
North American Mammals and the American Black Bear, *Ursus Americanus* *A Guide to Sources*

Ella L. Ingram and Kelly Myer Polacek,
Guest Columnists

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In the Spring 2010 issue of *RUSQ* (volume 49, number 3), Stefanie R. Bluemle introduced an occasional series for *The Alert Collector* on delineated bibliographies, columns that illustrate the working method behind bibliographic creation. Ella L. Ingram and Kelly Myer Polacek offer *The Alert Collector* readers the second such column, explaining their process of collection building, working from the broad to the specific. Ingram and Polacek begin by creating a core list of works relating to North American mammals and end with a focus on the American black bear. Their model can be applied to a wide range of subjects and offers a framework for collection development librarians who must craft collections without the support of expert bibliographers.

Ingram and Polacek met as graduate students at Indiana University in Bloomington. Ingram holds a PhD in Ecology, Evolution, and Behavior and works at Rose-Hulman Institute of Technology in Terre Haute, Indiana, where she is an associate professor of applied biology. She spent her sabbatical as a volunteer at the North American Bear Center in Ely, Minnesota. While there, she worked on a variety of projects relating to the available research and trade publications relating to black bears. Polacek combines her MLS and MS in biology with her work as a reference librarian at Montana State University. This work is her second contribution to the *Alert Collector* column. She has a special interest in understanding cognitive development as it relates to overcoming misconceptions students have in the sciences. Ingram and Polacek have published together in the education literature; however, this work is their first joint effort in librarianship.—Editor

The diversity of North American mammals merits their consideration for inclusion in both small and large library collections. Here we summarize the best works of the late-1990s through the 2000s and note early works that remain as important now as in the past. This guide has a wide breadth of coverage that includes annotations of books, periodicals, reference materials, web resources, important publications, and videos. It includes instructions on how to build a general North American mammal collection, and provides an example of how to use the guide to develop a subcollection for the American black bear. It serves as an annotated bibliography, a collection development tool, and a springboard for scholars new to the field.

Mammals large and small are among the most recognizable parts of the natural world. In urban areas, companion animals, residents of the local zoo, even various rodents can be identified by name; in rural areas, parents invariably point

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out cows, pigs, and sheep to children. Many individuals travel to protected or wild places specifically to encounter North America's remaining megafauna. This fascination with mammals is not new: indigenous Americans revered many mammals and our country's forefathers wrote extensively about America's mammalian richness. Today, some mammals flourish from human interaction (e.g., urban rats) while others suffer the consequences of human activity (e.g., the 36 mammals listed as endangered by the U.S. Fish and Wildlife Service). Americans are drawn to stories and images of North American mammals in a wide variety of contexts—children's books feature mammals as main characters, the polar bear is the symbolic representation of climate change, People for the Ethical Treatment of Animals (PETA) stages regular high-profile protests, and outdoor or nature magazines regularly include stories of close encounters with mammalian wildlife. The more than 400 mammals existing today compose a major component of the biological milieu and human history of North America.

To provide insight into the general collection development process implemented, we targeted a single mammal for special treatment. The American black bear regularly makes the evening news or the morning newspaper—there have been almost one thousand articles referencing the black bear in U.S. newspapers in the last two years alone. Characterized both as the gentlest of large animals and a ferocious man-killer, the American black bear is both loved and feared. Of the eight species of bear existing today, the American black bear has the largest population size and is the only species increasing in number over much of its range (limited to most of Canada and about one-third of the United States). Smaller than the brown (or grizzly) bear and the polar bear, the American black bear also is the most catholic in its feeding habits and desired habitats, making it uniquely able to coexist with human habitation. Despite the biological success of the American black bear, there is a paucity of materials available for use by the science librarian or collections manager. The most recent bibliographic guides were published in the early 1980s (see Tracy, Frederick, Anderson, and Jordan 1982, listed below under "Books and Reference Sources"). We used the techniques and resources listed in the first part of this guide to generate an excellent collection of materials specific to the American black bear. Such a process could be repeated for other North American mammals important to your collection.

WEB RESOURCES

Websites were located using a Google search of the terms *North American Mammals* (without quotes).

Smithsonian Institution North American Mammals (www.mnh.si.edu/mna).

This site is based on the books *The Smithsonian Book of North American Mammals* by Don E. Wilson and Sue Ruff

and *Mammals of North America* by Roland W. Kays and Don E. Wilson (both listed below under "Books and Reference Sources"). It is a searchable database of living mammals in North America. Search for mammals by species, location, species name, family tree, and conservation status. The site also includes some special collections including skull, teeth, and bone identification, and a glossary of important evolutionary and ecological terms. The entire site is also available in Spanish.

eNature.com (www.enature.com/home).

An ideal website for individuals seeking information about local mammals in the United States. The site boasts reviews by zoologists and natural history specialists. Users can learn about local wildlife based on zip code. This site is unique in offering users an iterative selection process allowing them to identify a recently viewed organism in their own area. Alternatively, by clicking on "Mammals," users are offered a simple list about individual or groups of related mammals. It includes information about national parks and refuges. It contains some overlap with the Audubon Society books.

List of Mammals of North America (http://en.wikipedia.org/wiki/List_of_mammals_of_North_America).

A comprehensive but not exhaustive list of extant North American mammals that includes those organisms that went extinct within the last 10,000 years. Animals are listed by order and family; entries contain links to articles about more than 300 species, most of which link to a separate Wikipedia page. This site includes only terrestrial mammals; marine mammals are described separately without geographic limitation at http://en.wikipedia.org/wiki/Marine_mammals.

BOOKS AND REFERENCE SOURCES

Reference sources were identified by browsing the library collection of the local land grant university and by searching for *mammal AND (encyclopedia OR handbook OR guide)* in WorldCat. Books about mammals in general were excluded with a preference for books that focused on North American mammals.

Feldhamer, George A., Bruce C. Thompson, and Joseph A. Chapman, eds. *Wild Mammals of North America: Biology, Management, and Conservation*. Baltimore, Md.: Johns Hopkins Univ. Pr., 2003. (ISBN: 9-780-8018-7416-1).

Although not a comprehensive discussion of mammals, this 1,200-page reference is still ideal for those interested in the life history and management of North American mammals. Intended for use as a reference tool and a textbook, the prose is dense with scientific information on the distribution, anatomy, physiology, reproduction, genetics, life cycle, behavior, feeding habits, ecology, and conservation status of organisms. Articles include some maps, black-and-white images, and contain extensive references. Appropriate for research libraries.

Kays, Roland W., and Don E. Wilson. *Mammals of North America*. 2nd ed. Princeton, N.J.: Princeton Univ. Pr., 2009. (ISBN: 9-780-6911-4278-4).

Mammals of North America is a detailed field guide to 462 species of North American mammals. Text descriptions include size, weight, migration, and feeding behaviors. It contains habitat coverage map for each species. Color illustrations are annotated and can include information about sexual dimorphisms, seasonal changes in physical appearance, and differences between adult and juveniles. This is a short and handy field guide that includes index, glossary, and footprint and scat identification keys where appropriate.

Wilson, Don E. and Sue Ruff, eds. *Smithsonian Book of North American Mammals*. Vancouver, Canada: Univ. of British Columbia Pr., 2003. (ISBN: 9-780-7748-0762-3).

Articles are approximately 5 to 10 paragraphs long. Summarized for each article are organism size, identifying features, common names, synonyms, status, and subspecies. Most articles contain 1 to 3 references. It includes index and glossary.

Important Periodicals

We conducted several searches in Web of Science for articles on North American mammals. Using the Source Title option, results were analyzed for most common journal titles. The journals listed below contain the highest frequency of relevant publications for North American mammals. These peer-reviewed titles are listed in order of impact factor.

Journal of Biogeography. Oxford: Wiley-Blackwell, 1974–. 12 issues per year. (ISSN: 0305-0270).

The *Journal of Biogeography* publishes papers dealing with all aspects of species distribution in space, within ecological systems, and across geologic time. It is global in scope and publishes a variety of traditions and viewpoints within the discipline.

American Museum of Natural History Bulletin. New York: Museum of Natural History Library, 1881–. Irregular. (ISSN: 0003-0090).

The *Bulletin* publishes longer monographic pieces relating to zoology, paleontology, and geology.

Journal of Vertebrate Paleontology. London: Taylor & Francis, 1980–. 6 issues per year. (ISSN: 0272-4634).

The *Journal of Vertebrate Paleontology* is the publication of the Society of Vertebrate Paleontology. It publishes articles on evolution, morphology, taxonomy, phylogeny, paleoanthropology, fossils, and fossilization.

Journal of Mammalogy. Lawrence, Kans.: Allen, 1919–. 24 issues per year. (ISSN: 0022-2372).

The *Journal of Mammalogy* is published by the American Society of Mammalogists. Its coverage includes ecology, genetics, conservation, behavior, and physiology.

Canadian Journal of Zoology—Revue Canadienne de Zoologie. Ottawa, Canada: National Research Council Research Pr., 1929–. 12 issues per year. (ISSN: 0008-4301).

The *Canadian Journal of Zoology* publishes original research and review articles in the broad field of zoology including behavior, ecology, genetics, pathology, evolution, among others.

Databases

We reviewed the collection of databases available at the local land grant institution, evaluating their content relevance for research libraries. We isolated three databases as containing both comprehensive and specific scientific information about North American mammals.

Academic Search Complete, EBSCO

Academic Search Complete contains abstracts for more than 8,000 journals and full text for more than 4,500 journals. National Geographic coverage goes back to the 1880s. Explode the subject term *mammals*, then freestyle search for *north america**, which results in 500+ articles. Results include peer-reviewed journals, newspapers, and magazines. Search within results for specific mammal.

Wildlife and Ecology Studies Worldwide

This database covers a wide range of wildlife topics, including fish, fauna, birds, and mammals around the world; their habitats and behaviors; and management issues including disease, health, and interactions with humans. Includes publications from the U.S. Fish and Wildlife Service, such as field studies, research reports, and surveys not captured by other databases. Use the subject index to limit search terms to *north america* and *mammals*, resulting in approximately 2,000 articles in the last 10 years, then use freestyle searching for specific mammal or topic.

Web of Science

This database searches Science Citation Index and Social Sciences Citation Index. The search *mammal* AND "north america**"* results in 2,000+ articles. Results can be limited by Web of Science's category (e.g., ecology or zoology), or use the Refine Search box to freestyle search for a specific mammal. The same search in Web of Knowledge (which includes Biological Abstracts and Zoological Record) results in more than 185,000 records; we recommend searching those databases separately and using the option of limiting by specific taxa.

DVDs

Mutual of Omaha's Wild Kingdom: Mammals of North America. Directed by Marlin Perkins, 2005. USA: Brentwood Home Video. DVD.

Mutual of Omaha's Wild Kingdom: Mammals of North America Volume 2. Directed by Marlin Perkins, 2006. Newbury Park, Calif.: BCI Eclipse Company. DVD.

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Together, these videos include the 20 most requested episodes of *Mutual of Omaha's Wild Kingdom* collected throughout almost 30 years of production. Includes stories and footage of polar bears, problem bears, otter, coatimundi, desert big-horns, sea cows, grizzly bears, big horn sheep, and wolves, among others.

THE AMERICAN BLACK BEAR

We applied the same strategies used to produce the recommendations above to the case of the American black bear. American black bears emerge from hibernation in spring simultaneous with increased human visitation to American black bear habitat. Although generally reclusive, American black bears will forage where food is available, including in areas frequented by humans, so human–black bear encounters begin occurring around this time. The research strategies we employed can be replicated for any mammal of interest.

Web Resources

American Black Bear (http://en.wikipedia.org/wiki/American_Black_bear).

An excellent starting point for learning basic facts about the American black bear, this Wikipedia entry contains sections on taxonomy, physical characteristics, behavior, range and population sizes, and relationships with humans. Images supplement each section except the taxonomy chapter. The entry references more than 60 unique sources, with more than half of those books or peer-reviewed literature, and most sources other than books are available via links. Updated or edited approximately three times per month.

Bear League (www.savebears.org).

Providing authoritative information on successful coexistence between humans and American black bears, this website includes downloadable fact sheets, easily accessible suggestions for recreation in bear country, and current news of human–bear conflicts. The group is based in the Lake Tahoe basin, but the recommendations are applicable across the American black bear's range. Focused entirely on coexistence, there is little biological or ecological information provided.

Bear Viewing Association (<http://web.mac.com/gobearviewing/iweb/gobearviewing/Home.html>).

The web presence of the Bear Viewing Association (run by Steve Stringham in Alaska, also president of WildWatch at www.bear-viewing-in-alaska.info), this website is comprehensive in its recommendations for finding locations, choosing guides, organizing trips, and improving photography for bear viewing expeditions. Highly informative but visually distracting, this website is the best resource for planning a bear viewing trip anywhere.

International Association for Bear Research and Management (www.bearbiology.com).

This website is the home for the premier professional association in bear studies. The site includes basic educational material on all bears, but more importantly holds membership and contact information for bear specialists, current and archived newsletters, a job board, and announcements of conferences and workshops, among other items. The website contains PDFs of articles published in the journal *Ursus* through 2008.

North American Bear Center (www.bear.org).

The award-winning website of the North American Bear Center in Ely, MN provides access to fact sheets, research projects including supplementary video, live video feeds to denning bears, daily research updates, and other information. Associated with the Lily the Black Bear Facebook site, where moderators have answered questions submitted by 130,000 fans, both sites are platforms for promoting education and outreach. Some material is cross-posted to www.bearstudy.org—the web outreach of the Wildlife Research Institute (Lynn Rogers is the chair of both not-for-profit organizations).

Books

Craighead, Lance. *Bears of the World*. Stillwater, Minn.: Voyageur, 2000. (ISBN: 9-780-8965-8503-4).

This book includes several chapters general to bears, and a chapter on each bear species extant today. This text contains the most comprehensive description of the evolution of bears, although certain details are updated in Brown 2009 (listed under “Reference Sources” below) and other recent research, and evolutionary consequences are described throughout. Supplemented by full color photographs and species distribution maps, this book provides a beyond-the-basics introduction to the eight bear species. The final chapter addresses conservation, a topic even greater in importance now than when the book was published.

DeBruyn, Terry D. *Walking with Bears: One Man's Relationship with Three Generations of Wild Bears*. New York: Lyons, 1999. (ISBN: 9-781-5582-1642-6).

By describing the trials and triumphs of his research on black bear behavior, DeBruyn introduces readers to the inner lives of one bear family over the course of a year. By recounting in detail both the daily rituals of research and the daily patterns of black bear life, this work dispels common myths about black bears and reveals the challenges of their continued existence in North America. This book was the first one to combine rigorous research with engaging descriptions targeted to the non-scientist. Although out of print, this work is available at 291 libraries in the United States. Includes color plates, some black-and-white photography, and reference notes.

Herrero, Stephen. *Bear Attacks: Their Causes and Avoidance*. Revised edition. Guilford, Conn.: Globe Pequot, 2002. (ISBN: 9-781-5857-4557-9).

Herrero provides significant insight into the circumstances leading to, and mechanisms for surviving, attacks by both black bears and brown (grizzly) bears. He recounts numerous cases in detail, and explains how both intentional and inadvertent actions can exacerbate or ameliorate the likelihood and severity of attacks. This book provides recommendations for safe hiking and camping in bear country.

Rockwell, David. *Giving Voice to the Bear: North American Indian Myths, Rituals, and Images of the Bear*. Revised edition. Lanham, Md.: Roberts Rinehart, 2003. (ISBN: 9-781-5709-8393-1).

Bears—both black and brown—hold a prominent place in the mythologies of most indigenous North American cultures. Rockwell compares and synthesizes the various conceptions of the bear in this book. Stories are not the focus; rather, Rockwell briefly recounts myths or rituals to explain their underlying significance. This work is the only book to examine bears only in native mythology. Black-and-white art reproductions and photographs supplement the work. Text contains an index, bibliography, and notes.

Smith, Dave. *Backcountry Bear Basics*. 2nd ed. Seattle, Wash.: The Mountaineers, 2006. (ISBN: 9-781-5948-5028-8).

This book explains safety procedures for activities in bear country. Smith acknowledges common myths, then describes why they are myths. He lists differences between black bears and brown bears and what to do in encounters with each species. The book contains notes with reference, a recommended reading list, and an index. It includes photos and drawings to support and illustrate recommendations.

Smith, Richard P. *Black Bear Hunting*. Mechanicsburg, Pa.: Stackpole, 2007. (ISBN: 9-780-8117-0269-0).

Arguably the most complete work on black bear hunting, Smith intersperses his recommendations with personal stories of hunts—both successful and unsuccessful. Chapters range from planning and choosing guides to tracking to skinning and mounting trophy animals. A final chapter addresses hunters and hunting in the context of conservation. An authoritative work, this work is completely revised and updated from Smith's earlier *Hunting Trophy Black Bears* (1990), and more wide-ranging than his *Book of the Black Bear* (1985).

Reference Sources

"American Black Bear." In *Encyclopedia of North American Mammals*. Edited by Amy-Jane Beer and Pat Morris, 38–41. San Diego, Calif.: Thunder Bay, 2004. (ISBN: 9-781-5922-3191-1).

Basic statistics are given in a summary panel, and the entry prose describes behavior, intelligence, habitat preferences, interactions with humans, hibernation, and reproduction. It is appropriate as a comprehensive introduction for novices. The authors are biologists, and their scientific interest in mammals is apparent in the writing but not overwhelming. A glossary, useful websites, further reading, and index are included in the encyclopedia.

Bowers, Nora, Rick Bowers, and Kenn Kaufman. *Field Guide to Mammals of North America*. New York: Houghton Mifflin, 2004. (ISBN: 9-780-6183-8296-5).

As a full-color field guide with descriptions, this work provides several paragraphs of natural history on the American black bear. Small photos show the various color phases of the bear. Distribution, size, and identifying characteristics are given. The book has a sturdy binding and cover for field use. This work is a good alternative to Fiona Reid's *Peterson Field Guide to Mammals of North America*. (Houghton Mifflin Harcourt, 2006 [ISBN: 0-3959-396-2]).

Brown, Gary. *The Bear Almanac: A Comprehensive Guide to the Bears of the World*. Revised edition. Guilford, Conn.: Lyons, 2009. (ISBN: 9-781-5992-1331-6).

This book is a compendium of facts about the eight existing species of bears today. Ranging from biogeographic distribution to physiology to human use of bears and bear parts, this work provides species comparisons alongside unique aspects of each animal. The text is supplemented by numerous line drawings, full color photos, and charts. This updated edition incorporates recent research on life history, population status, and conservation status.

Garshelis, David L. "Family Ursidae." In *Handbook of the Mammals of the World*. Edited by Don E. Wilson and Russell A. Mittenmeier, 448–85. Barcelona, Spain: Lynx Edicions, 2009. (ISBN: 9-788-4965-5349-1).

The bear chapter describes all eight species of bears and begins with 37 pages of introductory material—both specific to individual bear species and comparative. The text is supplemented by several color photos per page. The American black bear entry lists subspecies and distribution, habitat, feeding ecology, activity patterns, home range and movement, breeding, and conservation status. It includes 39 references to primary research in the American black bear entry. Garshelis is the Bear Project Leader for Minnesota DNR and Bear Specialist Group co-chair for the International Union for the Conservation of Nature.

Mertz, Leslie Ann. "Bears." In *Grzimek's Animal Life Encyclopedia*, 2nd ed. Edited by Michael Hutchins, 295–307 (Farmington Hills, Mich.: Gale, 2003). (ISBN: 9-780-7876-5362-0).

This article provides information on the American black bear as well as the seven other bear species. It includes photos and maps. The article closes with list of resources including books, periodicals, organizations, and other references.

Tracy, Diane M., Frederick C. Dean, Candy M. Anderson, and Teresa M. Jordan. *Black Bear Bibliography*. Fairbanks: Univ. of Alaska, 1982.

This extensive bibliography includes peer-reviewed articles, popular writings, books, conference proceedings, research data, government fact sheets, international publications, unpublished materials, and many other source types in a diverse collection of more than 3,500 items. Entries are not annotated but go back as far as 1630.

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Important Periodicals

In addition to the periodical titles above, we suggest these titles for a collection focusing specifically on the American black bear. These peer-reviewed titles are listed in order of impact factor.

Journal of Mammalogy. Lawrence, Kans.: Allen, 1919–. 24 issues per year. (ISSN: 0022-2372).

The *Journal of Mammalogy* is published by the American Society of Mammalogists. Its coverage includes ecology, genetics, conservation, behavior, and physiology.

Journal of Wildlife Management. Hoboken, N.J.: Wiley, 1937–. 8 issues per year. (ISSN: 0022-541x).

The *Journal of Wildlife Management* covers wildlife science, management and conservation. Archives (through volume 67) are available to all via JSTOR.

Ursus. Knoxville, Tenn.: International Association for Bear Research and Management, 1968–. 2 issues per year. (ISSN: 1537-6176).

Ursus publishes original research, reviews, opinions, and public policy related to all aspects of bear management and research worldwide.

Canadian Field Naturalist. Ottawa: Ottawa Field-Naturalists' Club, 1879–. 4 issues per year. (ISSN: 0008-3550).

Canadian Field Naturalist publishes scientific papers by amateur and professional naturalists in any field of natural history relevant to Canada and includes book reviews, status reports for individual species, news, and commentaries.

Human–Wildlife Interactions. Logan, Utah: Jack H. Berryman Institute, 2007–. 2 issues per year. (ISSN: 2155-3858).

Human–Wildlife Interactions publishes manuscripts on all aspects of human and wildlife encounters—interactions that adversely affect either group. Topics include wildlife ecology, animal behavior, management applications, economics, and human dimensions. Publications include letters, book reviews, opinions, and policy pieces.

Databases

Academic Search Complete, EBSCO.

This general knowledge, multidisciplinary database contains approximately 500 scholarly and popular writings on the black bear. For specific results, search for *DE*= "BLACK bear", which will yield approximately 500 results. Exploding the term searches for (*DE* "BLACK bear" OR *DE* "GLACIER bear" OR *DE* "KERMODE bear") and adds only 10 articles to the results.

AGRICOLA, U.S. Department of Agriculture.

AGRICOLA indexes a variety of publications including agriculture, veterinary science, plant sciences, and economics.

Search for SA "Ursus americanus," which yields approximately 120 results.

ProQuest Dissertation and Theses, ProQuest.

Dissertations and theses often contain extensive bibliographies themselves and make an excellent source for a variety of information about black bears. Advance search for "ursus americanus" using the dropdown option "Citation and abstract," yields approximately 100 results.

Web of Science, Thomson Corporation.

For high retrieval, search *Topic*=(*american black bear*" OR "ursus americanus"), which yields approximately 635 results. Sort by date for recent publication or by times cited for highly cited articles. Refine options include Zoology, Ecology, and Veterinary Sciences, among others.

Influential Authors and Articles

We used both Google Scholar and Web of Science to locate highly cited or otherwise influential articles on the American black bear. The articles below are organized into three groups: (1) Ecology—articles describing American black bears in their environment, including social organization, feeding behavior, and habitat use; (2) Evolution—articles describing the genetics, evolutionary history, and diversification of American black bears; and (3) Human Relations—articles describing conflicts, management practices, and politics involving American black bears.

Articles are arranged oldest to most recent.

Ecology

Rogers, Lynn L. 1987. "Effects of Food Supply and Kinship on Social Behavior, Movements, and Population Growth of Black Bears in Northeastern Minnesota." *Wildlife Monographs* 97:1–72.

This monograph describes an extensive analysis of social structure, home range, feeding behavior, and demography in a single American black bear population over 17 years. Major findings were low reproductive rates, very large home ranges, and low food availability in the Superior National Forest; the single most important factor influencing a bear's life is food availability. The work's scientific value is still high, and it is historically interesting as a record of the state of bear science at the time. It includes more than 150 references and is cited more than 300 times.

Elowe, Kenneth D., and Wendell E. Dodge. 1989. "Factors Affecting Black Bear Reproductive Success and Cub Survival." *Journal of Wildlife Management* 53(4): 962–68.

This long-term study on 18 wild bear families in Massachusetts revealed significant cub mortality, with most deaths occurring immediately following emergence from dens in the first year. Seventy-five percent of male cubs that

survived the first year were killed in their second year when dispersing. Food and habitat were not limiting factors for this population; hunting, mother behavior, and disease were the major sources of mortality. This article has been cited more than 120 times.

Hilderbrand, G. V., S. D. Farley, C. T. Robbins, T. A. Hanley, K. Titus, and C. Servheen. 1996. "Use of Stable Isotopes to Determine Diets of Living and Extinct Bears." *Canadian Journal of Zoology* 74(11): 2080–88.

This work describes a method that significantly increased the possible scope of ecological work on free-living animals (where direct observation of diet or fecal studies may not be feasible or accurate). A variety of tissues were used to differentiate the proportions of meat and vegetation in the diet and to identify food from marine or terrestrial sources. The method has been applied to organisms ranging from migratory songbirds to horses. This article has been cited more than 200 times.

Welch, Christy A., Jeffrey Keay, Katherine C. Kendall, and Charles T. Robbins. 1997. "Constraints on Frugivory by Bears." *Ecology* 78(4): 1105–19.

The research team examined food choice, bite size, bite rate, berry size, and berry abundance to establish feeding patterns leading to maximal energy intake for captive brown and American black bears and for free-living brown bears. They observed the most efficient foraging on plants with bunched berries and low leaf-to-fruit ratio and concluded that these foraging parameters impose strong limits on bear size and subsequent reproduction. This is one of more than 50 studies performed at Washington State University's Bear Research Facility and has been cited more than 80 times.

Evolution

Paetkau, David, and Curtis Strobeck. 1994. "Microsatellite Analysis of Genetic Variation in Black Bear Populations." *Molecular Ecology* 3(5): 489–95.

The article describes the development of genetic markers and application to determining population differences in genetic variation, and found meaningful differences in the amount of variation in populations. Most important as an explanation of a relatively new genetic technique. This article has been cited more than 270 times.

Wooding, Stephen, and Ryk Ward. 1997. "Phylogeography and Pleistocene Evolution in the North American Black Bear." *Molecular Biology & Evolution* 14(11): 1096–95.

An early study applying molecular techniques to bear studies, the researchers found historical separation and recent mixing between eastern and western populations. They conclude that forest fragmentation in the late Pleistocene has strongly influenced distributions of extant forest animal species. This article has been cited more than 60 times.

Talbot, Sandra L., and Gerald F. Shields. 1996. "A Phylogeny of the Bears (Ursidae) Inferred from Complete Sequences of Three Mitochondrial Genes." *Molecular Phylogenetics & Evolution* 5(3): 567–75.

Yu, Li, Yi-Wei Li, Oliver A. Ryder, and Ya-Ping Zhang. 2007. "Analysis of Complete Mitochondrial Genome Sequences Increases Phylogenetic Resolution of Bears (Ursidae), a Mammalian Family that Experienced Rapid Speciation." *BMC Evolutionary Biology* 7:198.

Considered together, these two articles describe the rapid diversification of the Ursidae family, placement of the giant panda in the bear family, and reveal the biases and challenges of phylogenetic techniques. Talbot's early work was the most definitive phylogeny when published. Yu's recent study clarifies unresolved questions from Talbot's work. Talbot and Shields has been cited more than 80 times. Yu et al. has been cited more than 20 times.

Human Relations

Carlstead, Kathy, John Seidensticker, and Robert Baldwin. 1991. "Environmental Enrichment for Zoo Bears." *Zoo Biology* 10(1): 3–16.

Describes feeding and foraging strategies to reduce stereotypic behavior. Reports survey results regarding ursine diets at 67 zoos. Recommendations have been applied to many animals, from fish to giraffes. This article has been cited more than 60 times.

Noyce, Karen V., and David L. Garshelis. 1997. "Influence of Natural Food Abundance on Black Bear Harvests in Minnesota." *Journal of Wildlife Management* 61(4): 1067–74.

This study found that bear harvest data (i.e., hunting takes) was not informative about overall population status, but fall food abundance was. It provides an alternate perspective regarding data sources for management officials. This article has been cited more than 20 times.

Beckmann, Jon P., and Joel Berger. 2003. "Rapid Ecological and Behavioural Changes in Carnivores: The Responses of Black Bears (*Ursus americanus*) to Altered Food." *Journal of Zoology* 261(2): 207–12.

This study found that access to garbage significantly altered black bear behavior—urban bears (those eating human garbage) were less active, more nocturnal, and dened later and for shorter periods than their rural counterparts. This article is notable for the short time scale over which these changes occurred and has been cited more than 30 times.

Hristienko, Hank, and John E. McDonald Jr. 2007. "Going into the 21st Century: A Perspective on Trends and Controversies in the Management of the American Black Bear." *Ursus* 18(1): 72–88.

The most complete review of government management practices to date. Analysis revealed that restrictive hunting

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was associated with increased bear–human conflict. The article recommends both hunting and education programs to attain sustainable black bear populations. This article has been cited more than 10 times.

DVDs

Bears. Directed by David Lickley. 2001. Burbank, Calif.: Sling-shot Entertainment, 2008. (ISBN: 9-1388-0020-1). DVD.

This IMAX production of the National Wildlife Federation includes footage of polar bears in the arctic tundra, grizzly bears in Alaska, and black bears in the Northern Rockies. It includes detailed footage of a mother black bear and her cubs. An inside look at the daily life of bears with commentary about the potential struggles they may face.

Bears of Sequoia. Directed by Steven M. Bumgardner. 2006. Three Rivers, Calif.: Sequoia Natural History Association, 2007. DVD.

Documents the life of the American black bear and describes the events of several human encounters. It is featured

at the Lodgepole Visitor Center in Sequoia National Park and includes more than 50 bears that live in the park. Available from SequoiaHistory.org.

Bearwalker of the Northwoods. Directed by Ted Oakes. Ely, Minn.: North American Bear Center, 2010. DVD.

This one-hour BBC production follows Dr. Lynn Rogers as he uses trust to establish relationships with two families of wild bears. Challenges experienced by both the bears and their researchers are explored over the course of a year. This title was produced by the same team that created the Planet Earth series. It is available from Bear.org.

Growing Up Wilderness. Produced by Animal Planet. Santa Monica, Calif.: Genius Entertainment, 2008. DVD.

This film tracks the life of four juvenile animals as they navigate the unfamiliar territory of the wild. Charlie the bear cub, rescued from an Internet auction, learns how to live in the wild with the help of the Minnesota Wildlife Science Center.