THE BEAR BIBLIOGRAPHY PROJECT

FREDERICK C. DEAN, Alaska Cooperative Park Studies Unit, University of Alaska, Fairbanks 99701
DIANE M. TRACY, Alaska Cooperative Park Studies Unit, University of Alaska, Fairbanks 99701

Abstract: Over 6,000 references on bears have been assembled, including published and unpublished materials. The FAMULUS programs are being used to produce and search files on brown and American black bears (*Ursus arctos* and *U. americanus*). As of July 1977, over 1,000 references on each of these two species had been computerized. Effective searches by subject (based on title), author, date, and keywords (for about 5 percent) are possible. Draft review copies were distributed. Announcements of general availability and search costs will be made as soon as feasible. Work is continuing, although additional support will be needed for maximum productivity.

The project objective is to produce an extensive, computerized bibliography on bears in order to reduce greatly the need for repetitive bibliographic searches. The U.S. National Park Service contracted this project through the Alaska Cooperative Park Studies Unit. National Park Service concerns dictated that the initial emphasis be placed on black bears and brown bears in North America, although we hope eventually to computerize citations on all species of bears on a worldwide basis. We expect to produce a set of files, stored in computer-readable format, which can be edited, searched, and printed out to suit the needs of many different workers. We will attempt to provide a clear specification statement covering the procedures for organizing and handling the material collected as well as an explicit statement of what has been searched and the search strategy.

The production of partial and even rather extensive bibliographies on bears is not new. We started the project with an extensive base of references that Dean had collected over a period of 20 years. The original file includes material from such bibliographies as that in Couturier's (1954) massive work, Hatler's (1964) supplement to Couturier, black bear bibliographies by Tigner and Gilbert (1960), Bray and Barnes (1967), and Eagar and Stafford (1974), several years' worth of ASCA profile results from the Institute for Scientific Information, Termatrex searches of the Review of Recent Literature produced by the American Society of Mammalogists for the entire period of their availability, and other structured searches.

We would like to acknowledge collectively the help of many members of the Bear Biology Association who responded to our request for assistance. Special thanks for very substantial contributions are due K. Lloyd and F. Bunnell, University of British Columbia; V. Cahalane, Clarksville, New York; J. Rothman, Hot Springs, Arkansas; W. Tietje and R. Ruff, University of Wisconsin; the Canadian Wildlife Service; and the U.S. National Park Service.

METHODS

Our current procedure is to collect as many references as possible, for both published and unpublished technical and semitechnical reports, and for popular publications (when the information in the latter seems to warrant inclusion). The initial search strategy includes all species and the world's literature insofar as possible. In general, the incorporation of the material into the computer will follow a scheme of priority that favors brown and black bears and North American information. Recent information receives greater attention than older information, and the priority of one paper over another is judged subjectively.

A system of programs called FAMULUS (Burton et al. 1969) is being used for the construction, editing, and manipulation of the files. The programs were developed by the U.S. Forest Service and have been used widely. They are currently available in versions that will run on IBM, CDC, and HIS computers (possibly others as well). We will not describe FAMULUS in detail. End users will be most interested in the capabilities of the programs SEARCH, PRINT (GALLEY), and PUNCH (OSSIFY). The SEARCH program permits individually constructed searches of either simple or complex design; logical combinations of "and," "or," and "not" are then possible, e.g., references simultaneously dealing with "brown bear" and "attacks" but not "Alaska" published after 1969. The PRINT and PUNCH programs provide convenient means of obtaining copies of either the entire file or selected parts of it. In particular, the PUNCH program will allow the transfer of card-image files from one computer to another.

FAMULUS handles the information associated with a reference in several fields which in our case have been specified for author, date of publication, title, publication or publisher, characteristics (such as number of references, language, source of hard copy if possible, date of inclusion in the file) and keywords; unspecified fields have also been reserved. Since the

EDIT program allows internal modifications and additions within citations, we are including some references in the computer file that have not yet been fully processed. Keywords will be added as rapidly as possible. FAMULUS allows searches on one or more specified fields; thus, even those papers without keywords may be searched on the basis of the words in the titles, the author field, and other fields.

Separate computer files are being made for the black bear, the brown bear, general bear information, and other species as one group. The latter collection will be split as the number of entries grows. Keywording is based on a thesaurus evolved at the University of Alaska several years ago as an outgrowth of the one used by the Fish and Wildlife Reference Service.

Originally the project was to include abstracts. Current interpretations of the recently changed copyright law suggest that we may not be able to use even author's abstracts from copyrighted periodicals or such sources as *Biological Abstracts*. We clearly will not be able to write many new abstracts. Doing a thorough job of keyword indexing will be much more rewarding.

All references encountered have been transcribed to a card file from which coding sheets are prepared. The data are then typed into a computer file and edited after proofing against the coding sheets. The file is then run through the FAMULUS EDIT program, adding the references and the associated information to what was already on the FAMULUS file. From this point, it may be searched and reproduced.

RESULTS

As of July 1977, our collection included about 4,500 citations for black and brown bears and about 1,100 references for other species. We are still a long way from having complete bibliographies for any of these species. As of July 1977, working computer files contained more than 1,100 references on the brown bear and over 1,000 on the black bear. Approximately 5 percent were assigned keywords (in some cases more than 40 per citation). Draft copies and a statement describing the search were distributed to more than 30 cooperators with hopes of generating useful criticism. In addition, authors with several references have been given an opportunity to proof our listings of their work.

An interactive search demonstration provided at the Kalispell meeting served to introduce the potential usefulness of the computerized files to the conferees. Users will ultimately be able to order individually tailored searches across files based on reasonably clearly specified boundaries; charges have not been worked out yet but should be moderate. Individuals wishing to operate the entire file on their own computer system can make arrangements to do so.

What is the project's future? We probably have knowledge of a substantial proportion of the generally known and published material, especially for North America. However, if this project is to be of maximum possible use, we need additional help. Individual workers can provide complete lists of their own papers and unpublished reports and advise us of material we may not otherwise locate. That sort of cooperation will measurably improve the quality of the end result. Since a bibliography is intended to ease the task of someone seeking information, completeness and accuracy are extremely important!

Once the file is ready for serious searching and/or reproduction, we expect to announce its availability and the associated costs. In addition to computer searches, there should be hard-copy editions available. After this initial job is done, there will have to be a continuing effort aimed at keeping the bibliographies current. However, a small annual effort on the part of each of those working with bears should reduce our individual requirements for extended time in the search phase of library work. It would be especially helpful if workers outside of North America could keep us up to date on their publications.

We are currently seeking financial support that will permit full-time rather than sporadic continuation, at least until keyword assignment of the present collection is completed.

LITERATURE CITED

BRAY, O. E., AND V. G. BARNES. 1967. A literature review on black bear populations and activities. Natl. Park Serv. and Colorado Coop. Wildl. Res. Unit, Fort Collins. 34pp.

BURTON, H. D., R. M. RUSSELL, AND T. B. YERKE. 1969. FAMULUS: a computer-based system for augmenting personal documentation efforts. USDA For. Serv. Res. Note PSW-193. 5pp.

COUTURIER, M. A. J. 1954. L'ours brun, *Ursus arctos* L. Published by author. Grenoble, France. 904pp.

EAGAR, D. C., AND S. K. STAFFORD. 1974. A bibliography of the black bear (*Ursus americanus*) in North America: 1960-1973. Proc. Eastern Workshop on Black Bear Manage. and Res. 2:229-238.

HATLER, D. 1964. A contribution toward supplementing a bibliography on the brown bear (*Ursus arctos* L.). Univ. of Alaska, Fairbanks. 20pp. (Unpubl.)

TIGNER, J. R., AND D. L. GILBERT. 1960. A contribution toward a bibliography on the black bear. Colorado Dept. Game and Fish Tech. Bull. 5. 42pp.