An Improved Approach to Fossil Mammal Type Collection Housing

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INTRODUCTION

The American Museum of Natural History (AMNH) houses the world's largest collection of fossil mammals, consisting of an estimated 400,000 specimens that are actively used by both in-house and visiting researchers.

Over 2,000 of these specimens are type specimens, which are used as the basis of new species (holotype) and genus (genotype) descriptions. Type specimens are among the most heavily-used objects in the collection and are a critical resource for current and future research. Unlike many institutions, the AMNH stores its fossil mamma type specimens intermixed in the main collection.

For these reasons, measures to protect the integrity of the type specimens in the AMNH fossil mammal collections were identified as a priority for preventive conservation work.



PURPOSE

As one element of a larger National Science Foundation funded project:

1. Complete a physical inventory of fossil mammal types
2. Design a series of archival-quality housings for type specimens based on the following set of parameters:
   - ***-Relatively cheap***
   - ***-Quick to build***
   - ***-If possible, minimise changing original housing dimensions***
   - ***-Require minimal training to construct***
3. Develop training materials for staff and vounteers who would continue the project.

MATERIALS & METHODS

Prior to rehousing, the fossils were overcrowded, poorly-supported and oftentimes stored in inadequately-sized boxes using non-archival materials, such as acidic tissue and cotton batting.

Cotton batting was used to house these poorly supported specimens

Specimen too large for its box

Specimens inadequately stored using nonarchival materials

Standardized, conservation quality storage supports were designed and created to rehouse small to medium-sized specimens, while larger fossils required customized blue-board boxes or drawer protection to accommodate for height and/or size.

Custom-made blue-board box adjusted for the height of the specimen

Custom-made blue-board box (without rivets)

Drawer with custom-made blue-board and standardized stoage housing a specimen

Simple yet effective supports and bumpers for specimens were created from materials such as, Ethafoam®, Tri-Rod shaped Ethafoam®, Tyvek® and Volara®. Also, paper hands encased in mylar were used to show the handler the safest places from which to lift the specimen.

Ethafoam padding in both boxes (white and plastic). Mylar covers for specimen labels

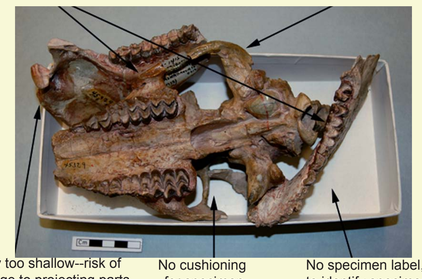
Tri-Rod-shaped Ethafoam bumpers

Tyvek footprints were created to outline the placement of the fossil. Note the paper hands indicating the safest area to life the specimen

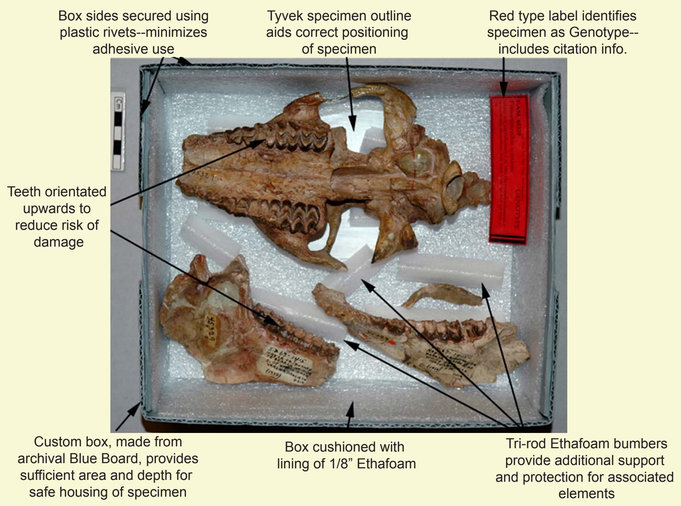
Volara was used to pad drawers for extra support

TYPE SPECIMEN REHOUSING

BEFORE



AFTER



MORE BEFORE & AFTERS

OUTCOME

Over the course of twenty days (~110 hours in total), 190 specimens were collected, rehoused, photo-documented, and returned to the collections. The following are statistics specific to the amount of time spent rehousing specimens:

Average time rehousing/specimen in pre-made box: 7 min/specimen
Total time constructing custom boxes: ~8.5 hours
Average construction time per custom box: 7 min/box
Average time rehousing/specimen in custom box: 15 min/specimen
Average time rehousing/specimen is cust. box (incl. box construction): 22 min/specimen
Average time rehousing full drawers: 30 min
# of rehoused full drawers: ~10

Example of a two-tiered drawer. It took over an hour to rehouse this particular specimen, but most specimens were not this complex. Many of the trays and supports were created from the materal left over from previous rehousing.

Condition reports for specimens were created and entered into an Access database that was specifically designed for this project to monitor progress, identify rehoused specimens and summarize the type and extent of rehousing.

Training materials and protocols were developed, including specimen handling guides, a step-by-step PowerPoint presentation on constructing a blue-board box. These materials are currently used to guide and instruct collections staff and volunteers who are continuing with the rehousing project.

CONTINUED WORK

The type rehousing project is continuing, with specimen rehousing being carried out by volunteers under the direction of AMNH staff. Specimen housings have continued to evolve towards even simpler and more efficient designs.

New student interns will be participating in the project during the summer of 2007. Updates on the project are posted on the Division of Paleontology website:

http://paleo.amnh.org/projects/ProjectFMTypes.htm

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