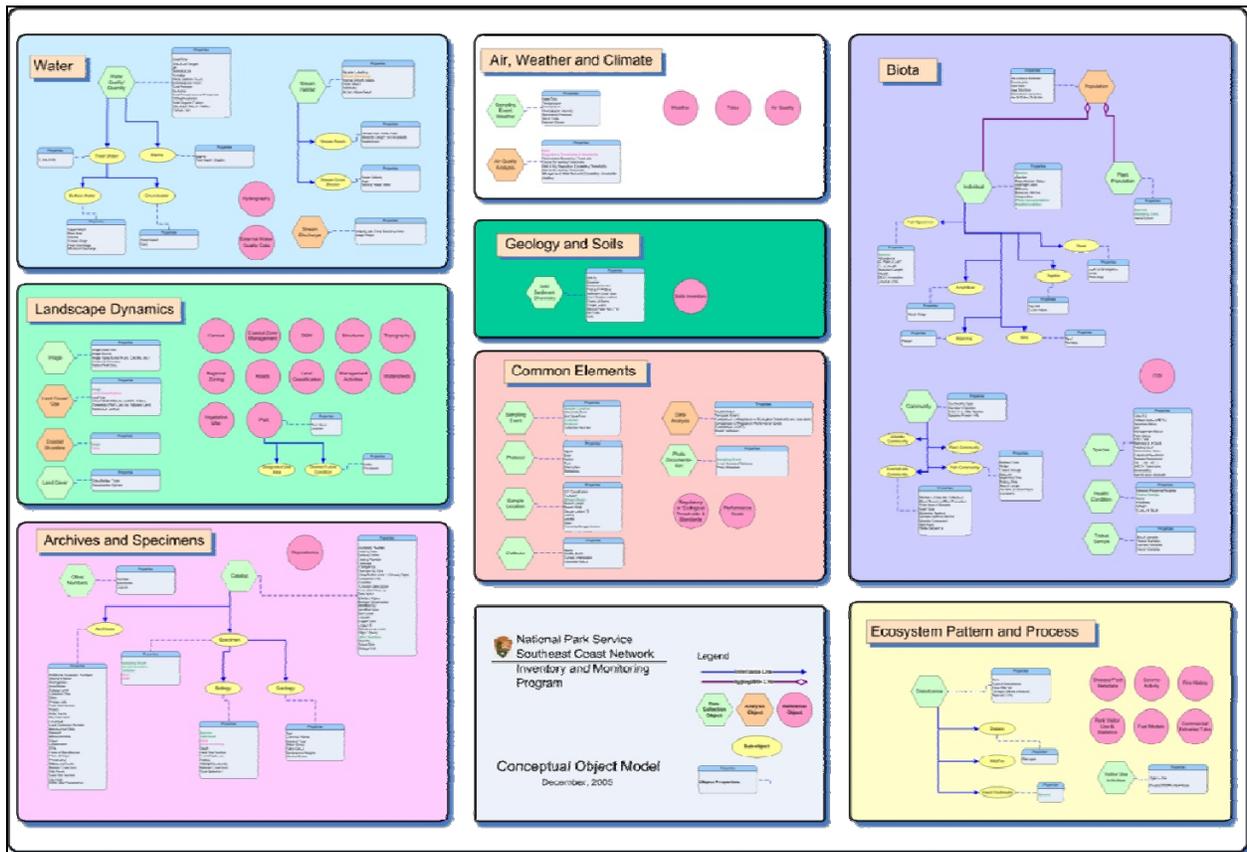




# Southeast Coast Network Information Management and Archiving Plan

## Appendices

Natural Resource Report NPS/SECN/NRR—2008/062



**ON THE COVER**

Conceptual Object Model for the Information System that will support the Southeast Coast Network.

From: DataLOGIC, Inc., 2005

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# **Southeast Coast Network Information Management and Archiving Plan**

## *Appendices*

Natural Resource Report NPS/SECN/NRR—2008/062

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Fort Collins, Colorado

The Natural Resource Publication series addresses natural resource topics that are of interest and applicability to a broad readership in the National Park Service and to others in the management of natural resources, including the scientific community, the public, and the NPS conservation and environmental constituencies. Manuscripts are peer-reviewed to ensure that the information is scientifically credible, technically accurate, appropriately written for the intended audience, and is designed and published in a professional manner.

Natural Resource Reports are the designated medium for disseminating high priority, current natural resource management information with managerial application. The series targets a general, diverse audience, and may contain NPS policy considerations or address sensitive issues of management applicability. Examples of the diverse array of reports published in this series include vital signs monitoring plans; monitoring protocols; "how to" resource management papers; proceedings of resource management workshops or conferences; annual reports of resource programs or divisions of the Natural Resource Program Center; resource action plans; fact sheets; and regularly-published newsletters.

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# Data Dissemination: Internet and Intranet Resources

*Southeast Coast Network*

*Version 1.0*

## Revision History Log:

Revision Date	Author	Changes Made	Reason for Change	New Version Number

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### ***Purpose, Scope and Applicability***

The purpose of this guidance document is to describe the internet and intranet (web) resources that the SECN utilizes to disseminate data, both internally and to the broader end-user group. National and network web resources will be described in detail, including what data will be posted to different websites. In addition, distinctions will be made between internet and intranet web resources. This document is intended to guide users to the appropriate web portal for SECN data and information – but does not provide user-guides and/or cheat sheets for the use of these online resources. User-guides and cheat sheets will be provided in other SOP's and appendices (as needed) or are already available online as part of the National Information Management systems.

### ***SECN Data and Information Dissemination Goals***

The SECN data dissemination strategy aims to ensure that:

- Data and information are easily discoverable and obtainable.
- Only certified data (data subject to complete quality assurance procedures) are released unless necessary to respond to limited/specific data requests (e.g. within network requests and FOIA).
- Distributed data and information are accompanied by appropriate documentation.
- Sensitive data and information are identified and protected from unauthorized access and inappropriate use.

### ***National Information Management Systems***

One of the primary goals of the NPS I&M Program is to make existing and new natural resource information more available and useful to a wide variety of potential end-user groups in order to facilitate natural resource management, research and education. To that end, the NPS Natural Resource Program Center (NRPC) and the I&M Program are continually developing and implementing a national-level, programmatic information management framework. NRPC and I&M staff are in the process of integrating current applications into one standardized web portal to eliminate redundant data storage and streamline standard functions across applications. This integration will start with NPSpecies, NatureBib and the Data Store (all described below) and will be expanded to include other national information management systems (e.g. NPStoret, RPRS, PEPC, and others). Thus, the current natural resource data management framework is in transition, but will be accessed following the general procedures depicted in Figure 1, below. Descriptions of the individual information management systems will be updated as this transition to a single data portal is put into practice. The descriptions of national information management systems reflect the current status of these applications, not the anticipated outcome of this transition process.

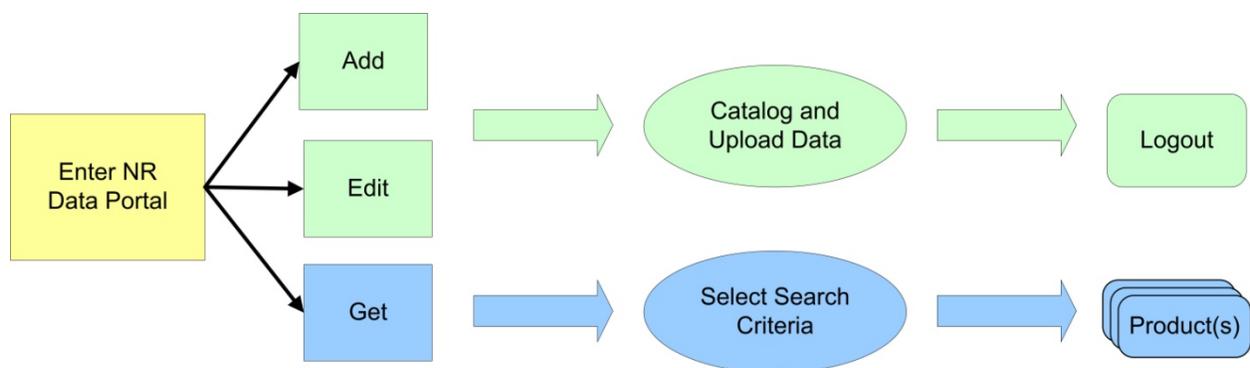


Figure 1. Natural Resource Data Portal

**NPSpecies** – NPSpecies is the National Park Service database to store, manage and disseminate scientific information on the biodiversity of organisms in National Park Service units throughout the United States and its territories. The database lists the species that occur within each park along with the accompanying physical or written evidence documenting the occurrence of the species (e.g., references and vouchers). Taxonomy and nomenclature are based on the ITIS (Integrated Taxonomic Information System) taxonomy database. NPSpecies is linked to NatureBib for bibliographic references that provide written evidence of a species occurrence in a park and will be linked to NR/GIS Metadata to document biological inventory products (e.g. reports, data sets, maps, etc.). It is required that information in NPSpecies be certified before any data are made available to the public. NPSpecies certification is the quality assurance process in which species lists, evidence, and park checklist fields (park status, abundance, residency, nativity, and cultivation) are reviewed for completeness and accuracy. SECN guidance for NPSpecies certification are available in a separate appendix: SECN Guidance for NPSpecies Certification. Additional details regarding NPSpecies can be found at:

<http://science.nature.nps.gov/im/apps/npspp/DesktopApp.htm>.

**NatureBib** – NatureBib is the master web-based database for scientific citations presented as bibliographic references. NatureBib merges a number of previously separate NPS databases dealing with natural resource related topics like air, deer, geology and paleontology. Although currently focusing on natural resource references, NatureBib may eventually be linked to references on cultural resources and other park operations. The public version of NatureBib is in development. The database will be accessible through the National Park Service's Z39.50 interface, NPS Focus. As with NPSpecies, it is possible to download data from the master web version into the MS Access desktop version that can be used locally on computers without an internet connection. Additional details regarding NatureBib may be found at:

<http://www.nature.nps.gov/nrbib>.

**NPS Data Store** – The NPS Data Store application manages and shares natural resource and GIS metadata and data generated by the Natural Resource and Servicewide GIS Programs of the National Park Service. To facilitate data dissemination to the public and throughout the National Park Service, the NPS Data Store application posts information to the NPS GIS Clearinghouse located in NPSFocus. The NPS Data Store is part of the NPS Metadata System and provides two functions: the NR-GIS Metadata Database and the NR-GIS Data Server. The NR-GIS Metadata Database is a repository of and search engine for metadata describing natural resource and GIS data. The NR-GIS Data Server hosts natural resource and GIS data (documented by the metadata in the NR-GIS Metadata Database) for download. Additional details regarding the NPS Data Store can be found at: <http://science.nature.nps.gov/nrdata>.

**NPS Focus** - The NPS Focus Digital Library is the National Park Service digital image/resource management solution sponsored by the NPS Office of the Chief Information Officer. Structurally the system is a composite of many image collections separately maintained by parks/programs but offers one-stop searching and browsing across all of them. Unlike other digital library projects in the United States,

the NPS Digital Library is completely decentralized with separate centers being set up in virtually every State and U.S territory. The NPS Focus project provides the technology infrastructure, guidance and training for the NPS. In general it does not create the digital content being added to NPS Focus. NPS Focus is available via the internet and the intranet at the following websites: <http://NPSFocus.nps.gov> (Internet) and <http://focus.inside.nps.gov> (Intranet).

**Research Permit and Reporting System (RPRS)** - Permits are required for anyone conducting on-the-ground research on a park unit. RPRS is a web-based application used by researchers, park staff, and the public for completing and tracking the steps of requesting and issuing research permits, and reporting on research accomplishments (via the IAR - Investigator's Annual Report).

**NPSTORET** – STORET is an interagency water quality database developed and supported by the Environmental Protection Agency (EPA) to house local, state, and federal water quality data collected in support of managing the nation's water resources under the Clean Water Act. STORET is used by NPS as a repository of physical, chemical, biological, and other monitoring data collected in and around national park units by park staff, contractors, and cooperators. The NPS operates its own service-wide copy of STORET and makes periodic uploads to the EPA STORET National Data Warehouse so that data collected by and for parks will be accessible to the public. NPS Director's Order 77 (<http://www.nps.gov/applications/npspolicy/DOrders.cfm>) indicates that the NPS should archive water quality data in STORET, and the NPS Water Resources Division (WRD) requires that any data collected as part of a funded WRD project get archived in STORET. NPSTORET is the NPS master database designed to facilitate park-level standardized reporting for STORET. Additional details regarding NPSTORET can be found at: <http://www.nature.nps.gov/water/infodata.htm> Additional information on STORET can be found at: <http://www.epa.gov/storet>

### ***Southeast Coast Network Information Management Systems***

Collecting natural resource data is the first step towards understanding the ecosystems within national park units. These ecosystems are evolving, as is our knowledge of them and how they function. Raw data are used to analyze, synthesize, and model aspects of ecosystems. In turn we use results and interpretations to make decisions about network park's critical natural resources. Thus, data collected and maintained by the SECN will become information through analysis, synthesis and adaptive modeling.

Because one of the goals of the I&M program is to base management decisions on scientific knowledge in a rapidly changing environment, it is incumbent on the SECN to develop tools that allow managers to make decisions on the most recent data available from as many related sources as possible. It is therefore the interpretation of the Southeast Coast Network that this necessitates the development of a single decision support system that efficiently and cost-effectively allows for concurrent analysis of data from multiple vital signs and predictive modeling (See Chapter 4 of the vital signs monitoring plan for additional information). This integration will allow the network to institutionalize quality information management practices across network parks and to build partnerships with external agencies.

Database development began in MS Access in order to address the following issues:

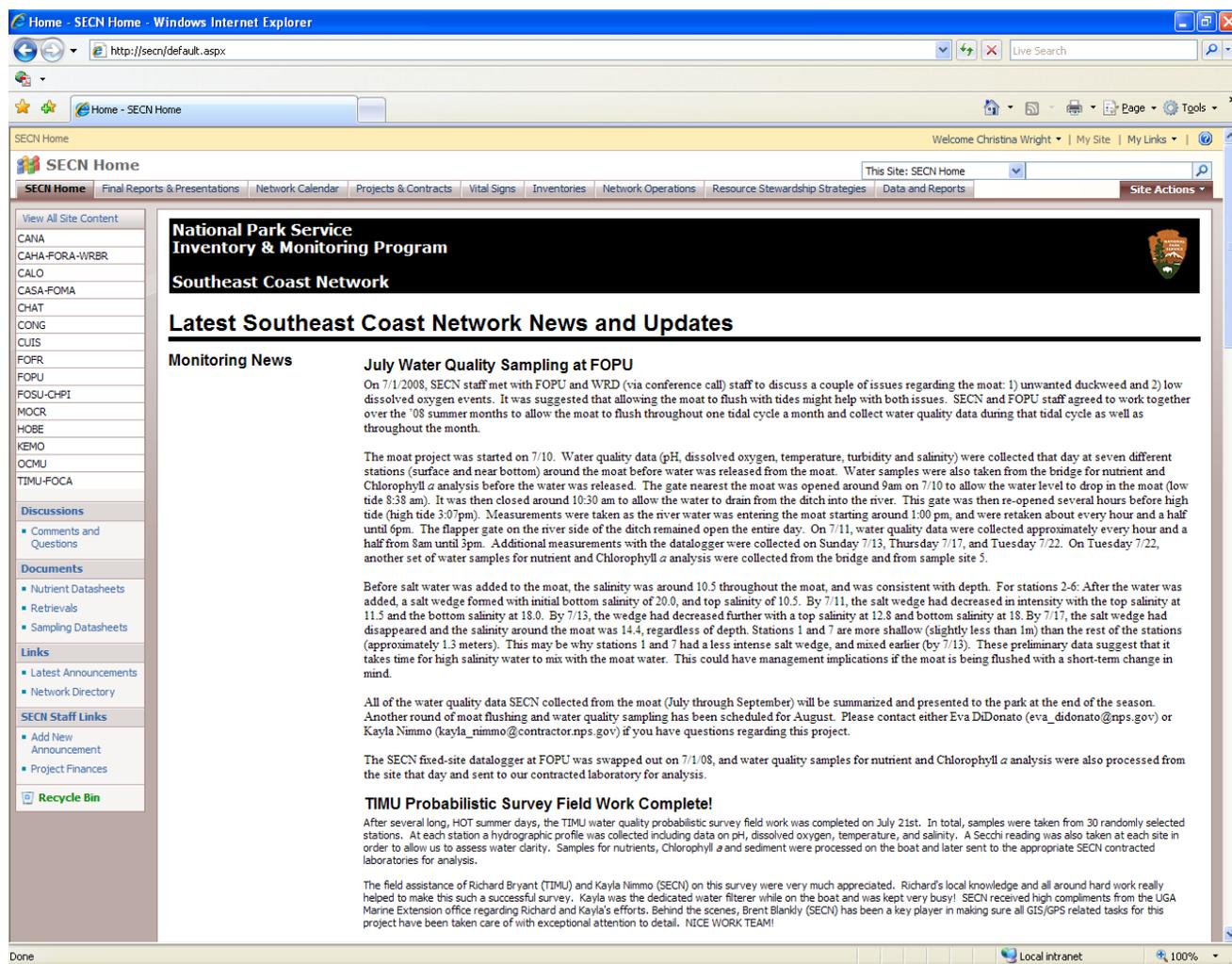
- SECN monitoring protocols are in the development or pilot testing phase. In these early stages, changes to data collection procedures and parameters are possible (if not guaranteed) and the deployment of supporting stand-alone databases will be much faster.
- Current bandwidth issues among network offices make the use of a client-server (enterprise) database solution less feasible in the short-term. Thus local, working copies of protocol databases in MS Access will better meet network needs.

Beginning in FY08, SECN staff have been working closely with the Southeast Regional Office, Information Technology Division as we migrated from MS Access to utilizing a combination of

Microsoft SQL Server, SQL Server Reporting Services and SharePoint Services to distribute information to Network and Park staff as live data.

## SECN SharePoint Services Website

The SECN currently uses Microsoft Office SharePoint Services to work collaboratively on network documents, to support data management for SECN long-term monitoring protocols and to disseminate information to SECN technical steering committee members. This website is available to NPS personnel only with access rights assigned to NPS active directory user accounts. The News page is available to any NPS personnel in the Active Directory system (<http://secn>) and the remainder of the site is available only to those given access by the site administrators. The utilization of SharePoint technologies provides many distinct advantages over other potential NPS intranet sites. Perhaps the greatest advantage is that SharePoint Services is a true content management system and in combination with SQL Server and Reporting Services, this intranet site truly becomes a one-stop shop for information by SECN staff and network park staff.



Looking along the top navigation bar of the SECN SharePoint home page, users can select from many different and inter-connected information access options: Final Reports and Deliverables, Network Calendar, Projects and Contracts, Vital Signs, Inventories, Network Operations, Resource Stewardship Strategies and Data and Reports.

## SECN Internet and Intranet Websites

The SECN recently converted its websites to adhere to the National programmatic standard provided by the Natural Resource Program Center (NRPC), Inventory and Monitoring Program. These standards help ensure that web pages across the service are developed in a consistent format that are aesthetically pleasing and provide visual and content continuity among the 32 networks. These pages are available at:

- SECN internet page is available at: <http://science.nature.nps.gov/im/units/secn/>
- SECN intranet page is available at: <http://www1.nrintra.nps.gov/im/units/secn/index.cfm>

Currently, there is very little difference between the two websites, although the intranet site contains more documents and reports that have not been finalized and therefore are not available for wider dissemination. The SECN websites are important tools in publicizing to various audiences the ongoing activities of the network. These websites also provide a portal for reports, publications, and basic descriptions of the different components of the SECN Inventory and Monitoring program – with links to more detailed information. Table 1, below, provides an overview of the content stored and/or disseminated by the various national and network information management systems described above.

Hard copy (non-digital) material (e.g. documents, photographs, data sheets) and administrative records are discussed separately as part of the Archiving chapter of the SECN Information Management and Archiving Plan.

**Table 1.**  
**Data and information products provided on national I&M and SECN websites**

<b>Web Application / Repository</b>	<b>General Description and URL</b>	<b>Example Items Available at Site</b>
NPSpecies	Database of species documented on NPS park units – focusing on vertebrates and vascular plants but includes all taxonomic groups. ( <a href="https://science1.nature.nps.gov/npspecies">https://science1.nature.nps.gov/npspecies</a> )	<ul style="list-style-type: none"> <li>- Species lists</li> <li>- Observation records</li> <li>- Link to NatureBib records</li> <li>- Natural history specimen records</li> </ul>
NatureBib	Bibliographic database of park-related natural resource information. ( <a href="https://science1.nature.nps.gov/naturebib">https://science1.nature.nps.gov/naturebib</a> )	<ul style="list-style-type: none"> <li>- Bibliographic citations</li> <li>- Electronic documents in public domain or where copyright permission was obtained</li> </ul>
NPS Data Store	The NPS Data Store application manages and shares natural resource and GIS metadata and data generated by the Natural Resource and Servicewide GIS Programs of the National Park Service. ( <a href="http://science.nature.nps.gov/nrdata/index.cfm">http://science.nature.nps.gov/nrdata/index.cfm</a> )	<ul style="list-style-type: none"> <li>- Metadata for GIS data and/or SECN datasets</li> <li>- Static datasets or data snapshots (tabular and spatial)</li> </ul>
NPSFocus	Portal to a variety of digital NPS information resources. NPS Focus consists of an integration of the Blue Angel Technologies' MetaStar 8 software and the LizardTech image management suite to search across a wide range of NPS digital collections all at once. ( <a href="http://npsfocus.nps.gov/">http://npsfocus.nps.gov/</a> )	<ul style="list-style-type: none"> <li>- The NPS Digital Library includes all image types: pictorial, drawings, maps, texts, and GIS DOQ/DRG images</li> </ul>
Research Permit and Reporting System	RPRS is a web-based application used by researchers, park staff, and the public for completing and tracking the steps of requesting and issuing research permits, and reporting on research accomplishments. ( <a href="https://science1.nature.nps.gov/research/ac/ResearchIndex">https://science1.nature.nps.gov/research/ac/ResearchIndex</a> )	<ul style="list-style-type: none"> <li>- Investigator's Annual Reports</li> </ul>

Web Application / Repository	General Description and URL	Example Items Available at Site
SECN SharePoint Website	The SECN currently uses SharePoint services to work collaboratively on network documents, facilitate the entry and/or upload of monitoring data and to disseminate information to SECN staff, Board of Director's and Technical Steering Committee members. ( <a href="http://secn">http://secn</a> )	<ul style="list-style-type: none"> <li>- Live, monitoring data</li> <li>- Metadata</li> <li>- Data Entry forms in InfoPath</li> <li>- Information products based on most recent, certified data and provisional data as circumstances warrant</li> <li>- Reports, publications, planning documents, protocols, calendars, contract information etc. (draft and final versions)</li> </ul>
SECN Internet Site	The internet site provides a portal for final reports, publications, and basic descriptions of the different components of the SECN Inventory and Monitoring program – with links to more detailed, finalized / reviewed information. ( <a href="http://www1.nature.nps.gov/im/units/secn/">http://www1.nature.nps.gov/im/units/secn/</a> )	<ul style="list-style-type: none"> <li>- SECN News</li> <li>- Reports &amp; Publications (Final)</li> <li>- Resource Briefs</li> <li>- Monitoring Protocols (Final)</li> <li>- Planning Documents (Final)</li> </ul>
SECN Intranet Site	The intranet site provides a portal for both draft and final reports, publications, and basic descriptions of the different components of the SECN Inventory and Monitoring program – with links to more detailed, finalized / reviewed information and also draft documents available for collaboration and/or comment. ( <a href="http://www1.nrintra.nps.gov/im/units/secn/index.cfm">http://www1.nrintra.nps.gov/im/units/secn/index.cfm</a> )	<ul style="list-style-type: none"> <li>- SECN News</li> <li>- Reports &amp; Publications (Draft and/or Final)</li> <li>- Resource Briefs</li> <li>- Monitoring Protocols (Draft and/or Final)</li> <li>- Planning Documents (Draft and/or Final)</li> </ul>

In summary, information will be made available to two primary audiences: public and NPS employees, as determined by data sensitivity and development status. Only fully documented, certified, non-sensitive data and data products may be uploaded to public distribution repositories or otherwise released to the public. As described above, several of the national (service-wide) information management systems, will be integrated over the next 2-5 years for access via one data portal / user interface. This integration of natural resource applications will strive to meet the following goals, while eliminating redundant data storage and streamlining standard functions across applications:

- Standardize on Core Technologies
- Introduce User-Driven Requirements
- Introduce Development Methodologies, Software/System Development Life Cycle (SDLC)
- Service Oriented Architecture (SOA) Implementation

### ***Related Topics***

There are several topics related to data distribution that are not presented in this guidance document. Please use the following additional resources for guidance on these related topics.

[SECN Digital Photo Management Strategy](#) (Photo Management)

[SECN Policies for Fulfilling Data Requests](#) (FOIA, Sensitive Information, Data Quality)

[SECN Data Processing and Lifecycle Workflow](#) (Data Processing Steps, Quality Assurance and Control)

Individual SECN Long-term Monitoring Protocols and Associated SOP's (Additional details from the above)



# Quality Assurance / Quality Control & Field Data Collection Standards

*Southeast Coast Network*

*Version 1.0*

## Revision History Log:

Revision Date	Author	Changes Made	Reason for Change	New Version Number

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## Credits:

The material in this appendix was taken or modified from content in:

Dieffenbach, F. 2005. QA / QC and Field Collection Standards. National Park Service, Northeast Temperate Network. <http://www1.nrintra.nps.gov/im/units/NETN/datamgmt/datamgmt.cfm> (Accessed on October 11, 2007).

## *Data Collection*

Careful, accurate recording of field observations in the data collection phase of a project will help reduce the incidence of invalid data in the resulting data set. Unlike a typographical error that occurs when a recorded observation is incorrectly transferred from a paper field form to a digital database, an incorrect entry in the field cannot be easily corrected. Therefore, attention to detail during data collection is crucial to overall data quality and will reduce the overall frequency and criticality of errors at subsequent stages in the data lifecycle.

Paper field notebooks or data forms have been the primary methods for ecological data collection for many years. Although paper may have advantages in terms of longevity and ease of use, it does not work well under some environmental conditions, and processing options are limited until the data are transferred into digital format. Today, many electronic data collection options are available, including handheld computers, automated data collection instruments, and tape recorders. These technologies are in limited use by the SECN, but are gaining wider user all of the time. For example, the SECN water quality monitoring has acquired many YSI data logger instruments that record data and export directly to desktop computers. Regardless of the collection method, data should ideally be transferred from one form to another only once because each transfer has the potential to introduce additional errors into the data set.

Before the data collection phase of a project begins, the science information specialist and program ecologist are responsible for developing and providing the protocols/SOPs for data collection and storage to the field crew personnel. Field sheets and field data recording procedures should be reviewed and approved by all project personnel and then officially documented in the protocol SOPs. Program Ecologists, will ensure that field crews understand the procedures and closely follow them in the field. If training is necessary, the science information specialist will work with the program ecologists to provide that training. Field technicians are responsible for proofing raw data forms in the field, ensuring their readability and legibility, and verifying and explaining any unusual entries. They are expected to understand the data collection forms, know how to take measurements, and follow the protocols.

## *Glossary of Terms*

**Automated data loggers** – Instruments with their own data acquisition systems may be used to collect some types of data, such as water quality data. These devices can be calibrated and programmed to automatically record data over extended periods of time. Data is stored in the system and ‘dumped’ directly to a computer thereby eliminating the possibility for manual data entry errors.

**Calibration, maintenance, and other requirements** – A series of checks performed on an instrument. Accurate field measurements are only possible if field equipment is regularly calibrated and maintained. Consult reference manuals and/or project Standard Operating Procedures for recommended calibration and maintenance procedures. Maintain records of equipment calibration and failures that accompany their field data whenever possible.

**Field log** – A record of decisions and events that occurred while conducting field operations.

**Training** – Project specific education conducted by the project leader focused on data collection procedures and other Protocol specific tasks. A training manual may be appropriate for long-term monitoring efforts and activities that involve a large number of field staff.

**Quantitative data quality assessments** – A periodic data quality evaluation performed during data collection activities to determine if protocols are being followed and quality objectives are being achieved. Replication of measures is a primary tool for performing quantitative assessments. Project leaders should periodically review the work of field technicians to ensure that the work satisfies all project standards.

## ***Data Collection Methods***

**Field Computers** – The use of field computers increases data collection and data entry efficiency by eliminating the need for paper field forms. Data can be downloaded directly from the field computers to office desktop computers thereby eliminating a separate data entry step. Fewer chances for error exist because QA/QC checks can be built into the field database. Field computers, however, are subject to environmental constraints such as heat, dust, and moisture – thus the use of ruggedized tablet computers are highly recommended (though more expensive).

When computers are used for data entry in the field, the data should be downloaded daily to avoid potential loss of information. No field computer should be used unless it is equipped with a removable flash memory card to store field data in case of a catastrophic failure of the field unit. Batteries should be checked prior to a data collection trip, and should be charged at the end of every field day. Also, to prevent the loss of valuable time in the field should the field computer fail, field teams should always have hard copy field data sheets with them on data collection trips.

**Palm Computers (PDAs)** – The small size and relatively low cost of these devices make them attractive options for entering field data. PDAs are better for field projects that are not overly reliant on text-based data entry intensive due to the difficulty in keying in large quantities of information into a PDA. PDAs can be ruggedized fairly easily and at a relatively low cost and most run either Windows CE or Palm operating systems. PDAs may require additional processing or programming to transfer/create the database structure to the field units.

**Automated Data Loggers** – Data loggers are mainly used to collect ambient information such as air or water quality parameters. These devices can be calibrated and programmed to automatically record data and store them for later download directly to a computer, thereby eliminating the possibility for manual data entry errors. Data loggers must be properly calibrated and maintained to protect against sensor or probe drift and instrument failure. Field crews must receive proper training and detailed SOPs outlining the calibration and unit maintenance procedures prior to working with data loggers in the field. Pre- and post-deployment calibration procedures should be part of the documentation process that accompanies all data collected for each use of the instrument in the field.

**Field Forms** – Paper field forms are the most common method of recording field data. Use a formatted, protocol-specific data sheet as opposed to a field notebook. Field notebooks are important for entering additional notes and observations. It is recommended that personnel use acid-free paper to prevent fading and subsequent data loss. In addition, some circumstances may warrant the use of paper and writing implements that can withstand moisture, dust, and other extreme environmental conditions (e.g., “Rite in the rain” paper).

Standardized data sheets that identify the pieces of information to be recorded in formats that reflect the design of the computer data entry interface will help ensure that all relevant information is recorded and subsequent data entry errors are minimized. Data sheets should contain as much basic preprinted project information as possible and have sufficient space for recording relevant metadata such as date, collectors, weather conditions, etc. They should clearly specify all required information, using examples where needed to ensure that the proper data are recorded.

Data recording personnel should adhere to the following guidelines:

- Field notes should be recorded with #0.5 pencils or waterproof (museum quality) pens to ensure long-term legibility or the ability to recover information if the writing becomes unreadable at a later date
- All information added to the data sheet must be printed and clearly legible.

- If alterations to the information are necessary, the original information should be crossed out with a single line and the new information written next to the original entry. Information should never be erased and old information should not be overwritten.
- Upon return from the field, copies of all original data sheets should be made and checked for legibility and completeness (i.e., no data cut off at the edges). Copies of the data sheets will be stored as specified in the protocol SOP; original data sheets will be used for data entry after which they will be stored in the fire proof cabinet. Copies of original datasheets should be archived offsite.
- Organization is the key to good data collection methods. Maintain a field log of important decisions and events that will help clarify information and contribute to an accurate report of the data collection procedures.

**GPS Units** – There are many different manufacturers of GPS units, however two main types of GPS units are often used during field work in SECN parks to collect location information.

- Handheld Units (e.g., Garmin) – are good for collecting general position information but are not recommended for obtaining high accuracy location information.
- Trimble GPS Receivers – are good for collecting highly accurate (submeter) location information.

Knowledge of the proper techniques for collecting GPS data is essential for collecting quality spatial data. There are multiple factors which can affect the quality of GPS data (e.g. number and position of satellites) as well as details such as units, datum, and projection without which data are rendered useless. Proper training in the use of GPS receivers is required for all personnel using SECN GPS equipment or involved in SECN GPS data collection efforts. In addition, [SECN GPS Cheat Sheets for Trimble Recon or GeoXH and Pathfinder Office](#) provide a quick reference guide for GPS users who need refresher training in this equipment.

**Cameras** – Photographs provide an excellent visual record of field visits. Cameras are useful for capturing photo point records of long-term study sites. They also serve well for automated data collection by remotely recording information using web cams or trip cameras. Digital photos should always be taken in the highest resolution possible, and should be saved in a non-compressed format (i.e., RAW or TIF). JPEG and GIF formats should not be used due to degradation of image resolution as files are manipulated. For additional information regarding data quality for digital photos and photo management, please refer to [SECN Digital Photo Management Strategy](#).

## ***Data Entry***

### **General Procedures**

Data entry is the initial set of operations where raw data are transferred from paper field forms into a computerized data entry form linked to database tables – or entered directly into a database in the field using a field computer. When data are gathered or stored digitally in the field (e.g., on a data logger), data entry consists of the transfer of data (downloading) to a file in an office computer where they can be further manipulated.

Transferring data from field projects into the computer seems to be a fairly simple task. But the value of the data depends upon their accuracy, and data quality must be verifiable and documented. Without proper preparation and some established guidelines, data quality and integrity can be questionable. Ideally, data entry occurs as soon as possible – immediately after data collection is completed or as an ongoing process during long projects. In addition, data entry should be done by a person who is familiar

with the data (and preferably the person who collected the data). The primary goal of data entry is to transcribe the data from paper records into the computer with 100% accuracy – however this is an impossible goal because a few transcription errors are unavoidable during data entry. Thus, all data or a pre-determined subset of data should be checked during a data verification process. Any data entry errors found should be corrected and will trigger a complete (100%) verification of data entered since the last data verification process.

The science information specialist, along with the program ecologist, will provide training in the use of the database to all data entry technicians and other users. The program ecologist makes certain that data entry technicians understand how to enter data and follow the protocols. Data entry technicians are responsible for becoming familiar with the field data forms and differences in handwriting. They must also become familiar with the database software, database structure, and any standard codes for data entry used by the Network. At minimum, data entry technicians should know how to open a data entry form, create a new record, edit an existing record (to correct mistakes made during data entry) and exit the database properly.

The following measures help reduce errors during data entry:

- Timeliness -- All data should be entered or downloaded into the project database as soon as possible, preferably no less than once a week. Do not delay data entry until all the project data have been collected. Downloaded data should be periodically stored on CD or some other semi-permanent media.
- Design efficient data entry forms – A data entry application that resembles the field data forms can effectively reduce manual data entry errors due to the 1:1 correspondence of the attributes.
- Devise a way to distinguish validated data from newly entered data – Data may be entered into an empty database, a temporary table, or simply flagged to distinguish data that has been checked. Regardless of the strategy, the process for validation must be clearly documented.
- Build automated error checking features into the database. Data entry forms can incorporate auto-filled fields, range limits, pick lists, and spelling checks to reduce potential errors. Forms can also be designed to control access to the database (i.e., forms may be set for data entry only, which prevents accidental deletion or alteration of existing data) and control the sequence of data entry (i.e., certain fields require an entry before more information can be entered).
- Organize data entry area – The workspace where data will be entered should be free of unrelated material, and should enable data entry staff to organize their forms and equipment. The same guidelines apply to the verification and validation phases.
- Have two data entry technicians available for data entry. Although not required, when one technician reads the data off the field data forms and another enters them into the computer, the work is often faster and results in a lower error rate. If only one person is available, he/she should work at a slower pace to avoid errors. Like many monotonous tasks, data entry can be done in a personal rhythm that eases the work for some people.

## Specific Procedures

The following specific procedures will help minimize data entry related problems:

1. Field staff must be familiar with the data forms: Forms that are new or staff that are not acquainted with existing forms present potential data entry challenges that are nearly 100% avoidable. Prior to introducing new forms, or expecting new staff to use existing forms, the program ecologist and/or science information specialist must familiarize field personnel with the data entry forms, and thoroughly explain all aspects of the forms.

2. Standardized Value Coding: Establish codes that will be used in specified fields to promote consistency. Only values contained in the code list for a field are acceptable. Null values should be identified with a predetermined value. For example, “N/A” may be used for values that are Not Applicable, and “None” may be used when no items were observed or when a measurement was not taken.
3. Print. DO NOT WRITE IN CURSIVE. Handwriting ranges widely in quality and legibility. To minimize difficulties standard “Block” printing is required.
4. Establish Book-marking Procedures: Data are entered in one logical set at a time--usually one complete field form. Each paper form should be initialed after its data are entered to avoid confusion about whether it has been processed. A colored pen is good for this purpose. Data entry should be interrupted only at logical stopping points -- identifying acceptable stopping points to prepare for interruptions or the end of the work day. The best stopping point is at the completion of the entry of any single, complete field form rather than in the middle of a logically single operation.
5. Transcription Notes, Comments, and Questions: Errors or questions about the data content can be recorded on separate, but associated data entry comment forms. Data entry comment forms must include a mechanism to relate the remarks back to the originating data.
6. Print a hardcopy of the data: A copy of all the entered data should be printed for later verification. The print should contain record identifying fields, and should be printed in the same order as it was entered to help reconcile field form and entered data. Verify that ALL the data were printed (i.e., none is off the right margin) and are readable (font size and attributes).
7. Data Entry Documentation: The name of the operator and the date of entry should be indicated on a cover sheet or other suitable location. The identical information should be recorded at the top of the printout of the entered data. The field data and the printout are kept together from this point on for use in data verification.

### ***Data Verification and Validation Procedures***

Data contained in a database must be evaluated by verifying and validating it against the values present on the original field forms. As a rule, fewer problems are identified during the verification and validation process when preceded by effective quality assurance practices. Like the data entry phase, the process of verification and validation should follow a protocol specific Standard Operating Procedure (SOP) manual. Failing to follow SOPs for data entry, validation, and verification may render a dataset suspect. The science information specialist and the program ecologist will work together to establish verification and validation procedures. The program ecologist will ensure that the procedures are followed.

Verification follows data entry and involves checking the accuracy of the computerized records against the original source, usually hard copy field records, and identifying and correcting any errors. When the computerized data are verified as accurately reflecting the original field data (i.e., the entered data matches the collected data), the paper forms can be archived and most data manipulation can be done on the computer.

Although data may have been correctly transferred from the field forms, the values contained in the dataset may lie outside the acceptable range of values. For example, entries of stream pH of 25.0 or a temperature of 95°C in data files raise doubt about their accuracy; and such entries almost certainly are incorrect, whether or not they were properly transcribed from field forms. The process of reviewing data for range and logic errors is validation.

## Data Verification – General Procedures

The effectiveness of the following methods is correlated with effort -- the methods that eliminate the most errors are time consuming and costly, while the simplest and cheapest methods will not be as efficient at detecting errors.

- Visual review at data entry – The data entry technician checks each record after it is input. The values recorded in the database are compared with the original values from the hard copy and any errors are corrected immediately. This method is the least complicated since no additional personnel or software is required. The reliability of this method depends wholly on the person keying the data and is generally the least reliable of the data verification methods.
- Visual review after data entry – All records are printed following completion of data entry. The values on the printout are compared with the original values from the hard copy. Errors are marked and corrected in a timely manner. The reliability of this technique can be improved by using multiple people to perform the review. For example, one technician reads the original data sheets while the second checks the corresponding value on the data sheet.
- Duplicate data entry – All data is entered as normal, then a predetermined number of records are randomly selected and re-entered into a replica of the primary database. The two record sets are compared and errors are corrected. The success of this method increases as the number of randomly selected values is increased.
- Summary Statistics -- Simple statistical summaries using the entered data can be used to count the number of sampling sites, plots per site, or dates per sample. Other aspects of the dataset can be explored to find clues to errors. The more checks devised to test the completeness of the data, the greater the confidence that the data are completely verified.

## Data Verification – Specific Procedures

In the following outline, it is assumed that a pair of people are working together. The checker needs a red and green fine-tipped marker for identifying errors and for indicating corrections. The reader also needs a marker (green is good). Straight edges make reading aligned tabular data much easier. A notepad should be kept handy for making notes that may be useful during validation.

1. Compare entered data with field forms: Two people work together to compare the entered data with the field form data. One person reads the original data (field forms) while the other individual “verifies” that the entered data matches the original. The three most common errors that will be detected are: duplicated records (entered twice); missing records (inadvertently skipped during entry); and, misspellings (wrong number or code). When an error is found, the correction to be made is highlighted in red on the printout, NOT on the original data sheets.
2. Certify verification: After verifying the data from each field sheet, the reader should date and initial the original field form at the top (or where indicated), stating that verification was done. The reading and checking is continued until all the data sheets in a data set are compared. Thereafter, an original set of data sheets with completion marks (both entry and verification) and a set of printouts with needed corrections marked in red are available.
3. Correct errors: Locate problematic errors one-at-a-time and make appropriate corrections. Do not rely on “search and replace” features – they may inadvertently introduce “other” undesirable problems. As each correction is made, a second mark (green) will be added to the red mark on the printout signifying that the record was corrected. When all identified errors are corrected in the computer file, the printout is inspected again for any corrections that were missed (red without green check). Finally, the printout is initialed and dated at the top to indicate that all errors were

corrected. The printout is saved with the original field form to document that this portion of the verification process was completed.

4. Summary analyses. Entered data can be summarized to identify duplicate or omitted entries. For example, the number of records, the number of sampling sites, samples per site, or sites per date can be viewed. If the results differ from the known number from the field forms, additional investigation would be necessary. The same question can be posed in different ways; differences in the answer provide clues to errors. The more checks you can be devised to test the completeness of the data, the greater is the confidence that the data are completely verified.

### ***Suggested Methods – Data Validation***

General step-by-step data validation instructions are not useful because each data set has unique measurement ranges, sampling precision, and accuracy. Nonetheless, validation is a critically important step in the certification of the data, and will be accomplished by the Program Ecologist after verification is complete. Certain components of data validation can be built into data entry forms (e.g. range limits), while additional data validation can be accomplished during verification. As a general rule, invalid data commonly consists of slightly misspelled species names or site codes, the wrong date, or out-of-range errors.

The following general methods may be used to validate data, though specific procedures for data validation depend upon the specific monitoring protocol and will be documented in that protocol's data management SOP documents.

- Data entry application programming – Data entry forms can be designed to reject unacceptable values. The simplest validation during data entry is range checking.
- Outlier Detection – Values that are unusually large or small with respect to the majority of collected data. Database, graphic, and statistical tools can be used for ad-hoc queries and displays of the data. Histograms, line plots, and basic statistics reveal possible logic and range errors. Such exploratory techniques identify obvious outliers, however the challenge in detecting outliers is in deciding how unusual a value must be before it is rejected. Data quality assurance procedures should not aim to eliminate outliers. Eliminating data contamination may be a better way to describe this quality assurance goal. When an outlier is detected, attempts should be made to determine if data contamination is responsible. Some values may appear unusual but prove to be quite valid after thorough investigation.
- Catalog the error types found in each data set – When particular validation errors are found, it is important to catalog them in an error log for that data set. Notes on the error(s) should include a description, how detected, and how corrected. Simple, generic errors and more esoteric and cryptic errors must be documented. This list of errors is a valuable reference for the next validation session and ultimately for building formal validation procedures into the data entry process and other automated, post-entry error-checking routines.
- Summary Statistics -- Simple statistical summaries can be used to assess the validity of the data. The more thoroughly a dataset is tested the more certain we will be that the data are valid.
- Modify field data forms to avoid common mistakes – After validating a dataset, and equipped with a catalog of validation errors and exploratory data results, field data forms and field procedures should be evaluated. Often minor changes, small annotations, or adding check boxes to a field form remove ambiguity about what to enter on the form. In fact, repeated validation errors suggest that the field form --not the field crew-- is usually the cause. Repeated validation errors can also mean that protocol(s) or field training is faulty, which must be recognized and corrected.

- Rectify ALL instances of Invalid Data – A vitally important, but easily overlooked validation step involves correcting erroneous or invalid data at the source. This involves retrieving the original record and any copies to correct and annotate the errors that were found and fixed in the digital files. Without annotating the original field forms, the digital and paper records will not be consistent and can easily render the entire data set suspect.

## ***Version Control***

The SECN manages data files from a multitude of sources, comprised of many formats as raw data are transformed to ‘provisional’ and ‘certified’ status (Please refer to Chapter 5 of the SECN Information Management and Archiving Plan for an explanation of these data categories). Until data have gone through a complete QA/QC review, they may be considered ‘working’ data and thus may exist in different states over time. Determining the status of a single file can be difficult if no clear method has been developed to indicate level of review and completeness that a particular file has gone through. In contrast, determining the status of a current file within a series of similarly named files can be almost impossible. Version control is the process of documenting the temporal integrity of files as they are being changed or updated. Change includes any alteration in the structure or content of the files, and such changes should not be made without the ability to undo mistakes caused by incorrect manipulation of the data. Whenever a data set has gone through a particular QA/QC review, the file should be saved with a unique name, a simple act that should become routine for all data handlers.

Several options for version control may be used, including: dates, dates and time, sequential numbers, and database software with version control. The SECN has implemented the date/time method for versioning data sets and builds this capacity into all database backup utilities. For example, prior to any major changes to a database, the latest version of the file should be stored with the appropriate version number to allow for the tracking of changes over time.

General guidelines for version control file naming are as follows:

<project\_file>\_<QA/QC\_status>\_<date>\_<time>.<ext>

Where:

<project\_file> = the name of the established base file name

<QA/QC\_status> = data status, e.g.: “RAW”; “PROVISIONAL”; “CERTIFIED”

<date> = The date of the file, as YYYYMMDD.

<time> = The time the file was saved as military short time HHMM

<ext> = the file extension, such as .mdb, .xls

For example:

CUISplum\_YSIdata\_CERTIFIED\_20051231\_1637.mdb

With proper controls and communication, versioning ensures that only the most current version of a data set is used in any analysis. Again, version control typically applies to working data sets that are being verified and validated by program personnel – or when major upgrades to a database occur and the older version is being archived. Certain verification and validation steps will not require versioning of the database itself, but will be built into the database structure itself through tools and applications.

## ***QA/QC Review and Communication***

QA/QC review is required prior to communicating/disseminating data and information. Only data and information that adhere to NPS quality standards will be released. Brunt (2000) identifies a series of checks that should be performed during the QA/QC process and associates each with four distinct project segments: design; acquisition; metadata; and, archive. The Southeast Coast Network has adopted the checklist presented by Brunt (Table 1) and has integrated it into the data certification process, generating a record of the QA/QC checks that have been performed, who performed the checks, the date the check was performed, and any comments that were recorded for each check. QA/QC reports will be

permanently archived with other project information. Data documentation and metadata will be used to notify end users, project managers, and network management of data quality. A descriptive document for each data set/database will provide information on the specific QA/QC procedures applied and the results of the review. Descriptive documents or formal FGDC-compliant metadata will document quality for spatial and non-spatial data files posted on the Internet.

**Table 1. Quality assurance and quality control procedures that are associated with data design, data acquisition, metadata development and data archival phases in a comprehensive data management system (From Brunt, 2000).**

Quality assurance and quality control (QA / QC)	Design	Acquisition	Metadata	Archive
Check that data sheets represent experimental design	X			
Check that measurement units are defined on the data sheet	X			
Check that attribute names meet protocol standards	X			
Check that date, site and coded values meet standards	X			
Check that attribute names and descriptions are provided	X			
Check that data are complete		X		
Check that data entry procedures were followed		X		
Check that data include time, location and collector(s)		X	X	X
Check that measurement data are within the specified range		X		
Check that data values or codes are represented correctly		X		
Check that data are formatted correctly for further use		X	X	X
Check that data table attribute names are reasonable		X	X	X
Check that the data table design reflects experimental design		X	X	X
Check that values for each attribute are represented one way		X	X	X
Check that errors and corrections are recorded		X	X	X
Check that metadata are present			X	X
Check the metadata content for accuracy and completeness			X	X
Check that the data dictionary is present and accurate			X	X
Check that measurement units are consistent		X	X	X
Check that data and metadata are complete				X

### ***Feedback***

Quality assurance procedures may require revision if random checks and data audits reveal an unacceptable level of data quality. However, quality checks should not be performed with the sole objective of eliminating errors, as the results may also prove useful in improving the overall process. For example, if the month and day are repeatedly reversed in a date field, the data entry technicians may require retraining about the month/day entry order. If retraining is unsuccessful in reducing the error's occurrence, the computer program may need to be rewritten so that month and day are entered separately, field length limits are enforced, or a pick list is created. In this manner, the validation process will serve as a means of improving quality as well as controlling the lack of quality.

Edwards (2000) suggests the initiation of quality circles, regular meetings of program ecologists, the science information specialist and other data management personnel for discussing data quality problems and issues (Edwards 2000). These meetings promote teamwork attitudes while focusing brainpower on data quality issues. Participants become more aware of quality issues and learn to anticipate problems.

Moreover, all participants develop a greater appreciation of the importance of their role in data quality and the entire monitoring effort.

The Network intends to evaluate each project by conducting post-project reviews with cooperators, project leaders, Network staff, and others familiar with the project to identify notable project successes as well as elements that could be improved. For projects that are anticipated to continue for long-periods, similar assessments will be performed with cooperators, Network staff, and others familiar with the project to identify notable successes as well as elements that warrant a mid-project correction.

### ***Audits and Quality Control***

Periodic data audits and quality control checks help ensure that data quality procedures specified are effective and/or are being utilized.

Periodic checks may include verification of the following:

- Data collection and reporting requirements have been met;
- Data collection and reporting procedures are being followed;
- Verification and validation procedures are being followed;
- Data file structures and maintenance are clear, accurate and according to plan;
- Revision control of program documents and field sheets is adequate;
- Calibration and maintenance procedures are being followed;
- Seasonal and temporary staff have been trained in data management practice;
- Metadata collection and construction for the program is complete;
- Data are being archived and catalogued appropriately for long term storage;
- The results of these quality assessments are documented

### ***Backup and Archiving***

Losing data at any stage of a project is frustrating, but to lose some or all of a data set after it has passed a comprehensive QA/QC process is inexcusable. To prevent this from happening, the following minimal steps shall be followed:

- Field forms shall be systematically organized and stored on a regular basis. For example, data may be organized according to sampling date, with all forms from each date combined and sealed in folders;
- Working copies of original field forms shall be made shortly following data verification and stored separately from the originals. One set of copies shall be forwarded directly to the Network Science Information Specialist;
- Electronically acquired data shall be downloaded from the collection device on a regular basis, preferably on a daily basis. Dedicated data loggers will utilize more extended download periods. Upon download, data will be sent to the Science Information Specialist via CD, over email and/or copied to the network's data server.
- Following data verification, copies of electronic data sets shall be burned to CD's or other removable storage media and/or copied to the network's data server and notification sent to the network Science Information Specialist

*Literature Cited*

Brunt, J. W. 2000. Data management principles, implementation and administration. Pages 25-47 in W. K. Michener and J. W. Brunt, editors. Ecological data: Design, management and processing. Blackwell Science, Malden, MA.

Edwards, D. 2000. Data Quality Assurance. W. K. Michener and J. W. Brunt, editors. Ecological data: design, management, and processing. Blackwell Science, Malden, MA.

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# GPS Cheat Sheets for Trimble Recon/GeoXH and Pathfinder Office

*Southeast Coast Network*

*Version 1.0*

## Revision History Log:

Revision Date	Author	Changes Made	Reason for Change	New Version Number

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**Credits:** Graphics and material presented in this appendix were taken or summarized from the following documents:

- Trimble Navigation Limited. April 2005. TerraSync Software Reference Manual Version 2.50 Revision A.
- Trimble Navigation Limited. April 2005. GPS Pathfinder Office Getting Started Guide Version 3.10 Revision A.
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## Recommended Citation:

McCort, S. 2006. GPS cheat sheets for Trimble Recon or GeoXH and Pathfinder Office. National Park Service, Southeast Coast Network Inventory and Monitoring Program.

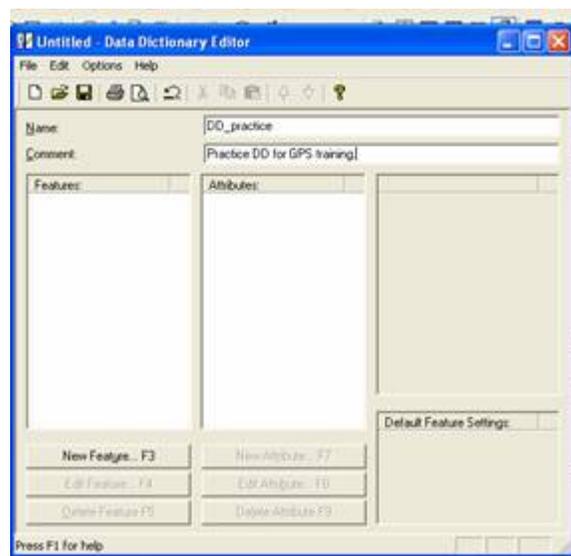
## *Creating Data Dictionaries in Pathfinder Office (Version 3.1)*

### Getting Started:

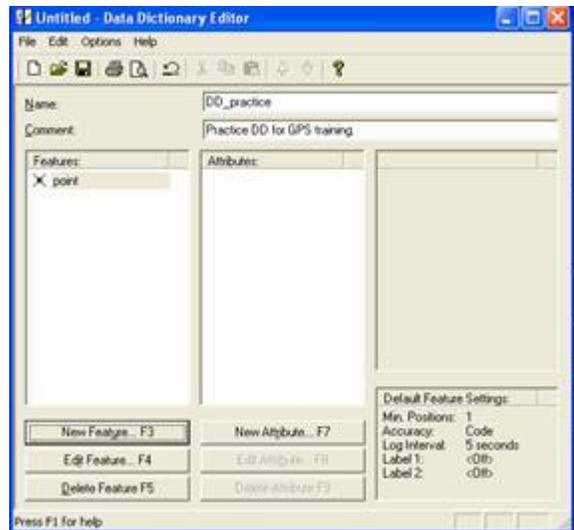
- Open GPS Pathfinder Office, select a project, click **OK**.
- Click the **Utilities** menu, then click on **Data Dictionary Editor**. You should see a new data dictionary editor window.
- Start here to create a new data dictionary. To edit an existing data dictionary, click on the 'open' icon and browse to appropriate location.

### New Data Dictionaries:

- Type in a data dictionary name and comments. Comments will not show up when the data dictionary is loaded in the GPS unit. Try to keep the name short and descriptive.
- **TIP:** Data dictionaries are able to store many features. This allows you to collect comprehensive data in the field. To add a new feature, click the **New Feature** button.



- Select the feature type (point, line or polygon), type in a feature name, and any comments needed. **TIP:** Each feature will become a GIS file (shapefile) when data are exported. Use GIS file naming conventions (less than 8 characters, no spaces, no special characters except underscores).
- Click on the default settings tab. Choose a logging interval (usually 1 or 5 seconds for points and 5 seconds for lines and areas). Leave all other settings as default.
- If desired, click on the symbol tab or line style tab and choose a symbol or line style for the feature. Click **OK**. The feature should now appear in the left window of the editor:



- The feature has been created – time to add feature attributes. TIP: Each attribute will become a column in the feature’s table once the feature is exported to a GIS file. The records for the columns will come from the data that you input when you’re out in the field. Click on the New Attribute button.
- Now you are asked to select a type of attribute. Below is a table with descriptions of each attribute type:

Option	Description	Use this option to...
Menu	Menu attributes have a small definable set of values. These values can be strings of letters, numbers, or other characters.	select a single value from a list of possible values.
Numeric	Numeric attributes allow only a decimal or whole number to be entered while collecting a feature.	enter only numeric values.
Text	Text attributes allow a string of letters, numbers, and other characters to be entered while collecting a feature.	enter any information or value.
Date	Date attributes allow a date to be entered while collecting a feature.	collect a date value.
Time	Time attributes allow a time to be entered while collecting a feature.	collect a time value.
File Name and Separator	See help topic in Pathfinder Office.	Not commonly used.

- TIP: For attribute names, use database naming conventions: less than eight characters, no spaces, no special characters except underscores.
- TIP: Menu attributes are very handy in the field because the user inputs attribute data from a pick list instead of having to type in data. Try to use menu attributes as much as possible, and always include an “other” in the pick list options.
- TIP: Always have a “Notes” or “Comments” attribute for each feature (at least 50 characters in length).

- TIP: If you want to use the same attributes for multiple features in a data dictionary, you will have to set them up each time you create a new feature (a little time consuming, but remember the data dictionary is created once at the beginning of a project).
- The best way to understand and learn how to create a data dictionary is to practice creating one. Please refer to the SECN Creating a Data Dictionary Exercise for more practice in creating data dictionaries.

### *Steps for Transferring a Data Dictionary from the Computer to Datalogger*

#### **Connecting to the computer:**

- Connect the datalogger to the computer either by placing the device in its cradle or with the USB cable provided. Microsoft Activesync will automatically open.
- You'll be prompted to set up partnership. Do NOT synchronize your device with the computer. Either select 'Guest Partnership' or cancel out of any windows prompting you to set up a partnership.
- You should now see a window indicating that you've successfully connected the datalogger to the computer.
- Minimize this window and continue with the next step.

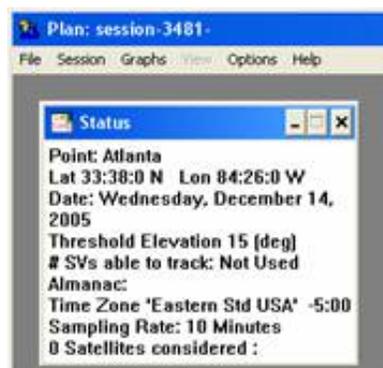
#### **Transferring the Data Dictionary in Pathfinder Office:**

- Open up Pathfinder Office. Navigate to the project that you've been using and hit 'OK'.
- Click the Utilities menu and select Data Transfer. The Data Transfer window will open up and the connection between Pathfinder Office (PO) and the datalogger will automatically establish itself. If this does not happen, make sure "GIS Datalogger on Windows CE" appears under where it says "Device".
- In the Data Transfer window, click on the Send tab (for sending files from the computer to the datalogger).
- Now click the Add button and select Data Dictionary. Navigate to where your data dictionary is stored and click Open. The Data Dictionary file should appear in the 'Files to Send' window as shown below. Then click the Transfer All button. Once the file is transferred, you will see a window that says 'Transfer Completed'. The Data Dictionary is now in the datalogger and ready for use in the field.

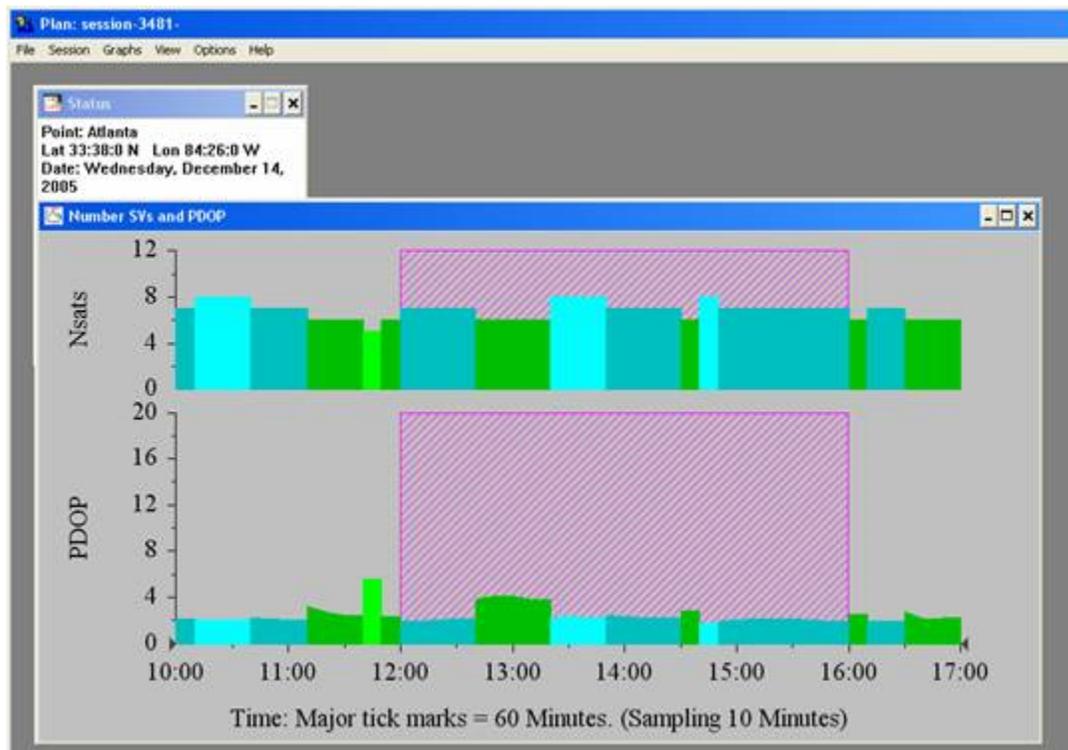


### *Downloading an Almanac for Quick Plan in Pathfinder Office*

- Using your favorite web browser, navigate to: <http://www.trimble.com/gpsdataresources.html>
- Click on GPS almanac in ssf file format link.
- A download window will open. Click Save.
- Rename the file 'Almanac.ssf'. Then save the file to the following location: C:\Program Files\Common Files\Trimble\Almanacs
- Click YES when it prompts you to overwrite the existing file. Now there is a current almanac ready for use in Quick Plan.
- In order for Quick Plan to be accurate, a current almanac file must be available. Almanac files are current for thirty days, so if an almanac file has not been downloaded either from the datalogger during data transfer or from Trimble.com within thirty days, follow the steps outlined above then proceed to the steps below.
- Open Pathfinder Office and close the window prompting you to select a project (a project folder isn't needed to view Quick Plan).
- Click Utilities > Quick Plan
- A calendar box will pop up. You can use Quick Plan to plan GPS outings in advance of up to thirty days from the current almanac. Select a date and click OK.
- Now a cities box will pop up. Select the appropriate proximate city. Click OK. You should now see a status box.



- From this screen, select Graphs > Number SVs and PDOP. This will bring up two bar graphs: the top graph is Number of Satellites versus Time and the bottom graph is PDOP versus Time.
- To highlight specific time periods on the graphs, click Options > Auto Time. You can set parameters for number of satellites and PDOP for specific time periods. Once you've set the parameters, click OK. You will see a box listing time intervals that meet your parameters as well as highlighted segments on both bar graphs (seen below).

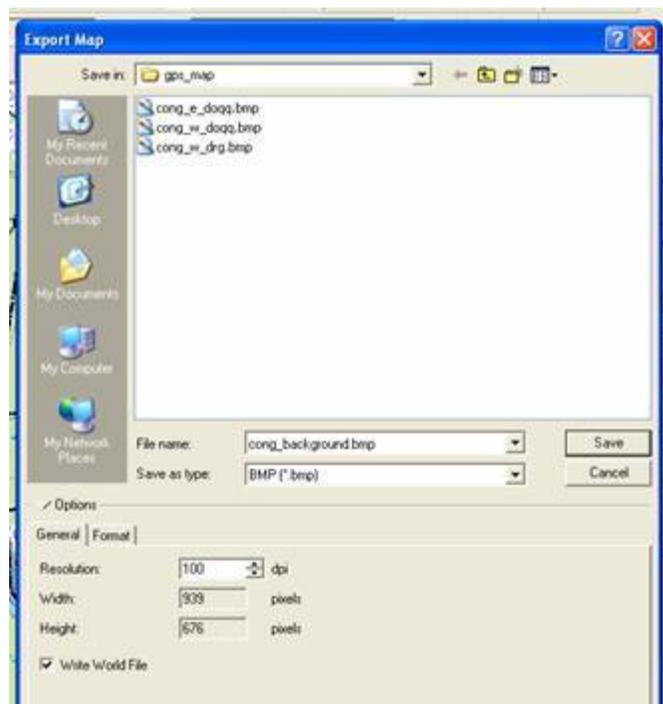


### ***Steps for Loading a Background Map to the Trimble Recon or GeoXH Datalogger:***

#### **In ArcMap:**

- Make sure the data frame is in the appropriate projection / coordinate system and datum for the area of interest.
- Create the background map. The map can have several layers such as trails, boundary, streams, aeriels, etc.
- Export the map as a bitmap image with a world file (here's where it gets a little tricky). Follow these steps to export the bitmap image with a world file:
  - Click 'File' and 'Export Map'.
  - In the Export window, use the 'save in' dropdown to navigate to the designated location for the background map.

- For 'Save as Type' dropdown, make sure BMP (\*.bmp) is selected.
- Under 'Options' create the world file by checking the box next to where it says 'Write World File'. If desired, change the resolution and click 'Save'.
- The image is almost ready to be loaded into the datalogger, but one more step must be completed first – changing the file extension of the world file from .bpw to .wld. Use Windows Explore to navigate to the bitmap image. The image has two files associated with it - .bmp and .bpw. Change the .bpw to .wld by renaming the file. It should now be ready to send to the datalogger. Note: You must be able to see the file extensions in Windows Explore to change the extension by renaming the file. If you are not able to see the file extension go to the Tools menu in My Computer, click Folder Options, click the View tab, and clear the Hide extensions for know file types check box.



### Connecting to the computer:

- Connect the datalogger to the computer either by placing the device in its cradle or with the USB cable provided. Microsoft Activesync will automatically open.
- In the 'New Partnership' window, you'll be prompted to set up partnership. Do NOT set up a partnership. Either cancel the sync window or select 'Guest Partnership' and click 'Next'.
- You should now see this window indicating that you've successfully connected the datalogger to the computer:
- Minimize the window and continue with the next step.

### Transferring the Background to the Datalogger:

- Open up Pathfinder Office. Navigate to the project that you've been using and hit 'OK'.
- Click the Utilities menu and select Data Transfer. The Data Transfer window will open up and the connection between Pathfinder Office (PO) and the datalogger will automatically establish itself. If this does not happen make sure the "GIS Datalogger on Windows CE" is selected under Device.

- In the Data Transfer window, click on the Send tab (the computer is sending files to the datalogger).
- Now click the Add button and select Background.
- Click the Add button and navigate to where the bitmap image is located. Click on the image and click Open.
- Set the projection/coordinate system and datum to match the background map by clicking on the Change button.
- Click OK. The file should appear in the data transfer window.



- Click the Transfer All button. Once the file has transferred you will see a window that says 'Transfer Completed'.

### ***Collecting Data Using TerraSync on a Windows CE Device***

1. Assemble the GPS Unit. Some units will have dataloggers and receivers separate from each other (ProXR), and in others the receivers are integrated into the dataloggers. (GeoXH or GeoXT).
2. Starting TerraSync: Turn on the datalogger. The opening page looks is very similar to most Windows pages.
  - Tap on Start > TerraSync. (or Start > Programs > TerraSync if TerraSync is not on the Start Menu).
  - TerraSync will open up to the status screen shown below. If the skyplot is not showing, click the top drop down menu (upper left corner) and click on 'Status', and then right below, on the second drop down menu, click 'Skyplot'.
  - Move to a clear view of the sky. In a few minutes the GPS unit will start tracking satellites, and the skyplot screen will show satellite and PDOP status.

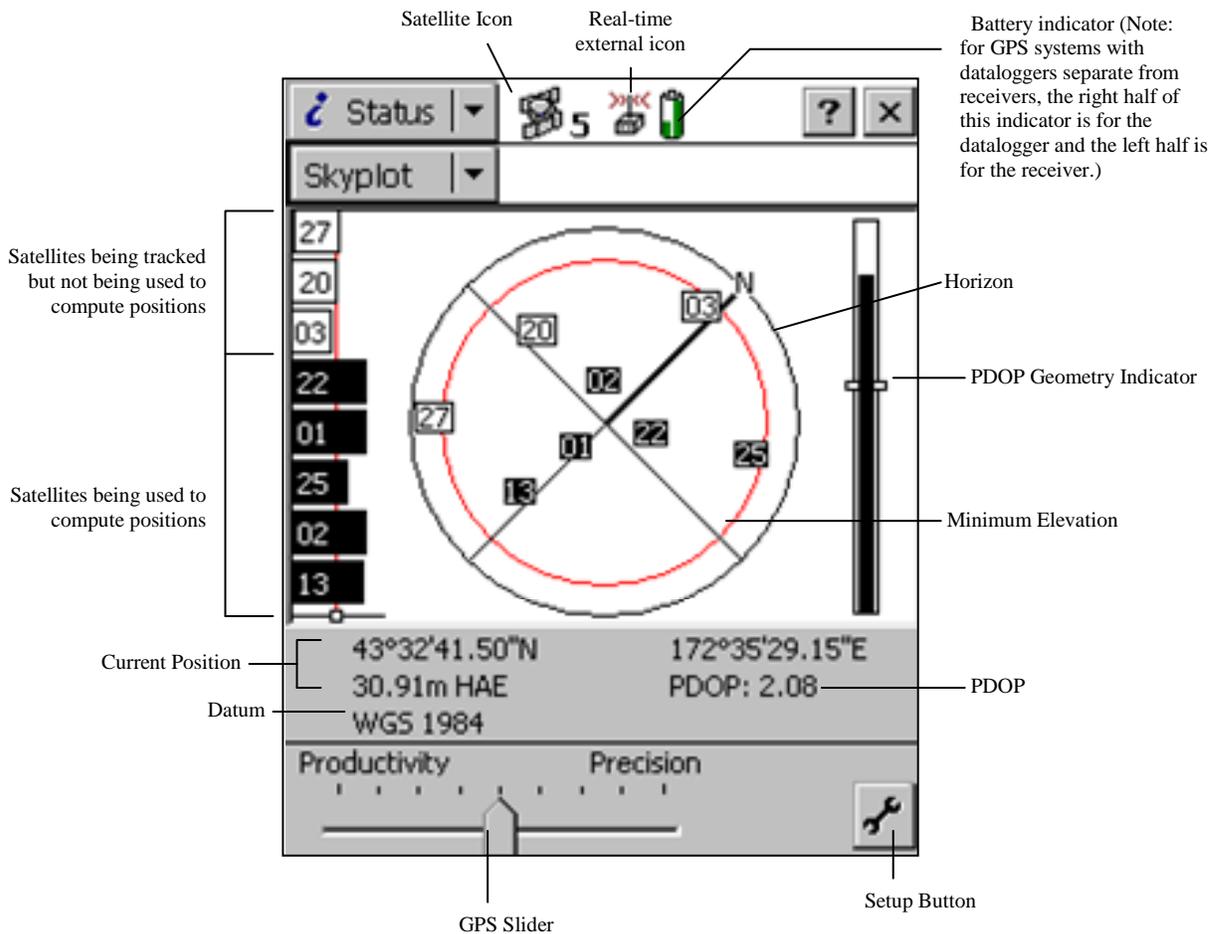


Figure 1: Skyplot screen in TerraSync

3. Set the critical settings for your GPS mission:
  - Using the stylus, click the arrow next to the Status icon (upper left corner of the screen), and choose Setup from the drop down list.
  - Click on the GPS Settings button, located in the center of the screen.
  - TerraSync has an accuracy slider bar that will globally adjust the critical settings to allow for either easier data collection or more precise data collection. Slide the bar back and forth to see how it changes the PDOP mask and other values listed below the bar.
  - Now disable the accuracy slider bar by un-checking the box next to the bar. We will input our settings manually.
  - Change the values of the critical system settings to those listed below. Do this by clicking in the values box, and then highlighting the value listed in a drop down menu, or by typing in the appropriate value with the keypad. (If the keypad does not show, tap on the keyboard icon at the bottom of the screen.) Use the slider bar to the right of the screen to scroll down or up.

DOP Type	PDOP
Max PDOP	6.0
Min SNR	39.0
Min Elevation	15°
Velocity Filter	Off
NMEA Output	Off

When you are finished, tap OK. This should bring you back to the main Setup Menu. Now tap the Logging Settings button. Make the following changes, if necessary:

- Log Velocity Data: No
- Log SuperCorrect Data: Yes
- Log QA/QC Data: No
- Antenna Height: Height (in meters) of the top of the antenna while you are wearing or holding your GPS unit (so that the positions you record are at your feet).
- Allow Position Update: Confirm
- Confirm End Feature: Yes
- Filename Prefix: Default is 'R' for Rover. Change this if you have multiple GPS units – type a unique prefix for each one.
- Between Feature Logging Style: Time
- Interval: 1s or 5s

When you are finished, tap OK. This should bring you back to the main Setup Menu. Now tap the Real-time Settings button. Make the following changes, if necessary:

- Choice 1: Integrated Beacon (if available)
- Choice 2: Integrated WAAS or SBAS (if available)
- Choice 3: Use Uncorrected GPS

GeoXH receivers will only have the option Integrated WAAS or SBAS for real-time corrections and not all receivers will have integrated real-time differential GPS capabilities. When you are finished, tap OK. This should bring you back to the main Setup Menu.

Now tap the Coordinate System button. Set the coordinate system to match the background file exported from ArcMap. Below is an example of parameters:

- System: UTM
- Zone: 16, 17, or 18 North
- Datum: NAD 1983 Conus (Cors 96)
- Altitude Reference: Height Above Ellipsoid (HAE)
- Altitude Units: Meters
- Coordinate Units: Meters
- Display USNG: Off

When you are finished, tap OK. This should bring you back to the main Setup Menu.

#### 4. Collecting Data:

Tap the dropdown arrow on the top drop-down menu (upper left of the screen) and tap Data. This should bring up the 'Create New Data File' menu. Input the following parameters:

- File Type: Rover
  - File Name\*: Your name and date (for example, sara121505). To clear the auto-name, either highlight it and type over it, or move the cursor to the end of the name and backspace to delete it.
  - Dictionary Name: Choose a data dictionary that's been transferred or use the Generic dictionary.
- Now tap on Create at the top right of the screen and confirm the antenna height and tap OK.

*\*A word about file names: TerraSync automatically names files with a letter prefix (default is R for Rover) followed by a series of numbers. If your organization is using more than one GPS unit, be sure to set the prefixes differently in each unit if you wish to use automatic file names, otherwise data collected by two GPS units at the same time will have identical file names. Here's what the file names automatically generated by TerraSync represent for the following example: R121513A (RMMDDHHX)*

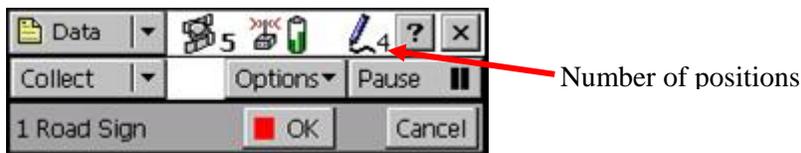
- Prefix: R for Rover
- MM: Current month (12 or December)
- DD: Current day of the month (December 15th)
- HH: Current hour of the day (13 or 1:00 p.m)
- X: Increments within this hour, starting at A for the first file in that hour, then B for the second file and so on.

**Logging points, lines and areas:**

You should now be on the 'Choose Feature' screen. Choose the type of feature you need to collect (point, line or area), and tap the Create button (upper right of the screen).

**Collecting points:**

After tapping Create, the GPS unit will automatically start logging positions (at five second intervals for generic points, and at specified intervals for points generated from a data dictionary). Allow the GPS unit to log several positions while standing at the feature that you're collecting (at least 30 if you're logging at 1-second intervals).



While positions are being logged, type in comments using the keypad. When finished, tap OK. Confirm closing and storing feature by tapping OK again if prompted.

**Collecting lines:**

- Position yourself at the start of the linear feature that you wish to collect.
- Highlight the line feature from the Choose Feature menu and tap on the Options menu (upper middle of the screen; under the battery indicator icon).
- Under the Options menu, tap on Log Later. NOTE — When you use the Log Later option, the pause icon flashes in the status bar to let you know that the TerraSync software is not logging GPS positions.

- Tap on Create. Since Log Later has been selected, the GPS unit will not start logging positions immediately. This gives you time to type in comments or fill out the data dictionary.
- When you are ready to start traveling along the linear feature, tap Log to begin collecting positions and start moving along the feature. Keep moving; if you must stop or go around an obstacle, tap on Pause. Tap Log when you're ready to resume logging positions. If you stop and pause logging, be sure to resume logging a few feet further along the line than where you stopped.
- When you reach the end of the feature, tap OK and confirm closing and storing the feature by tapping OK again if prompted.

***Collecting areas:***

- Position yourself at the start of the area feature that you wish to collect.
- Highlight the area feature from the Choose Feature menu and tap on the Options menu (upper middle of the screen; under the battery indicator icon).
- Under the Options menu, tap on Log Later. NOTE — When you use the Log Later option, the pause icon flashes in the status bar to let you know that the TerraSync software is not logging GPS positions.
- Tap on Create. Since Log Later has been selected, the GPS unit will not start logging positions immediately. This gives you time to type in comments or fill out the data dictionary.
- When you are ready to start traveling the perimeter of the area feature, tap Log to begin collecting positions and start moving along the feature. Keep moving; if you must stop or go around an obstacle, tap on Pause. Tap Log when you're ready to resume logging positions. If you stop and pause logging, be sure to resume logging a few feet further along the perimeter than where you stopped.
- When you have almost reached the point that you started the feature, tap OK and confirm closing and storing the feature by tapping OK again if prompted.

***Continuing line and area features (nesting)***

When recording a line or area feature, you could come across another feature that you need to record. The feature may be adjacent to the line/area feature, or it may be some distance away. When collecting a path (line feature), for example, you might encounter a gate (point feature). You do not have to record the entire path and then return to record the gate. Simply end the path feature, collect the gate feature, and then use the Continue option to resume collecting the path feature.

- In the attribute entry form, tap OK to close the line or area feature you are collecting. The Collect Features screen appears.
- In the Choose Feature list, highlight the feature that you want to collect and tap Create. The attribute entry form appears and logging starts.
- When you have recorded attributes for the feature and logged sufficient GPS positions, tap OK to close the feature. The Collect Features screen appears again.
- Tap Options. From the option list, select Continue. The Continue feature form appears, listing all the line and area features that are available for continuation, in the order they were collected.

- Select a feature from the list and tap Continue. TerraSync returns to the attribute entry form for the selected line or area feature, and continues to log GPS positions for that feature.

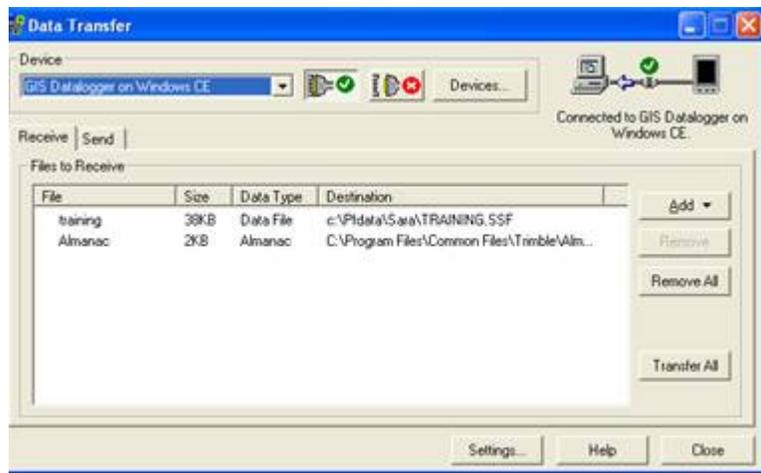
***Steps for Transferring a Data File from the Datalogger to the Computer:***

**Connecting to the computer**

- Connect the datalogger to the computer with the USB cable provided (Recon) or by pressing the datalogger onto its cradle (GeoXH). Microsoft Activesync will automatically open.
- In the ‘New Partnership’ window, you’ll be prompted to set up partnership. Do NOT synchronize the device with the computer. Either cancel the synch window or select ‘Guest Partnership’ and click ‘Next’.
- You should now see this window indicating that you’ve successfully connected the datalogger to the computer:
- Minimize the window and continue with the next step.

**Transferring a Data File in Pathfinder Office:**

- Open up Pathfinder Office. Navigate to the project that you’ve been using and hit ‘OK’.
- Click the Utilities menu and select Data Transfer. The Data Transfer window will open up and the connection between Pathfinder Office (PO) and the datalogger will automatically establish itself. If this does not happen, make sure that “GIS Datalogger on Windows CE” is selected for the Device.
- In the Data Transfer window, click on the Receive tab (the computer is receiving files from the datalogger).
- Now click the Add button and select Data File. Select the data file(s) to transfer and click Open. The data file should appear in the ‘Files to Receive’ window.
- Click the Add button again and now select Almanac. Click ‘OK’ for the default output file. The almanac should now appear in the ‘Files to Receive’ window. The window should look similar to this:

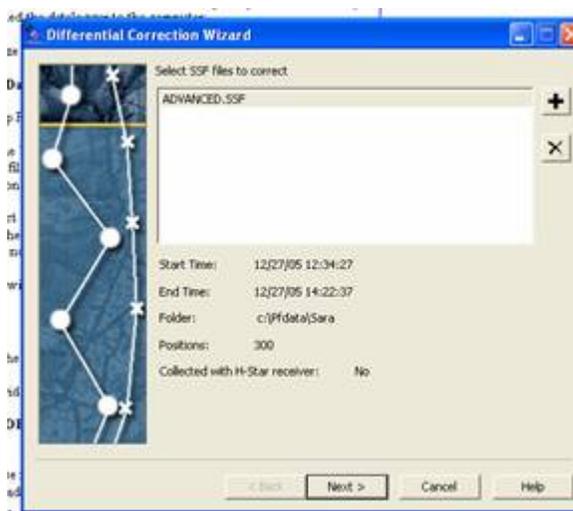


- Now click the Transfer All button and click ‘Yes’ to overwrite the existing almanac. Once the files are transferred, you will see a window that says ‘Transfer Completed’. The data file is now in the computer and ready to be differentially corrected.
- Close the ‘Transfer Completed’ and ‘Data Transfer’ windows. Leave Pathfinder Office open and proceed to differential correction.

### *Steps for Differentially Correcting Data Files (post-processing) in PO 3.1*

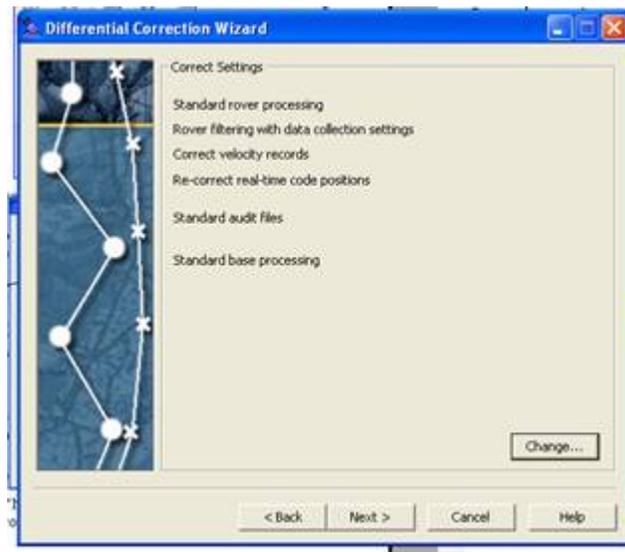
Differentially Correcting a File in Pathfinder Office:

- Open up Pathfinder Office. Navigate to the project that you’ve been using and hit ‘OK’.
- Click the Utilities menu and select Differential Correction. The ‘Differential Correction’ wizard will open up and the last file(s) transferred from the datalogger will appear in the box. These will have an .SSF extension. Use the add and remove buttons to the right to add or remove files from the box. Click Next.



- In the next window, select the processing type ‘Standard: Automatic Standard Carrier and Code Processing’. GeoXH receivers have the option of using “Automatic H-Star Carrier and Code Processing” for higher accuracy. Click Next.

- The next window is the Correct Settings window, which should look like this:



- Leave the settings as default. Click Next.
- Now it's time to select a base station. Under 'Base Data' make sure that the 'Base Provider Search' radio button is checked. Click on the top right Select button. The 'Select Base Provider' window should appear.
- Click on Update List (middle right button). This will update the base data provider list with the latest providers from Trimble's website.
- Now choose a base provider from the list. The distance and integrity index are shown to the right of the list of base providers. Choose a CORS base station with a small distance (less than 150km) and high integrity index (usually at the top of the list). Click on the provider to highlight it and click OK. The window should look similar to the following (next page):
- Click Next.: Choose input and output file locations and names and click Start.
- The differential correction process will start and a summary page will appear. On the summary page, make sure that under Coverage Details there is at least 90% total coverage. In most cases you should get 100%. If you get less than 90%, use another base provider or wait an hour or so and try again. Sometimes there is some lag time between base data collection and when data are posted on the Internet for download.

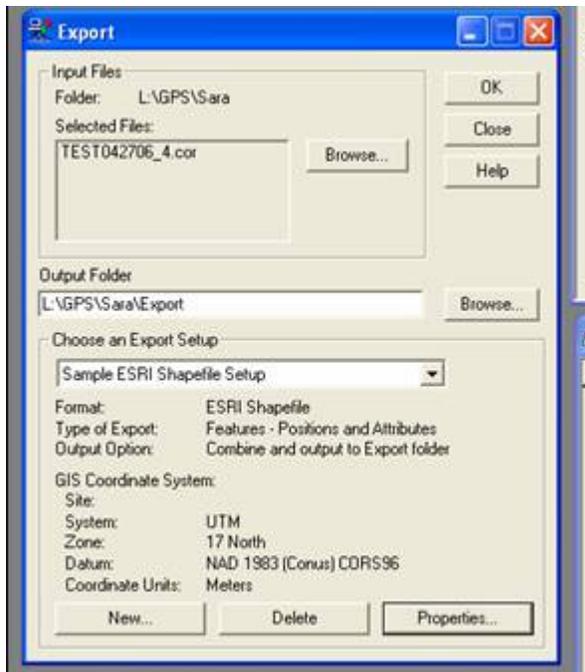


- You can differentially correct a file more than one time if you need to change a setting or try with a different base provider. Do not be afraid to try it a few times to get as much of your data corrected as possible.
- Click Close. The corrected data file has a .cor extension. This is the file that you will be exporting into a GIS format.

### ***Steps for Exporting Corrected Data Files into GIS Format***

#### **Exporting a Corrected Data File in Pathfinder Office:**

- Create a new directory within the Export directory and name it with the date. (Example: 5-28-05). This is where the new GIS file will be exported to. NOTE: It is very important to create a new directory for all new files that are exported that use the same data dictionary, otherwise previous files will be overwritten by new ones and data will be lost. If exporting multiple times on the same date, use a letter (a, b, c, etc) after the date in the directory name.
- Open up Pathfinder Office. Navigate to the project that you've been using and hit 'OK'.
- In Pathfinder Office, click Utilities and Export. The Export window will open and the last file(s) that were differentially corrected will appear in the 'Input Files' box.
- Now browse to the 'Output Folder' that was created in step 1.



- Now 'Choose an Export Setup' by clicking on the dropdown arrow and selecting Sample ESRI Shapefile Setup.
- Now check to make sure the 'GIS Coordinate System' is correct\*. The coordinate system should be:
  - System: UTM
  - Zone: (16, 17, or 18) North
  - Datum: NAD 1983 (Conus) CORS96
  - Coordinate Units: Meters
- To change the coordinate system, click on the 'Properties' button.
- Select the 'Coordinate System' tab, select 'Use Export Coordinate System' and click on the 'Change' button. Pick the correct coordinate system and datum and click 'OK' and then OK.
- While in the properties window, select the Attributes tab and select any additional attributes you would like added to the exported file's attribute table (for QA/QC purposes or additional information). You only need to select these once since they will stay selected on subsequent exports.
- Now click OK at the top of the Export window. Once the export has finished, an 'Export Complete' window appears. Close all windows and exit Pathfinder Office. The data are now ready to go into a GIS. Don't forget to define projections for all newly created shapefiles in ArcCatalog before loading them into ArcMap, otherwise you'll get a message saying that your files are missing spatial reference information.



# SECN Data Mining Strategy

*Southeast Coast Network*

*Version 1.0*

## Revision History Log:

Revision Date	Author	Changes Made	Reason for Change	New Version Number

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## ***Introduction***

A fundamental step in developing and maintaining the information base for SECN is locating, evaluating, and documenting park-related natural resource information (and relevant local/regional natural resource information). The term “data mining” refers to this process, which requires regular visits to network parks and establishing data mining procedures specific to each park. The range of materials that require documenting is broad, ranging from historical inventories, ongoing monitoring projects, to GIS and remote-sensing data. Data mining efforts in the SECN are ongoing and will continue over the next few years until the current backlog of information has been processed.

## ***Scope and Applicability***

Most, if not all park units, have some quantity of natural resource data and information. Data mining involves sorting through park data to pick out relevant information. This is a very labor intensive process, but one that is critical in developing a complete baseline of information for each of the network’s parks. Of highest priority is to compile and curate high quality, well documented data originating from park-specific scientific investigations. Regionally relevant studies (e.g. regional groundwater resources, air quality etc.) are another key component of understanding the environmental setting of SECN parks. This document describes the data mining process used by the SECN and the tools that facilitate the acquisition and incorporation of mined data sets into Network and Park holdings from a wide variety of sources.

## ***SECN Data Mining and Data Management Scoping Meetings***

The first step in data mining was to assess the current state of data and information at each park unit, along with a general overview of the available IT infrastructure and training needs. A questionnaire was developed to jump start data management related discussions with each park – to gather input from park staff about their needs and expectations regarding the data gathered and products generated through the I&M program, the current state of data and information at their park, and any improvements or training that would be useful in the short term. The discussion topics were as follows:

### **Data Needs**

- 1) I have attached information regarding data sets and other relevant natural resource information that we are aware of already (Sources: NatureBib, NPSpecies, GIS files etc.). What is missing from these lists? Are there data sets that you already have at the park and that we should be aware of and/or incorporate into I&M or other service-wide databases?
- 2) What about data that you do not have, but you know exists and would find helpful? (E.g. state heritage program data, data never received from previously completed projects, GIS layers etc.)
- 3) Do you have any datasets that need to be upgraded from old software or made digital so that they are usable? How much of this type of work exists at the park?
- 4) What about natural resource specimens and ANCS+? Do you have issues or concerns about this?
- 5) Would it be possible for us to have a copy of your ProCite database?

### **Training Needs**

- 6) Do you have any training needs related to GIS and/or data management? (E.g. Service-wide / I&M databases, GIS software or analysis techniques, other?)

### **General Information Management**

- 7) Do you have any services that you would like or that you expect from I&M that are relevant to data management

## SECN Information Management and Archiving Plan Appendices

and/or GIS? (E.g. training, GIS support, data servers, data conversion, etc.)

8) What types of products would be most useful to you coming out of the inventory studies and eventually from monitoring? (Anything beyond the typical project deliverables: report, database, GIS files, metadata....)

9) How would you like to access those products (or any data resulting from the I&M program)? Options might include: online/server, FTP server, all data onsite, combination of methods...

10) How do you envision information flow within the program? Are there ways we can improve communication?

### **Implementation Needs**

12) Does the park have any immediate and/or long-term issues related to information management? (E.g. poor internet connection, inadequate or outdated hardware, outdated or non-existent software etc.)

13) Data Swat-team approach...Do you need any assistance at the park in areas such as organizing the data you have, updating information into more usable formats, getting data into service-wide databases, etc.? What can we do to help you?

This questionnaire was used during park scoping meetings with SECN technical steering committee members, prior to visiting any parks for data mining purposes. The results from each meeting were reported out to all SECN staff and the park of origin to focus data mining efforts.

### ***Data Mining Process***

During the data mining process, SECN uses a suite of cataloging tools to describe and document data sources so that potential users can find them. The following provides a list of potential activities that occur during park data mining trips:

- Scanning unbound / hard copy reports into PDF format and entering them into Reference Manager (the server version of ProCite, which serves as a cataloging tool and provides cite-while-you-write functionality)
- Document all relevant reports, maps, photos etc. in Reference Manager, NatureBib and NPSpecies, as appropriate
- Setting up Reference Manager on the park LAN and individual workstations (there are 5 concurrent use licenses with each copy)
- Training in use of Reference Manager for potential users
- Setting up/installing ArcGIS if not already in use at park
- Setting up park GIS data into standard I&M data structure
- Combining network GIS data holdings with Park GIS data holdings - and looking at data clean-up needs, metadata needs, etc. (Note: this work typically continues after data mining ends, and the cleaned up data are copied to the Southeast Region's GIS server and sent to the park for their local use).
- Training in ArcGIS and/or GPS data collection if desired
- Looking at park data holdings, assisting with data organization and incorporating data into SECN holdings
- Updating datasets into current software programs, if needed and as time permits
- Training in I&M databases if needed

A description of general data types that are often found and cataloged at parks are described in Table 1 below.

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**Table 1. Description of data mining data types and processing steps**

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**SECN Information Management and Archiving Plan Appendices**

Data Description	Processing Steps
Gray literature, unpublished reports, research summaries, published reports, journal articles	Review and add document to Reference Manager. Evaluate for species data and add to NPSpecies (as needed) as part of the follow-up to data mining. Add citation to NatureBib if appropriate (upon return from data mining).
Photographs	Extentsis Portfolio 8 was a late addition to SECN cataloging software and has not yet been deployed during data mining. However, in some cases, park data photos (e.g. photo points for monitoring), were scanned and archived. Please refer to <a href="#">SECN Digital Photo Management Strategy</a> for instructions regarding image naming conventions and use of Portfolio 8.
Databases, spreadsheets, other electronic data assemblages	Review for associated documentation, locate project leader (if available) and document to the extent possible. File on SECN server, together with documentation and metadata. Evaluate for NPSpecies data.
GIS data	Retain copy at SECN office and document in SECN GIS catalog. Create metadata using ArcCatalog, if possible. Place documented GIS data on SER regional GIS server and archive those data layers that are of unknown source and/or quality. Provide park a copy of combined network and park data holdings.
Species lists	Create NPSpecies / NatureBib record if author and date are included with list.
Assemblages of field forms	Scan to PDF if not bound and archive appropriately.
ANCS+ natural history specimen data	Process records for inclusion in the voucher table of NPSpecies.
Park library records (ProCite)	Incorporate into Network bibliographic software and NatureBib, as appropriate.

SECN data management staff complete most of these cataloging tasks, and have been the primary users of NatureBib and NPSpecies. SECN places a high priority on maintaining and building these databases, and will continue to perform this work as needed. Data management staff will provide training to park staff interested in learning to use the databases, and will provide reports from the databases in formats that are useful and easily accessible to park staff (e.g., Excel files, hard-copy printouts, web-based species lists).

Upon return from park data mining trips, several clean-up activities are required. All reference manager databases are combined into one file, checked for duplicates, data entry cleaned up (see Reference Manager SOP for details, and then the cleaned up data set is combined with the master SECN database and a copy is sent to the park for their local use. GIS data are also cleaned up and (where possible) documented with minimally compliant metadata. GIS data that have sufficient information to generate minimally compliant metadata are incorporated into SECN master data holdings, the remaining GIS data are cleaned up and archived in miscellaneous, park GIS data folders in case additional information becomes available for those data sets. The combined network and park GIS data are then returned to the park for local use and copied onto the Southeast Region's GIS server. Park tabular data sets are also reviewed.

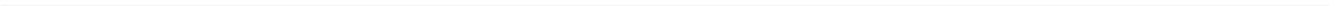
### ***Other Data Mining Activities***

- SECN obtained permission from all network parks to have access to their ANCS+, natural history collection records. This information was obtained, reviewed and submitted for inclusion into NPSpecies.
- SECN has a cooperative agreement with Clemson University to conduct data mining. To date, SECN has received an access database of park-specific and regionally relevant bibliographic citations and a wide range of GIS data from freely available, Federal, State and Local sources.
- As part of each biological inventory project, cooperators provided a literature review of previously conducted park-specific studies and a search of museum and herbarium collections throughout the Southeast (and beyond, in some cases). This information was incorporated into NPSpecies upon completion of the inventory projects.

### ***SECN Data Mining Status***

As of September 1, 2008 – the following parks have been visited by the data mining swat team, using the procedures described above: CHPI / FOSU / FOMO, CONG, CUIS, FOPU, HOBE and TIMU /FOCA. Data mining at the remaining parks is in various states of completion. Typically, documents containing species information have been copied and/or scanned, park ProCite databases have been incorporated into Reference Manager and NatureBib (as appropriate), all ANCS+ records have been received and in some cases, park GIS data have been incorporated into network holdings. Data mining activities will continue into the future as time and network resources permit.

## SECN Information Management and Archiving Plan Appendices



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# SECN Geospatial Data Specifications and Strategy

*Southeast Coast Network*

*Version 1.0*

## Revision History Log:

Revision Date	Author	Changes Made	Reason for Change	New Version Number

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## ***Introduction***

Almost every conceivable long-term monitoring protocol, biological inventory study or other type of scientific investigation results in the collection of spatial data. Therefore, geospatial data is a very large and important component of the SECN information management strategy. Throughout the SECN Information Needs Assessment, geospatial data layers were discussed as critical components of the long-term monitoring protocols being discussed and resulted in the formation of many reference (data collected and maintained by others outside SECN), data (data collection efforts being led by SECN) and analysis (objects created from the analysis of reference and/or data objects) objects for each of the categories or business areas within the SECN Inventory and Monitoring Program. Please refer to chapter 2 of the SECN Information Management and Archiving Plan for details on the Information Needs Assessment and the Conceptual Object Model.

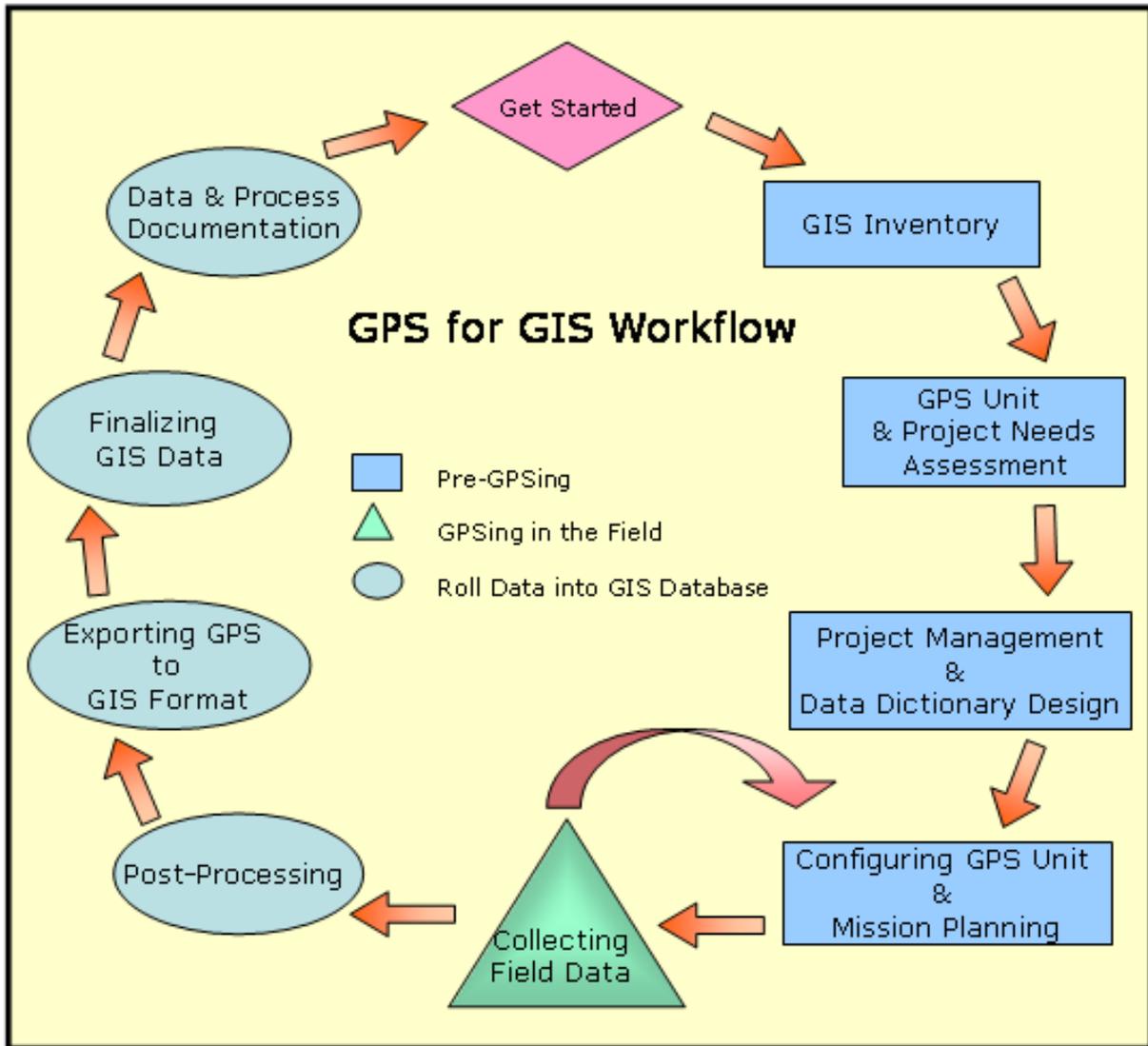
## ***Geospatial Data Strategy***

To date, SECN staff have been compiling, organizing and documenting baseline geospatial data from the NPS GIS program and other Federal, State and Local sources (including non-governmental sources). Data layers considered to be complete and fully documented have been incorporated into the SECN geospatial data holdings – which have since been merged with the Southeast Region’s Geospatial Support Offices data. These data layers have also been documented in the SECN GIS catalog. The catalog is currently in an MS Access database to facilitate data access, querying and reporting. The GIS catalog is located on the SECN server and will be incorporated into web services hosted through the SECN Sharepoint website – available to Network and affiliated Park staff. The GIS catalog only contains information on SECN GIS layers that are considered part of the SECN master data layers (in other words, it does not contain information about working GIS files). Any new GIS layers received by the SECN (as certified / master data) will be added to the Southeast Region Geospatial Support Office’s directory structure and input into the GIS catalog to keep all users at remote network and park offices informed of available GIS data. Integrating SECN geospatial data with the Southeast Region’s GIS data will reduce the likelihood of purchasing duplicate data sets, remove redundancy between the two data servers, and allow users to search only one location for geospatial data.

Given the bandwidth issues between SECN offices, data from the Southeast Region’s GIS server are copied onto external hard drives on a quarterly or bi-annual basis (or upon the acquisition of new and significant data sets) and replicated at both the FOSU and CUIS network offices for their use locally. Master GIS data acquired by the FOSU and CUIS offices are sent to the SECN office at the Southeast Regional office to be incorporated into Southeast Region’s GIS Server. Any proprietary GIS data layers are treated according to the data use agreement mandated as part of the purchasing process.

Data being collected using GPS (global positioning system) equipment may also become part of the SECN master data collection. The National Park Service has developed a detailed GPS for GIS workflow that is described online at <http://www.nps.gov/gis/gps/gps4gis/>. This workflow is summarized by the graphic below. All of the steps below, including the generation of NPS and Federal Geographic Data Committee (FGDC)-compliant metadata must be followed for any GPS

data turned into a GIS data set that is incorporated into the regional and network’s master data collection.



Given the multitude of steps required to turn raw GPS data into a fully documented, GIS data set – it is crucial that any GPS data to be collected are planned in advance and follow the guidance and standards described in this document and the following appendices to the SECN Information Management and Archiving Plan: [SECN Metadata Guidance](#) and [SECN Standard Directory Structure and File Naming Conventions](#). In addition, there are several [GPS Cheat Sheets](#) available for Trimble Recon or GeoXH Data Logger, to provide guidance for improving the quality of data collected using SECN GPS equipment.

## *Credits*

The information below was taken, slightly modified (e.g. to remove irrelevant content and enhance applicability) and reformatted from:

National Park Service. 2007. Specifications for Geospatial and other data deliverables of GIS and Resource Mapping, Inventories and Studies.

**Please Note:** Although written from the perspective of data deliverables, the geospatial data specifications described in this document apply to all SECN GIS data sets, regardless of how they were acquired (e.g. downloaded or freely available, developed from GPS data collection, purchased from external vendors, etc.). Data obtained from other sources may require reprojection, clipping and/or other processing steps to meet network and NPS specifications and needs; these additional processing steps will be added to the accompanying metadata file once the data set is considered final.

## *Specifications for Geospatial and Other Data Deliverables of GIS*

National Park Service (NPS), Geographic Information Systems (GIS), Resource Management, Inventory and Monitoring, and other program area projects and activities generate both spatial and tabular data sets. The spatial data sets are incorporated into park, regional, and national databases and made available to a wide range of users. Conformance to certain standards and product specifications is necessary to ensure these data sets are discoverable and usable by data consumers. This document provides general standards for spatial data collection and submission. Park-, network-, region-, and program-level project managers may require further specifications that may vary from project to project. Any deviation from these standards must be approved by the appropriate project manager.

## *Deliverables*

Complete and verified data for NPS projects (regardless of source) shall be delivered via CD-ROM and/or DVD, via electronic data transfer (e.g., e-mail or FTP), or via another method approved by the project manager. CD/DVD should be in -R format, so that it cannot be modified. The products delivered to the project manager shall contain the following items:

### **1. Required Items:**

- Descriptive document
- Geospatial data
- Associated data table(s) or relational Microsoft Access database
- FGDC and/or NPS Metadata Profile (preferred) compliant metadata

### **2. As Specified by Contract:**

- Linked document(s)
- Linked graphics or digital photographs

## Descriptive Document

A Microsoft Word document (and/or ASCII text file if specified) describing the data set shall accompany any submission and provide all necessary information for understanding the submittal. The document should include, but is not limited to, the following:

- Contents of the CD/DVD or .zip file
- Description of the project, including all related deliverables and any project codes (e.g., RPRS)
- Version and date of the data
- Information on sensitive data issues (if any exist or as appropriate)
- Contact information for those responsible for creating the data and who have the responsibility for maintaining the master version of the data
- A short description of data themes (limited to one to two sentences for each theme)
- Linking fields (to documents, a Microsoft Access database, and/or digital photographs)

The following is an example of a Descriptive Document for a park with alpha code "CODE" that may be used as a template.

A CD-R or DVD-R that contains the following files:

CODEBird.Zip containing the following files:

- CODE\_BirdSurvey\_Readme.Doc -- known as the Descriptive Document
- CODE\_Bird\_File\_Names.Doc -- naming convention or codes used for file names - if applicable
- CODE\_BirdSurvey2000.Doc – a descriptive document for the Code 2000 bird survey
- CODEBird.e00 – exported ArcInfo Coverage
- CODEBird.lyr – ArcGIS layer file
- CODEBird.xml – FGDC metadata XML format metadata file
- CODEBird.mdb – Microsoft Access database
- CODE\_Bird\_Data\_Dict.Doc – descriptions of attributes and data tables

This first version of bird data was completed on 05/28/02.

None of the information contained in this data set is considered sensitive.

The data were created by Joe Smith of the National Park Service, Some NPS Project, phone – (999) 999-9999.

The Key Field “LocationID” links the Access database and the coverage.

## Spatial Data

There are several ways to represent spatial data in a GIS including points, lines, polygons, or rasters/images. Determining the appropriate representation(s) for your study involves consideration of scale and study goals. **Prior to data collection, these issues should be addressed and resolved in the project study plan in consultation with the project or data manager.** Additionally, network and park data management plans may dictate the appropriate format.

### 1. File Naming Conventions

A clear and meaningful file name should be used that conveys the nature of the data, subject, and park unit represented. Data and related file names should not contain spaces or special characters. An underscore may be used to make field names more readable (e.g., Code\_birdsurvey). Field names should conform to ArcGIS field naming limitations. If attributes are stored in shapefiles, field names must be 10 characters or less to avoid truncation. The directory structure recommended by the NPS GIS and national I&M programs may be downloaded by clicking on **Recommended GIS File Folder/Directory Structure** at <http://science.nature.nps.gov/im/policies/index.cfm>.

File naming conventions and folder/directory structures for GPS and GIS data are described in detail in [SECN Standard Directory Structure and File Naming Conventions](#).

### 2. Coordinate Systems

All spatial data collected or submitted for national, regional, or network NPS programs shall be geo-referenced with projection information defined in the data file that is submitted. All projection specifications shall be approved by the appropriate Project Manager at the beginning of the project.

### Park Unit Data Standard

In general, the standard projection for most park-level GIS layers is Universal Transverse Mercator with the following parameters:

Projection	Universal Transverse Mercator
Zone	SECN parks are in the following zones: Zone 16: CHAT, HOBE, KEMO Zone 17: CANA, CASA, CHPI, CONG, CUIS, FOCA, FOFR, FOMA, FOPU, FOSU, MOCR, OCMU and TIMU Zone 18: CAHA, CALO,
Datum	North American Datum 1983
Spheroid	GRS 1980
False Easting	0
False Northing	0
Units	meters

\*\*\*If the park crosses UTM zone boundaries, it is recommended that only one zone, or a different coordinate system, be used.

**Regional and National Data Standard**

Projection	Geographic
Datum	North American Datum 1983
Spheroid	GRS 1980
False Easting	0
False Northing	0
Units	Decimal Degrees (five significant digits to the right of the decimal point)

**3. Spatial Data Formats**

The data format(s) should be clearly stipulated and agreed upon with contractors, cooperators or principal investigators before data collection and processing start. If there are questions about choosing a data format, converting between formats, or using non-standard formats, contact the SECN Science Information Specialist for guidance before data collection begins.

**Vector Data:** All vector data shall be supplied as an ArcInfo interchange file (\*.E00) and/or ArcView Shapefile, or as an ESRI ArcGIS Geodatabase (GDB) compatible with the current version of ArcInfo or ESRI file-based Geodatabase workspace.

- ESRI ArcInfo Coverage/export file -- Data developed in ArcInfo coverage format should be exported to an Arc Interchange file (.E00 file). ArcGIS 9.x .E00 files should include the metadata (.XML) file from ArcCatalog. All coverages should be created as double precision data sets. If the data set was originally obtained in single precision, convert it to double precision before submitting. All coverages should be topologically clean and correct and shall contain complete, well-defined projection information.
- ESRI Shapefile -- Shapefile format shall be used only if an ArcInfo coverage format file does not exist. The shapefile format should include, at a minimum, the .SHP, .DBF, .SHX, and .PRJ files. Shapefiles from ArcGIS files should include the metadata (.XML) and projection (.PRJ) files.
- ESRI ArcGIS Geodatabase -- A geodatabase (GDB--short for geographic database) is a physical store of geographic information inside a relational database management system (RDBMS). Because a personal geodatabase is stored as a Microsoft Access file, data delivered as a GDB file shall be delivered as the Microsoft Access .MDB file that is the GDB. The schema should be supplied by the NPS or the development of the schema should be specifically addressed in the project plan.
- ESRI ArcGIS File Based Geodatabase -- Data delivered as an ESRI File Geodatabase shall be delivered as the folder somename.gdb containing all the components of the Geodatabase. The schema should be supplied by the NPS or the development of the schema should be specifically addressed in the project plan.

**Raster Data:** All cell-based data sets or grids shall be supplied as an ArcInfo GRID and/or ArcInfo interchange file, compatible with the current version of ArcGIS. All geo-referenced digital aerial photography and imagery are to be supplied as an ERDAS Imagine File, an 8-bit grayscale GeoTiff, a 24-bit RGB GeoTiff, or a tagged image file format (.TIFF) file with any associated geo-reference information included. Digital aerial photography and imagery may also be acceptable in the data formats specified below:

- ArcInfo GRID File -- This is an ESRI format that supports 32-bit integer and 32-bit floating-point raster grids and is the preferred format for non-imagery raster data. Grids are useful for representing geographic phenomena that vary continuously over space and for performing spatial modeling and analysis of flows, trends, and surfaces. Generally, grid themes should be delivered as .E00 files as stipulated above. It is recommended that large grid themes be submitted as separate compressed workspaces because .E00 files may be extremely large and unwieldy. All data submitted in grid format shall include all well-defined projection files associated with them.
- ERDAS Imagine file -- Imagine files (.IMG) shall include well-defined projection files that are associated with them. Pyramid files (.RRD) shall be included if available.
- GeoTIFF v1.0 -- This is a raster format with geo-referencing stored in the header of the file. All data submitted in GeoTiff format shall include all well-defined projection files associated with them.
- TIFF -- TIFF files (.TIFF) shall include world files and all well-defined projection files associated with them.

**Special Cases:**

**Computer Aided Design (CAD) files** -- Generally, CAD formats are NOT recommended and will only be accepted upon the direct specification and approval of the project and/or data managers. Although some CAD drawings (i.e. building blueprints) do not contain coordinate system information, most define their datum and projection. However, some GIS products do not always read and interpret this information correctly when the data are imported. Therefore, all CAD export files must contain complete metadata records as defined in section VI of this document. AutoCAD DWG/DXF and MicroStation DGN files may be imported, exported, and directly read in ArcGIS, but all blocks and cells must be exploded before CAD files are submitted for exportation.

- DWG format--Data submitted in DWG format may be exported from AutoCAD using the e-transmit function (this will include all information stored in the drawing). Non-geographic elements such as drawing borders, title blocks, north arrows, and detail drawings should not be included in export files. Place these elements on specific layers or levels in AutoCAD and MicroStation respectively, so they can be isolated when the data is brought into the GIS environment.
- DXF format--Specific elements may be selected for export in the DXF format by checking "Select Objects" under Tools-->Options on the "Save Drawing As" dialog box. This dialog box should also be used to set the decimal places of accuracy to 16 to preserve double precision data quality and to select either an ASCII or a binary format for the DXF export. Several Autodesk products like Land Desktop and Map3D allow for direct export to either ESRI Shapefiles (SHP) or ArcInfo Interchange (E00) formats. Drawings, element/layer

combinations like topologies, and/or individual objects exported to ERSI Shapefiles must be specified as points, lines, polygons, or text. Multiple geometry types may be combined into a single ArcInfo Interchange export file.

***Other possible raster file formats*** -- Other file formats that may be utilized natively as an ArcGIS layer include: .BMP, .BSQ, .BIL, .BIP, ERMapper, IMPELL Bitmaps, Image Catalogs, .JPEG, JPEG2000, MrSID, and Sun Rasterfiles. However, because applicable header or world files must be included .BMP, .JPEG, and Sun Rasterfiles are unacceptable formats for this application. All aforementioned acceptable formats must include all well-defined projection files associated with them. Again, the appropriate project manager(s) must approve any deviation from the preferred standards discussed above.

### **Collection Methods**

Digital data may be captured using one or more approaches including, but not limited to, using a GPS (Global Positioning System) for collection or digitizing features from maps or aerial photographs. The appropriate method should be determined in the study plan and after consultation with the Principal investigator, Science Information Specialist and/or Remote Sensing Specialist.

When using GPS collection, the GPS unit type, model, averaging method used for static mapping (point), error correction technique (type of differential correction used), and GPS quality filters employed shall be recorded in the metadata and discussed in the Descriptive Document.

When digitizing features from maps or photographs, the source, scale, date, and methods (i.e., process steps) shall be recorded in the metadata and discussed in the Descriptive Document.

### **Scale and Spatial Resolution**

Project planners should contact the SECN Science Information Specialist and/or Remote Sensing Specialist for specific scale and spatial resolution requirements for vector and raster/image data. These requirements should be clearly specified in the contract or cooperative agreement.

### **Horizontal and Vertical Accuracy**

All spatial data collected shall be analyzed for their spatial accuracy and shall meet or exceed the National Map Accuracy Standards for the appropriate scale (please refer to <http://erg.usgs.gov/isb/pubs/factsheets/fs17199.html> for details). Longitude and Latitude (decimal degree) coordinates for geographic data should be recorded to a minimum of five significant digits to the right of the decimal point and stored in double precision attribute or database fields providing an approximate precision of one meter in CONUS. More decimal places should be used if a higher precision is required.

### **Attribute Data**

Simple attribute data such as that used for map symbolization shall be delivered as part of the ArcGIS feature attribute table. Complex attributes shall be delivered in a well-structured relational database format as a Microsoft Access .MDB file using current versions of Microsoft Access. Map features and database records shall share a common unique identifier or primary key that relates the map feature to the table record.

Because the ArcInfo coverage/shapefile format is not ideal for storage and management of complex relational data such as one-to-many relationships and data normalization NPS project managers may request that relational attribute data be stored either in a separate, well-structured relational database system or in a geodatabase data format.

## Quality Control

Accuracy assessments of spatial and attribute data are project specific. Project planners should contact appropriate GIS or data management staff for specific details. QA/QC procedures shall be documented by the Contractor in the appropriate Metadata sections.

## Metadata

All data submitted shall include metadata that meets the minimum NPS content standard for metadata - the NPS Metadata Profile (see <http://science.nature.nps.gov/nrdata/docs/metastds.cfm>), which contains minimally-compliant FGDC metadata elements (for additional FGDC metadata information see <http://geology.usgs.gov/tools/metadata/>) in addition to NPS-specific elements. For NPS Profile Metadata Authoring Guidance relevant to natural resource data and XML templates for NPS Profile-format metadata see <http://science.nature.nps.gov/nrdata/docs/metahelp/createhelp.cfm> and the guidance at <http://science.nature.nps.gov/nrdata/docs/metahelp/NR-GISMetadataAuthoringGuidance.pdf>

The metadata must be located in the same directory as the data, share the same naming prefix, and when appropriate, be attached to that data. The metadata should be delivered in extensible markup language with an .XML extension.

If applicable, FGDC Biologic Data Profile (BDP) metadata elements should be included in the metadata record (see FGDC Metadata).

The metadata record must be parsed with no errors prior to submission using the Metadata Parser (MP) provided by the FDGC. To learn more about getting started with FGDC metadata or using the MetaParser program see <http://geology.usgs.gov/tools/metadata/> or contact the SECN Science Information Specialist. For complete information on FGDC metadata see Geospatial Metadata — Federal Geographic Data Committee.

Recommended metadata authoring tools include:

- ArcCatalog – used in conjunction with the NPS Metadata Editor and Tools
- The NPS Metadata Tools and Editor (a stand-alone or ArcGIS extension ) —found at <http://science.nature.nps.gov/nrdata/tools/index.cfm> – used to author and parse any type of NPS metadata, including Biological Data Profile metadata

Specifications for the attributes and database tables attached or linked to the spatial data must be documented in the “Entity and Attribute Information” section of the FGDC metadata and include:

- Attribute Label (field name)
- Attribute Definition (field description)

- Field format (not an FGDC field, this field is part of either the ESRI or NPS metadata profile extensions to the FGDC standard)
- Attribute Domain Values (valid values)

Prior to the metadata being loaded into the NPS Data Store, NPS staff shall be responsible for inserting the DOI solicitor-approved NPS data distribution liability statement (found at <http://www.nps.gov/gis/liability.htm>) and the appropriate NPS Info Tags (found at [http://nrdata.nps.gov/profiles/NPS\\_Profile.xml](http://nrdata.nps.gov/profiles/NPS_Profile.xml)) into the NPS\_Information Section of the metadata.

Please refer to the [SECN Metadata Guidance Document](#) for more detailed information regarding metadata generation.

### **Linked Documents**

Project documents such as user manuals, detailed map unit descriptions, and site photographs may be linked to map features through “hot linking.” Hot linking (hyperlinking) allows the user to click a map feature and have a related document open and jump to the chapter associated with an attribute of that map feature. To be hot linked (hyperlinked) an associated document shall meet the following requirements:

#### **HTML Documents (recommended for most linked topics)**

- The document(s) shall be an HTML formatted file.
- The document(s) shall include a table of contents with separate listings and anchors for each "topic" or description that relates to a GIS feature (i.e., extensive textual descriptions of each and every feature of a theme).
- The document shall include a separate tabular list of which "topics" correspond to each linking field value in the GIS theme (i.e., the key values for linking the document to the GIS).

#### **Windows Help File (not recommended for most projects)**

- The document(s) shall be a Microsoft Help formatted file.
- The document(s) shall include a table of contents with separate listings and anchors for each "topic" or description that relates to a GIS feature (i.e., extensive textual descriptions of each and every feature of a theme).
- The document shall include a separate tabular list of "topics" that correspond to each linking field value in the GIS theme (i.e., the key values for linking the document to the GIS).

#### **Microsoft Word documents, Adobe Acrobat and other formats**

- The document(s) shall be a Word, Acrobat, or other appropriately formatted file.
- The document(s) shall include a table of contents with separate listings and anchors (if appropriate) for each "topic" or description that relates to a GIS feature (i.e., extensive textual descriptions of each and every feature of a theme).

For more information about linking documents to GIS features, see the NPS Theme Manager at [http://science.nature.nps.gov/nrgis/applications/gisapps/gis\\_tools/8x/thememanager8.aspx](http://science.nature.nps.gov/nrgis/applications/gisapps/gis_tools/8x/thememanager8.aspx).

## **Linked Graphics or Digital Photographs**

If any linked digital photographs are included with the data set, they should be in a format that is readable in ESRI's ArcGIS. Image types that can be directly hot linked (hyperlinked) to a layer in ArcMap include .GIF, .JPEG/.JPG, MacPaint, Microsoft DIB, Sun Raster files, .TIFF, .TIFF/LZW compressed, X-Bitmap, and .XWD.

Images and graphics shall be organized in a file folder or directory structure that provides a logical hierarchical format. The directory structure recommended by the NPS GIS and national I&M programs may be downloaded by clicking on Recommended GIS File Folder/Directory Structure at <http://science.nature.nps.gov/im/policies/index.cfm>.

Map features with linked graphics/photographs should contain a GIS attribute field that records the relative directory path and file name. The suggested field name is "Images." Map layers should have meaningful names that relate to the map theme and its attributes and digital image file names should be encoded with this value. Any file coding schemes that are used should be documented and included in the Descriptive Document.

Digital photographs should include appropriate metadata documentation as describe in the NPS Digital Metadata Standard, available at [http://www.nps.gov/gis/data\\_info/nps\\_standards.html](http://www.nps.gov/gis/data_info/nps_standards.html). This standard has been integrated with the GPS-Photo Link application available from Geospatial Experts and is recommended for producing both the photo metadata and shapefiles with photos linked to GPS coordinates.

# SECN Metadata Guidance Document

*Southeast Coast Network*

*Version 1.0*

## Revision History Log:

Revision Date	Author	Changes Made	Reason for Change	New Version Number

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**Credits:** This document was adapted from content in the North Coast and Cascades Network (NCCN) metadata guidance document (and other sources listed within the document text):

North Coast and Cascades Network – National Park Service. 2006. Metadata Development Guidelines. USDI National Park Service.

## ***Overview***

Data documentation is a critical step toward ensuring that data sets are usable for their intended purposes well into the future. This involves the development of metadata, which is defined as structured information about the content, quality, condition, and other characteristics of a data set. In addition to spatial information, metadata include information about data format, collection and analysis methods, time of collection, originator, access/use constraints, and distribution. Metadata also provides the means to catalog data sets, within intranet and internet systems, making their associated data sets available to a broad range of potential users. While most frequently developed for geospatial data, metadata describing non-geospatial data sets are also needed. For example, water samples collected daily for an annual report to summarize water quality should be documented with complete protocols and metadata for the database in which the data are stored.

In reality, the development of complete metadata may be seen as a professional courtesy that will save future users from performing the unnecessary and frustrating task of try to interpret what a data set contains – and there are few things worse than finding a potentially useful data set that has been rendered useless due to a lack of documentation. Complete metadata ensures that future users of data will be able to make the best and appropriate use of the data because it documents the original intent, purpose, source and quality of a data set.

The following procedures and specifications were developed for the Southeast Coast Network (SECN) of the National Park Service (NPS) Inventory & Monitoring (I&M) Program for the creation of metadata to document I&M-generated data sets. It is recommended that these procedures and specifications also be used for other SECN data sets that are not necessarily a part of the I&M Program. These guidelines outline the general approach to generating metadata compliant with the Federal Geographic Data Committee (FGDC) standards, provide links to background information and more detailed guidance documents and Standard Operating Procedures, and describe how to post completed metadata to the NPS Data Store. Furthermore, these guidelines will help users comply with the NPS Data Store requirement of including the NPS Profile in metadata records and will provide instruction on the creation of the Biological Profile where appropriate.

## ***Scope and Applicability***

These guidelines apply to all SECN staff, contractors and cooperators responsible for generating and submitting metadata to document natural resource data sets. Compliance with these guidelines is required for all I&M project data sets (including both tabular and geospatial data sets) and for other projects as stipulated by project study plans, cooperative agreements, contracts or research permits. These guidelines should also be used for creating metadata for any data sets that will be uploaded to NPS data repositories such as the NPS Data Store and the Biodiversity Data Store.

## Terms, Definitions and Acronyms

<b><i>ArcCatalog</i></b>	Module in ESRI's ArcGIS® software within which metadata for spatial (e.g. coverages, shapefiles) and associated non-spatial data sets or products (e.g. tables) can be created
<b><i>Biological Data Profile</i></b>	Set of definitions for the documentation of biological data through the creation of extended elements to the FGDC Content Standard for Digital Geospatial Metadata (CSDGM).
<b><i>CSDGM</i></b>	Content Standard for Digital Geospatial Metadata. The FGDC-promulgated metadata standard established to provide a common set of terminology and definitions for documenting digital geospatial data.
<b><i>Dataset Catalog</i></b>	NPS Inventory and Monitoring Program tool for metadata creation. This program is not currently used by the SECN.
<b><i>ESRI</i></b> company.	Environmental Systems Research Institute. A GIS software development company.
<b><i>FGDC</i></b>	Federal Geographic Data Committee. The interagency committee that promotes the coordinated development, use, sharing, and dissemination of geographic data.
<b><i>Geospatial One-stop</i></b>	Federal government portal that provides public access to geospatial data, metadata, and links to other clearinghouses.
<b><i>GIS</i></b>	Geographic Information System. A computer system for capturing, manipulating, analyzing and displaying data related to positions on the Earth's surface.
<b><i>ISO</i></b>	International Organization for Standardization. A network of national standards institutes of 150 countries, responsible for the 'ISO 19115' international metadata standard.
<b><i>Metadata</i></b>	Data about the content, quality, condition, and other characteristics of a data set, documented in a standardized format.
<b><i>MP</i></b>	Metadata Parser. A command-line program developed by the USGS to locate syntax errors in metadata files, verify FGDC-compliance, and convert between file formats.
<b><i>NBII</i></b>	National Biological Information Infrastructure. Collaborative program instrumental in developing the Biological Data Profile of the FGDC's CSDGM.
<b><i>NPS</i></b>	National Park Service
<b><i>NPS Metadata Profile</i></b>	The NPS Natural Resource and GIS Metadata Profile extends the FGDC CSDGM to incorporate NPS-specific elements such as park and project details. The NPS Profile includes the Biological Data Profile and the ESRI Profile.

## SECN Information Management and Archiving Plan Appendices

<b><i>NPS Data Store</i></b>	The NPS Natural Resource, GIS, and I&M Programs' web-based system (incorporating database, data server, and secure web interface) to integrate data dissemination and metadata maintenance for Natural Resource, GIS, and other program data sets, digital documents, and digital photos.
<b><i>SECN</i></b>	Southeast Coast Network. One of the 32 NPS Inventory and Monitoring Networks.
<b><i>SOP</i></b>	Standard Operating Procedure
<b><i>SGML</i></b>	Standard Generalized Markup Language. An ISO standard flexible markup language (predecessor to XML) used in many applications including electronic publishing on the Web.
<b><i>XML</i></b>	Extensible Markup Language. A simple and flexible text format (a profile, or subset, of SGML) that facilitates large-scale electronic publishing and exchange of data on the Web.

### ***General Requirements***

The general goal of the NPS metadata system is to catalog all data sets and to produce FGDC-compliant metadata for those data sets that require comprehensive documentation. The NPS Natural Resource, GIS and I&M Programs released the NPS Data Store in 2005 as an FGDC-structured database and data server system that provides a secure web interface and tools to import metadata records from desktop metadata authoring programs.

The NPS Integrated Metadata System Plan for spatial and natural resource data sets incorporates the generation of metadata by Network and Park users (through desktop applications), metadata posting to and retrieval from the NPS Data Store (through an online, Oracle-based server), and dissemination of non-sensitive records to the public through the Geospatial One-Stop clearinghouse available at: <http://gos2.geodata.gov/wps/portal/gos> (Figure 1). When completed, the metadata database component of this system will become the master database for NPS spatial and natural resource metadata. For more information, see the NPS Data Store website available at: <http://science.nature.nps.gov/nrdata/docs/metaplan.cfm>.

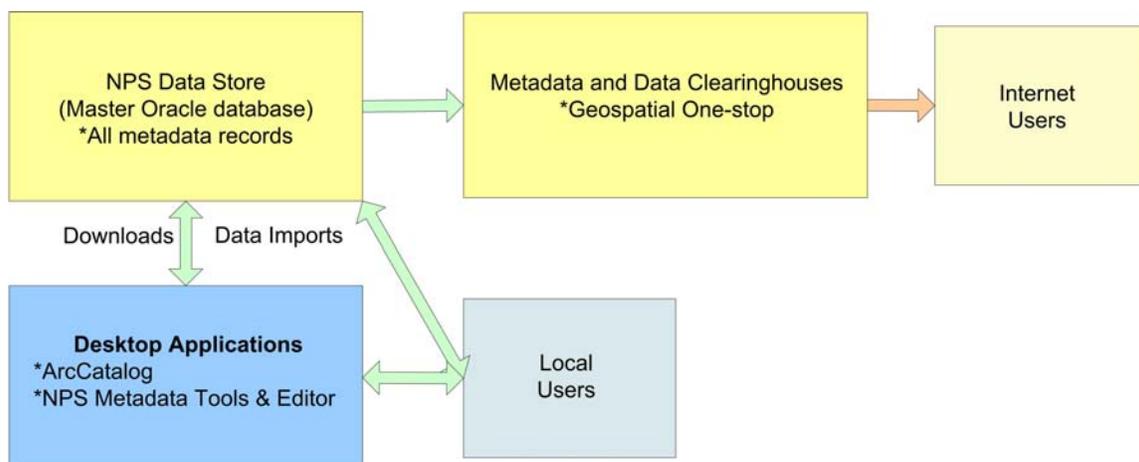


Figure 1. Metadata workflow conceptual diagram, adapted from the NPS Integrated Metadata System Plan.

Metadata creation should begin during the planning phase of a project and can be easily initiated using ‘metadata questionnaires’ (see [SECN Metadata Guidance Document](#) for details), which should be completed by the Project Lead (typically a Network Ecologist). A formal metadata record will then be created with the assistance of the GIS Specialist or the Science Information Specialist. The metadata record should continue to be updated during the data acquisition and data delivery phases of a project. When the project is complete, the metadata record should be finalized by reviewing for quality, parsing for errors, checking FGDC- and NPS-compliance, and screening for sensitivity. If appropriate, the resolution of sensitive data may be degraded to allow release to the public and the accompanying metadata revised accordingly. Non-sensitive data will then be uploaded to the NPS Data Store by the Science Information Specialist or GIS Specialist.

Currently, the SECN uses ArcCatalog and the NPS Metadata Tools and Editor (which functions as a stand-alone program and as an extension to ArcCatalog) for metadata authoring. It is recommended that network users begin using this program in conjunction with ArcCatalog as the preferred system for metadata creation. The NPS Metadata Tools and Editor provides for population of the NPS Profile (NPS-specific metadata elements, some of which are required for data and metadata upload to the NPS Data Store) as well as the Biological Profile of the FGDC Content Standard for Digital Geospatial Metadata (CSDGM) and taxonomic information from the Integrated Taxonomic Information System (ITIS) for data sets containing biological information. The NPS Metadata Tools and Editor can be used to create metadata for spatial and non-spatial data sets.

#### **NPS Links**

NPS Metadata Tools and Editor: <http://science.nature.nps.gov/nrdata/tools/index.cfm>

NPS Data Store: <http://science.nature.nps.gov/nrdata/index.cfm>

#### **FGDC Links**

Biological data profile:

<http://www.fgdc.gov/standards/projects/FGDC-standards-projects/metadata/biometadata/biodatap.pdf>

CSDGM workbook: [http://www.fgdc.gov/metadata/documents/workbook\\_0501\\_bmk.pdf](http://www.fgdc.gov/metadata/documents/workbook_0501_bmk.pdf)

CSDGM standard:

[http://www.fgdc.gov/standards/projects/FGDC-standards-projects/metadata/base-metadata/v2\\_0698.pdf](http://www.fgdc.gov/standards/projects/FGDC-standards-projects/metadata/base-metadata/v2_0698.pdf)

CSDGM graphical representation: <http://www.fgdc.gov/csdgmgraphical/index.html>

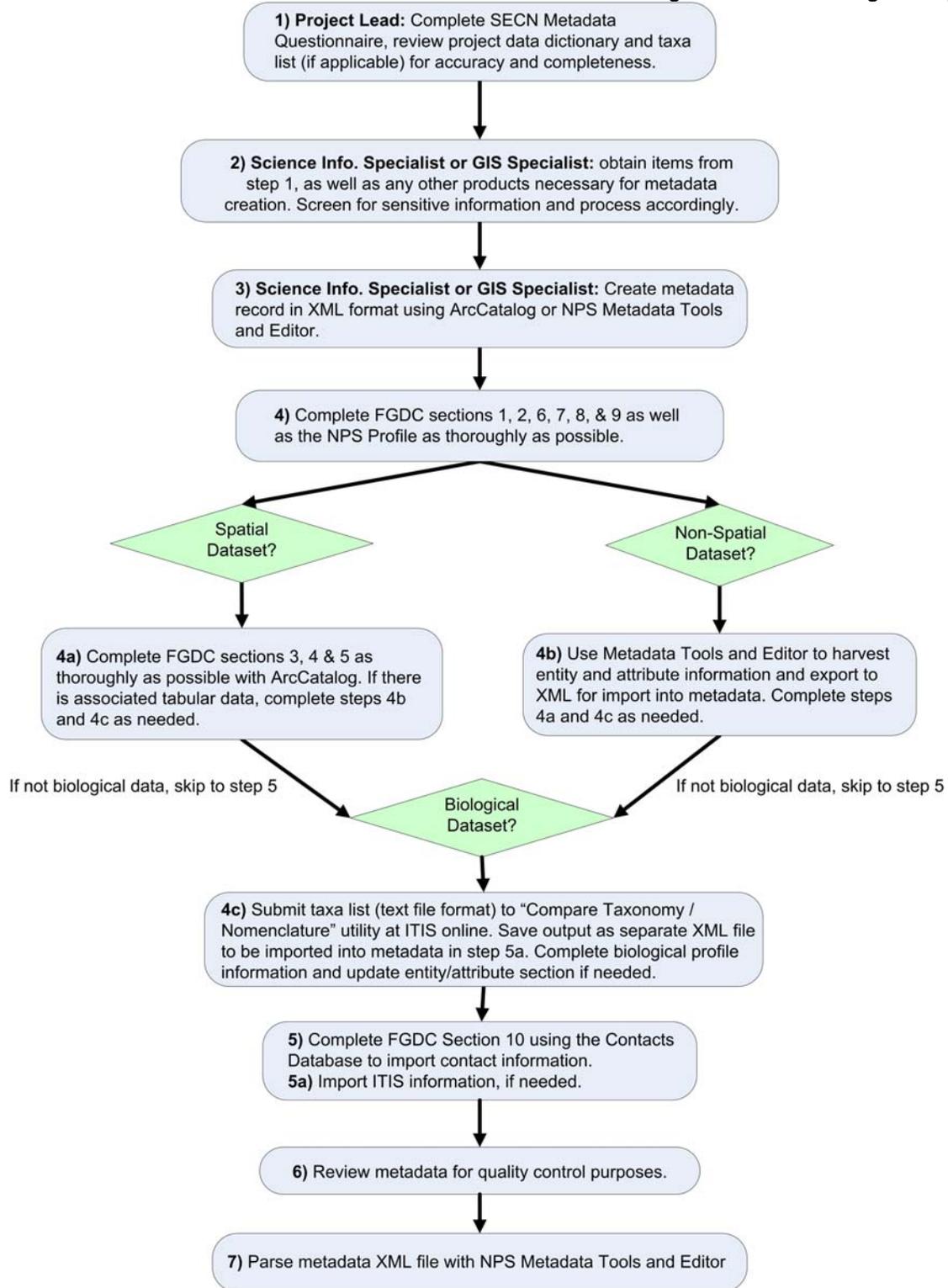
#### **ITIS Links**

Compare Taxonomy/Nomenclature for Biological Profile: <http://www.itis.gov/tools.html>

### ***General Metadata Procedures***

Metadata creation will follow the steps diagramed in Figure 2. For detailed, step-by-step instructions on creating a metadata record, please refer to “Creating Simple Geospatial Metadata” and “Creating Non-Geospatial Metadata”(National Park Service 2007c, National Park Service 2007d).

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**Figure 2 – Metadata Creation Workflow**

### **Metadata Questionnaires and Information Gathering:**

- The Principal Investigator (e.g. Network Ecologist) should obtain and complete the Metadata Interview Questionnaire (please refer to Appendix 1 of this document) at project onset to facilitate compiling the information required to create FGDC- and NPS-compliant metadata.
  - The Science Information Specialist or GIS Specialist can provide assistance in obtaining the Metadata Interview Questionnaire, if needed.
  - The Metadata Interview Questionnaire may continue to be edited during data acquisition; the Project Lead or Principal Investigator should coordinate with the Science Information Specialist or GIS Specialist as changes are made to the metadata record.
- If a data dictionary has been created for the project, this will provide much of the information needed to complete the Entity and Attribute Information (FGDC Section 5) of the metadata record.
- For data sets containing biological data, the taxa list should be reviewed by the Project Lead (or PI) for completeness and taxonomic accuracy.
- For a complete list of information that should be compiled to assist in metadata creation, see ‘Products and Information Necessary for Metadata Creation’ described in Appendix 2 of this document.

### **Data Sensitivity Review:**

- If the data includes any information about protected, threatened or endangered species, it is likely not releasable to the public.
- For more information on screening data for sensitivity, please refer to [SECN Policies for Fulfilling Data Requests](#).
- Sensitive data and metadata should not be posted to the NPS Data Store at this time. Future releases (likely Version 2) of the NPS Data Store will include support for managing sensitive data and metadata.

### **Metadata Software Selection:**

Use the information in the completed Metadata Interview Questionnaire to create a metadata record for each data set using the following desktop applications. For those data sets identified as requiring FGDC-compliant metadata (all spatial data sets), formal documentation can be generated with the NPS Metadata Tools and Editor and ArcCatalog programs.

- The NPS Metadata Tools and Editor is a custom software application for authoring and editing NPS metadata. It extends the basic functionality of ESRI’s ArcCatalog for managing geospatial data and also provides a stand-alone version for creating and manipulating metadata outside of ArcCatalog. The NPS Metadata Tools and Editor is available at <http://science.nature.nps.gov/nrgis/tools/index.cfm>.
  - It can be used for metadata creation and editing, import, export and parsing (MP is built in).
  - The stand-alone version is preferred for documenting non-spatial data sets.

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- The extension version enhances ArcCatalog to handle the NPS and Biological Data profiles and is useful for spatial data sets.
- The next release (Version 2.0) is anticipated to have tighter integration with the NPS data store using web services technology and identical functionality between the ArcCatalog and stand-alone versions.
- Help documentation on the use of the NPS Metadata Tools and Editor for creating and posting metadata is available on the NR-GIS Metadata and Data Store website at:  
<http://science.nature.nps.gov/nrdata/docs/metahelp/metahelp.cfm>
- ArcCatalog automatically harvests spatial organization and reference information as well as entity and attribute information for GIS data sets. Refer to ESRI help documentation within the software for details on metadata creation.

With the release of the NPS Metadata Tools and Editor, the Dataset Catalog is of limited usefulness and is therefore not used by the SECN for metadata generation of any type.

#### NPS and SECN Requirements:

- All GIS data sets to be posted to NPS Data Store must conform to the NPS Metadata Profile (<http://science.nature.nps.gov/nrdata/docs/npsprofile.cfm>) in addition to the FDGC CSDGM.
  - Some NPS Metadata Profile elements (NPS Unit Name, NPS Unit Code, and NPS Theme Category) can be populated from the NPS Metadata Thesauri, available as a downloadable Excel file at: <http://science.nature.nps.gov/nrdata/docs/metastds.cfm>.
    - The NPS Metadata Tools and Editor includes stylesheets (editing views) which have pick lists for populating the NPS Profile and Biological Data Profile elements.
    - If the NPS Metadata Profile elements have not been populated, the NPS Data Store will prompt for them during upload.
  - NPS Data Store also requires an ISO Topic Category for each metadata record
    - This element can be populated prior to upload using the NPS Metadata Tools and Editor pick lists or manually entered (refer to the NPS Metadata Thesauri).
    - The NPS Data Store will prompt for this during upload if not already populated.
  - Templates can be used to add NPS Metadata Profile elements to existing metadata files or to create new metadata files. Default NPS Profile templates are available at:  
<http://science.nature.nps.gov/nrdata/docs/metahelp/metahelp.cfm>.

#### Refer to the following Metadata help documents for specifics on NPS and NPS Data Store requirements:

National Park Service. 2006. Biological profile (National biological information infrastructure - NBII) metadata guide. pp. 1-7. NPS Data Store. (Accessed on 10-18-2007).  
<http://science.nature.nps.gov/nrdata/docs/metahelp/BiologicalProfileGuide.pdf>

- National Park Service. 2006. NPS data store: Creating metadata. pp. 1-10. NPS Data Store. (Accessed on 10-18-2007). <http://science.nature.nps.gov/nrdata/docs/metahelp/NR-GISCreatingMetadata.pdf>
- National Park Service. 2007. NPS metadata tools and editor: Creating non-geospatial metadata. pp. 1-15. NPS Data Store (Accessed on 10-18-2007).  
<http://science.nature.nps.gov/nrdata/docs/metahelp/NR-GISDataStoreCreatingNGSMetadata.pdf>
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- National Park Service. 2006. NPS data store: Deleting single records. pp. 1-2. NPS Data Store (Accessed on 10-18-2007).  
<http://science.nature.nps.gov/nrdata/docs/metahelp/NR-GISDataStoreDeleting.pdf>
- National Park Service. 2006. NPS data store: Editing category information. pp. 1-2. NPS Data Store (Accessed on 10-18-2007).  
<http://science.nature.nps.gov/nrdata/docs/metahelp/metahelp/NR-GISDataStoreEditCategory.pdf>
- National Park Service. 2007. NPS data store: uploading data and metadata. pp. 1-7. NPS Data Store (Accessed on 10-18-2007).  
<http://science.nature.nps.gov/nrdata/docs/metahelp/NR-GISMetadataDataUploadGuidance.pdf>
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<http://science.nature.nps.gov/nrdata/docs/metahelp/NR-GISMetadataAuthoringGuidance.pdf>
- National Park Service. 2007. NPS data store: parsing metadata with NPS metadata tools and editor. pp. 1-7. NPS Data Store (Accessed on 10-18-2007).  
<http://science.nature.nps.gov/nrdata/docs/metahelp/NR-GISMetadataParsingGuidance.pdf>
- SECN requires the following references in all metadata records associated with I&M projects.
    - Metadata records should reference the SECN project name and project code as maintained in the SECN Master Database.
      - The preferred location for this information is in the Related Key element (<RelKeyV></RelKeyV>) in the Program Information section (NPS Section 0) of the NPS Profile.
      - Alternatively, this could be entered in the Larger Work Citation element (<lworkcit></lworkcit >) of the Citation Information (FGDC Section 8).

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- Metadata records should contain references to all products generated by a project (e.g. GIS layers, relational databases, and reports). These references can be entered in the repeatable Cross Reference element (<crossref></crossref>) of the Identification Information section.
- An ESRI sample script is available to be used in ArcCatalog for more automated population of the Contact Information (FGDC Section 10, which is a repeating section throughout a metadata record). The sample script provides an Access database (ContactDB) for storing contact information and a metadata importer to add that contact information from that database to an existing metadata record.
  - See A6 – Appendix 3 for specifics on configuring ArcCatalog to use the ContactDB.
- Standard language for NPS liability should be inserted into the Distribution Liability metadata element (<distliab></distliab>) of the Distribution Information (FGDC Section 6).
  - This can be found at: <http://www.nps.gov/gis/liability.htm> as well as in the NPS Data Store help documentation, available at: <http://science.nature.nps.gov/nrdata/docs/metahelp/metahelp.cfm>.
  - If it is not already entered, NPS Metadata Tools and Editor and the Dataset Catalog will populate this field automatically.

#### Biological Data Profile:

If a data set includes biological information, the Biological Data Profile provides a set of extended metadata elements to document the species observed, taxonomic information, methods, and analytical tools.

- The most direct and preferred, means to populate the Biological Data Profile metadata elements are outlined in Biological Profile (National Biological Information Infrastructure - NBII) Metadata Guide (National Park Service 2006a). This approach primarily utilizes the NPS Metadata Tools and Editor.

#### Metadata Review:

Review metadata for quality control (QC) prior to posting to the NPS Data Store. A useful QC Checklist is available for download on the NPS Intermountain Region GIS website at:

[http://imgis.nps.gov/tips\\_templates.html](http://imgis.nps.gov/tips_templates.html).

#### Metadata Parsing and Exporting to XML format:

The NPS Data Store requires that metadata records be parsed as FGDC-structured metadata and then exported to XML format.

- If using ArcCatalog, these steps can both be done directly with the NPS Metadata Tools and Editor. See Parsing Metadata with the NPS Metadata Tools and Editor (National Park Service 2007a) for more information.
- If using other applications, export the metadata first to ASCII text format and then parse with Metadata Parser (MP). MP can simultaneously output an XML format metadata file as well.
  - The MP must be customized to handle NPS, Biological Data or ESRI Profile metadata elements. For specifics, refer to the README.txt file included in the zipped NPS Metadata

Profile configuration files available from the NPS Data Store website at:

<http://science.nature.nps.gov/nrdata/docs/metahelp/metahelp.cfm>

### **Metadata Posting:**

Post the metadata to the NPS Data Store. Authorized NPS staff may request upload and edit access to the NR-GIS Metadata and Data Store through the NPS Natural Resource Universal Web Login (UWL) available at: <https://science1.nature.nps.gov/nrdata/>. This is also the portal for uploading data. Metadata about non-sensitive data will automatically be made available to the public via the Geospatial One-Stop metadata clearinghouse (Figure 1).

More information about metadata upload format requirements is available at:

<http://science.nature.nps.gov/nrdata/docs/metahelp/metainfo.cfm> and in Metadata and Data Uploading Guidance (National Park Service 2007b).

### **Editing/Updating Metadata Already Posted to the NPS Data Store:**

As of Version 1, the NPS Data Store application allows online editing of NPS Theme Category and ISO Theme Keyword information and the deletion of single metadata records and/or data sets only (see help documentation at: <http://science.nature.nps.gov/nrdata/docs/metahelp/edithelp.cfm>).

- For metadata records simply needing edits to NPS Theme Category or ISO Theme Keyword elements, refer to Editing Category Information (National Park Service 2006c).
- If a metadata record posted to the NPS Data Store contains errors or requires edits to other elements, it will need to be deleted from the NPS Data Store, edited, and then reposted. Refer to Deleting Single Records (National Park Service 2006b).
  - The user should first download the metadata record (save in XML format) to the local system, then edit as needed in a text editor or metadata software program.
  - The edited metadata record can then be resubmitted to the NPS Data Store.
  - If the data set documented by the metadata record requires no edits, it will not need to be reposted. Simply ascertain that the metadata file still specifies the correct pathway to the data set on the NPS Data Store Server before resubmitting the metadata file.

## ***Responsibilities***

### **Principal Investigator (NPS):**

The person creating or modifying data as part of any NPS I&M project is also responsible for initiating metadata development. NPS-compliant metadata must accompany all data sets (metadata for geospatial data sets must in addition be FGDC-compliant) and are due when the final report and deliverables are submitted to the SECN and/or to the parks included in the study. The Principal Investigator may choose to delegate this responsibility depending upon who is assigned the role of data set developer/administrator. Individuals unfamiliar with metadata generation should use the guidance provided in this document and reference materials. For additional assistance the Science Information Specialist or GIS Specialist may be contacted.

**Principal Investigator (Non-NPS):**

If data originate outside the NPS, the Principal Investigator will have primary responsibility for compliance with the metadata standards as set forth in this document and providing documentation of the data set in the form of a metadata XML file as stipulated by written agreements with SECN parks (contracts, cooperative agreements, study plans, research permits). NPS-compliant metadata must accompany all data sets (metadata for geospatial data sets must in addition be FGDC-compliant) and are due when the final report and deliverables are submitted to the SECN and/or to the parks included in the study.

**Science Information Specialist and/or GIS Specialist (NPS):**

The Science Information Specialist must ensure that NPS-compliant metadata are generated for all non-spatial I&M data received from the Principal Investigator (NPS or Non-NPS). The Science Information Specialist or the GIS Specialist must ensure that all geospatial data resulting from an I&M project are FGDC- and NPS-compliant. The Science Information Specialist or the GIS Specialist can provide assistance in metadata creation.

## Appendix 1 – SECN Metadata Interview Questionnaire

**Filename:**

**Date created:**

**Data creator(s):** (Agency, Division, Position, Name)

**Sensitivity:** (Can this data be shared outside of the park service?)

**Date (or date range) the data represent:**

**Description of the dataset and its use** (What do the features represent?; What are the use constraints?):

**Description of how the dataset was created:** (Make and model of GPS unit, SOPs used.)

**Sources of data:** (Complete citations of hardcopy or digital sources [maps, reports, and other data sets] or Person and their level of expertise.)

**Quality:**

**Completeness:** Complete, not complete, work in progress, or other. If not complete, describe what's missing:

**Logical consistency:** (duplication, lines don't snap, etc.)

**Positional accuracy:** (how many feet or meters from true location and a description of why you think it's that—e.g., <5m for differentially corrected GPS, 5-40 feet for Garmin GPS, 12m for 1:24,000 topo if correctly placed)

**Attribute accuracy:** (How confident are you about the data in the attribute table?)

**Attributes:** (List all of the user created fields and describe what is in each field, including definitions for categorical data)

**Spatial reference information:**

Projection: (e.g., UTM zone 17)

Map units: (e.g., meters)

Datum: (e.g., NAD 83)

### Distribution Liability Statement

The National Park Service shall not be held liable for improper or incorrect use of the data described and/or contained herein. These data and related graphics, (if available), are not legal documents and are not intended to be used as such. The information contained in these data is dynamic and may change over time. The data are not better than the original sources from which they were derived. It is the responsibility of the data user to use the data appropriately and consistent within the limitations of geospatial data in general and these data in particular. The related graphics are intended to aid the data user in acquiring relevant data; it is not appropriate to use the related graphics as data. The National Park Service gives no warranty, expressed or implied, as to the accuracy, reliability, or completeness of these data. It is strongly recommended that these data be directly acquired from an NPS server and not indirectly through other sources, which may have changed the data in some way. Although these data have been processed successfully on a computer system at the National Park Service, no warranty expressed or implied is made regarding the utility of the data on another system or for general or scientific purposes, nor shall the act of distribution constitute any such warranty. This disclaimer applies both to individual use of the data and aggregate use with other data.

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## Appendix 2 – Products and Information Needed for Metadata Generation

The following is a list of data and information products as well as protocol-specific information necessary for the successful development of FGDC-compliant metadata and/or to meet the minimum requirements of SECN metadata generation for all spatial and non-spatial datasets.

### Products

- Study Plan
- Complete methods documentation, including field data collection, analysis, and GIS data layer processing steps
- Data dictionary, if available
- Grant proposals, contracts, agreements, permits
- Data collection forms
- Publications
- All reports, including annual, progress and final reports
- Databases
- Tabular data (Microsoft Excel spreadsheets, Microsoft Access databases, text files, etc)
- Catalog of vouchers (photographs/specimens)
- GIS data layers (ArcView shapefiles or ArcInfo e00 files)

### Information

- Is the data sensitive; are rare, threatened or endangered species reported?
  - If yes, what are the access constraints?: Public, NPS Only, SECN Only, Park Only
- Funding sources
- Additional contact persons and their contact information
- List of others who deserve credit for the project
- Verify the data accuracy and completeness:
  - Have all data been entered?
  - Have all data been verified for accuracy?
  - Have all data been validated for logical errors?
- Reference for any codesets or controlled vocabulary used in the project (for example, Henderson's plant associations, American Ornithological Union species codes, and Integrated Taxonomic Information System TSNs)
- Keywords for searching on data set
- Related data sets for cross referencing
- References for any models, analytical tools or statistical procedures used to develop the data set

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## Appendix 3 – Installation and Use of the ArcCatalog Metadata Contact Database

These instructions are for an ESRI Sample Script. The sample provides an Access database that can be used to record contact information and a metadata importer that can be used to add that contact information from that database to the existing metadata. These instructions were developed by the NPS Intermountain Geographic Resource Information Management Team (Denver, CO). Instructions are given for both ArcGIS 8.3 and ArcGIS 9.x users.

### Installation:

1. Make sure ArcObjects Developer Kit is installed on your PC or laptop. If not, load it from the install CDs.
  - To determine if this program is installed, check to see if you have the following directory
    - **ArcGIS 9.2 users:** In the arcgis directory: DeveloperKit
2. User must be at least a Power User account on the PC or laptop
3. Set-up VB Utility Tools. Follow these steps to fix the registry and enable the capability to compile \*.dll files with a mouse click.
  - For ArcGIS 9.2 users, go to ...\\arcgis\\developerkit\\tools
  - double click on register\_in\_menu.reg and let it run
  - double click on FixRegistry.exe and let it fix errors if any are found
4. Open and compile the Visual Basic project.
  - For ArcGIS 9.2 users, go to ...\\arcgis\\developerkit\\SamplesCOM\\Metadata\\ContactDB\_Importer\_visual\_basic\\visual\_basic
  - right click on the ContactDB.dll and choose register
5. Add the registered file to the Component Categories Manager. Follow steps these steps in order:
  - Run Categories.exe. For ArcGIS 9.2 users, go to ...\\arcgis\\bin (A dialog box for the Component Categories Manager will come up).
  - Navigate to the 'Metadata Importers' folder. Select the folder and click Add Object. A dialog box titled "Find Add-In" will popup.
  - Navigate to the compiled ContactDB.dll (from step 4b) and click Open.
  - The Add Objects dialog box appears listing "ContactDB", which is checked by default. Click OK.
6. In the Component Categories Manager, you can see that "ContactDB\_Importer.ContactDB" has been added to the list of components in the Metadata Importers category. Click Exit.

**Use:**

1. Open & edit the blank Access DB that comes with the Visual Basic project.
  - For ArcGIS 9.2 users, go to  
 ...\\arcgis\developerkit\SamplesCOM\Metadata>ContactDB\_Importer\_visual\_basi  
 c\visual\_basic
  - Copy the ContactDB.mdb to a new location outside of the ArcGIS directory structure. Suggestion – Put it in a location where everyone in your office doing metadata can access it (e.g. at SERO, the ContactDB.mdb is located at L:\GIS\gis\_tools)
  - Open the ContactDB.mdb and add contact information for all individuals whose name might need to be added to a metadata record.
2. In ArcCatalog, click a shapefile or another data source in the Catalog tree.
3. Click the Metadata tab then click the Import Metadata button on the Metadata toolbar.
4. In the Metadata Import dialog box:
  - Unclick “Enable automatic update of metadata”
  - Choose Format "FGDC Contact Database Importer"
  - Navigate to the ContactDB.mdb that you customized in the first step

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**Literature Cited**

National Park Service. 2006a. Biological profile (National biological information infrastructure - NBII) metadata guide . National Park Service. Available: <http://science.nature.nps.gov/nrdata/docs/metahelp/BiologicalProfileGuide.pdf>. (October 2007a).

National Park Service. 2006b. NPS data store: Deleting single records. National Park Service. Available: <http://science.nature.nps.gov/nrdata/docs/metahelp/NR-GISDataStoreDeleting.pdf>. (October 2007b).

National Park Service. 2006c. NPS data store: Editing category information. National Park Service. Available: <http://science.nature.nps.gov/nrdata/docs/metahelp/metahelp/NR-GISDataStoreEditCategory.pdf>. (October 2007c).

National Park Service. 2007a. NPS data store: parsing metadata with NPS metadata tools and editor. Available: <http://science.nature.nps.gov/nrdata/docs/metahelp/NR-GISMetadataParsingGuidance.pdf>. (October 2007a).

National Park Service. 2007b. NPS data store: uploading data and metadata. Available: <http://science.nature.nps.gov/nrdata/docs/metahelp/NR-GISMetadataDataUploadGuidance.pdf>. (October 2007b).

National Park Service. 2007c. NPS metadata tools and editor: Creating non-geospatial metadata.  
Available: <http://science.nature.nps.gov/nrdata/docs/metahelp/NR-GISDataStoreCreatingNGSMetadata.pdf>. (October 2007c).

National Park Service. 2007d. NPS metadata tools and editor: Creating simple geospatial metadata.  
Available: <http://science.nature.nps.gov/nrdata/docs/metahelp/NR-GISDataStoreCreatingNGSMetadata.pdf>. (October 2007d).

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# SECN Digital Photo Management Strategy

*Southeast Coast Network*

*Version 1.0*

## Revision History Log:

Revision Date	Author	Changes Made	Reason for Change	New Version Number

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## Credits:

The information contained in this appendix (except materials regarding Extensis Portfolio) was taken or adapted from material contained in:

Southwest Alaska Network and Southeast Alaska Network. 2004. Digital Photograph Management Strategy for Alaska Inventory and Monitoring Program. National Park Service. Anchorage, AK.

## Recommended Citation:

Davie, E., M.W. Byrne, T. Curtis and D. Lagana. 2006. Using Extensis Portfolio 8 to organize and catalog photos and generate metadata. National Park Service, Southeast Coast Network Inventory and Monitoring Program.

## ***Introduction***

The Inventory and Monitoring Program is tasked with organizing and maintaining a variety of research information, including digital images collected as data and images taken to document protocols and procedures. Concurrently, there is a growing need to make all NPS digital photos useful and available service-wide. Whether for the I&M Program or for other NPS projects, this document describes a management strategy to organize, store, name and retrieve photographs in electronic format. The intent is to centralize processing and storage, reduce wasted disk space and to make photos available to all NPS employees.

## **Assumptions and Definitions**

- This document refers only to photographs in an electronic format.
- In this document ‘digital photo’ refers to a photo in electronic format, regardless of how it was acquired, by scanning or from a digital camera.
- ‘Photo processing’ is used in this document to refer to the sum total of all steps necessary to go from a photo on your camera’s storage card to the photo library.
- ‘Documented’ photos refer to photos that have completed metadata in either the parks photo database or a project database.

Photos are taken and used by NPS personnel for a variety of purposes. NPS photo users vary tremendously in their knowledge and access to imaging software and hardware. While it is impossible to anticipate every use/collection scenario, most photos should fit into one of the general “photo type” categories defined below:

- ***Library Photos:*** These photos are final products that have been edited, documented, reviewed and added to the park’s or network’s digital photo library. Metadata for these photos is stored in a central database using approved software (Extensis Portfolio). These photos can be used for multiple purposes by a variety of staff. They are public domain.
- ***Working photos:*** Photos in this category are “works in progress”. Working photos should be documented and ultimately moved into the network’s photo library or they should be deleted. Metadata for working photos does not exist but is in progress. Working photos are stored in centrally located, employee-specific folders on a network drive that is part of a regular back-up routine.
- ***Data Photos:*** Data photos are photos collected as data. Examples include: 1) site specific photos documenting a shoreline classification and, 2) photos taken as repeatedly as a photo point to monitor site conditions. Data photos are collected as part of a well-defined data collection protocol. Metadata for data photos is stored along with the photo in the protocol folder data structure. Representative, unique and instructive data photos should be added to the parks digital photo library.
- ***Aerial Photos:*** Aerial photos are an important element of inventory and monitoring datasets and are acquired and processed to meet highly specific specifications. Therefore, digital aerial photos standards are mentioned in this document but are discussed in greater detail on a protocol-specific basis.

## *Digital Photo Lifecycle*

The digital photo cycle typically runs through the following steps. Photos are acquired, stored, viewed, renamed, edited, documented, stored in a photo library, archived and, in some cases deleted. Some of the issues and questions which crop up along the cycle include:

- Acquisition
  - Digital cameras – What is the best quality and size?
  - Scanning images – What parameters to use?
- Processing
  - Download and Storage – Where? For how long? Naming standards?
  - Viewing – With which software? Or as contact sheets?
  - Renaming – Manually or batch? Naming standards?
  - Editing – Which software? Should you write over the master or make a copy?
  - Documenting – Which attributes should be documented? How is the documentation ‘attached’ to the photo?
- Long-term Storage
  - On-line storage – Where? Managed by whom? For how long?
  - Off-line storage and archiving– Where and when? When to delete?

This document will attempt to address these questions and provide logical standards and guidelines to facilitate good photo management. This document discusses imaging standards and how digital photos will be stored in a repository, documented and cataloged. Figure 1 summarizes the general photo management process and workflow.

### **Acquisition - Digital Camera Specifications**

Digital cameras should be set at the highest resolution possible, with the recognition that you can always save a copy of your photo at a lower resolution, but you cannot make a low resolution photo into a high resolution photo.

Publication quality photos should be taken at a minimum of 5 megapixels. If the camera will allow, the resolution should be set at 1760 x 1168 or higher. The quality should be set for “super fine” or “high”. Because the destination of a photo is unknown at the time it is taken, it is recommended all photos be taken with this resolution or for lower resolution cameras, the highest resolution possible. It is best to decrease the resolution for web use or thumbnails in the office using software.

Most digital cameras can digitally imprint the date and time onto the photo image and in general, it is recommended that this feature **NOT** be used. Date and time data are embedded in jpg and tiff file headers by most digital cameras. If the image is being cataloged and documented it has value and imprinting the image reduces the image quality and hence the image value. The exception may be for projects collecting massive numbers of photos – imprinted dates and time could facilitate data linking. This should be decided as part of a protocol’s data management SOP.

Digital camera internal clocks are subject to minor cumulative errors. Accurate camera date and time is important to maintain, it is recorded as the file creation date for each photo and for jpg formats it is

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embedded in the photo itself. It is best to frequently sync a camera time to an active GPS or to the network time. Beware of time zone changes where appropriate.

Different brands of digital cameras name photos differently. Typically the camera will have several file naming options. These may include:

- Sequential numbering which resets each time a memory card is formatted or a new card is used.
- Sequential numbering which loops from 0001 to 9999.
- Numbering based on date-photo sequence.

As a general rule, the most useful setting is a date-photo sequence, then the 0001-9999 loop and the least useful the card based sequence. Projects must carefully review the naming options of the project cameras for the most useful convention. Projects must also ensure the same convention is used by all cameras collecting data photos. Photos will be renamed later following the naming conventions described below.

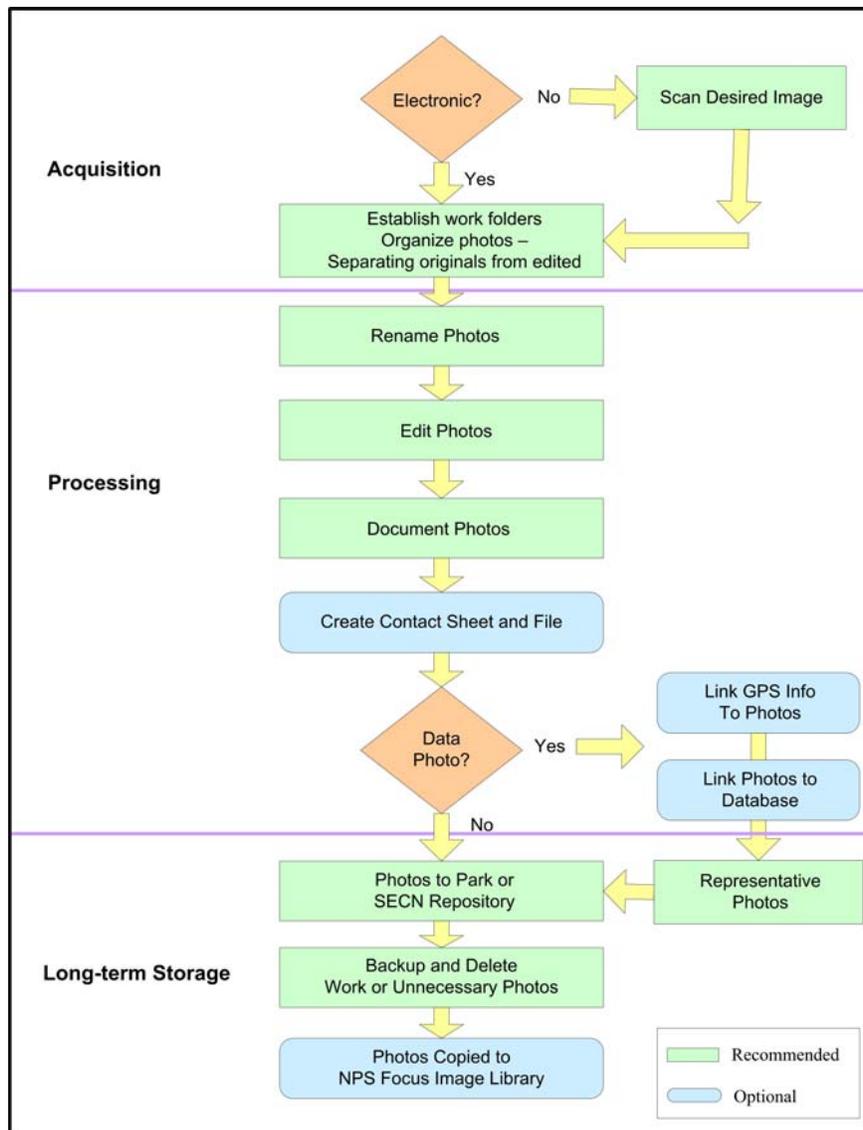


Figure 1 SECN photograph management process

## Acquisition - Scanning Specifications

The scanning resolution is selected based on the size of the original image. The smaller the photo, slide, or other material, the higher the resolution should be used to acquire a detailed scan. Below are the minimum recommended scan resolutions for different formats. Higher resolution scans will yield better quality images but also result in larger file sizes.

- **35mm color slides or negatives** (scanner should be set up to scan transparent materials - both hardware and software)
  - Choose source size of approx. 1.3 x .85 inches (software should auto-detect the exact dimensions)
  - Choose target size same as original
  - Choose resolution 2400 dpi, 24 bit color (do NOT use 32 or 48 bit color)
  - Save as uncompressed TIF file
  - Scan to yield file approximately: 3120 x 2040 pixels, file size 15-20MB
- **3 1/2" x 5" color photographs**
  - Choose source size 3.5 inch x 5.0 inch (software should auto-detect the exact size)
  - Choose target size the same as the original
  - For color photos, choose resolution 600-700 dpi, 24 bit color (do NOT use 32 or 48 bit color)
  - For black & white photos, choose resolution 600-700 dpi, 8 bit grayscale (do NOT use 16 bit grayscale)
  - Save as uncompressed TIF file
  - Scan to yield file approximately: 3000 x 2100 pixels, file size 15-20MB
- **4" x 6" color OR black & white photographs**
  - Choose source size 4.0 inch x 6.0 inch (software should auto-detect the exact size)
  - Choose target size the same as the original
  - For color photos, choose resolution 600 dpi, 24 bit color (do NOT use 32 or 48 bit color)
  - For black & white photos, choose resolution 600 dpi, 8 bit grayscale (do NOT use 16bit grayscale)
  - Save as uncompressed TIF file
  - Scan to yield file approximately: 3600 x 2400 pixels, file size 15-20MB
- **5" x 7" color OR black & white photograph**
  - Choose source size 5.0 inch x 7.0 inch (software should auto-detect the exact size)
  - Choose target size the same as the original
  - For color photos, choose resolution 600 (450 if controls allow it) dpi, 24 bit color (do NOT use 32 or 48 bit color)
  - For black & white photos, choose resolution 600 (450 if controls allow it) dpi, 8 bit grayscale (do NOT use 16 bit grayscale)
  - Save as uncompressed TIF file
  - Scan to yield file approximately: 4200 x 3000 pixels, file size 20-25MB for color

- **8" x 10" color OR black & white photograph**
  - Choose source size 8.0 inch x 10.0 inch (software should auto-detect the exact size)
  - Choose target size the same as the original
  - For color photos, choose resolution 300 dpi, 24 bit color (do NOT use 32 or 48 bit color)
  - For black & white photos, choose resolution 300 dpi, 8 bit grayscale (do NOT use 16 bit grayscale)
  - Save as uncompressed TIF file
  - Scan to yield file approximately: 4200 x 3000 pixels, file size 20-25MB for color
- **8 1/2" x 11" typewritten/printed paper**
  - Scan at resolution 300 dpi or 400 dpi if the text has very small print
  - Save as uncompressed TIF file
- **9" x 9" aerial photograph**
  - If possible scan from diapositive transparencies rather than prints
  - Scan at resolution 1200 dpi or as high as possible/feasible
  - Scan with sharpness set to extreme
  - Save as uncompressed TIF file

### ***Processing Overview***

Effectively dealing with hundreds of photos requires consistent downloading, naming, editing and documentation. This section describes the general process for managing photos and will provide additional information for each type of photo as defined in the Introduction.

After the images have been acquired, either by digital camera or scanning, the general processing of photos are as follows:

- Migrate photos to the pre-established directory structure for photos
- Rename the photos
- View, delete and edit the photos and needed
- Document the photos
- Prepare photos for on-line long-term storage or off-line archiving.

The following steps provide general guidance on processing photos using Extensis Portfolio 8. Depending on the purpose, these may be modified as needed. Any existing park-specific photo collection protocols should be reviewed. Data photos may need more processing and consideration. Data photos organization, storage and documentation must be carefully integrated with a project database to ensure that data photos are available and useful. Pre-built photo database tools can simplify data entry. Large multi-year projects anticipating thousands of photos should invest in custom forms to facilitate data photo entry.

### **Step 1: Establish organization for photos**

Within a user's workspace on a networked drive (or other drive that is regularly backed up), the following directory structure is recommended for storing photos during the processing phase. If nothing else, it is important that photo originals be maintained intact and stored separately from working/edited photos to prevent accidentally "ruining" a photo during editing and having no original to return to – or accidentally saving the only copy of a photo to a lower resolution, rendering it no longer acceptable for other uses.

\Images

- \Originals – raw, downloaded photos, including poor photos of unique subject matter
- \Edited – photos which have been processed: renamed and edited
- \Working – photos that are still being processed
- \Data – photos taken as part of a project data collection protocol
- \Misc – miscellaneous or incidental photos which do not fit the above categories

Note that the above directory structure applies to photos being processed. Once final, the working folder can be eliminated and the originals archived separately from the edited (final) documented photos which are migrated to the directory structure described below.

### **Original and Edited Photos**

Raw, unaltered photos should be carefully preserved in the \Originals photo archive. This original set of photos should be preserved as is and copies of raw photos moved to clearly named folders for review and editing (e.g. \Working). In addition, after downloading or scanning photos to the \Originals directory, this directory should be set to “read-only” permissions to prevent inadvertent edits.

### **Working Photos**

It is unlikely that a photo will go directly from the scanner or camera exit port to the \Edited photo folder or to the project data repository where it will live forever. Photos need to be processed before they are ready to be used in a database or in the photo library. Photos being processed “working photos” should be stored within a user’s photo library on a networked drive or drive that is backed up on a regular schedule.

### **Data Photos**

Photos taken as part of a project’s data collection protocol are project data that need to be organized, documented and preserved in conjunction with all other project data. Project data photos should be organized and contained within the protocol data structure and supported by detailed protocols that define how and where photos are downloaded, edited and rolled up into final folder locations.

It is recommended photos not be stored or embedded directly within a MS Access database; instead a photo linking tool between the photographs and the database should be used.

Incidental or opportunistic photos taken by project personnel are not data photos and can be managed as miscellaneous photos stored in the \Misc image subdirectory. These photos may be further processed to become “Library” photos. Photos of interest to a greater audience should be copied to the Network Image Library.

### **Library Photos**

Library photos are public photos readily available to be used for a variety of purposes. High quality photos are encouraged where possible, but may also include lower resolution photos. These photos have been reviewed, processed, documented and ready to be stored in a digital photo repository (e.g. NPS Focus).

## **Step 2: Acquire Images**

Follow the setup guidelines presented in the main body of the Digital Image Management Strategy for digital photos and scans.

### Step 3: Download and Organize Images

Photos may be downloaded from a digital camera directly or scanned from printed photos or slides. Store digital images files in their original form in the /Originals directory and do not modify these photos. Change the directory to be “read-only” by right clicking on the folder, select Properties, and check “read-only”. Copy photos to the /Edited subfolder, as needed. Use intermediate folders where appropriate to facilitate batch renaming and batch resizing.

### Step 4: Geolink Images (optional)

Geolinking photos is a highly efficient way to link photos to a location and to a field data collection record. If a careful, step by step data collection process is integrated with a time-synched digital camera and appropriate GPS data, geo-linking software can greatly reduce photo processing time. However, the process can be involved, especially for projects collecting hundreds of photos.

See the photo linking cheat sheet in the Appendix for an introduction to the process. For more information, contact your GIS liaison.

### Step 5: Rename Images

Use a batch renaming software to rename photos in \Edited. Do this before reviewing and deleting so that photo names in \Original and \Edited are similar. Rename photos, consistent with project and park guidelines. You may elect to use your image cataloging software to rename. Create a readme.txt within the photos directory explaining the naming standards used. Some software that comes with digital cameras will rename photos as they are downloaded. Use this feature whenever desirable and feasible. However, check the effect of these types of software downloads on the file date.

### Step 6: Review Images

Complete an initial review of the photos in \Edited folder:

- Delete any “junk photos”, such as accidental photos of the sky, ground, backpack, black photos.
- Poor quality photos should be deleted, except where the subject is highly unique.
- Medium quality photos should be assessed against existing photos of the same subject in the park photo library. If the photos duplicate the subject with no enhancement of quality or perspective, the photo may not be worth saving and should be deleted.
- Orient any photos, using your preferred software. Choose your rotation software carefully – some modify the image, some change the file date. This may be particularly significant for data photos.

**All data photos may need to be preserved to enable correlation of field records and sequentially numbered photos.**

### Step 7: Editing Images

Photos should be rotated to make the horizon level.

- Photos of people should have ‘red eye’ removed.
- Photos should be cropped to remove edge areas that grossly distract from the subject.

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- If you elect to modify your images, such as cropping, color enhancing or balancing, etc. do this at this step. If you will be doing extensive modifying, you may want to save versions of the image until the modifications are satisfactory.
- If different pixel sizes of the same image is desirable, use one of the following methods:
  1. (Preferred) Put the low resolution (~1600 x 1200) copies in the ‘root’ and the high version in the subfolder indicated by the extension HighRes. Most users seem happy with lower resolution version and never go to the high resolution folder. In reality, high resolution images are too big to leave on the network long-term anyway.
  2. While it is very logical to put photos of different resolution in the same folder, it is incredibly annoying when you look at the folder in a thumbnail viewer – there are two copies of everything! It makes thumbnail browsing very inefficient.

### Step 8: Catalog and Document Images

Using your preferred image cataloging software, such as Portfolio Extensis, you are ready to create your project Collection and add metadata to your photos. This is best described in the context of a given software, so refer to the Appendix Cheat Sheets for instructions. In general, consider the following:

- Name of your project collection (short name for your project)
- Metadata elements required
- Set up features, such as user defined fields, selected list of keywords to use, etc.

### Step 9: Linking to Project Data (if necessary)

Data photos, such as site photos taken as part of a complex project, should be organized in the project folder system and linked to the project database. However, this requires custom code or using the PhotoTools developed by the Alaska Support Office. Currently, this PhotoTools is in “beta” form and is not supported. This tool allows the best of both worlds: easy use of the software for thumbnail viewing, cataloging, and contact sheet printout, and; flexibility in custom made databases. Multi-year projects collecting hundreds of photographs as data should invest in using the PhotoTools and developing the database tables and forms to assist with data photo management. Contact the Southeast Coast Network Science Information Specialist for information.

### Step 10: Posting Images to the Library

As the project reaches a milestone, such as when reports are written, the images should be reviewed for samples of interest to a greater audience. This may include scenic views, animals, activities, methods, equipment, or facilities. If the project includes 60 pictures of essentially the same method, all needed for the project, select a few that are representative. These representative images should be included in the park library. They should then be copied, using the preferred software, to the Library repository. Notify the photo manager (data manager or interpreter).

**NOTE: It is important to copy images within the preferred software. This will ensure the metadata stays with the image and is not lost.**

## Step 11: Archiving Images

As with all materials from a project, images should be organized, packaged, and delivered to archives. This may consist of the following:

- CD or DVD of images
- Contact sheet of the images, with documentation
- Photos prints and negatives, if any
- Other project information, such as reports, field notes, samples, etc.

**Special note for Data Photos:** Data photos are photos collected as part of a documented data collection protocol. The project’s data processing protocol should contain a detailed section on processing data photos. This protocol should include information, such as:

- File folder structure conducive to data entry and linking.
- Photo naming standard conducive to data entry and linking.
- Field collection method for uniquely linking each photo to its related field data sheet/record.
- Consistent photo database that facilitates linking of photos to the projects data.
- Step-by-step procedural documentation.

### *Image Naming Standards*

In an ideal world all image file names would be unique and informative straight out of the camera. Until this is possible we will be faced with the task of renaming photos. Images must be given very specific file names that will continue to uniquely identify them for the coming decades. When dealing with hundreds of photos, such as in the case of data photos, descriptive naming is neither practical nor useful and photo file names should either be retained as produced by the camera or batch renaming without descriptive components should be used. **In all cases, photo names should not use spaces or special characters.** The following section provides the SECN photo naming standards.

#### **Instructions for assigning image file names**

All photos should follow the convention described here when being named.

- Each name will have exactly 20 characters.
- Camera number should reference a specific network owned camera and serial number.
- Each file name will follow the format presented below:

**PARKMMDDYYYYPHCOG####**

**PARK** - Four character park code of where picture or file was taken or created

**MMDDYYYY** - Date photo was taken or GPS file was created in month, day and year format. Must be 8 characters long.

**PH** - Photographer Initials (if unknown put XX). The complete photographer’s name will be provided in the photo metadata record.

**C** - Camera number (if a personal camera was used put P)

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<b>Camera Number</b>	<b>Brand/Model</b>	<b>NPS Property Number</b>	<b>Serial Number</b>
1	Pentax Optio WP	NP5000100202	9329071
2	Nikon D100	NP5000080901	2069885

**OG** – Project code comprised of the following:

**O** - Office Code: this will indicate which office the person taking the pictures is working from (numbers [or letters] can be added later should the need arise).

- 0 = SERO office
- 1 = FOSU office
- 2 = CUIS office

**G** - General category: this is a numeric code from 1 to 7 symbolizing the general category the Protocol code falls into. Please categorize photos according to the predominant subject matter.

<b>General Category Number</b>	<b>Category Description</b>
1	Flora
2	Fauna
3	Geophysical
4	Water
5	People / Meetings
6	Scenic
7	General

**###** - Three Digit Number: an incremental (sequential) number at the end of the file name to assist in creating a unique photo id (restart at 001 for each day).

**Instructions for assigning image file names – for NPS Focus Digital Library**

The NPS Focus Digital Library represents the first NPS effort to maintain a central repository of pictorial and textual digital content service-wide. Digital files may be searched from NPS Focus website and to improve search capabilities, naming guidelines have been provided as described below.

The image file name should consist of three of four parts:

- The park code (e.g. CAHA, CALO, CANA, CUIS, CHPI etc.)
- A brief description of the image
- The date of the image written as YYYYMM
- A numeric extender for multi-part and multi-page items

Each of the first three parts is separated by a hyphen and the fourth part by an underscore. Multi-part and multi-page items consist of:

- Multiple images associated with one record (such as multiple angles of the same monument)
- Multiple pages of an item that has been scanned.

Note that all sections of the file name have been separated by a hyphen. When an item being digitized consists of multiple parts, the main filename should be followed by an underscore and part number beginning with \_1, \_2, \_3, etc.

**Examples:**

FOFR-VascularPlants-2001.jpg

CUIS-PlumOrchardSonde-1999\_1.tif

TIMU-VegPlotSaltMarsh-1999\_2.tif

**Special Collections Naming Standards – Archives**

In some cases, NPS Archives may scan images and store them electronically. They generally consist of legacy images that were already within the archives. These are usually images that were not previously generated electronically by the project. These photos are tied to a particular accession and catalog number, and hence, the image name reflects these numbers. Images from more recent projects are provided to NPS Archives, usually on a media such as a CD or DVD. In this case, it is the CD or DVD itself that is being archived with an accession and catalog number, and not the individual images.

The image file name should consist of three parts:

- The park code (e.g. CAHA, CALO, MOCR, CHPI, FOSU, CONG)
- 5-digit Accession Number, assigned by authorized staff
- 5-digit Catalog Number, assigned by authorized staff

Examples include: CHPI\_00301\_00001.jpg and CHPI\_00301\_00002.jpg

***Image Viewing and Editing***

Software to view and edit photographs is plentiful and is subject to individual preference. Because of this, no specific software is being recommended at this time. However, to ensure consistent results and procedures, multi-year projects collecting photos as data should select a standard program to view and to edit photos. Standard software is also a fundamental project requirement to ensure a useful photo processing protocol. Standard software also facilitates communications between project personnel and minimizes confusion.

**Viewing:**

Thumbnails give a quick icon view of many photos so photos may be quickly selected visually. It is recommended that 1) a quick viewing software or database be used to look at thumbnails, captions, descriptions, dates and keywords, and where appropriate, 2) a contact sheet of these thumbnails be printed for quick reference.

## **Editing:**

At a minimum, photos should be edited as follows:

- Poor quality photos should be deleted, except where the subject is highly unique.
- Medium quality photos should be assessed against existing photos of the same subject in existing photo libraries at the Park or Network level. If the photos duplicate the subject with no enhancement of quality or perspective, the photo may not be worth saving and should be deleted.
- Photos should be rotated to portrait or landscape, as appropriate.
- Photos should be rotated to make the horizon level.
- Photos of people should have 'red eye' removed.
- Photos should be cropped to remove edge areas that grossly distract from the subject.

Large groups of photos acquired under sub-optimal exposure or lighting can be batch processed to enhance contrast or brightness. Batch processing can also be used to resize groups of photos for use on the web. Detailed suggestions for editing may be found in the Appendices of this document.

## ***Image Documentation and Cataloging***

Images should be documented and cataloged. Documentation, or metadata, provides the minimum information a user will need to appropriately use the photo. Cataloging provides a collective means for searching, finding, and retrieving photos. A variety of software is available to facilitate this process. NPS does not yet have a standard software package to document, catalog and effectively use photos at the park level. Various software packages are under review, some are in use at various parks across the nation.

All software or combinations of software should meet these minimum requirements:

- Meet the minimum metadata
- Ability to add additional fields, as desired
- Ability to establish a template of these fields
- Ability to create a thumbnail view
- Ability to search
- Ability to do basic functions like rotate, zoom, pan

## **Minimum Metadata Attributes:**

All photos should be documented with these minimal metadata attributes:

- File name (usually inherent)
- File location (usually inherent)
- Storage Location of the original/hardcopy/negative
- Description
- Photographer, Contributors, or Archive Institution (all that apply)
- Collection Name, if applicable (historic and archives)
- Publisher
- Date Taken
- Format/Size/Source
- Type of Media of original
- Subject

- Keywords
- Park Code
- Place
- Any necessary credits
- Distribution Restrictions, such as copyright or sensitivity

Digital photos capture some metadata and will hold this information in an EXIF file that stays with the photograph until the photograph is modified. These include:

- File name
- Aperture
- Date Digitized
- Date Taken
- Exposure Bias
- Exposure Time
- F-Number
- Flash (yes, no)
- Focal Length
- ISO Speed
- Light source
- Metering Mode
- Shutter Speed

Additional Attributes may include (IPTC standards):

- Special instructions for how the photo was taken
- Subject distance
- Caption writer
- City, State, Country
- Equipment make
- Equipment model
- Object name

If the image is processed, for example cropped or modified in Photoshop, the following attributes should be documented:

- Height
- Width
- Artist
- Artist Copyright
- Creating Software
- Date
- Model of printer intended

### **Special Note for Data Photo Metadata**

Projects should store data photo metadata attributes in the appropriate relational tables of the project database. Project databases should contain at least the minimum metadata requirements listed above.

## *Long-term Storage*

### **Originals and Interim Photo Storage**

Once the photos have been processed and have reached a logical milestone, original photos should be archived onto archival quality DVDs and labeled as originals. Other project interim photos may be backed-up using normal project back-up procedures and deleted. Any working photos, such as those in PhotoShop, may be maintained at the user's discretion. Users should be considerate of disk space, however, and should use CDs or DVDs to backup files not frequently used.

### **Data Photos Storage**

Projects with data photos that can be viewed via an Access database can serve the database and photos out to all NPS sites via the NPS wide-area network. Each project must assess the need and utility of making its data widely available. Projects with data of interest to the public can deliver the complete database and data photos via a CD or DVD. High value projects may choose to make the project data and photos available via a custom web application.

As the project reaches a milestone, such as when a report is written, photos should be reviewed for samples of interest to a greater audience. This may include scenic views, animals, activities, methods, equipment, or facilities. If the project includes multiple pictures of essentially the same method or item, all needed for the project, select a few that are representative. These representative photos should be copied to "library" photos.

### **Library Photo Storage**

Once the photos are documented, they should be made available within one of the digital image libraries and cataloged (park, region or national). The network data manager or other designated photo contact staff will maintain the Southeast Coast Network Image Library.

### **Southeast Coast Network Digital Image Library**

The intention of this library is to provide a repository for Southeast Coast Network parks to share the organization, management, and access for images collected as part of the SECN long-term monitoring program. This Library is stored on the Read-only S:\ drive in the regional office in Atlanta and includes final, edited photos that have been submitted from all network offices (CUIS, FOSU, OCMU and SERO), utilizing the naming convention described above. Given the current bandwidth situation between the network offices, the central photo repository may need to be distributed to all network staff utilizing an external hard drive, similarly to how the GIS data is distributed.

### **NPS Focus Digital Image Library**

The NPS Focus Digital Library consists of a seamless integration of a metadata management system and a separate image management system. It represents the first NPS effort to maintain a central repository for pictorial and textual digital content as well as a coordinated effort to set up policies and procedures for scanning, serving, and archiving digital resources. The system is designed to support all interested NPS endeavors.

NPS Focus is a library or repository of images. It is not a multimedia application. NPS Staff and the public will use NPS Focus to search for relevant images and then link to them or download images from the library to build into a web page, PowerPoint presentation, or other application (Evans 2003).

While NPS Focus provides a solid infrastructure for image repository for the future, it is still in the early stages of development. As such, procedures for uploading and maintaining images have not been defined yet. NPS Focus also requires images to be in DjVu or MrSID formats. Images to include in this repository are final images significant to the park/region. Files are organized by park and by file name. No other subdirectories are used.

### ***Photograph Property and Use***

All photos collected with the National Park Service funds and staff time are property of NPS. Contractors using photographs as part of their project should provide copies, preferably high resolution digital copies, to the NPS project manager.

When using a photograph, provide credit to the photographer. This is usually written on the right side of the photograph or at the bottom in a smaller font size (e.g. san serif) than the text in the document.

### **Photographs of People and Rights to Privacy**

When taking a photo of a person, the subject's right to privacy may come into play. Photos with the following criteria should seek a model waiver form:

- The person is recognizable, AND
- The person is not a government employee (on-duty), AND
- The photo will be used for profit to the photographer.

OR

- Any photos of a minor, where the minor is recognizable.

Photos with the following criteria do not need a model waiver form:

- Photos are public domain (unless protected by law)
- Photos are not for profit
- If photos are used for profit, such as in a magazine, it is not NPS who profits

In the case of NPS, it is rarely the case where a model waiver form is needed. Typically these photos are used for education and editorial purposes, where photos of subjects are acceptable.

Other violations of privacy may include:

- The photographer intruded on the person's seclusion to take the photo

OR

- Private information about the person is now made public

OR

- When the photo causes the average, reasonable person to believe something about them that isn't true.

These instances should not occur within the scope of government work. NPS and contracting photographers should exercise the following guidelines when photographing people:

- Generally avoid photos of minors for public distribution.

- Intentionally do not identify the non-government people pictured, providing one less invasion of privacy.

### ***References***

- Evans, Kass. 2003. National Park Service NPS Focus Image Creation and Management Guide. Draft Rev January 23, 2003. Retrieved January 7, 2004 from the World Wide Web:  
<http://focus.nps.gov/doc/techdoc/ImagingGuide.html>
- Duboff, Leonard D. 1989. The photographer's business and legal handbook. Images Press, New York, NY. ISBN 0-929667-02-6.

## *Using Extensis Portfolio 8 to organize and catalog photos and generate metadata*

In general:

1. When you get back from the field or event in which you took photos, download the photos to the hard drive of your computer.
2. Look through the photos. If there are blurry ones or ones that are not needed, delete them.
3. Move them into the centralized photo storage folder using the Extensis Portfolio 8 software. Rename them as you move them to conform to the established naming convention.
4. **Do the metadata!!** Add keywords, edit date/time taken if the camera doesn't have the correct date set in it, write a brief description. The more complete and comprehensive the metadata is, the more useful the photo and database are!

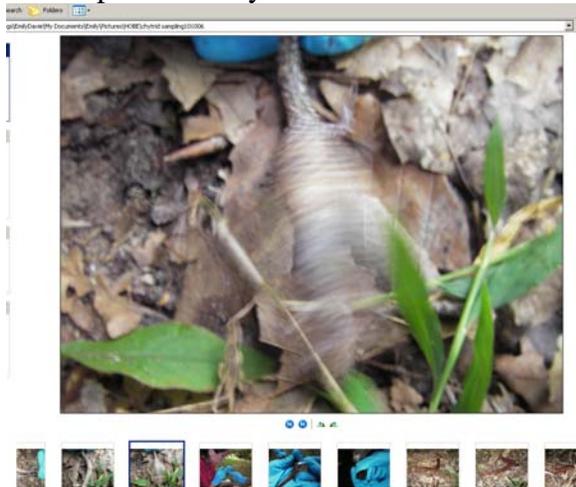
### Step-by-Step Instructions:

To add photos to the database:

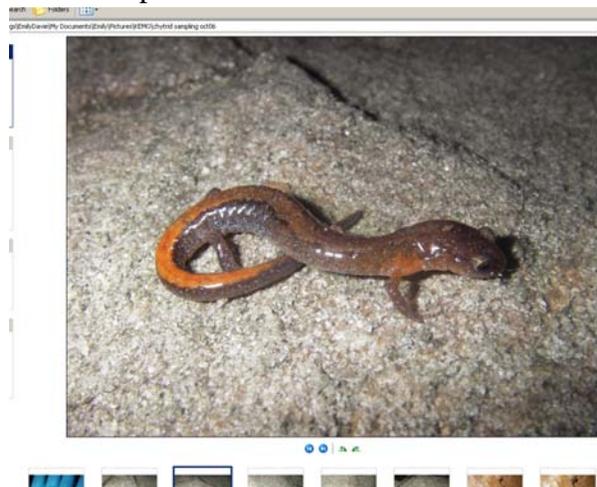
- Download the pictures to your hard drive, somewhere you can find them easily. A good example might be the photos folder of the My Documents folder (i.e. C:\Documents and Settings\UserName\My Documents\My Pictures)
- Look through the photos. Delete blurry, unrecognizable, multiple duplicates or bad photos.

Example:

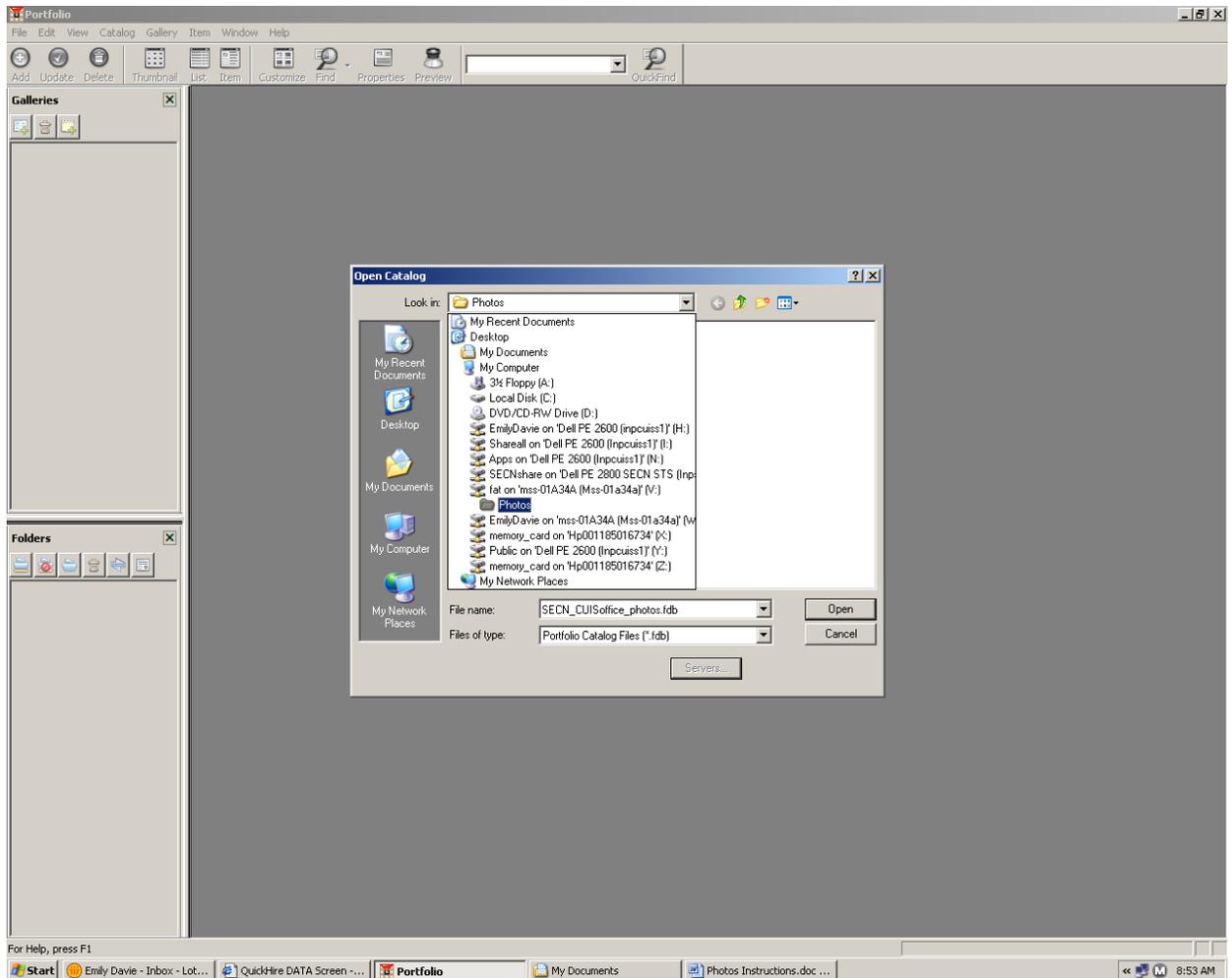
Bad photo: blurry and should be deleted!



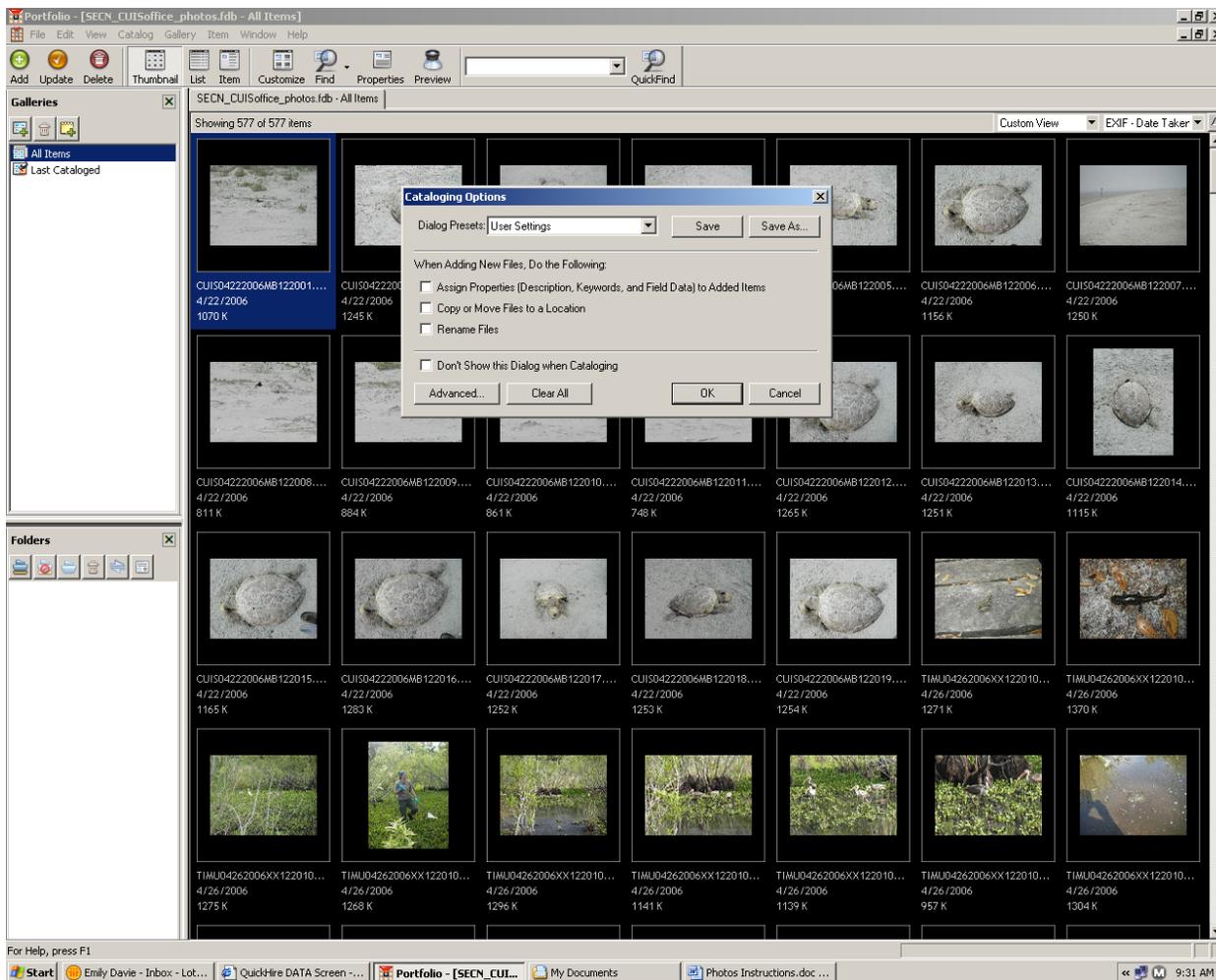
Good photo.



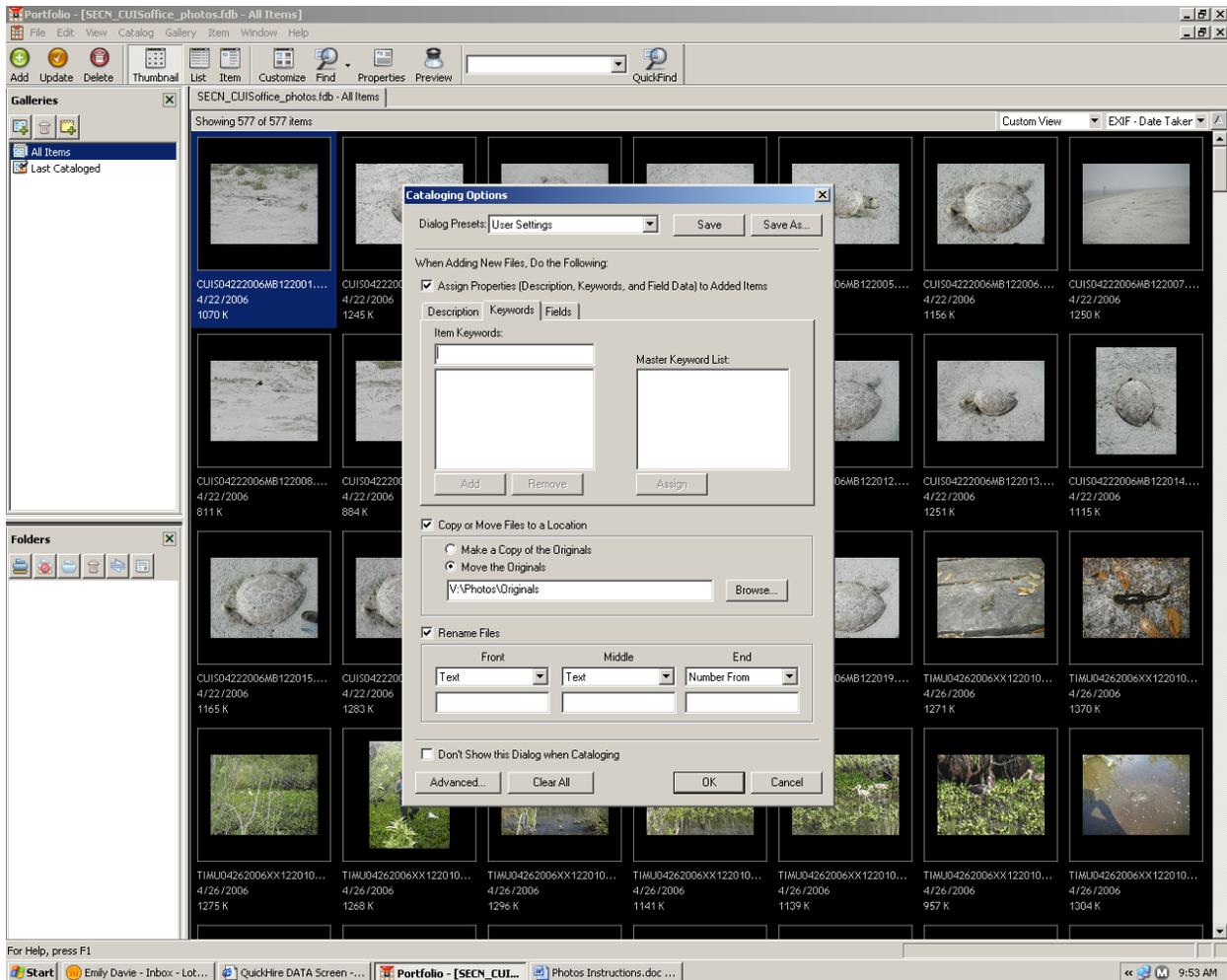
- Open the Extensis Portfolio 8 software program. Check the box to open an existing catalog, browse to the Images folder on the network drive and open the database file (e.g. SECN\_CUISoffice\_photos.fdb). It will probably take a few moments to load the entire database.



- Click on the Add button or go to ‘Catalog’ and then ‘Add Items’. This will bring up a screen to allow you to navigate to where the photos you want to add are stored. Navigate to the photos and select the photos you would like to catalog.
  - ◆ You can add move multiple photos at the same time, **but** the first 17 characters of the name you will apply to them must be identical, i.e. they must have the same park, date, photographer, camera, office and category codes! The last three digits will make the photo name unique but the rest of the name for all photos moved in the same batch must be identical.
- After you have selected the photos you wish to transfer together, click ‘Open’ – you will get the following screen:



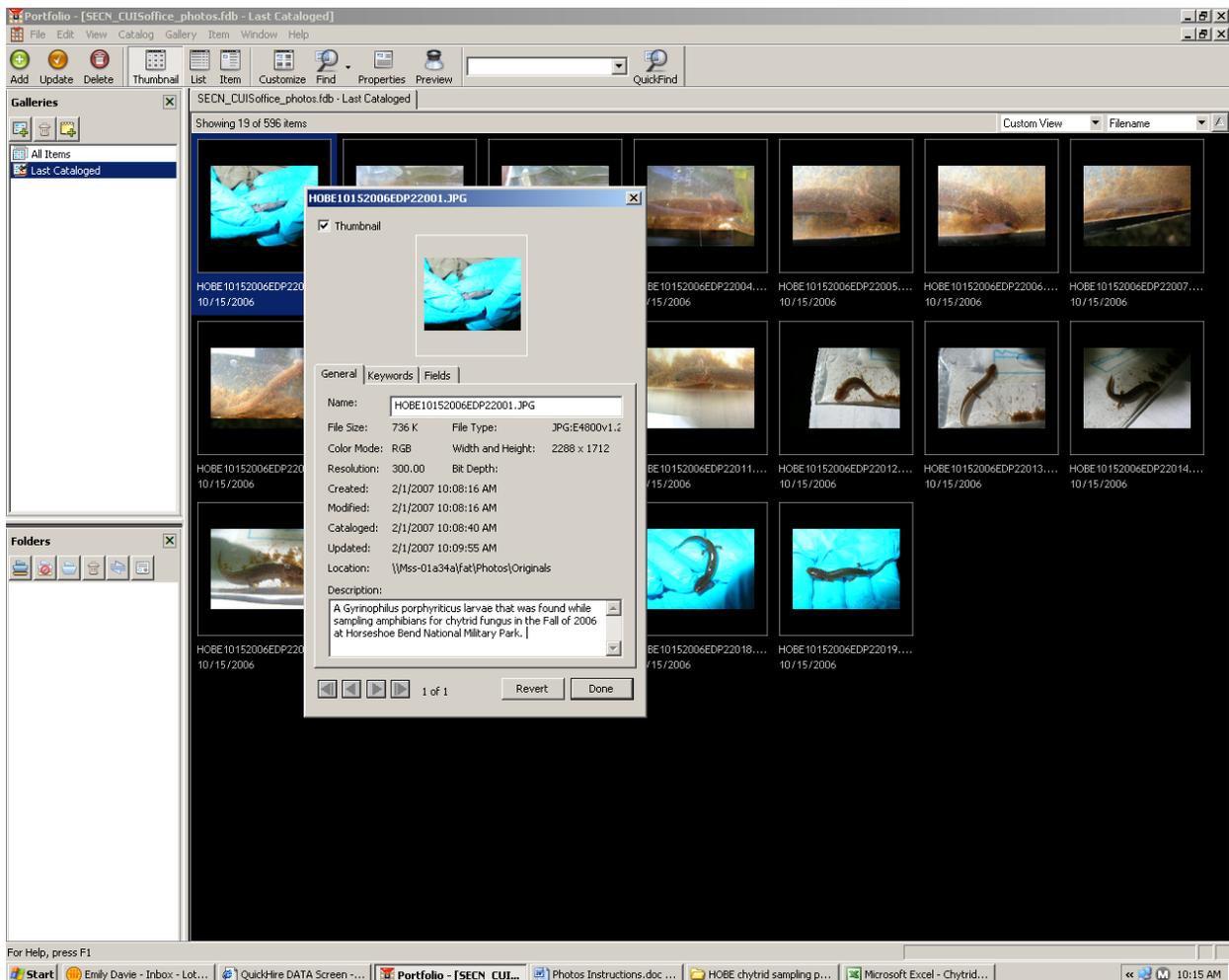
- Check the boxes for ‘Assign Properties [Description, Keyword...] to Added Items’, ‘Copy or Move Files to a Location’ and ‘Rename Files’. This should expand these sections to look like the following:



- Under the ‘Assign Properties’ checkbox, fill in as many Keywords as apply to all photos being transferred in the batch. If a description statement can be made that applies to all photos being transferred, enter that under the Description tab.
- Under the ‘Copy or Move Files’ checkbox, select ‘Move the Originals’ and use the Browse button to navigate to the location of the external drive “Fat on ‘mss-01A34A’ and then to the ‘Photos’ folder and ‘Originals’ subfolder.
- Under the ‘Rename Files’ checkbox you will create the new name for all photos being moved so that they conform to the defined naming convention.
  - ◆ Under the ‘Front’ and ‘Middle’ headings, use the drop-down menu to select ‘Text’ – use these spaces to enter the first 17 characters of the name. This part of the name will be identical for all the photos being moved in this batch (e.g. CUIS01012005XX127).
  - ◆ Under the ‘End’ heading select ‘Number From’ and enter 001 as the start number. You *must* have a *three digit* start number here to maintain the same number of characters for all names!
  - ◆ There is a file titled “Naming Convention LookUp Table.doc” to help you with the codes used in naming photo files. There are also “Photos READ ME.doc” and

“Data Structure Information.ppt” files that contain useful information about storing files for Network use.

- Click OK when done. The program will now move the photos and refresh the screen showing all photos cataloged in the program. This may take a couple minutes to process.
- You can scroll to the bottom of the catalog screen to find the latest additions or you can click on the ‘Last Cataloged’ item on the upper left side column of the program to see only the last photos that were added to the catalog. Select a photo and click on the ‘Properties’ button (found on the toolbar at the top of the screen).



- Add any specific, useful metadata that you can to each photo. It will greatly help the usefulness of this program later!
  - ◆ Add a more specific description if you can.
  - ◆ Add any keywords specific to the photo that haven't been added yet.
  - ◆ Check the Fields to make sure they are correct. If the date on a camera was not set right, you can edit the field for 'Date Taken' to fix it. If there is copyright information you can add that, etc.

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# SECN GIS and GPS Directory Structure and File Naming Conventions

*Southeast Coast Network*

*Version 1.0*

## Revision History Log:

Revision Date	Author	Changes Made	Reason for Change	New Version Number

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## Recommended Citation

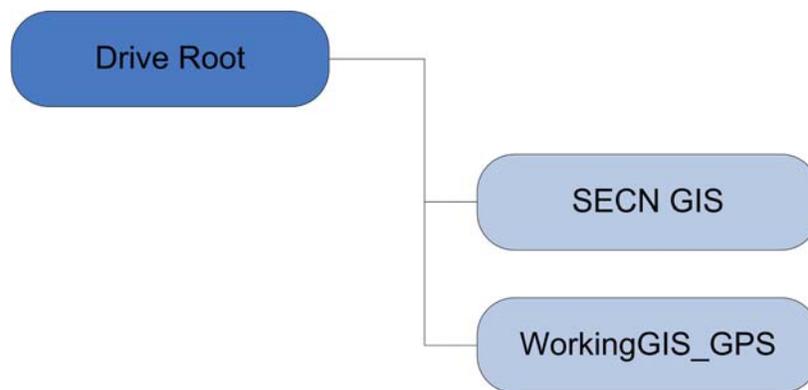
Davie, E. M.W. Byrne, T. Curtis, and D. Lagana. 2006. SECN GIS and GPS Directory Structure and File Naming Conventions. National Park Service, Southeast Coast Network Inventory and Monitoring Program.

## ***Overview***

Due to the current situation of three SECN offices (Atlanta, GA; Charleston, SC and St Marys, GA) housing SECN staff and a long-term plan for two network offices (Charleston, SC and St Marys, GA), data must be managed in a standardized structure which does not change. This is particularly important since connectivity between the three offices is often slow, requiring the replication of SECN master data sets at some or all three locations. The following directory structure standard and file naming conventions will: 1) promote efficiency by facilitating data discovery and allowing everyone to access all SECN data sources, 2) reduce redundancy of data across multiple computers within an office and 3) allow better access to useful information.

## ***Server Root Directory Data Structure***

Each network office has a root directory structure similar to that depicted in Figure 1. Here, data are differentiated into master (SECN\_GIS) and working (WorkingGIS\_GPS) data sets.



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**Figure 1 SECN Server Primary Directory Structure for GIS and GPS data**

The following sections will expand upon each directory above to illustrate the underlying directory structures and explain the type of materials to be located within each folder. Photo (images), document and monitoring database directory structures will be discussed separately.

## ***SECN\_GIS Directory Structure***

The SECN\_GIS directory contains all of the SECN master GIS data – in other words GIS data accompanied by FGDC compliant metadata (minimally compliant or better). **These data are write-protected to force users to make copies for use in analyses, map making etc.** At the Southeast Regional Office (SERO) in Atlanta, these data have been integrated with the SERO regional GIS server and will ultimately be moved off of the SECN server to avoid duplication of data and prevent unnecessary data acquisition costs. Copies of these data sets may continue to reside at CUIS and FOSU for as long as necessary due to access and bandwidth considerations. Only data that are considered complete and non-changing can be moved into the SECN\_GIS directory structure, by the SECN Science Information Specialist or GIS Specialist following review of the data file and metadata submitted by the SECN Ecologist or Technician.

In the SECN\_GIS folder, data are organized by park and therefore the directory structure below is repeated for each park unit in the Southeast Coast Network. The contents of the directories

depicted in Figure 2 are described in Table 1, along with the three additional, high-level directories - Misc\_GIS, GIS\_Tools and SECN\_Projects.

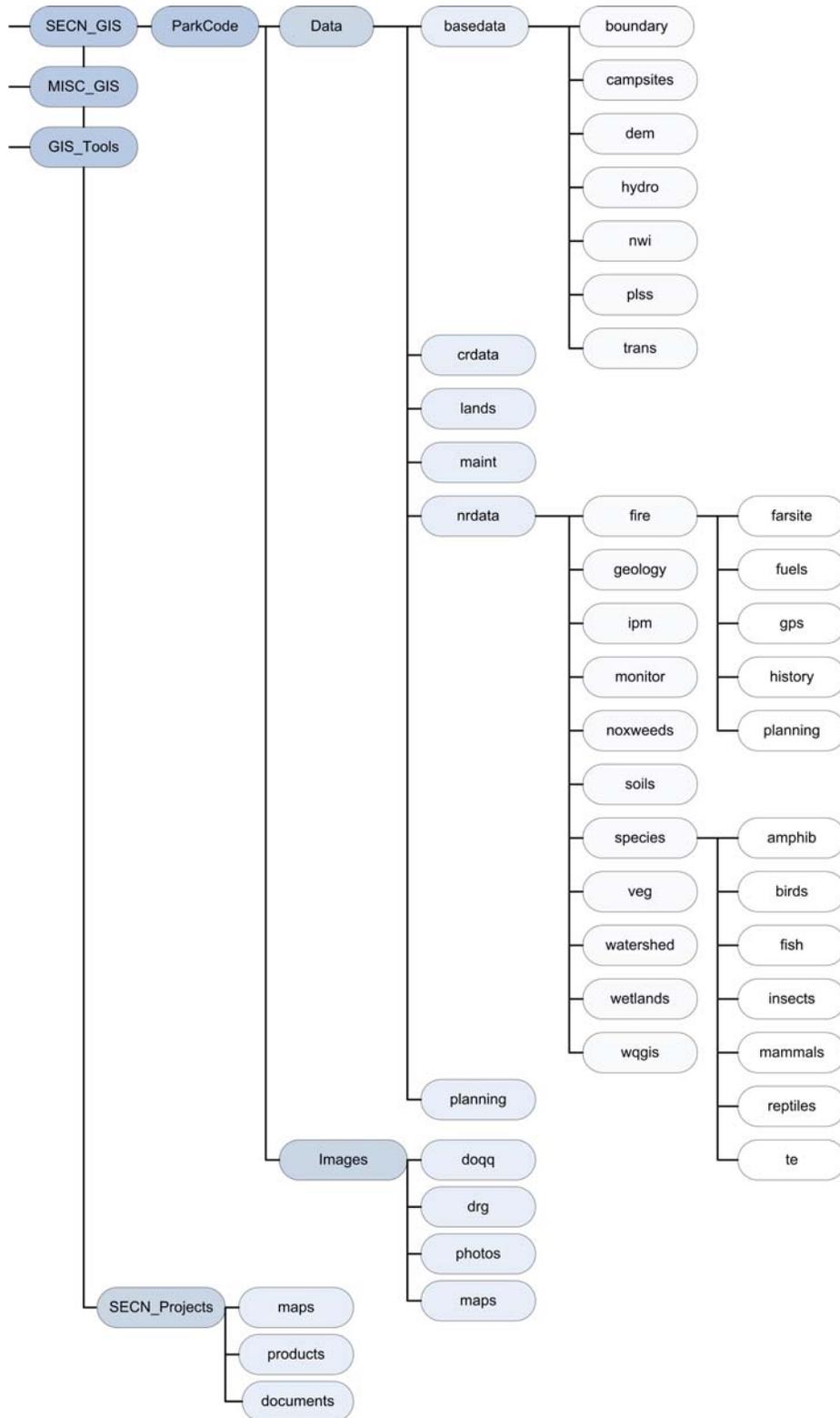


Figure 2 Directory structure for SECN GIS master data layers

**Table 1 Description of SECN\_GIS folder content and examples of appropriate data layers.**

<b>Folder Name</b>	<b>Description of Content and Examples of Data to be Stored in Each Folder</b>
Misc_GIS	Miscellaneous GIS data, typically those at a regional, state or national scale. Examples include: Hydrologic Unit Codes (HUCS), County Boundaries, Roads, Cities, USGS Quads, etc.
GIS_Tools	GIS and GPS training materials, metadata tools, map templates, ESRI scripts etc.
SECN_Projects	Upper level folder – please leave empty and populate lower level folders. This indicates that the data within cross park boundaries, from several parks to the entire network.
Maps	ArcMap .mxd map documents
Products	Finished and distributable maps as .pdf, .tif, and .jpg files.
Documents	Word, Excel and other support documents that accompany GIS data and/or map documents.
ParkCode	Upper level folder that indicates the park unit of the data contained within the directory
Data	Upper level folder - please leave empty and populate lower level folders. Data (mainly vector data) are kept separate from Images.
Basedata	Upper level folder - please leave empty and populate lower level folders
Boundaries	States, counties, park boundaries
Campsites	Campgrounds
Cities	Nearby cities, clipped to vicinity of park
DEM	Digital elevation models, GRIDs, LIDAR
GPS	Waypoints, XYZ point files
Hydrology	Lakes and rivers (See 'watersheds', 'wetlands' and 'wqgis' for similar files)
Hypsography	Contour lines
NWI	National Wetlands Inventory
PLSS	Public Land Survey System - Township, Range, Section lines
Trans	Transportation
Crdata	Cultural Resources Data - Monuments, historical assets
Lands	Lands – data from NPS Lands division
Maint	Maintenance – buildings, infrastructure, facilities
nrdata	Natural Resources Data - Upper level folder - please leave empty and populate lower level folders
Fire	Upper level folder - please leave empty and populate lower level folders
Farsite	Upper level folder - please leave empty and populate lower level folders.
Fuels	Fire fuels
GPS	Fire related waypoints, XYZ point files
History	Old fires
planning	Fire management planning data
Geology	Geologic resources data. Soils data stored separately
lpm	Integrated Pest Management
Monitor	Monitoring data if not species specific
Noxweeds	Non-native, invasive plant data
Soils	Soil resources data
Species	Upper level folder – please leave empty and populate lower level folders. Includes all raster data other than DEMs which are included above.

Folder Name	Description of Content and Examples of Data to be Stored in Each Folder
Amphib	Amphibian data
Birds	Bird data
Fish	Fish Data
Insects	Insect data
Mammals	Mammal data
Reptiles	Reptile data
te	Threatened and endangered species data
Veg	Vegetation data
Watershed	Watersheds – including hydrologic unit code (HUC) data. (See 'hydro', 'wetlands' and 'wqgis' for similar files)
Wetlands	Wetlands (See 'nwi', 'hydro', 'watersheds', and 'wqgis' for similar files)
Wqgis	Water Quality (See 'hydro', 'watersheds', 'wetlands' and for similar files)
Planning	Data from NPS planning division
Images	Upper level folder – please leave empty and populate lower level folders
DOQQ	B&W, CIR, and natural color air and satellite photos - year photos were taken. There may be multiple DOQQ folders for parks with many years worth of DOQQ data (use DOQQ_Year).
DRG	TOPO maps
Photos	photographs of park features (snapshots of places and things)

Within each park folder (in addition to data and images) there is also a Park\_Data folder which contains all park GIS data gathered during SECN data mining activities. For more information on SECN data mining, please refer to [SECN Data Mining Strategy](#). The data in Park\_Data are any GIS data that are not properly documented (metadata incomplete or non-existent) and therefore cannot be migrated into the SECN\_GIS master data. These data are used only for background information and are not to be used in maps or analyses.

### ***GIS Naming Conventions***

In general names of files should have:

- No spaces
- A descriptive name
- No special characters (-\*&^%\$#@!>}\ etc.)
- Preferably less than 20 characters total.
- Dates should be in month, day, year order and should be 8 digits long. Example: Jan. 2, 2006 would be entered as 01022006
- Conform to any ArcGIS or other standard GIS / remote sensing software file naming limitations

Additional guidance for GIS naming conventions beyond the above will be provided within the protocol document or supporting SOP's on an as needed basis. Additional GIS specifications can be found in [SECN Geospatial Data Specifications and Strategy](#).

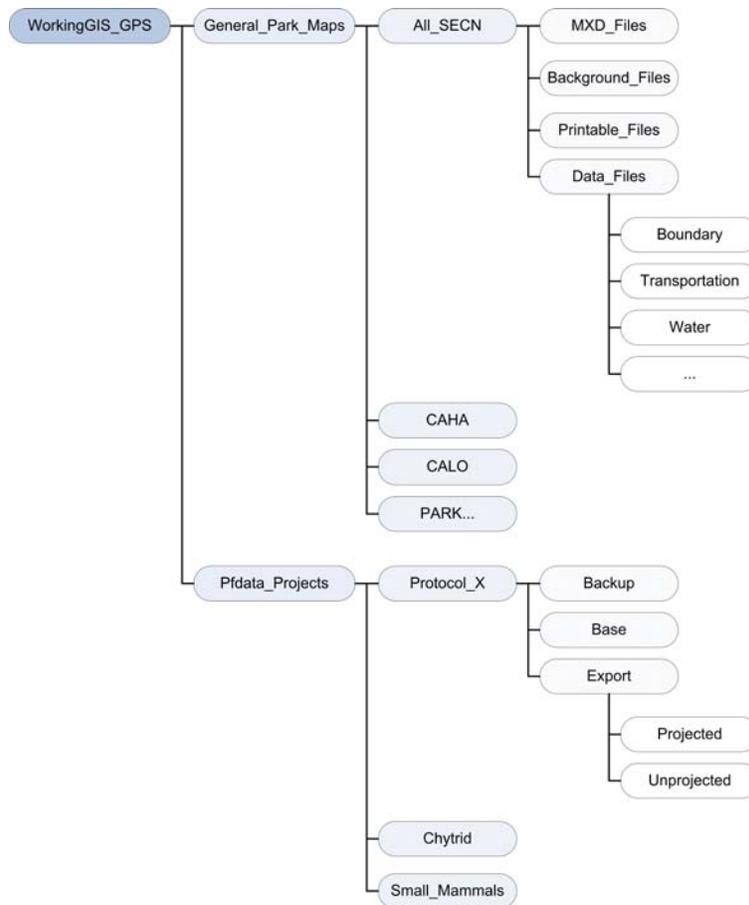
### ***WorkingGIS\_GPS Folder***

To preserve the integrity of the SECN master GIS data sets, each network office will create a workspace to house working GIS and GPS files. The example provided below is the one used at Cumberland Island National Seashore.

The workingGIS\_GPS folder will contain all files and data that are not part of the SECN\_GIS directory structure and typically are still being processed. The General\_Park\_Maps folder should contain a folder for each park and one for the entire network. These folders will house maps and data created in house by programs such as ArcMap. The Pfdata\_Projects folder will contain data and files that are organized by protocol via the Pathfinder Office software program. This includes GPS coverages that are downloaded from the Trimble GPS unit (until such time as those coverages are incorporated into the network directory structure (SECN\_GIS)).

Each park or network area folder within the General\_Park\_Maps subfolder will contain the following:

- **MXDfiles:** contains .mxd file types including a general park map to be used as a base map that can be added to for more detailed projects or as a ready to use map of that particular park.
- **BackgroundFiles:** contains file types (.bmp, .wld, etc.) that can be uploaded to a GPS unit to be used as a background map in the display.
- **PrintableFiles:** contains file types that can be opened and printed as they are. Example: .pdf, .emf or .bmp files.
- **DataFiles:** contains subfolders to organize all associated file types that compose shapefiles, layers, or coverages. This may include shapefiles that have been clipped or merged from SECN\_GIS data, or coverages that have been created using ArcMap or a similar program.



**Figure 3 Directory Structure for SECN working GIS and GPS data**

**Pfdata\_Projects** will be the default folder to which all data is transferred when using the Pathfinder Office Software. When creating a new project with that program, a new project folder will be created with the following three subfolders containing the file types described here:

- **Backup:** contains backup files of all data transferred from the GPS unit.
- **Base:** contains base provider information used in post-processing GPS data.
- **Export:** contains exported GPS data (shapefiles). It is recommended that this data be organized into subfolders as necessary. A suggestion is to put all files that compose each individual shapefile into a folder labeled by the park it references and then by the date it was created.

### ***GPS Naming Conventions***

All files created in GPS units should follow the convention described here when being named.

- Each name will have exactly 20 characters.
- GPS numbers should reference a specific network owned GPS unit and serial number.
- Each file name will follow the format presented below:

# PARKMMDDYYYYPHCOG###

**PARK** - Four character park code of where picture or file was taken or created

**MMDDYYYY** - Date photo was taken or GPS file was created in month, day and year format. Must be 8 characters long.

**PH** - Photographer Initials or GPS File creators initials (if unknown put XX). The complete photographer's name will be provided in the photo metadata record.

**C** - GPS unit number

GPS Unit Number	Brand/Model	NPS Property Number	Serial Number
1	Trimble ProXR Receiver, Recon Handheld	SECN000901	0224093518
2	Trimble GEOXH	xx	4615461790
3	Garmin GPSMAP 60CSx	NA	74960920

**OG** – Project code comprise of the following

**O** - Office Code: this will indicate which office the person taking the pictures is working from (numbers [or letters] can be added later should the need arise).

- 0 = SERO office
- 1 = FOSU office
- 2 = CUIS office

**G** - General category: this is a numeric code from 0 to 9 symbolizing the general category the Protocol code falls into.

General Category Number	Category Description
1	Flora
2	Fauna
3	Geophysical
4	Water
5	People / Meetings
6	Scenic
7	General

**###** - Three Digit Number: an incremental (sequential) number at the end of the file name to assist in creating a unique photo id (restart at 001 for each day).

# NPSpecies Certification Guidance

*Southeast Coast Network*

*Version 1.0*

## Revision History Log:

Revision Date	Author	Changes Made	Reason for Change	New Version Number

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## Overview

NPSpecies is the National Park Service biodiversity database that documents the presence of species that occur within a particular NPS unit using three types of evidence: references, vouchers and observations (see below for definitions). In order to provide for both data quality (currency, completeness and accuracy) and data integrity (protecting sensitive data) each taxonomic group goes through a quality assurance review (Certification, see definition below) upon the completion of inventory projects and as needed following the original certification.

This document is meant to augment existing guidance documents in order to clearly state SECN policies for data quality and consistency. General NPSpecies requirements are described first, followed by any special guidance needed to document special cases, by taxonomic group, that are not well defined in the national guidance. National guidance for NPSpecies certification can be found online at: <http://science.nature.nps.gov/im/apps/npspp/qa.cfm>. Training materials for conducting NPSpecies certification using the desktop version of the database are available in the Shared Documents folder on the SECN sharepoint at <http://inpsrosecn/default.aspx> for those with access or by request at [ser\\_secn@nps.gov](mailto:ser_secn@nps.gov).

## Terms and Definitions

- **Certification:** The NPSpecies quality assurance process which reviews the evidence in the database for accuracy and to ensure the evidence is park specific. Following a review of the evidence, the species list is reviewed for redundant/synonymous scientific names and updated to reflect the currently accepted taxonomy. Once the taxonomy has been rectified and updated, the checklist fields and Management Fields are completed using available data (the evidence) or assigned a status of “unknown”.
- **Checklist Fields:** The checklist fields supply park-specific information to the species profile and include the following: Park Status, Abundance, Residency, Nativity, and Cultivation. The document that defines each checklist field may be found at <http://www1.nrintra.nps.gov/im/inventory/npspecies/training.cfm> (NPS Only).
- **Evidence:** There are 3 forms of evidence in NPSpecies: references, vouchers, and observations. Evidence in NPSpecies is the proof or documentation that supports the presence of a species at a particular park. See below for the definition of each form of evidence.
- **Management Fields:** The management fields are yes/no fields in the database that designate a species as Pest (jeopardizing human health and/or safety), Weedy (an invasive plant), Management Priority (species specifically addressed in park management documents or listed on Federal and/or State threatened and endangered species lists), and/or Exploitation concern (species of note to law enforcement, usually those at risk of poaching).
- **Observation:** Observations are species sightings on NPS property that may be recorded by any individual. Observations are thus less reliable due to the typical lack of information regarding the credentials of individuals that submit observation records. However, observation records may be very valid, important information – for example, for birds there are large numbers of highly qualified birders that may be collecting bird species observation data at a park and online birding listserv and Audubon Society data comprise a large amount of the birding data used for certain SECN park species lists.

- **Reference:** References are documents that record evidence from scientific studies conducted at NPS units. These are typically done by recognized subject matter experts and are thus usually very reliable forms of documentation. Scientific names in a reference document that are potential or expected (not documented) species should not be included in NPSpecies.
- **Voucher:** Vouchers include museum and herbarium specimens, some other physical object, audio recording or photograph that documents the occurrence of a species at a park. Vouchers are the most preferred evidence because there is a physical object that exists and which can be examined after the fact to verify the species identification if it should later come into question.

### ***General Data Entry Guidance That Applies to All NPSpecies Data***

NPSpecies was designed to house data that documents species occurring at each NPS unit and provide a means to fulfill goal one of the biological inventories: to document 90% or more of the species occurring at each park unit with significant natural resources. Therefore, NPSpecies should only include species actually documented at the park and should NOT include county records, field guide information or other evidence when it is obvious that records are not park specific. Certain exceptions to this rule may exist and will be presented in this document for each individual taxonomic group.

### **Evidence that should be entered into NPSpecies:**

Please note that all evidence in this section is assumed to be park-specific. This evidence should come from a known source – in other words species lists or other documents of unknown origin should not be included in NPSpecies and observation data should be carefully reviewed to only include records from reputable observers with acceptable identification skills in particular taxonomic group(s).

- Reports (published or unpublished), journal articles, book and book chapters that report on scientific investigations at the park
- Species lists that include a date and author and are based on actual observations in the field
- Thesis / dissertations
- Voucher records (current and historic) which include location information and date
- Observation records from known, reputable sources

### **Evidence that should NOT be entered into NPSpecies**

- Park general management plans
- T&E species management plans
- Other summary documents which may mention species but are not based on new data collected at the park
- County records
- Field guide or other information not specific to the park

*NPSpecies Terms, Definitions and Guidance for Data Entry*

This section defines fields in NPSpecies which require further definition from the guidance developed nationally. For all NPSpecies field definitions not contained in this document, please refer to the national guidance for definitions, available at <http://science.nature.nps.gov/im/apps/npspp/Documents.htm>

The information contained in this section was taken and/or adapted from material contained in: Fabre, L.L and J. Stingelin-Keefer. 2004. NPSpecies data entry and data management standards. National Park Service, Northeast Region Inventory and Monitoring Program.

Table 1 – Common NPSpecies Definitions

Label	Service-wide Definition	Examples	SECN Standards
<b>Standard Scientific Name</b>			<p>The integrated taxonomic information system (ITIS) used by NPSpecies tracks changes in taxonomy over time. Therefore, all species should be entered as they were recorded by the data source being entered.</p> <p>In certain cases, only a genus is listed in an author's species list due to uncertainty of species identification. In these cases, enter the genus into the Park Species List even if a species is identified within that genus. Although this will not be included in Local List, it does help to pinpoint gaps in the inventory records for each Network.</p> <p>In the case of invertebrates, enter the lowest taxonomic level with comments if additional information is present.</p>
<b>Data Source</b>	The principle source of a value entered in a single field, multiple fields, or an entire record as applicable.	<p>Common examples:</p> <ul style="list-style-type: none"> <li>*Smith and Doe (2002)</li> <li>*John Doe (pers. knowledge)</li> <li>*Jane Smith (pers. Comm..)</li> <li>*Park ANCS+ Database</li> </ul>	The preferred method for entering a data source in this field will be Author(s) and year. For example, Johnston et al., 2006.
<b>Details</b>	Additional details pertinent to the value entered in SPECIFIC FIELD if clarification or elaboration is desired.		See specific checklist fields below for more specific details.
<b>Comments</b>	Additional information pertinent to the values entered in an ENTIRE RECORD if clarification or elaboration is desired.		Additional data that does not fit into the specific details fields for each checklist item (nativity, abundance, residency etc.) can be added here. Add author and date to identify the data source.
<b>Last Modified By</b>	The name of a person that last modified the existing record, or for reference links, the person that last modified an existing link between a reference and species.	See NatureBib regarding the documentation of who last modified a reference proper.	Use full first and last name. Do not use initials

Table 2 – Checklist and Management Field Definitions

Label	Service-wide Definition	Comments	SECN Standards
<b>Present in Park</b>	Species' occurrence in park is documented and assumed to be extant.	All checklist fields are only applicable to organisms with the Local List checkbox checked.	Species must be reported from within the park boundary.
<b>Probably Present</b>	Park is within species' range and contains appropriate habitat. Documented occurrences of the species in the adjoining region of the park give reason to suspect that it probably occurs within the park. The degree of probability may vary within this category, including species that range from common to rare.		If a species is reported and it is uncertain if the species occurred within a park parcel or on adjacent non-NPS land, the species can be included on the park species list but the park status will be reported as Probably Present. Only include those species documented as bordering the park for which the appropriate habitat exists at the park. Examples for the proper use of probably present include pelagic birds or fly-over records.
<b>Unconfirmed</b>	Included for the park based on weak ("unconfirmed record") or no evidence, giving minimal indication of the species' occurrence in the park.		There should be very few records in NPSpecies that are listed as unconfirmed. One example of the proper use of unconfirmed is when the species has been repeatedly documented in areas adjacent to the park AND there are no barriers between where it has been documented and the park AND the park contains appropriate habitat for the species. Detailed comments should be entered along with an unconfirmed species to allow future users of the database to understand why it was included.
<b>Encroaching</b>	The species is not documented in the park, but is documented as being adjacent to the park and has potential to occur in the park.		Potential invasive organisms are good candidates for this Park Status designation, either before they enter a park or after they have been eliminated from a park. As with Unconfirmed, there should be very few Encroaching species in NPSpecies.
<b>Historic</b>	Species' historical occurrence in the park is documented, but recent investigations indicate that the species is now probably absent.		The length of time since the last sighting, in conjunction with the ease of detection of the species will determine when a species changes from present in park to historic. Please refer to the individual taxonomic groups at the end of this appendix for additional guidance.

**SECN Information Management and Archiving Plan Appendices**

<b>Label</b>	<b>Service-wide Definition</b>	<b>Comments</b>	<b>SECN Standards</b>
<b>Abundance</b>	The current abundance of each organism in each park.	Applicable only to organisms with the Local List checkbox checked and a Park Status of "Present". The values attempt to balance abundance with suitable habitat, and temporal/behavioral considerations. In practice, the entered value should apply (although there are numerous exceptions) to the abundance in the most suitable habitat of the organism.	If none of the evidence in the database provides abundance values, this field should be designated "Unknown". Park staff may change this value from unknown, based on their knowledge of the species at the park. The source (Author(s) and Date) should be recorded for all abundance values other than Unknown.  In cases where abundance varies by season, enter the Abundance for the season when the species is most abundant in the park. Abundance values, by season, may be entered into the Abundance Details field (if available).
<b>Abundance Details</b>			If data are available, add seasonal abundance using the format as given in this example: Winter = Abundant; Spring = Common; Summer = Uncommon;
<b>Nativity</b>	Nativity classification for each organism for each park (Native, Non-native, Unknown).		Unless park-specific information on nativity exists, species are designated native or non-native to the state in which the park resides. Two sources of nativity information used are NatureServe and the Plants database from USDA. These sources are available online at: <a href="http://www.natureserve.org/explorer/">http://www.natureserve.org/explorer/</a> and <a href="http://plants.usda.gov/">http://plants.usda.gov/</a> respectively and the source of nativity information should be included in the nativity details field.
<b>Cultivation</b>	Cultivation classification for each non-native organism in each park.  Cultivation is intended to distinguish between non-native organisms that were introduced as part of a park's mission, and non-native organisms that occur in the park naturally. Cultivation was not intended to apply to organisms that are cultivated for landscape purposes or animals in enclosures.	Applicable only to organisms with the Local List checkbox checked, a Park Status of "Present" or "Probably Present" and a Nativity of Non-Native.	Because the NPSpecies definition of cultivation varies greatly from the usual definition, the SECN Science Information Specialist will follow up with personnel involved in certifying data to ensure that this term is being applied correctly.

**SECN Information Management and Archiving Plan Appendices**

<b>Label</b>	<b>Service-wide Definition</b>	<b>Comments</b>	<b>SECN Standards</b>
<b>Weedy?</b>	Yes/No field for plant species only. Plant species are considered "weedy" or "invasive" if they (a) occur almost exclusively in disturbed habitats, (b) relatively recently occupied natural habitats in competition with native species, or (c) occur across a broad range of ecological conditions.	The definition of Weedy Plant has been found to be too general to be of use from both an ecological and managerial perspective. The Pest field was added to provide a more narrowly definition that was specifically oriented to management. No similarly narrow counterpart to the ecological aspects of the definition of Weedy Plant is currently in NPSpecies.	To avoid confusion pertaining to this field, Weedy=Invasive.  The source designating a species as weedy should be included in the weedy details field for the species.
<b>Pest?</b>	Yes/No if a species is a "pest" in the park. "Pests are living organisms that interfere with the purposes or management objectives of a specific site within a park, or that jeopardize human health and safety." (NPS Management Policies 2001. Section 4.4.5.1)		To avoid overlap with the Weedy species designation, Pest applies only to animals that interfere with the purposes or management objectives of a specific site within a park, or that jeopardize human health and safety.
<b>Management Priority?</b>	Yes/No flag if a species is a management priority in the park. Organisms identified by the park's chief of Natural Resources or addressed in a park's Resource Management Plan are good candidates for having Management Priority checked in NPSpecies.		Can apply both to species of concern (e.g. T&E species) and to species that are exceptionally problematic (e.g. Invasive species). In addition to park management plans, network staff consulted US FWS and State T&E species lists as well as State invasive species lists.
<b>Exploitation Concern?</b>	Yes/No if a species is an exploitation concern in the park. Organisms identified by a park's law enforcers or contained within the Critical Incident Report System database are good candidates for having the Exploitation Concern checked in NPSpecies.		In addition to organisms identified by a park's law enforcers or contained within the Critical Incident Report System database, network staff consulted SERPIN. Southeastern Rare Plant Information Network. <a href="http://www.serpiln.org/index1.html">http://www.serpiln.org/index1.html</a> and similar sources to identify species commonly exploited.

## ***Special NPSpecies Certification Guidance by Taxonomic Group***

The service-wide NPSpecies guidance documents provide basic terms and definitions to all database users without making exceptions based on different circumstances that arise in different taxonomic groups. Therefore, this section contains guidance specific to each taxonomic group, to answer questions that have come up and to ensure consistency across the network.

### **Birds**

Given the widespread availability of birding data from SECN parks, no current bird inventories were conducted. Data were compiled from a wide variety of sources including books, online list serves, comprehensive checklists based on personal birding data and data from local Audubon societies. All bird data were certified following the definitions provided in Table 2 above, with the exceptions described below:

**1) Pelagic Birds:** Even though the open water is not technically within the park boundary, many pelagic birds are seen at SECN coastal parks. We are recommending that these pelagic species seen at the park be listed as “Probably Present” for park status and a note in the park status details field that lists the species as pelagic.

**2) Fly-overs:** For species only seen as Fly-overs and never actually using park habitat, these species should be listed as “Probably Present” for park status with a note in the comments field that the records of the species are from fly-overs.

**3) Species outside typical range:** You may occasionally see birds at the park which are outside of their typical range. However, if recorded at the park, they should be listed as “Present in Park” for park status and as “Vagrant” for residency.

**4) Species seen only a few times:** These species should be listed as “Present in Park” for park status and as “Rare” (only seen a few times yearly) or “Occasional” (Only seen every few years) for abundance. You may also use “Migratory” or “Vagrant” for residency, as applicable.

**5) Species seen nearby but not at the park:** There may be a bird species that has been observed near to the park but has never been seen at the park. In such cases where you want to include these species (e.g. hard to detect species), all of the following must be true:

- The species has been documented adjacent to the park
- No barriers exist between where it has been documented and the park
- Appropriate habitat for the species exists at the park

The species may be included on the park species list and listed as “unconfirmed” for park status along with detailed comments as to why it was included in NPSpecies and a citation of the evidence documenting the species adjacent to the park in the park status details field. There should be very few of these types of records in NPSpecies, if any at all.

### **Fish**

The SECN fish inventory provided the majority of data used to populate NPSpecies (for all SECN parks, except for TIMU, which had a complete inventory done by USGS). A few other studies existed prior to the current inventory which were assessed by Johnston et al. 2006 and

included, following her recommendations. All species documented solely from historical studies and/or voucher records that were older than 10 years were assigned “Probably Present” for their park status value. A few species from CHAT were further demoted to “Historic” due to the construction of dams along the Chattahoochee River that now block the migration of those species far enough north to currently occur at the park. These details are provided in the Park Status Details field for future users of the database. Otherwise, all fish data were certified following the definitions provided in Table 2 above.

## **Mammals**

Three separate inventories were conducted to document mammals at SECN parks: SECN mammal inventory (all parks except CANA and bats at all NC parks), SECN Bat Inventory – Loeb (Bats at CHAT, CONG, FOPU, OCMU, FOSU and CHPI) and SECN Bat Inventory – Cumming (Bats at all FL parks, CUIS and FOFR). At the time of certification (FY 2007), no data had been received from the SECN Bat Inventory – Cumming, so the certification of mammals at those parks did not include bats unless they had been documented previously.

All mammal data were certified following the definitions provided in Table 2 above. The only exceptions to these rules occurred for marine mammals (which were not a part of the above inventories). All marine mammals found in park waters or routinely visible from park lands were certified as present in park.

## **Reptiles and amphibians**

The SECN reptile and amphibian inventory provided the majority of data used to populate NPSpecies (for all SECN parks, except CANA which relied on data from Rich Seigel who has studied reptiles and amphibians at the park for over 20 years). The herpetological inventory also provided historical voucher records, a complete literature review of each SECN Park and personal observation data from local herpetologists who had not previously published their findings.

All reptile and amphibian data were certified following the definitions provided in Table 2 above. The only exceptions to this rule were for subspecies – where to remove redundancy from the list, the majority of subspecies recorded previously at a park were linked to the species level (binomial) record during certification. Only state or federally listed subspecies (or species of concern) were left on the certified species list unless the park requested all names be left on the certified list. The other exception was the inclusion of two snake species at CANA which have been routinely documented in the vicinity of the park, but not within the park boundary proper – these species were listed as probably present upon the recommendation of Rich Seigel, subject matter expert.

## **Vascular Plants**

Vascular plant data was compiled from current and legacy studies within SECN park units. Current vascular plant inventories (where they occurred) were smaller in scope than other data sets described above and typically only covered 2-4 parks each. Most parks had several previous studies that had occurred in addition to any current inventories. All vascular plant data were certified following the definitions provided in Table 2 above.

Data for nativity (when not provided by a current inventory) was taken from NatureServe at <http://www.natureserve.org/explorer> on a state by state basis or from the Plants Database at

<http://plants.usda.gov> or the Integrated Taxonomic Information System at <http://www.itis.gov> on a US-wide basis.

Species of Management Concern were determined by comparing the lists to the USFWS list of T&E and to the following reference for species of special concern: NatureServe. 2006. NatureServe Explorer: An online encyclopedia of life [web application] available at <http://www.natureserve.org/explorer>.; and Southeast Rare Plant Information Network. Park technical steering committee members supplemented and/or edited this information as necessary.

Weedy species designations were determined by comparing the list to the following references: The PLANTS Database (<http://plants.usda.gov>) – National Plant Data Center, Baton Rouge, LA 70874-4490 USA and the Federal Noxious Weed List, USDA APHIS PPQ in the Federal Noxious Weed Act (FNWA) – the only part of FNWA remaining in effect. Additional state sources were used when available.

**Recommended Citation:**

Wright, C.J., M.W. Byrne, T. Curtis and J.C. DeVivo. 2007. SECN guidance for NPSpecies certification. National Park Service, Southeast Coast Network Inventory and Monitoring Program.



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# Database Documentation and Data Dictionary Guidance Document

*Southeast Coast Network*

*Version 1.0*

## Revision History Log:

Revision Date	Author	Changes Made	Reason for Change	New Version Number

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## ***Purpose, Scope and Applicability***

The purpose of this SOP is to standardize the contents of data dictionaries developed to accompany and document all data sets or databases. The data dictionary serves as part of the metadata for each tabular data set or database, describing the creator, contents, data elements and units, and any derived or calculated fields. In addition, the data dictionary may also serve (in part) as guidance to data entry personnel to understand the entire contents of the database. The standards described in this procedure pertain to all tabular data sets or data bases that are newly developed and all relevant legacy data.

## ***Procedures and General Requirements***

- The data dictionary should be developed along with the database or data set, by its creator. By specifying the contents and data elements of the database, there is less chance of error by the data collectors and data entry staff, because everything is described in advance.
- The introductory section should include: (1) Name, project identification number and date, (2) List of parks included in the database, (3) Contact information for the project lead, (4) Database software used and data filename, (5) Short abstract of the database contents that includes the purpose and general description, (6) References or citations that accompany the database, and (7) List of tables used in the database.
- Following the introduction, each data element in the database will be described. Data elements will be organized under table headings, as they exist in the database itself. This description will include the field name as used in the database, a brief description of the data included in the field, standard format for data entry, units (if necessary), and any standard designations or codes, such as those used for no data (e.g. ND, \*, -9999, etc.), direction (e.g. N, S, E, W, etc.). Even if you believe that a code used in the database is widely known (e.g. state two letter codes) it must be defined in the data dictionary.
- For any calculated fields or manipulated/transformed data, all formulae and/or transformation methods will also be described and included in the description of the data element.
- The data dictionary will likely be a MS Word or ASCII text file that is always stored along with the database itself. In addition, the dictionary file name will match that of the database (e.g. database = filename.mdb, dictionary = filename\_dic.txt) for easy reference. Include a version number in the filename as well, to ensure as databases are updated, the data dictionary follows suit.
- If/when the database is migrated to newer software versions, edited, or otherwise changed; these changes should also be documented in the data dictionary. Remember, the purpose of the data dictionary is to provide a user who had no involvement in the study, information to make use of the data in the database - appropriately and without making assumptions regarding the content.

## ***Responsibilities***

### **Science Information Specialist or Database Programmer:**

It is the responsibility of the database creator to also develop the data dictionary for the database. Keep in mind that this is metadata for the database and that the data dictionary is necessary to ensure the usability of the data beyond the life of the project (or the tenure of project personnel).

Do not assume that anything is self-explanatory – if something is that easy to understand, it won't take you very long to document the contents.

**Data Entry Personnel:**

Become familiar with the contents of the data dictionary, prior to beginning data entry. The data dictionary and training from the database creator should answer the majority of questions you might have regarding the contents of the database. If any of the data elements are still unclear after reading the data dictionary, the dictionary should be revised to provide better documentation for current and future users. Work with the science information specialist or database programmer to ensure the data dictionary reflects the necessary changes.

**Database Users:**

Request training in the use of the database and read the data dictionary before using the database to familiarize yourself with the contents. In addition, read any additional reference material (e.g. metadata) that accompanies the database. All datasets have limits to their scope and applicability and you should know the purpose and limits of the data, before you use the data.

***Sample Data Dictionary***

This section includes the data dictionary developed for the SECN bat inventory of Florida Parks. If you do not follow this format when developing your own data dictionary, please be certain that your new format includes all of the necessary information to support the database you are developing.

---

**Data Dictionary – SECN Bat Inventory**

**Database Name:** BatInventoryFBN.mdb and BatInventoryFBN\_be.mdb

**Project ID Number:** J2114\_03\_0007

**Date:** January 29, 2004

**Parks included:** CANA, CASA, CUIS, FOCA, FOFR, FOMA, and TIMU

**Database software:** MS Access 2002

**Database version:** 1.0

**Contact Info:** Christina Wright, Science Information Specialist

[Christina\\_wright@nps.gov](mailto:Christina_wright@nps.gov)

404-562-3113 x533

**Abstract:** BatInventoryFBN was developed for bat inventories conducted at SECN parks. The database can store data from Anabat recording sessions, bat roost surveys, and bat capture in harp or mist nets with supporting voucher specimen and/or photo documentation.

**References:** None.

**Tables in the Database:** tblAnabatRemoteData, tblAnabatStationData, tblBatCaptureData, tblEvents, tblLocations, tblNetData, tblObserver, tblRoostBridge, tblRoostCulvert, tblRoostData, tblRoostTree, tblObserverLookup, tblParkCode, tblSetProjectID, tluBatSpecies and tluProject.

**Overview:** This document is the data dictionary for the bat inventory database and defines all of the fields in the primary tables. Primary keys are highlighted in bold. The data dictionary is organized by table, with only a general overview of look-up tables at the end of this document.

The database relationships are also provided at the end of this document as an overview of the general structure of the database.

***tblAnabatRemoteData:***

- **AnabatRemoteDataID** – This field is the primary key in the table and is an autonumber created by MS Access during the data entry process.
- EventID – This field is a foreign key. EventID is an autonumber created by MS Access during the data entry process and the primary key of the table tblEvents.
- TimeInterval – The duration of the recording, formatted as military short time (hh:mm).
- NumberOfFiles – The number of files recorded during the time interval above.
- NumberUsable – The number of files recorded that contain usable information.
- NumberIdentifiable – The number of files that contain identifiable bat recordings.
- BatSpecies – Scientific Name of the bat species that were recorded.
- Habitat – Habitat description where the recording event took place.

***tblAnabatStationData:***

- **AnabatStationID** – This field is the primary key in the table and is an autonumber created by MS Access during the data entry process.
- EventID – This field is a foreign key. EventID is an autonumber created by MS Access during the data entry process and the primary key of the table tblEvents.
- AnabatIdentification – Anabat identification given by the collector.
- Sensitivity – The sensitivity level of Anabat.
- Orientation – The orientation of Anabat, in degrees.
- StartTime – The time that recording began – in military short time (hh:mm).
- EndTime – The time that recording ended – in military short time (hh:mm).
- Height – Height of Anabat, in meters.
- DivRatio – Values provided by combo box (8 or 16).
- Z-caimType – Values provided by combo box (CF, mini, regular, or standard)
- MicType – Values provided by combo box (Low or High Frequency).
- ComputerID – Identification of computer used.
- Notes – General notes or comments.

***tblBatCaptureData:***

- **BatCaptureID** – This field is the primary key in the table and is an autonumber created by MS Access during the data entry process.
- EventID – This field is a foreign key. EventID is an autonumber created by MS Access during the data entry process and the primary key of the table tblEvents.
- TimeCaptured – Time of day that the bat was captured, in military short time (hh:mm).
- TimeReleased – Time of day that the bat was released, in military short time (hh:mm).
- Species – Scientific Name of the bat that was captured, potential species provided by the lookup table tluSpecies.
- Sex – Sex of the captured bat.

- ReproductionStatus – Reproductive status of the captured bat. Values supplied by combo box.
- Age – Age of captured bat. Values supplied by combo box.
- ForeArm – Length of forearm in millimeters (mm).
- Collection – Type of sample collected, if any. Values supplied by combo box.
- TotalMass – Total mass of bag plus bat in grams (g).
- MassofBag – Mass of bag in grams (g).
- MassofBat – Mass of bat in grams (g).
- BandNumber – Band number.
- BandType – Type of band applied to bat. Values supplied by combo box (plastic or metal).
- BandColor – Color of band applied to bat.
- TransmitterNumber – Transmitter number.
- TransmitterType – Transmitter type. Values supplied by combo box (BD2, LB2).
- CaptureMethod – Capture method. Values supplied by combo box (hand, harp & mist net)
- PhotoCollected – Check box to indicate whether or not a photo was taken.
- Notes – Any general notes or comments.

***tblEvents:***

- **EventID** – This field is the primary key in the table and is an autonumber created by MS Access during the data entry process.
- ProjectID – This field is a foreign key. ProjectID is an autonumber created by MS Access during the data entry process and the primary key of the table tblSetProject.
- LocationID – This field is a foreign key. LocationID is an autonumber created by MS Access during the data entry process and the primary key of the table tblLocation.
- LocationCode – Optional location code developed by the observer.
- StartDate – Date upon which the sampling began (MM/DD/YY).
- EndDate – Date upon which the sampling ended (MM/DD/YY).
- StartTime – Time at which the sampling began, in military short time (HH:MM).
- EndTime – Time at which the sampling ended, in military short time (HH:MM).
- Moon Phase – Phase of the moon. Values supplied by combo box (new, one fourth, one half, three fourths, full).
- Waxing Waning – Designation of whether the moon is waxing or waning.
- MoonRise – Time of moon rise, in military short time (HH:MM).
- MoonSet – Time of moon set, in military short time (HH:MM).
- TemperatureF – Temperature at time of sampling, degrees Fahrenheit (f).
- TemperatureC – Temperature at time of sampling, degrees Celcius (C).
- RH(%) – Relative humidity as a percent.
- Wind Speed – Wind speed in kilometers per hour (km/h).
- CloudCover – Cloud cover as a percentage.
- Precipitation – Description of precipitation events.
- BarPressure – Barometric pressure in kilopascals (kPa).

***tblLocations:***

- **LocationID** – This is an AutoNumber field that is automatically generated by MS Access as a unique, primary key.
- **LocationCode** – Optional location code developed by the observer.
- **ParkCode** – The official four-character NPS unit code. A look-up table has been included in the database that includes all of the parks in the SECN.
- **Description** – This is an optional field that provides a brief description of the unique sampling location identified by the LocationID fields (up to 255 characters in length).
- **UTMX** – Identify the UTMX (easting) coordinate for the center of the plot OR the starting point of a line or polygon. *Note that in order to preserve the integrity and accuracy of the original data, coordinate information for each project should be entered in either UTMx or latitude/longitude, but not both. The data can later be converted, if required.*
- **UTMY** – Identify the UTMY (northing) coordinate for the center of the plot OR the starting point of a line or polygon. *Note that in order to preserve the integrity and accuracy of the original data, coordinate information for each project should be entered in either UTMx or latitude/longitude, but not both. The data can later be converted, if required.*
- **UTMZone** – Identify the UTM zone (zones 1-52). This information is required if coordinates are specified with the UTM grid coordinate system. UTMZone is defined as a Text field to accommodate data collected by PLGR GPS units.
- **Lat** - Identify the latitude for the center of the plot OR the starting point of a line or polygon. *Note that in order to preserve the integrity and accuracy of the original data, coordinate information for each project should be entered in either UTMx or latitude/longitude, but not both. The data can later be converted, if required.*
- **Lon** – Identify the Longitude for the center of the plot OR the starting point of a line or polygon. *Note that in order to preserve the integrity and accuracy of the original data, coordinate information for each project should be entered in either UTMx or latitude/longitude, but not both. The data can later be converted, if required.*
- **Datum**: Identify the reference system used for defining the coordinates of points (i.e. North American Datum of 1927 or North American Datum of 1983 (NAD27 or NAD83).
- **EstHError** – (Estimated Horizontal Error) Calculate the “error buffer” associated with the x,y coordinates for the location. This metadata value makes it possible with a GIS to show the uncertainty associated with a location, depending on how the coordinates for that location were obtained. Report error in meters (or some fraction of a meter if available) for both UTM and latitude/longitude coordinates. The required Federal reporting standard in the horizontal component is the radius of a circle of uncertainty, such that the true or theoretical location of the point falls within that circle 95% of the time.
- **AccNotes** – This memo field may be used for any notes related to the positional accuracy of the coordinates. Identify the source data (map, date of map and scale, or GPS unit, or other) used to determine positional coordinates. Another option is to make this a text field with a list of choices of how the coordinates were determined.

- Elevation – Elevation of sampling location, in meters (m).
- EstVError – (Estimated Vertical Error) This is the vertical error (in meters) associated with the elevation for the location.
- Aspect – Aspect of the sampling location (N, E, S, W).
- Slope – Slope of the sampling location, in degrees.
- StationName – Name or number of the sampling station recorded by the observer.
- HabitatType – Memo field used to describe the surrounding habitat.
- Purpose – Any comments related to the sampling event’s purpose.
- Notes – This memo field may be used for any additional notes related to the conditions under which the data is being collected.

***tblNetData:***

- **MistNetID** – This is an AutoNumber field that is automatically generated by MS Access as a unique, primary key.
- EventID – This field is a foreign key. EventID is an autonumber created by MS Access during the data entry process and the primary key of the table tblEvents.
- TrapType – Type of trap used. Values supplied by combo box (harp net, mist net).
- NetSize – Size of net used.
- NetNumber – Number of nets used.
- NetOrientation – Orientation of net during sampling.
- FieldConfiguration – Configuration of nets in the field.
- NetStartTime – Time that netting was started, in military short time (HH:MM).
- NetEndTime – Time that netting ended, in military short time (HH:MM).
- Notes – Any general notes relating to netting.

***tblObserver:***

- **ObserverID** – This is an AutoNumber field that is automatically generated by MS Access as a unique, primary key.
- ObsInits – Observer’s initials (3 characters max).
- LastName – Observer’s last name.
- FirstName – Observer’s first name.
- MiddleInit – Observer’s middle initial.
- Agency/Title – Agency that the observer works for and/or the observer’s title.
- ADDRESS – First line of the observer’s address.
- ADDRESS2 – Second line of the observer’s address (optional).
- CITY – City
- State – Two letter code for state.
- ZipCode – Zip Code (format 00000/-9999).
- EmailAddress – Observer’s email address.
- HomePhone – Observer’s home phone number.
- WorkPhone – Observer’s work phone number.
- WorkExtension – Observer’s work phone number extension.
- FaxNumber – Observer’s FAX number.
- Notes – Any general notes or comments related to the observer’s contact information.

***tblRoostBridge:***

- **RoostBridgeID** – This is an AutoNumber field that is automatically generated by MS Access as a unique, primary key.
- RoostID – Unique roost identification number assigned by the observer.
- BridgeType – Type of bridge where bats were located.
- Height – Height of bridge where bats were located.
- Length – Length of bridge where bats were located.
- Width – Width of bridge where bats were located.

***tblRoostCulvert:***

- **RoostCulvertID** – This is an AutoNumber field that is automatically generated by MS Access as a unique, primary key.
- RoostID – Unique roost identification number assigned by the observer.
- CulvertType – Type of culvert hosting the bat roost.
- CulvertsNumber – Number of culverts hosting the bat roost.
- CulvertLength – Length of culvert hosting the bat roost, in inches.
- CulvertWidth – Width of the culvert hosting the bat roost, in inches.

***tblRoostData:***

- RoostID – This is an AutoNumber field that is automatically generated by MS Access as a unique, primary key.
- LocationID – This field is a foreign key. LocationID is an autonumber created by MS Access during the data entry process and the primary key of the table tblLocation.
- EventID – This field is a foreign key. EventID is an autonumber created by MS Access during the data entry process and the primary key of the table tblEvents.
- RoostType – Type of roost found. Values provided by combo box (building, tree, bridge, cave, other).
- Species – Scientific Name of bat species found at the roost.
- NumberofBats – Number of bats of a particular species found at the roost.
- GuanoPresent – Yes/No check box to indicate whether or not guano is present.
- GroupType – Type of group present at the roost. Values provided by combo box (group, individual, other).
- PredatorDisturbance – Yes/no check box indicating evidence of predator disturbance.
- PredationEvidence – Notes on evidence of predation.
- RoostOpeningHeight – Distance in meters (m) where roost opening is above water or ground.
- RoostOpeningSize – Opening size of roost, in centimeters (cm).
- Aspect – Compass bearing of opening from roost support in degrees.
- WaterDistance – Distance from nearest water source identified in meters (m).
- WaterDepth – Depth of water in meters (m).
- CanopyCoverage – Description of canopy coverage in area surrounding the roost.
- HabitatType – Description of habitat type in area surrounding the roost.
- DistancetoClosestTree – Distance in meters (m) to the closest tree.

- DirectiontoClosestTree – Compass bearing of the closest tree, in degrees.
- SpeciesofClosestTree – Scientific name of the closest tree species.
- ClosestKnownRoost – Distance in meters to the closest known roost.
- Notes – Any general notes or comments.

***tblRoostTree:***

- RoostTreeID – This is an AutoNumber field that is automatically generated by MS Access as a unique, primary key.
- RoostID – Unique roost identification number assigned by the observer.
- Species – Scientific Name of bat species found at the roost.
- DBH – Diameter at breast height of the tree, in centimeters (cm).
- Height – Height of tree containing the bat roost, in meters (m).
- CavityDimensions - Dimensions of tree cavities containing bat roosts, in centimeters (cm).

***tblObserverLookup:***

- This is a linking table that only contains the primary keys of tblObserver and tblEvents (and ObserverLookup – an autonumber primary key for this table).

***tblParkCode:***

- This is a lookup table that includes the ParkCode (4 letter NPS park code), ParkName (the official park name), and ParkType (the type of park – e.g. national monument, national battlefield, national park etc.).

***tblSetProjectID:***

- This is a look up table that sets the project ID number for the study, in advance.

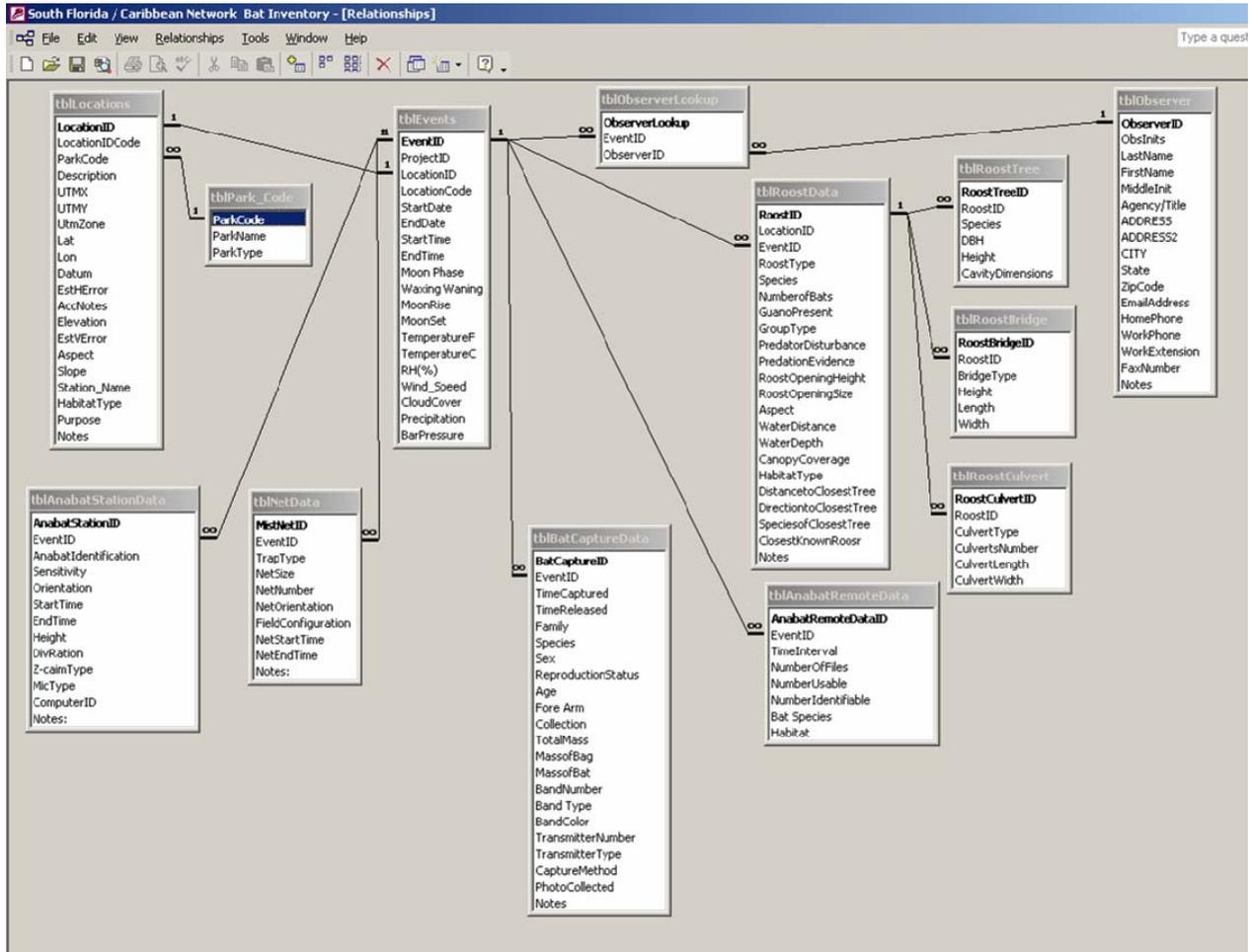
***tluBatSpecies:***

- This is a lookup table of bat species that may be found in GA and FL, using online sources of information. Included in the table are: SpeciesID (autonumber), Scientific Name, Species code (4 letter code developed from the first two letters of the genus and species names), Common Name, and Taxonomic Serial Number for the species from the ITIS taxonomic database.

***tluProject:***

- This lookup table combines information already described in other tables, already filled-in. The fields in this table are: ProjectID, Project, ParkCode, ParkName, and State.

# Entity Relationship Diagram for BatInventoryFBN:



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# SECN Policies for Fulfilling Data Requests

*Southeast Coast Network*

*Version 1.0*

## Revision History Log:

Revision Date	Author	Changes Made	Reason for Change	New Version Number

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## *Overview*

As part of the National Park Service’s effort to “improve park management through greater reliance on scientific knowledge,” a primary role of the Inventory and Monitoring (I&M) Program is to collect, organize, and make available natural resource data and to contribute to the Service’s institutional knowledge by facilitating the transformation of data into information through analysis, synthesis, and modeling (<http://science.nature.nps.gov/im/index.cfm>).

As the SECN Inventory and Monitoring Program progressed from planning into implementation, the number of data requests received has been increasing. There are three typical types of data requests received:

- Requests for data by parks and/or partners to use in ongoing scientific research or in the development of planning documents
- Requests for data by non-affiliated sources to use in ongoing scientific research
- Freedom of Information Act data requests

In order to ensure data and/or information quality and to comply with Director’s Order 11b “Ensuring Quality of Information Disseminated by the National Park Service”, the SECN has established quality assurance and quality control procedures to be implemented throughout the data life cycle (<http://www.nps.gov/policy/DOrders/11B-final.htm>). Specific quality assurance and quality control procedures are included in individual monitoring protocol documents. This document provides an overview of the SECN data quality assurance process, followed by specific guidance for data requests as listed above. Guidance for NPSpecies data requests has also been included in this document.

## *General Data Quality Assurance Procedures*

The National Park Service requires a quality assurance / quality control review prior to communicating and/or disseminating data and information. Only data and information that adhere to NPS quality standards can be released. Therefore, the SECN must evaluate and identify the types of data and information it will disseminate and the appropriate review and documentation guidelines that will be provided along with all data and information products disseminated by the Network.

Specific details of each protocol’s quality assurance process will vary. However, several standard practices will be implemented for all SECN protocols, in which data are classified into one of three categories – Raw, Provisional, and Certified:

- **Raw** – Data that have not been subjected to either quality control or documentation procedures
- **Provisional** – Data that have been initially screened for quality to meet minimum standards for generation of provisional information products.
- **Certified** – Data that have undergone thorough quality assurance and screening as well as complete documentation.

All data migrate from Raw to Certified data following procedures set forth in network SOPs and Protocols. Please refer to individual protocol documents for specific quality assurance procedures being followed for a particular dataset. Figure 1 provides an overview of the typical

data quality assurance procedures followed by every network protocol to migrate data from raw to provisional and finally to certified.

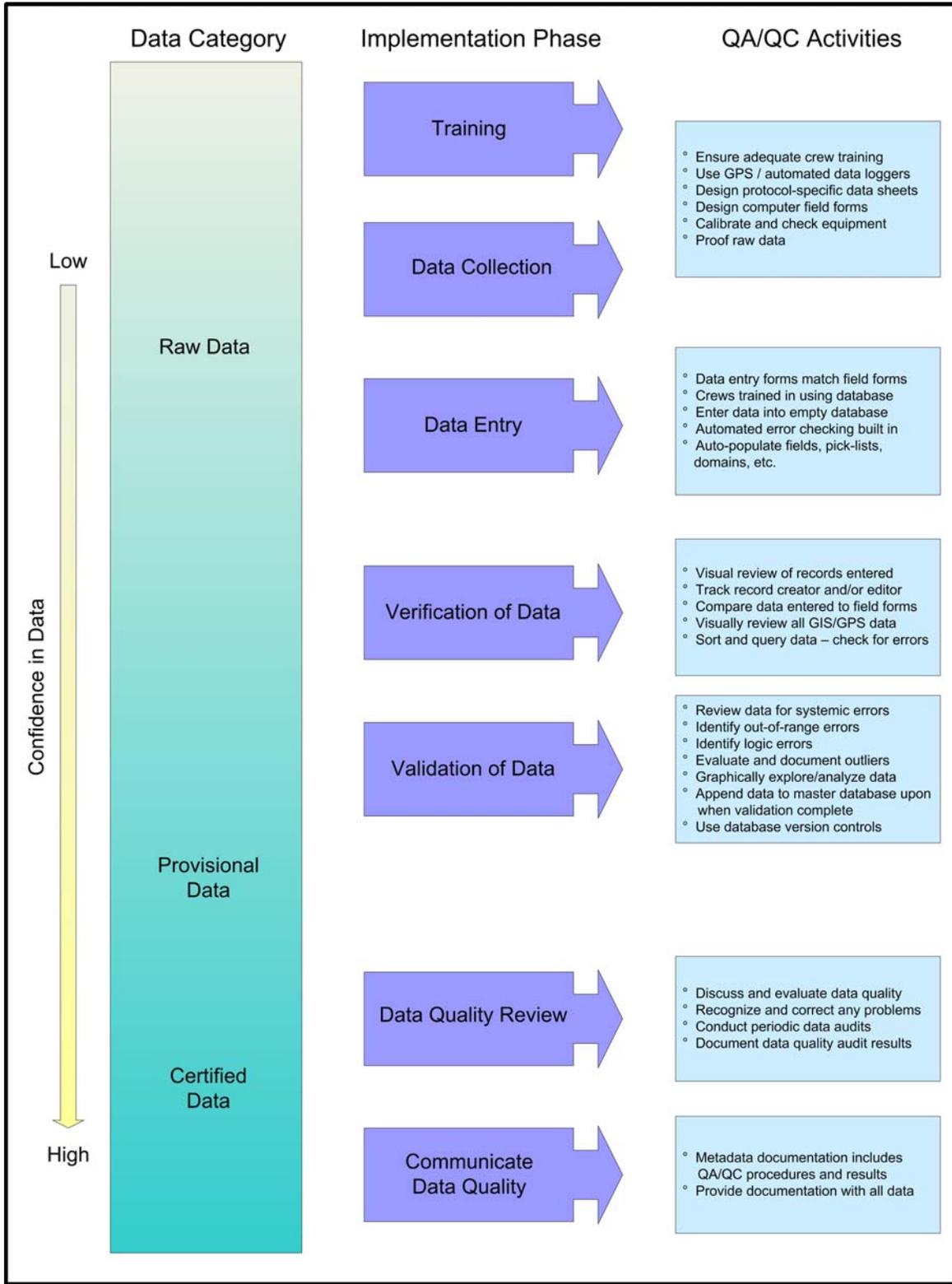


Figure 1 – QA/QC controls from raw through certified data.

The Network will use data documentation and metadata to accompany all SECN datasets. Dataset documentation for all datasets will include:

- A data dictionary to define all fields in the dataset
- The protocol document or general methodology document to define how data were collected
- A descriptive document for each data set/database to provide a ‘data quality report’ (i.e., information on the specific QA/QC procedures applied and the results of the review)
- Formal (FGDC-compliant) or informal metadata. This metadata requirement applies to non-spatial, tabular data as well as spatial data.

### ***Guidance for All Non-FOIA Data Requests Received by SECN***

- All data requests should be submitted to the SECN Science Information Specialist or forwarded to the SECN Science Information Specialist by other network staff.
- All data requests will be reviewed by the SECN Science Information Specialist to determine the best way to proceed with the request (e.g. fill the request, deny the request, request more information about the request).
- The SECN Science Information Specialist will work with the appropriate Network Ecologist towards filling the data request (if approved).
- Data requested from internal (NPS) sources will be shared only after they have gone through minimal QA/QC procedures so that they are considered provisional data by the guidelines established in the long-term monitoring protocol. Whenever possible, data will not be shared until they have gone through the entire QA/QC process and are considered certified.
- The sharing of sensitive data to NPS personnel outside of the park of origin requires prior park approval.
- Data released to the public and other external (non-NPS) users will be limited to non-sensitive, certified data as defined in the long-term monitoring protocol or project study plan.
- Information products disseminated to the public and other external (non-NPS) users will be based solely on non-sensitive, certified data. Once reviewed for release, all static information products will be posted on the SECN website <http://science.nature.nps.gov/im/units/secn/index.cfm>.
- NPSpecies data will not be shared with non-NPS users, prior to certification. To the greatest extent possible, SECN will rely on the public version of NPSpecies (not yet released) to provide a public outlet for NPSpecies data.
- The Network will provide documentation / metadata to accompany all SECN datasets. Dataset documentation for all datasets will include:
  - A data dictionary to define all fields in the dataset
  - The protocol document or general methodology document to define how data were collected
  - A descriptive document for each data set/database to provide a ‘data quality report’ (i.e., information on the specific QA/QC procedures applied and the results of the review)

- Formal (FGDC-compliant) or informal metadata. This metadata requirement applies to non-spatial, tabular data as well as spatial data.
- All data will be accompanied by the standard NPS data distribution liability statement:

*The National Park Service shall not be held liable for improper or incorrect use of the data described and/or contained herein. These data and related graphics (i.e. GIF or JPG format files) are not legal documents and are not intended to be used as such. The information contained in these data is dynamic and may change over time. The data are not better than the original sources from which they were derived. It is the responsibility of the data user to use the data appropriately and consistent within the limitations of geospatial data in general and these data in particular. The related graphics are intended to aid the data user in acquiring relevant data; it is not appropriate to use the related graphics as data. The National Park Service gives no warranty, expressed or implied, as to the accuracy, reliability, or completeness of these data. It is strongly recommended that these data are directly acquired from an NPS server and not indirectly through other sources which may have changed the data in some way. Although these data have been processed successfully on computer systems at the National Park Service, no warranty expressed or implied is made regarding the utility of the data on other systems for general or scientific purposes, nor shall the act of distribution constitute any such warranty. This disclaimer applies both to individual use of the data and aggregate use with other data.*

### **Guidance for All FOIA Data Requests Received by SECN**

Information gathered and products created with SECN support are considered the property of the NPS. Two major pieces of legislation set the tone for information dissemination and protection by federal agencies: the Freedom of Information Act (FOIA) available at [http://www4.law.cornell.edu/uscode/html/uscode05/usc\\_sec\\_05\\_00000552---000-.html](http://www4.law.cornell.edu/uscode/html/uscode05/usc_sec_05_00000552---000-.html) and the National Parks Omnibus Management Act of 1998 (NPOMA) available at [http://www4.law.cornell.edu/uscode/html/uscode16/usc\\_sup\\_01\\_16\\_10\\_79.html](http://www4.law.cornell.edu/uscode/html/uscode16/usc_sup_01_16_10_79.html). Each provides for wide and proactive sharing of information and each recognizes instances where such sharing may be harmful.

This section of Appendix A4 summarizes the legal requirements related to protected information and describes procedures for classifying and managing protected information as well as procedures for responding to FOIA requests. Much of the following material was copied or derived from NPS Director's Order #66: FOIA and Protected Resource Information (Internal NPS Draft only), the Northeast Coastal and Barrier Network Information Management Plan and the Sierra Nevada Network Sensitive Data Guidelines document.

### **Legal and Policy Framework**

#### ***Freedom of Information Act, 5 U.S.C. § 552***

The Freedom of Information Act of 1966, amended in (1F6) 1996 to provide guidance for electronic information distribution (commonly referred to as EFOIA), applies to records owned or controlled by a federal agency, regardless of whether or not the federal government created

the records. FOIA is a broad disclosure law intended to establish a right for any person to access federal agency records that are not protected from disclosure by exemptions. Under the terms of FOIA, agencies make some non-protected records generally available for inspection and copying in public reading rooms and via the Internet. Other records are provided in response to specific requests through a specified process. The Department of the Interior's revised FOIA regulations (43 CFR Part 2, Subparts A through E [see 67 FR 64527]) and the Department's Freedom of Information Act Handbook (383 DM 15) can be accessed at <http://www.doi.gov/foia/>.

***National Parks Omnibus Management Act, Section 207, 16 U.S.C. § 5937***

The National Parks Omnibus Management Act prohibits the release, under FOIA, of information regarding the nature and specific location of certain cultural and natural resources in the National Park System. Information prohibited from release includes the location of endangered or threatened species—specifically maps or narrative descriptions indicating site specific locations. The law also identifies conditions under which the Secretary may release this information.

***National Park Service Management Policies***

The NPS Management Policies (2006) explain the dual goals of the National Park Service with regard to information on resources—to withhold information that will put particular resources at risk and to expeditiously release information that does not (<http://www.nps.gov/policy/mp/Index2006.htm>).

***Director's Order #66 Freedom of Information Act and the Protection of Exempted Information (Drafts 12-04-03, 4-12-04)***

The final Order will function as a supplement to the Department of the Interior FOIA regulations. It is intended to clarify internal NPS operational questions and responsibilities regarding procedures, signature authority, security requirements, and the relationship of paper and electronic records to FOIA and EFOIA. Also, the final Order will specifically address records concerning the location and nature of specific types of park resources that are prohibited from disclosure by the resource confidentiality laws. The draft of the Order states that any federal agency holding information about the nature and specific location of park resources that qualifies as protected information under the provisions of NPOMA must withhold that information from the public unless the Director of the National Park Service or designee determines that its release would:

- Further the purposes of the unit of the National Park System in which the resource is located
- Not create an unreasonable risk of harm, theft, or destruction of the resource
- Be consistent with other applicable laws protecting the resource—the expected Order will be accompanied by Reference Manual 66 which will give more detail (refer also to NPOMA).

**NPS Sensitive Information Classification**

The classification of protected natural resource information from SECN activities will be done on a case-by-case, project-by-project basis. According to the National Parks Omnibus Management Act, if NPS determines disclosure of information would be harmful, information may be withheld concerning the nature and specific location of:

- Endangered, threatened, rare, or commercially valuable NPS resources
- Mineral or paleontologic objects
- Objects of cultural patrimony

The Federal Cave Resources Protection Act (16 U.S.C. § 4304, available at [http://www4.law.cornell.edu/uscode/html/uscode16/usc\\_sup\\_01\\_16\\_10\\_63.html](http://www4.law.cornell.edu/uscode/html/uscode16/usc_sup_01_16_10_63.html)) similarly authorizes the withholding of information concerning the specific location of any significant caves. Network staff will work closely with the investigators on all projects to ensure potentially sensitive park resources are identified and information about these resources is tracked throughout the project. Network staff will be responsible for identifying all potentially sensitive resources to the principal investigator(s) working on each project. The investigators, whether NPS staff or partners, will develop procedures to flag all potentially sensitive resources in any products that come from the project, including documents, maps, databases and metadata. All records and other references to the potentially sensitive resources should be specifically identified by the investigator when submitting any products. Partners should not release any information before consulting with NPS staff to ensure that the information is not classified as protected.

Network staff will compile information about potentially sensitive resources from each project and forward it in the context in which it would be made available to the public (report, map, database etc.) to each appropriate park designee, who, in turn, will determine whether or not to protect the information. For inventory reports, monitoring project reports, or other stand-alone documents, this process will be most efficiently conducted as part of the final draft review for each document. For information contained in other formats that will not have a discrete review process, Network staff will be responsible for flagging any potentially sensitive information and forwarding a request to the appropriate park designee.

The following guidance for determining whether information should be protected is suggested in the draft Director's Order #66 (the final guidance may be contained in the Reference Manual 66):

- Has harm, theft, or destruction occurred to a similar resource on federal, state, or private lands?
- Has harm, theft, or destruction occurred to other types of resources of similar commercial value, cultural importance, rarity, or threatened or endangered status on federal, state, or private lands?
- Is information about locations of the park resource in the park specific enough so that the park resource likely could be found at these locations at predictable times now or in the future?
- Would information about the nature of the park resource that is otherwise not of concern permit finding the resource if the information were available in conjunction with other specific types or classes of information?
- Even where relatively out-dated, is there information that would reveal locations or characteristics of the park resource such that the information could be used to find the park resource as it exists now or is likely to exist in the future?

- Does NPS have the capacity to protect the park resource if the public knows its specific location?

In the SECN, information that may qualify as protected will likely pertain to rare, federal and state-listed species of plants and animals. Protected information could include the location, density or abundance, or presence/absence of the resources in question. Specific examples are maps, narrative descriptions, or databases indicating site specific locations of species.

Information that is already in the public domain can be released. For instance, the return of condors to the Grand Canyon has been well documented by the press. If parties request site-specific information about where the condors have been seen, this information can be released. However, specific nest site locations cannot.

### **Procedures for Classifying Sensitive Information**

The procedures for classifying protected information and managing information about sensitive park resources can be summarized as follows:

- Network and park staff (project leaders, I&M Coordinator, Science Information Specialist) will ensure that all known potentially sensitive park resources are identified and marked as such in Network reports, databases, data sets, GIS layers etc.
- Project leaders will ensure investigators working on park or Network projects understand that (1) all data and associated information must be made available for review by park or Network staff prior to public release in any format, and (2) any information classified by the NPS as protected should not be released in any format except as specifically coordinated with the NPS.
- Project leaders will identify all known potentially sensitive park resources to the principal investigator at project initiation.
- All known references to potentially sensitive park resources generated from each project will be identified to the park or Network by the principal investigator.
- Park and Network staff will provide a complete list of all references to potentially sensitive park resources to the appropriate park designee (typically the Superintendent, Resource Manager, or SECN Technical Steering Committee representative) for review.
- Each park designee determines which information should be protected.
- Park and Network staff will ensure that all protected information is properly identified and marked before uploading into local or national databases, and before archiving the databases.
- Park and Network staff will ensure all references to protected information are removed or obscured in any reports, publications, maps or other public forum. Following the standard for FOIA requests, non-releasable information will be segregated. Where practical, releasable information will not be withheld.

### **Managing Protected Information**

Any information a park designee determines should be protected will be removed by Network staff, or by partners with Network staff guidance, before publication or posting of documents or

other media in which the information is contained. Following the standard for FOIA requests, the Network will segregate non-releasable information and where practical will not withhold associated releasable information.

The method used to withhold protected information depends on the nature of the resource and the medium in which the information is contained. It is the responsibility of Network staff, with guidance from the park designee, to determine appropriate measures to withhold protected information. Appropriate measures may include:

- Generalizing location data to make an area large enough so that the public will be provided some information without learning the specific location of the park resource
- Generalizing text descriptions of locations
- Coding data located on field data sheets, in databases, GIS files, or printed maps
- Cutting off the last digits of UTM coordinates in databases or metadata
- Increase the pixel size of maps to the point that finding the object of interest is not possible

National I&M Program data bases are equipped with the capacity to mark protected information when records are being uploaded. All records that are marked 'sensitive' upon uploading will be available only through secure applications. Thus, access to information on sensitive park resources will be limited to NPS staff or partners who have signed a confidentiality agreement and procedures regarding the release of protected information can be provided along with access to the databases. It is critical that the Network implement quality control and quality assurance measures to ensure anyone uploading records into these databases will know the procedures for identifying and entering protected information.

The NPS Data Store similarly recognizes protected data by the Constraints on Access element in Section 1 of FGDC Compliant metadata, which must be submitted with any data set uploaded to the Data Store. Data sets marked as sensitive are not made available to the public through the NPS GIS Clearinghouse (see SECN Information Management Plan, Chapter 9 for more information).

### **Sensitive Information and Working with Partners**

Network staff must work with any partners collecting or reporting information from projects to ensure:

- All records and other information associated with projects are submitted to the NPS
- Protected information is identified as described above
- Protected information is withheld from public release
- The NPS and the partner have a signed agreement including a confidentiality clause
- Specific procedures for review of information that may be reported by partners are established (this consultation must occur before the partner releases potentially sensitive information to any outside party, whether as part of a publication, posted to a website, or pursuant to a FOIA request or any other request.)

## Partner Agreements

The rights and responsibilities of the NPS and partners regarding potentially sensitive park resources should be stated clearly in any Cooperative Agreement, contract, Interagency Agreement, Volunteer In Park agreement or other written confirmation of a working relationship. Each agreement should address the following:

- Clarification of the ownership of data and associated information - such as:
  - “All associated data (including, but not limited to field notes, maps, slides, photographs, charts/graphs, tabular and GIS data with associated metadata) are required to be submitted to the Network annually and are owned by the National Park Service.”*
- Names of all known potentially sensitive park resources - since the agreement itself is a public document only the names of the resources should be provided, not specific information about their distribution or abundance, in case that information should be protected.
- Summary of procedures and responsibilities for classification of protected information – especially with regard to cooperation between the Network staff and the project staff.
- A requirement for the partner to withhold protected information and to consult with the NPS before releasing any information on sensitive park resources - the following confidentiality agreement is recommended:

*“I agree to keep confidential any protected information that I may develop or otherwise acquire as part of my work with the National Park Service. I understand that with regard to protected information, I am an agent of the National Park Service and must not release that information. I also understand that by law I may not share protected information with anyone through any means except as specifically authorized by the National Park Service. I understand that protected information concerns the nature and specific location of endangered, threatened, rare, commercially valuable, mineral, paleontological, or cultural patrimony resources such as threatened or endangered species, rare features, archeological sites, museum collections, caves, fossil sites, gemstones, and sacred ceremonial sites. Lastly, I understand that protected information must not be inadvertently disclosed through any means including websites, maps, scientific articles, presentation and speeches.”*

- If agreements do not contain specific responsibilities for the NPS and the partner regarding protected information, then Network staff must work with partners to institute appropriate procedures. Note that Federal ownership of information means the information is subject to public release through FOIA.

## Responding to FOIA Requests

When the Network receives a specific FOIA request for information, it will be handled according to standard Department of the Interior and NPS procedures, following the Department’s Regulations, the Department’s FOIA Handbook (National Park Service 2004d), and the NPS

Directors Order #66 (National Park Service 2004a) and Reference Manual 66B (National Park Service 2004c).

The procedures for responding to FOIA requests for information can be summarized as follows:

- When a request is received by a park or the Network, it is the responsibility of the NPS official recipient (the park Superintendent or the Network Coordinator) to comply with FOIA. Notification of the request is forwarded to the regional FOIA program coordinator and the request is logged into the Electronic FOIA Tracking System.
- Upon receipt of a request, the FOIA Officer will make a determination as to whether it is subject to FOIA (i.e., a request for records) or merely a request for information. If the requester seeks an answer to a specific question, or an explanation of policy, procedures, or a Departmental action, DOI is not required to process the request under FOIA. Nonetheless, the FOIA Officer should refer the request for information to the appropriate office for response in a timely manner.
- The request is ‘perfected’ (finalized) by estimating fees and determining the requestors payment limit or request for payment exemption; from this date the NPS has 20 days to respond.
- The requested records are compiled by the recipient office, noting any records that contain protected information and thus are exempted from release. The recipient must consult with the NPS solicitor regarding any exempted records.
- When a record contains both exempt and nonexempt material, a reasonable attempt should be made to segregate and release nonexempt information.
- A draft response to the request containing the requested records along with an explanation of any withheld records should be submitted to the Regional FOIA Program Coordinator, then forwarded to the Regional FOIA Officer and finally to the Regional Director for signature and release.

### **Exemptions through FOIA**

Nine exemptions and three special law enforcement record exclusions permit the withholding of sensitive or confidential information from release through FOIA. Although the NPS does not rely on any particular exemption, the one most likely to be used in context of park natural resources requires withholding records prohibited from disclosure by another statute. Four resource confidentiality laws and one Executive Order direct the NPS to protect information regarding the nature and location of certain sensitive park resources. In some instances, acknowledgement that a particular resource exists at all in a park may reveal too much information. In such cases, a response that neither confirms nor denies the existence of such records may be appropriate in reply to a FOIA request. Such a reply is known as a Glomar response.

### **Release of Records through FOIA**

FOIA dictates that once an agency has shared records with any party outside the federal government without a pre-release agreement, it must make the records available to any and all other parties who request them. This provision is referred to as the “release to one, release to all” rule.

When published research findings are produced under a grant or other federal assistance, including funding from the I&M Program, and the findings are used by a bureau in developing an agency action that has the force and effect of law (e.g., a policy or regulation), the research data related to such findings are considered agency records even if they are in the possession of the recipient.

### **FOIA and Working with Federal Agency Partners**

In general, any federal agency holding information about the nature and specific location of park resources that qualifies as protected information under the provisions of NPOMA must withhold that information from the public until approved by the Director of the National Park Service. When another federal agency informs NPS it has received a FOIA request regarding information that the other agency holds about park resources, NPS first assists the agency in determining whether the requested records fit within the definition of protected information. The agency must withhold the information pending action from the NPS. NPS will ask the agency to forward the FOIA request to the NPS with either:

- A preliminary recommendation that the information be withheld
- A preliminary recommendation that it be released, or
- A statement that the agency will not be making a recommendation whether the information should be released.

The NPS will make its determination about what information, if any, is to be withheld based on information received from the agency, the requester, any other party that it consults, and its own inquiry into whether the information can be released under the provisions of NPOMA.

### **FOIA and Working with State Agency Partners**

Before sharing information with state employees, whether from state agencies or state funded universities, NPS must be aware that those state employees may be obligated to release information in their possession to any party requesting it because state freedom of information or sunshine laws require such release. In states with Freedom of Information laws (such as California) that allow the withholding of certain types of information, it may be possible that state employees would have the authority to enter into contractual agreements with NPS to withhold protected information. NPS must not share protected information with any state employee where state laws require the release of all information in state records.

### **FOIA and Requests for Non-NPS Information**

The NPS cannot guarantee confidentiality of information received from any non-NPS entity. Once NPS receives information from others, its treatment is governed by FOIA. Such information must be released in response to a FOIA request if it does not qualify as protected information. The NPS must, however, withhold any information it receives that does qualify as protected.

### ***Literature Cited***

Department of the Interior, 1991. Departmental Manual: Freedom of Information Handbook, 383 DM 15. <http://elips.doi.gov/elips/release/2911.htm>

Mortenson, D., 2005. Data Management Plan for the Inventory and Monitoring Program, Southwest Alaska Network. United States National Park Service. Anchorage, Alaska. 234 pp.

National Park Service, 2004a. Draft Director's Order #66: FOIA and Protected Resource Information. <http://data2.itc.nps.gov/npspolicy/DOrders.cfm>.



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## Data Processing and Lifecycle Workflow

*Southeast Coast Network*

*Version 1.0*

### Revision History Log:

Revision Date	Author	Changes Made	Reason for Change	New Version Number

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### *Overview and Categorization of SECN Data*

As data are collected for each of the Network's vital signs, data may take different forms and be maintained in different places as they are acquired, processed and documented prior to being added to the SECN master database. All data used and maintained by the SECN, regardless of source or origin, must meet certain standards. To meet these standards, all data and data products are subjected to certain processing steps, including data quality assurance and control, data documentation, and data integration into National information management systems and into the SECN master database once certified.

Specific details of each protocol's data lifecycle may vary depending on protocol implementation and project personnel – these details will be fully documented in protocol documents and/or supporting protocol SOP's. However, several standard practices will be implemented for all SECN protocols:

- Data are classified in one of three categories – Raw, Provisional, and Certified. All data migrate from Raw to Certified data following procedures set forth in network SOPs and protocols. Category descriptions are as follows:
  - **Raw** – Data that have not been subjected to either quality control or documentation procedures
  - **Provisional** – Data that have been initially screened for quality to meet minimum standards for generation of provisional information products.
  - **Certified** – Data that have undergone thorough quality assurance and screening as well as complete documentation.
- All raw data are archived, intact in their original format.
- Working data sets are the focal point for all modification, processing, quality assurance screening and documentation of data. Working data are not stored in separate databases, but rather separate tables within the same database for a single protocol. Once the QA/QC review process is completed, data from the working data table will be migrated to the certified table and deleted from the working data table such that only raw and certified data are archived for the life of the project.
- Upon data certification all data will be archived and posted (as appropriate) or otherwise integrated with national information management applications.
- Certified data will be maintained in the SECN master database that will be write-protected to ensure data integrity over time. Users will be able to access (read-only) and download data sets of interest, depending on user security access restrictions.
- As a general rule, information products (e.g. maps, charts, graphs, etc.) developed by the SECN will be based only on certified data. These products are also archived and made available to users through appropriate data servers or national repositories.
- Provisional information products may be developed using uncertified data in special cases, but will not be released to the public through national systems until such time as they have been certified. There may be certain exemptions from this process for data requests from within the network or with partners – and with FOIA requests. Regardless,

all data that are shared and information products produced, must be accompanied by metadata that describes the QA/QC processes performed on that dataset and a statement describing the level of quality of that dataset.

- Certified data should be considered static and un-editable. Any subsequent changes required to certified data sets will only be done by the SECN Science Information Specialist and must be documented in an edit log which is distributed along with the data.

### ***Data Processing and Workflow Steps***

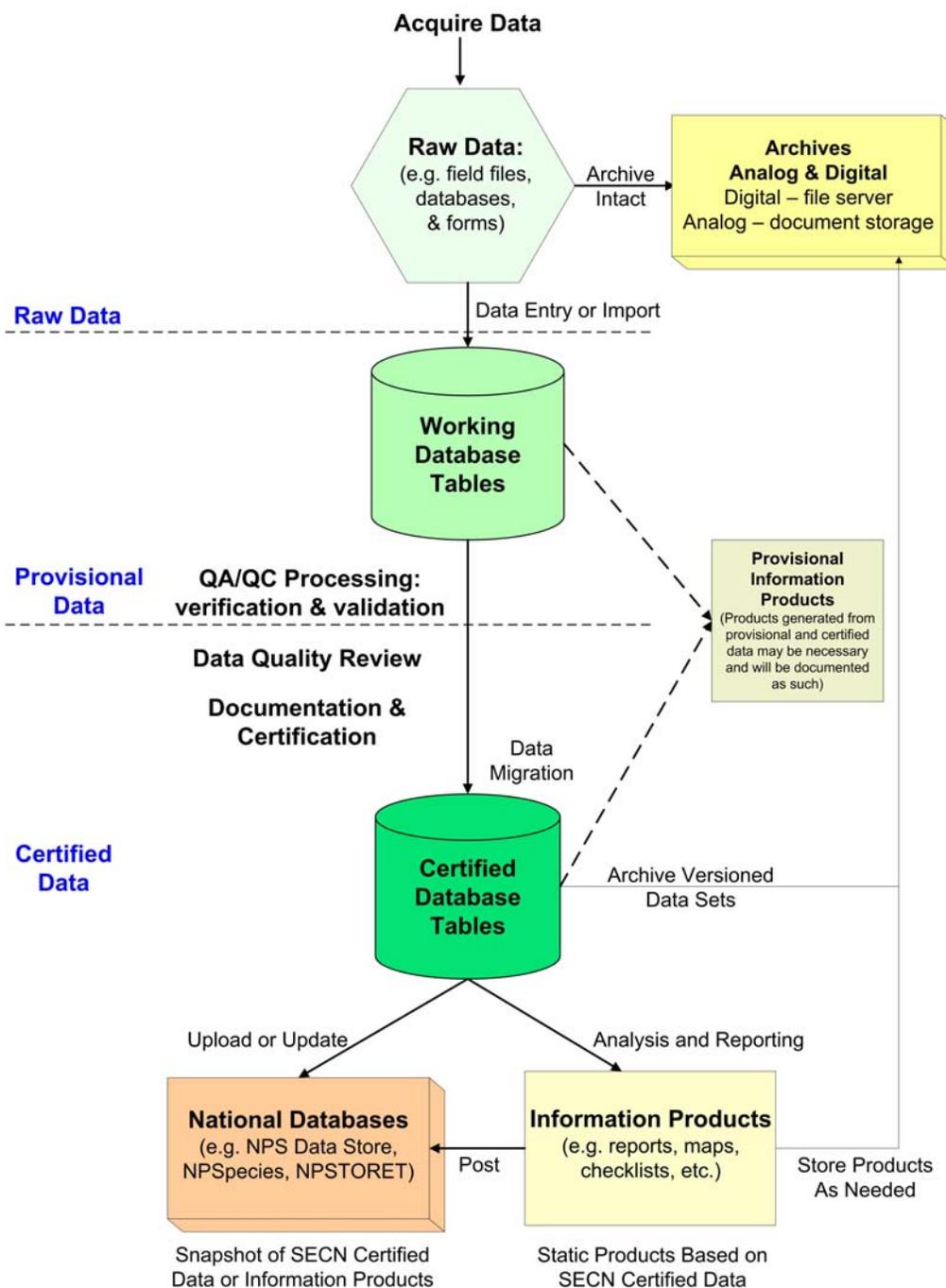
A general schematic for the migration of all SECN data throughout the data lifecycle is depicted below in Figure 1. The migration of raw data to certified data is shown, along with corresponding data dissemination strategies to both the SECN master database as well as national information management systems. The personnel responsible for each step are described in the text below. Also provided is a general timeline for submitting data and/or products from the field office to the SECN Science Information Specialist.

The typical steps involved in data processing and lifecycle are as follows:

- 1) **Acquire data** – For data recorded by hand in the field, data forms should be reviewed regularly (at least daily) for completeness and validity in order to capture errors as close to their origin as possible. Field data collection is the responsibility of SECN Ecologists and/or technicians. Raw data collected by data loggers or other automated collectors will be sent immediately to the SECN Science Information Specialist for archiving and to the protocol lead for import into the protocol database.
- 2) **Data entry / import** – Analog data are entered manually and digital data files are uploaded to the working database. Data entry and/or import is the responsibility of SECN Ecologists and/or technicians in the field or as soon as possible following the return from the field (preferably the same day) for protocols using paper field forms.
- 3) **Archive raw data** – Copies of all raw data files are archived intact. Digital files are copied to the project archive directory. Hard copy forms are either scanned and placed in project archive directory, or copied and placed in the archives. Archiving of hard copy field forms is the responsibility of the personnel collecting the data in the field (e.g. SECN Ecologists, Technicians or Park staff).
- 4) **Verification, processing and validation** – The accuracy of raw data transcription is verified; data is processed to remove missing values and other data flaws; and data is validated using database queries to capture missing data, out-of-range values, and logical errors. At this point, data sets may be considered ‘Provisional’. The QA/QC review of data is highly involved and protocol specific. Additional details will be provided in SECN protocol documents or supporting SOP’s. Data QA/QC is the responsibility of SECN Ecologists and Technicians as defined in the protocol document.
- 5) **Documentation and certification** – Data are considered “Certified” when the project lead ecologist has reviewed the data from step 4 above and migrated the data within the protocol database from the edited table to the certified table (where it is no longer editable except by the SECN Science Information Specialist upon request). Data set metadata will be developed upon data certification. Both data and metadata are then submitted to the SECN Science Information Specialist to be checked to assure they meet proper standards and are ready to be

posted and delivered. Data submission to the SECN Science Information Specialist will occur on an annual basis, at the minimum and will be scheduled in advance to minimize the likelihood of all SECN data being submitted at the same time.

- 6) **GIS Data Documentation and Certification** - GIS Data developed from field data collection with GPS units or developed through data analysis techniques should be processed and reviewed for QA/QC purposes and completed as soon as a protocol reaches a milestone – such as the end of sampling at a particular park for the particular sampling event, at the end of sampling at a park for a particular season or at the end of the field season as appropriate. Once the data have gone through the necessary QA/QC steps and the GIS layer has been finalized, FGDC-compliant metadata will be developed by the SECN Ecologist or Technician to accompany the GIS data file and submitted to the SECN data manager for incorporation into the SECN data structure. The scheduling of GIS data submission should be included in the data management portion of each protocol document or supporting SOP.
- 7) **Archive versioned data set** – Copies of the certified data and metadata are submitted to national or network repositories as deemed appropriate to the requirements of the protocol. This can be accomplished by storing a compressed copy of the working database, or by exporting data to a more software-independent format. This is the responsibility of the SECN data manager upon completion of the data and metadata review.
- 8) **Reporting and analysis** – Certified data are used to generate data products, analysis, and reports, including automated summary reports for monitoring projects. The analysis and reporting schedule is a key component of the protocol document and will be described in detail there. At a minimum, annual summary reports will be provided by SECN Ecologists and Technicians. These static products will be submitted to the SECN data manager for distribution via email and/or the SECN internet or intranet website as appropriate. Reports and other static information products will also be stored in the digital library or document archives as part of the records management requirements of the program.
- 9) **Post products and data to national databases** – To make data available to others, reports and other products are posted to national repositories such as NR-GIS Data Store or the NR Data Image Server and national databases such as NPSpecies, NPSTORET, and NR-GIS Metadata Database. In addition, products are catalogued in NatureBib and posted to the Biodiversity Data Store. Data products may not be posted if they contain protected information about the nature or location of rare, threatened or endangered species, or other natural resources of management concern. The posting of products to national databases is the responsibility of the SECN data manager and/or ecologist as determined during the protocol development process.
- 10) **Track changes** – Certified data are considered complete and accurate – meeting the QA/QC standards set forth in SECN protocol documents. Therefore, changes to certified data should not occur very frequently. Should changes be required, all subsequent changes to certified data are to be documented in an edit log which accompanies project data and metadata upon distribution. Significant edits will trigger reposting of the data and products to national databases and repositories. Only the SECN data manager can make changes to certified data.



**Figure 1 Schematic of the migration of data through the typical data lifecycle**

This sequence of events occurs in an iterative fashion for long-term monitoring projects. As long-term monitoring projects reach reporting milestones; products are finalized by the program ecologist and products are sent to the science information specialist who will review the product for conformance with format standards and then integrate and store the product on the network data server. After storing the products, they are indexed via the metadata records that are part of the NR-GIS Metadata Database and uploaded to the data store (as appropriate). The metadata records provide pointers to data and data products. Distribution then follows as data discovery allows potential users to find and either request or download the data sets from their repositories.

In addition to storing and distributing data products, product integration also involves updates to national databases such as NPSpecies and NPSTORET.

### *Programmatic Roles and Responsibilities*

<b>Role</b>	<b>Data Stewardship Responsibility</b>
<b>Network Roles</b>	
Field Crew Member	Collect, record, and verify monitoring data
Field Crew Leader	Supervise crew and organize data
GIS Specialist or Data Technician	Acquire data sets from external sources. Process and manage data
Remote Sensing Specialist	Acquire data sets from external sources. Process and manage data. Integrate spatial data and develop network sampling framework with program ecologists
Program Ecologists	Oversee and direct data collection operations following standard operating procedures and protocols, including data management. Identify, justify and document "outlier" data. Apply standard statistical methods to develop sampling designs and analyze data Oversee all aspects of specimen acquisition, documentation and preservation. Interpret and report findings.
Science Information Specialist	Ensure inventory and monitoring data are organized, useful, compliant, secure, and available. Oversee archival of related field documents and resultant reports as appropriate.
Database / Application Developer	Develop network databases within the NRDT and SECN conceptual object model framework Develop "front-end" applications to facilitate the rapid entry and quality control of monitoring data Work with network Ecologists and Science Information Specialist to facilitate data querying and reporting for different end-user groups
<b>Park Roles</b>	
Field Crew Member	Collect, record, and verify monitoring data
Learning Center GIS coordinator	Support park management objectives with GIS needs
End Users (e.g. managers, scientists, interpreters, public)	Interpret information and use Information products to inform management decisions Identify new information product needs and inform the scope and direction of science information product development
Park Curator, Museum Specialist or their designee	Coordinate curation and archival processes with network Ecologists and Science Information Specialist Maintain specimens and archives as appropriate.
Information Technology Specialist	Provide IT support for hardware, software and networking
<b>Regional Office Roles</b>	
Regional GIS Coordinator	Update regional GIS catalog with published SECN data sets Provide central repository data for relevant park, regional, and national GIS data sets and accompanying metadata documentation
Information Technology Specialist	Provide IT support for hardware, software and networking
<b>National Roles</b>	
I&M Data Manager (National)	Provide service-wide database availability and support

Program ecologists, science information specialist and the database programmer comprise the central data management team for vital signs monitoring protocols. Because of the collaborative nature of information management, communication among these positions is essential to meeting program goals. The following section outlines the individual and shared responsibilities of each role.

**Program Ecologist** – The program ecologist coordinates the efforts of all involved personnel to ensure that protocols are developed to meet the information needs of the overall I&M program and resource management decision makers. Typically, they are the primary point of contact for information and are responsible for coordination and supervision of all phases of data collection (including training, data entry, and monitoring quality assurance procedures). Their active involvement in information management helps determine the quality and utility of data collected, integration with other protocols implemented by the Network and the overall success of the inventory and monitoring program.

In addition, the program ecologist works closely with the science information specialist to:

- Develop and implement quality assurance and quality control procedures
- Identify training needs for staff related to data handling procedures, quality control measures, and database software use
- Coordinate the design of field data forms and the user interface for the project database
- Develop certified data and provide documentation to accompany the dataset for appending the newly certified data into the SECN master database
- Identify sensitive information that requires special consideration prior to distribution
- Provide project documentation, original field data, databases reports and summaries, and other products related to the project to the science information specialist for archiving
- Create data summary procedures to automate transforming data into meaningful information
- Identify and prioritize legacy data for conversion to desired formats
- Increase the accessibility and interpretability of existing natural resources information

**Network Science Information Specialist and Database Programmer** – The science information specialist plays a vital role as coordinator and facilitator by creating and maintaining data infrastructure and standards, and by communicating the goals of data management to the broader user group. Science information specialists and GIS specialists collaborate and establish standards for all spatial data that are collected. The science information specialist and database programmer also have close working relationships with cooperators and network staff to develop databases and ensure data are properly recorded and stored – and work with park staff and other information users to make sure that data are made available and usable to all necessary personnel.

In addition, the science information specialist and database programmer will work closely with program ecologists to:

- Define the scope of the protocol data, refine object model to reflect and integrate data objects and properties into the integrated decision support system design
- Become familiar with how data are collected, handled and used
- Develop and implement quality control and quality assurance aspects of protocols

- Identify elements that can be built into the database structure to facilitate quality control, such as required fields, range limits, pick-lists and validation rules
- Create a user interface that streamlines the process of data entry, review, validation, and reporting
- Ensure that protocol documentation is complete, complies with metadata requirements, and enhances the interpretability and longevity of programmatic data
- Ensure proper archiving of materials (e.g. protocols, SOP's, data sheets, data, information products, etc.)
- Reviews data being submitted as master (certified) data prior to appending these data into the SECN master database
- Identify and prioritize legacy data for conversion to desired formats

**GIS / Remote Sensing Specialist(s)** – The GIS and remote sensing specialists manage spatial data themes associated with network inventory and monitoring projects, as well as other spatial data related to the full range of park resources. They incorporate spatial data into the GIS. They also maintain standards for geographic data and are responsible for sharing and disseminating spatial data throughout the network.

The GIS and remote sensing specialists will work in collaboration with program ecologists, science information specialist and database programmer to:

- Determine the spatial data and analysis needs for the program and/or individual protocols
- Develop procedures for field collection of spatial data including the use of GPS and other spatial data collection techniques
- Display, analyze, and create maps from spatial data to meet program objectives
- Properly document data in compliance with spatial metadata standards
- Create relationships between spatial and non-spatial data and integrate GIS applications with the network decision support system
- Establish and implement procedures to protect sensitive spatial data according to program needs
- Develop and maintain an infrastructure for metadata creation and maintenance and ensure metadata are created and comply with national and agency standards.

Keeping track of data throughout its lifecycle is the shared responsibility of everyone involved in a long-term monitoring program. This, in essence is data stewardship. Data stewardship is a principle of mutual accountability rather than a particular job for one individual. The importance of data stewardship must not be understated – and the degree of success with which it is implemented will have direct bearing on the quality and utility of data and information products developed by the Network.

Successful data stewardship requires that all people involved in Network activities learn and understand the expectations for continuous information management AND be accountable to perform the duties required to meet these expectations. This requirement is equally important for network and park staff, as well as contractors or cooperators. All personnel involved in protocol implementation receive training, briefings, materials and additional regular communication about data stewardship from supervisors, program ecologists and information management personnel to promote the appropriate level of understanding about how these efforts relate to park and

network management objectives, NPS and Department of the Interior policies, and other federal government requirements.



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# SECN Digital Archiving Guidance Document

*Southeast Coast Network*

*Version 1.0*

## Revision History Log:

Revision Date	Author	Changes Made	Reason for Change	New Version Number

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## ***Introduction***

Security and longevity are two of the critical components of information management. Countless data sets have been lost over time simply because they were not sufficiently documented, organized and maintained following their creation. Data longevity can be enhanced through proper documentation (e.g. metadata) and by maintaining the data in currently accessible and interpretable formats. Digital data must also be maintained in environments that protect against loss from a variety of factors including: improper storage conditions, hardware failure, software obsolescence, storage media deterioration and natural disasters (e.g. flooding and hurricanes). This document describes how SECN maintains and protects its digital assets to ensure their long term security and longevity.

## **Scope and Definitions**

This document pertains to electronic / digital data sets. The preservation of hard copy archives are presented in a separate appendix: [SECN Records Management Standard Operating Procedure](#). Digital archives refer to non-changing data sets and information products that will be write-protected to ensure against inadvertent editing.

**Online Archive:** Online archives include the SECN Internet and Intranet sites, as well as the SECN Sharepoint Services site. The SECN internet site will contain final (not draft) information products for dissemination to all audiences. The SECN Intranet site will contain final and/or draft information products, including internal planning documents, for NPS staff. The SECN Sharepoint Services site will serve as a collaborative workspace for SECN and network park staff – as well as providing data via web services, as appropriate. The SECN Sharepoint Services site is housed on the SECN server which provides the physical hardware for SECN data and information products.

**Offline Archive:** Some data and/or information may be stored offline (e.g. raw data). Currently, gold, archival quality CD-R's and high quality DVD-R's are the preferred long-term storage media.

**Product Library:** Certain static products may be stored in product libraries. This includes final reports and other documents stored in the SECN bibliographic database repository (Reference Manager) or photographs stored in the SECN Image Management Database repository (Portfolio Extensis).

## ***Relevant NPS and SECN Policies***

- The SECN will keep current with all Department of Interior software platform migrations. Currently the standard office software platform is Microsoft products (e.g. Microsoft Office) for all Department of Interior (DOI) Agencies (DOI, Assistant Secretary for Policy, Management, and Budget, Findings and Determination, September 13, 2002).
- SECN will update and maintain datasets no more than two versions behind the current software version – or will store the data set in American Standard Code for Information Interchange (ASCII) format, complete with data and file documentation.

### *Electronic Archiving Process and Workflow*

Electronic files should be consolidated and packaged for electronic archival when a protocol reaches periodic milestones (e.g. annually at the conclusion of each field season) or at the end of a project (for any short term projects that may occur). SECN program ecologists are responsible for packaging electronic files and data for the science information specialist – including raw data in its native format and certified data ready for merging into the SECN master database. Figure 1 illustrates the general workflow of electronic storage (in green), which is then followed by the hardcopy storage.

The program ecologist should prepare the electronic files as follows:

- Complete the Protocol Documentation – complying with file naming and documentation standards
- Make a clear distinction between draft and final files. Draft or working files will be included in project backup, but will be deleted for final online project archival
- Make a clear distinction between public and sensitive information

The science information specialist will:

- Archive the project information on the centralized \Final\_Project\_Deliverables directory. Stored indefinitely.
- Complete a project backup on CD or DVD.
- Integrate deliverables, such as final reports, into appropriate catalogs, electronic libraries and clearinghouses, as described in this plan or in the monitoring protocols. Stored indefinitely.

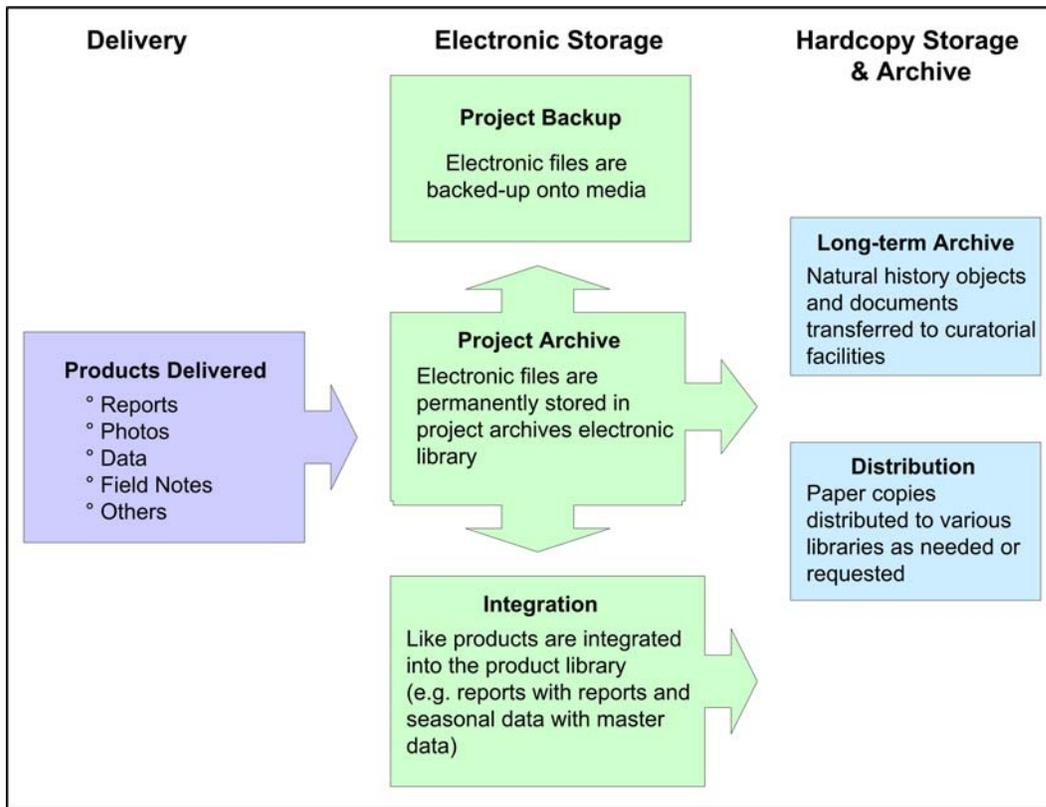


Figure 1. Electronic files storage and archiving

### ***Quality Control for Data Migration and/or Conversion***

Databases that are converted from one version of database software to an upgraded version will require additional quality control, particularly when the database applications are actively used for data entry or analysis. Forms, queries, reports, and data entry will be thoroughly tested during upgrades. An archive of the original database will be stored in its original version until all testing and verification of migration procedures have been completed.

For datasets of limited use, the Network may decide to convert to ASCII format for long-term archiving. In this case, the datasets will no longer be upgraded. Complete documentation is necessary and should include table, field and object relationship descriptions. All ASCII files created from databases will undergo quality control activities or functions to ensure that the number of records and fields correspond to the source data set, and that conversion has not created errors or data loss.

### ***Data Backups for Catastrophic Event Protection***

Nothing is more frustrating than losing a week's worth (or more) of work due to some type of catastrophic system failure without proper backup procedures in place. Thus, it is crucial that all working files be stored on computer systems that are backed up on a regularly scheduled basis. This section describes the backup procedures of SECN servers and provides recommendations for personnel working on systems without automated backup procedures.

The risk of data loss exists from a variety of sources including catastrophic events (e.g., fire, flood), user error, hardware failure, software failure, corruption, and security breaches or vandalism. Performing regular backups of data and arranging for off-site storage of backup sets are the most important safeguards against data loss.

SECN Atlanta office is integrated into the Southeast Regional Office (SERO) local area network. SERO server backups are accomplished as follows:

- SERO uses a 26 slot Overland Storage NEO 2000 tape library rack-mountable Super DLT tape backup system and Veritas Backup Executive software (currently Version 10.0).
- All SERO servers are fully backed up every weekend and differentially backed up each weekday night (Monday – Thursday) to append any changed files.
- SERO has enough tapes and storage space in the library to keep a minimum of three months worth of data before the tapes are overwritten and reused.
- Twice monthly, tapes containing a full backup are removed from the drive and taken to an offsite facility for storage.

Cumberland Island National Seashore backup strategy:

- The network staff at CUIS use 5 – 500 GB Maxtor Shared Storage Plus hard drive units in sequence to back up all Network Staff computers
- CUIS network staff computers are fully backed up every weekend and differentially backed up each weekday night (Monday – Thursday) to append any changed files.

Fort Sumter National Monument backup strategy:

- Network staff at FOSU are housed at a small satellite office with DSL internet access
- Currently, network staff are using individual 200 GB Maxtor hard drive units hooked up to each machine individually for backup.
- Network staff at FOSU are also sending data files to the science information specialist or posting these files to the SECN Sharepoint Portal on the SECN server for archiving.

### **Backup of Desktop Computers**

The backup of data that resides solely on the desktop computers of network staff is ultimately the responsibility of each staff member. SECN strongly recommends that all working files be stored on network drives which are included in automated backup procedures, whenever possible. When users are on travel or for some reason unable to access network drives, the backup of working data files to CD, DVD or data sticks can serve as a short term backup strategy for these users.



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# SECN Records Management Standard Operating Procedure

*Southeast Coast Network*

*Version 1.0*

## Revision History Log:

Revision Date	Author	Changes Made	Reason for Change	New Version Number

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**Credits:** This document was adapted from content in the NPS Records Management Handbook: National Park Service. 2005. Records Management Handbook 140 pages. Available online at: <http://data2.itc.nps.gov/npspolicy/DOrders.cfm>

## ***Introduction***

Records Management is an integral function of the Southeast Coast Inventory and Monitoring Network. A functional records management system is legally mandated in order to improve efficiency and ensure accountability. This system should be instituted to control the creation, maintenance and use, and disposition of records.

## **Why is Records Management Important?**

All federal employees are required to manage agency records responsibly and in accordance with laws and regulations. Records management is the application of management techniques to the creation, use, maintenance, retention, preservation and disposition of records.

- **Resource Management:** The requirement for managing resources forever sets a high standard for record keeping; resources cannot be managed well in the future with out complete records of how they were managed in the past.
- **Efficient use of staff and funds:** Good records management makes us more efficient. Keeping records we don't need wastes space in the office and on the file server. Time is wasted when we look through disorganized or unneeded files to find the information that we really need.
- **Responsiveness:** Complete information can be found quickly if it is well organized, enhancing our ability to respond in a timely manner to requests from agency staff, the public and other agencies.
- **Accountability:** Documentation of important actions and decisions must be available to protect the interests of the agency and the public, particularly in the event of legal actions.

## **Authorities and Responsibilities**

There are many laws, regulations and other authorities that provide direction for records management in the National Park Service which are summarized in [Director's Order #19](#).

- The general authority for issuing this Director's Order is contained in 16 USC 1 through 4, and 16 USC 6 and the delegation of authority contained in Part 245 of the Department of the Interior (DOI) Manual (the Departmental Manual).
- The [Federal Records Act](#), as amended, is the basic law regarding federal government recordkeeping responsibilities and activities (44 USC 2901-2909; 3101-3107; 3301-3324). Records are defined in 44 USC 3301. By law, the National Archives and Records Administration (NARA) has government-wide responsibility for records management, and retains the ultimate authority over disposal of records. NARA regulations that govern agency recordkeeping activities, including those of the NPS, are contained in 36 CFR Chapter XII, Subchapter B. Part 380 of the Departmental Manual contains DOI guidance on records management.
- The [Freedom of Information Act](#) (FOIA) and the [Privacy Act](#) form the basic legal framework regarding release and protection of non-classified records (5 USC 552). DOI FOIA Regulations are contained in 43 CFR Part 2, Subparts A and B (FOIA) and D (Privacy). Additional guidelines can be found in Public Law 105-391 (the National Parks Omnibus Management Act of 1998).

- Regulations on vital records are contained in 36 CFR 1236. Part 380, Chapter 6 of the Departmental Manual contains DOI guidance on vital records. Additional guidance on vital records may be found in departmental guidance on continuity of operations plans.
- NPS guidance related to museum-held archival records and manuscript collections is contained in [Director's Order 24, "NPS Museum Collections Management"](#) and its accompanying guidance, the [Museum Handbook \(Parts I-III\)](#).
- Numerous other NPS Director's Orders contain information or procedures with regards to specific types of records.

## **Records**

Records are defined by the Federal Records Act of 1950, as amended, (FRA - 44 U.S.C. 3301) as

*“all books, papers, maps, photographs, machine-readable materials or other documentary materials, regardless of physical form or characteristics, made or received by an agency of the United States Government under Federal law or in connection with the transaction of public business and preserved or appropriate for preservation by that agency or its legitimate successor as evidence of the organization, functions, policies, decisions, procedures, operations or other activities of the Government or because of the informational value of data in them.”*

## **Defining Records**

There are three key points in this definition, as follows:

1. includes all information created *or* received
2. includes any recorded information that provides documentation or evidence of the Network's activities
3. includes every format and medium.

To help determine if an item is a record, you should ask

- Does it document SECN policies, activities, transactions, or resources?
- Was the creator or recipient acting in an official capacity during creation or receipt of the materials?
- Is the subject matter related to an authorized activity of the agency?

Answering “yes” to any of these questions may indicate that you have federal records.

The Federal Records Act also lists items excluded from the definition of a federal record. These items are called *non-record* materials and include:

- reference materials
- library books
- “vertical” or subject files
- other items maintained strictly for convenience of use
- stocks of publications
- blank forms stock
- museum materials or artifacts

- rough notes or calculations (working files)
- personal papers

When in doubt about the record or non-record status of a document or file, contact your local records liaison or the service-wide records officer (Michael Grimes, [michael\\_grimes@nps.gov](mailto:michael_grimes@nps.gov) or 202-354-1908)!

### **The Record and Non-record Copies**

Once you have determined if you have a record, you must then determine if you have the *record copy* of that item. The record copy (the “copy of record” or original) is the original file copy of a record maintained by whoever created it or received it (the *office of record*). It must be retained or destroyed according to the disposition schedule.

Additional *information copies* (also called distribution copies or use copies) of a record are often kept for reference. They are usually deemed to be non-record, so you may discard them when you don’t need them anymore.

### **Resource Management Records**

*Resource management records* are the fundamental *program records* of the SECN, i.e., they document the substantive mission-specific work of the network instead of the routine, administrative work of a government agency.

**Resource management records are valuable, continuously active records that document all cultural, natural, and informational resources that are found within every unit of the National Park Service.**

Resource management records include the documentary products of archeological surveys and excavations, compliance, **natural resource inventories and surveys**, historic structure management and maintenance, recordation and restoration projects, cultural landscape research, facilities and built environments, scientific projects, and various natural and cultural resource maintenance projects. These records document park resources and serve as information bases for their continuing management.

Resource management records include, but are not limited to: artifact and specimen inventories; computer disks, tapes, and other electronic media; drawings; field notes; films; laboratory reports; maps; manuscripts; oral histories; printouts of computerized data; photographic negatives, prints, and slides; reports; and audio and videotapes. They may be found in paper, photographic, audiovisual, and electronic formats.

To help determine if an item is a resource management record, you should ask:

- Is the subject matter related to a resource or topic identified in the planning and scoping documents of the unit, such as the enabling legislation, general management plan, statement for management, resource management plan, scope of collections statement, etc.?
- Does it document NPS policies, decisions, acquisition, studies, conditions, observations, protection, monitoring, preservation, activities, transactions and management or maintenance of resources?

- Are these records used in the ongoing management of the resource? Do they provide institutional memory regarding the resource or establish baseline data?
- Are these records used to document NPS information resources? Do they provide information about the creation, use, or definition of NPS databases?

### **Informational Resources**

“Informational resources” has many meanings depending on context. As a rule these resource records are closely related to concepts of meaning, knowledge, instruction, communication, and representation. Frequently the format of the records includes various non-textual media. Informational resource records describe databases, including metadata and raw data (e.g., financial data, geospatial data, and various kinds of scientific and mathematical data).

The informational resources may exist in a variety of formats, including but not limited to: finding aids, databases, the PMIS system, the research permit system, E-TIC, metadata, GPS data, e-mail, geospatial data (GIS), institutional memory, oral history tapes, digital photographs, interpretive plans, visitor use statistics, and weather observations. A more comprehensive list of databases (systems) can be found on *Inside NPS*. They frequently cross cultural/natural resource lines and contain information on both areas.

### **Associated Records**

*Associated records* are a subset of resource management records that are essential for the control and use of museum objects. Associated records include all documentation generated by the activity of collecting and analyzing artifacts, specimens, or other resources that are (or subsequently may be) designated as part of a park’s museum collection. Examples include but are not limited to analytical study data, artifact or specimen inventories, computer documentation and data, conservation treatment records, daily journals, drawings, field notes, manuscripts, maps, photographic negatives, prints and slides, and reports generated by archeological and scientific investigations. All associated records must be managed as part of the museum collection. See also the definition in 36 CFR Part 79.

### **Managing Resource Management Records**

Although [NPS-28, “Cultural Resource Management Guideline,”](#) describes resource management records and associated records as “nonofficial records,” these records do in fact meet the definition of federal records as outlined in the Federal Records Act and discussed in Section 2.1 of this document. They are therefore subject to the preservation oversight of the National Archives and Records Administration. The National Archives and Records Administration usually accepts agency records at the age of 30+ years from active life. However, NPS resource management records and associated records continue to be active indefinitely because they may be needed at any time to manage the resources. These records may continue to reside within the national park system unit that created/received them and might not retire to the National Archives UNLESS the National Park Service has determined that it is not able or willing to meet the storage and professional management standards applicable to permanently valuable federal records as specified by the National Archives. This does not mean that permanently valuable resource management records are retained in offices indefinitely. They must at some point be transferred to a facility that can meet the NARA archival storage standards and where the records will be secured against damage and loss, available to the public for research access, and available to park staff on short notice for resource management needs.

## Records Terminology

The National Park Service has used many different guidance documents in its history relating to the management of its records and documentary resources. Different guidance documents use different terms in different ways, leading to confusion among NPS staff as to what various terms mean. Following are some of the terms that have been used to describe various types of records:

Record Active  
 Non-record Inactive  
 Official Current  
 Sub-Official Semi-Current  
 Non-Official Non-Current  
 Permanent  
 Temporary

The terms **Record** and **Non-record** are used to differentiate the value and/or type of records, **Permanent** and **Temporary** are used to differentiate the retention standards, and **Active** and **Inactive** are used to determine the status of records with regard to frequency of use and physical location in offices or in off-site records storage.

The terms **official**, **sub-official**, and **non-official**, while currently used in some NPS guidance documents, are open to local interpretation and their use is discouraged. Readers are referred to the Federal Records Act in support of the selected terms to be used (44 U.S.C. 3301).

The term *archive*, as a verb, refers to the process of retiring selected records to an approved permanent storage facility. The term *Archives* can refer to either the collected papers of an organization or unit or to the facility where permanently valuable documents are maintained for preservation and research use. In a computer environment, to *archive* refers to moving selected files to a particular storage area within the computer or to an external storage device such as a disc or CD; however in the computer environment there is no guarantee that files will remain intact or be accessible permanently as paper records are in an archival facility.

### *Managing Records for Active Use*

*Active* records are used on a regular basis (at least once a month), so they are needed close at hand. We manage *series* of records, rather than individual items. The application of the NPS system of file codes, the establishment of a useable filing system, and some simple filing practices are key factors in managing active records. Effective management of active records also will help us to manage the records once they become *inactive* by reducing the need to identify and sort records before they are destroyed or transferred.

### The Concept of the Series

The *series* is a critical concept in the management of records. A series is a group of records that are managed together because they

- all relate to a particular subject or function (special events permits)
- result from the same activity (survey data)
- document a particular transaction (purchase orders)
- take a particular physical form or have some other relationship arising from their creation, receipt or use (architectural records)

- shows a particular type of arrangement (alphabetical by subject)
- show a context relationship
- comprise all documents with a particular file code within a filing system

A series *does not* have to be exclusively one media or format.

## Project and Case Files

*Project files* and *case files* document

- a particular undertaking (such as the construction of a water line)
- an incident (such as planning for the celebration of an important historical event)
- a decision (such as approving a proposal to include a natural area in the national park system)

Project and case files usually contain a variety of different document and record types, such as correspondence, contracts, reports, printouts of e-mail messages, and other documents. Individually, these documents may not contain much information, but taken together, they tell the “story” of the project or case. It is very important that these files are complete and maintained intact.

These files are usually permanent, especially when they relate to a resource. At a minimum, they should be kept for the longest retention period represented by the documents contained in the file. So, if the file contains four records that are listed on the schedule as having a three-year retention period and one record that is permanent, that file would be retained permanently.

Our director’s orders, handbooks, and other guidance often describe what records should be included in a given project or case file. These documents can be used to guide staff on what should be included in the files and can even be used to create checklists to ensure that these important records are maintained together and available for future use.

Project and case files are managed differently than other NPS records. It is not appropriate to file code each document or to attempt to organize the documents by file code. They should be arranged by project phase and function. Project/case files should be created, and actively managed, by a designated staff member (usually the contracting officer’s technical representative or the project manager). Project/case files should use an established checklist and filing organization and ensure that all necessary documents get incorporated into the file. The file is created, maintained, and then transferred altogether. It is not weeded or split up, and it should be retired eventually to the designated archives facility as a resource management record and permanently retained.

The project manager may be involved over a period of years in major multi-phased projects and should maintain all documentation relating to pre-planning of the project as well as the project itself. The contracting officer’s technical representatives may be assigned responsibility for one or more phases of a project and should be responsible for all documentation of their portion of the project to ensure that complete documentation (essential evidence) is collected and preserved.

Contract files for each NPS project are also created and maintained in the administrative office handling procurement. These are the business/fiscal files documenting the award and payment of contractors. Major milestone documents such as the scope of work, request for quotation or request for proposal, bid package of the awarded vendor, as well as the final contract and deliverables reports and documents should be duplicated in both the contracting and procurement

files and in the contracting officer's technical representative's or team leader's project file.

The contracting and procurement file version is a temporary record and should be destroyed six years and three months after the final payment, because it contains pre-award information and *proprietary information* of vendors and internal government operations documentation on vendor selection and financial information. If the contracting officer's technical representative has performed the project file creation and maintenance diligently, a complete historical record will be maintained in the project file. It will not be necessary to review or save documents from any contracting and procurement office files. They can be destroyed according to the "Records Management Schedule." The project file of the resource manager will be retained as the permanent record of the project. Before the contracting and procurement file is destroyed, the records manager, archivist, or contracting officer's technical representative should check the project file to ensure that all critical documents are incorporated into the permanent file.

Examples of project files include the following:

- several folders documenting creation or modification of a park's *General Management Plan*, public comments on the *General Management Plan*, and a copy of the *Final General Management Plan*
- one or more folders of records documenting preservation of a historic structure — may include copies of funding requests, funding approval, award of contract memo, policy/guidance memos to address problems during project, completion report, contract documents, COTR records.
- inventory and monitoring projects for specific natural areas of the park — may include copies of records relating to funding, policy/guidance memos to address problems during project, and annual reports
- annual reports of the park historian, including outlines of research work
- memos, contracting and funding documents, assessment reports and final treatment reports, and photographs and drawings documenting funding of and award of contract for conservation treatment of historic objects in the park museum collection
- multimedia files containing planning, study, implementation, trouble-shooting, and summary of a park-wide underground utilities project

### **Special Note on Research Material**

Project files for cultural and natural resource studies and research should include the source material collected or created in the course of the research. This includes field notes, drawings, photographs, and copies of primary source material (original documents). Copies of secondary source material (copies of published, widely distributed information) may be maintained if they provide significant related information or provide context to the project. If they provide only transitional information they may be discarded. If the research is contracted out, the contract should specify that this material is transferred to the National Park Service at the completion of the project.

### **Establishing a Filing System**

A *filing system* records what you file, how they are arranged, and where they are stored. This system should provide for ease of filing, efficient access for all users, and maximum protection for your office's records.

### Determining What Records to File

The first step is to determine what records need to be filed: All staff should have an opportunity to provide input into this process so that no records are missed and so that all are committed to using and maintaining the system.

#### 1. What series of records do your staff create or receive during the course of their work?

Which records must be maintained because your office created them or acted upon them (i.e., you are the office of record)? These series should be given the greatest attention, because they document your functions. Other records may be maintained for reference; while they may be useful, staff must look at them objectively to determine if they are really needed, where to file them, and how long to keep them.

#### 2. What are the access needs?

Do they need to be protected because they have personal or other sensitive information? Do many people need the same records or does just one person work with them? Do they use them every day or just once in a while?

#### 3. How long do the records need to stay in the office?

Records must be readily available when they are active; when no longer active they can create problems in office function by taking up space and slowing retrieval for current records. They may be active for a short period of time (a matter of months, perhaps) or years, depending on how they are used.

Once you know what series your office must file and you have determined your needs for them, records can be arranged.

### Filing Arrangements

NPS records should be filed by series, and by how they are used and retrieved. The alphanumeric NPS file codes are a component of the arrangement. Director's Order #19 suggests staff use the file codes to identify individual series of records but states that offices and units are free to arrange records as needed for easy access and to meet their functional needs.

Once the series have been established, the files within the series then should be arranged to provide for the easy location and retrieval of information. The most common methods of arranging records are *alphabetic*, *numeric*, and *chronological*.

- **Alphabetic.** Records are arranged alphabetically by name, subject, geographic location, or other element.
- **Numeric.** This scheme arranges records identified by number, such as contracts, purchase orders, and similar files.
- **Chronological.** This method arranges records according to date. Correspondence is commonly arranged in this manner.

### Location of Files or File Stations

A critical issue in good records management is where files are located, sometimes known as file stations. A *file station* is any location where records are maintained for current use. There are basically two types of file stations — *centralized* and *decentralized*. Which one is used depends on the needs of the staff in that unit.

1. Centralized files, sometimes called *central files*, means that all record copies for the unit or office are stored in the same place. This provides maximum protection for and control of the records and allows all staff equal access to them. However, centralized files require a dedicated space and an authorized staff person to manage the records and to assist others in using them.
2. Decentralized files, as the name suggests, can be found in more than one location. This system is appropriate if the records are:
  - used by a limited number of staff and/or
  - centralized files are too far away to be used easily and/or
  - information must be available to the originator immediately and/or
  - a particular unit makes constant reference to the records

**The SECN should employ a decentralized file system.**

1. **Division/Branch Files** — Division files should contain all necessary documentation for the work of that specific division. This may include project files, transactional records, human resource records, budget records, etc. — anything that documents the ongoing work of the division or branch. Division or branch files contain significantly more detail because that is where the work is actually planned, carried out, and documented, and they hold more detailed and extensive records that document a more complete history of the resource management work.
2. **Individual or Desk Files** — These files are maintained by individual employees at their desk or in their immediate work area. These files may use a variety of filing arrangements or not be arranged at all. They should be only duplicates of records maintained in the division or branch files but used frequently by staff to support ongoing work. It is possible that unique agency records are being maintained in desk files, particularly if the work site is remote from other division or branch activities. Records should be surveyed by a knowledgeable records management/archives professional periodically to ensure that all government records are being appropriately maintained and cared for, and that they are correctly retired and transferred at the close of their active life. These records can be extremely important to the future management of park resources.

**Active Records Storage Requirements**

Records must be

1. Accessible to everyone who needs them, and
2. Secured from unauthorized access, and
3. Protected against accidental or intentional damage.

They should be stored in a cool, dry place if possible, particularly if they are on audiovisual media, since they are unstable compared to paper. Most office staff do not need to worry about specific requirements for permanent records. If you are concerned about the long-term preservation of records, please contact curatorial staff.

Use appropriate filing furniture and tools for the specific type of material you are working with. Most paper documents of standard sizes (letter and legal) should be stored in correctly sized file folders in file cabinet drawers. Filing furniture should be in good repair and should be the correct size for the quantity and type of material to be filed. If your file cabinets are full, clean out your

files and retire or destroy some records before you buy more filing cabinets. Keep only those files in your work area that are needed for current business.

### ***Managing Special Media Records***

Records management principles apply to all records regardless of their physical form. Most staff members have access to personal computers and electronic mail, databases, and other federal records in an electronic form. Like other records, they need to be identified according to the NPS file system, organized, and managed as directed in NPS-19, Appendix B (Rev. 5/03). Staff must be aware that electronic and audiovisual records present unique problems. Described below are additional techniques to ensure the successful management of audiovisual and electronic record formats.

### **Electronic Records**

With ready access to personal computers that have word-processing and database applications, electronic mail, and connections to the Internet, NPS staff regularly create, receive, and use electronic records. NPS staff is advised to regularly check the chief information officer's website for current guidance and new developments regarding management of electronic records in the Park Service.

### **Managing Electronic Text Files**

Most electronic records are text files, created by word-processing applications or electronic mail. They can be understood when printed out and do not need to stay in electronic form to be valuable. Staff needs to determine which should be considered federal records. They may delete non-record material or reference copies. Anything that is a record must be printed out and managed in paper form. All Department of the Interior staff are directed to do this by a September 10, 1999, memorandum from the Office of the Secretary. This procedure will be in place until the National Park Service develops and implements an approved electronic recordkeeping system.

Some text files need to be maintained electronically for future revision/use or as the source for a posting on a website. These can be treated as information copies. Basic records management principles still apply:

- a. Save only needed documents
- b. Label the records.
- c. Arrange the records.

### **Digital Photographs**

The technology of digital photography has revolutionized the world of image creation and use. NPS staff using digital cameras in the field can get immediate quality results and ensure that excellent photographic documentation of critical resources and program activities can be captured.

Digital photographs must be standardized and planned for just as digital documents. The following issues are critical:

- A standard image format must be used to create and store these images (in TIFF — tagged image file format).
- Digital image files must have a clear naming convention for identification.

- Digital image files must be actively converted or migrated forward into every new software version that is installed, then checked visually to ensure correct and complete transfer.
- Staff should strongly consider preservation-quality printing of at least a sampling of the digital image files to ensure that at least some of the recordation survives an electronic records disaster.
- A metadata system must be created for digital image files, identifying critical information about the creation and use of the image files.
- Any digital manipulation (e.g., resizing, color modification, cleanup of “noise,” merging of images, etc.) of images must be fully documented as to type of manipulation, reason, when, and why done. The original digital image file must be kept as well as the manipulated file, with each clearly identified.

### **Electronic Storage Media**

Various forms of storage media have existed for maintaining electronic records outside the computer environment. These have evolved, along with the computers themselves, over time. Duplicate it, convert or migrate it forward onto newer technologies as they become available, or simply do not store your valuable information in digital form unless there is no other choice. Work with your information technology (IT) staff to determine the best storage method for your data, do not maintain records in electronic form unless necessary, and educate yourself as to the nature of computer storage and evolving standards.

Agency responsibilities for electronic records, including e-mail, and standards for their creation, use, preservation, and disposition are in 36 CFR XII, Part 1234, Electronic Records Management.

### ***Records Disposition***

Records disposition is a decision point in the life cycle of records. Often, people interpret the term “disposition” to mean “disposal” or “destruction.” “Disposition”, in this context however, simply means that the records have come to a point when a decision must be made concerning what happens to them next.

The legally required disposition for records no longer needed for current agency business is NPS-19, Appendix B, the “Records Management Schedule.” Depending on the record series, the required disposition action might be one of the following:

1. Send records to an intermediate records storage facility such as a federal records center (FRC) where they will remain for a defined period of time as indicated in the “Records Management Schedule” before a re-review of their status and disposition occurs at a later date.
2. Transfer records to an archival storage facility if they have permanent value.
3. Destroy records if they are temporary and are determined by agency staff to have no further value AND they have met the required retention period defined in the “Records Management Schedule.”

### **The “Records Management Schedule”**

[NPS-19, Appendix B](#) (rev. 5/03) is the “Records Management Schedule”. Arranged according to the NPS file codes it describes the range of records the agency has and what should be done with them. No one can destroy records or transfer them to the National Archives without these

instructions.

NPS-19, Appendix B “Records Management Schedule” defines the various functional areas of the National Park Service and the types of records they produce. It contains detailed descriptions of records unique to the National Park Service. The schedule directs us how long to maintain the records of these functions.

### Disposition Instructions

Each series of NPS records has *disposition instructions* directing staff on what to do with the records. According to the schedule, records will be either *temporary*, *permanent*, or their disposition instructions will indicate *DISPOSITION SUSPENDED - DO NOT DESTROY*. These terms are described below.

1. **Temporary.** Temporary records have value for only a specified period of time. These records have been approved for destruction or deletion.
2. **Permanent.** Permanent records have enduring value and must be preserved forever. These records have been approved for long-term archival storage.
3. **DISPOSITION SUSPENDED.** This is noted in the schedule for record series that should not be destroyed or transferred to the National Archives and Records Administration. These series have long-term value to the National Park Service for managing its cultural, natural, and informational resources. Many of these series should be managed as part of the agency’s archival holdings, which are administered under the direction of the Museum Management Program.

### Transferring Records

There are two situations in which records may be physically *transferred*.

1. Inactive records (those that are used less than once a month) are sent to an off-site storage location temporarily until it is time to either arrange for permanent storage or destruction.
2. Permanent records are sent to the National Archives and Records Administration or the agency’s archival collections for preservation.

### Facilities for Maintaining Inactive Records

When records are no longer required for active use in the office, they should be stored somewhere else. This contributes to both cost-effectiveness and efficiency of operations — it keeps an office from using up expensive office space to store records that are no longer needed for current business, and from buying extra file cabinets; it also gets unneeded records out of the way so staff can more easily and quickly find and store the records that really are used. There are a variety of storage facilities available, depending on the retention period of the record series and its content.

#### Temporary Records Storage Facilities

Storing temporary records in other facilities has a cost, but it is usually significantly cheaper than storing the records in the office. Transfer to off-site storage is a good option if the records meet any two of the following three criteria:

- There are a lot of them — at least 10 linear feet (about one five-drawer file cabinet) of the same type of record
- You do not use them much — less than once every month
- You have to keep them for a long time — at least two more years.

Examples of temporary records storage facilities include:

1. Federal Records Centers (FRCs)
2. Commercial Facilities

### **Permanent Records Storage Facilities**

1. Archives and Records Administration (NARA)  
Permanent federal records are designated by NPS-19, Appendix B, for transfer to the National Archives and Records Administration, usually when they are 30 years old. When permanently valuable federal records transfer to the National Archives, ownership AND custody of the records is transferred, unlike transfers to the federal records centers. This means that the National Park Service is no longer responsible for management or costs associated with storage, public reference, or legal requests for the information. Additional guidance on lands records may be found in Director's Order #25, Chapter 15.
2. NPS Denver Service Center — Technical Information Center  
The NPS Denver Service Center's — Technical Information Center (TIC) is the designated central repository for managing all NPS-generated planning documents, design and construction drawings, and related technical report records.
3. Park Archives  
A number of park units have on-site archival storage facilities and staff where they are able to manage selected series (usually resource management records) of permanent records as archival collections within their museum management programs. These records are retained on-site for ready access by park staff and the research community.

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## **Appendix 1 - Natural Resources Project Documentation Checklist**

(from Director's Order 77: "Natural Resources Management Guideline")

- Field notes
- Daily journals
- Maps
- Drawings
- Photographs, negatives and slides
- Videotapes
- Raw data sheets
- Remote sensing data
- Copies of contracts
- Correspondence
- Repository agreements
- Specialists' reports and analyses
- Reports and studies
- Collection inventories
- Field catalogs
- Analytical study data
- Sound recordings
- Computer data and documentation
- Tabulations and lists
- Specimen preparation records
- Conservation treatment records
- Reports concerning scientific samples lost through destructive analysis

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## Appendix 2 – Filing Practices

Good filing practices make it easier to find, file, and dispose of records. Described below are principles that will assist staff in properly and easily filing records. A little time spent on this will save you a lot of time later.

### Filing Paper Records

#### 1. Do a pre-file check.

Are there file codes or series identification on all the records? Have all office supplies and duplicate copies of records, envelopes, and personal papers been removed? Are the records complete and signed (as needed)? Doing such a pre-file check will spare staff from sorting through unneeded materials and from searching for missing items.

#### 2. Use folders and identify the contents.

Use the proper size folder. Although most records are letter size, legal and oversized folders should be used when more than a few larger records will be filed. The occasional oversized item may be folded to fit into a smaller folder, but large numbers of such items should be placed in oversized folders and in the appropriate file cabinets. Full-cut folders (those with labeling area across the full width of the folder at the top) provide maximum space for labeling and are recommended for regular use. Other types, such as half-cut, third-cut, and fifth-cut, have significantly less space for labeling.

Label the folders. The best means of labeling file folders is to write directly on the folder header with black ink. Mandatory information should include the file code, a good descriptive title, and date range; other information may be included, such as the *cut-off* and disposition date. Typed adhesive labels are acceptable, but they will eventually dry out and fall off, so it's best if they are only used for temporary records.

An example of a properly labeled folder:

<b>A7227 “Practical Records Management” Course Materials (NCR - March 2002)</b>
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*(Note, this file could also be placed under P8615 for NPS In-Service Training)*

#### 3. Prepare the records for filing.

Maintain records in the order they were created or received. Check fasteners to ensure that they are intact and will not damage adjacent documents. Paperclips tend to get stuck to other documents — replace them with staples where appropriate. Do not use rubber bands or string to group records. Organize the day's filing in the appropriate order for efficiency, e.g., if filing by file code, place documents in filing code order; if chronological, place in date order. A filing organizer or guide (available from office supply stores or GSA) may be helpful.

#### 4. File regularly

Set aside regular, uninterrupted time to file records. This is much easier than filing records that have piled up for a week or more.

#### 5. Maintain the files.

Once the records are filed, take care to maintain them and ensure that records are not lost or damaged.

- Make sure the folder is not overloaded; use the score lines on each folder as an indicator. If documents are more than three-quarters of an inch thick, split the documents into multiple folders (labeled and numbered 1 of 2, 2 of 2, etc.).
- Keep food and drink away from filing areas to avoid damaging records and to prevent insect infestation.
- Be careful when handling records so they are not damaged. Make sure you have put the documents all the way into the folders and insert the folders straight in file drawers. Any documents sticking out can be damaged by opening/closing the drawer.
- Do not overload file drawers/boxes. This is a safety issue for staff — an overloaded drawer can cause a cabinet to tip over. Records in overstuffed drawers/boxes are easily damaged during filing and retrieval.
- Periodically screen the files to ensure that non-record or other extraneous materials do not get in the files.
- Transfer inactive records to appropriate storage after review and approval by departmental authority.

### **Filing Other Media**

Similar practices apply to photographs, tapes, computer media, etc., which should be identified with clear and consistent labels, organized and filed according to a file plan, filed regularly, and maintained.

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## Appendix 3 – Frequently Asked Questions about Records Management

**What is records management?** Records management is all the activities associated with the creation or receipt, management (care and feeding) and use of and disposition (permanent retention or destruction) of materials documenting the daily activities and functions of the NPS and all its employees.

**Why is it important?** As an agency of the federal government, NPS is responsible for managing its records responsibly and according to law and regulation. The NPS also has a strong business need for excellent records management, since its mission is to care for natural and cultural resources so that they are “unimpaired” for future generations. This requirement for managing resources *in perpetuity* sets a high standard for record keeping, as no resources can be well-managed in the future without complete records of how they were managed in the past. Because the National Park system manages some of America's most significant cultural and natural resources, the public also has a significant interest in our records.

**What are my records responsibilities as an NPS employee?** Employees have three basic responsibilities with respect to records: one, to create the records needed to document what you do; two, to manage those records so that they preserved and can be retrieved when needed; and three, to dispose of records in accordance with NPS guidelines and Federal regulations.

**What are records?** Records are defined in 44 USC 3301. In sum, this statute tells us that records are created or received during course of business, that we have and keep this documentation as evidence of agency and staff actions and that records are not determined by their media, which means e-mail messages can be records too.

There are four quick questions one may ask to determine if something is a record: one, do the items in question document what the agency does? Two, do they deal with an authorized activity of the agency? Three, was the creator or recipient acting in an official capacity when he or she created or received them? Finally, were these materials made available to others? If the answer to any of these questions is yes, then the item in question is probably a Federal record.

**What should we do with our old records? Can we just recycle or destroy them when we no longer need them?** No, records are government property and cannot be loaned, recycled or otherwise destroyed without authorization. For guidance on what to do with NPS records, consult [NPS 19, Appendix B](#) (the Records Retention Schedule).

**What can we, then, do to reduce the volume of records we have in our office?** There are several things you can do. First, do not keep extra copies of records that your office is not responsible for maintaining. Second, review your files for outdated reference materials (such as manuals) that can be obtained from another source and discard those items you do not need. Third, use the [NPS Records Retention Schedule](#) (NPS-19, Appendix B) to determine what records may be destroyed or transferred. Finally, consider storing records that you no longer need on a regular basis at a Federal Records Center or other off-site storage facility.

**Why not just manage all of our records electronically?** It would seem that our records management responsibilities would be so much easier to meet if we just had some sort of electronic recordkeeping system. However, there are at least two large obstacles that NPS must overcome before such a system could be acquired. First, staff must commit themselves to good management of records – in whatever form they are – before they could be managed electronically. Without establishing good filing and disposition practices in place, an electronic recordkeeping system simply automates our problems. Also, we have been directed by the Department *not* to acquire any such systems until the completion of an agency-wide study that will guide us in the selection and acquisition of an electronic recordkeeping system. Patience on this issue will help us in the future by ensuring that we get the system we need and that we can continue to work effectively with our colleagues throughout the Department.

**Who do I contact for help with my records?** There are many people in NPS who you can consult for records management assistance. Many parks or sites have a person who has been designated with responsibility for records management. Others have archivists and curators who can answer questions. Also, a Records Advisory Committee has been formed; one of the functions of the group will be to provide guidance and assistance to NPS staff. Finally, you should feel free to contact the Servicewide Records Officer, Michael Grimes, for help. He can be reached at michael\_grimes@nps.gov or at 202-354-1908.



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# Summary of Laws and Regulations for the Management of NPS Natural History Collections

*Southeast Coast Network*

*Version 1.0*

## Revision History Log:

Revision Date	Author	Changes Made	Reason for Change	New Version Number

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**Credits:** This document was reformatted and adopted from materials developed by Steve Harrison, Cape Hatteras National Seashore:

Harrison, S. 2001. Natural history collections laws and policies., Cape Hatteras National Seashore, National Park Service. 8 pages.

## ***Overview***

The following is a synopsis of current regulations, policies and guidelines for the accountability and preservation of natural history collections in the national park system – providing excerpts from cited documents, as appropriate. This synopsis is not exhaustive. It was prepared to assist the network coordinator when preparing contracts and cooperative agreements to accomplish the biological inventory component of the Inventory and Monitoring Program. It was also intended to assist parks in the Southeast Coast Network of the Inventory & Monitoring program in issuing collecting permits for inventories and later documenting the collections.

### ***NPS Management Policies (2006)***

#### **NPS-conducted or -sponsored Inventory, Monitoring, and Research Studies**

Superintendents may authorize NPS staff to carry out routine inventory, monitoring, study, and related duties without requiring an NPS scientific research and collecting permit. With or without an NPS permit, staff will comply appropriately with professional standards and with general and park-specific research and collecting permit conditions. All research and data and specimen collection conducted by NPS employees will be appropriately documented and carried out in accordance with all laws, regulations, policies, and professional standards pertaining to survey, inventory, monitoring, and research. NPS staff will be expected to make their findings available to the public, such as by publication in professional journals or presentation in interpretive programs.

#### **Natural Resource Collections**

Natural resource collections include non-living and living specimens. Guidance for collecting and managing specimens and associated field records can be found in the Code of Federal Regulations (36 CFR 2.5) and NPS guidance documents, including the museum handbook. Nonliving specimens and their associated field records are managed as museum collections. Living collections will be managed in accordance with the provisions of a park's general management plan, the Animal Welfare Act, and other appropriate requirements.

Field data, objects, specimens, and features obtained for preservation during inventory, monitoring, research, and study projects, together with associated records and reports, will be managed over the long term within the museum collection. Specimens that are not authorized for consumptive analysis remain federal property and will be labeled and cataloged into the NPS cataloging system (ANCS+, or its successor) in accordance with applicable regulations (36 CFR 2.5).

*(See Paleontological Resources and Their Contexts 4.8.2.1; Collecting Natural Products 8.8; Consumptive Uses 8.9; Natural and Cultural Studies, Research, and Collection Activities 8.10; Social Science Studies 8.11. Also see Director's Order #24: Museum Management).*

### **Code of Federal Regulations**

Title 36--PARKS, FORESTS, AND PUBLIC PROPERTY  
[Revised as of July 1, 2000]

Sec. 2.5 Research specimens:

- Taking plants, fish, wildlife, rocks or minerals except in accordance with other regulations of this chapter or pursuant to the terms and conditions of a specimen collection permit, is prohibited.
- A specimen collection permit may be issued only to an official representative of a reputable scientific or educational institution or a State or Federal agency for the purpose of research, baseline inventories, monitoring, impact analysis, group study, or museum display when the superintendent determines that the collection is necessary to the stated scientific or resource management goals of the institution or agency and that all applicable Federal and State permits have been acquired, and that the intended use of the specimens and their final disposal is in accordance with applicable law and Federal administrative policies. A permit shall not be issued if removal of the specimen would result in damage to other natural or cultural resources, affect adversely environmental or scenic values, or if the specimen is readily available outside of the park area.
- A permit to take an endangered or threatened species listed pursuant to the Endangered Species Act, or similarly identified by the States, shall not be issued unless the species cannot be obtained outside of the park area and the primary purpose of the collection is to enhance the protection or management of the species.
- In park areas where the enabling legislation authorizes the killing of wildlife, a permit which authorizes the killing of plants, fish or wildlife may be issued only when the superintendent approves a written research proposal and determines that the collection will benefit science or has the potential for improving the management and protection of park resources.
- In park areas where enabling legislation does not expressly prohibit the killing of wildlife, a permit authorizing the killing of plants, fish or wildlife may be issued only when the superintendent approves a written research proposal and determines that the collection will not result in the derogation of the values or purposes for which the park area was established and has the potential for conserving and perpetuating the species subject to collection.
- In park areas where the enabling legislation prohibits the killing of wildlife, issuance of a collecting permit for wildlife or fish or plants, is prohibited.
- Specimen collection permits shall contain the following conditions:
  - Specimens placed in displays or collections will bear official National Park Service museum labels and their catalog numbers will be registered in the National Park Service National Catalog.
  - Specimens and data derived from consumed specimens will be made available to the public and reports and publications resulting from a research specimen collection permit shall be filed with the superintendent.
- Violation of the terms and conditions of a permit issued in accordance with this section is prohibited and may result in the suspension or revocation of the permit.

**[Reference Manual 77: Natural Resource Management](#)**

***Chapter 5, Program Administration and Management (Collections, page 57)***

Natural resource specimens preserved and maintained in park museum collections play an important role in the NPS mission to preserve and protect the natural resources within each park. Natural resource collections document park resources for the purposes of information, resource protection and management, and future analysis. Systematically collected specimens are the

products and subjects of vital research that provide baseline data necessary for continued and effective park management. Museum specimens collected in the past may provide information that is otherwise unobtainable.

The NPS museum program objectives include the commitment to collect, document, and preserve objects, specimens, samples, and associated records. A critical element in the preservation of permanently retained natural resource collections is ensuring that early and continuing consideration of curatorial concerns is an integral part of the park's scientific research planning process. Many park research projects produce specimens that may have inherent long-term preservation value. The responsibility for the curation of such specimens and associated data must be determined by a park's scientific and curatorial staff prior to starting a research project and be written into the conditions of each research proposal, cooperative agreement, contract, or collecting permit. Planning includes determining provisions for field documentation and preparation of specimens, identifying the recipient NPS or non-NPS repository for the specimens, and ensuring that each project funds the cataloging and initial preservation and storage costs.

The value of a natural resource museum collection is in its use or potential use. Some categories of functional unity and utility are: general reference collections, voucher collections, research collections, and exhibit collections.

***Chapter 5, Program Administration and Management (Project Documentation, page 53).***

Data, records, reports, and other related information generated as a result of research activities conducted within a park or on museum specimens collected in a park. Natural resource archives may contain field notes, daily journals, maps, drawings, photos and negatives, slides, videotapes, raw data sheets, remote sensing data, copies of contracts, correspondence, repository agreements, specialists' reports and analyses, reports and manuscripts, collection inventories, field catalogs, analytical study data, sound recordings, computer documentation and data, tabulations and lists, specimen preparation records, conservation treatment records, and reports on all scientific samples lost through destructive analysis.

***Museum Handbook, Part 1: Museum Collections***

Chapter 1, National Park Service Museums and Collections (Section C.2, Natural History Collections). Extensive and precise documentation of specimens must be maintained to ensure that information gleaned from specimens is available and useful. For this reason, field records (e.g., field notebooks, photographs, negatives, drawings, maps, raw data sheets, instrument charts, and remote sensing materials) should be maintained as integral parts of the collection.

***Museum Handbook, Part 2: Museum Records***

Chapter 2: Accessioning and Chapter 3: Cataloging

Documentation is a continuous process that starts when a specimen is first collected and includes field notes, field cataloging, mapping, photographing, conservation treatment and subsequent annotations, and other information gathered about a specific specimen.

*Director's Order 24, NPS Museum Collections Management*Section 4.3.16, Project-generated Collections

Require project budgets to include funding for the basic management of collections that are project-generated. Collections management includes cataloging; labeling; conservation examination and treatment (including specimen preparation); initial storage of objects and specimens; and organization and storage of project documentation, including appraisal, arrangement, description, finding aid production, and appropriate archival housing.

- Before starting, permitting, or contracting a project, specify in writing in the task directive, proposal, agreement, permit, or contract, the parties responsible, the designated NPS or non-NPS repository, the collections management tasks, and a time schedule for completion.
- Fund subsequent ongoing maintenance costs of collections management from the operating base of the responsible park, center, or other repository.
- If project-generated collections cannot be accommodated in available storage space and new storage space construction is necessary, program to construct new space to accommodate the expanded collection. If interim storage is needed, specify in the project task directive the location of that storage, and state that it must meet NPS standards. Identify the funding source for interim storage.

4.3.17 Systematic Collections

Add collections made through systematic research to the museum collection. House those associated with a single accession at the same repository to facilitate research and use. As appropriate, lend these collections for exhibit, research, conservation, and other approved uses. Superintendents may authorize housing of collections from the same accession at different repositories if by so doing preservation, research, and use will be improved.

Note: Director's Order #12: Conservation Planning, Environmental Impact Analysis, and Decision Making, its attendant Handbook, and draft Director's Order #88, Administrative Records, direct the creation of administrative records and project files for all compliance actions. These files are permanent and so to be retained in perpetuity, as per DO-19. These files should then be linked to the collecting permit project file, the creation of which is outlined in the RPRS Guide "Administrative Guide for Park Research Coordinators" (see below).

*Director's Order 19, Records Management***General Records Management Requirements**

4.4 Records and data that are collected, created or generated by other organizations working for the NPS under contracts, interagency agreements, cooperative agreements or other agreement instruments with the NPS, are considered NPS records unless the contract or agreement specifically states otherwise. All partnership agreements, contracts or other agreement instruments should clearly state this. Copies or originals of all project documents and data generated under these agreements should be obtained and retained by the NPS office managing the project.

4.5 Contracts, interagency agreements, and cooperative agreements and similar agreement instruments should address copyright issues of any material produced under the agreement. Copyright is not necessarily vested with the NPS unless specifically obtained under the terms of the contract or other agreement.

### **Mission Critical Records**

5.1 Mission critical records are those records that are most necessary for fulfillment of the NPS mission. Mission critical records are permanent records that will eventually become archival records. They should receive the highest priority in records management activities and resources and should receive archival care as soon as practical in the life of the record.

5.2 Mission critical records include: All records of natural and cultural resources and their management that contain information that affects the future management of the resource. General management plans and other major planning documents that record basic management philosophies and policies, or that direct park management and activities for long periods of time. All land records regarding legal title, rights, and usage of NPS lands. Any records that directly support the specific legislated mission of a park unit in addition to, or distinct from, the overall NPS mission.

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# SECN Curatorial Responsibilities Guidance Document

*Southeast Coast Network*

*Version 1.0*

## Revision History Log:

Revision Date	Author	Changes Made	Reason for Change	New Version Number

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## Credits

Materials in this document were taken or adapted from materials developed by Nancy Russell, Museum Curator at the South Florida Collections Management Center, Everglades National Park.

- Materials in this document regarding loan agreements were taken or adapted from the Plain Language website located online at [http://www.plainlanguage.gov/examples/before\\_after/natlparksBEFORE.cfm](http://www.plainlanguage.gov/examples/before_after/natlparksBEFORE.cfm)

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## ***Introduction***

A museum collection is generated and maintained to document and support a park's resource management, research and interpretive programs. The National Park Service (NPS) museum program objectives include the commitment to collect, document and preserve objects, specimens, samples and associated records as defined within a park's approved scope of collection statement (SOCS). The collection is a nonrenewable resource.

In the NPS, the Superintendent is responsible for the accountability, preservation, protection and use of the site's museum collections. The Superintendent ensures that all research projects generating museum specimens include funding to ensure that the cataloging and the initial preservation and storage requirements are accomplished. The Superintendent recommends or approves all planning documents that are related to the proper management of the museum collections. The day-to-day care for a park's collection is delegated by the Superintendent to the park curatorial staff or other designated staff when no curatorial personnel exist at a particular park unit. Park curatorial staff or their designee may also undertake the responsibility of researching and interpreting the collection. These personnel must be involved in reviewing specimen collecting activities, including permit requests, to insure that NPS curatorial requirements are met.

In general, it is important to remember that all specimens collected for permanent retention, as well as their derivatives and byproducts, remain the property of the National Park Service. If specimens are collected that are to be permanently retained—regardless of where they are kept—those specimens must be accessioned and cataloged into the National Park Service's Automated National Catalog System (ANCS+), and must bear National Park Service labels containing NPS accession and catalog numbers. The appendices to this document describe (in detail) the process of natural resource studies, curatorial responsibilities and the typical personnel involved in each step.

## **Scope and Definitions**

The curatorial requirements outlined in this document apply to both NPS and non-NPS researchers. Park- or Network-generated research projects and specimens collected by NPS personnel are not exempt from these requirements.

This document is intended to provide guidance for dealing with natural resource museum collections for parks within the Southeast Coast Network (SECN) - the majority of which do not have curatorial facilities nor pre-existing natural resource museum collections (as opposed to cultural resource collections). The body of this document provides general information that applies to all studies generating natural resource specimens. Appendices to this document provide more detailed information and include the following topics: curatorial responsibilities throughout a scientific investigation, examples of data export formats to support the cataloging of specimens and recommended curation materials and supplies.

**Natural resource museum collection:** A collection comprised of permanently retained specimens and samples taken from the living and nonliving components of the natural world and project documentation generated by the collecting and research activities. A specimen without its associated documentation has limited or no scientific value. The decision to permanently retain a specimen in a park's museum collection depends on the purpose of the collecting activity or the recommendations of the researcher/collector in consultation with park curatorial staff. General

reference collections, voucher specimens, exhibit specimens and most research specimens are managed as part of a park's museum collection. Natural resource museum collections can include biological specimens, geological specimens, paleontological specimens and environmental samples.

**Project Documentation:** Data, records, reports and other related information generated as a result of research activities conducted within a park or on museum specimens collected in a park. Natural resource archives may contain field notes, daily journals, maps, drawings, photos and negatives, slides, videotapes, raw data sheets, remote sensing data, copies of contracts, correspondence, repository agreements, specialists' reports and analyses, reports and manuscripts, collection inventories, field catalogs, analytical study data, sound recordings, computer documentation and data, tabulations and lists, specimen preparation records, conservation treatment records and reports on all scientific samples lost through destructive analysis.

### ***Relevant NPS Policies***

The policies and procedures stated in this document are authorized by the following NPS policies and guidelines: NPS *Management Policies*, Director's Order #24 (NPS Museum Collection Management), Director's Order #77 (Reference Manual 77: Natural Resource Management and NPS-75 Natural Resources Inventory and Monitoring), NPS Museum Handbook, Parts I-III and Automated National Catalog System (ANCS+) User's Manual. Complete text of NPS policies is available at [www.nps.gov/policy](http://www.nps.gov/policy). Relevant excerpts for natural history collections are presented below.

NPS Management Policies state:

*"Natural resource collections include nonliving and living specimens and associated field records. If placed in exhibits or retained in permanent collections, nonliving specimens and their associated field records will be cataloged into a park's museum collection." (4:4)*

Natural resource collections are managed according to NPS *Management Policies*, Museum Objects and Library Materials (5:9-11); Security and Protective Measures (5:13-14); and Preservation of Data and Collections and Protection of Research Potential (5:3-4). Director's Order #24 (NPS Museum Collection Management) requires that the park Superintendent ensures that all projects undertaken with the park budget for curation of generated museum specimens.

Section 4.3.16 of Project-generated Collections states that Superintendent's must:

*"Require project budgets to include funding for the basic management of collections that are project-generated. Collections management includes cataloging; labeling; conservation examination and treatment (including specimen preparation); initial storage of objects and specimens; and organization and storage of project documentation, including appraisal, arrangement, description, finding aid production and appropriate archival housing."*

*Before starting, permitting or contracting a project, specify in writing in the task directive, proposal, agreement, permit or contract, the parties responsible, the designated NPS or non-NPS repository, the collections management tasks and a time schedule for completion.*

*Fund subsequent ongoing maintenance costs of collections management from the operating base of the responsible park, center or other repository.*

*If project-generated collections cannot be accommodated in available storage space, and new storage space construction is necessary, program to construct new space to accommodate the expanded collection. If interim storage is needed, specify in the project task directive the location of that storage, and state that it must meet NPS standards. Identify the funding source for interim storage."*

Director's Order #77 (Natural Resource Management Guideline) states:

*"A critical element in the preservation of permanently retained natural resource collections is ensuring that early and continuing consideration of curatorial concerns is an integral part of the park's scientific research planning process. Many park research projects produce specimens that may have inherent long-term preservation value. The responsibility for the curation of such specimens and associated data must be determined by a park's scientific and curatorial staff prior to starting a research project and be written into the conditions of each research proposal, cooperative agreement, contract or collecting permit. Planning includes determining provisions for field documentation and preparation of specimens, identifying the recipient NPS or non-NPS repository for the specimens and ensuring that each project funds the cataloging and initial preservation and storage costs."*

### ***Ownership of Collections and Repositories***

**All specimens collected for permanent retention, as well as their derivatives and byproducts, remain the property of the National Park Service.** If you collect specimens that are to be permanently retained—regardless of where they are kept—those specimens must be accessioned and cataloged into the National Park Service's Automated National Catalog System (ANCS+), and must bear National Park Service labels containing NPS accession and catalog numbers.

### **NPS Repositories**

Currently there are only two parks within the SECN which have adequate facilities and staff to accept natural resource specimens - Cumberland Island National Seashore (CUIS) and Timucuan Ecological and Historic Preserve (TIMU), although TIMU is also accepting specimens for Castillo de San Marcos National Monument (CASA) and Fort Matanzas National Monument (FOMA). Two other parks or groups of parks - the Outer Banks Group (CAHA, FORA and WRBR) and Chattahoochee River National Recreation Area (CHAT) may be accepting natural resource specimens in certain cases - to be determined on a case by case basis.

The use of a single repository simplifies collection management and accountability of collections while enabling researchers to access more park specimens at a single location. Unfortunately, given the widespread nature of SECN parks across five states there is no one preferred option for storing natural resource specimens within a single, centrally located NPS museum facility. For SECN parks not listed above, it is likely that non-NPS facilities will be used to house their natural resource specimens. The use of non-NPS facilities to house specimens on loan has additional requirements which are described below.

### **Non-NPS Repositories**

There are situations when the use of non-NPS repositories is appropriate, in the absence of adequate/local NPS facilities and in furtherance of the National Park Service mission to ensure access and preservation of museum collections. All such repositories must meet NPS standards for the preservation and protection of museum collections. **The proposed repository for specimens collected must be discussed with the Curator's office as part of the permit application process. Anticipated curation costs beyond cataloging (e.g. specimen preparation techniques and supplies, storage cabinet and supply purchases, conservation, etc.) must also be discussed at that time. See Appendix 2: Required Curation Materials and Supplies for more information.** The National Park Service reserves the right to mandate specific repositories for collections from park property.

Please note that the National Park Service does not loan specimens to individuals—institutional sponsorship is required. All loans of specimens to institutions (for cataloging, research, conservation, exhibit or storage purposes) must be accompanied by the required loan paperwork, approved by the appropriate park Superintendent. The maximum time period for any loan is 10 years; extensions or renewals of loans can be granted.

### ***Loan Agreements***

The National Park Service enters into two types of loans, incoming and outgoing. Incoming loan transactions are considered accessions - which are outside the scope of this document. The National Park Service makes outgoing loans to further its mission of preservation, education and research. Museum property sent out by a park to another park, repository, non-NPS institution or organization, or service-providing organization for exhibition, exhibit preparation, study, conservation, photography, collections management or storage, is considered an outgoing loan by the lending park. Outgoing loans are temporary assignments of custody (but not title) by the lender (NPS Park or center) to the borrower.

**In order to avoid possible liability, all conditions of the outgoing loan between lender and borrower must be agreed to by a signed outgoing loan agreement prior to the initiation of the outgoing loan.** Outgoing loan terms and conditions provide legal protection to both the lender and the borrower and are included in this chapter. The National Park Service enters into two types of outgoing loans: standard outgoing loans and repository outgoing loans.

### **Standard Outgoing Loans**

Objects from the park's museum collection are loaned only for the purposes of exhibition, research, scientific preparation, analysis, photography, conservation, or other requested services. Loans are made to educational institutions (e.g., NPS park museums, non-NPS museums,

historical societies, universities and other organizations); service-providing organizations (e.g., non-NPS and NPS conservation and analytical laboratories or exhibit preparation firms or contractors providing these services); and other National Park Service divisions, offices, or units. Only cataloged objects can be loaned to institutions for exhibit purposes. If objects loaned for research purposes are not cataloged, they must be adequately documented through another means (i.e., field specimen log for archeological collections). Objects loaned for conservation purposes must be cataloged, unless the conservation treatment is necessary to assist with the preparation of the material for identification purposes.

### **Repository Outgoing Loans**

Repository outgoing loans are made for purposes of collections management (including cataloging and storage) or solely storage to non-NPS repositories, such as universities or research institutions, to NPS centers, and occasionally to other NPS parks. Arrangements with a non-NPS repository may be covered by a cooperative agreement, although each loan transaction should also be documented with an outgoing loan agreement. Outgoing loan agreements must be completed and signed for each transaction and reviewed regularly. Outgoing loans to non-NPS repositories should be renewed every ten (10) years.

### **Documentation of Outgoing Loans**

Information needed to make an outgoing loan is contained on the Outgoing Loan Agreement (Form 10-127 Rev.). The conditions governing outgoing loans are described in the Conditions for Standard Outgoing Loans (Form 10-127a Rev.), the Conditions for Repository Outgoing Loans (non-NPS) (Form 10-127c Rev.) and Conditions for Repository Outgoing Loans (NPS) (Form 10-127d Rev.; Figure 5.7). Please refer to the Museum Handbook, Part 2, Chapter 5 available online at: <http://www.cr.nps.gov/museum/publications/MHII/mh2ch5.pdf> for instructions and copies of these forms. Specific conditions, such as special handling or additional insurance conditions, to be met by the borrower should be noted in the special conditions section of the outgoing loan agreement.

The Superintendent must sign the outgoing loan agreement, but other staff may process the loan. The standard outgoing loan agreement is generated by the lending park. Between NPS units, the lending park will follow outgoing loan procedures. The NPS repository agreement may be generated by the NPS repository and must also be signed by the Superintendent. All non-NPS repository loan agreements must be generated by the lending park. The lending park or center must update the status field in ANCS. An object temporary removal slip should be completed for all standard loans. For further details on documenting and tracking loans, please refer to the Museum Handbook, Part 2, Chapter 5 available online at: <http://www.cr.nps.gov/museum/publications/MHII/mh2ch5.pdf>.

All loans must have a specific termination date. If a borrower requests an extension, you may grant it if you follow section E.3 of the Museum Handbook, Part II available online at <http://www.cr.nps.gov/museum/publications/handbook.html>. Repository loans remain at the designated repository until you ask for them back. You may renew these loans following the guidelines as listed previously. The repository must return the loan if it is unable to meet the terms of the agreement.

## Loans and NPS Inventory Procedures

Objects on loan are subject to NPS inventory procedures as outlined in Chapter 4 of the Museum Handbook, Part 2 which is available online at <http://www.cr.nps.gov/museum/publications/handbook.html>. During the first year of a loan, the loan agreement serves as verification for inventory purposes. After the first year, the borrower must make objects available for you to inventory. The borrower may verify in writing or by phone the presence and condition of objects in your inventory.

Repositories are required to furnish information each year for the park annual Collections Management Report (CMR). You should require a non-NPS repository to complete the CMR as part of the loan or cooperative agreement. In addition to inventory, all loans should include a regular monitoring schedule.

## Loans and NPS Collections Management Policies

Objects on loan remain subject to NPS museum management policies. Federal policies and mandates governing NPS museum collections take precedence over state and local laws and regulations. Non-NPS repositories must meet National Park Service standards for management of museum collections. These standards are outlined in the NPS Museum Handbook, Part I available online at <http://www.cr.nps.gov/museum/publications/handbook.html>. Standards for storage of federal archeological objects are outlined in 36 CFR Part 79 "Curation of Federally Owned and Administered Archeological Collections." Systematic collections must remain intact.

## *Natural Resource Studies & Curatorial Responsibilities – The Process*

All projects, protocols or scientific investigations involving the collection of natural resource specimens should follow the procedures outlined in this section. Again, Park- or Network-generated research projects and specimens collected by NPS personnel are not exempt from these requirements. The sections that follow should be given to anyone conducting scientific investigations resulting in the generation of natural resource specimens.

## Receiving an Accession Number

Accession (and catalog) numbers are assigned at the park level by the park research coordinator, curatorial staff or their designee - and are a condition of receiving a park research permit. Please have the following information ready when calling to receive an accession number from the park:

- Please have your study number available when you call.
- Be prepared to discuss your project briefly (specimen collection, destructive analysis, associated records, proposed repositories, etc.).
- The accession number will be emailed to you by the Permit Coordinator, along with this document and appropriate cataloging databases and instructions.
- The park accession number must appear on all reports, field notes and correspondence relating to the collection and on the label of each specimen collected.

## Data Collection Phase

During collection it is essential to gather complete information required for cataloging specimens. **It is highly recommended that you review the fields in the cataloging database**

**prior to collection.** The Museum Catalog Worksheet-NH (Form 10-254D) may be used during field work for documenting pertinent data on-site, thus assuring that the collector has recorded all pertinent ANCS+-related data. This form is available from ANCS+ and is described in the Museum Handbook, Part 2, and Chapter 1 at [www.cr.nps.gov/museum/publications/MHII/mh2ch1.pdf](http://www.cr.nps.gov/museum/publications/MHII/mh2ch1.pdf).

**Per Director's Order #77, the use of longitude/latitude or Universal Transverse Mercator Grid (UTM) coordinates is required** in the natural resource specimen catalog record to integrate information into the Geographic Information System (GIS). Collection of location information (coordinates) is essential for the efficient and effective use of the collection information for park-related management programs, for determining gaps in research needs, and for helping resource managers make decisions and set priorities, for the following programs:

- Inventory and monitoring
- Environmental compliance
- Fire planning
- Development planning
- Wildlife management
- Vegetation management
- Environmental impact plans
- Resource management plans

### **Post-Collection Phase**

Call the park Research Coordinator or Curator's office and obtain a block of catalog numbers for the specimens that will be permanently retained. When you call, please have the following information ready:

- Your accession number.
- Dates collecting began and ended.
- Number of specimens collected (estimates are acceptable for large collections).
- The name of the institution and point of contact where specimens will be cataloged.

The Research Coordinator or Curator will send you (or the individual responsible for cataloging the collection):

- Additional copies of the cataloging database(s), if needed.
- Sample catalog records, if needed.
- At the request of the cataloger, a copy of the Automated National Catalog System (ANCS+) software, to allow direct entry of data, can be sent instead of the export file. ANCS+ is a Windows-based, user-friendly program based on a commercial product called Re:discovery.
- NPS specimen labels and instructions for their completion. If you are using ANCS+, NPS labels can be generated electronically.
- An NPS Outgoing Loan Agreement form, to be signed by the institutional representative responsible for the loan. (All specimens, as well as their derivatives and byproducts, remain the property of the United States).

### **Cataloging Specimens**

Cataloging of NPS specimens must be done in ANCS+ or by using the export templates to

catalog in MS Excel. Refer to the instructions that accompany the database for additional information on required fields and formats for cataloging NPS specimens.

**Cataloging of specimens to NPS standards is the responsibility of the collector.** The cataloging process records the documentary information of the specimen and can serve as an index to additional sources of information. It is the primary property and location record of a natural resource specimen. This information is entered into the NPS Automated National Catalog System (ANCS+), making the information available for future accountability, inventory and research purposes.

**NOTE: Specimens that are to be consumed in the course of research should not be cataloged.**

For standard cataloging procedures, refer to the NPS Museum Handbook, Part II, Chapters 3 and 4, Appendix H, and the ANCS+ User Manual. Electronic copies of these documents are available at [www.cr.nps.gov/museum/publications/index.htm](http://www.cr.nps.gov/museum/publications/index.htm)

### **Specimen Labels**

As stated in Director's Order #77 (Natural Resources Management Guideline), NPS specimen labels:

- Become a permanent record and identify the specimen as belonging to the NPS irrespective of where it is being stored or used;
- Provide data that are essential to the identification of the specimen and are required for the proper cataloging of the specimen; and
- Must be completed by the collector before cataloging.

Specimen labels are provided by the NPS to park and non-NPS researchers who collect specimens as part of an approved research project. For guidance on standard labeling procedures refer to the NPS Museum Handbook, Part II, Appendix H. Labels must be printed on archival quality (acid-free) paper or Tyvek using permanent ink. All labels **MUST** contain the appropriate park accession and catalog numbers in permanent ink, in this format:

Accession Number:

**PARK-1234** using first the official NPS four letter park code, hyphen, and four digit number assigned by the park (e.g. CUIS-0001). Please note there is only 1 accession number for each individual study.

Catalog Number:

**PARK 999999** using first the official NPS four letter park code, space, and six digit number assigned by the park for each specimen (e.g. CUIS 000001). Please note each specimen receives a unique catalog number - assigned as part of a series of catalog numbers for an individual study.

**Note that the hyphen is necessary to distinguish the accession number from the catalog number.** Do not use hyphens in the catalog number.

- The accession number **MUST** appear on all reports, correspondence and original field records pertaining to the collection.

- Catalog numbers should be cited in your final report when referencing individual specimens.

### Post-Cataloging

Within one year of the final date of collecting, you must submit:

- Any specimens that are to be permanently retained, along with your labels and project documentation, to the repository in which they are to be curated. If the approved repository is not at the park, you must provide the Research Coordinator or Curator's office with confirmation that specimens and associated documentation have been deposited at the chosen repository.
- An electronic copy of your catalog records (either in ANCS+ or the appropriate export file) to the Curator's office.
- Copies of all of your field records (notes, maps, recordings, etc.) to the Permit Coordinator's office. Please copy notes, maps and other written or printed matter onto acid-free paper. This requirement is a safeguard, in case original materials are accidentally destroyed or lost in the future. **Original field records must be retained permanently in association with the collection.**

If you find that you will have trouble meeting this deadline, call or write the Curator at the address below to make other arrangements.

### Material Transfer Agreements

All specimens (including anything derived from such material) removed from NPS property or stored outside NPS facilities remains federal property. If you wish to send specimens (or their progeny or derivatives) to a colleague outside your own laboratory for further analysis, your colleague must complete a Material Transfer Agreement with the appropriate park and may also be required to apply for a Scientific Research and Collecting Permit. **No materials can be transferred until the appropriate paperwork has been completed.** For assistance with specimen transfers, please contact the Research Permit Office at the appropriate park.

### *Cataloging Biological Specimens – Data Files and ANCS+*

Contract catalogers or others who collect and document natural history specimens at Southeast Coast Network (SECN) Parks need to prepare data files that can be imported into the Automated National Cataloging System (ANCS+), the museum collection management system for the National Park Service (NPS). If you are cataloging biology specimens for NPS collections, this document will help you.

### Formatting Your Data File

- Start with an export template created from ANCS+, provided by SECN or Park staff. This template includes all mandatory data fields and was emailed to you with your museum accession number. If you need another copy of this database template, please contact the SECN data manager.

- If you are cataloging geology or paleontology specimens, contact the Museum Curator for a different template.
- If you have data that requires additional fields, contact the Museum Curator to discuss additional needs and a new export template will be emailed to you. **Do not add your own fields without discussing it with the Museum Curator.**
- The export file is a delimited text file (NHEXPORT.txt), which can easily be opened or imported into MS Access, or it is available as an Excel worksheet (NHEXPORT.xls). If you have already created databases in Excel or Access, you will likely have to modify them to successfully import your data into ANCS+.
- **The Catalog number must be the first column in your file.** Catalog number is the unique key that ANCS+ uses to match up existing records with the incoming data, so that records can be updated as well as added to the database.
- **The column headers in your file must match the fields selected in the ANCS+ Import/Export template.** The easiest way to accomplish this is to start with a template exported from ANCS+.
- **The columns must be in the same order in your file as they are in the ANCS+ Import/Export template.** Your file must not contain extra columns. It should also not be missing any columns (fields) that are included in the ANCS+ Import/Export template. Otherwise the import process will not be able to match the fields.

### Cataloging with the Export Format

The table below (Table 1) provides information on the mandatory fields and the data and format that must be included in each field for the catalog record to be considered complete.

Note: Some fields in ANCS+ require special formatting, including the addition of spaces, underscores or hyphens. When entering data in ANCS+, ANCS+ controls the data format in those fields and this control isn't available in MS Excel or MS Access, so the cataloger must enter these manually. **Failure to use the proper formatting can cause the import to fail.** You may request a pre-formatted spreadsheet from the SECN data manager to assist in the upload of information into ANCS+.

**Table 1 Data Dictionary for the ANCS+ Export File**

<b>Mandatory Fields</b> ANCS+ Field Name (NPSpecies Field Name)	<b>Description &amp; Format Requirements</b>
Catalog # (Specimen ID)	Enter the complete catalog number from the list of numbers provided by the NPS staff for your use.  A standard NPS catalog number includes a 4-letter park acronym, plus a <i>unique</i> number of up to 7 digits, spaced so the last digit is always in the 12 <sup>th</sup> character space. Examples: CUIS 1234567 or CUIS 1.

**SECN Information Management and Archiving Plan Appendices**

Accession # (No NPSpecies equivalent)	Enter the complete accession number provided by NPS staff for your use. <b>Note:</b> Accession numbers indicate groups of records and thus are not unique for each catalog record.  A standard NPS accession number includes a 4-letter park acronym, a hyphen, plus a number of up to 5 digits, padded with zeros and spaced so the last digit is in the 10 <sup>th</sup> character space.  Examples: CUIS-12345 or CUIS-00001.
NPS Class 1 (No NPSpecies Equivalent)	Enter BIOLOGY
NPS Class 2 (Kingdom)	Enter the Kingdom (Plantae, Animalia, Monera, Protista or Fungi).
NPS Class 3 (No NPSpecies Equivalent)	Enter the Major Group, a broad taxonomic category taken from the NPS Hierarchical Classification Outline (HCO) to represent a subcategory of the 6 Kingdoms.  Examples: Bryophyta, Monocotyledoneae, Dicotyledoneae, Mammalia, Reptilia, Aves, Insecta, etc.  Refer to NPS Museum Handbook Part II, Appendix H: Natural History and the Hierarchical Classification Outline (HCO).
NPS Class 4 (Order or Family)	Enter the Filing Group: For plants, enter the Family name. For insects, enter the Order. For mammals, enter the Family or Subfamily name. For birds, enter the Family or Subfamily name. For fish, enter the Family name  Examples: Asteraceae, Poaceae, Lepidoptera, Passeridae  Refer to NPS Museum Handbook Part II, Appendix H: Natural History and the Hierarchical Classification Outline (HCO).
Obj/Science (Standard Scientific Name)	Enter the scientific name of the specimen. Contains a set of subfields such as Genus, Species, Subspecies, etc. Use a space-underscore-underscore delimiter to separate each subfield. Example: Genus name __Species Modifier __Species name.  <b>Do Not create separate columns in your table for each subfield.</b> There are fifteen subfields available for use. In order, they are: Genus name, Species Modifier, Species Name, Species Authority, Species Year, Subspecies, Subspecies Authority, Subspecies Year, Variety, Variety Authority, Variety Year, Forma, Forma Authority, Forma Year, and Descriptive Name.  Make entries as appropriate. Refer to the ANCS+ User Manual, Chapter 2, Section V.
Common Name (Standard Common Names)	Enter the common name of the specimen.
TSN (TSN)	Taxonomic Serial Number linked to ITIS
Item Count (No NPSpecies Equivalent)	Item Count if individual specimens.  <b>Note:</b> If entering data in the Item Count field, leave the Quantity field blank.
Quantity (No NPSpecies Equivalent)	Enter quantity if bags, boxes, etc.  <b>Note:</b> If entering data in the Quantity field, leave the Item Count field blank.
Storage Unit (No NPSpecies Equivalent)	Enter "EA" for individual specimens.

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Description* (No NPSpecies Equivalent)	Enter a description of the specimen. The description should provide enough information to identify the specimen from others. Do not use unauthorized abbreviations or codes.  For plants, include information such as presence of roots, flowers, seeds, etc.
Dimens/Weight*	Enter the dimensions and/or weight of the specimen, if appropriate. Use metric measurements.  Examples: H 15.0, W 8.9, L 5.6 cm, H 10.3, W 6.8, D 4.5 cm or 0.05 g.  See the Museum Handbook, Part II, Appendix C, for instructions on additional standardized formats for recording measurements.
Age*	Enter the age of the specimen at time of death, as appropriate.
Sex*	Enter the sex of the specimen. Choose from the following:  Fetal Female Juvenile Male Unknown
Condition (No NPSpecies equivalent)	Condition of the specimen. Enter either "COM/GD" (for Complete/Good) or "COM/FR" (for Complete/Fair), which are usually acceptable for recently collected specimens. If you have a specimen that does not fit these condition descriptions, please contact SECN staff.
Collector (Observer)	Enter the name of the collector, last name first. For example, "Doe, John" or "Smith, Tom"  <b>Note:</b> If there is more than one collector, use a space-hyphen-hyphen delimiter to separate each subfield. For example, Doe, John --Smith, Tom
Collection Date (Date)	Enter the date the specimen was collected, in the following format: MM/DD/YYYY  <b>Note:</b> If there is a range in dates, use a space-hyphen-hyphen-space-hyphen-hyphen-space-hyphen-hyphen delimiter to separate each subfield. For example: 10/28/2004 -- -- --10/29/2004
Collection # (Observer Number)	Enter the field collection number, if one exists.
Other Numbers	Record other numbers assigned to the specimen, such as temporary catalog numbers assigned by other institutions. If known, indicate a source for the other number. Record field collection numbers in the Collection Num field above.
Identified By (NPSpecies equivalent?)	Enter the full name of the person, last name first, who identified the specimen.  Example: Jones, Sarah
Ident Date	Enter the date of identification, in the following format: MM/DD/YYYY
Locality (Location Description)	Concise description of collection site within the park
Park (Park Code)	Enter the 4-letter acronym for the appropriate park  Examples: CAHA, CALO, MOCR, CONG, FOSU, etc.
County (County)	Enter the county from which the specimen was originally collected.
State (State)	Enter the state from which the specimen was originally collected. Use the two-letter US Postal Code.

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<p>Lat Long N/W (Latitude, Longitude)</p>	<p><b>Note: Either Latitude/Longitude or UTM Coordinates are required for every specimen. Enter both, if available.</b></p> <p>This field in ANCS+ contains a set of subfields for degrees, minutes and seconds of latitude and longitude, but all data can be entered in the template without the underscore delimiters and the data will import just fine. <b>Do Not create separate columns in your table for latitude and longitude.</b></p> <p>Example: 38_30_15/118_22_30 would be the entry for 38 30' 15" N, 118 22' 30" E</p>
<p>UTM Z/E/N (UTM X, UTM Y, UTM Zone)</p>	<p><b>Note: Either Latitude/Longitude or UTM Coordinates are required for every specimen. Enter both, if available.</b></p> <p>Enter the UTM (Universal Transverse Mercator Grid) coordinates for the collection site. <b>Do Not create separate columns in your table for each subfield.</b> You cannot enter characters. The field is formatted to accept 2 digits, a slash, 6 digits, a slash, and 7 digits as follows:</p> <ul style="list-style-type: none"> <li>a. UTM Zone = 2 numbers</li> <li>b. UTM X (Easting) = 6 numbers</li> <li>c. UTM Y (Northing) = 7 numbers</li> </ul> <p>Example: 05/291000/4264000 would be the entry for UTM zone 5, 291000E, 4264000N</p>
<p>Habitat (Habitat)</p>	<p>Enter specific information about the habitat or community type.</p> <p>Examples: "Subalpine fir/grouse whortleberry habitat type" or "Geyer will/beaked sedge riparian community type"</p>
<p>Habitat/Comm (Habitat)</p>	<p>Enter information about the general habitat or community type.</p> <p>Examples: "marsh", "spruce/fir forest" or "grassland"</p>
<p>Elevation* (Elevation and Elevation Units)</p>	<p>Enter the elevation where collection was made, if known. Enter elevation, in meters, for terrestrial collection sites. Do not convert to English measurements.</p> <p>Example: 550 m.</p>
<p>Waterbody/Drain*</p>	<p>For aquatic and marine sites only, record the waterbody or drainage of the collection site. The field in ANCS+ will expand into two subfields: Waterbody and Drainage. Use a space-underscore-underscore delimiter to separate each subfield, if using both or before the name of the drainage, if only the latter is used.</p> <p>Examples: Waterbody: Turner River Drainage: " __Florida Bay"</p>
<p>Assoc Spec* (No NPSpecies equivalent?)</p>	<p>Enter other species that are found in the same environment or location, if documented.</p>
<p>Exotic/Native (more choices in NPSpecies)</p>	<p>Enter either "NATIVE" or "EXOTIC"</p> <p>Native species are defined as all species that have occurred or now occur as a result of natural processes on lands designated as units of the national park system. Native species in a place are evolving in concert with each other.</p> <p>Exotic species are those species that occupy or could occupy park lands directly or indirectly as the result of deliberate or accidental human activities.</p>

Threat/Endang (different choices from NPSpecies)	Enter the federal status under the Endangered Species Act, if the specimen is a threatened or endangered species. Choose from the following options:  C = Taxa for which the Service has on file sufficient information on biological vulnerability and threat(s) to support proposals to list them as endangered or threatened species. E = Endangered PE = Proposed Endangered PT = Proposed Threatened T = Threatened
Rare (No NPSpecies Equivalent?)	Document the presence of a taxa on any other list, besides the Federal T&E lists, denoting rarity in the area, such as regional, state, county, or park lists.  Example: lists of species of special concern maintained by state heritage programs
Type Specimen (NPSpecies Equivalent?)	If appropriate, enter the type for the specimen, or "Voucher" if the specimen is a voucher specimen. This indicates that the specimen has been recognized in publication as a "type specimen".  Example: Allotype, Holotype, Paratype, etc.
Location (Steward/Repository)	Enter the physical storage location of the specimen.
Cataloger (Entered Date)	Enter the full name of the cataloger, last name first. Example: "Doe, John" or "Smith, Thomas J."
Catalog Date (Entered Date)	Enter the date of cataloging, in the following format: MM/DD/YYYY

## *Recommended Curation Materials and Supplies*

### **General Supplies**

- Acid-free paper—a 25% rag paper with a pH of approximately 7.0; free of acid, lignin, alum and sulfur.
- Calipers
- Pencil—"H" or #2 hardness graphite lead pencil.
- Permanent black ink—fade resistant, indelible ink. Acceptable inks are Higgins®, Black Magic® and Pelikan 17 Black. (Note: Sharpies® are not archival).
- Pigma pen—permanent black ink pen.
- Polyethylene Ziplock™ or similar bags—avoid bags developed for food storage and home use because of printing inks and dyes.
- Tape measure, cloth—metric and SAE.

### **Safety Supplies**

1. Neoprene gloves—heavier synthetic gloves for handling fluid preserved specimens as they are resistant to alcohol and formaldehyde.
2. Nitrile gloves—synthetic rubber gloves for handling natural history specimens that may have been treated with poisonous chemicals.

3. Respirator—it is the collector’s responsibility to be medically evaluated for respirator use, be fit tested, use appropriate cartridge filters for the activity and be trained in its proper use.

### Archives (Project Documentation)

- Archival file folders—acid-free, lignin-free, buffered folders, letter or legal size.
- Archival map folders—large, heavy stock buffered folders. **Note:** Do not use buffered folders for blueprints or photographs unless first placed inside a sleeve of unbuffered paper or Mylar® as a barrier.
- Archival document storage box—made of buffered board and for use with documents placed inside archival file folders; letter or legal size.
- Archival record storage box—buffered corrugated fiberboard box with separate telescoping lid used to store documents placed inside archival file folders, for projects with larger quantities of associated field records.
- Archival photo enclosures
  - ❖ All materials used to house photographic images must have passed the Photographic Activity Test (PAT).
  - ❖ Polyethylene photo pages may be used—do not use yellowed polyethylene pages as they may be contaminated with damaging chemicals. Never use PVC photographic pages.
  - ❖ Alkaline buffered paper enclosures may be used for black-and-white cellulose ester film.
  - ❖ Use only unbuffered materials for color images (prints, negatives, transparencies and slides).
  - ❖ Due to the humidity control issues, do not use Polyester (Mylar®) envelopes for photographs.

### Entomology Collections

- Stainless steel pins for mounting insects
- Insect pinning trays—constructed of 0.5” thick cardboard and covered with acid-free white chrome paper. On the inside bottom is a rigid polyethylene foam liner to mount the pinned insects.
- Entomology cabinet—51-5/8”H x 21-3/4”W x 22-3/4” D or 84”H x 23”W x 20-7/16” D steel cabinets with a gasket and locking door.
- Aluminum Cornell type entomology drawers
- NPS entomology specimen labels

For insects preserved in fluids, see Wet Collections below.

### Plant Collections

Herbarium specimens should be glued, taped or sewn (or a combination approach) onto the mounting sheets as appropriate for the specimen to ensure that they are adequately mounted.

Note: specimens must be mounted when submitted by the collector. Researchers may do this themselves (using approved materials and techniques) or they may have Fairchild Tropic Botanical Gardens or another herbarium mount the specimens for them. **The researcher is responsible for the cost of mounting.** For reference and budget planning purposes, Fairchild charges \$774 per 100 sheets for mounting.

- Herbarium mounting sheets—an 11.5”W x 16.5”L sheet of white, acid-free and buffered paper stock.
- Herbarium adhesive—methylcellulose.
- Herbarium mounting tape—a white cloth tape with water-activated adhesive.
- Herbarium folder—a folder measuring 16-5/8” L x 12” W (when folded), made of acid-free and buffered heavy-stock paper.
- Herbarium fragment folder—an acid-free and buffered paper enclosure.
- Herbarium cabinet—40”H x 29-1/8”W x 19-1/8”D or 84-1/8”H x 29-18”W x 19-1/8” D steel single-door cabinet with gasket and locking door.
- NPS herbarium specimen labels

For plants preserved in fluids, see Wet Collections below.

### Mammal Collections

- Specimen trays—made from buffered, acid-free board.
  - ❖ Contact with buffered paper can damage pigments in bird and mammal specimens. Line buffered trays with polyethylene sheeting to block direct migration of alkalis to these specimens.

### Wet Specimen Collections

Evaporation of preservatives from fluid specimens endangers specimen preservation, increases collection management responsibilities, creates an increased fire hazard in museum storage and threatens the health and safety of curatorial staff. To ensure that all park specimens are appropriately preserved without creating future management problems, **all wet specimens must be submitted in approved containers with approved closures**, as listed below.

- Containers must be screw-top, clear flint glass jars with polyethylene insert and a flexible polypropylene lid. Wide-mouthed jars are preferred.
- Containers should be filled to the neck with the preservative fluid. This reduces the air-to-fluid ratio in the container and allows for immediate detection of evaporative loss of fluid because all containers are filled to a standard height.
- Specimens should not be allowed to protrude above the level of the fluid in the container. Use the largest jar size necessary to ensure that this does not occur.

Jars should be appropriately sized to the specimens they contain. Multiple specimens of the *same species* may be stored within one jar if:

- Each specimen is individually tagged with the park catalog number.

- Tags, ink and string are chemically resistant.
- An inventory of the specimens is included in each jar.

The fluid preservative used is necessitated by the specimens collected. In general, 70% ethanol (ethyl alcohol) is the preferred preservative. However, 10% buffered formalin is currently the preservative of choice for eggs and larvae of fishes and amphibians. Formalin is also commonly used as a fixative for many types of specimens. **In all cases, the chemicals used for fixation and storage must be documented for each specimen.** It is important to record all fixation and preservation chemicals, processes and exposure times because these may affect future use of the specimen, especially for molecular studies. General information about fluid preservatives is presented below.

- Each specimen is individually tagged with the park catalog number.
- Alcohol should be diluted with distilled, purified or deionized water to avoid the formation of precipitates.
- Formaldehyde is not considered a good long-term preservative for most specimens. In addition, it represents significant health and safety issues for collectors, researchers and staff. Use of formaldehyde or formalin should be limited only to those situations when it is required for the preservation of the specimen and ethanol is inappropriate.
- Isopropanol is used as a preservative at concentrations of 45-50%. At this strength it has been shown to cause considerable shrinkage of specimens. Use of isopropanol as a fluid preservative must be justified and approved by the Curator's office in advance.
- For fish, it has been recommended that specimens fixed at 10% formalin be transferred to 35%, then to 55% and then to the 70% concentration of ethanol storage solution.
- Methanol is not a good preservative and must not be used.
- Phenols are not good long-term (i.e. greater than 10 years) preservatives and must not be used.
- There are no published reports on the long-term effectiveness of ethylene glycol as either a preservative or an additive and it must not be used.
- Fungal activity is a problem with glycerol solutions and they must not be used.
- **It is the responsibility of the collector to know the hazards associated with fluid preservatives and to ensure safe handling procedures during preparation and transportation of specimens.**

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# Project Closeout Checklist

*Southeast Coast Network*

*Version 1.0*

## Revision History Log:

Revision Date	Author	Changes Made	Reason for Change	New Version Number

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## Overview

This document contains a checklist of possible items developed during the course of a project that should be marked “received” or not applicable as a project approaches completion. Items in blue are typically provided by the cooperator while the rest is done by network staff (for those projects done via contract or cooperative agreement). Brief notes describing additional requirements of deliverables is provided at the end of this document to ensure those items received meet the needs of the NPS and I&M program. These deliverable descriptions are generally applicable across all I&M projects but may be overruled by project specific requirements for deliverables as outlined in protocol documents and/or contracts or agreements documentation.

## Checklist of Project Closeout Items

### 1. Folder

- Email correspondence with cooperators
- Payment correspondence with contracting officer
- Statement of Work
- [Proposal](#)
- Contracting Documents
- [Interim Reports](#)
- [Final Reports](#)
- [Publications](#) / news stories / PR resulting from work
- CD with electronic data:
  - GIS file(s)
  - [FGDC-compliant metadata \(or answers to metadata questionnaire\)](#)
  - [Database or spreadsheets](#) (see below for details)
  - [Data Dictionary for database or spreadsheet](#) (see below for details)
  - [Reports](#) (see below for details)
  - [Project photos](#)
  - [Photo documentation if not in database or report](#)
    - (+ accession number, archive catalog number and item number)
  - Contracting documents
  - CD readme file describing all contents of CD

### 2. NPSpecies (if applicable)

- Data entered into NPSpecies (or in [NPSpecies compatible format](#))
- Data certified

### 3. NatureBIB

- Final Report or data set in NatureBib

### 4. [Reports](#)

- Meets network requirements – see below for additional details
- Summary of findings on web page
- Downloadable report available on web **with sensitive data removed**
- [Copies submitted to parks for local archives](#)

### 5. [GIS](#)

- [Metadata complete and FGDC compliant](#)
- Data installed on GIS server
- Data provided to the parks
- Data submitted to GIS clearinghouse

### 6. Vouchers

- Copies of all loan agreements
- Vouchers properly cataloged and accession/catalog numbers in database/spreadsheet
- [Voucher list in ANCS+ ready format](#)

## 7. Final Reporting

- Review by COTR
- Review by SECN Program Coordinator
- Review by Southeast Region, I&M Regional Coordinator
- Form filled out for WASO
- Submitted to WASO
- Final Approval

### ***Product / Deliverable Specifications***

**Final Reports:** At the completion of a project, the investigator must submit a draft final report (in the latest version of MS Word) to the designated NPS Key Official who will review the manuscript and may also seek additional comments from NPS regional staff, park personnel, and peer scientists to ensure the technical quality and accuracy of information. All appropriate comments from draft final report reviews should be addressed and incorporated during the preparation of the final report – and must be approved by the NPS Key Official before accepting the final report. For biological/species inventories, the final report should include a table of "Organisms Found" and a table of "Organisms Expected but not Found".

**Database Specifications:** All databases should be submitted in the latest version of MS Access and all spreadsheets should be submitted in the latest version of MS Excel. Both databases and spreadsheets must be compatible with the Natural Resource Database Template (NRDT) data structure. In addition, all data sets must also be fully documented with an accompanying data dictionary which defines all attributes, describes entity relationships and provides units of measure. Also included with the data dictionary is a report on data quality assurance (e.g. what quality assurance steps were implemented, the results of any data quality audits conducted, etc.). For biological/species inventories, all species information must be entered in the desktop version of NPSpecies or be provided as an MS Access or MS Excel file, formatted for direct uploading into NPSpecies and ANCS+. In addition, it is required that cooperators collect data for all mandatory fields from ANCS+ (NPS museum database) for any specimens collected during the course of a project.

#### **Spatial Data Formats (from the national standard document)**

**Vector Data:** All vector data shall be supplied as an ArcInfo interchange file (\*.E00) and/or ArcView Shapefile, or as an ESRI ArcGIS Geodatabase (GDB) compatible with the current version of ArcInfo or ESRI file-based Geodatabase workspace. All vector data submitted will be accompanied by FDGC-compliant metadata.

**Raster Data:** All cell-based data sets or grids shall be supplied as an ArcInfo GRID and/or ArcInfo interchange file, compatible with the current version of ArcGIS. All geo-referenced digital aerial photography and imagery are to be supplied as an ERDAS Imagine File, an 8-bit grayscale GeoTiff, a 24-bit RGB GeoTiff, or a tagged image file format (.TIFF) file with any associated geo-reference information included. All raster data submitted will be accompanied by FDGC-compliant metadata.

**Metadata Specifications:** Spatial data documentation will be completed using the full standards set by the FGDC Content Standard for Digital Geospatial Metadata (CSDGM) - available at <http://www.fgdc.gov/metadata/csdgm/>. Tabular data documentation will be completed using the minimum standards set by the FGDC Content Standard for Digital Geospatial Metadata. These goals allow for data discovery through the use of FGDC clearinghouses and the NPS Data Store. If a data set includes biological information, the FGDC Biological Data Profile provides a set of extended metadata elements to document the species observed, taxonomic information, methods, and analytical tools - the

biological profile section of metadata is considered mandatory, if applicable. The NPS has developed multiple documents to assist in the generation of FGDC compliant metadata that also meets the NPS Data Store requirements. Please see the documents at <http://science.nature.nps.gov/nrdata/docs/metahelp/metahelp.cfm> for additional information and/or contact the NPS Key Official.

**Digital Photo Specifications:** Digital cameras should be set at a resolution appropriate for the highest level to which a photo may be used. Publication quality photos should be taken at a minimum of 5 megapixels. If the camera will allow, the resolution should be set at 1760 x 1168 or higher. The quality should be set for “super fine” or “high”. Because the destination of a photo is unknown at the time it is taken, it is recommended all photos be taken with this resolution or for lower resolution cameras, the highest resolution possible. It is best to decrease the resolution for web use or thumbnails in the office using software. Most digital cameras can digitally imprint the date and time onto the photo image. In general, it is recommended that this feature not be used. Date and time data are embedded in jpg and tiff file headers by most digital cameras. If the image is being cataloged and documented it has value – imprinting the image reduces the image quality and hence the image value.  
(From Southwest Alaska Network and Southeast Alaska Network. 2004. Digital Photograph Management Strategy...)

**Project Archives:** Data, records, reports and other related information generated as a result of research activities conducted within a park or on museum specimens collected in a park may contain (as applicable): copies of all field notes and daily journals, maps, drawings, copies of photos and negatives, digital photos, copies of all data sheets, electronic copies of all data (spatial and non-spatial), reports and manuscripts, collection inventories, field catalogs, specimen preparation records, conservation treatment records , reports on all scientific samples lost through destructive analysis.

The Department of the Interior protects and manages the nation's natural resources and cultural heritage; provides scientific and other information about those resources; and honors its special responsibilities to American Indians, Alaska Natives, and affiliated Island Communities.

NPS D-104, September 2008

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**National Park Service**  
**U.S. Department of the Interior**



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**Natural Resource Program Center**  
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Fort Collins, CO 80525

[www.nature.nps.gov](http://www.nature.nps.gov)

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