pro-cite index (to facilitate electronic searches) for its library. If SLINP continues to embrace such digital applications, it will soon be using computers for sorting, storing, searching, and retrieving all of its data.

It should be noted that digitally stored data is not infallible, depending on the storage medium. For example, digital data stored on magnetic media (eg. DAT, 3.5" floppy disks) is sensitive to environmental conditions like moisture, temperature, and magnetic fields that can destroy it. On the other hand, magnetic media tends to allow itself to be rewritten. Media using some type of non-oxidizing metal like aluminum or gold (eg. CDs, laserdiscs, DVD) are not so vulnerable and have also tended to offer greater storage capacity, albeit in read-only format. The introduction of recordable CDs (CD-R) and, even better, re-recordable CDs (CD-RR) has given us the best of both worlds.

1.4.2 Internet vs. Intranet

The capacity to link a number of stand-alone computers into an interconnected whole has given rise to the computer network, an incomparable tool for the proliferation and exchange of data files. The largest of these is undoubtedly the World Wide Web on the Internet: a global computer network linked mainly by the world's telephone lines. Over the past couple of years, the growth of the Internet has been exponential. This growth is expected to continue well into the next decade. Alternative transmission technologies (cable TV lines, fibre optic cable, satellites) are being applied to conserve the bandwidth of the presently overburdened phone lines. The current federal government supports the building of the "information highway".

Networks also exist in a number of smaller configurations (LANs, WANs, etc...), each of which can be referred to as an intranet (a limited or internal network). SLINP presently has two intranets: the general Parks Canada network whose server is administered from the main office, and a FASTLINE network that is administered from the GIS office.

An intranet can have many of the advantages of the Internet (including ubiquitous accessibility, browsing, searches, and hyperlinks) without the expense of an Internet Service Provider (ISP) account. Intranets also allow for virtually complete content control and virtually guaranteed access. Any intranet file written in Hypertext Markup Language (HTML) will behave as a web page whose links point to other files on the network server's hard drive instead of other web sites.

The HTML language is currently at Version 4.0 and is still the most popular file format for net-based documents. Its main disadvantage is that the appearance of HTML files will vary depending on the browser being used and on how this browser is configured. To

address these inconsistencies, Adobe Systems Inc. has developed the Portable Document Format (PDF) which makes files look the same regardless of which browser or computer is used to view them (See http://www.adobe.com/prodindex/acrobat/prodinfo.html). Adobe has developed a PDF reader (currently Acrobat Reader 3.01), that is available for free. However, Adobe charges upwards of $300 for the Acrobat 3 editing program needed to create PDF documents. On the other hand there are many HTML editors that are freely available and often come bundled with existing versions of browsers (eg. Composer in Netscape) and word processors (eg. Wordperfect 8). Given these factors, SLINP should monitor the usage and proliferation of the PDF format over the next 3-5 years, but at this time use the following standards for creating its FASTLINE IntraNET files:

1. **Browser** - Netscape Navigator (Version 4 or greater), uniformly configured among computers with access to the FASTLINE IntraNET. The FASTLINE IntraNET User Guide will contain information on configuration and use. The preference for Netscape over Microsoft's browser, Internet Explorer (currently IE4), is purely a bias on the author's part. Netscape has been chosen here because both SLINP and the author are currently using some version of Navigator. The software package accompanying this plan includes a downloaded executable for installing a stand-alone version (browser only) of Netscape Communicator 4. While Netscape was charging a licencing fee for this software at the start of this project, it has since made it freeware in an attempt to recoup marketshare from Microsoft.
2. **File format** - HTML(Version 3 or greater), using the *.htm (or *.html) extension. Note that HTML has recently been proposed by Microsoft to be a new universal file format standard, much like ASCII has been to date (El-Maraghi, 1998).

1.4.3 Monitoring vs. Ground-truthing

Most of SLINP's biodiversity data has traditionally been collected using labour-intensive field approaches (radio telemetry, plot surveys, etc...). These data would then be stored in cardfiles or DOS-based data storage programs (eg. dbase). With the park's increasing reliance of computer-based applications (mainly GIS) for resource management initiatives, there have also developed opportunities to take advantage of larger-scale monitoring technologies. The use of satellite imagery and associated spectral analyses has somewhat supplanted the traditional field approaches. Excursions into the field are taken to confirm data gleaned from satellite imagery, as opposed to gleaning the information first-hand. This process, ground-truthing, will likely occur with greater frequency in the future because of its efficiency and because of shrinking finances to hire the field staff that the more traditional monitoring approaches require. The efficacy of ground-truthing techniques should, however, not be assumed. The techniques, like those for monitoring, must be comprehensive and logical enough to yield results whose quality is not compromised and the field experience of those engaged in any ground-truthing exercise must still be extensive.

1.4.4 Staffing vs. Contracting

The last couple of years have presented SLINP (and Parks Canada as a whole) with new challenges to adequately meet its mandate in the face of the federal government's downsizing initiatives. Work that was once done by staff (who are now gone or have been replaced by student labour) is now either discontinued or done through service contracts. While this may be fiscally prudent, even necessary if certain work is to get done at all, it presents its own difficulties. Long-term projects may invariably suffer from inconsistent human resource allocations (contracts are always short-term) and, consequently, uneven data quality. The challenge will be to develop detailed protocols and terms of reference with feedback loops that absolutely guarantee consistent approaches to data collection.

1.5 Emerging Technologies

1.5.1 DVD-ROM and DVD-R

A new data storage medium similar to the CD became available to consumers within the last year. The digital versatile disk (DVD) promises all the conveniences of CD data storage technology, but with a storage capacity that exceeds CDs more than twenty-fold. Following closely behind the release of DVDs (mostly movies) has been the marketing of recordable and re-recordable DVDs. They essentially offer the same reliability and versatility as CDs, though it would be prudent to wait another year or more before embracing this exciting new technology. The technology is still in its infancy, and competing standards make its reliability tenuous. Pricing of both disks and players is also still somewhat high. It is, however, the opinion of this writer that this data storage medium will be the best choice for SLINP to use for its archiving, backup, and dissemination of digital data. With a maximum capacity of over 17 GB, the DVD is by far the leading current contender for replacing CDs as a mass storage medium for data. It has been predicted that DVD drives will outsell CD-ROM drives in 1998.

1.5.2 Javascript

The Java programming language is a product of Sun Microsystems Inc. and has been the topic of much heated discussion in the computer programming subculture. It is viewed as a potential usurper of existing programming languages (including BASIC and C++, the languages of the ubiquitous Windows and DOS). It's main strength lies in its platform independence, meaning that a program written in Java will run on any computer, whether it be Apple, Unix, or "Wintel" (Intel computer running Windows). In essence, it makes a moot point of software compatibility issues.

Current applications of Java are most commonly found on the Internet in the form of small applications (called 'applets') that are downloaded from web sites. Essentially an applet is not only program data, but also the program to run the data. As recently as 1997, Corel Corp. was considering releasing Java versions of its WordPerfect and Draw programs, but this plan has since been shelved more likely because of shifting financial priorities than any problems with the programming language per se. During the course of

researching this management plan, Sun Microsystems applied to the International Standards Organization for approval of its Java language and received it in principal.

SLINP would benefit from staying abreast of both developments in the Java language field and in applications, such as Netscape Navigator and Corel Barista, that support it. While it is, at this time, by no means inevitable that Java will render traditional languages obsolete, its evolution may have significant ramifications for SLINP's IntraNET management in the future (such as software and hardware choices).

1.5.3 Digital Photography

It has been about six years since Kodak introduced its Photo CD technology, giving consumers the option of having their photo film developed digitally onto a CD-ROM. The Kodak Photo CD format is now recognized and accepted around the world as a bona fide graphics file format (graphics programs such as Corel PhotoPaint will import and export files in this format). The process, however, still required the photos to be taken with standard film and developed using traditional photo processing technologies. The introduction of digital cameras for the consumer market has changed this significantly.

Numerous makes and brands of digital camera are now on the market, albeit still very expensive ($700-$3500) compared to average film cameras ($200+). No doubt the price of digital camera equipment, as with most technology goods, will fall significantly over the next 3-5 years. The principle of their use and operation will, however, remain basically the same. Rather than requiring film, a digital camera uses RAM to store each picture as a digital file. Once the RAM has reached capacity (more RAM doubtless translates to a higher priced unit), an adapter permits the photo files to be uploaded to a computer for viewing and/or manipulation. Thus emptied, the camera is ready to take more pictures.

While the initial expense is somewhat prohibitive, a digital camera eliminates the costs of buying and developing film. On the other hand, unless the RAM is modular and can be replaced, a 'full' camera is useless until its contents can be downloaded to another system. SLINP should certainly be investigating this technology, and weighing the costs and benefits in relation to the camera's intended use. Intended uses might include photo-monitoring (eg. beach bean), warden investigations (eg. evidence), and standard photos of sites, facilities, and resources (eg. slide collection). Desirable features would include a high colour capacity (eg. 32-bit), high resolution (eg. 1200x1200dpi), and high RAM (as with computers, the more the better).

One final note: photo files that have been loaded onto a hard drive become the de facto "negatives" and must be backed up onto another medium. If they are not backed up, the master copies will be lost in the event of a hard drive crash as surely as a fire would destroy traditional 35mm negatives.

1.5.4 Other New Technologies

While it is virtually impossible to keep abreast of all the developments in computer technology, a number of emerging imminent technologies will have an impact on the immediate future of computers:

1. **USB** - the universal serial bus, now installed on most new PCs, will (apparently) facilitate the automatic detection and configuration of peripheral devices (when added or removed). It is meant to support a greater bandwidth (for multimedia programs and devices) than existing buses.
2. **IEEE 1394** (aka FireWire) - designed to address the same issues as the USB, mainly bandwidth limitations, IEEE 1394 is actually even more advanced and will let PCs connect with consumer electronics that use digitized imagery (camcorders, cameras, DVD).
3. **AGP** - the accelerated graphics port, found on Pentium II machines, is a vast improvement in bus architecture over the current PCI standard. PCI buses can transfer 130MB per second; AGP can move 500MB per second.
4. **Windows 98 and NT 5** - these are the impending next generations of Microsoft's flagship product. The arrival of these operating systems is a virtual certainty, though Microsoft's current legal problems (from bundling its internet browser with Windows) may delay the release of Win98 (and change its appearance). Both packages will doubtless offer increased support for various devices (eg. USB, MMX, AGP) and standards that have come on the market since the previous incarnations of these products.
5. **Copper** - not new in and of itself, but just last year IBM announced it had developed a processor based on copper (current CPUs use aluminum). In large processors (eg. network servers), where electricity must travel further, copper in CPUs is expected to demonstrate significant speed increases since it conducts electricity faster than aluminum.
6. **Merced** - a next-generation processor co-developed by Intel and Hewlett-Packard, slated for release in 1999. Starting speeds are estimated to be around 900 MHz. A second version, likely not to be seen until 2001, will be closer to 1800 MHz (1.8 Gigahertz). It was designed primarily with high-end servers in mind.
7. **Linux** - similar to Java in that it is a cross-platform programming technology borne out of the rapidly evolving world of the Internet and, in the Internet spirit, both the operating system and any most applications are free. Linux will likely become more popular, and applications more common, as the Internet moves into the mainstream of society.
8. **Fibre-optics** - like copper, it is not a new technology, but as Canada builds its Information Superhighway, it will become a more commonly applied transmission medium. Increased deployment may bring down the current high price of fibre-optic cabling, making it a more financially attractive alternative to current LAN cabling.

2.0 GOALS & OBJECTIVES

This plan looks to address SLINP's future information management on a number of levels. The vision, goals, and objectives presented here are the framework upon which the park's information management program will be developed and evaluated.

2.1 Vision

In time, there will be an information management program for St. Lawrence Islands National Park and the 1000 Islands ecosystem that is supported by a system which provides:

V1 - instant and widely accessible information

V2 - information that is current, accurate, and comprehensive to facilitate 'informed' decision-making
V3 - information that contributes to people's understanding, appreciation, and enjoyment of the 1000 Islands ecosystem
V4 - information that will be available and accessible to future generations

2.2 Goals

In 1995, during the ecosystem conservation planning process, SLINP's database was identified as an issue that would require management attention. Since that time, restructuring has brought about the amalgamation of the ecosystem conservation and education (formerly Resource Conservation and Visitor Services) sections and, with it, a broader definition of the scope of SLINP's database. Nevertheless, this plan will address the following basic goals for the park's database:

G1 - To identify , collect, and keep current the basic information needed to monitor and undertake adaptive management
G2 - To develop a park information management system for data storage, collation, manipulation and modelling purposes
G3 - To develop a mechanism to monitor and keep data in the park's database current according to data decay and natural change rates, differentiating between basic data and other data
G4 - To develop a policy to clarify conditions of data security and access, costs for data dissemination, and other data management issues for SLINP
G5 - To gather identified data on natural resources in the ecosystem for the purpose of undertaking regional analyses, assessing regional trends, and developing ecosystem conservation strategies
G6 - To investigate pooling data with other area resource management agencies to facilitate regional analyses of mutual interest

2.3 Objectives

By the year 2002-2003, SLINP will have:

O1 - a complete and updated inventory of its database
O2 - a standard system for indexing and accessing all file types
O3 - an archive of its original master files in both hard and soft copies
O4 - an information resource centre whose physical environment ensures adequate protection
O5 - data and/or metadata available on an intranet in a standard format suitable for browsing/searching
O6 - data and/or metadata accessible on an intranet from at least 8 terminals at Mallorytown Landing (number of terminals based on the capacity of the current hub connected to the GIS computer)
O7 - data accessible and distributable via reliable media to individuals and outside parties/agencies

O8 - secure host data that is updated regularly and continually enhanced
O9 - distributable data that is updated regularly
O10 - dedicated staff resources to oversee and maintain the database

Table 1: ***Relationship among vision, goals, and objectives***

Vision	Goals & Objectives
V1	G2, G4 --- *O5, O6, O7, O8*
V2	G1, G2, G3, G5, G6 --- *O1, O2, O8, O9, O10*
V3	G4, G5 --- *O5, O7, O9*
V4	G3, G4 --- *O3, O4, O8*

3.0 DATA MANAGEMENT ISSUES

A number of issues, mostly procedural, will need to be resolved as SLINP moves towards a comprehensive information management strategy. The issues identified in this section have been gleaned from a combination of the author's own experiences while working at SLINP and the input of other SLINP staff (consulted via questionnaires and personal interviews).

Table 2: ***Data Management Issues***

File Inventories

- cataloguing (logical, systematic, holistic)
- naming conventions
- archiving (master copies, hard-soft copies)

Deficiencies

- languages (French-English)
- quality
    - physical decay
    - relevance
    - replacing vs. duplicating
    - updating (data pedigrees and family trees)
    - content
    - usability (problem of useless, outdated stuff)
    - reproducibility
- adaptability (to other media and formats)
- accessibility
- human resources (dedicated to information management)
- Year 2000 compliance

Filing and Retrieval Systems

- consistency
- maintenance
    - refresh schedules
    - metadata
    - logs
- software
- physical storage

Database Security

- redundancy (multiple formats vs. standardization)
- master copies (centralization)
- gatekeepers (controlled access)
- physical environment (protection)

Information Use Policies

- accessibility
- copyright (others and ours)
- cost-recovery (for information made available to public)
- user-friendly
- training (of staff in the use of system)
- availability/circulation (for staff vs. for public)

3.1 Inventories

An inventory of SLINP's existing database components is a vital first step towards a comprehensive information strategy. With the amalgamation of ecosystem conservation and education resources, the scope of SLINP's database has grown considerably.

Table 3: ***Scope of the Plan***

Paper Files	Photo Files	Digital Files
library texts historic documents charts/maps vertical files journals/periodicals	aerial photos slide collections video footage film footage historic photos	visitor use data monitor data binary media sightings records green files (warden) GIS
	Sound Files	

Note that many items, though not files in the literal sense, are still referred to as such. Collectively, they represent SLINP's complete information database and are subdivided primarily by base material and storage medium.

3.1.1 Archiving

Issue: SLINP's current archiving activities are limited to a few culturally significant texts, various resource files, and a few 'reference-only' materials. Digital files, consisting mainly of data files from the park's GIS program, have been subject to a more vigorous archiving regimen. All original SLINP master data (in its original format) of all file types, as well as irreplaceable files, must be archived. Original data masters include SLINP reports, slide collections, metadata files, digital files, and video film footage. Irreplaceable files include historic documents and photos. This issue does not affect copyrighted files.

Recommended protocols:

1. *One copy of every original work should be designated as archival (i.e. a "master")*
2. *An archived item may not be removed except for duplication purposes. Upon duplication, it is returned promptly to its designated storage location.*
3. *An archived item may only be accessed by information management personnel.*
4. *An archived item may only be returned to its designated storage location by information management personnel.*

File Type	*Actions*
Aerial photos	Archive one hard copy* of each item. Archive soft index file** and metadata.
Backup media	Archive one copy of each two latest full backups. Archive soft index file and metadata.
Charts/Maps	Archive one hard copy of each item. Archive soft index file and metadata.
Historic documents	Archive one hard copy of each item. Archive soft index file and metadata.
Audio tapes	Archive one hard copy of each item. Archive soft index file and metadata.
Film footage	Archive one hard copy of each item. Archive soft index file and metadata.
Video footage	Archive one hard copy of each item. Archive soft index file and metadata.
Historic photos	Archive one hard copy of each item. Archive one soft copy, soft index file, and metadata.
Binary media	Archive one copy of each two latest full backups. Archive soft index file and metadata.
Journals/Periodicals	Archive one hard copy of each item. Archive soft index file and metadata.

Vertical Files	Archive one hard copy of each item. Archive soft index file and metadata.
Library texts	Archive one hard copy of each item. Archive soft index file and metadata.
Master slide collection	Archive one hard copy of each item. Archive one soft copy, soft index file and metadata.

* To archive a hard copy means to give it an inventory number and store it in a corresponding zone

** A soft index file is made by copying item details to an indexed HTML file. Each HTML file (one file per item) and metadata file is backed up (and archived as well). Labour (data input) and material costs (backup media).

3.1.2 Quality

Issue: Some current files may be of such poor quality as to make their inclusion in the inventory questionable. The main qualities being considered here include physical deterioration (from age, overuse, poor storage, and/or improper handling) and obsolescence (files representing information that is out-of-date or otherwise known to be inaccurate). Judgement will need to be exercised as to whether to keep, replace, or cull a file. How ruthlessly or conservatively this judgement is applied will determine both the quality and quantity of files in the completed inventory. This quality assessment also applies to corresponding file containers (shelves, cabinets, folders, envelopes, drawers, jewel cases, paperboard boxes, corrugated cardboard boxes, vinyl sleeves).

File Type	*Actions*
Aerial photos	Damaged (torn, faded, stained, or crinkled) items should be replaced or discarded.
Backup media	Any existing backups on magnetic media (DAT, 5.25" or 3.5" floppy) should updated to laser media.
Charts/Maps	Archive one hard copy of each item. Archive soft index file and metadata.
Historic documents	All historic items are kept, regardless of quality. Restoration may be appropriate, or even necessary.
Audio tapes	Damaged tapes (or items with poor sound quality) should be replaced or discarded.
Film footage	Damaged film (or items of poor picture and/or sound quality) should be replaced, repaired, or discarded.
Video footage	Damaged videos (or items of poor picture and/or sound quality) should be replaced, or discarded.
Historic photos	All historic photos are kept, regardless of quality. Restoration may be appropriate, or even necessary.

Binary media	All files on magnetic media (DAT, 5.25" or 3.5" floppy) should be updated to laser media.
Journals/Periodicals	Items with entirely irrelevant or obsolete content should be discarded.
Vertical Files	Damaged files should be replaced. Obsolete files should be discarded or updated.
Library texts	Damaged texts should be replaced. Obsolete texts should be discarded or updated.
Master slide collection	Slides suffering from fading or obsolescence should be discarded and replaced.

3.1.3 Cataloguing

Issue: The park has numerous systems for cataloguing its various data assets. Virtually every file type (slide, text, topographic map, etc...) has its own set of cataloguing parameters. Given the variety of file types affected under this information management plan, the continued use of these various indexing systems may prove cumbersome.

Recommendation: Develop a new, homogenous cataloguing system using a standard letter coding scheme and subject index (See Appendix 2 and Appendix 4).

3.1.4 Naming conventions

Issue: The scope of this information plan is greater and (hopefully) more comprehensive than any other ever attempted at SLINP, bringing together (under the rubrik of 'ecological information') what were previously treated as disparate and unrelated data types.

Recommendation: Harmonizing all databases into a digital-based system will mean that subject-indexed storage will no longer be crucial at the physical level, where files should be stored in sequence and never need to be re-organized. It will allow for the on-going creation and maintenance of an infinite variety of "on-line" indexing schemes and cross-referencing systems to suit the needs of individual users.

File Type Affected	Letter Code
Library Texts	**L**
Historic Documents	**D**
Cartographics	**C**
Vertical Files	**K**
Journals, Periodicals	**J**
Aerial Photos	**A**
Master Slide Collection	**M**
Videographics	**V**
Films - 16mm	**F**

Historic Photos	**H**
Sound Files	**S**
BInary MedIa	**I**
Backup media	**B**

3.1.5 Reproducibility

Issue: To ensure future data reproduction quality, the inventory should include formats that are widely recognized and easily reproducible. This issue applies mainly to soft data, and to storage media.

Recommendations:

A - Storage media: Obsolete hard formats (eg. 5.25" floppy, 8-track, phonographs, etc...) should be replaced as soon as possible, their contents transferred to more contemporary media (or simply discarded).

B - Soft formats: Acceptable soft formats include those that are recognized by a majority of software packages (not formats for a specific software application). These include *.zip, *.htm(or *.html), *.txt, *.jpg, *.gif, *.wav, etc..... Extensions such as *.wpd (Wordperfect), *.doc (Microsoft Word), *.dbf (D-Base), etc.... should only be used when preserving an original format copy. It should still be exported to a generic file type to ensure future reproducibility.

3.1.6 Updating

Issue: Updating the database is, and has been, an on-going process. Some file types will require protocols that ensure that they remain relatively current and useful for informed decision-making.

File Types Affected	Protocol	Cost
Maps	***Update every 5-10 years minimum; old editions become archival***	***$$$***
Aerial Photos	***Update every 5-10 years minimum; old editions become archival***	***$$$$***
Satellite Imagery	***Update every 5-10 years minimum; old editions become archival***	***$$$$***
Visitor Use Data	***Updated annually (or as per protocols)***	***$***
Monitor Data	***Updated annually (or as per protocols)***	***$***
All others	***Updated continuously***	***$ - $$$$$***

3.2 Data Deficiencies

3.2.1 Languages

Issue: Most of SLINPs data is presented in English (eg. texts), organized in English database fields (eg. monitor data), and/or based on codes abbreviated from English terminology (eg. species names). As a federal government entity, SLINP is obliged to provide its publicly available information in both official languages. This issue will need to be addressed where and when the public is permitted access to files on the FASTLINE IntraNET. The two scenerios when this is most likely to occur will be 1)accessing the IntraNET from a terminal in the VRC, and 2)downloading IntraNET files from distributed media (CD or DVD).

Recommendation: Develop all IntraNET files in English, but include French keywords in each soft index file. When and if a terminal is put in the VRC, a French version of the IntraNET browser can be incorporated and documents can be assessed as to their value (i.e. need, demand, importance) for translation.

3.2.2 Quality

Issue: The quality of some data must be questioned in terms of its usefulness to contemporary decision-making. The main qualities being considered here are the efficacy, statistical defensibility, and reliability of basic data collected and inputted in the past. This issue mainly affects visitor use data, monitoring data, sightings records, and older resource studies. All items of questionable quality may be kept for archival purposes, but can not be reliably included with more contemporary studies or databases.

3.2.3 Adaptability

Issue: The adaptability of various file types to other media (especially digital) for backup purposes will vary, as will the adaptability of digital files to other digital file types. While conversion drivers exist for many digital file types, it is the extent and type of conversion to a digital format that is the issue here.

File Type Affected	Options
Library Texts	*Digital metadata for inventory and searching only - format: HTM*
Historic Documents	*Full digital text reproduction - formats: TXT, HTM*
Cartographics	*Digital metadata for inventory and searching only; custom image maps of TIE linked to each map type plus a master list - formats: GIF, HTM*
Vertical Files	*Digital metadata for inventory and searching only - format: HTM*
Journals/Periodicals	*Digital metadata for inventory and searching only - format: HTM*
Aerial Photos	*Digital metadata for inventory and searching only; custom image maps of TIE linked to each flight line plus a master list - format: GIF, HTM*

Master Slide Collection	*Full digital reproduction all images - format: JPG, HTM*
Videographics	*Digital metadata for inventory and searching only - format: HTM*
Films - 16mm	*Digital metadata for inventory and searching only - format: HTM*
Historic Photos	*Full digital reproduction of all images - format: JPG, HTM*
Binary Media	*Full digital backup of all media, plus digital metadata for searching and inventory - format: ZIP, HTM*
Backup Media	*Full digital backup of all media - format: ZIP*
Sound Files	*Full digital reproduction or digital metadata for searching and inventory only - format: WAV, HTM*

3.2.4 Dedicated human resources

Issue: The prevailing approach to archiving and storage at SLINP has been to indulge the activity "when there's time", and giving it a low priority in an existing job description. A project of the magnitude presented by this plan will not yield top-quality results if such an approach continues. The finished IntraNET and IRC will reflect back on the approach used: haphazard and inconsistent, or organized and comprehensive.

Recommendation: SLINP should dedicate the time required to "do it right".

File Type Affected	Options	Cost
All files	1. ***Rewrite existing job description(s) of duties to include or stress a significant temporal dedication to information management activities.*** 2. ***Create full-time position for information management***	***$$$$*** ***$$$$$***

3.2.5 Usability

Issue: For various reasons, including factual obsolescence and outdated formats, certain files may no longer be useable by contemporary staff. These concerns are addressed in other parts of this plan, and are reiterated here for emphasis. Each and every file of all file types will need to be evaluated (and possibly culled, replaced, or updated) in this context.

3.2.6 Year 2000 compliance

Issue: Some of SLINP's older digital data (eg. Pro-cite, dBASE files) may have been generated on software versions that are not compliant to Year 2000 date turnover. This has the potential to render these files useless and irretrievable at the turn of the millenium. Also, some hardware may require replacement or BIOS updating.

File Type Affected	Options	Cost
All soft media	1. Ensure compliance by: -checking BIOS settings on all computer systems using or accessing SLINP's soft data; download upgraded drivers..... or replace main system boards..... -checking operating systems on all computers creating, using or accessing SLINP's soft data; download patches..... or upgrade to 32-bit system.....Win95B..... .....Win98..... .....WinNT4..... .....WinNT5..... -checking all software used to produce or use data and; cease using..... or upgrade to 32-bit versions.....ProCite4..... or import to new format/software...HTML..... ...MS Access..... 2. Ignore compliance. Risk the possibility of losing functionality of system hardware, system software, and data files.	**net time** ***$150-300*** ***net time*** ***$120-230*** ***$120-240*** ***$240-400*** ***$240-400*** ***$0*** ***$100*** ***labour*** ***labour*** ***Immeasurable***

3.3 Filing and Retrieval Systems

3.3.1 Consistency

Issue: Current information management systems at SLINP have been designed to keep track of a variety of different data types. Procedures and approaches have, unfortunately, varied greatly from one data type to another.

Options:

1. Maintain current coding and classification - virtually impossible if all file types are to be harmonized
2. Phase out current coding and classification
3. Replace current coding and classification

File Type Affected	Current Coding	Current Classification	Proposed Coding	Cost
Library Texts	***Dewey***	***dewey, Procite***	As the IntraNET is developed, augment existing schemes with new coding, and ultimately phase out current codings and classifications as the primary means of archiving, storage, and retrieval. See Appendix 2 for proposed coding and Appendix 4 for new subject classifications.	
Historic Documents	***ParksCan***	***ParksCan***		
Maps	***source***	***source***		
Vertical Files	***ParksCan***	***ParksCan***		
Periodicals	***Dewey***	***dewey, Procite***		
Aerial Photos	***source***	***source***		
Slide Collection - Master	***ParksCan***	***ParksCan***		
Slide Collection - General	***ParksCan***	***ParksCan***		
Satellite Imagery	***source***	***na***		
Film Footage - Video	***na***	***na***		
Film Footage - 16mm	***na***	***na***		
Historic Photos	***ParksCan***	***ParksCan***		
Custom Images	***na***	***na***		
Visitor Use Data	***ParksCan***	***na***		

Monitor Data	***na***	***na***		
Binary Media	***na***	***na***		
Sightings Records	***SLINP***	***SLINP***		
Green Files	***ParksCan***	***ParksCan***		
GIS	***SLINP***	***SLINP***		

3.3.2 Refresh schedules

Issue: Many information bases/indexes require regular updating as new materials are added (eg. library). Others, such as maps and aerial photos, require periodic updating. Soft files, including the entire IntraNET, will require a refresh regimen.

Recommendations:

1. Protocol for new items - indexed/added to IntraNET and IRC immediately
2. Geographic reference materials - refreshed minimum every 5 years
3. Soft data (all databases, IntraNET files) backed up regularly

Schedule:

1. databases - backed up after day's input; plus full backup
2. IntraNET
    - internal backup daily
    - external backup weekly (to rewritable media)
    - full external backup monthly (to fixed media)

3.3.3 Metadata

Issue: Metadata files need to be developed in standard formats to allow browsing and reproducibility

Recommendations: Maintain spreadsheet-type lists of all information stored for each file type in the IntraNET databases. All metadata file creation and maintenance should only be done by the IntraNET administrator ("Gatekeeper"). Hard copies and soft copies of metadata lists should be stored locally and in a separate isolated location.

3.3.4 Data logs

All revisions and updates to the IntraNET will need to be logged so that if a new gatekeeper is brought in, the risk of work duplication is minimized. A data log, essentially a journal of work completed and work-in-progress, will also allow

managers/administrators to gauge productivity and provide reasonably accurate estimates for benchmark completions.

3.3.5 Software

Issue: Some existing data has been compiled on old software (DOS) which may run poorly on newer operating systems. Older software is also likely not Year 2000 ready. Upgrades may not be worthwhile compared to importing data into a newer program. Some IntraNET software will require site licences to use effectively.

Recommendations:

1. *Acquire site licences for search engine software; single-user licences for utilities like thumbnail generators, gif animators, and HTML editors.*
2. *Evaluate the time and cost factors for upgrades vs. export/import to another program.*
3. *Definitely update all databases to Year 2000 ready compilers.*

3.4 Database Security

3.4.1 Redundancy

Issue: Many items and file types exist only in one format. In the event that the one format becomes irretrievable, an item can become lost or unusable.

File Type Affected	Protocols
All soft file types	All file types will be stored in a number of formats, and all will be backed up to at least 2 removable media (plus one hard copy where appropriate) **TEXT** • stored in original format plus two of *doc, *wpd, and *.txt(ASCII) • IRC-Online documents are also stored in *.htm(HTML) **DATA** - stored in original format plus two of *.mdb, *.dbf, *.xls, and *.txt(ASCII) **IntraNET** - stored in original HTML and ASCII **GRAPHICS** - stored in original format plus two of *jpg, *.gif, *.pcd, *.tif

3.4.2 Master copies

Issue: Master copies are essentially irreplaceable. Their safety and security must be uncompromisingly guaranteed.

File Type Affected	Protocols
All file types	All file types will be secure from environmental degradation (see Physical Environment), obsolescence (see Reproducability), theft and abuse (see Accessibility)

3.4.3 Gatekeepers

Issue: A lack of sufficient staff time dedicated to maintaining and enhancing information resources has hampered efforts to keep various systems organized.

Recommendation: Guarantee a degree of human resource dedication.

Options:

1) Minimal dedication - include duties in an existing position, $

Benefits: i)existing staff are 'acclimatized' to the park and its resources; ii)relatively inexpensive

Costs: i)may not satisfactorily addess the volume of work; ii)will reduce availability for other duties

2) Partial dedication - allocate periodic service or term contracts, $½-$$

Benefits: i)no existing staff duties are compromised; ii)database receives longer periods of full attention

Costs: i)different individuals over time increases the potential for work that is inconsistent and of varied quality

3) Full dedication - seasonal or full position devoted to information management, $$$

Benefits: i)database receives best possible attention; ii)greater consistency of work

Costs: i)relatively expensive; ii)diversion of capital from other projects

3.4.4 Physical environment

Issue: The physical environment for storing master copies of hard and soft data must be set up to minimize or eliminate adverse conditions. Storage area(s) must be identifiable.

Recommendation: Assess the existing storage facilities in terms of space availability and the vulnerability of information files to damage or degradation (See Appendix 5).

Options:

1) Maintain existing storage methods, -

Benefits: i)may be adequate for a few years; ii)minimal reorganization

Costs: i)space limitations; ii)higher potential degradation of some data

2) Fortify existing storage, $$

Benefits: i)minimal reorganization; ii)adverse effects minimized

Costs: i)space limitations

3) Replace existing storage facilities, $$$$$

Benefits: i)creates an environment optimized for space and usage

Costs: i)new building

Identifiability: Establish an Information Resource Centre (IRC) so that storage areas for all file types are easily recognizable. The IRC can exist in one of two forms:

1. **distinct** - One room in one building, or an entire building (existing or new), is dedicated to storing all master files. Zones for each file type would be established (eg. Zone L would be where all library texts are stored) and clearly marked. Zone coding can use the same letters as those used to distinguish file types. The IRC is a perceivable entity.
2. **fragmented** - Numerous locations in several buildings are used to store file types. Zones for each file type must still be established (eg. Zone A, for aerial photos, is the bottom drawer of the filing cabinet near the SW corner of the warden office; Zone D, historic documents, is the at the NE corner of the interp building). The "IRC" becomes more of a conceptual framework for management purposes (like "ecosystem") and less of a physical entity.

3.5 Information Use Policies

3.5.1 Accessibility

Issue: Where information is made available for the public, service and accessibility must be taken into consideration.

File Type Affected	Protocols
None - IntraNET access only	1. Handicap accessible (variety of input methods within reach, larger easy-to-read font)

	2. Browser in French/English 3. Personal assistance readily available

3.5.2 Copyright

Issue: SLINP must remain sensitive to copyright laws in its use and proliferation of ecosystem data. Data from outside sources (eg. satellite imagery) may not always be freely duplicated. Similarly, SLINP information products (web page content, brochures, reports, photo images, thematic maps) require some measure of copyright protection if they are to be made available to the public.

Recommended policy:

1. SLINP should include an appropriate reference for outside sources of data incorporated into the IntraNET.
2. SLINP should attach a copyright message to its own information products. The message could state that the product may be freely reproduced so long as SLINP is referenced.
3. All materials from outside sources (i.e. copyrighted by someone else) should be listed, along with a source for obtaining replacements, in case an item is lost, stolen, or damaged. Materials on such a list would likely include texts, maps, software, periodicals, and film/video footage.

3.5.3 Cost-recovery

Issue: Given current fiscal restraints (restraints that are not going to be reversed in the foreseeable future), any costs arising from the reproduction of any type of data for use outside of SLINP should be fully recoverable.

Options:

1) Zero cost-recovery - absorb all costs, $$$

A realistic option for the next 2-3 years, during which SLINP would gauge the amount and type of demand/interest in its data, and its data reproduction costs. In the longer term, this may be in option where sufficient funding exists..

2) Partial cost-recovery - recover all or some costs of reproducing materials only, $½

Such costs would not include expenses incurred in data proliferation (eg. staff wages, office equipment purchases, etc..), but would include any costs associated with the 'product' made available to interested publics. Some examples:

- **a soft copy of a file** - recover cost of the diskette (or other storage medium); no charge for soft copy transmission (eg. e-mail)

- **a hard copy of a report** - recover cost of paper, toner, and binding (applies to both printouts and photocopies)
- **forwarding** - recover cost of shipping materials (eg. envelopes) and postage

FASTLINE partners could be exempt from some of all of these costs.

3) Full cost-recovery - recover reproduction and proliferation costs, $$

Costs would include all items listed in #2, plus a surcharge towards:

- staff time/wages
- equipment purchases
- equipment maintenance

This option would be more expensive to administer and difficult to quantify. Only where the reproduction of data imposes significant demands on the equipment and labour resources may it be necessary to consider surcharges.

3.5.4 User-friendliness

Issue: Any new systems for accessing SLINP information must not be cumbersome to use or difficult to learn. The application of familiar technologies, along with concise user reference material, is recommended as a means to that end.

Options:

1) Familiar technologies

- use of desktop computer terminals
- use of a well-known browser interface (Netscape 4)

2) Reference materials

- soft copy on the IntraNET
- hard copy at each IntraNET terminal

3) System administration

- use of a common inventory code system (bar code)
- use of designated zones for types of information, or storage of all data types in one central location (IRC)

3.5.5 Training

Issue: New and existing staff will need to familiarize themselves with the mechanisms they will use to access the IntraNET.

Options:

1. Allow users to train themselves with(out) reference materials
2. Incorporate into duties of the gatekeeper the following:
    - produce a hard copy user manual for each terminal
    - produce a soft, on-line copy of the user manual
    - provide personal and technical assistance as required

3.5.6 Availability/Accessibility/Circulation

Issue: Information materials need to be in accessible, reproducible formats. Their availability will need to be promoted. Access to certain sensitive data will require restrictions on use.

Recommendations:

1) Open access

- selective uploading to FASTLINE website, submission to search engines
- terminal in VRC with use restricted to FASTLINE IntraNET
- terminal in EEC with use restricted to FASTLINE IntraNET
- terminals in IRC with use restrictions

2) Access restrictions

- use Windows NT security and directory isolation to limit access to sensitive data (Green Files) such as occurrence records and special resource protection (eg. location of hibernacula)
- render all accessible soft data as archival and read-only
- disallow removal of archival master copies of hard and soft data from the information resource centre
- disallow unregulated access to archival master copies of hard and soft data by designating an archivist
- gatekeeper sets up LIKSE search engine to run in "kiosk mode" (cannot change preferences) on all other terminals

4.0 COST ESTIMATIONS

Labour Calculations

Total # Time/Item Total Time Total Time Total Time Costs

File Type of Items (minutes) (minutes) (hours) (weeks) ($8.00/hr) ($10.00/hr) ($13.00/hr) ($15.00/hr)

Periodicals 2,000 10 20,000 333 8.33 $2,666.67 $3,333.33 $4,333.33 $5,000.00

Master Slides 4,500 10 45,000 750 18.75 $6,000.00 $7,500.00 $9,750.00 $11,250.00

Vertical Files 6,000 5 30,000 500 12.50 $4,000.00 $5,000.00 $6,500.00 $7,500.00

Library Texts 1,500 10 15,000 250 6.25 $2,000.00 $2,500.00 $3,250.00 $3,750.00

Charts/Maps *50* 10 500 8 0.21 $66.67 $83.33 $108.33 $125.00

Historic Papers *100* 10 1,000 17 0.42 $133.33 $166.67 $216.67 $250.00

Historic Photos *100* 10 1,000 17 0.42 $133.33 $166.67 $216.67 $250.00

Sound Files *30* 5 150 3 0.06 $20.00 $25.00 $32.50 $37.50

Backup Media *10* 2 20 0 0.01 $2.67 $3.33 $4.33 $5.00

Aerial Photos *100* 5 500 8 0.21 $66.67 $83.33 $108.33 $125.00

Films (16mm) *20* 5 100 2 0.04 $13.33 $16.67 $21.67 $25.00

Videography *40* 5 200 3 0.08 $26.67 $33.33 $43.33 $50.00

Binary Media *20* 5 100 2 0.04 $13.33 $16.67 $21.67 $25.00

TOTAL 14,470 113,570 1,893 47.32 $15,142.67 $18,928.33 $24,606.83 $28,392.50

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1. Italics denote very rough estimates only; file type will need to counted

NOTE: Time estimates are based on a 300MHz system , with EIDE drives and a serial-ported flatbed scanner. It would be reasonable to double these estimates for slower systems, high resolution scans, and/or less proficient computer operators.

Equipment Calculations

Hardware Specifications Quantity Unit Price TOTAL Price

Hard drive dedicated to IntraNET 5+GB, UltraWideSCSI 1 market $700+

DVD burner 4GB minimum 1 market $700+

Ethernet Card 6 market

Cabling Category 5 STP $30 / 50' $300+

Coax

Bar Code Reader Code 39 compliant 1 $200-700 $700

Year2000 compliance New computers 1-8 $2K-4K $16,000

New system boards 1-8 $200-400 $1600

Fastest server system Merced chip (700+MHz) 1 ???????

Fireproof Container *Sentry Fire-Safe 1250* 1 $129.97 $149.46

Software

Network terminals Windows NT 5 Workstation 7 ? $?

Search Engine LIKSE 1 US$50 $70.00

Browser Netscape 4 8 free $00.00

ImageMapper CoffeeCup 1 US$25 $40.00

Thumbnail Viewer ThumbsPlus 1 US$70 $100.00

Compression Utility latest PKZIP or Winzip 1 US$50 $70.00

Year2000 compliance BIOS Update 1-8 free $00.00

Ongoing expenses

Backup media CD, DVD ? $3-5 each

Toner

Labels

Paper

TOTAL COST (including labour, equipment, materials, etc,....): approx. $40K-60K

> Rough estimate of computer hardware market prices:
> Assumption: market technologies and costs "improve" at the same rate
> Moore's Law: specifications for latest technology doubles approximately every 1½ - 2 years
> Variation: Current market price (for a current specification) halves approximately every 1½ - 2 years
> Thus, in 18-24 months, you will get:
> a) Current specification at half-price (or better)
> b) Twice the current specification at the current price

5.0 IMPLEMENTATION SCHEDULES

The following is the general "Cradle-to-Grave" methodology for each file type:

A)Inventory:

1. collect all items of a given file type
2. cull and store remainder in one location (or designated zone(s))

B)Catalogue: develop, print, and affix bar code for each item, filling in details on a master data sheet. Once the bar code has been affixed, the item can still be used but it MUST always be returned promptly to its proper place in the sequence.

C)Backup: Create digital masters of analogue masters where appropriate. This stage does not apply to copyrighted information. Only metadata of copyrighted materials will be backed up digitally.

D)IntraNET:

1. Create digital metadata for each item, and master lists of all items, based on master data sheets

2. Integrate/link files within appropriate IntraNET pages

E)Backup:

1. Copy all digital data and/or metadata to removable media (CD, DVD)
2. Backup all removable media files twice:
    - store one copy (of each CD or DVD) in a fireproof safe on site (SLINP)
    - store second copy in a separate location (other than SLINP)
3. Print one hard copy of every HTML page (the whole IntraNET) and store sequentially (by IRC letter code and number) in a dedicated file cabinet

Note: access restricted to gatekeeper for reference purposes only in the event of a complete catastrophic loss of all soft IntraNET files

5.1 Digital Files

A) Existing binary documents (eg. soft copies of SLINP reports)

For each report:

1. open file in original format (WPD, DOC, etc...)
2. export as HTML (if word processor includes filter) and fine-tune formatting or open HTML editor and cut & paste text from original format; export graphics as GIF (for line art) or JPG (for photos) files; tables may require reformatting
3. save HTML document and graphics files in a new subdirectory of IRC On-line; subdirectory is named after the original document (eg. "Ecosystem Management Plan")
4. original document and HTML document are backed up to CD or DVD
5. HTML document includes IRC# of backed-up file
6. add item to metadata files (GK-Domain and IRC On-line)

B) Software (CD-ROMs, diskettes)

For each item:

1. create HTML page and assign an IRC inventory number
2. diskettes - copy and backup to CD or DVD
3. CD-ROMs - do not copy/backup; store only
4. protection - each CD and DVD is stored in a jewel case (hard plastic); all are treated with "CD Stoplight"
5. add item to metadata files

6. store all files in one location/zone

C) Statistics (visitor use data, monitoring data, sightings records)

For each database:

1. open file in original format and export to MS-Access format
2. create HTML page for each data set, including a link for downloading each file in its original format and in Access
3. save all in appropriate subdirectory
4. add items to metadata files
5. backup to CD or DVD

5.2 Paper Files

A) Charts & Maps

1. create HTML page for each map and assign an IRC inventory number
2. store one copy of all files in one location (IRC zone); extras may circulate
3. create geographic image map with links to each HTML page (Note: image map HTML page becomes the metadata file)
4. backup all HTML pages to CD or DVD
5. protection -stored flat and *not* folded, out of direct sunlight

B) Historic Documents

1. repeat steps 2-5 from part D above

C) Journals & Periodicals

1. collect all and cull -discard (or donate to a school or library) all items with no articles, editorials, or notes relevant to SLINP)
2. create HTML pages for each whole periodical as per texts ("C" above)
3. create HTML pages for lone articles (where a periodical contains only 1-2 relevant articles) as per vertical files ("D" above)
4. record each item details in a metadata file
5. backup all soft files to CD or DVD
6. protection -as per vertical files

D) Library Texts

1. collect all texts and cull all outdated or severely damaged items

2. create HTML page for each text and assign an IRC inventory number; include title page information, publishing information, and contents via OCR or keypunch
3. add item details to metadata files
4. backup all HTML pages to CD or DVD
5. protection -all texts are stored vertically; soft covers are reinforced with clear MacTac

E) Vertical Files

1. cull all files that are irrelevant (rarely, if ever, used), outdated, or severely damaged
2. create HTML page for each file and assign an IRC inventory number; include title, author, and publishing details; include an abstract or summary for longer articles (3+ pages); use OCR for shorter articles (1-2 pages) and save in IRC On-line; HTML file includes a link to On-line copy)
3. add item details to metadata files
4. backup all soft files to CD or DVD
5. protection -hard copies are printed on archive-quality paper (acid-free, etc...)

5.3 Photo Files

A) Aerial Photos

1. create HTML page for each photo (pair) and assign an IRC inventory number
2. store all photos in one location (IRC zone)
3. create geographic image map with links to HTML pages
4. backup all HTML pages to CD or DVD
5. protection -store photo pairs in envelopes along with a cardboard piece (to prevent bending/kinking); store out of direct sunlight and away from sources of humidity/moisture

B) Master Slides

1. collect all slides (check general slide collection and other locations) and cull; cull all slides that are outdated, faded, or damaged; some slides will require cleaning
2. scan each slide at the highest colour setting and resolution (with existing SLINP technologies)
3. assign an IRC inventory number to each slide and save as a JPG file
4. create an HTML page for each slide/image
5. create thumbnail (metadata) pages

6. backup all JPG, HTML, and thumbnail files to CD or DVD
7. protection -store slides in a dark location away from direct sunlight; store slides in vinyl sleeves; replace paperboard frames with plastic; label all slides "MASTER" with red permanent marker

C) Historic Photo

1. scan all photos at highest resolution in original "colour" (if B&W, keep as B&W) and save as a JPG file (assign corresponding IRC inventory number to both)
2. create HTML page for each photo
3. create thumbnail HTML page (metadata)
4. backup all JPG, HTML, and thumbnail files to CD or DVD
5. protection -as per aerial photos

D) Film & Videos

1. create HTML page for each item and assign a respective IRC inventory number
2. store all master files in one location
3. add items to metadata files
4. backup metadata to CD or DVD
5. backup/copy all unscrambled videos to stereo hi-fi SuperVHS tape (in SP mode)
6. protection
    - *films* - stored away from light in a cannister; store cannisters vertically; store wound at end (i.e. rewind before playing, not after playing)
    - *videos* - remove recording tabs to prevent accidental erasure; store in a plastic, protective case; wound as for films

5.4 Sound Files

A) Music

For each music product:

1. create HTML page for each item and assign an IRC inventory number
2. store all files in one location
3. add items to metadata files
4. backup soft data to CD or DVD
5. backup/copy all music to stereo hi-fi VHS tape
6. protection

- *tapes* - recording tabs removed; each tape in a jewel case
- *CDs* - treat with CD-Stoplight; each CD in a jewel case
- *LPs* - each LP cleaned; stored in a dust jacket in a record sleeve; stored vertically

B) Narratives and Sound Banks - repeat as above

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Appendix 1 - Acronyms

CD - Compact Disk
CD-R - Recordable Compact Disk
CD-RR - Re-recordable Compact Disk
DAT - Digital Audio Tape
DVD - Digital Versatile Disk (now), Digital Video Disk (earlier)
DVD-R - Recordable Digital Versatile Disk
DVD -RR - Re-recordable Digital Versatile Disk
EEC - Ecosystem Education Centre
FASTLINE - Frontenac Axis St. Lawrence Islands Network on the Environment
GIS - Geographical Information System
GPS - Global Positioning System
IRC - Information Resource Centre
ISP - Internet Service Provider
LAN - Local Area Network
LIKSE - Local Internet Keyword Search Engine
LP - vinyl long-playing record
MMX - Multi-Media Extensions
OCR - Optical Character Recognition
POTS - Plain Old Telephone Service
RAM - Random Access Memory
ROM - Read Only Memory
SLINP - St. Lawrence Islands National Park
TIE - Thousand Islands Ecosystem
VRC - Visitor Resource Centre
WAN - Wide Area Network

Appendix 2 - IRC Codes

File Type Affected	Letter Code	Subdivision Type	Gradations	Sample Code
Library Texts	**L**	***By subject or none***	00 - 99 custom subject index	IRC-L - 123456 IRC-L-12-

				123
Historic Documents	**D**	***By subject or none***	0 - 9 custom subject index	IRC-D-123 or IRC-D-1-123
Cartographics	**C**	***By theme*** ***(10 max)***	1. Hydrographic 2. Topographic 3. OBMs 4. Thematic	IRC-C-1-123 IRC-C-2-123 IRC-C-3-123 IRC-C-4-123
Vertical Files	**K**	***By subject or none***	00 - 99 custom subject index	IRC-K-123456 IRC-K-12-123456
Journals, Periodicals	**J**	***By title or none***	00-?? title index	IRC-J-12-1234 IRC-J-1234
Aerial Photos	**A**	***By year***	Gradate by flight line before applying date coding	IRC-A-1997-1234
Master Slide Collection	**M**	***By subject or none***	00 - 99 custom subject index	IRC-M-12345 IRC-M-12-12345
Videographics	**V**	***By source or none***	1. SLINP 2. Other	IRC-V-123 IRC-V-1-123
Films - 16mm	**F**	***None***	n/a	IRC-F-123
Historic Photos	**H**	***By subject*** ***or none***	0 - 9 custom subject index	IRC-H -123 IRC-H-1-123
Sound Files	**S**	***None***	1. CD 2. Audiotape 3. Other (record, reel-to-reel, 8-track, etc..)	IRC-S-123 IRC-S-1-123
BInary MedIa	**I**	***By format or none***	1. CD-ROM 2. DAT 3. Diskette 4. DVD	IRC-I-123 IRC-I-1-123

Backup media	**B**	***By format or none***	1. CD 2. DAT 3. Diskette 4. DVD	IRC-B-123 IRC-B-1-123

Code scheme: File Type Prefix <space> (Prefix) Item number

Priority for using subdivisions: less than 1000 items - do not use subdivisions

Code scheme (Master Slide #45 about Settlement) adapted to a bar code

Item #45 of Type M data, plus Mod 43 check sum digit

Duplicate original media copy 'a' of Item #1 of Type M data, plus check #

Appendix 3: Proposed Directory Structure

C:\The FASTLINE IntraNET (*main system files and guides*)

- **...\cgi-bin** (*storage for common files to minimize redundancies*)
- ..**\Database** (*HTML files for all information types)*
  - **...\Digital Files**
    - **...\Binary Media**
    - **...\Monitor Data**
    - **...\Sightings Records**
    - **...\Visitor Use Data**
  - **...\Paper Files**
    - **...\Charts&Maps**
    - **...\Historic**
    - **...\Journals&Periodicals**
    - **...\Library Texts**
    - **...\Vertical Files**
  - **...\Photo Files**
    - **...\Aerial**
    - **...\Film**
    - **...\Historic**
    - **...\Slides**
    - **...\Video**

    - **...\Sound Files**
        - **...\Music**
        - **...\Narrative**
        - **...\Sound Banks**
- **...\GKs Domain** (*isolated directory reserved for gatekeeper/archivist/webmaster*)
    - **...\Backup** (*full IntraNET directory backup*)
    - **...\Downloaded** (*installation files for software products*)
    - **...\Metadata** (*metadata differs from IRC On-line by inclusion of keywords, etc.. In web pages*)
    - **...\Templates**
- **...\Green Files** (*isolated directory reserved for sensitive warden information*)
- **..\IRC On-line** (*full-text versions of frequently used files, plus metadata*)
    - **...\Metadata**
    - **...\Other Government Documents**
        - **...\Statutes-Federal**
        - **...\Statutes-Provincial**
    - **...\Parks Canada Documents**
        - **...\Guiding Principles and Operational Policies**
        - **...\Natural Resources Management Process Manual**
    - **...\SLINP Documents**
    - **...\User Zone** (*directory for browser and individual user files*)
        - **..\Netscape**
            - **...\Communicator**
                - **...\Users**
                    - **...\Jeff Leggo** (*contains his preferences, history, bookmarks, etc...*)
                    - **...\Kathleen Burtch** (*contains her preferences, history, bookmarks, etc...*)

Appendix 4: Custom Indices

Humans	Special Events Land-based Recreation Water-based Recreation Tourism Impacts Transportation Agriculture Organizations Urban Other	
History	Architecture Archaeology	

	Anthropology Exploration Settlement Military Navigation Modern Native Other	
Earth Science	Geography Cartography Geomorphology Paleontology, Palynology Astronomy Climatology, Meteorology Pedology Geology Hydrology Other	
Life Science	Herpetology Botany Icthyology Ornithology Mammology Entomology Invertebrate Zoology Microbiology Mycology Other	
SLINP	Properties Facilities Staff Administration, Management Ecosystem Conservation Education, Interpretation FASTLINE Publications Operations Other	
Government	Federal Provincial USA International Municipal Agencies	

	Parks Canada, NP-Ontario Parks Canada, NP-Other Parks Canada, HP-Ontario Parks Canada, HP-Other	
Reference	Planning Skills Language Arts&Crafts Management Computer Manuals/Guides Administration Fiction Indexes/Catalogues Other	
French		
Other		

Periodicals

- Magazine Title
- **Equinox**
- Magazine Title
- Magazine Title
- Magazine Title
- Magazine Title
- **Seasons**
- Magazine Title
- Magazine Title
- Magazine Title
- Magazine Title
- **Canadian Geographic**
- Magazine Title
- Magazine Title
- **Nature Canada**
- Magazine Title
- Magazine Title
- Magazine Title
- Magazine Title
- etc.....

Appendix 5: Environmental Hazards

File Type	*Hazards*									Storage Notes
	Fire	Temp	Electro surge	Humidity	Dust	Magnetic fields	Light	Vermin	Water	
Aerial photos	*X*			*X*			*X*	*X*	*X*	**Fire**: basic precautions (smoke detectors and ABC extinguishers in every room where there is a storage zone); extra precaution (backup media stored in fireproof safe) **Temperature**: maintain room temperatures in the 18-24° Celsius (68-
Backup media	***X***	***X***	***½***		***X***	***X***				
Cartographics	***X***			***X***			***X***	***X***	***X***	
Historic documents	***X***			***X***			***X***	***X***	***X***	
Audio tapes	***X***	***X***			***X***	***X***			***X***	
Film footage	***X***	***X***			***X***		***X***		***X***	
Video footage	***X***	***X***			***X***	***X***			***X***	
Historic photos	***X***			***X***			***X***	***X***	***X***	
Binary media	***X***	***X***	***½***		***X***	***X***				
Journals/Periodicals	***X***			***X***			***X***	***X***	***X***	
Vertical Files	***X***			***X***			***X***	***X***	***X***	
Library texts	***X***			***X***			***X***	***X***	***X***	

Master slides	***X***	***X***			***X***		***X***		***X***	75°F) range **Electric surge**: Binary and backup media can not physically be harmed by power surges, but may become damaged or irretrievable should a surge occur during use. NOTE: a complete hard drive version of the IntraNET is *extra* to the file types listed here. Every computer should be surge protected (eg. APC Backup). **Humidity**: maintain room humidities in the 40-60% range **Dust**: use proper containers (jewel cases for CD, DVD, DAT, and audiotape, vinyl sleeves for slides, film cannisters, and plastic boxes for videos), all stored vertically. All spooled media (tape and film) should be stored at end (always rewind *before*, not after, playing a piece of spooled media) **Magnetic fields**: check to ensure there are no magnetic fields in zones containing magnetic media (DAT, audiotape,videotape, floppy disks).