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Electronic Keepers: How to Keep Up With Online Resources in the 21st Century

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Zookeepers today are very different animals than their predecessors 20 years ago. Demographically, they are likely to be young, college-educated, and more often than not female (AAZK, 2005). They are also frequently computer-savvy and comfortable using the Internet. These are all important competencies because keepers are now expected to do a lot more than just clean cages; they also interact with the public, present education programs, help design exhibits, and participate actively in providing not just physical and veterinary care but also enrichment for the animals in their charge (Hancocks, 2001).

To do all this well, keepers need the best possible information. Sometimes, however, this can be a challenge, especially when budgets are tight and the information resources available at the institution are limited. How can you find good, authoritative, current information when you don't have access to expensive books, journals and databases?

Your institution probably has a library; it's a requirement if it is AZA-accredited (AZA, 2005). However, a recent survey (Barr, 2005) found that even many AZA zoos and aquariums have relatively small libraries, and often there isn't a professional librarian, or indeed anyone, staffing the library full time. Nevertheless, check out what is available; you might be pleasantly surprised, especially if there is a trained person who can show you what is accessible (not just in print but online as well).

When you need information fast or you need it to be very current and can't get to the library, you can go online yourself. However, if you go to Google®, Yahoo®, or some other search engine and just type in a search term or two, you may get several millions hits, few of them particularly relevant or reliable. Of course, there are some tricks you can use to limit and refine your search. For instance, experiment to find the most relevant terms; put phrases in quotes; use the advanced search feature; try more than one search engine; etc.

The main thing to remember is that just because something is published on the Web doesn't mean it's correct. Anybody anywhere with a computer, Internet connection and a little know-how can put up a website. (As the saying goes, on the Internet no one knows you're a dog.) How then do you evaluate what you find? Here are a few tips on what to look for:

- What sort of organization is sponsoring the site – is it an educational institution, a governmental agency, a commercial enterprise? That can tell you a lot about the **accuracy, authority and objectivity** of a site. The URL extension can help:
 - .edu for educational or research institutions
 - .org for nonprofit organizations
 - .gov for government resources
 - .int for international organizations (also different countries have their own extensions – e.g. .uk, .ca, etc.
 - .com for commercial products or commercially-sponsored sites
 - .mil for US Department of Defense
 - .net for networks
- Who is the **author/producer** of the website? What are their credentials? Try the "About" page, and if it's not clear (or you can't find an About page), that should be a warning flag. "About" should tell you whose site it is, the intended purpose, when it

was last updated. There should also be a way to contact someone. If you can't readily find this, be wary; it may just be poor design but in any case you should definitely have that kind of information in order to properly judge the reliability of the site.

- What is the **purpose** of the site? Is it primarily to share information or summarize research? To advocate a particular position on a subject? Or to advertise a product? What is the target audience? That might give you clues to the site's purposes and help you decide on its usefulness and accuracy.
- How **current** is the information – is there a date when the site was last updated? Look at the bottom. Remember, however, that the updating may not have encompassed the entire site – perhaps only a small change was made. Check for dates throughout. What about links— do the ones given work? If there are a lot of broken links, the site is not being well maintained.
- What about **functionality**? Is the site well designed, "user friendly" and easy to navigate? Are the connections intuitive or is it difficult to figure out what to click? Are the graphics attractive and helpful, or are they distracting and annoying? No matter how good the information is, if the site is poorly designed and you can't easily find what you want, people may end up frustrated and avoid using it.
- For more about evaluating Internet resources, check out <http://www.lib.berkeley.edu/TeachingLib/Guides/Internet/Evaluate.html>.

Following is a list of websites you should find helpful. Some will come up using general search engines, but some won't – they are part of the "Invisible Web" where much good information lurks hidden away from Google® and other common search engines. All sites have been checked recently and have been around a while (always a good sign), but there are no guarantees on the Internet; a site can be here today and gone or inaccessible tomorrow.

Organizations:

- AAZK, of course! <http://www.aazk.org/aazknew/>. You can find grant information, glossaries and guidelines under Committees, links to organizations, and lots more.
- American Zoo and Aquarium Association (AZA) at <http://www.aza.org>. A lot of the information is for members only but there are fact sheets, SSP listings, links, and more. Plus anyone at an AZA institution should be familiar with the organization.
- IUCN Species Conservation commission of the World Conservation Union – <http://www.iucn.org/themes/ssc/>; a primary conservation site and a good source of news. This is where you find the Red List.
- <http://www.aczm.org/> - American College of Zoological Medicine (ACZM) is an international specialty organization recognized by the American Veterinary Medical Association (AVMA) for certification of veterinarians with special expertise in zoological medicine. Website includes a reading list and links to other sites.

General sites:

- Librarians' Index to the Internet: <http://lii.org/>. There is one whole section on Animals, with the topics such as Assistance & Therapy Animals; Bones; Cephalopods; Endangered Species; Marine Biology; Paleontology; Species Identification; Wildlife Conservation; and Zoos, to mention just a few. Each has blurbs about and links to relevant sites, all selected by librarians.
- Natural History Caucus, Special Libraries Association (<http://www.lib.washington.edu/sla/>). This looks a bit dry but it has some really good links – bibliographies, reference sources (check these especially), etc. with clickable links. It definitely is worth bookmarking.
- Scirus (<http://www.scirus.com/>). This is a comprehensive science-specific search engine. It's almost too comprehensive, but you can sort by relevance or date as well as by journal or

Web results. There is so much here that your search strategy needs to be pretty focused. Try using multiple terms – e.g., “chiroptera reproduction vespertilionidae” just as you would with Google®, for instance.

- Science.gov (<http://www.science.gov/>). There is a wealth of governmental resources available on the Web, and this is a good place to start. You can select Biology and Nature and then enter a search of your own, choose a “narrower topic,” or choose a particular government website from an extensive alphabetical list.
- University of Michigan Museum of Zoology maintains the Animal Diversity Web (<http://animaldiversity.ummz.umich.edu/>). This is a good source of information on different species, not in any order. You can also click on a group of animals pictured; thus, clicking on the octopus in the upper left hand corner of the homepage takes you to Mollusca.
- The Electronic Zoo (<http://netvet.wustl.edu/ssi.htm>) – links galore.
- You can now search PBS programs by keyword or title. For example, try *Nature* at <http://www.pbs.org/wnet/nature/database.html>. There’s a section for teachers, including teacher guides; lots of links; video clips, photos, and more; a Critter Guide for different animals; etc. This can be very helpful if someone says “Gee, I saw a program on PBS about tigers...”
- Tree of Life (<http://tolweb.org/tree/phylogeny.html>). Emphasis on phylogeny but has references and links.
- University of California at Berkeley - <http://www.ucmp.berkeley.edu>. This link is to the Museum of Palaeontology but it’s an excellent, up to date site and has general stuff besides. Go here for information about dinosaurs – and their descendents, birds! It covers all taxa and has links to many organizations worldwide.

For more specific information:

- Mammalian Species - published regularly by the American Society of Mammalogists. Each year 25-30 new accounts are issued, each of which covers a single species. These vary in length from 2-14 pages. Subscriptions are \$30.00 per year and most zoo libraries do get these; however, PDF files of the first 631 accounts are also now available free online at http://www.science.smith.edu/departments/Biology/VHAYSSSEN/msi/msi_intro.html.
- PrimateLit – a bibliographic database (<http://primatelit.library.wisc.edu/>). Gives citations to primate literature going way back; very easy to use. Also has lots of helpful links.
- Bat Conservation International (BCI) (<http://batcon.org>). The premier source for information on bats.
- The Cephalopod Page (<http://is.dal.ca/~ceph/TCP/index.html>). Once you get away from the main page and the annoying ink blot which follows the pointer around, there’s lots of good – and fun! – information here.
- AmphibiaWeb (<http://elib.cs.berkeley.edu/aw/>) - inspired by the global declines.
- Crocodylian, Tuatara and Turtle Species of the World - <http://www.flmnh.ufl.edu/natsci/herpetology/turtcroclist/>.
- Entomology Index of Internet Resources from Iowa State University - <http://www.ent.iastate.edu/List/>.
- The Ultimate Ungulate - <http://www.ultimateungulate.com/>. A very well-done site.
- Ichthyology Web Resources - <http://www2.biology.ualberta.ca/jackson.hp/IWR/index.php>

- Bird Life International - <http://www.birdlife.org/index.html>. A global alliance of conservation organizations concerned with birds; up-to-date news from around the world and you can search for species information.
- Searchable Ornithological Research Archive (SORA) - *The Condor* and other ornithological journals are now available and searchable for free on-line at <http://elibrary.unm.edu/sora/>.
- Poisonous plants - <http://www.ansci.cornell.edu/plants/index.html>.

And there are many more good websites - this is only a sample.

Whenever you are searching for information, whether in print or online, **always check more than one source**. That way you not only get more information but ensure greater accuracy. And if you find contradictory information, keep digging!

One final note: do check out the resources available at your local libraries. You will probably find many databases with information simply not to be found on the free web. Ask the reference librarian for help - he or she will probably be delighted to assist you! Also feel free to contact me at dorbarr@aol.com.

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Zoo Biology Group - A Great Resource for Zoo Professionals

Need assistance? You could try Zoo Biology, it is probably your best bet for zoo/animal information. Zoo Biology is the original discussion, Q&A group dealing with the diverse range of Zoo Sciences. First established in 1999, the Zoo Biology Group is concerned with all the disciplines involved in the running of a zoological garden - captive breeding, husbandry, cage design and construction, diets, enrichment, management, record keeping, etc. This group is restricted to zoo professionals. It is specifically a forum for professional zoo staff. Exceptions may be considered in the case of students or allied professions. A genuine commitment to both *in-situ* and *ex-situ* conservation is absolutely essential. You are encouraged to copy answers to the group. The useful archive section increases each day. There are 1400+ Zoo Biology subscribers to date and 99% of subscribers have between five and 40 years of practical zoo experience in all areas. An immense combined expertise is waiting to share their knowledge. This group is moderated. To Subscribe to Zoo Biology send an e-mail to: zoo-biology-subscribe@yahoogroups.com < Leave the subject and message area blank. When you subscribe at the same time please send a separate e-mail to: peter@elvinhow.prestel.co.uk giving your brief bio. (e.g. collection, work area and interests). All details will be kept strictly confidential. Failure to do this will mean that your subscription will not be processed. This step is essential to keep the group restricted to professional zoo staff. To Unsubscribe from Zoo Biology send an e-mail to: zoo-biology-unsubscribe@yahoogroups.com Leave the subject and message area blank.