Natural History Museum of Utah (UMNH)

Preparing Paleontological Collections for Reposit

Although the Museum is also known as the Natural History Museum of Utah (NHMU), we remain legally, Utah Museum of Natural History. The acronym UMNH will continue to be used for all collection purposes.

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Introduction

The Utah Museum of Natural History (Museum or UMNH) serves as the State designated repository (Utah Administrative Code R807-1) for paleontological collections acquired under permit from state lands in Utah. Additionally, we reposit Federal collections. Criteria for determining whether the Museum will curate a collection are in the Museum's formally adopted Collections Management Policy (CMP) and in compliance with Utah State law. Reposited materials will be curated in accordance with the Museum's established CMP and this procedure.

STEP 1: Apply yearly for a UMNH Repository Agreement

The Museum will review repository agreement applications from contract companies, research institutions and land management agencies to curate paleontological artifacts.

Application must be submitted in the name of an organization or institution, with the Principal Investigator (PI) serving as applicant and manager of the agreement. There are three requirements for application:

1. The applicant's organization must have applied for a UMNH accession number under the previous agreement or notify UMNH that no collections were made under the previous agreement, listing the agreement number. (There is a place on the application to note this.)
2. The application fee is due at the time of application submission.
3. A shortened CV of the PI must be submitted every 3 years or if there is a change in organization.

All efforts should be made to submit applications prior to the end of the calendar year for most efficient processing, and to ensure the agreement is in place when the PI is applying for a new permit.

UMNH repository agreements are valid for a maximum of one calendar year. UMNH repository agreements will **always have a December 31st expiration**. The PI must apply for a new agreement each year if they anticipate collections to be made, despite the expiration of the permit. If a permit transcends the end of a calendar year, it is the responsibility of the PI to reapply for a new repository agreement to cover the term of the permit.

All projects conducted by an organization in the state of Utah will be covered by the same agreement. However, firms with multiple branches must apply for separate agreements. Please note that when applying for accession numbers **each collection from a different landowner/ manager** will require a different accession number. (See Step 2)

The Museum will accept only complete collections from each site or project, rather than collections that have been divided among several repositories. If a project is carried out in phases (i.e., survey, testing, and excavation) collections must be reposited at the end of each calendar year. If the PI requires access to materials from an earlier phase of the project, these materials can be loaned to them by the Museum. Loans can be requested from the appropriate collection manager and will comply with UMNH loan policy.

Timelines are dictated by the permits obtained by the PI, however, in order to best manage our collections and anticipation of space for new collections, the Museum does maintain some time restrictions. At the end of each calendar year, holders of UMNH repository agreements who have collected under the agreement are required to apply for accession number(s). If a repository agreement holder did not collect under the agreement, they need only note this (with the previous year's agreement number) on the following year's repository agreement.

STEP 2: Request Accession Number(s)
(Request after collections are made prior to end of calendar year)

The purpose of the unique UMNH accession number is to link **all** appropriate legal data for collected objects or specimens together. Information includes: the source of the material (i.e., repositor), the investigator, the year in which the work is carried out, land manager/owner at time of collection, the permits, project numbers etc. Only the UMNH registrar is authorized to assign UMNH accession numbers. The accession number (e.g., UMNH.A.2013.15) is a required element of object numbering.

Accession Request Webform

It is the responsibility of the PI to request an accession number prior to the end of the calendar year when the fieldwork was completed, and prior to processing the collection. To request an accession number, submit the online form found on the museum's website, https://nhmu.utah.edu. Submission for an accession number must include a copy of the valid collecting permit for the collections as well as the Preliminary Inventory Spreadsheet. The template for the Preliminary Inventory Spreadsheet is available on the website. Due to management in our databasing system, this spreadsheet is the only acceptable format for your inventories (both preliminary and later final).

All questions about the following procedure should be emailed to both the Registrar and the Paleontology Collection Manager.

Preliminary Inventory Spreadsheet

While in the field, the collector/repositor will have used their own system for numbering localities and specimens. Once these have been submitted to the Museum, UMNH locality and specimen numbers will be assigned on the Preliminary Inventory Spreadsheet which is then returned to the repositor, for processing of collections. It is important that the returned Preliminary Inventory Spreadsheet be used and edited to eventually become the Final Inventory Spreadsheet. This is essential as the formatting of this worksheet was designed for the most efficient importing of data into our database. This will allow for ease of use by future researchers.

1. **Specimen Data**

   Collection (column A)
   UMNH numbers are assigned by paleontological collection type. By assigning the locality and specimen to a particular collection we can more effectively respond to research requests. Prefixes are used to distinguish these collections:

   VP for Vertebrate Paleontology
   IP for Invertebrate Paleontology
   PB for Paleobotany
   IC for Ichnology

   Unique Specimen Field Numbers (column B)
   The field numbers are assigned in the field by the collector. While cataloging/ numbering systems may vary, each specimen and each site should be given a **unique** field number. For better ingestion and searching in our database we request that all spaces be removed and replaced with "-", "_" or "."

   As an Example, the system UMNH Paleontology Department uses in the field:

   Unique Field Locality Number
   CLB-17-1 means Carolyn Levitt-Bussian discovered this site in 2017, it was the first site she discovered in 2017 (the three initials of the person who discovered it, followed by the year collected, then the site number that is of that year)

Unique Field Specimen Number

CLB-17-1-1 represents the first specimen collected at this locality (the three initials of the person who discovered it, followed by the year collected, the site number and then the specimen number). Work done at this same locality in later years would use the same locality number, but the specimen number would be preceded by the year collected, with the number element collected that year after the decimal point i.e., CLB-17-1-2018.1

If you name your sites with an acronym, you can use that acronym as part of your Unique Field Specimen Number as long as it is somehow unique to each specimen.

This Unique Field Specimen Number will be written, along with the UMNH Specimen Number, on the element(s).

Taxon (column C)

We know that sometimes the exact genus and species identifications of the fossil you have collected might be unknown to you (or not yet named). We prefer whatever clade name you put here to be narrowed down as far as possible. If you do not know what it is, please provide an educated guess and indicate in the comments field this is a preliminary ID. **HOWEVER, DO NOT include question marks or other punctuation** as these spreadsheets will be imported into our collections database system and we do not wish to have superfluous punctuation.

Element (column D)

Please describe the anatomical element to the best of your ability (e.g., femur, leaf, shell, etc.). If it is unrecognizable, "bone fragment(s)" is acceptable. We do, however, prefer a tentative identification where possible. There should be a separate row for each individual, identifiable element collected.

Element Description (column E)

This is where we want you to provide any more descriptive information you want to provide for the element. This includes right, left, partial, complete, articulated, isolated, distal, proximal, etc.

Number of Pieces (column F)

If the element is fragmented, please provide the number of pieces it has fragmented into.

UMNH Specimen Number (column G)

The specimen number is to be assigned by the UMNH Paleontology Collections Manager at the time of receiving the Preliminary Inventory Spreadsheet during the accession number request process. Once returned to the repositor, it is expected that the repositor will use this spreadsheet with the assigned UMNH numbers as reference for numbering the specimens for final reposit. The Specimen Number should be written on the specimen by the Repositor. The numbers are in the formats depending on the kind of fossil:

UMNH.VP.####
UMNH.PB.#####
UMNH.IP.#####
UMNH.IC.####

The whole organism (e.g. animal, plant, trackway) receives one UMNH #. Each component (e.g. bone) gets a suffix to that number, UMNH.VP.####.1, .2, .3 etc. Regarding a bonebed, if you can't decisively say this femur went with the same animal as this humerus, each element gets its own unique specimen number.

If an element has been fragmented into many pieces, as long as the association is maintained (e.g. in the same box, bag), each fragment does not need to be individually numbered. This is now considered a "lot" and only needs one number. This would also be true for turtle shell pieces, osteoderms, etc. One piece in the lot needs to be labeled, but all in same bag (also labeled).

Date Collected (column H)
We prefer this data to be the most accurate possible (month/day/year). However, if all you know is the year, please write that. Some information is better than none.

2. Information on Collector

Collected by: Names (People information) (columns I, J, K)
For the **Collector**, **Site Discoverer**, and **Preparator** fields, we are asking for very specific data. There will be specific records made in our database from this information. If we just have John Smith and we have multiple John Smith's in our database, we won't know which one collected which specimen. Full, given names are best. Nicknames are confusing and lead to errors.

Affiliated institution (column L)
Records will also be made of institutions and organizations. Thus, we also request the person's affiliated institution. Please be consistent using the official organization name.

Collectors Role in Institution (column M)
Finally, that person's role in their institution, (Curator, Graduate Student, Volunteer, etc.) to create the most accurate record possible.

3. Accession Data

Accession Number (column N)
The UMNH Accession Number is assigned by our Registrar, See STEP 2 above.

Land Ownership (column O)
Please be as detailed as possible when it comes to filling out the Land Ownership field. Land ownership refers to the owner/manager of the land **at the time the collections were made**. If the land changes hands after this point, we are not interested in that information here.

If, for example, the site is from BLM land in a national monument, write the official BLM acronym for that monument (e.g., GSENM for Grand Staircase-Escalante National Monument). If it is from Utah State land, **entering STATE is no longer sufficient**. It is the collector's responsibility to discern the actual land manager. For state land this is often SITLA; however, it could also be DWR, Sovereign lands, etc. Right-of-ways (ROWs) generally do not change legal ownership of material collected.

Permit Number (column P)
Indicate which permit number each specimen was collected under and ensure copies of all permits are included in files.

4. Locality Data

Unique Field Locality Number (column Q)
Field Locality Numbers are assigned in the field by the collector. While numbering systems may vary, each locality should be given a **unique** field number. See Unique Specimen Field Numbers for example.
Again, for better ingestion and searching in our database, we request that all spaces be removed and replaced with "-", "_" or "."

Locality Name (column R)
In addition to the locality number, the locality might have a name associated with it (e.g., Cleveland Lloyd Dinosaur Quarry, The Skin Site, etc.). Please feel free to include that here.

UMNH Locality Number (column S)
UMNH locality numbers are in the format UMNH.VP.LOC.####. Note this is very similar to the UMNH specimen number however, "LOC" is added. This number will be assigned by the UMNH Paleontology Collections Manager at the time of receiving the Preliminary Inventory Spreadsheet/during the accession number request process.

It is possible to have a site containing specimens from all four collection types (e.g. VP, IP, etc.). Please be sure to separate out the vertebrates from the invertebrates from the plants on your spreadsheet allowing a separate row for each collection (e.g., the vertebrate fossils first on the spreadsheet, the invertebrates next, then the paleobotanical specimens last).

If a site has been visited repeatedly, it may already have been assigned an UMNH Locality Number. The Repositor should alert the Paleontology Collections Manager to this fact, to ensure that a new number is not erroneously assigned to a site already in the UMNH database.

UGS Locality Number (column T)
The Utah Geological Survey assigns numbers to every site in Utah, no matter who manages the land. Martha Hayden, Assistant to the Utah State Paleontologist, assigns these numbers and manages the database for the state. Locality information needs to be given to Martha for a UGS number to be assigned. This number needs to be incorporated into the Preliminary Inventory Spreadsheet. Martha can be contacted at: marthahayden@utah.gov

Locality Notes (column U)
This is a place for any additional information/ notes with regards to the site.

5. Geographic Locality Data (columns V-AE)

- **Datum:** Please do not abbreviate. Enter NAD83, not just 83 (e.g., NAD27, NAD83, and WGS84)
- **Accuracy:** Record accuracy from your GPS (feel free to put a + or – in front of the number e.g., +3m)
- **UTM Zone**: Please be sure to include the letter (e.g., 12S, 12T, etc.)
- **Easting** and **Northing**: UMNH records location coordinates in UTM format: Zone, Easting, and Northing
- If you collect the coordinates in Latitude and Longitude, please convert to Easting and Northing (http://www.rcn.montana.edu/resources/converter.aspx).
- **Verbatim**: If data are converted, please list the original Lat/Long data including hemisphere (EW, NS) in this column

6. Geologic Locality Data (columns AF-AK)

It is important to include any data you have relating to the stratigraphy and geologic age of a site: Geologic Period (e.g., Cretaceous), Geologic Epoch (e.g., Late Cretaceous or Pleistocene), Geologic Stage (e.g., Campanian), Formation, and Member.

7. Locality Discovery Information

Date (Locality) Discovered (column AL)
Please enter the date that the locality was first discovered in the MM/ DD/YYYY format

People information see "2. Information on Collector" (columns AM-AQ)

8. Preparation Information

People information see "2. Information on Collector" (columns AR-AV)

Adhesives/Consolidants Used in Preparation (column AW)
Preparation details will enable UMNH to better manage and conserve collections. In the case of preparation and conservation, it is important to know the types of adhesives and consolidants used.

Date Preparation Completed (column AX)

General Notes (column AY)
Please document other numbers (with definition) or other pertinent info that does not match another column.

STEP 3: Prepare the Collections for Repositing

All fossils must be prepared before they are brought to the museum.

All collections to be reposited at UMNH must be prepared according to these procedures. No other techniques of curation are presently accepted. If a collection is received that does not satisfy these conditions, the collection may be refused at the discretion of the museum and the permitting agency will be notified immediately. If the PI has made a good faith effort to discuss the curation procedures with the museum in advance, we will work with the individual to determine an acceptable solution in a reasonable period of time.

If you have any questions with regards to how to appropriately prepare and glue fossils before they are reposited at the UMNH, please email your questions the UMNH Fossil Preparation Laboratory Manager (Tylor Birthisel: tbirthisel@nhmu.utah.edu and cc clevitt@nhmu.utah.edu).

- There should not be loose dirt on the specimen. Please brush off any loose dirt before repositing.
- All fossils must be marked/**numbered** with a UMNH Specimen # and the Unique Specimen Field # before they are brought to the museum. Please see Appendix F titled, "Assembling an Archival Marking Kit for Paleontological Specimens" for the preferred process of marking and labeling numbers on fossils.
- All fossils must be **packed properly** for transport.*
- All fossils must be **accompanied by associated records** on an archival/gold disc; i.e., Final Report, Specimen inventory sheet (Excel) enclosed with each box, Field Notes and journals (scanned or typed), Field Maps/Quarry Maps, USGS Maps with Site Location(s), Stratigraphic Sections, Preparation Sheets/Logs, Lab and analysis records/notes, Photographs with printed inventory enclosed, and additional Digital data.

How to apply numbers to fossils

Davidson et al 2006.pdf
Please see Appendix F titled, "Assembling an Archival Marking Kit for Paleontological Specimens" for the preferred process of marking and labeling numbers on fossils.

Important Points:
1. Find a flat part of the specimen to put the number on (that is not on a joint or important process).
2. Apply a base coat stripe of thin Paraloid B-72 in Acetone. Various conservation supply companies carry Acryloid B-72 [polyvinyl acetate)] (PVAC) (see Appendix E).
3. Apply a stripe of white acrylic paint.
4. Put the UMNH Specimen # and the Unique Specimen Field # on the white stripe using India ink or an Archival pen.
5. Please apply a topcoat of thin Paraloid B-72 in Acetone over the number.

Legibility

When writing numbers on specimens, numbers should be written carefully and legibly so similar numbers will not be confused (i.e., "4" and "9" and "1" and "7" should all be clearly distinct). When labeling specimens, small, legible numbers should be placed in a location that can be easily seen but will not disfigure the specimen or obscure an important area. If possible, avoid putting the number in an area that is too rough or unstable.

Individual specimens must have their UMNH Specimen # and the Unique Specimen Field # labeled directly on them. The associated UMNH Locality #, Accession Number, Taxon, Element, Formation, Collector and Date Collected should be written on an acid-free paper tag contained together with the specimen in the container. Specimens that are too small to have numbers written directly on them (generally 1 cm^2 or less in size) should be placed in a specimen bag or vial with an acid-free paper tag clearly numbered with their UMNH Specimen # and the Unique Specimen Field # with indelible ink.

***Packing fossils for transportation to UMNH**

Specimens should be brought to UMNH in a receptacle which offers the most protection. This can mean a clamshell or cradle, an appropriately sized box, foam-lined Ziploc bags, specimen vials, etc. Upon scheduling a drop off time with the Collections Manager and Registrar, you need to specify in what form the fossil will be arriving (e.g., pallet, boxes, clamshell, etc.) and how many of each type, so we know what to expect and how much space to designate for this collection.

When boxing materials, use the following guidelines:

1. Each box should weigh no more than 30 lbs.
2. Specimens from different sites must not be placed in the same box unless prior consultation and approval by UMNH is obtained.
3. Specimens should be individually wrapped in toilet paper, paper towel, thin polyethylene foam, or bubble wrap and taped (preferably with masking tape) to secure the package. Then, the specimen should be placed in an individual Ziplock bag. If storing and transporting the specimen in an individual box or tray makes sense for the structural stability of the fossil, please do this before putting it in the Ziplock bag. In order to make the package even more secure, please tape the excess part of the Ziplock bag around the fossil. Insert a specimen label with the specimen catalog number *inside* the bag prior to taping it shut, ideally readable through the bag.
4. Fragile specimens should be supported and protected within the storage box by wrapping or padding with polyethylene foam, tissue paper, paper towel, bubble wrap, or cotton. Specimens should be packed so they will not be abraded or crushed. The best way to secure fragile fossils would be to create a cavity mount into a piece of polyethylene foam. This reduces the chance of the fossil moving in transit. Pieces of acid-free corrugated board or polyethylene foam can be used to construct internal dividers.
5. When multiple sites or multiple animals are packaged in one box, specimens must be separated by site number in some physical way; either with acid-free corrugated board internal dividers, polyethylene foam, in separate bags, or separate smaller boxes.
6. Large, heavy specimens must not be boxed with small, fragile specimens (e.g., large fossil elements together with microfossils). Ideally, large specimens should be stored in a clamshell or cradle or, at the very least, in their own box. Be sure that the box can withstand the weight of the fossil and the bottom of the box won't fall out. It is preferred that large, heavy fossils be reposited in a clamshell archival storage jacket (Please contact the Paleo Prep Lab Manager for instructions on how to make one).
7. Microfossils should be stored and transported in glass or plastic specimen vials. Clear plastic wrap should be used to wrap the fossil before placing it inside the vial and used as stuffing, so the fossil doesn't move within the vial. Please do not use cotton.
8. If specimens cannot be boxed (e.g. too large or fragile) please contact the UMNH Paleo Collection Manager to discuss alternatives.

9. A **Box Inventory Sheet** must be placed inside each box. Only the contents of the box should be listed on this spreadsheet with the following columns at a minimum: The UMNH Specimen Number, the Field Specimen Number, the Accession Number, Landowner, and the UMNH Site Number.
10. Two copies of the Full Final Box Inventory Spreadsheet should accompany the collections.

Authorized materials
Materials that should be used for preparing collections to be reposited at UMNH include*:

Acid-free paper (minimum 20 lb. weight)
Acid-free board and/or corrugated board and map tubes
Acid-free metal edge document boxes (i.e., clamshell boxes – both 2" and 5" depth accepted)
Archival gold CD-ROM, DVD, Blu-ray discs (for electronic images and records)
Plastic clips for documents (e.g., Plastiklips™)
India ink (using quill and ink)
Specified black ink pens for artifact labeling (currently only Zig™, Staedtler™ and Pigma™ are approved)
Black markers for labeling specimen boxes and jackets only (only Sharpie™ pens are approved)
B-72, Paraloid, or Vinac with solvent of Acetone or Alcohol
Other consolidates and adhesives may be considered with prior written authorization by UMNH.

Proscribed materials
Materials that should not be used for preparing collections to be reposited at UMNH include*:

Metal paperclips (coated or uncoated)
Elastic bands
Staples
Common adhesives or labels
Newspaper
Packing "peanuts" of any variety
Any materials of unknown composition
Common foams (i.e., polystyrene [e.g., Styrofoam™], polyurethane, etc.)
Packing material with evidence of pests or material that has been soiled

Associated Records

Collections will not be accepted by the Museum without associated records. All records must be legible and provided in digital format. A printed, color, bound copy (double-sided) of the report must also be included.

Digital Records

All electronic data should be recorded on an archival gold CD or DVD in archival sleeves or holders. Several file formats are acceptable as archival for digital records. Our preference is born-digital documentation, however, when scanning documents, care should be taken to ensure legibility. Scan at 400dpi (300dpi for color), ensure all pages are rotated correctly, are in frame, and legible.

File formats for digital documentation:

- Acceptable archival file format for documents and text include: PDF/A
- Acceptable archival formats for, datasets, databases and spreadsheets include: CSV, Excel format
- Acceptable archival file formats for images (e.g., photographs) include: DNG, and uncompressed TIFF (because JPGs are compressed they are not archival, please convert)
- Acceptable archival file formats for vector-based images (e.g., maps) include: PDF/A
- Maps related to the site and/or report may be embedded in the appropriate PDF/A version of the report

Required Documentation

Because the associated records are an archival copy of your work that will be used by both Museum personnel and future researchers, they must be complete. Associated records should include, when applicable:

- Field Notes (legible, ideally typed) in pdfs.
  - Please do not submit one pdf per page. Combine all pages for each note taker into one pdf.
  - File name should be: UMNH Accession#_FieldNotes_LastNameFirstInitial_YearCollected
    i.e. UMNH.A.2007.49_FieldNotes_LevittC_2007
- Quarry Maps
  - File name should be: UMNH Locality Number_QuarryMap _YearCollected
    i.e. UMNH.VP.LOC.1_QuarryMap_2020
- Stratigraphic Sections
  - File name should be: UMNH Locality Number_StratSec_YearCollected
    i.e. UMNH.VP.LOC.1_StratSec_2020
- Lab and Analysis records
  - File name should be: UMNH Specimen #_type of analysis_year of analysis
    i.e. UMNH.VP.20202_CarbonDating_2007
- Aerial/Topo Map(s) with Site Location(s)
  - File name should be: UMNH Locality Number_MapType_Year
    i.e. UMNH.VP.LOC.1_UGSMAP_2020
- Locality form(s) (can be UGS, BLM or UMNH forms)
  - File name should be: Locality Number_LocalityForm_YearCollected
    i.e. UMNH.VP.LOC.1_LocForm_2020
- Preparation Sheets
  - File name should be: UMNH Specimen #_PrepSheet_Year of completion
    i.e. UMNH.VP.20202_ PrepSheet _2007
- Publications referring to any specimen in the reposited collection
  - File Name should be: Author Last Name_Year Published_Title
    i.e. Irmis_2015_ChinleNuggetTransisiton
- Final UMNH Inventory Spreadsheet as excel file or CSV
  - File Name should be:
    UMNH Accession#_RepositorsSpreadsheet_Institution Repositing_Year Reposited
    i.e. UMNH.A.2007.49_RepositorsSpreadsheet_SWCA_2007
- Final Report -one printed copy, in color, archivally bound & digital copy
  - File Name should be: UMNH Accession #_Report_InstitutionRepositing_Year Collected
    i.e. UMNH.A.2007.49_Report_SWCA_2007
- Photographic log (see heading **Photographic Materials** below**)**

- A **Box Inventory Sheet** must be placed inside each box. Only the contents of the box should be listed on this spreadsheet with the following columns at a minimum: The UMNH Specimen Number, the Field Specimen Number, the Accession Number, Land Ownership, and the UMNH Site Number.

- Archival gold CD, DVD or M-Disk in sleeve

Any materials released or destroyed during analysis (destructive analysis, histology, etc.) must be accounted for in the written documentation of the project. It is the responsibility of the permitee to ensure that collections analyzed by outside specialists are received by the Museum in the conditions required by these procedures.

Photographic Materials

Photographic records provide an essential component of project documentation. **However, photographs must be culled, and only those of specific intent and importance should be reposited**. The submitted material will be made available to researchers and may be used for other collections' purposes. Thorough documentation of photographs and a logical numbering system is required see below. UMNH paleo does not currently require a printed copy of every photo. However, if photos appear in the report, please also include a digital image file for each image. These, too, should be listed on the photo log.

Photographic Log
Documentation for each image should be typed in photo number order on photographic log. Each sheet should contain general information such as the project name, site number and cataloger. The following documentation for each image should be recorded:

A. Date of photograph (as near as possible)
B. Photo number: UMNH Specimen #_Taxon_element_YYYY_# in sequence (e.g., UMNH.VP.123_Testudines_femur_2022.5)
C. Subject (description of what is visible in the photograph i.e., Field Specimen Number of specimen being photographed, the full name of any individual pictured, etc.)
D. Site information (UMNH LOC number, locality name, Geologic Formation imaged, etc.)
E. Photographer's full name

Please do not include any data not associated with specimens being reposited at UMNH. For example, if you have spreadsheets about specimens that were not collected or are NOT being reposited at UMNH, please DO NOT include them in the documents you provide UMNH. **We are only interested in the data associated with the specimens in our care.**

STEP 4: Dropping off Collections

All specimens must be prepared prior to drop off at UMNH.

Collections will not be accepted from third party researchers. Instead, those researchers should return material to the PI/repository agreement holder for delivery to UMNH.

Never mail specimens without prior authorization from Collections Manager and/or Registrar.

Set an Appointment
The Natural History Museum of Utah requests 30 days advance notice of intent to reposit processed collections. As both the Registrar and the Paleontology Collections Manager must be present for drop off, an appointment must be made. It is best to contact both by email, with some suggested dates and times that you are available. Please forward a completed Reposited Collection Checklist form with your request for drop off.

Curation Fees
UMNH will be compensated for the curation of collections reposited by the fees as outlined in Appendix A, and is subject to revision by the Museum. Payment must be made before or at the time collections are reposited. No collection will be accepted before fees are paid. Any deviations must be requested in writing and approved by the appropriate curator and collections manager.

Drop-off Documentation
A Reposited Collection Checklist form must accompany each deposit of materials at UMNH. Preliminary receipt of drop off is generally emailed that day. However, full inventory can take time, depending on size and complexity. This form with preliminary acceptance usually suffices for agency reporting requirements. However, it is the responsibility of the permit holder, not the repository, to submit this to the land manger/agency. When Museum staff has verified the inventory, a final approval will be emailed to the repositor.

If Museum staff discovers any discrepancies between the repositor's inventory and the actual reposit, the repositor will be notified so the discrepancy can be resolved. If the collection does not satisfy the conditions specified in these procedures, the collection may be refused at the discretion of the Museum, and the permittee and agency notified immediately. In such cases, the Museum will assist the permittee or agency in determining what must be done to rectify the problem(s).

Pest Management

The Museum currently undertakes an Integrated Pest Management plan to ensure the collections currently in the facility are free of pests. UMNH, at its discretion, will undertake measures necessary to ascertain all incoming materials are pest-free. The Museum is equipped with a walk-in freezer for pest eradication. However, this process can be detrimental to certain specimens and adhesives. Therefore, paleontological specimens do not always go through this process. However, if you have pest concerns for the collections you will be repositing (e.g., specimens were collected on or near an ant nest), please contact the Paleontology Collection Manager to discuss options.

Appendix A
UMNH Curation Fees
As published on UMNH website November 2021

UMNH will be compensated for the curation (storage, care, and management in perpetuity) of collections at the following rate with the fee schedule effective 2021. Due to the rising costs of resources, there will be a 3% annual increase. Fees will be assessed based upon the year collections are **submitted** to the Museum for curation. Please budget for curation costs accordingly. All prices are in US dollars.

These prices do not include the box/container itself. This must be purchased by the repositor prior to drop off. See appendix D for suppliers.

Max box weight is 30lbs.	Effective 1/1/2023	Effective 1/1/2024	Effective 1/1/2025
Artifact/Specimen Box archival box (1.3cu ft)	$760.00	$790.00	$800.00
Document Box 2” clamshell	$110.00	$115.00	$120.00
Document Box 5” clamshell	$250.00	$260.00	$270.00

Oversized material (material exceeding one or more standard box dimensions or weight limitation) will be assessed by the number of standard boxes the material displaces.

Appendix B
Definitions

Accession
(1) [noun] An object or specimen that has been accepted into the Museum's collections. (2) [verb] The formal process used to accept and record an object or specimen into the Museum's collections.

Collections Committee
The chief curator, division curators, registrar, executive director, and ad hoc members from appropriate academic disciplines as necessary. The committee makes recommendations and approves proposed multi-division acquisitions, deaccessions and long-term Museum collections commitments.

Accession number
The unique identification number assigned to a group of objects or specimens entering the Museum's permanent or reposited collection.

Acquisition
An object or specimen brought into the Museum for anticipated placement in the permanent or reposited collections or for educational utilization.

Cast
An object or specimen that was made or sold for the purpose of reproducing an original object or specimen, but not with the intent to defraud a buyer (see also Reproduction).

Catalog
(1) [noun] A collection of records that classifies and describes objects or specimens in the Museum's collections. (2) [verb] The act of creating a record that classifies and describes an object or specimen in the Museum's collections.

Collections Management
Practices and procedures that prescribe the prudent acquisition, care, display, documentation, loan, preservation, security, disposal of, and accountability for, collection objects and specimens.

Deaccession
(1) [noun] An object or specimen that has been permanently removed from the Museum's collections. (2) [verb] The formal process used to permanently remove an object or specimen from the Museum's collections.

Deed of Gift
A mechanism of conveyance, signed and dated by a donor and countersigned and dated by the authorized Museum employee (i.e., registrar, division curators, etc.) which transfers legal title of a donated object or specimen to the Museum.

Disposal
The physical act of removing a deaccessioned object from the Museum's collections.

Donation/Gift
Something voluntarily transferred without compensation by the donor to the Museum.

Exchange
The transfer of ownership of an object(s) or specimen(s) from one institution to another institution in return for another object(s) or specimen(s) being given in reciprocation.

Exhibition
The presentation of ideas through the display of objects or specimens with the intent of educating the viewer.

Incoming Loan
Object(s) or specimen(s) placed in the temporary custody of the Museum (not involving change of ownership) for exhibition, research, or acquisition approval.

Inventory
The act of physically locating objects or specimens for which the Museum is responsible and comparing them with documentation records.

Loan Agreement
A form used between a lender and a borrower that identifies the lender, specifies the item(s) to be lent, and outlines the conditions of the loan and the respective responsibilities of the lender and borrower.

Loan Number
The unique identification number assigned to an incoming loan upon receipt.

Outgoing Loan
An object in the Museum's collection, lent to a borrowing institution in the care of an individual (not involving change of ownership) for research or exhibition.

Preventive conservation
Planned care of an object or specimen and its environment to mitigate deterioration, destruction, or neglect.

Provenance
The origin, source, and ownership history of an object (generally for art).

Provenience
The origin and source of an object or specimen (generally for natural history items).

Purchase
The act of obtaining ownership of an object or specimen through the transfer of money.

Record
The documents and information pertaining to the receipt, acquisition, management, and disposition of an object or specimen in the Museum's custody.

Repatriation
The return of human remains or cultural objects on request from the permanent collection to the appropriate representative tribe with a documented connection to the materials. The materials may be retained by the tribe or reburied at their discretion.

Reproduction
An object or specimen that was made or sold for the purpose of reproducing an original object, but not with the intent to defraud a buyer (see also Cast).

Researcher Agreement / Rights & Reproduction Agreement
A form to be completed and signed by an applicant which defines terms of use of collections including photographic images of objects or specimens in the Museum's collection and/or for the permission to reproduce such images in a publication or other format. The form records information on the applicant and the intended use of the photographic image and provides rules governing rights and reproductions issues.

Risk Management
A program of practices and procedures to control losses and minimize damage to objects for which the Museum is responsible. The University of Utah Risk Management oversees all insurance held for the Museum.

Repository
As the authorized repository of archaeological and paleontology objects/specimens for the State of Utah, UMNH stores, curates, and manages the reposited collections.

Title
The legal right to possess an object or specimen. Title to the collections is held by the Utah Museum of Natural History. Possessing "good title" to an object or specimen is understood to mean that the object or specimen is free of all liens, encumbrances, and claims of any kind, whether from the United States or any other country.

Transfer
The conveyance of ownership of an object or specimen from one entity to another.

Appendix C
Accessibility
Excerpts from UMNH Collections Management Policy (CMP)

Access Policy
Access to the collections provides opportunities for research and education. However, measures must be undertaken to preserve the integrity and security of the collections. Access to collections must be pre-approved by Curators or Collection Managers and will follow the guidelines of individual collections. Researchers and interested parties must contact the respective UMNH Curator or Collection Manager in order to schedule an appointment to study a specific object or specimen from the collections. Requests for access to collection objects and specimens will be considered by the appropriate Curator and Collections Manager taking into consideration risk to objects or specimens, resources available for supervision and research goals. Access to collections storage areas shall only be under the supervision of collections personnel or, in the case of contractors or inspectors, the Facilities Manager.

UMNH policy, guided by state and federal law, allows for curatorial discretion to restrict access to sensitive data such as site, locality, donor, valuation and cultural information. Reposited collections and their associated records may be safeguarded by further restrictions placed by the public land agency. In cases where a Curator needs greater clarification, they may contact the public land management agency. Curators, Collection Managers and the Registrar will take all reasonable steps to ensure that this sensitive information is safeguarded.

Outgoing Loans
For research, exhibitions, education, or other stated purpose, the UMNH will agree to arrangements with other like institutions for the loan of UMNH permanent collection objects or specimens. An Outgoing Loan Agreement will accompany loans originating from the UMNH and signed by both responsible parties. A General Facility Report will be required from the borrowing institution if the object or specimen is loaned for exhibition. Loans from UMNH will be made for a period of one year, with the option of renewal at the discretion of the appropriate Curator or Collection Manager but are non-transferable without written authorization from Curator or Collection Manager. Collection objects or specimens will not be loaned to individuals. If the loan is for research purposes, results of analyses (including publications, reports, images, GenBank number, digital data such as CT scans etc.) must be forwarded to the Museum and remaining materials, not consumed during analysis in the case of destructive studies, will be returned to division Curator or Collection Managers upon conclusion of the study.

Appendix D
Conservation/Archival Supply Companies

Conservation Resources
800-634-6932
www.conservationresources.com

Gaylord Bros. (Demco)
Syracuse, NY
800-448-6160
www.gaylord.com

Hollinger Metal Edge, Inc.
Commerce, CA
800-862-2228 or
Fredericksburg, VA
800-634-0491
http://www.hollingermetaledge.com

ULINE
Pleasant Prairie, WI 53158
1-800-295-5510
http://www.uline.com/

Light Impressions
1-800-975-6429 www.lightimpressionsdirect.com

Print File, Inc.
1-800-508-8539
www.printfile.com

Talas
Brooklyn, NY
212-219-0770
talasonline.com

University Products
Holyoke, MA
800-628-1912
www.universityproducts.com

Appendix E
UMNH Collections Personnel

Registration

Janaki Krishna
Registrar
801-585-7484
jkrishna@umnh.utah.edu

Forms and policies:
https://nhmu.utah.edu/collections/policies-forms

Paleontology

Carrie Levitt-Bussian
Paleontology Collections Manager
801-581-5578
clevitt@nhmu.utah.edu

Tylor Birthisel
Paleontology Prep Lab Manager
801-587-8434
tbirthisel@nhmu.utah.edu

Museum Information
Natural History Museum of Utah
University of Utah
301 Wakara Way
Salt Lake City, UT 84108
Before mailing, please contact Registrar and Collections Manager.
Website: www.nhmu.utah.edu

Appendix F

Assembling an Archival Marking Kit for Paleontological Specimens

Amy Davidson, Preparator, Division of Paleontology, American Museum of Natural History, New York, NY
Samantha Alderson, Objects Conservator, Division of Anthropology, American Museum of Natural History, New York, NY
Marilyn Fox, Preparator, Division of Vertebrate Paleontology, Yale Peabody Museum of Natural History, New Haven, CT

A poster presented at the 66th Annual Society of Vertebrate Paleontology Meeting, Oct 2006, Ottawa, Canada

The use of proper application methods and archival materials results in numbers and labels that remain legible, durable, and removable over time. Assembling a marking kit makes archival marking of specimens convenient and more consistent throughout a department or institution.

Abstract

Will the number you put on your specimen, its tag, box or other housing, be legible in one hundred years? Is it rub-proof, water-proof, fade-proof? Will a future worker be able to remove it if necessary? This poster will present a plan for assembling an archival marking kit, adapted for fossils from a similar kit for anthropological objects. Having a well-designed kit saves time and can help improve and standardize marking practices. The proposed kit includes a variety of high quality materials, including India ink, acrylic paint, Acryloid/Paraloid B72 in a convenient nail-polish bottle and also in a tube, Japanese and archival papers, Bristol board and various dispensers, brushes, pens, etc. Possible additions to the kit (such as disposable pens) will be discussed. But even the best materials can fail if not used well. This poster illustrates marking failures and solutions for problematic fossil surfaces (dark, rough, friable, very small or fragile, etc.) and problematic materials such as coated surfaces and plastics. Also included are a discussion of permanence and removability, looking both at the materials included in the kit and others that could be used or have been used in the past.

NON-ARCHIVAL PRODUCTS CAN AGE POORLY

Many commercial products used in the past should be avoided

Nail Polish is usually cellulose nitrate, an unstable resin that can yellow, become brittle and flake off of surfaces.

Correction Fluid can also become brittle and flake off over time.

Commercial Pens (Bic, Flair, etc.) often utilize dye-based inks that fade severely. Even so-called "Permanent Markers" (Sharpies, etc) are not lightfast, actually fading rapidly with light exposure. In this case "permanence" refers only to the fact that the markers are waterproof.

Self Adhesive Tape (Scotch, Masking, etc) often ages poorly and falls off.