

**REPORT TO:
NATIONAL PARK SERVICE, NORTHERN GREAT PLAINS NETWORK**

**Results of a Survey of Vertebrate Collections for Voucher
Specimens Collected within the Current Boundaries of
Northern Great Plains Network Parks**

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30 SEPTEMBER 2003



INTRODUCTION

The United States National Park Service (NPS) in 1916 was charged with a mission

"...to promote and regulate the use of the...national parks...which purpose is to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations." (The National Park Service Organic Act 16 U.S.C. 1 2 3, and 4; NPS 2001a)

To fulfill aspects of this mission, specifically the conservation of natural objects and wildlife, the NPS needs a full knowledge of the biodiversity of each park. To meet this challenge the NPS has created the Inventory and Monitoring Program (IMP), which is charged with conducting baseline inventories of basic biological and geophysical natural resources (NPS 2001b). In 1992 the IMP embarked on an ambitious survey of biodiversity in the parks. To compliment these efforts, the NPS also has begun to survey natural history museums and collections in North America for plant and animal voucher specimens that were collected from within park boundaries, thus providing another means of assessing the biodiversity of the parks. The documentation of biodiversity with voucher specimens provides a critically important baseline for comparison through time and space, and will be the capital for currently unimagined but important future studies (Huber 1998). Current and future biodiversity surveys within parks should continue to collect voucher specimens and deposit them in properly curated museums. Unfortunately, the exact location and status of many of the specimens and collections from past park surveys remains uncertain (Stohlgren et al. 1992). The purpose of this project was to determine the location of voucher specimens of vertebrates collected from within the current boundaries of U.S. National Parks in the Northern Great Plains Network (NGPN; Appendix A). This work has generated a database that includes specimens collected from the NGPN Parks, the associated institutions, and certain information on the specimens.

METHODS

Data Requests. A list of institutions that potentially housed specimens from states where the NGPN Parks are found (Nebraska, North Dakota, South Dakota, and Wyoming) was generated using Hafner et al. (1997) and our knowledge of other regional and national collections, in order to maximize the efficiency of our efforts. Contact information for museum personnel was compiled using Hafner et al. (1997), our own contacts, and internet searches (Appendix B). All institutions were contacted via e-mail initially. E-mail letters were sent to from one to four or more individuals, depending on the structure and size of the institution (see sample letter Appendix C). Letters requested collection number, species, state, county, specific locality, and date of collection for vertebrates from the NGPN counties. Before we requested any data we studied the toponymy of county names important to this study (See Appendix E) because we fully recognized the potential problems caused by the change of geographic names. Our list of requested county names thus includes historic counties that would have included the current NGPN parks.

Data Obtained. Institutions typically responded to our requests in one of four ways: 1) they sent requested data or responded that they had no specimens from requested counties, 2) they informed us that the information was on-line, 3) they requested more information from us about our research, or 4) they did not respond. Institutions that did not respond to our initial

requests were re-contacted at least once, after a re-examination of our contact information. Those institutions requesting further information on our research were sent an official letter restating our request, and documenting the intent of this survey. A number of institutions noted that their collections were databased and accessible on-line (Appendix D). We visited those websites to determine if they provided the information needed for this study, which they did in most cases. We then queried those on-line collections and downloaded relevant data. Institutions with websites that did not provide all the information needed were recontacted via e-mail to further clarify our specific data needs. Most institutions provided data in text or Microsoft Excel formats. A relative few institutions provided hard copies of their holdings. In the latter case, the data were examined and only those specimens found to be applicable were entered into our working files.

Data Treatments. Once collection data was received from an institution two fields were added: "In Park" and "Park ID". If the data set included counties not requested because they did not contain NGPN parks, they were deleted. The data sets were then organized by state, county, and specific location. Using maps and the descriptions of the boundaries of NGPN parks we then scrutinized specific locality data for every specimen to determine if they fell within one of the NGPN park boundaries. DeLorme Gazetteers and the TopoZone website (<http://www.topozone.com/>) were regularly used to locate specific localities relative to park boundaries. In some cases research had to be conducted to find the location of unofficial site names, currently unused site names, and abandoned town names. Each record was assigned one of the following in the "In Park" field:

Code	Meaning
Y	The specific location given definitely lies within the current park boundaries.
Y?	The specific location given likely lies within the current park boundary, but could vary based on interpretation.
N?	Either the specific location given could lie within current park boundaries, but not enough information is given to make an accurate decision, or depending on interpretation it comes very close to current park boundary.
N	The specific location given defiantly does not lie within the current park boundary.
?	There is not enough data to make a decision (i.e. only data provided was State and/or county)

For those specimens assigned "Y", "Y?", or "N?" in the "In Park" field, the appropriate park abbreviation was entered into the "Park ID" field.

Evaluated data were consolidated by vertebrate group (i.e., birds, fishes, herps, and mammals) in separate Microsoft Excel files. Separate sheets were prepared for "Y", "Y?", or "N?" categories ("N" and "?" data were not included) so that the NPS could apply their own standards to the data sets. Data sets included fields for Park, Museum, Museum Catalog Number, Genus, Species, Subspecies, Sex, State, County, Specific locality, Other locality data, Date Collected, Collector, Collector Number, and Prep. Type (in this order). All data were standardized into the same formats and symbologies. Standardization of symbols included data for sex (M = male, F = female, U = Unknown), state, and prep type (ALC = alcohol preserved, SO = skin only, SK = skeleton only, SL = skull only, SSL = skin / skull, SSK = skin / skeleton).

If the prep type was something rare then the full description was preserved. It should be noted that data was never added. If the institution did not provide the data then those cells were left blank. Therefore blank cells only confer that the institution did not provide these data. Furthermore, location information was never altered or updated, even if the location includes unofficial site names, currently unused site names, and abandoned town names.

ASSESSMENTS

After reviewing potential museums, we contacted 73 institutions in this study, and had a 70% response rate. The outcome of our survey is as follows (and see also Appendix F): 1) the museum did not respond to our data request (X=30.06%); 2) data were sent (R=34.66%); 3) data were sent, but were incomplete (Ri=2.76%); 4) the museum had no specimens that matched our request (N=31.29%); or 5) the internal organization of the museum's catalogs were such that they could not search their catalogues or deliver their data to satisfy our request (D=1.23%). If a museum responded by saying they would send us the data, but we never received this data after two re-contacts, then the institution was classified with those institutions not responding. Ri data included data that was not fully cataloged and only could be partly accessed for this survey (University of Wisconsin, Zoology Museum; University of Minnesota-St. Paul, James Ford Bell Museum of Natural History; University of Kansas-Lawrence, Natural History Museum).

Forty-two of the 73 institutions contacted sent us data on at least one vertebrate group of the specimens housed in their institution. Of these institutions 21 (50%) were ranked as providing the "highest professional care" for specimens within their collections, while 9 (21%) were ranked as having "professional staff and care", and 8 (19%) as having "adequate care". The remaining four institutions (10%) were in a category ranked as having less than adequate care, and being heavily dependant on student workers (Oregon State University, Department of Fisheries and Wildlife; Luther College, Decorah, Iowa; University of Nebraska - Kearney). No institutions providing data in this survey fell into the category of being "in imminent danger of being lost" (Appendix F). The final data sets generated by this study include 115 Y, 14 Y?, and 367 N? bird specimens (Appendix G), 221 Y, 41 Y?, and 162 N? fish lots/specimens (Appendix G), 667 Y, 266 Y?, and 294 N? herp specimens (Appendix G), and 2174 Y, 533 Y?, and 830 N? mammals specimens (Appendix H).

RECOMMENDATIONS

The long-term preventative conservation of museum specimens documented in this report is essential for current and future documentation of biodiversity in each of the NGPN parks. It is our recommendation that the specimens documented in this report remain in their current institutions, to conserve these "natural and historic objects", as mandated by Congress in 1916. The preservation of these specimens also will ensure that current and future efforts to preserve park wildlife will be scientifically based. The NPS should see to it that the institutions housing the specimens are committed to their care and meet minimum standards for the conservation of the specimens (see Rose et al. 1995 or SPNHC 1994). Justifications for these recommendations include:

- 1) Many of these specimens (~30%) were collected from these locations before the creation of the respective park, and therefore, the NPS has no jurisdiction over them.

- 2) Institutions housing these specimens have invested considerable resources into their collection, preparation, and conservation. We estimated that it costs \$40 - \$100 to collect a specimen (inflation added extrapolation from Anderson 1973), an average of \$60 to prepare a single research specimen (range \$24 to \$140 based on weight; Labeledz personal comm.), and \$0.07/specimen/year to conserve (Labeledz personal comm.). This is a large investment. Often these resources have come from the tax dollars of a state or municipality, and many individuals may have donated their time and money to these institutions to help preserve these specimens.
- 3) Movement of these specimens will complicate the future locating of voucher specimens used in previous research.
- 4) Movement of these specimens may subject them to unnecessary damage.
- 5) Movement of these specimens would cost the NPS from \$5.00 to \$30.00 per specimen (inflation added extrapolation for vertebrates from West 1987).
- 6) All of the institutions in which these specimens are housed allow access to the specimens for valid research and education. This means that other researchers and the NPS personnel can use these specimens. This maximizes the output of research and education, while conserving the specimens for the greater benefit of the people.
- 7) Having these specimens in multiple institutions lowers the chances of a complete loss or damage of all specimens in a single catastrophic event (e.g., tornado, fire, etc.).
- 8) Fostering positive relations between the NPS and these institutions will be mutually beneficial, by providing more resources for each to draw from in meeting their respective mandates.
- 9) Historically the NPS and the U.S. government have not been adequately committed to maintaining proper collection standards for scientific specimens over long periods of time (with the notable exception of the National Museum of Natural History in the Smithsonian Institution). The structure of the NPS, the lack of an institutional mandate or commitment for the care of collections, the lack of trained collections care professionals at each of the parks, and inadequate or unstable funding make the NPS an inappropriate place to store these resources.

The NPS should continue to track the status of these collections, remind institutions of their responsibility to care for these specimens, and put pressure on delinquent institutions to properly care for their collections. The NPS should develop partnerships and designate qualified regional institutions as depositories for future collecting from NPS lands. They should develop agreements, and foster partnerships that can benefit both the NPS and the natural history research collection community at large. Formal contracts should be developed with institutions currently housing these collections for their long-term care, including budget forecasts and contingency plans. Furthermore, in developing these relationships the NPS can easily track the status of these voucher specimens, through their agreements, and first-hand knowledge of the economic and political situation of these institutions.

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APPENDIX A

National Parks in the Northern Great Plains Network

APPENDIX B

Institutions and contact information

APPENDIX C

General e-mail letter sent to institutions contact person(s)

Dear (Contact Person),

I am investigating aspects of the distributional patterns of vertebrates found in the Northern Great Plains. I am therefore contacting museums to inquire about relevant holdings to aid me in this process. At this time, I am specifically interested in vertebrates from the following states and counties:

Nebraska: Boyd, Brown, Cedar, Cherry, Cheyenne, Dakota, Dixon, Emmett (discontinued), Holt, Keya Paha, Knox, L'eau qui Court (discontinued), Rock, Scotts Bluff, and Sioux.

North Dakota: Allred (discontinued), Billings, Buford (discontinued), Flannery (discontinued), McKenzie, Mercer, Wallace (discontinued), Walette (discontinued), and Williams.

South Dakota: Bon Homme, Bruguier (discontinued), Charles Mix, Cheyenne (discontinued), Clay, Cole (discontinued), Custer, Gregory, Jackson, Lincoln, Lugenbeel (discontinued), Pennington, Shannon, Stanley, Union, Washabaugh (discontinued), Washington (discontinued), White River (discontinued), Yankton, and Ziebach.

Wyoming: Converse (discontinued), Crook, Laramie, and Goshen.

If you have specimens in your holdings from any of the above listed counties, I would be interested in a list of material that includes the following: collection number, species, state, county, specific locality, and date of collection.

I thank you in advance for your assistance.

Sincerely,

Hugh H. Genoways

APPENDIX D

Institutions with web searchable collection databases.

APPENDIX E

Toponymic Study of Counties in Which Parks are Located

APPENDIX F

**Status of data requested from institutions and quality of
there care**