DOCUMENTATION STANDARDS FOR AUTOMATIC DATA PROCESSING IN MAMMALOGY

VERSION 2.0

AMERICAN SOCIETY OF MAMMALOGISTS
COMMITTEE ON INFORMATION RETRIEVAL
SUZANNE B. McLAREN, CHAIR

PETER V. AUGUST, LESLIE N. CARRAWAY, PAISELY S. CATO, WILLIAM L. GANNON, MARIE A. LAWRENCE, NORMAN A. SLADE, PHILIP D. SUDMAN, RICHARD W. THORINGTON, JR., STEPHEN L. WILLIAMS, AND SUSAN M. WOODWARD

1996

To obtain a copy of this publication, please contact:

Sue McLaren
O'Neil Research Center, CMNH
5800 Baum Blvd.
Pittsburgh PA 15206-3706

This document is also available in ASCII, Wordperfect 5.1, or PostScript format over the Internet. You can obtain copies via anonymous FTP using the following sequence of instructions (your commands are in italics):

For ASCII format	For PostScript	For WordPerfect 5.1
FTP edcserv.edu.uri.edu	*FTP edcserv.edc.uri.edu*	*FTP edcserv.edc.uri.edu*
Name: *anonymous*	*Name: anonymous*	Name: *anonymous*
Password: *anonymous*	Password: *anonymous*	Password: *anonymous*
ftp> *get mammdoc.asc*	ftp> *binary*	ftp> *binary*
ftp> *quit*	ftp> *get mammdoc.ps*	ftp> *get mammdoc.wp*
	ftp> *quit*	ftp> *quit*

Note: Before you download, get ASCII file called *mammdoc.doc*. This file will contain updates and further instructions.

ISBN 0-89338-051-2

DOCUMENTATION STANDARDS FOR AUTOMATIC DATA PROCESSING IN MAMMALOGY

VERSION 2.0

AMERICAN SOCIETY OF MAMMALOGISTS
COMMITTEE ON INFORMATION RETRIEVAL
SUZANNE B. McLAREN, CHAIR

PETER V. AUGUST, LESLIE N. CARRAWAY, PAISELY S. CATO,
WILLIAM L. GANNON, MARIE A. LAWRENCE, NORMAN A. SLADE,
PHILIP D. SUDMAN, RICHARD W. THORINGTON, JR.,
STEPHEN L. WILLIAMS, AND SUSAN M. WOODWARD

1996

ISBN 0-89338-051-2

CONTENTS

INTRODUCTION ii
I. INSTITUTIONAL DATA I-0
A. INSTITUTIONAL ACRONYM I-1
B. DIVISIONAL ACRONYM I-2
C. COLLECTION CATALOG NUMBER I-3
D. AVAILABILITY STATUS I-4
E. ACCESSION NUMBER I-5
F. SPECIAL NUMBER I-6
G. DONOR I-7
H. DATA CATALOGED I-8
I. PUBLISHED RECORDS I-9
J. TYPE DESCRIPTION I-10
II. TAXONOMIC DATA II-0
A. ORDER II-1
B. FAMILY II-2
C. GENUS II-3
D. SPECIES II-4
E. SUBSPECIES II-5
III. SPECIMEN DATA III-0
A. TYPE OF PRESERVATION III-1
B. SEX III-2
C. EXTERNAL MEASUREMENTS III-3
D. WEIGHT III-4
E. AGE III-5
F. REPRODUCTIVE DATA III-6
G. ECOLOGICAL NOTES III-7
H. DATE COLLECTED III-8
I. COLLECTOR III-9
J. COLLECTOR'S NUMBER III-10
K. PREPARATOR III-11
L. PREPARATOR'S NUMBER III-12
IV. GEOGRAPHIC DATA IV-0
A. CONTINENT IV-1
B. COUNTRY IV-2
C. STATE, PROVINCE (FIRST LEVEL POLITICAL SUBDIVISION) IV-3
D. COUNTY (SECOND LEVEL POLITICAL SUBDIVISION) IV-4
E. SPECIFIC LOCALITY IV-5
F. REFERENCE POINT IV-6
G. REFERENCE POINT MODIFIER IV-7
H. TOWNSHIP AND RANGE IV-8
I. ELEVATION IV-9
J. OCEAN IV-10
K. SEA IV-11
L. BAY, INLET, STRAIT, GULF, MAJOR ISLAND GROUP IV-12
M. LATITUDE AND LONGITUDE IV-13
N. UTM IV-14
O. COORDINATE PRECISION INDEX IV-15
V. OTHER DATA V-0
A. REMARKS OR COMMENTS V-1
B. ANCILLARY OR COLLATERAL COLLECTIONS V-2
C. SPECIMEN CONDITION REPORTING V-3
VI. APPENDICES VI-0
APPENDIX A. LISTING OF CATEGORIES BY USAGE STATUS VI-1

APPENDIX B. LISTING OF STANDATD ABBREVIATIONS VI-2
APPENDIX C. NOTATIONS OF THE CHIN SYSTEM..... VI-3
APPENDIX D. SAMPLE DATA RELEASE AGREEMENT VI-4
VII. AKNOWLEDGMENTS VII-1
VIII. LITERATURE CITED..... VIII-1

INTRODUCTION

Background.--In 1979, the American Society of Mammalogists' Committee on Information Retrieval published one of the first documentation standards guides (Williams et al., 1979) for the computerization of museum specimens in any discipline. The idea of computerizing collections was less than a decade old and the capability of networking among collections seemed a dream that was almost within reach. A special workshop funded by the National Museums Act (Grant No. FC-5-50896) was held to develop plans for a national network called NIRM (Network for Information Retrieval in Mammalogy). One of the principal aims of the workshop was to develop data documentation standards that would ultimately be used among networking collections. In planning a national network, a basic set of specimen data was declared "mandatory." Documentation Standards for Automatic Data Processing in Mammalogy (Williams et al., 1979) was an outgrowth of that workshop.

In the years since the NIRM workshop, hardware and software technology have moved much closer to making the idea of networking a reality. In the meantime, a number of things have occurred with respect to collections and their computerization: 1) some museums have used the Documentation Standards (Williams et al., 1979) publication to develop their databases; 2) some museums were unaware of the publication and developed their own standards; 3) quite a few collections changed the type of database software they were using (McLaren et al., 1989); 4) Geographic Information Systems (GIS) usage has begun to affect the way we look at locality data (McLaren and Braun, 1993); 5) ancillary collection development grew at a rapid rate in many collections; 6) a heightened awareness of specimen care and museum conservation issues has occurred; 7) the National Science Foundation and the Association of Systematics Collections have begun to encourage planning for inter-disciplinary networking; and 8) the Canadian Heritage Information Network (CHIN) utilized an inter-disciplinary approach that provides tested methods of dealing with data handling problems, and may limit the ways in which Canadian mammal collections could choose to follow the standards listed here. As a result of these occurrences, it is time to re-examine the 1979 publication.

Purpose.--The intent of this publication is simply to refine and expand upon the original work. One basic premise was at work in the refinement of the standards. It is recognized that each collection has its own idiosyncracies, and these standards merely serve as a framework. Each collection has peculiarities in content, philosophy, and usage that make strict adherence to a single set of standards difficult. Also, older computer systems may lack the flexibility that newer hardware and software can allow. Comments from committee members during the development of this publication have underscored the diversity of elements that must be considered if a set of standards is to be of value.

Some collections are just beginning to computerize. These can benefit from the hands-on experience that refinement of the original document will provide. For this reason, specific cautionary notes are given within the comments section of some categories.

A large portion of the audience is the group of collections already computerized. Whether this set of standards was used or not, it is inevitable that choices sometimes will be made that do not necessarily fit "the standards." Suggesting that those collections change their paths is not appropriate. The Society of Vertebrate Paleontology has produced their first documentation

standards publication (Blum, 1991). They were met with the same dilemma among their already computerized collections. The treatment of the entire subject of collection computerization and particularly of functional flexibility among documentation standards makes that publication very worthwhile reading. (Available from Michael Novacek, American Museum of Natural History). The fundamental message there, and here, is that the standards serve as a framework within which individual institutions must be allowed to have flexibility. When sharing data, the provider can use the Standards as a checklist to inform the receiver of variations from the Standards. Researchers who interact with Canadian museums and Canadian researchers who deal with non-Canadian institutions should recognize that there are differences between these standards and those developed for CHIN. An attempt has been made to point out common differences between the two standards by including information about CHIN variations in Appendix C in this document.

Essential, preferred, and optional fields.-- As mentioned earlier, the NIRM workshop developed a list of "mandatory" fields. The fields have been separated into "Essential", "Preferred", and "Optional" (Appendix A). The essential fields include those that each networking partner should expect to receive when transmitting data. The preferred fields are those that have proven useful for research and collection management according to the experience of current committee members. The "optional" fields are ones that may be useful to some collections. Clearly, the use of all the fields mentioned in this document would require considerable effort in data input, verification, maintenance, and disk space.

New fields.--The new documentation standards for ancillary collections data and specimen condition reporting will no doubt require the same kind of refinement after several years of broad, hands-on experience. Many older systems are based on software that employs a single flat file. Newer software provides the mechanism for true relational database management. With these latter systems, data subsets can be linked to the main specimen record database. Although the use of multiple linked subsets can slow record processing, it can save computer storage space. It also allows for the development of a dataview (i.e. subset of the database) that provides only portions of the specimen record to outside users. A linked subset arrangement is ideal for the recording of ancillary collections data and specimen condition reporting. This is particularly true because each of these new collection data entities involves more than a single field. Inclusion of these fields in the main database would require a considerable expansion of the specimen record. Collections in the development stage of computerization would be well-advised to understand the differences between flat file and relational database software in order to maximize their future capabilities.

Ethics.--As is the case with many new technologies, the topic of ethics in collection data exchange is becoming an important issue. In 1988, the Committee on Information Retrieval published a set of guidelines for usage of computerized mammal collection data (McLaren et al, 1988b). Basic tenets of those guidelines include the ideas that 1) data providers would not knowingly provide erroneous data and 2) data receivers would not disperse data to other users without acknowledging and informing the data provider. The Association of Systematics Collections (ASC) has also addressed the issue of data receivers who use collected information to build a new database which is later dispersed as though it is owned by the receiver (McLaren, 1993). ASC has suggested the development of a Collections Data Transmission Agreement to be used when data providers feel it is necessary to establish an understanding with data receivers about the ultimate use of collections data. In the late 1980's, it was felt that computerized collections data were covered by federal Copyright Law (McLaren, 1988a, 1988c), but recent U.S. Supreme Court decisions have clouded this issue. Similarly, in Canada, two publications (Erola and Fox, n.d.[< 1985]; House of Commons, 1985) that suggested proposed revisions to the Canadian Copyright Act discussed the

problems surrounding data stored on electronic media. However, recommendations favoring protection of database contents were not included in the revised Copyright Act. If copyright protection for collection databases does prove to be upheld, each database must be registered in order to make full use of the law. However, the type of document proposed by ASC would serve as a one-on-one understanding that clearly spells out the limits of the data receivers rights in data manipulation and dispersal. Appendix D provides a sample Data Release Agreement which was drawn up with legal assistance and is in use at a number of institutions. The indication of a monetary exchange may discomfort many but this is where legal advice came into play. Contractual agreements are controlled by state law in the United States. In many states and in Canada, if there is not an exchange of money, the data provided are considered a gift which is then used at the user's discretion. The exchange of a nominal fee ($1.00), legally validates the signing of the agreement as a binding contract.

This issue may seem trivial to new computer users. Data shared with professionals and graduate students for their research always has been dispersed through publication for the greater understanding of the subjects being studied. However, data that become buried within a new database and dispersed through the sale of that information can be a serious disservice to the science. Most collections are able to justify their continued existence and specimen care costs by demonstrating collection usage. When the ability to demonstrate that volume of usage is short-circuited by second hand data dispersal, a long-standing system of accountability is eroded. The collection data still are being used but caretakers would be unaware of it.

A second aspect of the subject lies in the recognition that a computerized collection database, while costly to maintain and time-saving to use, is only a tool in the study of mammals and the management of collections. Just because they come from a computer does not mean the data are accurate. Research in mammalogy never should be done strictly with computer output. Specimen examination and identification verification is the responsibility of every primary researcher. Second hand data dispersal eliminates the link to the original collection and to the specimens in question. That is the main reason why such practices should be considered unethical.

Organization of this document.--The body of this document is organized along the format of the original Documentation Standards for Automatic Data Processing in Mammalogy publication (Williams et al., 1979). Data fields are categorized according to I) Institutional Data, II) Taxonomic Data, III) Specimen (unique) Data, IV) Geographic Data, and V) Other Data subsections. Pagination within these subsections is linked specifically to the subsection, much as software users' manuals link page numbers to each chapter. Each field or category is described in detail, using these subheadings: 1) Description, 2) Format, 3) Accepted Variations, 4) Omit Conditions, 5) Contingency Requirements, 6) Valid Examples, and 7) Comments. Although not all subheadings are filled for each field, this arrangement provides a familiar and quick "look-up" when the reader is seeking a solution to a data handling problem. Information has been incorporated about Canadian collections that utilize the Canadian Heritage Information Network (CHIN) (Woodward, 1989a, 1989b). Reference to variations between CHIN and this document are noted under the "Comments" subheading of appropriate fields but detailed under Appendix C. It is hoped that an awareness of variations between documentation standards listed herein and those used by CHIN will facilitate cooperative data exchange between CHIN and non-CHIN mammal collections.

Appendix A provides a re-organized view of all fields based on their inclusion in the Essential, Preferred, or Optional categories.

I. INSTITUTIONAL DATA

Documentation standards in this section apply to data relevant or pertaining to the institution that maintains the collections contained on the computerized database.

CATEGORY: INSTITUTIONAL ACRONYM - Essential (for data transfer) *

DESCRIPTION: This category applies to a unique set of letters that identifies the institution maintaining the mammal collection.

FORMAT: Standardized institutional acronyms were most recently published in "Collections of Recent Mammals in North America" by Yates et al., 1987, Journal of Mammalogy 68(2):Suppl.

ACCEPTED VARIATIONS: None.**

OMIT CONDITIONS: This category was first declared mandatory by NIRM. The information should never be omitted when data are transferred between institutions.

CONTINGENCY REQUIREMENTS: None.

VALID EXAMPLES:

USNM
AMNH
CM
KU
ROM
TTU

COMMENTS: *This is not a field that must be maintained within each individual record. However, for the purpose of data sharing between collections, the capability of adding this category to transmitted data is essential. An awareness of the standard list of acronyms also is important. The list is part of a suite of mammal collections information which is regularly updated by the ASM Committee on Systematic Collections.

**If during the interval between updates, an institution changes its acronym, data senders from that institution should apprise receivers that the transmitted acronym does not conform to the standards as currently published. This is crucial to preventing the gathering of data from two institutions using identical acronyms.

CATEGORY: DIVISION ACRONYM - Optional

DESCRIPTION: The category applies to a unique letter or set of letters that differentiates the mammal collection from other collections maintained by an institution.

FORMAT: Enter the institution's standardized division acronym (example: M = Mammals: O = Ornithology; VP = Vertebrate Paleontology; V = Vertebrate Collections).

ACCEPTED VARIATIONS: None.

OMIT CONDITIONS: If this category is adopted by the institution is should not be omitted.

CONTINGENCY REQUIREMENTS: None.

VALID EXAMPLES:

M
V

COMMENTS: Current initiatives for interdisciplinary networking and expanded usage of collection databases for ecological research justifies inclusion of this field for future use. It can be added to transmitted data and need not reside permanently on the database.

CATEGORY: COLLECTION CATALOG NUMBER - Essential

DESCRIPTION: This category applies to a unique sequential number assigned to an individual specimen within the collection.

FORMAT: This category should be numerical and unique within the collection. Punctuation (e.g., commas) should not be recorded in this category. The use of leading zeros is dependent on the capabilities of the institution's computer facilities.

ACCEPTED VARIATIONS: None.

OMIT CONDITIONS: This category was first declared "mandatory" in 1975 and should never be omitted.

CONTINGENCY REQUIREMENTS: None.

VALID EXAMPLES:

75
2729
523184
000156

COMMENTS: The collection catalog number is the most logical field to use as a key field for relational databases. This field is extremely important for output where reference to a specific voucher specimen is needed. Although it is preferable to make this a strictly numeric field for some programming options, some collections have confronted old, numerical series problems by adding the letter "A" to a some catalog numbers (e.g. 1001, 1001A). In so doing, they maintain the important requirement of having a unique identifier for each specimen.

CATEGORY: AVAILABILITY STATUS - Preferred

DESCRIPTION: This category is designed to indicate those specimens that are no longer maintained by the institution, specimens that are not accessible for research purposes, or specimens that are stored irregularly.

FORMAT: Entries in this category consist of a standardized two-character alphabetic code or an asterisk (see VALID EXAMPLES).

ACCEPTED VARIATIONS: Entries adopted for specific internal use should be so noted at the time of data transmission.

OMIT CONDITIONS: This category is omitted for all specimens that are available and are being maintained in the regular collection. If for any reason the specimen or parts of the specimen are stored irregularly, this category can be used to provide that information.

CONTINGENCY REQUIREMENTS: The asterisk generally is used to indicate that additional information is available in the category for REMARKS (e.g. - SPECIMEN NOT FOUND DURING INVENTORY OF JAN 1970 or SPECIMEN EXCHANGED TO TTU on 15 SEP 1982).

VALID EXAMPLES:

* - Discarded; completely unavailable
M - Missing parts
HT - Holotype, stored in type cases
FV - Skin stored in fur vault
EX - Exchanged, provide further information in COMMENTS
EB - Specimen on exhibit, location information in COMMENTS
RK - Head with horns or antlers stored on racks with similar specimens, separated from skin or post-cranial skeleton
LN - On loan; if database is linked to a loan file, this category could be programmed to receive a code when specimen is loaned; category would be emptied upon return of loan when loan database is updated
ES - Endangered species; may limit loan destinations

COMMENTS: The development of this category is the result of the need to identify missing specimens without eliminating relevant information by simple omission. The convenience of locating irregularly stored specimens and designating inaccessible materials for potential borrowers is an outgrowth of the original purpose of this field. As a result this field has high internal use value and may be extremely variable among institutions. This category always should be printed immediately after the collection catalog number so that (1) the availability status can be determined in a simple and consistent manner, (2) such determination does not require other fields for external use; and (3) missing specimens can be indicated on all output (particularly output with limited working space that would prevent further explanation).

See APPENDIX C for CHIN variations.

CATEGORY: ACCESSION NUMBER - Preferred

DESCRIPTION: This category applies to a unique number assigned by the institution to the acquisition from which the specimen came. This number provides a cross-reference between the specimen(s) and records in the accession file such as permits, field records, contacts and relevant correspondence. In most cases, the accession record serves as the legal document of acceptance of the specimen/acquisition by the institution.

FORMAT: Entries are recorded in the form used by the institution.

ACCEPTED VARIATIONS: None.

OMIT CONDITIONS: If this category is adopted by the institution, it should not be omitted.

CONTINGENCY REQUIREMENTS: None

VALID EXAMPLES:

1977-942
33096
M77-27

COMMENTS:

CATEGORY: SPECIAL NUMBER - Optional

DESCRIPTION: This category applies to a number other than the standard numbers recorded by a collection. Any number that is not a COLLECTION CATALOG NUMBER, ACCESSION NUMBER, PREPARATOR'S NUMBER, COLLECTOR'S NUMBER, or other specifically constructed numerical category used by this institution, may be used in this category. Such numbers may include collecting site number, technique number, other collection numbers (example, collection catalog number of specimens received from other institutions as a result of trade gift, or purchase) or any other number that may be used for identification purposes.

FORMAT: Generally special numbers are entered exactly as they appear on the original data source. In all cases, such numbers should be coded in some manner for identification, differentiation from other number series, and retrieval. If more than one special number is recorded in this category, the number should be separated by a comma and one space.

ACCEPTED VARIATIONS: None.

OMIT CONDITIONS: If this category is adopted by the institution, it may be omitted if no appropriate data are available.

CONTINGENCY REQUIREMENTS: None.

VALID EXAMPLES:

TK 12543
TCWC 14513
PX 192A5.3
ZM 1977-4-21-3
AZ345, B22534

COMMENTS: If this category is used, the institution should maintain a dictionary of all known codes and their meanings. Such a practice will provide not only an explanation, but will prevent duplication of codes. If an institution desires to have coded information written out completely, such a function may be provided with special programming. Considerations about spacing between acronym and number should be weighed cautiously. Spacing may affect the sorting order of output and assignment of multiple special numbers to a single specimen can quickly exceed field length. Consistency is important.

The field may include numbers applied by a previous institution from whom the specimen or tissue was received on exchange.

CATEGORY: DONOR - Optional

DESCRIPTION: This category applies to the name(s) of the individual(s), project(s), or institution(s) designated on the original data source and/or in the accession papers as responsible for contributing the specimen.

FORMAT: If individuals, the initial(s) of the first name(s) follow the last name. The last name is separated from initials by a comma and one space. Other initials are separated by one space. If there are two donors, separate the names with the word "AND." If there are more than two donors, include the name of the primary donor and follow with "ET AL". Because of potential space problems (e.g. - labels, printouts, computer data storage), name modifiers and titles (e.g.- MRS, DR, JR, III) are not used unless such items are necessary to avoid confusion among individuals concerned with the collection. Project(s) and institution(s) are designated exactly as they appear on accession documentation or coded as defined in the institutions dictionary.

ACCEPTED VARIATIONS: None.

OMIT CONDITIONS: If this category is adopted by the institution, it may be omitted if no applicable data are available.

CONTINGENCY REQUIREMENTS: None.

VALID EXAMPLES:

ADAMS, J P
MCBRIDE, S P AND DOW, J J
ELLIS, C R ET AL
SAN DIEGO ZOO
MILLER, R G AND MILLER, B S

COMMENTS: See APPENDIX C for CHIN variations.

CATEGORY: DATE CATALOGED - Optional

DESCRIPTION: This category applies to the date that the specimen was cataloged into the institution's collection.

FORMAT: The date cataloged should be entered as day, month, and year. The day of the month is always a two-character numeric field. A leading zero is used for single digit numbers. The month of the year is always a three-character alphabetic field that is the first three letters of the month. The year is always a four-character numerical field. Day, month, and year are separated by one space.

ACCEPTED VARIATIONS: Multiple methods of date entry have been undertaken within various institutions. This is one of the simplest fields to standardize at the time of data transmission because most software provides options for variation in entry or output of date data.

OMIT CONDITIONS: If this category is adopted by the institution, it should not be omitted if the date cataloged is known. Retroactive data capture may dictate that "date cataloged" records the date when electronically captured (i.e. the date when added to the computer database, if these data were not previously recorded by the institution.

CONTINGENCY REQUIREMENTS: None

VALID EXAMPLES:

09 MAY 1975
13 JUN 1887
20 APR 2004

COMMENTS: This category will be almost entirely in-house for tracking work history for annual reports and grant proposals or for tracking staff productivity or bracketing time-frames for problem-solving.

See APPENDIX C for CHIN variations.

CATEGORY: PUBLISHED RECORD - Optional

DESCRIPTION: This category applies to bibliographic reference(s) to the specimen used in the literature.

FORMAT: The format and types of information used are determined by the institution to fulfill its needs.

ACCEPTED VARIATIONS: None.

OMIT CONDITIONS: If the category is adopted by the institution, it may be omitted if no appropriate data are available.

CONTINGENCY REQUIREMENTS: None.

VALID EXAMPLES:

ROM OCC PAPER 27
HOWELL, A H. PROC BIOL SOC WASHINGTON, 32:109. 20 MAY 1919
GOLDMAN, E A. 1915. PROC BIOL SOC WASHINGTON, 28:133-138. (COLL LIBRARY - VOL 36.)

COMMENTS: This field could be linked to a reference number in a citation database. For optimal use, flexibility of multiple entries for a single specimen is needed. Although retroactive data collection and maintenance of this field can be challenging, these data are particularly useful in demonstrating actual research value of the collection and identifying parts that deserve special consideration as vouchers of previous research.

CATEGORY: TYPE DESCRIPTION - Optional

DESCRIPTION: This category is applied to specific information concerning type specimens.

FORMAT: The format and types of information used are determined by the institution to fulfill its needs.

ACCEPTED VARIATIONS: None.

OMIT CONDITIONS: If the category is adopted by the institution, it may be omitted if no appropriate data are available.

CONTINGENCY REQUIREMENTS: None.

VALID EXAMPLES:

HOLOTYPE
TOPOTYPE
OCHOTONA SCHISTICEPS JEWETTI HOWELL

COMMENTS: The category has been used for indicating type description (example - holotype, topotype, lectotype) of individual specimens or listing the complete original nomenclature and author's name (e.g. - Ochotona schisticeps jewetti Howell) for holotypes only. If the latter documentation procedure is used, the author's name should be separated by two spaces to avoid confusing it with part of the scientific name. The use of taxonomic information can be useful for documenting original nomenclature, particularly when revision can cause taxonomic changes.

Alternative reference can be made using the AVAILABILITY STATUS, See I-4.

See APPENDIX C for CHIN variations.

II. TAXONOMIC DATA

Documentation standards in this section apply to accepted nomenclature of various levels of taxonomy in the collections stored on the computerized database. Although differences of opinion are not uncommon and some taxa are not well understood, many collections use Wilson and Reeder (1993) as a standard reference. This publication does not attempt to dictate the use of any specific standard reference but encourages communication between database users and caretakers. Additionally, the use of the optional category "PUBLISHED RECORD" (see I-9) may prove very useful in keeping taxonomic assignment choices clear to all users.

CATEGORY: ORDER - Optional

DESCRIPTION: This category applies to the most recent taxonomic designation of the order of the specimen.

FORMAT: Enter the official spelling of the order, written out completely, as defined by the current rulings of the International Code on Zoological Nomenclature.

ACCEPTED VARIATIONS: Depending on desired output and utilization, the orders of mammals may be coded (see COMMENTS) or, if using a true relational-database, stored in a separate, linked file. If the order has not been determined, enter "UNKNOWN."

OMIT CONDITIONS: If this category is adopted by the institution, it should not be omitted.

CONTINGENCY REQUIREMENTS: None.

VALID EXAMPLES:

CETACEA
MARSUPIALIA
MACROSCELIDEA
CHIROPTERA
UNKNOWN

COMMENTS: Utilization of this category is primarily for ease in retrieval and providing general phylogenetic arrangement by grouping specimens of a common order. Special programming will be required to obtain phylogenetic rather than alphabetical arrangement of output. The phylogenetic arrangement can be achieved either by special programming or by coding data. One disadvantage to coding data in this category is that input errors might be difficult to detect. If an institution desires to have coded information written out completely, such a function can be provided with special programming.

For collections with true-relational database capabilities, this field can be stored in a linked file which then serves as a spell check as new data are entered throughout the taxonomic hierarchy. This practice also limits repetitive entries.

CATEGORY: FAMILY - Preferred

DESCRIPTION: This category applies to the most recent taxonomic designation of the family of the specimen.

FORMAT: Enter the official spelling of the family, written out completely, as defined by the current rulings of the International Code on Zoological Nomenclature.

ACCEPTED VARIATIONS: Depending on desired output and utilization, the families of mammals may be coded (see COMMENTS) or, if using a true relational-database, stored in a separate, linked file. If the family has not been determined, enter "UNKNOWN."

OMIT CONDITIONS: If this category is adopted by the institution, it should not be omitted.

CONTINGENCY REQUIREMENTS: None.

VALID EXAMPLES:

SOLENODONTIDAE
PHYLLOSTOMIDAE
GEOMYIDAE
BOVIDAE
UNKNOWN

COMMENTS: Utilization of this category is primarily for ease in retrieval and providing general phylogenetic arrangement by grouping specimens of a common family. Special programming will be required to obtain phylogenetic rather than alphabetical arrangement of output. The phylogenetic arrangement can be achieved either by special programming or by coding data. One disadvantage to coding data in this category is that input errors might be difficult to detect. If an institution desires to have coded information written out completely, such a function can be provided with special programming. For collections with true relational database capabilities, this field can be stored in a linked file which then serves as a spell check as new data are entered throughout the taxonomic hierarchy. This practice also alleviates the need for repetitive entries.

CATEGORY: GENUS - Essential

DESCRIPTION: This category applies to the most recent taxonomic designation of the genus of the specimen.

FORMAT: Enter the official spelling of the generic name, written out completely, as defined by the current rulings of the International Code on Zoological Nomenclature.

ACCEPTED VARIATIONS: When laboratory hybrids are contained in the collection, the genus name followed by "-H" allows the specimens to sort with others of that genus but to fall out as a group at the end of the genus. In the event that a specimen has not been identified, a general term such as "BAT" or "RAT" or "CANID" may be used. When such terms are used they should be preceded by "ZZ" so that they will be listed at the end of a file instead of mixed within taxonomic listings. If using a true relational database, genus would be the key field to be shared by the main database and a linked file containing higher taxonomic levels.

OMIT CONDITIONS: This category was declared "mandatory" in 1975 and is never to be omitted.

CONTINGENCY REQUIREMENTS: None.

VALID EXAMPLES:

SPERMOPHILUS
CHIRODERMA
ZZRAT
NEOTOMA-H

COMMENTS: In the event that the genus of a specimen is uncertain, and the entry is supplemented with "ZZ", every effort should be made to correct this situation as soon as possible. When setting up contingency plans for odd situations such as for hybrids, it should be remembered that deviations from the norm may cause words to be missed during a search of the field. A dictionary of exceptions is essential to preventing such oversights, especially when the exception represents a small fraction of the total collection. Such information will be important for receivers of shared data as well.

See APPENDIX C for CHIN variations.

CATEGORY: SPECIES - Essential

DESCRIPTION: This category applies to the most recent taxonomic designation of the species of the specimen.

FORMAT: Enter the official spelling of the species, written out completely, as defined by the current rulings of the International Code on Zoological Nomenclature.

ACCEPTED VARIATIONS: Hybrids may be listed as Sp1 X Sp2. The International Code on Zoological Nomenclature does not advise which parent should be listed as Sp1 and among many museum specimens, lineage may not be known. Thus for consistency in input, output, and placement within the collection, it is suggested that the species names be listed in alphabetical order (e.g. familiaris X latrans) (See COMMENTS).

OMIT CONDITIONS: Although this category was declared "mandatory" in 1975, entries may be omitted if identification is unknown (see COMMENTS).

CONTINGENCY REQUIREMENTS: This category is used only after data have been entered in the category for GENUS.

VALID EXAMPLES:

CANADENSIS
DESERTI
PERSONATUS
FAMILIARIS X LATRANS

COMMENTS: In the previous edition of the Documentation Standards, it was suggested that "?" or "SP" be used following an uncertain determination or when the species name is unknown. Practical application has shown this to be problematic and is not recommended.

In the event that this field is unknown, it should be left blank.

See APPENDIX C for CHIN variations.

CATEGORY: SUBSPECIES - Preferred

DESCRIPTION: This category applies to the most recent taxonomic designation of the subspecies of the specimen.

FORMAT: Enter the official spelling of the subspecific name, written out completely, as defined by the current rulings of the International Code on Zoological Nomenclature.

ACCEPTED VARIATIONS: If it is appropriate, the name of the breed of a domestic mammal may be used in this category. To avoid confusion with actual subspecific names, breed names should be enclosed in parentheses (see OMIT CONDITIONS).

OMIT CONDITIONS: If this category is adopted by the institution, it may be left blank if the subspecies has not been determined, cannot be determined or if the species is monotypic (see ACCEPTED VARIATIONS).

CONTINGENCY REQUIREMENTS: The category is used only after data have been entered for categories for GENUS and SPECIES.

VALID EXAMPLES:

MERRIAMI
(GERMAN SHEPHERD)

COMMENTS: See APPENDIX C for CHIN variations.

III. SPECIMEN DATA

Documentation standards in this section strictly apply to data concerning the individual specimens used in database operations.

CATEGORY: TYPE OF PRESERVATION - Essential

DESCRIPTION: This category reports the preservation of the primary specimen and its parts.*

FORMAT: Data entered in this category consists of a standard two-character alphabetic code (see VALID EXAMPLES).

ACCEPTED VARIATIONS: This category is perhaps the most non-standardized of all categories in common among collections. Flexibility for internal usage is very important. Woodward (1989) proposed an expanded system which utilized more than two characters. However, numerous collections have adopted the originally proposed system and merely added new abbreviations when needed. This listing shows the original NIRM standards and some proposed new codes. The new codes acknowledge TYPES OF PRESERVATION that were overlooked in the original work or which has come into common use since that time.

OMIT CONDITIONS: This category was declared "mandatory" in 1975 and is never omitted.

CONTINGENCY REQUIREMENTS: None

VALID EXAMPLES: These codes represent the NIRM standards for the category.

Code	Definition
AL	Alcoholic
SS	Skin and skull
SB	Skin, skull, and body skeleton
SN	Complete skeleton
SK	Skull only
SO	Skin only
SA	Alcoholic with skull removed
KB	Skin and body skeleton (no skull)
AN	Anatomical
PS	Partial skeleton
CO	Cranium only
HM	Head mount
BM	Body mount
SC	Skin, skull, and alcoholic carcass
BS	Body skeleton
OT*	Other, with explanation in comments

Additions to the original list:

HO	Horn(s) only
AO	Antler(s) only
BO	Baculum only
MO	Mandible only
TH	Tooth (Teeth) only
TK	Tusk(s) only
SM	Skin, skull, and baculum

COMMENTS: *This category applies to traditional collections. Ancillary collections are addressed in another field for use as a subset of the main database. It was originally felt that coding of

data for this category would promote standardization of preservation descriptions and provide easier output operations that require this information, particularly in output with limited working space. For those collections that did not adopted these standards it may serve as a reference during data transfer.

CATEGORY: SEX - Essential

DESCRIPTIONS: This category applies to the sex of the specimen.

FORMAT: Data entered in this category consist of one alphabetic character.

ACCEPTED VARIATIONS: Long established databases used "U" for unknown sex because the "?" was unavailable on early printers even though the latter was used in hand ledgers from which the data were transcribed. Later computerization efforts often utilized the "?," as directly captured from the handwritten catalogs.

OMIT CONDITIONS: This category was declared "mandatory" in 1975 and should never be omitted.

CONTINGENCY REQUIREMENTS: None

VALID EXAMPLES:

F = Female
M = Male
U or ? = Unknown

COMMENTS: The use of "U" was adopted because some early computer systems were unable to provide a "?." This is apparently the only reason for the deviation from the use of "?" which is usually found on handwritten specimen documentation.

CATEGORY: EXTERNAL MEASUREMENTS - Optional

DESCRIPTION: This category applies to standard measurements (usually total length, tail length, length of hind foot, and length of ear at notch) taken from the specimen prior to preservation.

FORMAT: The format and types of measurements are determined by the institution to fulfill its needs.

ACCEPTED VARIATIONS: Other measurements such as calcar, tragus, forearm, weight, and special measurements for Pinnipedia and Cetacea, also may be included.

OMIT CONDITIONS: If this category is adopted by the institution it should not be omitted.

CONTINGENCY REQUIREMENTS: None.

VALID EXAMPLES:

TL 0236 MM TA 0120 MM HF 0017 MM EM 0012 MM
342, 101, 50, 20.1
92-10-9-10=5.5 G
X-X-14-7=X*
[142]-[81]*-12-7=37.5 G
X-X-X-X=X

COMMENTS: This category is primarily for research purposes and has little or no value for collection management. Although an institution's needs may require retrieval of measurements taken at the time of preservation, it should be realized that another category is available for weight if it is desirable to retrieve such data separately.

*It may be desirable to use the same method of designating missing or incomplete measurements in the database as on the original skin tags or field catalog.

See APPENDIX C for CHIN variations.

CATEGORY: WEIGHT - Optional

DESCRIPTION: This category applies to the weight of the specimen at the time of death.

FORMAT: The format and types of information are determined by the institution to fulfill its needs.

ACCEPTED VARIATIONS: None.

OMIT CONDITIONS: If this category is adopted by the institution, it may be omitted if appropriate data are not available.

CONTINGENCY REQUIREMENTS: None.

VALID EXAMPLES:

999 G
1.02 KG
400 KG
21.5 LB
8 OZ

COMMENTS: This category is primarily for research purposes and has little or no value for collection management. See EXTERNAL MEASUREMENTS (III-3) for alternative method of documentation.

See APPENDIX C for CHIN variations.

CATEGORY: AGE - Optional

DESCRIPTION: This category applies to the absolute and relative determination of the age of the specimen.

FORMAT: Because utilization of this category is generally restricted to specific projects or a small percentage of the collection, the format used is determined by the institution to fulfill its needs.

ACCEPTED VARIATIONS: None.

OMIT CONDITIONS: If this category is adopted by the institution, it may be omitted if no appropriate data are available.

CONTINGENCY REQUIREMENTS: None.

VALID EXAMPLES:

4 YEARS
AGE CLASS III
ADULT
23 WEEKS
115 DAYS

COMMENTS: Return on the cost of entering and storing these data should be carefully evaluated against potential internal utilization. Primary researchers will need to verify these data for their own studies. This category will have little or no value for collection management.

See APPENDIX C for CHIN variations.

CATEGORY: REPRODUCTIVE DATA - Optional

DESCRIPTION: This category applies to data concerning the reproductive condition of the specimen.

FORMAT: The format and types of information used are determined by the institution to fulfill its needs.

ACCEPTED VARIATIONS: None.

OMIT CONDITIONS: If this category is adopted by the institution, it may be omitted if no appropriate data are available.

CONTINGENCY REQUIREMENTS: None.

VALID EXAMPLES:

TESTES 8 X 2 MM
2 EMBRYOS (2, 0) CR 13 MM, LACTATING
1 EMBRYO, CR 130 MM
3 EMB, 2R, 1L X 9 MM
NO EMB, NOT LACT

COMMENTS: If this field is commonly used within a particular collection, it may be desirable to subdivide into individual fields such as TESTES, EMBRYOS, PLACENTAL SCARS, etc., for better retrieval. Return on the cost of entering and storing these data should be carefully evaluated. It will be used primarily for research and will have little or no value for collection management.

CATEGORY: ECOLOGICAL NOTES - Optional

DESCRIPTION: This category applies to data concerning the habitat of the locality where the specimen was captured.

FORMAT: The format and types of information used are determined by the institution to fulfill its needs.

ACCEPTED VARIATIONS: None.

OMIT CONDITIONS: If this category is adopted by the institution, it may be omitted if no appropriate data are available.

CONTINGENCY REQUIREMENTS: None.

VALID EXAMPLES:

ROCKY PLAIN
TALUS SLOPE
MESQUITE-GRASSLAND, BUFFALO GRASS DOMINANT

COMMENT: Unless the individual collection takes steps to set standards for this category, this will be an informational field with limited retrieval potential. It is a category primarily for research usage with little or no value for collection management.

CATEGORY: DATE COLLECTED - Essential

DESCRIPTION: This category applies to date that the specimen was captured based on the collector's field data. For specimens that have been maintained in captivity for more than 24 hours, the date of death in entered in this category.

FORMAT: The date of capture should be entered as day, month, year. The day of capture is always a two-character numeric field. A leading zero is used for single digit numbers. The month of the year is always a 3-character alphabetic field consisting of the first three letters in the name of the month. The year is always a four-character numeric field. The day, month and year are separated by one space.*

ACCEPTED VARIATIONS: Several methods of date entry have been undertaken within various institutions.* If the date collected has incomplete data, each missing numeric character is filled in with the number "9" and each missing alphabetic field is filled with the letter "X." If the date of capture is documented as a time interval, constant portions of the date are entered in appropriate positions and variable portions are replaced with 9's or X's. If such a procedure is used, an asterisk (*) may follow the date to indicate that additional information is recorded in the categories for REMARKS. The category for REMARKS may also be used to explain the date of death of captive mammals. If the date collected is documented as a season, instead of a day and a month, the following acronyms may be used in place of the month: SUM = summer; FAL = fall; WIN = winter; SPR = spring.

OMIT CONDITIONS: This category was designated "mandatory" in 1975 and should never be omitted.

CONTINGENCY REQUIREMENTS: None.

VALID EXAMPLES:

Input Data	Corresponding Original Data
15 JAN 1919	1-15-1919
09 JUN 1878	June 9, 1878
99 SEP 1936	September 1936
99 XXX 1967	1967
99 XXX 1967	15 Aug-10 Sept 1967
99 SUM 1970	Summer, 1970
99 XXX 9999	Date unknown

COMMENTS: The use of 9's and X's to replace missing data will allow standard retrieval and place such records at the end of any list of common data. For incomplete data, cataloger may provide additional information under REMARKS, if known. Some institutions prefer a strictly numerical field for ease of sorting and some software (such as Paradox) has a special data type strictly for handling dates. This is one of the simplest fields to standardize at the time of data transmission because most software provides options for variation in entry of date data.

CATEGORY: COLLECTOR - Essential*

DESCRIPTION: This category applies to the name(s) of the individual(s), project(s), or institution(s) designated on the original data source (field notes) or in the accession papers as responsible for capturing the specimen (see COMMENTS).

FORMAT: For individuals, the initial(s) of the first name(s) follow(s) the last name. The last name is separated from initials by a comma and one space. Other initials are separated by one space. If there are two collectors, the word "AND" should separate the names. Use only trailing initials to facilitated sorting and retrieval. If there are more than two collectors, "ET AL" should follow the name of the primary collector (individual with associated field notes for the specimen). Due to potential space problems, name modifiers and titles (MRS, DR, JR, III) are not used unless such items are needed to avoid confusing individuals within the collection. Project(s) and institution(s) are designated exactly as they appear on accession documentation. Class collections should be indicated as "ET AL" following the instructor's name.

ACCEPTED VARIATIONS: None.

OMIT CONDITIONS: If this category is adopted by the institution, it may be omitted if no applicable data are available.

CONTINGENCY REQUIREMENTS: None.

VALID EXAMPLES:

SMITH, J K
JOHNSON, T T AND THOMAS B A
MORRIS, T J ET AL

COMMENTS: *Some collections may use this category interchangeably with preparator. Use of both fields may not be essential. It should be understood that information stored in this category represents the source of the acquisition and should not be confused with the person who prepared the specimen (PREPARATOR). If the person listed does not have an associated preparation number (field number), it will be assumed that the person listed is ONLY the collector. This category is a reference source to field notes that contain such things as ecological and other collecting site information for the specimen. If this category is adopted, a master list of collector names and initials should be maintained. This will help standardize data, avoid misspellings, and fill in missing information, such as initials.

CATEGORY: COLLECTOR'S NUMBER - Essential*

DESCRIPTION: This category applies to the field number and/or alphabetic code assigned by the collector to a specimen at the time of capture.

FORMAT: Generally, data for this category are entered exactly as they appear on the original specimen tag.

ACCEPTED VARIATIONS: In the event that a collector has assigned the same number to two or more specimens, and it is possible to associate all the parts of each specimen, then alphabetic characters may be added to the end of each number to differentiate the specimens. Some collections associate the collector's initials with the field number.

OMIT CONDITIONS: If this category is adopted by the institution, it may be omitted if no applicable data are available.

CONTINGENCY REQUIREMENTS: This category may be used when the category for COLLECTOR is used and a original number has been assigned.

VALID EXAMPLES:

1006
10034
1977-125
905A
905B
SMW75-01
FN28429
009

COMMENTS: Leading zeros may be used if the Collector included such notation in field catalogs and on specimen tags. However, consistency in use of leading zeros is important for sorted output with most types of software.

CATEGORY: PREPARATOR - Essential*

DESCRIPTION: This category applies to the name(s) of the individual(s), referenced with a preparation number, who was (were) responsible for preparing the specimen.

FORMAT: The initial(s) of the first name(s) follow(s) the last name. The last name is separated from initials by a comma and one space. Other initials are separated by one space. If there are two preparators, the word "AND" is used to separate the names. Use only trailing initials to facilitated sorting and retrieval. Due to potential space problems, name modifiers and titles (MRS, DR, JR, III) are not used unless such items are needed to avoid confusing individuals within the collection.

ACCEPTED VARIATIONS: None.

OMIT CONDITIONS: If this category is adopted by the institution, it may be omitted if no applicable data are available.

CONTINGENCY REQUIREMENTS: None.

VALID EXAMPLES:

SMITH, J K
JOHNSON, T T AND THOMAS B A

COMMENTS: *Some collections may use this category interchangeably with collector. Use of both fields may not be essential depending upon individual practices of various institutions. It should be understood that information stored in this category represents the person(s) that prepared the specimen, as indicated by the preparator's number. It should not be confused with the person (COLLECTOR) who collected the specimen, although they might be the same person. The field for "COLLECTOR" is intended to give reference to the existence of supplemental field information. The field for "PREPARATOR" is intended to give reference to a field catalog and to identify the individual who obtained specimen measurements, reproductive data, etc. If this category is adopted by the institution, a master list of preparator names and initials should be maintained. Such a list will help standardize data, avoid misspellings, and fill in missing information, such as initials.

CATEGORY: PREPARATOR'S NUMBER - Essential*

DESCRIPTION: This category applies to the number assigned by the preparator to a specimen at the time of preparation.

FORMAT: Data for this category are entered exactly as they appear on the original specimen tag, except for the omission of the preparator's initials that would be entered in the category for PREPARATOR.

ACCEPTED VARIATIONS: In the event that a preparator has assigned the same number to two or more specimens, and it is possible to associate all the parts of each specimen, then alphabetic characters may be added to the end of each number to differentiate the specimens.

OMIT CONDITIONS: If this category is adopted by the institution, it may be omitted if no applicable data are available.

CONTINGENCY REQUIREMENTS: This category is used when the category for PREPARATOR is used.

VALID EXAMPLES:

X
1
678A
678B
1978-254

COMMENTS: Leading zeros may be used if the Preparator included such notation in field catalogs and specimen tags. However, consistency in use of leading zeros is important for sorted output with most types of software.

IV. GEOGRAPHICAL DATA

Documentation standards in this section apply to geographic descriptions of the location where specimens were obtained. The descriptions are based on a political hierarchial arrangement.

NOTE:

1. Equivalent hierarchical categories have been made available for material acquired from terrestrial and marine localities. Although categories for both types of localities may be used for "beached" marine mammals, it is intended that marine locality designations apply primarily to specimens acquired from open marine waters.

2. Two procedures for documenting detailed locality information have been used among institutions. One procedure involves no breakdown of total locality information (eg. 1.72 MI N, 5.8 MI W MEMPHIS), believing such data are used primarily for printing purposes and not retrieval. The other approach divides the components of the locality information into separate categories for the purpose of retrieval (eg. MEMPHIS and 1.72 MI N, 5.8 MI W). The categories that are affected by these two procedures are SPECIFIC LOCALITY, REFERENCE POINT AND REFERENCE POINT MODIFIER. SPECIFIC LOCALITY is used in the first procedure mentioned above. The other two categories (REFERENCE POINT AND REFERENCE POINT MODIFIER) are subsets of the first category and apply to the second procedure mentioned above.

3. Additionally, latitude, longitude, township and range, and altitude may be incorporated with specific locality. Careful thought should be given to data groupings because of its potential impact on future use of Geographic Information Systems software.

CATEGORY: CONTINENT - Optional

DESCRIPTION: The category applies to the continent of the collecting locality. For purposes of data entry, a continent is defined as one of seven great land masses on the globe.

FORMAT: Data in this category may be abbreviated by using the first two letters in the anglicized name of each continent or another logical two letter designation.

ACCEPTED VARIATIONS: None.

OMIT CONDITIONS: If this category is adopted by the institution, it should not be omitted.

CONTINGENCY REQUIREMENTS: None.

VALID EXAMPLES:

Code	Continent Name
AF	AFRICA
AN	ANTARCTICA
AS	ASIA
AU	AUSTRALIA
EU	EUROPE
NA	NORTH AMERICA
SA	SOUTH AMERICA
UN	LOCALITY UNKNOWN

COMMENTS: This category will be of most use to large collections with worldwide holdings. In such circumstances, this field is invaluable for selective retrieval of taxa with multi-continental distribution (eg. African sciurids or Australian emballonurids). It is also useful in report-writing that requires information on total holdings.

CATEGORY: COUNTRY OR CONTINENT - Essential

DESCRIPTION: For collections that opt not to have a separate field for continent, this category applies to the country or continent of the collecting locality. For purposes of data retrieval a continent is defined as one of seven great land masses on the globe, and a country is defined as the highest political unit or its territory.

FORMAT: Data in this category are to be written out completely and anglicized or transliterated before data entry. For references of standard names of continents see IV-1 (CONTINENT). Continent names should not be used in this field if country name is known. In most instances, the country name will be used.

ACCEPTED VARIATIONS: For specimens that have a collecting locality recorded as a boundary line, the name of the country entered in this category should be the country referred to by the more specific locality descriptions. If only country boundary line is specified as the locality, the following format is to be used: COUNTRY-COUNTRY BOUNDARY (in alphabetical order). If no appropriate data are available, enter "LOCALITY UNKNOWN."

OMIT CONDITIONS: This category was declared "mandatory" in 1975 and should not be omitted.

VALID EXAMPLES:

UNITED STATES
PEOPLES REPUBLIC OF CHINA
MEXICO-UNITED STATES BOUNDARY
LOCALITY UNKNOWN

COMMENTS: Utilization of this category is primarily for ease of retrieval and to provide general geographic arrangement for specimens. Originally, it was felt that the name of the country should be recorded as it appears on the original data source. If this method is used, a dictionary of equivalent names for the same political regions should be maintained (eg. Tanzania = German East Africa; Tanyanika Territory; Tanyanika). In the preceding example, each country name would have to be queried in a search for specimens from that region. It is much more advantageous to standardize country names to the most currently used political name. All names are retrieved together and sorted expeditiously. This avoids international misunderstandings when interacting with colleagues whose country's name change is politically sensitive. The use of a directory/look-up table can also delineate the handling of territories versus country names and shortened versions of official country names.

CATEGORY: STATE OR PROVINCE - Essential

DESCRIPTION: This category applies to the state, province, or other first level political subdivision of the collecting locality. For purposes of data entry, this category is defined as the primary administrative division of a country.

FORMAT: Data in this category are to be written out completely, and anglicized or transliterated before entry.

ACCEPTED VARIATIONS: None.

OMIT CONDITIONS: This category was declared "mandatory" in 1975 and is omitted only if no appropriate data are available.

CONTINGENCY REQUIREMENTS: This category is used after appropriate data have been entered for CONTINENT and/or COUNTRY.

VALID EXAMPLES:

VIRGINIA
QUINTANA ROO
QUEBEC

COMMENTS: The use of modifiers such as Province, Department, or Territory should follow logical in country usage. Utilization of modifier abbreviations must be consistent.

See APPENDIX B.

CATEGORY: COUNTY, PARISH, DISTRICT, DEPARTMENT, or MAJOR ISLAND GROUP - Essential

DESCRIPTION: For purposes of data entry this category is defined as the second administrative division of a country such as the county, parish, district, or department. A major island group is defined as the largest local geographic division of island groups.

FORMAT: Data in this category are to be written out completely and anglicized or transliterated before entry. To avoid confusion among different types of secondary administrative divisions, it is necessary to follow the name of the division with the geographic designation. To save space on printed output, these geographic designations are abbreviated as follows: CO = county; PAR = parish; DIST = district; DEPT = department; ID = island; IDS = islands.

ACCEPTED VARIATIONS: None.

OMIT CONDITIONS: This category was declared "mandatory" in 1975 and is omitted only if no appropriate data are available.

CONTINGENCY REQUIREMENTS: This category is used after appropriate data have been entered in the categories for CONTINENT or COUNTRY and STATE or PROVINCE.

VALID EXAMPLES:

UMTALI DIST
ALLEGHENY CO
ORLEANS PAR
PRIBILOF IDS

COMMENTS: Traditionally, when a specimen is collected in one county but the reference point is located in an adjacent county, the county where collected has been preceded by the word "in" to emphasize that distinction. This standard is not practical for purposes of computerized sorting because it alters alphabetical arrangements. The word "in" may be dropped from entry in the category. Reference to this peculiarity may be noted within the COMMENTS/REMARKS category.

CATEGORY: SPECIFIC LOCALITY - Preferred (interchangeable with REFERENCE POINT AND REFERENCE POINT MODIFIER)

DESCRIPTION: This category applies to the entire record of the most specific designation of the collecting locality, below the category for STATE or PROVINCE and/or COUNTY, PARISH, DISTRICT, DEPARTMENT, or MAJOR ISLAND GROUP, that was documented in the original records. This category replaces categories used for recording various parts of the specific locality, such as REFERENCE POINT, REFERENCE POINT MODIFIER, and may include ALTITUDE, LATITUDE, LONGITUDE, and TOWNSHIP AND RANGE (see COMMENTS).

FORMAT: The format and types of information used are determined by the institution to fulfill its individual needs. Data in this category are written out completely, anglicized or transliterated before entry. Abbreviations may be used if they occur in the STANDARD ABBREVIATIONS LIST (APPENDIX B) or the meanings of abbreviations used in the original data source are uncertain. If the specific locality cannot be determined, enter "SPECIFIC LOCALITY UNKNOWN." Units of measurements are the same as those used in the original documentation.

ACCEPTED VARIATIONS: None.

OMIT CONDITIONS: If this category is adopted by the institution, it should not be omitted.

CONTINGENCY REQUIREMENTS: If possible, this category is utilized after more general geographic designations have been entered in appropriate categories.

VALID EXAMPLES:

2.0 MI N, 1.7 MI W SANTA FE
6.8 MI N, 3 MI W LAS CRUCES, 2005 FT, T22S, R1E, SEC 9
FAIRMOUNT TWP, 2.1 MI N HARVEYVILLE
ALLEGHENY NATIONAL FOREST, SHEFFIELD
SPECIFIC LOCALITY UNKNOWN
* SANTA FE, 2.0 MI N, 1.7 MI W

COMMENTS: Utilization of this field offers several advantages: 1) the data do not require alteration to fit other categories; 2) output operations are considerably less complicated; 3) it generally follows standard documentation procedures and is easily understood by new users; 4) there is no confusion about what should be entered as a modifier versus the reference point. The biggest disadvantage is that as originally described, it does not allow easy sorting by reference point. * To facilitate sorting of specimens from localities around a single reference point while using this category, the data sequence may be altered as in the last VALID EXAMPLE. Road junctions have proven to be poor locality designators as are property names (e.g. Clayton Ranch) and local identifiers (e.g. Summit Trail, North Meadow, or Smith's Pond). Where field size is limited and more specific and lasting information is also available, these inexact or ephemeral data might have to be omitted. Sorting difficulties arise when the same locality is collected on different occasions and recorded differently each time. For example, 0.5 mi N Ogden and 1/2 mi N Ogden will sort as different localities and may be widely separated on a print-out.

CATEGORY: REFERENCE POINT - Preferred (when combined with REFERENCE POINT MODIFIER, interchangeable with SPECIFIC LOCALITY)

DESCRIPTION: This category applies to the reference point used in the original records to define the precise collecting locality of the specimen.

FORMAT: Data in this category are written out completely and anglicized or transliterated before entry. Abbreviations may be used if they occur on the STANDARD ABBREVIATIONS LIST (APPENDIX B) or the meanings of abbreviations used in the original data source are uncertain. If the specific locality cannot be determined, enter "SPECIFIC LOCALITY UNKNOWN."

ACCEPTED VARIATIONS: None.

OMIT CONDITIONS: If this category is adopted by the institution, it should not be omitted.

CONTINGENCY REQUIREMENTS: If possible, this category is utilized after more general geographic designations have been entered in appropriate categories.

VALID EXAMPLES:

SANTA FE
LAS CRUCES
HARVEYVILLE
JCT HWY 3 and HWY 24
POINT OF PINES
SPECIFIC LOCALITY UNKNOWN

COMMENTS: This category is designed primarily to permit sorting by reference point. Because sorting on the category gives specific geographic listings, it is particularly useful in those areas that do not have a breakdown of political boundaries to the level of county, parish, district, department, or major island group. If this category is to be functional, an awareness of data hierarchy, standardization of data among specimens, and data utilization is required.

CATEGORY: REFERENCE POINT MODIFIER - Preferred (when combined with REFERENCE POINT, interchangeable with SPECIFIC LOCALITY)

DESCRIPTION: This category applies to supplemental information, ideally a distance and direction, about the REFERENCE POINT of a collecting locality. Entries either may specify the relationship of the collecting locality to the REFERENCE POINT or present a more detailed designation than that given in the category for REFERENCE POINT.

FORMAT: The format is designed by the institution to fulfill specific needs. Abbreviations may be used if they occur on the STANDARD ABBREVIATIONS LIST (APPENDIX B) or the meanings of abbreviations used in the original data source are uncertain. Units of measurement used are the same as those in the original documentation.

ACCEPTED VARIATIONS: None.

OMIT CONDITIONS: If this category is adopted by the institution, it should not be omitted.

CONTINGENCY REQUIREMENTS: This category is utilized only after the category for REFERENCE POINT has been used.

VALID EXAMPLES:

2.0 MI N, 1.7 MI W
6.8 MI N, 3.9 MI W
FAIRMONT TWP, 2.1 MI N
6 KM W
ALLEGHENY NATL FOREST

COMMENTS: The use of commas (,) is encouraged to help clarify and differentiate locality information (e.g. ABINGTON BAEDERWOOD PARK is not the same as ABINGTON, BAEDERWOOD PARK). REFERENCE POINT and REFERENCE POINT MODIFIER are ideally suited for distances and directions from a specific reference point. They become difficult to use and standardize with deviations from this pattern. Also, sorting difficulties arise when the same locality is collected on different occasions and recorded differently each time. For example, 0.5 mi N Ogden and 1/2 mi N Ogden will sort as different localities and may be widely separated on a print-out.

CATEGORY: TOWNSHIP AND RANGE - Optional

DESCRIPTION: This category applies to the township and range of the collecting locality.

FORMAT: The format and types of information used are determined by the institution to fulfill individual needs. The standard abbreviations for township and range, as used in this category, are "T" and "R" respectively. Township designations should always precede range designations.

ACCEPTED VARIATIONS: None.

OMIT CONDITIONS: If this category is adopted by the institution it may be omitted if no appropriate data are available.

CONTINGENCY REQUIREMENTS: None.

VALID EXAMPLE:
T22S, R1E, SEC 9

COMMENTS: Township and range as used here are designations unique to a few US states. As such, collections with few specimens from the western United States will probably have little reason to designate this as a separate category.

CATEGORY: ELEVATION - Preferred

DESCRIPTION: This category applies to the elevation of the collecting locality as indicated on the original data source.

FORMAT: Data for this category are recorded with a numerical designation, followed by a space and either "M" (meters) or "F" (feet) to indicate units. The units of measurement used are the same as those in the original documentation.

ACCEPTED VARIATIONS: None.

OMIT CONDITIONS: If this category is adopted by the institution it may be omitted if no appropriate data are available.

CONTINGENCY REQUIREMENTS: This category should be used after appropriate data are entered in the categories for SPECIFIC LOCALITY or REFERENCE POINT and REFERENCE POINT MODIFIER.

VALID EXAMPLES:

3935 F
450 M
SEA LEVEL

COMMENTS: See APPENDIX C for CHIN variations.

CATEGORY: OCEAN - Essential

DESCRIPTION: This category applies to the most general designation of marine collecting localities. For purposes of data entry, ocean is defined as one of six greatdivisions of the whole body of salt water on the globe.

FORMAT: Data used in this category are to be written out completely and anglicized or transliterated before data entry. For reference of standard names for oceans see VALID EXAMPLES. If no information is available for specimens collected at marine localities, enter "LOCALITY UNKNOWN" in this category.

ACCEPTED VARIATIONS: None.

OMIT CONDITIONS: This category was declared "mandatory" in 1975 and is omitted only of no appropriate data are available.

CONTINGENCY REQUIREMENTS: None.

VALID EXAMPLES:

NORTH ATLANTIC OCEAN
SOUTH ATLANTIC OCEAN
NORTH PACIFIC OCEAN
SOUTH PACIFIC OCEAN
INDIAN OCEAN
ARCTIC OCEAN
LOCALITY UNKNOWN

COMMENTS: This category is used primarily for recording marine localities and providing the ability to list marine mammals according to such localities. In the case of beached specimens, this category may be used in conjunction with the appropriate categories for terrestrial localities. Some collections with few marinemammals choose not to set aside a separate field but to equate OCEAN with the COUNTRY field.

CATEGORY: SEA - Essential

DESCRIPTION: This category applies to marine mammal collecting localities. For purposes of data entry, sea is defined as the first division of an ocean.

FORMAT: Data in this category are to be written out completely and anglicized or transliterated before data entry. For reference of standard names for seas check VALID EXAMPLES.

ACCEPTED VARIATIONS: None.

OMIT CONDITIONS: This category was declared "mandatory" in 1975 and is omitted only of no appropriate data are available.

CONTINGENCY REQUIREMENTS: This category is used after appropriate data have been entered in the category for OCEAN.

VALID EXAMPLES: The standard names for seas (originally provided by the NMNH) are

ADEN, GULF OF
ADRIATIC SEA
AEGEAN SEA
ALASKA CANADA COASTAL
ALASKA, GULF OF
ADMUNSEN SEA
AMURSKIY LIMAN
ANDAMAN SEA
ARABIAN SEA
ARAFURA SEA
AZOV, SEA OF
BAFFIN SEA
BALEARIC (IBERIAN) SEA
BALI SEA
BALTIC SEA
BANDA SEA
BARENTS SEA
BASS SEA
BEAUFORT SEA
BELLINGHAUSEN SEA
BENGAL, BAY OF
BERING SEA
BERING STRAIT
BISCAY, BAY OF
BISMARCK SEA
BLACK SEA
BRISTOL BAY
BRISTOL CHANNEL
BOTHNIA, GULF OF
CALIFORNIA, GULF OF
CARPENTARIA, GULF OF
CARIBBEAN SEA
CELEBES SEA
CERAM SEA
CHIHLI, GULF OF
DAVIS STRAIT
DENMARK STRAIT
DRAKE PASSAGE
EAST CHINA SEA
EAST SIBERIAN SEA
ENGLISH CHANNEL
FINLAND, GULF OF
FLORES SEA
FORMOSA STRAIT
FUNDY, BAY OF
GOLFO SAN JORGE
GOLFO SAN MATIAS
GREAT AUSTRALIAN BIGHT
GREENLAND SEA
GUINEA, GULF OF
HALMAHERA SEA
HUDSON BAY
HUDSON STRAIT
IONIAN SEA
IRISH SEA
JAMES BAY
JAVA SEA
JAPAN, SEA OF
JOSEPH BONAPARTE GULF
KANE BASIN
KARA SEA
KATTEGAT
KOREA BAY
KOREA STRAIT
LACCADIVE
LAPTEV SEA
LIONS, GULF OF
LIGURIAN SEA
LINCOLN SEA
MAKASSAR STRAIT
MEDITERRANEAN SEA
MEXICO, GULF OF
MULUCCA SEA
MOZAMBIQUE CHANNEL
NORTH SEA
NORWEGIAN SEA
NORTHWEST PASSAGES
OKHOTSK, SEA OF
OMAN, GULF OF
PANAMA, GULF OF
PERSIAN GULF
PHILIPPINE SEA
RED SEA
RIO DE LA PLATA
RIGA, GULF OF
ROSS SEA
ST LAWRENCE, GULF OF
SAVU SEA
SAKHALINSKIY ZALIV
SCOTIA SEA
SIAM, GULF OF
SKACERRAK
SOLOMON SEA
SOUTH CHINA SEA
SUEZ, GULF OF
SULU SEA
TARTARY, GULF OF
TASMAN SEA
TELUK BONE
TELUK TOMINI
TIMOR SEA
TONKIN, GULF OF
TORRES STRAIT
TYRRHENIAN SEA
WEDDELL SEA

CHUKCHI SEA	MALACCA STRAIT	WHITE SEA
COOK STRAIT	MANNAR, GULF OF	YELLOW SEA
CORAL SEA	MARMARA SEA	ZALIV SHELEKHOVA

COMMENTS: See COMMENTS under OCEAN. Some collections may choose to equate SEA with the STATE field.

CATEGORY: BAY, INLET, STRAIT, ESTUARY, GULF, OR CHANNEL - Essential

DESCRIPTION: This category applies to marine mammal collecting localities. For purposes of data entry, a bay, inlet, strait, estuary, gulf, or channel are defined as a subdivision of a sea or a subdivision of an ocean if the name of the body of water does not occur in the list of standard names of seas (see VALID EXAMPLES in category for SEA).

FORMAT: Data in this category are to be written out completely and anglicized or transliterated before data entry. For locality designations that include any combination of bay, inlet, strait, estuary, gulf, or channel enter only the most specific geographic designation. To illustrate this rule, consider the case of a specimen that has a collecting locality description containing, in part, "TAMPA BAY, GULF OF MEXICO," TAMPA BAY would be entered in this category and MEXICO, GULF OF would be recorded under SEA.

ACCEPTED VARIATIONS: None.

OMIT CONDITIONS: This category was declared "mandatory" in 1975 and is omitted only of no appropriate data are available.

CONTINGENCY REQUIREMENTS: None.

VALID EXAMPLES:

TAMPA BAY
QUEEN CHARLOTTE CHANNEL
COOS BAY ESTUARY

COMMENTS: See COMMENTS category for OCEAN. More specific collecting locality descriptions for marine mammals may be documented with the category for LATITUDE AND LONGITUDE. Some collections with few marine mammals choose not to set aside a separate field but to equate this field with the COUNTY field.

CATEGORY: LATITUDE AND LONGITUDE - Preferred (for old specimens); Essential (for new specimens)

DESCRIPTION: This category applies to the latitude and longitude of the actual collecting locality and not the reference point.

FORMAT: The format used is to be determined by the institution. Latitude designations should precede longitude designations.

ACCEPTED VARIATIONS: None.

OMIT CONDITIONS: If this category is adopted by the institution, it may be omitted if no applicable data are available.*

CONTINGENCY REQUIREMENTS: None.

VALID EXAMPLES:

28 52N, 15 10W
2852N, 1510W
2852-S, 2158-E
0123010N, 0111257E
28N, 15W
58.75N, 135.06E

COMMENTS: *There is great interest in making this category a required field because of the potential for use of Geographic Information Systems. Some multi-disciplinary planning groups have suggested retroactive determination of these data for all specimen records with a separate field used to rank reliability of the coordinate determinations (see COORDINATE PRECISION INDEX category). In order to institute the use of latitude and longitude on a regular basis, collectors and preparators must be apprised of the need for including this information when other locality data are determined in the field.

See APPENDIX C for CHIN variations.

CATEGORY: Universal Transverse Mercator values or UTM - Optional

DESCRIPTION: A coordinate system for indicating locations on the Earth's surface, based upon ground distances. Locations are designated in terms of distances in meterseast (or west) of the center of a UTM zone and north (or south) of the equator (McLaren and Braun, 1993).

FORMAT: UTM Easting (6 digits), UTM Northing (7 digits), UTM Zone (2 digits) and a horizontal datum (at least 5 alphanumeric characters) shouldbe included as part of the entry for this category. Coordinates are expressed in meters.

OMIT CONDITIONS: If this category is adopted by the institution, it may be omitted if no applicable data are available.

CONTINGENCY REQUIREMENTS: None.

VALID EXAMPLES:

270900 4611600 19 NAD27

COMMENTS: UTMs are easier to work with than latitude and longitude because it is a base 10 number and is easier to obtain from a map. It would be helpful to use this field in conjunction with the COORDINATE PRECISION INDEX category. It may be desirable to allow more than 5 alphanumeric characters for the horizontal datum segment of this category. Designations outside of North America are not standardized at this time.

See APPENDIX C for CHIN variations.

CATEGORY: Coordinate Precision Index (CPI) - Optional

DESCRIPTION: This category is used to indicate the reliability of the coordinates that have been applied to a given collecting locality. The index is quasi-logarithmic and values will range from 1-9 (Hegstad, 1990).

1.1 - Designates coordinate data as entered by the collector and accurate to within ± 10 meters; e.g. data obtained using GPS technology.
1.2 - Designates coordinate data as entered by the collector and accurate to within ± 100 meters; e.g. data extrapolated using 1:24,000 topographic map.
1.3 - Designates coordinate data as entered by the collector and accurate to within ± 1 kilometer; e.g. data extrapolated using ≥ 1:100,000 scale map.
2 - Designates coordinate data which has been looked up in tables listing coordinates for various place names on the globe. Precision: Collection site within 3 miles of coordinates given.
3 - Designates coordinate data which have been computerized from relative distance data. It would also include center coordinates for small islands and other small geographic features.
4 - Designates center coordinates for larger geographic features given in the collector's data where no precise information is given. This would also cover most US counties and larger islands. Precision: Collection site within 30 miles of coordinates given.
5 - Designates center coordinates for even larger geographic features such as larger US counties, small states and countries, and very large islands. Precision: Collection site within 100 miles of coordinates given.
6 - Designates larger US counties, small states and countries and very large islands. Precision: Collection site within 300 miles of coordinates given.
7 - Designates center coordinates for very large geographic features such as "Africa" or "Australia." Precision: Collection site > 300 miles from coordinates given. Although of marginal value, this value indicates that some locality information known.
8.X - Designates an interim value, based on one of the above values of precision but where the data have the potential for more precision location. This marks them for future reference when the coordinates for this place name may be found. The "X" value represents the current precision level used.
9 - Designates that no locality data are available. This value flags any data in the coordinate fields as garbage. This avoids ambiguity when a particular computer system interprets a "blank field" as 00.00, which is a legitimate latitude/longitude.

FORMAT: Data in this category will consist of a single value from 1-9. The field will require 3 characters to accommodate the extensions described for #1 and #8.

ACCEPTED VARIATIONS: None

OMIT CONDITIONS: This category should not be omitted if fields for coordinates existand GIS utilization is anticipated.

CONTINGENCY REQUIREMENTS: This category is used after evaluation of the coordinate fields.

VALID EXAMPLES:

1
8.6

COMMENTS: See APPENDIX C for CHIN variations.

OTHER DATA

Documentation standards in this section apply to data for material used in databases that do not apply to categories in other sections.

CATEGORY: REMARKS OR COMMENTS

DESCRIPTION: This category serves the purpose of supplementing and/or adding to data presented in formatted categories, particularly when data do not conform to the respective category standards. It may also be used for data that do not relate to other category designations adopted by the institution.

FORMAT: This category is not intended for retrieval operations, so the format and types of information used are determined by the institution. Data in this category should not be abbreviated unless such abbreviations occur in the STANDARD ABBREVIATIONS LIST (APPENDIX B) or in Yates et al., (1987) or similarly recognized standards of the discipline. Complete sentence structure is preferred.

ACCEPTED VARIATIONS: None.

OMIT CONDITIONS: If this category is adopted by the institution, it may be omitted if no applicable data are available.

CONTINGENCY REQUIREMENTS: This category has no contingency requirements unless an asterisk (*) is used in another category (eg. AVAILABILITY STATUS, DATE COLLECTED, and TYPE OF PRESERVATION) to indicate additional information is recorded in the category for REMARKS.

VALID EXAMPLES:

SPECIMEN NOT FOUND DURING INVENTORY OF JAN 1970.
SPECIMEN EXCHANGED TO AMNH ON 30 SEP 1951.
COLLECTING DATE RECORDED AS 15 AUG 1967 - 10 SEP 1967

COMMENTS: This field could be used to include other information such as PUBLISHED RECORD (see also I-9), ECOLOGICAL NOTES (see also III-G), ANCILLARY COLLECTION (see also I-6 and V-2), CONDITION REPORTING (see also V-3), and information lacking documentation standards required for effective data manipulation.

CATEGORY: ANCILLARY COLLECTIONS - Optional

DESCRIPTION: This category records the existence of supplementary or ancillary preparations and documentation that accompany or complement the primary specimen (as described under the TYPE OF PRESERVATION category) and for which there is a separate collection maintained. Ancillary collections include parasites, phalli, photographs, slides, field notes, stomach contents and frozen tissues, blood components, and cell suspensions.

FORMAT: The format and types of information used are determined by the institution to fulfill its individual needs. Data about ancillary preparations are coded to standardize information and minimize space requirements. Entries should be separated by commas.

VALID EXAMPLES:

NON-FROZEN PREPARATIONS		FROZEN PREPARATIONS	
CR	Conservation Records	BR	Brain
FN	Field Notes	DT	Digestive Tract
NG	Negatives	EM	Embryo
PR	Prints	EY	Eyes
SL	Slides	H	Heart
SR	Sound Recordings	HT	Homogenated tissues
MP	Maps	K	Kidney
		L	Liver
DC	Dental casts	M	Muscle
EC	Endocrandial casts	SE	Semen
HS	Histological slides	SP	Spleen
KS	Karyotype slides	T	Testis
CS	Cleared & stained samples	B	Blood- whole
EP	Ectoparasites	P	Plasma
NP	Endoparasites	S	Serum
HR	Hair samples	A	Antisera
PI	Phalli	C	Cell lines
SA	Scat	GL	Genome libraries
ST	Sectioned teeth	IP	Isolated proteins
SC	Stomach contents	NA	Nucleic acids
EA	Embryos - in alcohol	OT	Other
OA	Organs - in alcohol	HT*	Homogenates of multiple tissues

* Homogenates of specific tissues shall bear the suffix of "/H"
(e.g. H/H = Heart homogenate; BR/H = Brain homogenate)

COMMENTS: The use of this category facilitates access to all preparations and supplementary documentation records for a particular specimen. It enhances the institution's ability to maximize the research potential of its specimens. Some listings may be more reasonably handled under TYPE OF PRESERVATION in many collections. Due to the volatile nature of frozen preparations, it is recommended that this category be used merely to record the fact that frozen preparations existed at a point in time, thus providing a method to trace data associated with these preparations. This is particularly true when ancillary materials and voucher specimens are held by separate institutions. A separate data file should be used for physical tracking of individual frozen samples.

CATEGORY: CONDITION REPORTING - Optional

DESCRIPTION: This category applies to the condition of a specimen at a given point in time.

FORMAT: The format and types of information used are determined by the institution to fulfill its specific needs. Recommended format includes the date (month/year), followed by a dash (-) and observations about the specimen. Observations are coded to standardize information and minimize space requirements. Different observations for a given time are separated by a comma and a space, whereas observations for different times are separated by a semicolon and a space. The coding of specimen condition involves the use of three descriptions --- POSITION, FEATURE and CONDITION. The following is a listing of suggested abbreviations:

FEATURE	FEATURE	CONDITION	POSITION
HEAD	LAB = label	BR = broken	R = right
TAIL	HRN = horn or antler	CR = cracked	L = left
BODY	PCR = postcranial	DS = distorted	F = front; anterior
HAIR	BBC = braincase region	DT = detached	B = back; posterior
LEG	RST = rostral region	LS = loose	U = upper; dorsal
FOOT	PLT = palatal region	MS = missing	L = lower; ventral
NAIL	SQM = squamosal	PD = part detached	
EYE	IPRT = interparietal	PM = part missing	
NOSE	CRP = coronoid process	SO = soiled, greasy	
EAR	ARP = articular process	AB = abraded	
MTH = mouth	ANP = angular process	CC = crushed	
CRN = cranium	D = dentition; tusk	CD = creased	
RAM = ramus	I = incisor	DC = discolored	
MAN = mandible	C = canine	ID = insect damage	
NSL = nasal	P = premolar	TR = torn	
PMX = premaxilla	M = molar	OK = no damage	
MXL = maxilla	OCC = occipital region		
ZYG = zygomatic arch	FRT = frontal		
PRT = parietal	TMP = temporal		
ORB = orbital region	AUD = auditory bulla		
PTG = pterygoid			

ACCEPTED VARIATIONS: None.

OMIT CONDITIONS: The category may be omitted when specimen has not been evaluated and appropriate data have not been determined. See COMMENTS.

VALID EXAMPLES:

1/1990 - OK; 6/1990 - ULM3 DT, LLM1 MS; 2/1991 - ULM3 MS, LLM2 DT

COMMENTS: This category enhances the institution's ability to electronically 1) assess research value of specimens in morphological studies; 2) maintain information normally recorded for loans; and 3) monitor stability of specimens through time. Ultimately, this category may be used to assess the physical condition of the entire collection. The format is suitable for current practices, yet provides sufficient detail to serve objectives of condition reporting for conservation. See also Woodward (1989) for a simplified scheme.

APPENDICES.

APPENDIX A. DATA CATEGORIES ARRANGED BY USAGE STATUS

ESSENTIAL:

- INSTITUTIONAL ACRONYM (For data transfer only)
- COLLECTION CATALOG NUMBER
- GENUS
- SPECIES
- TYPE OF PRESERVATION
- SEX
- DATE COLLECTED
- COLLECTOR or PREPARATOR or BOTH
- COLLECTOR'S NUMBER or PREPARATOR'S NUMBER or BOTH
- COUNTRY
- STATE, PROVINCE (FIRST LEVEL POLITICAL SUBDIVISION)
- COUNTY, DISTRICT (SECOND LEVEL POLITICAL SUBDIVISION)
- OCEAN
- SEA
- BAY, INLET, STRAIT, GULF, CHANNEL, MAJOR ISLAND GROUP
- *LATITUDE AND LONGITUDE (for new specimens)
- *UTM (for new specimens)

PREFERRED:

- AVAILABILITY STATUS
- ACCESSION NUMBER
- FAMILY
- SUBSPECIES
- SPECIFIC LOCALITY or REFERENCE POINT/REFERENCE POINT MODIFIER ELEVATION
- *LATITUDE AND LONGITUDE (for old specimens)
- *UTM (for old specimens)

OPTIONAL:

- DIVISIONAL ACRONYM
- SPECIAL NUMBER
- DONOR
- DATE CATALOGED
- PUBLISHED RECORDS
- TYPE DESCRIPTION
- ORDER
- EXTERNAL MEASUREMENTS
- WEIGHT
- AGE
- REPRODUCTIVE DATA
- ECOLOGICAL NOTES
- CONTINENT
- TOWNSHIP AND RANGE
- COORDINATE PRECISION INDEX
- REMARKS OR COMMENTS
- ANCILLARY COLLECTIONS
- SPECIMEN CONDITION REPORTING

APPENDIX B. STANDARD ABBREVIATIONS LIST

	ITEM	STANDARD ABBREVIATION
ADMINISTRATIVE DIVISIONS		
	PROVINCE	PROV
	TERRITORY	TERR
	COUNTY	CO
	PARISH	PAR
	DISTRICT	DIST
	DEPARTMENT	DEPT
	ISLAND	ID
	ISLANDS	IDS
	TOWNSHIP	TWP
	TOWNSHIP, RANGE	T, R
DIRECTION	NORTH	N
	SOUTH	S
	EAST	E
	WEST	W
LENGTH	INCH(ES)	IN
	FOOT (FEET)	F
	YARD(S)	YD
	MILE(S)	MI
	MILLIMETER(S)	MM
	CENTIMETER(S)	CM
	DECIMETER(S)	DM
	METER(S)	M
	KILOMETER(S)	KM
MASS (WEIGHT)	GRAM(S)	G
	KILOGRAM(S)	KG
	OUNCE(S)	OZ
	POUND(S)	LB
MISCELLANEOUS	STATION(S)	STA
	SECTION(S)	SEC
	JUNCTION(S)	JCT
	HIGHWAY(S)	HWY
	MOUNT	MT
	MOUNTAIN	MTN
	MOUNTAINS	MTS
	RIVER(S)	R
	CREEK(S)	CR
	ROAD	RD
	NATIONAL	NATL
	PARK	PK
	NATURE	NAT
	HEADQUARTERS	HQ

SEASON	SUMMER	SUM
	FALL(AUTUMN)	FAL or AUT
	WINTER	WIN
	SPRING	SPR

Note: Also see abbreviations as they are applied to specific categories such as SPECIMEN CONDITION REPORTING, ANCILLARY COLLECTIONS, CONTINENT, NATURE OF SPECIMEN, AVAILABILITY STATUS, etc.

APPENDIX C. Notations on the Canadian Hertiage Information Network System.

Punctuation (See I-4, II-5) --. The asterisk (*) is a problematic character as are {}, [], (), /, \, =. When attempting an electronic transfer with a Canadian museum, inclusion of these characters in the database should be discussed prior to data exchange.

Spacing (See I-10)--. The CHIN standard cannot accommodate the use of a double space between the scientific name and the author's name. The "extra" space will be closed when data are uploaded.

Names (See I-7)--.The CHIN standard is to separate all names with semicolons and enter as follows: MCBRIDE, SP; DOW JJ or ELLIS, CR; ET AL. See discussion of phrase indexing, below.

Dates (See I-8, III-8)--. The CHIN standard for all dates is YYYYMMDD and utilizes the following attributes: "?" - questionable; "C" - circa; "P" - prior to the date; and "L" - later than the date.

Taxonomic irregularities (See II-3, II-4)--. On CHIN there may be a separate field allocated to hybrid or common name. "ZZ" and the "-H" suffix would not be used.

Measurements (See III-3)--. External measurements are placed in separate fields by CHIN. Statistical calculations can be performed upon these fields. Units of measurements are entered in a separate field and are always listed in metric units. Original data are converted to metric if necessary.

Age (see III-5)--. CHIN uses a set a key words to ensure retrieval of expected targets. Modifiers can be used for greater precision but these words follow the key words. Terms are separated by semicolons. See discussion of phrase indexing, below.

Latitude and longitude (See IV-13)--. CHIN latitude and longitude fields go to seconds.

Universal Transverse Mercator values (See IV-14)--. CHIN breaks this into separate UTM Easting, UTM Northing, and UTM Zone fields. CHIN does not include a horizontal datum notation but does include other fields dealing with map reference topics.

Coordinate Precision Index (See IV-15)--. CHIN includes a field called Location Accuracy which is expressed as an alphanumeric strong.

Phrase indexed versus free text fields-. In phrase indexed fields such as those containing names, the contents of the strings delineated by semicolons are searchable. Fields like country, genus, and species are also

phrase indexed so that more than one term may appear in the field; this is handy when there is plurality in names or when original data are retained with "corrected" data. Free text fields may be searched on one or more words, where a word is defined as a group of letters surrounded on both sides by spaces. Non-standardized CHIN fields, like Habitat, are prime candidates for free text indexing.

APPENDIX D. SAMPLE DATA RELEASE AGREEMENT

The XXX Museum of Natural History, 1100 Fifth Avenue, Athens, Ohio 44325 (hereinafter "XMNH") agrees to supply to

_____

_____

(hereinafter the "User") the following information:

_____

_____

(hereinafter the "Data") subject to the following conditions:

1. Data made available by XXXMNH are supplied solely for the internal operations of the User. The User agrees that the Data will not be released in whole or in part to any other individual or organization without prior written permission of XMNH. This restrictionapplies to all reorganizations or recastings of the Data in whole or in part and to integrations of the Data with information from other sources.

2. The User acknowledges that XMNH is the owner of the Data and agrees to acknowledge the source of the Dat supplied by XMNH whenever such Data in whole or in part are used in any report, publication, document or public communication beyond the internal activities of the User.

3. XMNH makes no express or implied warranties as to the accuracy or completenessof the Data provided nor its suitability for any purpose. While XMNH believes that Data provided are its own, except as specifically noted, XMNH makes no warranties or representations as to possible infringement upon copyrights or property rights of otherin the Data.

4. XMNH reserves the right to make changes, corrections, additions, and/or deletions to the Data and is under no obligation to supply the User with updates.

5. The User assumes all responsibility for the use of the Data supplied by XMNHand further agrees to hold XMNH harmless for any claims, suits, causes of action or damages arising from use of such Data or actions taken based upon the Data provided by XMNH.

6. The User agrees to pay XMNH a fee of $ _____ for providing the Data.

By signing this agreement and accepting the Data described, the User agrees to be bound by the above terms and conditions.

_____

User Date

_____

For X Museum of Natural History Date

****

ADDENDUM. It is highly recommended that the User personally verify the Data by examining the voucher specimens in the collection. Not all data have been verified against original labels and field catalogs.

ACKNOWLEDGMENTS

We thank the members of the ASM Systematics Collections Committee who reviewed this manuscript for their constructive comments. We arevery appreciative of the support the ASM Board of Directors have given to this project. We are especially grateful to Productions Editor, Bob Timm for his advice and support in bringing this manuscript to publication.

The Carnegie Museum of Natural History was instrumental in the support of the development of the manuscript. We are most indebted to Director James E. King for covering the postage costs for mailing copies of the publication worldwide.

LITERATURE CITED

Blum, S. D. (Editor). 1991. Guidelines and standards for fossil vertebrate databases: Results of the Society of Vertebrate Paleontology Workshop on Computerization. American Museum of Natural History, New York, vi + 129 pp.

Erola, J. and F. Fox. n.d. (<1985). From Gutenberg to Telidon: White Paper on Copyright. Proposals for the Revision of the Canadian Copyright Act. Government of Canada., pp 10-11.

Fontaine, G., Chairman. 1985. Minutes of Proceedings and Evidence of the Subcommittee of the Standing Committee on Communications and Culture on The Revision of Copyright. House of Commons, Issue No. 27: 44.

Hegstad, H. 1990. A proposal concerning standard geographic references in systematic collections. Association of Systematics Collections Newsletter, 18(6):90-91.

McLaren, S. B. 1988a. Copyright law and museum databases. SPNHC Newsletter, 2(1):3-4.

McLaren, S. B. (Chair) 1988b. Guidelines for computer usage of computer-based collection data. Journal of Mammalogy, 69(1):217-218.

McLaren, S. B. 1988c. Is copyrighting your database the solution? SPNHC Newsletter, 2(2):4.

McLaren, S. B. (Chair) 1989. Survey report on computerized information retrieval mammal collections of North America. Committee on Information Retrieval, American Society of Mammalogists, 33 pp.

McLaren, S. B. 1993. On database accessibility. pp. 51-54 in ASC Guidelines for institutional database policies (E.C. Hathway and K. E. Hoagland, eds.). The Association of Systematics Collections, Washington, D.C. [Reprinted from article appearing in 1992 ASC Newsletter 20(6):158-159].

McLaren, S. B. and J. K. Braun (eds.). 1993. GIS applications in mammalogy. Special Publication of the Oklahoma Museum of Natural History, Norman, Oklahoma, 41 pp.

Williams, S. L., M. J. Smolen, and A. A. Brigida. 1979. Documentation standards for automatic data processing in mammalogy. The Museum of Texas Tech University, Lubbock, TX, vii + 48 pp.

Wilson, D. E. and D. M. Reeder. 1993. Mammal Species of the World: A taxonomic and geographic reference. 2nd Edition. Smithsonian Institution Press, Washington, D.C. xviii + 1-1206.

LITERATURE CITED (Continued)

Woodward, S. M. 1989a. Collection automation: Tailoring database and collection management to suit a natural history collection, Collection Forum, 5(2): 60-72.

Woodward, S. M. 1989b. A coding system for nature of specimen for Recent mammal collections: Mixing documentation needs, tradition, and computers. Collection Forum, 5(2):73-78.

Yates T. L, W. R. Barber, and D. M. Armstrong. 1987. Survey of North American collections of Recent mammals. Journal of Mammalogy, supplement, 68(2):76 pp.

CURRENT ADDRESSES FOR AUTHORS

PETER V. AUGUST
DEPT. OF NATURAL RESOURCE SCI
UNIVERSITY OF RHODE ISLAND
KINGSTON RI 02881

LESLIE N. CARRAWAY
5230 NW HIGHLAND DR
CORVALLIS OR 97330

PAISELY S. CATO
406 FERNDALE DR
COLLINSVILLE VA 24078

WILLIAM L. GANNON
DEPT OF BIOLOGY
UNIVERSITY OF NEW MEXICO
ALBUQUERQUE NM 87131

SUZANNE B. McLAREN
EDWARD O'NEIL RESEARCH CENTER
CARNEGIE MUSEUM OF NATURAL HIST
5800 BAUM BLVD
PITTSBURGH PA 15206-3706

NORMAN A. SLADE
UNIVERSITY OF KANSAS
DYCHE HALL
LAWRENCE KS 66045-2454

PHILIP D. SUDMAN
DEPT OF BIOLOGY
414 EAST CLARK
VERMILLION SD 57069-2390

RICHARD W. THORINGTON, JR.
DIVISION OF MAMMALS
SMITHSONIAN INSTITUTION
WASHINGTON DC 20560

STEPHEN L. WILLIAMS
STRECKER MUSEUM COMPLEX
BOX BAYLOR UNIVERSITY
PO BOX 97154
WACO TX 76798-7154

SUSAN M. WOODWARD
DEPT OF MAMMALOGY
ROYAL ONTARIO MUSEUM
100 QUEENS PARK
TORONTO ON
CANADA M5S 2C6

Corrections

(added 02 December 1999)

New addresses for authors:

Paisley Cato
San Diego Natural History Museum
1788 El Prado, Balboa Park
P.O. Box 121390
San Diego, CA 92112-1390

Stephen L. Williams
Strecker Museum
Baylor University
PO Box 97154
Waco, TX 76798-7154

Philip D. Sudman
Dept. of Biological Sciences
Tarleton State University
Box T-0100
Stephenville, TX 76402

Page 2—The FTP addresses on this page are no longer valid. Electronic copies of this document are available on the American Society of Mammalogists WWW site at http://