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Finding Natural Resource Information on the Internet¹

Ginger M. Allen, Kevin U. Hill, and Martin B. Main²

Introduction

The high level of interest among the public regarding wildlife and natural resources has led to an increase in demand for educational components to be included in environmental experiences. This is true both for commercial ecotourism operations as well as for parks and other public areas. For environmental education programs to maintain credibility, it is important that naturalists and interpretive guides provide consistently accurate information. Although students, interns and volunteers may have extensive field and classroom instruction, learning and sharing information about nature is a life long process. Consequently, the developers of the Florida Master Naturalist Program initiated this document describing the vast potential of the Internet as a resource for naturalists and environmental educators to obtain information on natural resources that can benefit their programs.

What Is the Internet?

The Internet is a system of networks, linking computers. Each network has software to provide or "serve" information and/or to access and view information. The Internet itself does not contain information; rather it serves as the physical conduit to information stored on computers worldwide.

Computers on the Internet may use one or all of the following Internet services:

- Telnet or remote login--Permits you to log onto another computer and use its software as if you were there
- FTP or File Transfer Protocol--Allows your computer to rapidly retrieve files from a remote computer
- World Wide Web, (WWW)--An Internet client-server- linked retrieval system distributing information

The World Wide Web (WWW) is the largest, fastest growing service on the Internet. When you use a Web browser such as Microsoft's Internet Explorer, or Netscape, you are viewing documents on the World Wide Web. The WWW functions by sending specially formatted documents to your browser. These Web documents are formatted using Hypertext Markup Language (HTML) which provides images and highlighted links to other documents on the Web.

A URL (uniform resource locator) is the unique address of a document on the Web. The URL consists of a server name and domain (separated by dots) and may also include specific document path information separated by forward slashes. (see Figure 1.)

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2. Ginger M. Allen, Wildlife Biological Scientist; Kevin U. Hill, Computer Coordinator; and Martin B. Main, Assistant Professor and Extension Wildlife Specialist; all with the Southwest Florida Research and Education Center (REC)--Immokalee, FL 34142.

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Parts of a Uniform Resource Locator (URL)



Figure 1. Uniform Resource Locator Address

The end of the URL Web site address ends with a code that categorizes the type of server you are accessing:

- .com=commercial
- .edu=educational
- .gov=government
- .org=nonprofit organizations
- .net=networking organizations
- .mil=military
- .int=some international organizations
- .ac=academic
- .ca=Canada
- .cn=China
- .au=Australia
- .br=Brazil
- .hk=Hong Kong
- .it=Italy
- .mx=Mexico
- .es=Spain
- .uk=British Commonwealth
- .za=Africa

There are two ways you can go directly to a URL. The first is to Click on File | Open Page and enter a URL in the white box and press Open to retrieve the document. This is the same process as using CTRL key + O key. The other way is to use the URL/Location/Go To box (white box above the document window). Click over the text of the URL

currently in the URL/Location box, while it is highlighted, type in the new URL and press. By pressing the gray pop-down arrow at the right end of the URL/Location box you can view a history of URLs you have visited.

Getting Connected to the Internet

Most users access the Internet using a modem to dial into an Internet Service Provider (ISP). These ISPs charge a monthly fee (AOL, Microsoft, Yahoo, Excite@Home, Local Providers, etc.). Internet access via modem, while less expensive, is relatively slow in comparison to some newer Internet access options such as cable modem, or digital subscriber line (DSL). Check with your local telephone company and/or cable TV provider to determine if these services are available in your area.

Exploring the Internet

Finding information (Web "pages" or "sites") on the Internet can be easy or very difficult. This is not always your fault but in part due to the sheer size of the WWW, and the fact that it is not indexed in any standard vocabulary (like a library's catalogs). When you are "searching the Web," you are not searching it directly; you are accessing one of several transitional databases and/or Web-pages which contain selections of other Web pages organized to allow you to find still other Web pages and sometimes other databases. Now you know what the term "Web" means. You click on these links, retrieve documents, images, and sounds, from servers around the world. There are a variety of different types of search tools. Some are for broad information, some very specific. Next we will give you an overview and some tips for using these tools. Hyperlinks in this document (blue and underlined text) are provided for the reader to click to jump to that location. To return to this document, click the Back button.

Searching by Subject Directories

A directory is a listing of links compiled by someone, and a Web directory is a site which organizes a very large amount of information. A site that organizes Web site links by subject is an easy

way to start a topic search. An example of this is the Florida Master Naturalist Program Web site (www.masternaturalist.org). Under RESOURCES on the Web site is a list of main topic links (see Figure 2.) for natural resource information. Once you choose your area of interest and click on it, you will find a much longer list of Web sites that the Florida Master Naturalist Program developers have compiled that will assist you in finding information on specific topics. Web pages range from broad categories to very specific information on animal and plant species. You can spend hours investigating topics using subject categories; they are also found on some main search engine pages.



Figure 2. Florida Master Naturalist Web site subject directory of Internet Links.

Using Search Engines

The term "search engine" is used to describe both true search engines and directories. They are not the same. The difference is how listings are compiled. Search Engines (Table 1.) use software "robots" to create their listings automatically by "crawling" through the Web collecting keywords about the pages it finds. These keywords are used to build a database that users can search for relevant information. Each search engine uses a different method to calculate something called a "relevance" which it "ranks." This "relevance ranking" evaluates the probability that the "hit" or "match" is on-target with your query. The creators of search engines change the way they calculate this relevance and do not tell users their methodology; therefore these rankings may be inaccurate since having high rankings means big business dollars for commercial Web sites.

In contrast to search engines, a directory (such as Yahoo, Britannica, and Clearinghouse) depends on humans for creating its listings. Webmasters submit a short description to the directory for their site, or editors write them for sites they review. A search looks for matches only in the descriptions submitted.

Use a directory when you want to see quickly what is available on a topic, when you are beginning your research, or when you know the compiler of the directory will forward you to the best sites.

For better searches using your favorite search engine, the information below can be applied to nearly all of the major search engines:

- Be Specific--start by using terms as close to your topic as possible.
- Using The + Symbol to Add

If you want a search engine to find pages that have all the words you enter, use the + symbol. For example, sites that have references to both conservation and wetlands on the same page. Use: +conservation +wetlands. Only pages that contain both words would appear in your results. If you just typed conservation wetlands, you would get land conservation, general conservation, etc. This method is helpful if to narrow down a search.

- Using The - Symbol to Subtract

If you want a search engine to find pages that have one word on them but not another word, use the - symbol. For example, you want information about pollution but do not want to be overwhelmed by pages relating to the whole problem. Use: pollution -air. In Figure 3, the - sign is the same as "without the words". This will undoubtedly cut the number of pages retrieved in half. You could eliminate time, geographic areas, revisions, etc. For example, if you did a search just for "birds" you would probably get over 3 million site results, however birds -central America - south America, gives you just over 240,000 sites mostly in North America. The - symbol is helpful for focusing results when you get too many hits that are unrelated to your topic. To refine your search, simply begin subtracting terms and you should get better results.



Figure 3. Using Advance Search techniques.

- Using Quotation Marks

Multiplying terms through a "phrase search" can be a much better way to get the information for which you are searching. Using the + symbol retrieves pages that have all those words on them, but they may not create a logical phrase or even be near each other in the document. A phrase search retrieves pages with the terms exactly in the order you specify. To do this put quotation marks around the phrase: "wetland conservation 2000". In Figure 3, quotation marks are the same as "with the exact phrase".

- Combining Symbols

You can combine symbols to create even more precise searches. Boolean operators (AND, OR and NOT) group, choose, or eliminate subjects based on the operator you choose. Use AND, OR and NOT to combine search sets in a variety of ways. AND finds Web pages in which both terms occur. OR finds Web pages in which either term occurs. NOT finds Web pages in which the first term appears but not the second. An "Advanced" search function is nearly always required to use true Boolean operators. Advanced search templates such as HotBot (www.hotbot.com) and AltaVista (www.av.com) use many Boolean operator drop down boxes which eliminates the user having to remember syntax.

Searcher Errors

If you begin searching and end up with "zero documents found", "something unrelated to your topic, or too much information you can check your search for the following problems and revise your methods:

- unrelated responses returned. This may be due to incorrect spelling, multiple meanings for words, or case sensitivity –

—The "hit" (Web site presented as a match for your terms) contains the search terms but they have different meanings (for example: "rails" can mean handrails, train rails, or a wetland bird) be more specific.

—Case sensitivity, which refers to capitalized or small case letters in words, may be the issue. Search again using a different "case," especially with

proper names. Note that different search engines may handle this problem differently.

- poorly described topic or too abstract (e.g. search for "pollution and regulations" instead of "pollution").
- query too general resulting in an over-abundance of responses (hits). You need to be more specific in your choice of search terms. For example, instead of using "plants" search for "wetland grasses."
- query too specific, resulting in insufficient responses. You need to broaden your search using synonyms or larger categories. For example, search for "wetland birds" instead of "*Laterallus jamaicensis*".
- used special search syntax, response is wrong or search does not perform the way you expect. This typically suggests that the search engine combined terms in a way you didnt expect. For example, you enter the search terms "Great" and "Blue" expecting documents that contain *both* terms and the search engine presents you with documents that have *either* "Great"(Great Danes) or "Blue"(Blue Moon). Also, check your syntax operators--perhaps you are using the wrong "syntax" for a particular search engine. By using + and - signs, you can make your search more specific. The way these signs/labels are used varies among search engines. If you are using a specialized search tool; perhaps it is not the right one for your information needs (review "help" pages of the search tool).
- still can't find the information you want. Try another search engine; each search engine uses a different method of computing "relevancy," therefore they present different results. You can also use a "meta-search" engine. Meta-search engines search the databases of other search engines, but do not maintain their own database. Meta-searches usually strip the advanced search syntax from queries, so statements with complex structures should not be used. Disadvantages of a meta-search include a limited number of results displayed from each of the search engines, presentation of results may be confusing, and it may take longer to conduct a search. Meta search

engine examples: <http://www.askjeeves.com>,
<http://cyber411.com>, <http://www.dogpile.com>,
<http://www.highway61.com>,
<http://www.thebighub.com>,
<http://www.mamma.com>,
<http://www.metafind.com> .

Finding On-line Journals, Magazines and Articles

There are many scientific and environmental journal and news information sites on-line. Some offer free weekly subscriptions and journal searches, examples of which include: <http://nature.com>, www.sciencemag.com, www.newscientist.com, <http://egi.lib.uidaho.edu>, <http://www.fcla.edu/FlaEnt>, and <http://enature.com>, which provides searchable field guides with over 4,800 plant and animal species.

Many organizations and agencies provide searchable databases with articles on natural resource issues.

Examples include:

Extension Digital Information Source (EDIS) (<http://edis.ifas.ufl.edu/>) is a comprehensive reference of Extension Publications produced by the University of Florida Institute of Food and Agricultural Sciences. The searchable database contains over 4,000 publications related to agriculture, natural resources, the environment, and human and rural development. All documents are on-line for easy access. There are many papers on wildlife management, species descriptions, and Florida's natural history.

Linking Florida's Natural Heritage (LFNH) (<http://susdl.fcla.edu/lfnh/>) is a virtual library of Florida ecological information from museum, library, and citation databases throughout Florida, made possible by cooperation among the Florida Museum of Natural History; the libraries of the University of Florida, Florida International University, Florida Atlantic University; and the Florida Center for Library Automation. The LFNH Web site allows queries of museum specimen databases, library catalogs, and other citation databases for taxonomic and topical information. In addition, scientific experts

selected 200 texts on Florida species and ecosystems that are available on the LFNH site.

The Educational Resources Information Center (ERIC) (ericir.syr.edu/) is a national information system designed to provide users with Internet access to a large body of education-related literature. The searchable database contains over one million abstracts of documents and journal articles. Some materials are available on-line, others can be purchased through the web site for a small fee. Many libraries also maintain ERIC downloadable documents on their microfiche readers. ERIC also maintains a clearinghouse (<http://www.ericse.org/>) with environmental education resources, lesson plans, and much more.

EcoNet (www.igc.org) is a large, fee-based network comprised of environmental discussions, reports, articles, and documents. Resources include press releases and weekly transcripts of "Living on Earth." Some materials are archived and available via anonymous ftp. Send a blank message to: econet-info@igc.apc.org for information.

Center for International Earth Science Information Network (<http://www.ciesin.org/>) contains environmental policies, conference information, full text of world treaties, and searchable environmental sources.

Environmental Protection Agency (EPA) (<http://epa.gov/>) maintains searchable databases covering a wide range of environmental issues in its "Online Library System". The publication, "Access EPA", is also available.

Envirolink Network for Change (www.envirolink.com) is a comprehensive resource for individuals, organizations and businesses working for social and environmental change. The site contains weekly articles, publications and a searchable database.

Finding Library Resources On-Line

If you require further information from books, journals, reports or microfiche, you can search for the materials on your computer and possibly from your local public library database before you go to the

library. A list of over 50 Florida public libraries with on-line tools can be found at www.rrc.usf.edu/catalogs.html. The links take you to a description of the catalog, with instructions. From there you can link to specific library catalogs, which usually search by Author, Title, Subject, etc. Local specialized digital libraries include Everglades Information (<http://everglades.fiu.edu/>) and Florida Heritage Collection (<http://susdl.fcla.edu/fh/>). Registered Florida college students can access either their community college libraries (<http://www.ccla.lib.fl.us/>) or state library systems (<http://webluis.fcla.edu/>).

The Library of Congress Online Catalog (<http://catalog.loc.gov/>) is a database of approximately 12 million records representing books, serials, computer files, manuscripts, cartographic materials, music, sound recordings, and visual materials in the Library's collections. The Library of Congress does interlibrary loans to other libraries that request information.

Searching for Images

Words function to describe pictures on the Web. Your search relies on the description given by the cataloger who provided the keywords. Search for images by using one of the "major" search engines, or by locating Web sites that are likely to contain images (museums, refuges, national parks, water management districts).

Some sites let you search for images directly: <http://mamma.com/>, <http://sunsite.berkeley.edu/ImageFinder/>, <http://search.corbis.com/>, <http://www.altavista.com>, <http://ncrtec.org/picture.htm>, <http://gallery.yahoo.com/>, <http://www.fiu.edu/~library/>.

Saving a Local Copy of Web Pages and Media

Bookmarks offer a convenient means of storing and retrieving web pages. Once you add a bookmark to your list, the location is stored until you remove it using the bookmark editor. The accessibility and ability to save bookmarks in a file is an excellent strategy for personalizing your Internet access.

Saving Web pages to your hard drive can be helpful if you need to access them while not connected to the Internet. The method used depends a great deal on the type and version of your Web browser.

Internet Explorer version 5.0 or later:

Open the Web page that you want to save. From the FILE menu, choose Save As, and choose a filename. If you select "Web Page, Complete" as the "save as type", all embedded graphics will be saved together with the HTML file.

Other Web Browsers

With the document in your screen, click on FILE (at top), then Save As (see Figure 4.) Select the disk drive where you want to save the file. Name the file so it depicts the subject matter you are retrieving. If you keep the extension ".htm" the document will re-open in your browser. If you add the extension ".txt" the document will be a plain text (ASCII) file readable in word processors. Click OK.



Figure 4. Saving a file to your computer while using a Netscape browser.

Images, sound, and other types of files

These file types do not download the same as text. You must save each image or file as a separate file. With your cursor over the image or item that contains a link to the file you want, click the right mouse button (hold down a Mac button). Click on Save Image As or equivalent for other files. Complete Save As dialog box, and keep the file extension as is (e.g., .jpg .jpeg .gif .wav).

For Additional Information

Abilock, D. Choose the Best Search Engine for Your Information Needs (<http://www.nueva.pvt.k12.ca.us/~debbie/library/research/adviceengine.html>).

Boolean Searching on the Internet by Laura Cohen
(<http://www.albany.edu/library/internet/boolean.html>).

Elkordy, A. 2000. Web Searching, Sleuthing, and Sifting (<http://thelearningsite.net>).

Finding Information on the Internet: A TUTORIAL Teaching Library Internet Workshops, Teaching Libraries of University of California, Berkeley
(<http://www.lib.berkeley.edu/TeachingLib/Guides/Internet/FindInfo.html>).

Finding It Online (Debbie Flanagan)
(<http://home.sprintmail.com/~debflanagan/main.html>).

Forest Resource Information Available on the Internet, by Larry V. Korhnak and Mary L. Duryea (<http://edis.ifas.ufl.edu/FR022>).

Guide to Effective Searching on the Internet (The Web Tools Company)
(<http://www.thewebtools.com/tutorial/tutorial.htm>).

How to Choose a Search Engine or Research Database by Laura Cohen
(<http://www.albany.edu/library/internet/choose.html>).

NetLearn, the directory of Internet Learning Resources (Robert Gordon University, Aberdeen)
(<http://www.rgu.ac.uk/~sim/research/netlearn/callist.htm>).

Search Tools Chart by the InfoPeople
(<http://infopeople.berkeley.edu:8000/src/chart.html>).

Sullivan, D. 2000. Search Engine Watch (<http://searchenginewatch.com>).

Table 1. Features of some popular web page search engines.

Search Engine	Google http://google.com/	AltaVista www.av.com <i>Advanced</i>	All The Web http://alltheweb.com <i>Advanced</i>	Infoseek/Go http://go.com/	Northern Light Power http://www.northernlight.com/ <i>Power search</i>
Database Type					
Case Sensitive	No	Yes	No	Yes	No
Search Type	Quick	Refined	Refined	Popular or commercial topic	Academic Subject