

**U.S. FISH AND WILDLIFE SERVICE
Information Resources Management
Network Control Center
Lakewood, CO**

Internet User's Guide

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Preface

The procedures in this document are for FWS personnel on the SWAN backbone, which includes Internet access for electronic mail (e-mail) and research purposes.

This document contains procedures and tips for using Internet utilities, and procedures for Internet navigation. Procedures for transmitting e-mail and using Transmission Control Protocol/Internet Protocol (TCP/IP) utilities, such as Telnet and FTP, are included as separate chapters. The Appendices contain additional reference information on using Internet services.

The Glossary at the back of this document contains definitions for frequently-used terms. There is also an Index to help you easily locate information in this user's guide.

Related FWS Publications

- ▶ *Draft Manual Chapter 270 FW 7, Automated Information System (AIS) Security Policies*, contains procedures that apply to all network transactions, including file transfer and e-mail.
- ▶ *Draft Manual Chapter 272 FW 3, Data Communications* defines Service policies and responsibilities regarding Government resources and security guidelines on e-mail, bulletin boards, the Service Wide Area Network (SWAN), and the Internet.
- ▶ *Draft Manual Chapter 273 FW 4.1, Electronic Mail Systems*, defines Service policies and responsibilities for the implementation, management, and use of e-mail systems within the Service.
- ▶ *X.400 Addressing Procedures*, distributed by the Network Control Center (NCC) gives procedures for using the X.400 component of FWS-Mail and for sending e-mail to users on other systems.
- ▶ *FWS-Mail Naming Conventions, Final Draft, September 10, 1992*, distributed by the NCC addresses the FWS electronic mail system (FWS-Mail) naming conventions for individual usernames, office names, and Post Office names.
- ▶ *Using the SMTP Internet Gateway*, developed by the NCC,

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contains procedures for using FWS-Mail to exchange e-mail over the Internet.

- ▶ *Internet Protocol Addressing Standards and Guidelines*, developed by the NCC, contains the Internet Protocol (IP) addressing standards used by the Service.
- ▶ *Internet Quick Reference Guide*, developed by the NCC, contains procedures and commands for sending e-mail through the FWS-Mail SMTP Internet Gateway, using anonymous FTP, and accessing remote hosts using Telnet.

Documentation Conventions

This document uses the following conventions:

- 1) *Italic* text enclosed within [square brackets] indicates a variable (e.g. [filename], [password], [username], [domain name]).
- 2) **Bolded** entries indicate constants.
- 3) **Bolded** text within angle brackets indicates a keyboard key, (e.g. <ESC>, <ENTER>).

The Glossary at the end of this document contains definitions of common data communications and Internet terms.

Abbreviations Used in This Document:

BITNET	"Because It's Time" Network
CARL	Colorado Alliance of Research Libraries
DNS	Domain Name Service
FTP	File Transfer Protocol
FWS	Fish and Wildlife Service
IP	Internet Protocol
IRM	Information Resources Management
LAN	Local Area Network
NCC	IRM Division's SWAN Network Control Center
NSF	National Science Foundation
SMTP	Simple Mail Transfer Protocol
SWAN	Service Wide Area Network
TCP/IP	Transmission Control Protocol/Internet Protocol
UUCP	Unix-to-Unix Copy Protocol
WAIS	Wide Area Information Server
WAN	Wide Area Network
WWW	World-Wide Web

Chapter 1. Introduction

If the Internet is a new concept for you, the following definitions will give you a quick orientation to some technical terms commonly used in discussing the Internet.

NOTE: Please refer to the Glossary at the back of this document for a more complete list of terms and definitions.

Protocol A formal description of message formats and the rules that computers must follow to exchange those messages.

Internet A wide area network (WAN) connecting thousands of networks in industry, education, Government, and research. The Internet network uses TCP/IP as the standard protocol for transmitting information.

TCP/IP Transmission Control Protocol/Internet Protocol. It is a set of control protocols that the Internet uses to support peer-to-peer connectivity functions. TCP/IP, which includes File Transfer Protocol (FTP), Telnet, and Simple Mail Transfer Protocol (SMTP), routes information on the Internet.

IP Internet Protocol. It is the network layer of the TCP/IP protocol that contains addressing information and some control information. Internet Protocol defines how data is routed from its source to its destination.

TCP Transmission Control Protocol. It is the transport layer of the TCP/IP protocol. It is connection-oriented and stream-oriented. TCP software allows two machines to be "connected" so that a process on one machine can use the IP protocol to send a stream of data to the other computer.

NOTE: For more information on **Protocol**, see page 3.

FWS Internet Connections

At this time, FWS personnel must be connected to a SWAN node and use TCP/IP software to access the Internet. NCC plans to implement Servicewide dial-up access to the Internet. A dial-up Internet connection will provide interactive Internet access to FWS personnel who are not connected to a SWAN node.

The NCC is responsible for managing Internet access for the Service. Each Regional IRM Coordinator is responsible for the Region meeting security requirements and for implementing access to the Internet.

Employees who require Internet access should contact their Regional IRM Coordinator, who is responsible for assigning IP addresses. An IP address is required for interactive Internet access. Interactive Internet access allows you to easily interact with remote hosts for the purpose of transferring files or doing research.

If you do not have Internet access, you can still transmit e-mail over the Internet. For more information, see the "Electronic Mail" section on pages 4—8.

Internet Concepts

The Internet offers worldwide connectivity and many useful resources including databases, directories, e-mail and online catalogs. The Internet is a wide area network that ties together thousands of local and wide area networks. Each host that is accessible through the Internet has its own unique IP address.

The Internet provides the capability to communicate with a remote host using utilities like Telnet and FTP. Internet defines a host as any computer system connected to the Internet that can be accessed using an IP address.

An IP address is always in numerical form. However, the Internet provides the option of using domain names as aliases for numeric IP addresses. An Internet domain name consists of alpha-numeric characters separated by dots (periods). For example, the IP address for the IRM/BFO server is **164.159.176.1**, which corresponds to its domain name of **dns.irm.r9.fws.gov**.

NOTE: Some documentation on the Internet makes a distinction between "domain" and "domain name." The domain name is the complete representation of an IP address (e.g., **dns.irm.r9.fws.gov**) and "domain" refers to the last part of an IP address (e.g., **fws.gov**).

Protocol

Protocol refers to a set of rules that computers must follow to exchange messages and data. For example, TCP/IP is the standard set of communication control protocols for routing information on the Internet. TCP/IP includes the *utilities* described in Table 1 below:

Table 1. Common Internet Utilities

Utility	Description
SMTP (electronic mail)	<p>Simple Mail Transfer Protocol. Your Internet e-mail address provides all the information required to get a message to you from anywhere in the world. There are two common forms for an e-mail address. One uses the Internet format, which contains the @ (at-sign) symbol; the other uses the UUCP format, which contains an ! (exclamation) symbol.</p> <p>FWS personnel have two methods for transmitting e-mail over the Internet:</p> <p>(1) The SWAN SMTP gateway available through FWS-Mail; or (2) TCP/IP software using SMTP.</p> <p>See pages 5—6 for procedures on using FWS-Mail to send e-mail messages or files.</p>
FTP	<p>File Transfer Protocol. A TCP/IP utility that lets you retrieve documents, files, programs, and other archived data on remote hosts that allow public access; it is the standard protocol for LAN-to-Host file transfer over the Internet.</p> <p>When you use the <i>anonymous FTP</i> utility, you don't need to arrange your access ahead of time and you don't need a password; it gives you access to whatever the system administrator has made available.</p> <p>NOTE: <i>Most anonymous FTP hosts request you to enter your e-mail address as your password. They can often obtain this information even if you don't offer it. In other words, you should know that you are not truly anonymous.</i></p>
Telnet	<p>A TCP/IP utility that lets you log in to remote host systems connected to the Internet, generally with a login name and password. Using Telnet, you can connect to hundreds of library</p>

	catalogs, search services, and specialized databases.
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Chapter 2. Electronic Mail

The Internet uses an addressing scheme to route messages. However, because the Internet is composed of many separate networks and e-mail addresses vary from one network to the next, it is often difficult to obtain an e-mail address for a user on another network. Contacting the person by mail or phone to request their username and network address is generally the best solution to this problem.

The best ways for FWS-Mail users to transmit e-mail over the Internet include:

- ▶ the FWS-Mail SMTP Internet gateway; or
- ▶ TCP/IP software, which allows you to use the SMTP utility to transmit e-mail over the Internet.

NOTE: For more information on the FWS-Mail SMTP Internet Gateway, see pages 5—6.

Internet E-Mail Addresses

E-mail to Internet users is addressed in the form

[username]@[domain name]

A domain name has multiple parts, which are separated by dots. An example of an Internet e-mail address is

SmithJ@mail.fws.gov

You can also use the Internet to exchange e-mail with users on commercial e-mail systems. Some commercial e-mail systems use the Internet format for e-mail addresses, but many do not.

NOTES: (1) See **Appendix B, E-Mail Address Conversions**, for examples of the Internet syntax for converting e-mail addresses when sending e-mail to users on various commercial e-mail systems. (2) You can obtain more information on exchanging mail with commercial e-

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mail systems by using anonymous FTP to retrieve the file, Net_Mail Guide, from the NETINFO directory on bitnic.educom.edu. For more information on FTP, see pages 9—17.

Using FWS-Mail to Send E-Mail on the Internet

The following information is from the NCC document, *Using the SMTP Internet Gateway*.

Accessing the SMTP Internet Gateway to Send E-Mail

The NCC has installed software that enables FWS-Mail users to exchange e-mail with Internet users. Access FWS-Mail in the usual way.

- (1) Select "Prepare new message" from the Main Menu.
- (2) Select "Address to person" from the Address Menu.
- (3) Select the **9DE~INTR** Post Office from the list and press **<ENTER>**.
- (4) When the program prompt "To:" appears, enter the recipient's Internet address. The syntax is:

[username]@[domain name]

For example:

SmithJ@dns.irm.r9.fws.gov

- (5) If you want to send the message to more people, repeat step 4 above. When you have finished entering e-mail addresses, press **<ESC>** to end addressing.
- (6) Enter the subject and the body of the message using the same procedures you use for other FWS-Mail messages.

Receiving Mail from Internet Users

The SMTP Gateway allows you to receive e-mail from Internet users. Your Internet address is your FWS-Mail username (e.g., SmithJ) followed by the @ symbol and the domain name of **mail.fws.gov**. The syntax is:

[FWS-Mail username]@**mail.fws.gov**

For example:

SmithJ@mail.fws.gov

NOTE: Questions regarding these procedures should be directed to your Post Office Administrator.

Mailing Lists

Mailing lists (forums) are also known as conference lists and discussion lists. Internet users may subscribe to one or more mailing lists, which are usually created to discuss specific topics. The subscribers to these discussion groups can "post" (send) messages that are distributed via e-mail from a central computer maintaining the list of users involved in the discussion. Anyone can post a message to a mailing list address. The message is distributed to all members (subscribers). The list members can respond, and the responses are distributed, forming a discussion group. Some mailing lists have membership restrictions, and most mailing lists provide new subscribers with the rules pertaining to that particular list.

NOTE: *Some lists are very active. Keep in mind that subscribing to mailing lists will increase the volume of e-mail that you receive. For example, if you subscribe to a very active list, you may receive 50—100 pieces of e-mail messages in a single day.*

The table below shows some mailing lists that may be of interest to FWS Internet users.

Table 2. Useful Mailing Lists

Discussion List Name	List Address
Bio.Net List (BIONET)	biosci@net.bio.net
Ecology List (ECOLOG-L)	listserv@umdd.umd.edu
Conservation Biology List (CONSBIO)	listserv@uwavm.u.washington.edu
Aquarium List (AQUA-L)	listserv@vm.uoguelph.ca
Marine List (MARINE-L)	listserv@vm.uoguelph.ca
Botony and Ecology Newsletter (BEN)	ben@cue.bc.ca
Carnivorous Plant List (CP)	listserv@opus.hpl.hp.com

NOTE: *For more information on mailing lists, see **Appendix E, BITNET** and **Appendix G, Electronic Forums for Natural Resources**.*

Subscribing to Mailing Lists

To subscribe to a list, send an e-mail message to the list address, leaving the "Subject" line blank. Enter the following in the body of the message:

SUBSCRIBE [*list name*] [*your first name*] [*your last name*]

For example, you may want to send an e-mail message to

biosci@net.bio.net

with the following in the body of the message:

SUBSCRIBE BIONET LIST John Doe

NOTES: (1) Replace "John Doe" with your own name. (2) **BIOSCI** is the remote host where the **BIONET** discussion list resides. The e-mail address for subscribing to the **BIONET** discussion list is **BIOSCI@net.bio.net**

When you subscribe to a mailing list, you automatically receive all new messages via e-mail. If you choose to reply to a message, consider whether you want the reply to go to the entire list or only to the person who posted the message. Keep in mind that your reply may be posted to newsgroups and will also be sent to everyone who subscribes to the mailing list. Do **not** post anything to a mailing list that you wouldn't want the whole world to know.

NOTE: You can also access files available on **BIOSCI** via anonymous FTP to **NET.BIO.NET (134.172.2.69)**. For more information on FTP, see pages 9—17.

A Biologist's Guide to Internet Resources

If you want to obtain the document, Una Smith's *A Biologist's Guide to Internet Resources*, send an e-mail message to

mail-server@rtfm.mit.edu

Enter the following in the body of the message:

SEND USENET/NEWS.ANSWERS/BIOLOGY/GUIDE

Because the file is quite large, it may be sent in parts. Save each part in a separate file, and delete the e-mail headers before merging the files.

Chapter 3. File Transfer Protocol (FTP)

FTP is a utility used for exchanging files between your computer and a remote host. It is a standard protocol for LAN-to-Host file transfer and requires that TCP/IP software be installed on your computer.

FTP lets you access many remote hosts, as an anonymous or guest user, to transfer files back to your computer. Accessing a remote host via anonymous FTP does not give you the ability to browse menus, run applications, send e-mail, or search databases on the remote host.

NOTE: *FTP hosts extend users the privilege of accessing their files via anonymous FTP for business and research purposes. Most hosts recommend that users restrict their FTPing to non-prime hours (7:00 P.M. to 6:00 A.M. local time for the site).*

This section contains basic information on FTP commands and using anonymous FTP. For more information on FTP, you can request the file, "Access Guide to Using the Internet," by sending an e-mail message to

NIS-INFO@nic.merit.edu.

The NIS-INFO server ignores the "subject" line, so you may leave it blank. The body of the message should say

SEND ACCESS.GUIDE.

FTP Commands

When you use FTP, you must know how to access the remote host.

NOTE: *The steps below are based on FTP Software Inc.'s PC/TCP program and resemble other TCP/IP software packages. If you are running TCP/IP software in Windows, the steps will be similar.*

To access FTP:

- (1) Enter the command

FTP <ENTER>

(2) If you are using a Windows application to access FTP, click on "System." Then select "New" from the pull-down menu and enter the host domain name or host IP address.

If you are using DOS TCP/IP software, enter the **OPEN** command to request the remote host. The syntax for the **OPEN** command is

OPEN [*remote host domain name*] <**ENTER**>

or

OPEN [*remote host IP address*] <**ENTER**>

For example:

OPEN net.bio.net <**ENTER**>

or

OPEN 134.172.2.69 <**ENTER**>

NOTE: *If you enter **OPEN** without specifying the remote host, FTP will prompt you to enter it.*

(3) After successfully accessing the remote host, you can view a directory listing using the **DIR** command.

(4) If you want to transfer a file to your computer, use the **GET** command; the syntax for the **GET** command is shown in Table 3 on page 11.

(5) After retrieving the files you want, use the **CLOSE** command to end the FTP session. On most remote hosts, FTP will respond with "Goodbye".

(6) Enter the **QUIT** command to leave the remote host.

The following table lists the FTP commands that are most frequently used. If you need help with FTP command syntax, simply enter the word "help" followed by a question mark:

HELP ? <**ENTER**>

Most FTP hosts also accept the command **REMOTEHELP** to view a list of recognized commands on the remote host.

NOTE: The commands shown in Table 3 are in upper case. However, if you are using a system that is "case sensitive," you may need to enter the commands in lower case.

Table 3. FTP Commands on Internet

Command	Description
ACCOUNT	Supplies accounting information.
ASCII	Specifies ASCII format to transfer text files.
BINARY	Specifies binary format to transfer binary files.
CD [<i>directory name</i>] For example: CD pub	Changes the current remote directory.
CD.. (UNIX command)	Moves up a directory.
CD[-] (VMS command)	Moves up a directory.
CLOSE	Ends FTP session with current host.
DIR	Lists files in the directory.
GET [<i>remote filename</i>] [<i>local filename</i>] For example: GET remotefile.Z fwsfile.new	Transfers a file from the remote host to the local computer and writes it to the file specified.
HELP	Displays help information.
LCD	Changes "local" directory.
LS	Requests a short directory listing on remote host.
MGET [<i>filename</i>] For example: MGET f*	Transfers multiple files from the remote host to the local computer. Wildcards are used to get several files, or a whole set of files at once, rather than having to do it manually one by one.
MPUT [<i>filename</i>] For example: MPUT *.c	Transfers multiple files from the local computer to the remote host. Wildcards are used to put several files, or a whole set of files at once, rather than having to transfer files manually one by one.
OPEN	Connects to remote host.
PROMPT	Turns queries off/on. (Default = on.)
PUT [<i>filename</i>] For example: PUT localfil.new	Transfers a file from the local computer to the remote host. The filename on the remote host will be the same as the filename on the local computer.

PWD	Prints remote directory.
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NOTE: *The commands in the above table are DOS commands. Most TCP/IP applications for Windows allow users to execute the same commands by clicking on "Command" at the top of the screen and entering the desired command.*

Anonymous FTP

To use anonymous FTP, specify your login name and password as follows:

login name: **ANONYMOUS**
password: [your Internet e-mail address (e.g.,
SmithJ@mail.fws.gov)]

or

login name: **ANONYMOUS**
password: **GUEST**

NOTE: *The first method above is recommended. When you use your e-mail address as your password, the remote host can notify you if any problems occur.*

After entering a login name and password, you can request a file using the **GET** command at the system prompt. When you use the **GET** command, specify two arguments: the filename you are requesting and the filename you want to give it on your computer system. For example:

GET [Directory/RemoteFilename.ext] [LocalFilename.ext] <**ENTER**>

For example:

GET pub/inetbook.doc fwsinet.doc <ENTER>

When FTP responds "Transfer complete," you can either continue browsing through directories and retrieving files or end the FTP session. When you are ready to end the session, enter the **CLOSE** command to break the connection with the remote host; then enter the **QUIT** command to leave the remote host.

File Transfer Formats

Transferring ASCII text files is easy because they do not contain special word processor control codes. However, word processors, such as WordPerfect and Microsoft Word, imbed special control codes in documents. When you transfer a file created with a word processor, you should transfer it as a *binary* file. Binary files contain characters outside the range of printable character codes (ASCII characters from number 32 to 126).

Most remote hosts on the Internet will prompt you to select the file transfer format, either ASCII (text) or binary. If you are transferring files that contain graphics, word processor control codes, compressed text, or computer programs, be sure to select **binary** as the file transfer format.

You can also enter the command

BINARY <ENTER>

to tell the remote host that all files transferred during the session should be in binary format.

Later, if you want to download a text file, enter the command

ASCII <ENTER>

before requesting the file with the **GET** command.

NOTE: *If you forget to specify the correct file transfer format when downloading a file, the file you receive may be unusable. For example, if you forget to specify **binary** as the file transfer format when downloading a program, you will not be able to run the program because your computer will try to read it as a text file.*

If you are unsure which file transfer format (ASCII or binary) the remote host will use, enter the command

STATUS <ENTER>

to see whether files will be downloaded as text files or as binary files.

NOTE: *Using FTP, you can transfer very large files. However, it is a commonly accepted practice to transfer large files during off-peak hours.*

Documents Available via Anonymous FTP

The best way for new users to learn more about the Internet is to get files via anonymous FTP. Merit Network Information Center Services maintains the documents described in Table 4 below. You can get the documents via anonymous FTP from any of the following hosts:

nic.merit.edu
ftp.merit.edu
ftp.michnet.net
nis.nsf.net

The table below lists some of the documents in the **/INTERNET/RESOURCES** directory:

Table 4. Helpful Documents for New Internet Users

File Name	Description
bibliography.txt	Bibliography of resources on the Internet and TCP/IP. (1,403 bytes)
hitchhikers.guide	<i>The Hitchhikers Guide to the Internet</i> by Ed Krol. (61,640 bytes)
zen-draft.ps*	<i>Zen and the Art of the Internet</i> by Brendan P. Kehoe. (492,397 bytes)
zen-draft.txt	<i>Zen and the Art of the Internet</i> by Brendan P. Kehoe. (492,397 bytes)

* The "ps" extension indicates a PostScript file. Because PostScript files contain special formatting commands for advanced printers, they are unreadable. You should download them only if your printer is PostScript enabled.

Documents for New and Experienced Internet Users

The following resources, which are available via anonymous FTP, may be of interest to both new and experienced Internet users:

Table 5. Useful Internet Documents Available via Anonymous FTP

FTP Host	Directory Location	File
nic.merit.edu (35.1.1.48)	/INTRODUCING THE INTERNET	"Access Guide to Introducing.the.Internet"
nic.merit.edu (35.1.1.48)	/INTERNET/NEWSLETTERS	<i>Internet Monthly Report</i>
nic.merit.edu (35.1.1.48)	/NSFNET/RESOURCES	<i>The Link Letter</i> (a bi-monthly NSFNET newsletter)
csd4.csd.uwm.edu (129.89.7.4)	/PUB	"inet.services.txt" (<i>Internet Services List</i> maintained by Scott Yanoff of the University of Wisconsin at Milwaukee)
world.std.com	/OBS/TRACY.LaQUEY	"The.Internet.Companion.no.controls"
ftp.nisc.sri.com (192.33.33.32)	/NETINFO	"interest-groups" (a list of interest group mailing lists available on the Internet) NOTE: A hardcopy, indexed version of this list, Internet Mailing Lists , is available from the publisher, Prentice Hall, and many bookstores.
ftp.nisc.sri.com (192.33.33.32)	/NETINFO	"Internet-technology-handbook-contents" (a list of technical Requests for Comments documents)
ftp.michnet.net (35.1.1.48)	DOCUMENTS/FYI	Many useful documents, including: - FYI_3, "FYI on Where to Start" (a bibliography of Internet resources) - FYI_04, "FYI on Questions and Answers: Answers to Commonly Asked 'New Internet User' Questions" by G.S. Malkin and A. Marine. - FYI_10, "There's Gold in them thar Networks! Searching for Treasure in all the Wrong Places" by J. Martin.
ftp.eff.org	/PUB/EFF/NEWSLETTERS	The "Big Dummy's Guide to the Internet" (369,296 bytes)
ftp.eff.org	/PUB/INTERNET-INFO	Many files maintained by the Electronic Frontier Foundation, including: - the "ftp.sites" file (a list of hosts accessible via anonymous FTP); and - the "internet.libraries.file" (a list of libraries accessible without charge)

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		via Telnet or modem).
rtfm.mit.edu	/PUB/USENET-BY-HIERARCHY/SCI/ BIO	A Biologists Guide to Internet Resources by Una Smith
rtfm.mit.edu	/PUB/USENET-BY-HIERARCHY/ BIONET/ANNOUNCE	"BIOSCI/bionet Frequently Asked Questions (FAQ)"

NOTE: Remote hosts frequently add new files, delete old files, and move files to new directories. The above table is current as of this date; however, at a later date, the files described in the above table may not be located in the directories shown.

Chapter 4. Telnet

Telnet is a utility that lets you connect to databases, library catalogs, and other information resources around the world. Using Telnet, you can establish a TCP/IP connection to a host at another site. Once the connection is made, you can work on the remote host as if you had a direct connection. Most telnet hosts are easy to use, and most of them have online help available.

Some Telnet hosts have access restrictions or require users to obtain authorized accounts. Other Telnet hosts allow public access; however, before you can access these hosts, you must know the public login name and password. Many Telnet hosts that allow public access also prompt new users to provide account information (name, company or organization, address, etc.). Because your login name and password are likely to be different on each Telnet host, it is important to keep a record of your login name and password for each account you obtain.

NOTE: *The steps below are based on FTP Software Inc.'s PC/TCP program and resemble other TCP/IP software packages. If you are running TCP/IP software in Windows, the steps will be similar.*

- (1) To request a Telnet session, enter

TELNET <ENTER>

NOTE: *It is not necessary to specify the remote host's IP address at this time.*

- (2) Use the **OPEN** command to make the connection to the remote host you want to access. The syntax is:

OPEN [remote host domain name] <ENTER>

or

OPEN [remote host IP address] <ENTER>

For example, to access the FedWorld Gateway, which offers access to many Government databases, files, and libraries, enter:

OPEN fedworld.doc.gov <ENTER>

If you prefer to use the numeric address, enter

OPEN 192.239.92.201 <ENTER>

NOTE: *The FedWorld host allows public access; however, it will prompt you to enter your name and select a password. After entering that information, you have an account on the host and should use your login name and password to access the FedWorld host in the future.*

(3) After successfully accessing the remote host, instructions will appear on the screen. The instructions are different for each remote host, so be sure to read them carefully.

(4) When you are ready to end the Telnet session, enter the **CLOSE** command.

(5) Enter the **QUIT** command to leave the remote host.

Telnet Commands

The following table shows commands that are frequently used in Telnet sessions. If you require help with Telnet command syntax, enter

HELP <ENTER>

NOTE: *The commands shown in Table 6 are in upper case. However, if you are using a system that is "case sensitive," you should enter the commands in the required case.*

Table 6. Telnet Commands on Internet

Command	Description
TELNET [<i>remote host domain name</i>] or TELNET [<i>remote host IP address</i>] For example: TELNET rs.internic.net or TELNET 198.41.0.5	Requests a telnet connection. NOTE: Some TCP software does not let you specify a remote host with the Telnet command; instead, it requires that you specify those parameters with the OPEN command.
CLOSE	Closes the current session and ends a connection.

DISPLAY	Displays operating parameters.
HELP	Displays help information.
MODE	Tries to enter line-by-line or character-at-a-time mode.
OPEN [<i>remote host domain name</i>] or OPEN [<i>remote host IP address</i>] For example: OPEN rs.internic.net or OPEN 198.41.0.5	Starts a Telnet session.
QUIT	Exits the remote host.
SEND	Transmits special characters. Enter SEND ? for more information.
SET	Sets operating parameters. Enter SET ? for more information.
SET ECHO	Enables/disables local echoing.
SET ESCAPE	Sets current "escape" character. (Default escape character = <CTRL>J)
STATUS	Prints status information.
TOGGLE	Toggles operating parameters Enter TOGGLE ? for more information.
<ENTER>	Leaves command mode.
<CTRL>J	Enters command mode.

NOTE: *The commands in the above table are DOS commands. Most TCP/IP applications for Windows allow users to execute the same commands by clicking on "Command" on the top of the screen and entering the desired command.*

Accessing the Colorado Alliance of Research Libraries

The Colorado Alliance of Research Libraries (CARL) offers online database searches, book reviews, and magazine fax delivery service. CARL menus are easy to use, and the online instructions are easy to follow. For example, if you select the menu option for Database Search, you can select the "Internet Resource Guide" option on the next menu. The *Internet Resource Guide*, which was compiled by the National Science Foundation (NSF) Network Service Center, tells users where to obtain more information on the Internet.

- (1) To request a Telnet session, enter

TELNET <ENTER>

- (2) To access CARL, enter

OPEN carl.pac.org <ENTER>

or

OPEN 192.54.81.128 <ENTER>

and select **5** for VT100 terminal emulation.

NOTE: *Many Telnet hosts require users to specify a terminal emulation mode (such as VT100).*

- (3) After accessing CARL (**TELNET carl.pac.org** or **TELNET 192.54.81.128**), the basic commands that you can use are:

W Request a word search.
B Browse names of Internet hosts.
S Stop or switch to another database.

- (4) When you want to leave the CARL system, enter the command

//EXIT <ENTER>

to return to your local computer.

Public Access Telnet Hosts

The table below lists some Telnet hosts; it gives access procedures and the login name and password to use, if required, for each host.

Table 7. Remote Telnet Hosts

Telnet Host	Description	Access Instructions Login name / Password
caticsuf.csufresno.edu (129.8.100.15)	Agricultural information, food & nutrition, and environment	Login: super
eureka.clemson.edu (130.127.8.3)	Clemson University Forestry & Agriculture Network	Login: PUBLIC
empire.cce.cornell.edu (132.236.89.2)	CENET (Cornell Extension NETwork)	Login: guest
martini.eecs.umich.edu 3000 (141.212.99.9)	Geographic host; offers information by city or area code (population, elevation, etc.)	No login name or password required.
rs.internic.net (198.41.0.5)	InterNIC; offers Gopher, WAIS, WHOIS, finger, and tons of information on the Internet)	No login name or password required. Enter ? for help.
nessie.cc.wvu.edu (140.160.240.11)	LIBS; offers access to many online services	Login: LIBS
yfn.ysu.edu (192.55.234.27)	Freenet; offers USA Today Headline News, Sports, etc.	Login: visitor
launchpad.unc.edu (152.2.22.80)	Usenet News, Library of Congress, nationwide libraries	Login: launch
ds.internic.net (198.49.45.10)	Netfind User Lookup; given a name and org./school, finds a user for you	Login: netfind
www.njit.edu (128.235.163.2)	World-Wide Web; offers access to various documents, lists, and services	Login: www

NOTE: Some Telnet hosts, such as **martini.eecs.umich.edu 3000**, specify a number after the domain name. The number specifies a port; if you do not specify it, you may not get in.

Chapter 5. Online Searches with WAIS

Wide Area Information Server (WAIS) is an indexed online search tool that makes it easy to locate information available on FTP and Telnet hosts. WAIS (pronounced "wayz") is a powerful tool for requesting concurrent searches of large databases and newsgroups on the Internet. When you specify a keyword, WAIS scans the Internet and locates items that contain your keywords.

There are a number of variations of WAIS access software, some of them still under development. IRM is testing several WAIS programs that can be installed and run from local computer systems. Guidance will be issued on WAIS software when this testing is completed.

FWS personnel at sites that do not have WAIS software installed on their local computers can use Telnet to access WAIS on any of the remote hosts that offer it. The InterNIC server at **rs.internic.net** and the World-Wide Web (WWW) at **www.njit.edu** are two popular WAIS servers.

Using the InterNIC WAIS

- (1) To request a Telnet session, enter

TELNET <ENTER>

at your system prompt.

- (2) To access the InterNIC WAIS server, enter

OPEN rs.internic.net <ENTER>

or

OPEN 198.41.0.5 <ENTER>

- (3) When you see the "**InterNIC>**" prompt, enter

WAIS [keyword] <ENTER>

to begin a search on the keyword specified. For example:

WAIS wildlife <ENTER>

If WAIS locates any "hits" on your keyword, they appear on the screen. To view one of the items listed on the screen, enter the number (e.g., 1, 2, 3 ...) of the item.

NOTE: *Some Telnet hosts accept the command, **SWAIS**. (The "s" stands for "simple.") SWAIS is one of many versions of WAIS software available on the Internet.*

(4) When you are ready to end your WAIS session, enter the **Q** command to quit.

Using the World-Wide Web WAIS

The World-Wide Web provides a hypertext interface to the Internet. Highlighted words on the screen are "hypertext links" that can retrieve and display information on various subjects. The bottom of each screen gives instructions for navigating the World-Wide Web.

(1) To request a Telnet session, enter

TELNET <ENTER>

(2) To access the World-Wide Web WAIS server, enter

OPEN www.njit.edu <ENTER>

or

OPEN 128.235.163.2 <ENTER>

(3) Press **<ENTER>** to accept VT100 terminal emulation.

(4) Select "Other Information Systems" from the **NJIT Information Technology Entry Print** screen.

(5) Select "WAIS" from the **Other Information Sources** menu.

(6) Select "Master list for WAIS" to access a WAIS server.

(7) Select Find (F) to perform a search.

(8) Specify your keyword at the prompt and press **<ENTER>** to start the search.

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- (9) Follow screen prompts to view search results.
- (10) Select Exit (X) to end the search and close the session.

Chapter 6. Online Searches with Gopher

Gopher, a card-catalog-like interface to the Internet developed by the University of Minnesota, is a menu system that allows you to access information services across the Internet. Like WAIS, Gopher obtains information based on keywords that you specify. Gopher can get the information by "telnetting" to other Gophers located on other remote hosts; however, this "telnetting" happens behind the scenes so you won't see the connections being made. All you see are the results of the search.

If you do not have Gopher software installed on your computer, you can use Telnet to access a remote host that offers Gopher. The InterNIC server at **rs.internic.net** and the World-Wide Web (WWW) at **www.njit.edu** are two popular Gopher servers.

Using the InterNIC Gopher Server

- (1) To request a Telnet session, enter

TELNET <ENTER>

- (2) To access the InterNIC WAIS server, enter

OPEN rs.internic.net <ENTER>

or

OPEN 198.41.0.5 <ENTER>

- (3) When you see the "**InterNIC>**" prompt, enter

GOPHER <ENTER>

and follow the directions on the screen to navigate through the menus and perform a search.

Using the World-Wide Web Gopher Server

The World-Wide Web provides a hypertext interface to the Internet. Highlighted words on the screen are "hypertext links" that can retrieve and display information on various subjects. The bottom of each screen gives instructions for navigating the World-Wide Web.

- (1) To request a Telnet session, enter

TELNET <ENTER>

- (2) To access the World-Wide Web WAIS server, enter

OPEN www.njit.edu <ENTER>

or

OPEN 128.235.163.2 <ENTER>

- (3) Press **<ENTER>** to accept VT100 terminal emulation, which this host requires.

- (4) Select "Other Information Systems" from the **NJIT Information Technology Entry Print** screen.

- (5) Select "Gopher" from the **Other Information Sources** menu.

- (6) Select a Gopher server from the list.

- (7) Select "Search Titles in Gopherspace using Veronica" to view a list of Gopherspace servers.

- (8) Select a Gopherspace server from the list to begin your search.

- (9) Select Find (F) to perform a search.

- (10) Specify your keyword at the prompt and press **<ENTER>** to start the search.

- (11) Follow screen prompts to view search results.

- (12) Select Exit (X) to end the search and close the session.

NOTE: See Appendix A for information on other Internet tools.

Appendix A. Internet Tools

The table below describes several tools that are available on the Internet.

Table A-1. Internet Tools

Tool	Description
Archie	<p>A service that allows you to search known FTP hosts for new files. Archie databases are accessible through an interactive Telnet session and e-mail queries. Currently, Archie tracks the contents of over 1000 anonymous FTP archive sites containing over a million files stored across the Internet.</p> <p>Enter</p> <p>ARCHIE <ENTER></p> <p>at the server login prompt.</p>
Gopher	<p>A menu interface that lets you search through Internet resources. Gopher is similar to a card catalog; it lets you find and retrieve resources by topic.</p>
Finger	<p>Requests a summary of users who are logged into the computer system. Valid commands:</p> <p>FINGER <ENTER> Requests a summary of all users logged into the computer system.</p> <p>FINGER [username] <ENTER> Requests specific information about a user.</p> <p>FINGER@[remote host domain name] <ENTER> Requests a summary of all users logged into the remote host.</p> <p>NOTE: Some remote hosts block Finger requests from outside sites.</p>
Ping	<p>Lets you to check to see if another host is currently "up" and running. For example:</p> <p>PING [remote host domain name] <ENTER></p> <p>Ping can trace the route a message takes from your site to another site.</p>
Talk	<p>Lets you to send an instant message to another user. For example:</p> <p>TALK [username].[remote host domain name] <ENTER></p>

WAIS	Wide Area Information Server. WAIS (pronounced "wayz") is a tool that performs indexed database searches. WAIS libraries are currently accessed through Telnet.
WWW	World-Wide Web. It provides a hypertext interface to the Internet, letting users follow links and find common resources.

Appendix B. E-mail Address Conversions

The following table shows examples of the Internet syntax to use for converting e-mail addresses on various mail programs.

Table B-1. E-mail Address Conversions

Mail Program	Internet Syntax
CompuServe: 12345,678	12345.678@compuserve.com
BITNET: kathy@host.bitnet	kathy %host@cunyvm.cuny.edu
FIDONET: john doe 1:2/3.4	john.doe@p4.f3.n2.z1.fidonet.org
MCI mail (numeric): 1234567	1234567@mcimail.com
UUCP: uunet!host!mike	mike%host@uunet.uu.net

Appendix C. WHOIS Database

It is sometimes possible to obtain local domain information by manually querying the primary Domain Name Service (DNS) with the **WHOIS** command. **WHOIS** is an Internet program that allows users to query a database of users and other Internet entities, such as domains, networks, and hosts. The information for people shows a user's company name, address, phone number, and e-mail address. However, not all hosts and users on the Internet are in the **WHOIS** database. Generally, you can find only names of network administrators.

Telnetting to rs.internic.net

The best way to obtain information from the **WHOIS** database is by "telnetting" to

rs.internic.net

or

198.41.0.5

and entering the command

WHOIS <ENTER>

to run the **WHOIS** program interactively.

***NOTE:** Telnet is the remote login utility provided with TCP/IP. For more information on Telnet, see pages 18—22.*

The syntax for the **WHOIS** command is

WHOIS [username]@[domain name] <ENTER>

or

WHOIS domain [domain name] <ENTER>

For example:

WHOIS SmithJ@dns.irm.r9.fws.gov <ENTER>

or

WHOIS domain fws.gov <ENTER>

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If you are entering only part of the name, end your search string with a period. For example:

WHOIS Smi. <ENTER>

If you need help using the **WHOIS** command, enter

WHOIS HELP <ENTER>

Appendix D. Archie

Archie was originally created to track anonymous FTP archive sites. An archive site is a remote host that provides access to a collection of files across the Internet. An "anonymous FTP archive site", for example, provides access to these files via the FTP protocol.

You can use Archie to obtain the names and locations of over a million files at over 900 FTP archive sites. Archie lets you specify keywords and search the "files" database for files containing your keywords. When Archie finds matches for your keywords, it tells you the name of the archive site, the IP address, the directory or subdirectory, and other useful information.

Public Archie servers are listed below. The syntax is

TELNET ARCHIE.*[domain name]*

or

TELNET *[IP address]*

Login as **ARCHIE** for each.

Table D-1. Public Archie Servers
TELNET ARCHIE.rutgers.edu or TELNET 128.6.18.15
TELNET ARCHIE.sura.net or TELNET 128.167.254.179
TELNET ARCHIE.unl.edu or TELNET 129.93.1.14
TELNET ARCHIE.ans.net or TELNET 147.255.1.2
TELNET ARCHIE.mcgill.ca or TELNET 132.206.2.3 or TELNET 132.206.51.1

NOTE: *The commands shown in Table D-2 are in upper case. However, if you are using a system that is "case sensitive," you should enter the commands in the required case.*

Table D-2. Archie Commands

Command	Explanation
MAIL	Mails the results of the last search back to you.
PROG	Searches for a file by name.
QUIT	Exits the program.
SHOW SEARCH	Shows the current search type.
SET SEARCH	Changes the search type (to exact, regexp, case, or subcase).
WHATIS	Searches through descriptive index.

NOTE: *More information on Archie is available via anonymous FTP from **ARCHIE mcgill.ca** in the **ARCHIE/DOC** directory.*

Appendix E. BITNET

The "Because It's Time" Network (BITNET) is an electronic communication network that links several thousand host computers at academic and research institutions all over the world. BITNET also includes Cooperating Networks in other countries. In addition, gateways allow the exchange of e-mail between BITNET and the Internet.

NOTE: *The European part of BITNET is called EARN (European Academic Research Network). The Canadian network is called NetNorth, and in Japan, the name is AsiaNet.*

BITNET hosts conferences (also known as "mailing lists" and "interest groups") on hundreds of topics. When you subscribe to the mailing list for a particular topic, you automatically receive any new messages (postings) that other subscribers send to the list. Some lists are very active. Keep in mind that subscribing to mailing lists will increase the volume of e-mail that you receive. For example, if you subscribe to a very active list, you may receive 50—100 pieces of e-mail in a single day.

Sending E-Mail to BITNET

For mail going from Internet to BITNET, the e-mail address must specify the gateway explicitly using the

`[user]@[node].bitnet.[domain name].edu`

BITNET style address. Normally, the routing to the gateway computers is handled automatically and is transparent to you.

File transfer over BITNET does not involve direct interactive connections. BITNET is a "store and forward" network. Any item that you request from a BITNET server, whether it is a short message or a long file, is forwarded to the nearest computer, where it is stored until it can be forwarded to the next link on the route to its final destination. Downloaded files take much more time to reach their destinations than e-mail messages. Most BITNET servers do not send large files during daytime hours; therefore, if any of the network links are busy, it may take several days to receive a large file.

Subscribing to BITNET Conferences

BITNET mailing lists are usually administered by a computer program called LISTSERV. The LISTSERV software, which manages bulletin boards, also acts as a server for files and messages transmitted to mailing lists, called BITNET conferences.

Conference participants can send a message to a single mailing list address. The message is distributed to everyone who has subscribed to the list. The members of that list can then respond, and the responses are distributed, forming a discussion group.

At the present time, FWS does not have a BITNET server; however, you can request a list of discussions by e-mail from

listserv@bitnic.educom.edu

with the following text in the body of your message:

GET INTERNET LISTING

NOTE: *The above command tells the BITNET server to send you a complete discussion list, which is a very large file. Therefore, it is best to make this request during off-peak hours.*

BITNET Addresses

Normally, a BITNET e-mail address looks like this:

[mailbox]@[domain name]

where the part to the left of the @ symbol is the users' mailbox code and the part to the right of the @ symbol is the code of the mailbox computer.

For example:

listserv@bitnic

It is common for Internet users to use BITNET addresses like

listserv@bitnic.bitnet

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Some Internet users, including FWS Internet users, must also give routing information in the BITNET address. If you have difficulty sending a subscription request to a discussion list, you can send an e-mail message to the LISTSERV manager at the following address:

listmgr@bitnic.educom.edu

and request gateway routing information for the discussion group you want.

For example, Internet users in North America can specify that mail to BITNET be sent through the **cunyvm.cuny.edu** gateway.

This BITNET server (**listserv@bitnic.educom.edu**) can also send you information about how to exchange mail between different networks. If you want to retrieve this information, enter the following text in the body of your message:

GET NET_MAIL_GUIDE

NOTE: *You can also use anonymous FTP to obtain the above file from the NETINFO directory at **bitnic.educom.edu**.*

Appendix F. The InterNIC Services

The InterNIC, established by the National Science Foundation, provides these services:

Directory of Database Services

The Directory of Database Services, provided by AT&T, includes a list of FTP hosts, lists of various servers available on the Internet, lists of white and yellow page directories, library catalogs, and data archives. You can retrieve files via anonymous FTP from

ds.internic.net

or use Telnet (at the same address) to access a special tutorial login that allows new users to access any of the online services (such as Archie, Gopher and WAIS) on the Directory and Database server. For more information about the Directory of Database Services, send a message to

admin@ds.internic.net

or call 1-908-668-6587.

InterNIC Information Services

InterNIC Information Services provides information about how to get Internet access, pointers to network tools and resources, and seminars on various topics. For a complete listing of Information Services offerings, retrieve the "Information Services Project Summary" file in the InterNIC Info Source directory at

ds.internic.net

or send a message to

info@internic.net

Appendix G. Electronic Forums for Natural Resources

This information was developed by Jeff Price, Diane Larson, and Tom Sklebar at Northern Prairie Research Center, Jamestown, ND, as a Research Information Bulletin. Minor editing changes have been made to conform with our documentation conventions shown on page iv. If you have comments or questions about these mailing lists, you may send an e-mail message to Jeff Price's FWS-Mail address, Pricej.

The Internet is a network of thousands of other networks linking millions of people worldwide through their computers. Besides being a method of exchanging e-mail, the Internet provides access to databases, programs, card catalogs, electronic forums (listservs) and much more. Electronic forums provide a way for hundreds of users to exchange information, discuss issues, and find solutions to common problems. An electronic forum is like a mailing list; every message sent to the list gets forwarded to every other member on that list. There are electronic forums on every imaginable topic; here we list those dealing with natural resource issues. For complete information on connecting to the Internet from U.S. Fish and Wildlife Service facilities, refer to the *Internet User's Guide* or *Using the SMTP Internet Gateway*, both distributed by Information Resources Management, Network Control Center, Lakewood, CO.

Joining an Electronic Forum

Most of the forums listed below use the program LISTSERV, written by Eric Thomas. There are some exceptions, and these have more explicit subscription information following the list description. To join a typical list send the following message:

SUBSCRIBE [*list name*] [*your first name*] [*your last name*]

with no subject to the following Internet address:

LISTSERV@[*list domain name*]

(where the *list domain name* is the domain name for that listserv).

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For example, to join the BIRDBAND list (information on bird banding), send the following message:

SUBSCRIBE BIRDBAND [*your first name*] [*your last name*]

to this Internet address:

LISTSERV@arizvm1.ccit.arizona.edu

with no subject.

This will place your name and Internet address on the mailing list for BIRDBAND and you will start receiving messages as they are posted to the list by other members.

Some of the forums listed use Mailbase instead of Listserv to run their mailing lists. All of these lists are located @mailbase.ac.uk. To join one of these mailing lists send the following command:

JOIN MAILBASE_NAME [*your first name*] [*your last name*]

to this Internet address:

MAILBASE@mailbase.ac.uk

with no subject.

Once your address has been added to the list you will usually receive more information about the list and using the listserver (or mailbase). Keep a copy of this information; it will remind you how to exit the list and how to get backcopies of information posted on the list. Also, keeping track of all lists joined will make it easier to leave the lists when your computer address changes.

Sending a Message to the Listserv

Before sending a message to the list, read the messages for a few days to learn what types of subjects are discussed on that list.

To send an original message to the mailing list, address the message to:

[listname]@[list domain name]

(e.g., **BIRDBAND@arizvm1.ccit.arizona.edu**).

The topic of the message should be well described in the subject line. Whenever possible, messages should contain fewer than 50 lines. If a message is longer than 50 lines the subject line should warn readers that a long message follows.

To reply to a message received from the list, a decision must be made whether the reply should go to the entire list or to the person who wrote the original message. Some lists route every message through the list; if this is the case, choosing REPLY will send the message to everyone on the list. Other lists send each message with the sender's original address on it. Choosing REPLY in this case will send the message only to the originator of the post. In general, unless the reply has broad applicability, it should be sent privately to an individual rather than to the entire list.

Limiting the Number of Messages Received

Some listservs can generate a lot of messages (more than 50 per day) while others may have only a few messages a month. For this reason, listservs should be joined one at a time to make sure you can keep up with the traffic on the list. By scanning the subject lines, it is easy to screen out messages in which you have no interest. This is why a good subject description is important. Some listservs offer a digest service which compiles all messages submitted in a day, attaches a table of contents, and distributes them in one packet, once a day. To set a listserv subscription to digest, send the command to the LISTSERV (not the list) with the following command in the body of the message:

SET *[listname]* DIGEST

(e.g., **SET BIRDBAND DIGEST**).

This can either be done after you subscribe or at the same time (but place

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the command on a separate line). The disadvantage to a digest is that you cannot REPLY to a message but have to address it to the proper party (be it an individual or the listserv).

Leaving a Listserv

It is a good idea to temporarily suspend receiving messages if you will be away from the computer for more than a few days. To temporarily stop receiving mail send the message:

SET [listname] NOMAIL

(e.g., **SET BIRDBAND NOMAIL**).

To restore message delivery send the message:

SET [listname] MAIL

(e.g., **SET BIRDBAND MAIL**).

Both of these commands are sent to the LISTSERV, not the list.

To permanently remove your name from a mailing list send the message:

SIGNOFF [listname]

(e.g., **SIGNOFF BIRDBAND**)

to the appropriate listserv (e.g., **LISTSERV@arizvm1.ccit.arizona.edu**).

Electronic forums are excellent sources of information and places to turn for advice and solutions to problems. We hope that this compilation will be of use to you.

Suggested Reading

Hardie, E.T.L. and V. Neau, eds. 1993. *Internet: Mailing Lists*, 1993 Edition. Englewood Cliffs, NJ: PTR Prentice Hall

Krol, E. 1992. *The Whole Internet User's Guide & Catalog*. Sebastopol, CA: O'Reilly & Associates, Inc.

Smith, U.R. 1993. *A Biologist's Guide to Internet Resources*. Usenet sci.answers. Available via anonymous FTP and e-mail from rtfm.mit.edu as file pub/usenet/news.answers/biology/guide. 40 pages.

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For further information contact:

Jeff T. Price, Diane L. Larson, or Tom Sklebar
Northern Prairie Wildlife Research Center
RR 1 Box 96C
Jamestown, ND 58401
Comm: (701) 252-5363
FWS-Mail: PriceJ, LarsonD, or SklebarT

Below is a list of electronic forums that we believe are of interest to those in the natural resources field. Lists are transient in nature: some lists close, others change their address, and new ones are formed every day. These addresses were all valid as of November 1, 1993.

Each entry has the following format:

[listname]@*[list domain name]* (number of people on the list) - general subject matter of the list.

Aquatic Subjects

AQUA-L@uoguelph.ca (332) - All matters relating to aquaculture.

BRINE-L@uga.cc.uga.edu (78) - Brine shrimp research.

COASTAL-RESEARCH@mailbase.ac.uk (64) - Coastal processes, including waves, currents, sediments, structures, mixing, and pollution.

CRUST-L@sivm.si.edu (65) - Crustacean systematics, distribution, and ecology.

CTURTLE@nervm.nerdc.ufl.edu (73) - Sea turtle biology and conservation.

ICAM-L%irmfao01.bitnet@cunyvm.cuny.edu (22) - Integrated coastal area management. Subscribe by sending the message to **listserv%irmfao01.bitnet@cunyvm.cuny.edu**

MARINE-L@vm.uoguelph.ca (364) - Marine issues including marine biology, shipboard education, coastal processes, maritime education, and aquaculture.

MOLLUSCA@ucmp1.berkeley.edu (211) - Mollusc evolution, taxonomy,

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and ecology.

PORIFERA@mailbase.ac.uk (33) - Sponge biology and chemistry.

Birds

BIRDBAND@arizvm1.ccit.arizona.edu (88) - Bird banding.

BIRDCHAT@arizvm1.ccit.arizona.edu (436) - General information about birds, bird identification, birding, and rare birds.

BIRDCNTR@arizvm1.ccit.arizona.edu (263) - Transcripts of rare bird alert hotlines from the central portion of North America.

BIRDEAST@arizvm1.ccit.arizona.edu (463) - Transcripts of rare bird alert hotlines from the eastern portion of North America.

BIRDWEST@arizvm1.ccit.arizona.edu (284) - Transcripts of rare bird alert hotlines from the western portion of North America.

Ecology and General Biology

BIODIV-L@bdt.ftpt.ansp.br (328) - Discussions, issues, and recommendations for the establishment of a biodiversity information network.

BIOSPH-L@ubvm.cc.buffalo.edu (240) - Ecology, pollution, and environmental issues.

CONSBIO@uwavm.u.washington.edu (399) - Conservation biology.

CONSLINK@sivm.si.edu (635) - Biological conservation.

ECOLOG-L@umdd.umd.edu (1054) - Listserv of the Ecological Society of America. Job listings, grants, news and general topics concerning ecology.

ECOSYS-L@vm.gmd.de (245) - Ecosystem theory and modelling.

FIRENET@life.anu.edu.au (129) - Rural and landscape fires, including fire behavior, weather, prevention, mitigation, suppression, and biotic responses to fire.

GRANTS-L@jhuvvm.hcf.jhu.edu (628) - NSF grants and contracts.

INDKNOW@uwavm.u.washington.edu (292) - Indigenous knowledge systems and traditional ecological knowledge of indigenous peoples around the world.

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METHODS@vm.ecs.rpi.edu (379) - Research methodology.

OTS-L@yalevm.cis.yale.edu (151) - Organization for Tropical Studies.

THPHYSIO@frmop11.cnusc.fr (31) - Thermal physiology.

Ecoregions

IAPWILD@vm1.nodak.edu (40) - International Arctic Project, polar research aims, directions and programs.

POLAR-L@uoguelph.ca (55) - Polar studies, including wildlife.

SFER-L@ucf1vm.cc.ucf.edu - South Florida Environmental Reader, a digest of environmental issues in South Florida.

Ethology

ETHOLOGY@finhutc.hut.fi (259) - Animal behavior and behavioral ecology.

Geographic Information Systems (GIS)

CHEST-ARC-INFO@mailbase.ac.uk (247) - Technical issues relating ARC-INFO.

CHEST-BARTHOLOMEWS@mailbase.ac.uk (127) - Discussion about the Bartholomews digital maps data.

CHEST-GEOPLAN@mailbase.ac.uk (37) - Information, ideas, problems, and solutions dealing with the MPL Geoplan data sets.

CHEST-OS@mailbase.ac.uk (59) - Information about Ordnance Survey digital data sets.

COASTGIS@irlearn.ucd.ie (151) - GIS of coastal regions.

GIS-ARTICLES@mailbase.ac.uk (58) - Research reports made available for electronic distribution within the GIS community.

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GIS-HELP@mailbase.ac.uk (39) - Problems, solutions, and work-arounds relevant to hardware and software problems with GIS.

GIS-L@ubvm.cc.buffalo.edu (1286) - General discussions about GIS.

GIS-UK@mailbase.ac.uk (82) - GIS topics in the United Kingdom.

IDRISI-L@toe.towson.edu - Idrisi discussion list. Send request to MAILSERV.towson.edu.

IDRISI-UK@mailbase.ac.uk (74) - Idrisi users group.

MAPS-L@uga.cc.uga.edu (626) - For map librarians, cartographers, and anyone working with cartographic information (including remote sensing and GIS).

TGIS-L@ubvm.cc.buffalo.edu (326) - Temporal and spatiotemporal topics with GIS.

TWSGIS-L@vm1.nodak.edu (48) - GIS and biological problems.

UIGIS-L@ubvm.cc.buffalo.edu (504) - User interfaces and spatial cognition in GIS.

VIGIS-L@uwavm.u.washington.edu (213) - Virtual reality and GIS.

Insects

BEE-L@uacsc2.albany.edu (294) - Biology of bees.

ENTOMO-L@uoguelph.ca (427) - Entomology in general.

SOCINSCT@uacsc2.albany.edu (85) - Social (primarily eusocial) insect biology.

Landscape Architecture

LARCH-L@suvvm.acs.syr.edu (155) - Issues and ideas of interest to landscape architects.

LARCHNET@uoguelph.ca (61) - Landscape architecture.

Mammals

ECS-ALL@mailbase.ac.uk (43) - Main list for all other European Cetacean Society lists.

ECS-BRAER@mailbase.ac.uk (11) - The Braer disaster in the Shetland Islands.

ECS-NEWS@mailbase.ac.uk (1) - News items within the European Cetacean Society.

ECS-PATHOLOGY@mailbase.ac.uk (2) - Dissections of whales and dolphins taking place around the world.

MARMAM@uvvm.uvic.ca (315) - Research and conservation of marine mammals.

Morphometrics and Systematics

CLASS-L@ccvm.sunysb.edu (543) - Classification, clustering and phylogeny estimation.

ENT-LIST@um.cc.umich.edu (100) - Systematics collections, collection management, and the entomology collections network. Subscribe by sending a request to **USERLPS5@um.cc.umich.edu**.

MORPHOMET@cunyvm.cuny.edu (228) - Biological morphometrics.

MUSEUM-L@unmvma.unm.edu (279) - Museum discussion list.

TAXACOM@harvarda.harvard.edu (372) - Collections, taxonomy, and systematics.

Plants

CP@opus.hpl.hp.com (109) - Conservation and biology of carnivorous plants in the U.S.

DIATOM-L@iubvm.ucs.indiana.edu (89) - Research on diatoms.

IOPI@life.anu.edu.au (155) - International Organization for Plant

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Information.

MICRONET@uoguelph.ca (100) - Mycorrhizae, root and fungus symbiotic associations.

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PLANT-HORMONES@mailbase.ac.uk (140) - Plant hormone research including extraction, purification, and analysis.

PLANT-TAXONOMY@mailbase.ac.uk (108) - Plant taxonomy.

POLPAL-L@uoguelph.ca (10) - Pollination (including aerobiology) and palynology.

Remote Sensing

CANSPACE@unb.ca (267) - Space based geodetic techniques, especially GPS. Daily posting of the Department of Defense Notice Advisories to Navstar Users.

CHEST-IMAGE@mailbase.ac.uk (126) - Technical discussion about image processing programs from ERDAS and VISILOG.

CHEST-SATELLITE@mailbase.ac.uk (54) - Technical issues relating to LANDSAT satellite data.

IMAGRS-L@earn.cvut.cz (427) - Digital image processing of remotely sensed data.

Glossary of Internet Terms

Address. The destination of data sent through a communications system that uniquely identifies something — a workstation on a LAN, a location in computer memory, or a packet of data travelling through a network. There are two separate uses of this term in Internet networking: "electronic mail address" and "Internet Protocol (IP) address."

Alias. A name that is translated into another name.

Anonymous FTP. The procedure of connecting to a remote host, as an anonymous guest user for the purpose of downloading files to your computer.

Archie. An Internet search utility. Archie is an electronic directory service for locating information throughout the Internet. You can use Archie to locate files on anonymous ftp archive sites, other online directories, and resource listings.

ASCII. American Standard Code for Information Interchange. An ASCII download is used to retrieve plain text files that do not contain special codes.

AsiaNet. The Japanese part of BITNET.

BBS. Bulletin Board System. **See Bulletin board system (BBS).**

Binary. The base 2 number system in which only the digits 1 and 0 are used. A binary download is used to retrieve files created with a word processing application (such as WordPerfect or Microsoft Word for Windows), graphics files, and computer programs.

BITNET. The "Because It's Time" Network. BITnet is a store-and-forward network with files and messages sent from computer to computer across the network. It provides e-mail, remote job entry and file transfer services.

Bulletin board system (BBS). A computer that is set up to receive calls and work as an online service. A BBS allows users to communicate with each other through networks with messaging software. They also offer other services (e.g., news, data base searches, and online shopping).

CARL. The Colorado Alliance of Research Libraries. There are over two million bibliographic records in the CARL database. Fields regarding a volume (e.g., author, title, subject) have been indexed, and users can search

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on a word or character string to request information on the volume's
availability.

Client. A computer that can request services from a server.

Discussion list. See Mailing List.

Domain. The last part of an IP address (e.g., **fws.gov**).

Domain name. Each domain name corresponds to an IP address. A domain name consists of alpha-numeric characters separated by "dots." For example, the IP address for the IRM/BFO server is **164.159.176.1**, which corresponds to its domain name of **dns.irm.r9.fws.gov**.

Domain Name Service (DNS). A worldwide system of distributed databases that provide the "translation" from domain names to IP addresses and vice versa.

Download. To transfer data from an online service "down" to your computer's disk.

EARN. European Academic Research Network. It is the European part of BITNET.

E-mail. Electronic mail. E-mail is the content of the communications that take place over a communications network.

FAQ. Frequently Asked Questions.

File server. A device that "serves" files on a network.

File transfer. The copying of a file from one computer to another over a computer network.

Finger. A program that lists who is currently logged in on another host.

FTP (File Transfer Protocol). In TCP/IP, a utility used for transferring files to and from host computers. See also *Anonymous FTP* and *TCP/IP*.

Gateway. Hardware and software that permits two networks using different protocols to communicate in a manner that is transparent to the user.

Gopher. An card-catalog-like interface to the Internet developed at the University of Minnesota. It works from a top-level, subject-oriented, menu system that accesses other information services across the Internet. It can also get information from Gophers on other servers.

Header. In an e-mail message, the part that precedes the body of a message and contains, among other things, the message originator, date, and time.

Host. A computer system on a network.

Internet. A wide area network connecting thousands of networks in industry, education, Government, and research. The Internet network uses TCP/IP as the standard protocol for transmitting information.

Internet e-mail address. The address for an Internet user's electronic mailbox. The syntax for Internet e-mail addresses is [*username*]@[*domain name*]. See also *domain name*.

Internet Protocol (IP). The network layer protocol for the TCP/IP that contains addressing information and some control information. Internet Protocol defines how data is routed from its source to its destination.

InterNIC. Services established by the National Science Foundation in 1992 that include the Directory of Database Services provided by AT&T, and Information Services provided by InterNIC Information Services.

IP address. An numeric address that is used for routing.

LAN. Local Area Network. A computer network that serves a limited geographical area. See also *WAN*.

LISTSERV. An automated mailing list distribution system that enables online discussions of technical and nontechnical issues conducted by electronic mail throughout the Internet.

Mailing list. A discussion group on the Internet, distributed via e-mail from a central computer maintaining the list of people involved in the discussion. Anyone can send a message to a single mailing list address. The message is distributed to everyone on the list of addresses. The members of that list can respond, and the responses are distributed, forming a discussion group.

NetNorth. The Canadian part of BITNET.

Network. A data communications system that interconnects computer systems at various sites.

Online. In the context of using the Internet or other networks, the act of being in direct communication with a remote host's central processing unit (CPU). An online database is a file of information that can be directly accessed by the user.

Ping. Packet InterNet Groper. A program that is useful for testing and debugging networks. Ping lets you to check to see if another system is currently "up" and running, and it can trace the route a message takes from your site to another site.

Post. To compose a message and send it to a mailing list.

Protocol. A set of rules that computers must follow to exchange messages or data. See also *Internet Protocol (IP)* and *TCP/IP*.

Server. A computer that can provide services to clients on a network.

SMTP (Simple Mail Transfer Protocol). In TCP/IP, a utility for transferring electronic mail among users. See also *TCP/IP*.

SWAIS. The command used on some Telnet hosts that offer WAIS "client" programs. The "s" stands for "simple."

SWAN. Service Wide Area Network. It is the data communications network that provides electronic connectivity for the Fish and Wildlife Service.

Talk. An instant message utility available on Internet.

TCP. Transmission Control Protocol. It is the transport layer of the TCP/IP protocol. It is connection-oriented and stream-oriented. TCP software allows two computers to be "connected" so that a process on one computer can use the IP protocol to send a stream of data to the other computer.

TCP/IP. Transmission Control Protocol/Internet Protocol. It is a set of communication control protocols that support peer-to-peer connectivity functions. TCP/IP includes FTP, Telnet, and SMTP.

Telnet. In TCP/IP, a utility allows a user at one site to access a remote host as if the user's computer were locally attached. See also *TCP/IP*.

Terminal emulation. A "mode" that determines how your keystrokes and screen interact with the operating system on a remote host. Many Telnet hosts, for example, require users to specify a terminal emulation mode (such as VT100), which mimics the terminal that would normally be attached directly to the remote host's system.

USENET. A global news-network database on the Internet.

UUCP. Unix-to-Unix Copy Protocol, a dial-up, store-and-forward protocol (this means that the only services you get are e-mail and network news).

VT100. The most common terminal-emulation system used by remote hosts on the Internet.

WAIS. Wide Area Information Server. An indexed online search tool that makes it easy to locate information available at FTP and Telnet hosts. WAIS (pronounced "wayz") is a powerful tool for requesting concurrent searches of large databases and newsgroups on the Internet. When you specify a keyword, WAIS scans the Internet and locates items that contain your keywords. Login as **WAIS**.

WAN. Wide Area Network. A WAN links networks in a wide geographic area. In contrast to a LAN, it uses common-carrier lines; e.g. national and international telephone services. See also *LAN*.

WWW. World-Wide Web, first developed at CERN, the European particle physics lab in Geneva. It provides a hypertext interface to the Internet, letting users follow links and find common resources -- if they're part of the "web." Users can use highlighted words (hypertext links) to "launch" to information on various subjects.