

Idaho Virtualization Laboratory

(Virtual Idaho Museum of Natural History)

Handling and Scanning Policy

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This document is intended to lay out the procedures used within the Idaho Virtualization Laboratory (IVL) for the scanning of museum specimens which may include but is not restricted to; modern skeletal, fossil skeletal material, other paleontological specimens, archeological material, material from cultural anthropology, as well as for general specimen handling. The procedures are intended to produce the optimal data extraction with procedures designed to ensure the protection of the original specimens as much as is humanly possible. Protocols and all handling are to be coordinated with the relevant curator in charge and/or the collections manager of the Idaho Museum of Natural History (IMNH), or the equivalent for the institution that owns the original specimen being scanned.

OVERVIEW OF SPECIMEN HANDLING PROCESS:

The general process in dealing with modern skeletal material is as follows:

1. Determine the ownership of the specimen and arrange with the owner to do the scanning, as well as make any necessary agreements on file usage and storage. These agreements will include, if applicable, an Intercampus Loan Form as well as a standard Agreement for Use and Reproduction. These forms can be provided by the IVL or if the loaning agency prefers to provide their own, those forms will be used instead. If the specimen is owned directly by the IMNH, ownership and control of the files will automatically be retained by that unit, as the IVL is an associated laboratory of the IMNH. Usage of file material in all contexts will be negotiated with the curator in charge of the collection or the Collections Manager and approved by the Director of the IMNH. If ownership is outside of the IMNH, then direct negotiation is to be done to do the scanning and for use and storage of the files. Financial ramifications and conditions are to be included in agreements. Many specimens in collections are casts, replicas or other materials covered under copyright law. These items will not be considered for scanning because of the complicated process of obtaining permission.
2. Examine the specimen to assess the quality of the material and ascertain if any material may require extra care even beyond the procedures outline herein. If extra care is required the IVL will coordinate with the owner of the specimen, in order to add the required precautions to the regular handling protocols.

3. Determine the basic purpose of the scanning.
 - a. If the purpose is towards general specimen archiving, evaluate each element and make note of special needs, as well as determine the optimal scanning process.
 - b. If the purpose is to generate a virtual composite specimen, evaluate each axial element (all non-bilaterally symmetric elements) and make note of special needs, as well as determine the optimal scanning process for these elements. Select the best representative of the bilaterally symmetrical elements and do the same for them.
 - c. Consider the possibility of damage from various light sources used in the process, from the standard lights in the copy stand used during the photographic imaging, to the lasers or X-rays used in the scanning process.
4. Photograph the specimen to be scanned in multiple views to record data on the original external morphology of element, as well as provide supporting data for working on scanned versions.
5. Transfer all appropriate specimen data to the specimen database to be linked with the photographic and scanned image data. Information pertaining to specific location or any other data determined to be inappropriate or harmful in any way by the curator in charge or the Collections Manager will not be included.
6. Determine scanning method(s) to be used.
 - a. If CT-scanning is to be used, coordinate with collections manager regarding moving the specimen to the CT-scanning facility. Specimens are to be cradled during the process in a way to avoid any damage due to stresses associated with gravity, or from any other sources. IVL and/or collections personnel are to be with the specimen at all times and rigorous steps are to be taken to pack the specimen(s) for transport both to- and from the scanning facility in a way to avoid any damage of any kind.
 - b. If the scanning is to include surface scanning using IVL resident equipment, then steps must be taken in all handling to prevent damage to the specimen. This includes the proper stabilization during the scanning process using neutral material such as ethafoam and not applying pressure that might stress or damage the specimen. Movement of specimens from collections drawers to the scanning platform is to be done very carefully, cradling the specimen in a way to avoid unnecessary stresses. Specimens are to be contained in industry standard collections case drawers when not being scanned. Transport to the IVL is to be done within the wheeled collections cabinet or in other arrangements approved by the relevant collections manager. Care is to be continued throughout the scanning process as different views are done. When completed, any residue from the neutral stabilizing material is to be removed from the specimen using a light

brushing from a paint brush. The specimen is then returned to the collections case.

- c. If other scanning equipment is used, follow the protocols within the IVL, or external to the IVL that are relevant.
 - d. The curator in charge and/or the Collections Manager should be notified of all procedures.
7. Scanning procedures are to follow the basic specimen handling protocols of the IMNH, or the parent institution owning the specimen. For the IMNH, these include:
- a. In the contact area around the specimen – defined broadly – steps are to be taken to avoid contact with materials related to eating, drinking, and, especially, smoking.
 - b. Only authorized individuals are to have contact with the specimens.
 - c. The appropriate gloves are to be worn for those specimens that require such handling.
 - d. Anyone handling specimens should wash and dry their hands thoroughly before and after handling objects.
 - e. Specimens should ALWAYS be handled using both hands, supporting the specimen in a way to reduce stresses as much as possible. NEVER handle specimens by a handle or protrusion. Heavy objects should be handled with the help of sufficient additional people to avoid possible dropping or other damage to specimens.
 - f. Those handling specimens should remove all loose jewelry or clothing (i.e., bracelets, necklaces, large rings, ties, etc.) before handling.
 - g. Soft (#2) lead pencils only are to be used in the immediate vicinity of objects. No pens or markers!
 - h. Specimens should be treated with the highest regard.
 - i. Remember, water and large temperature variations can be very destructive to specimens. Consideration should be made during periods of climatically very hot or very cold periods.
8. The moving and transport of a specimen is an especially critical time. The following procedures and realizations should be used and considered when doing so:
- a. Movement within the IMNH, especially up to the IVL, should be done using the transport collections cabinet or some other method approved by the relevant collections manager.

- b. Transport to facilities outside the IMNH building must be done with maximum care, including the proper packaging to avoid damage and use of appropriate vehicles. Driving to the external facility should follow the highest standards to avoid accidents or other problems. Transport from the vehicle to the laboratory at the external site should be sufficient and consistent with protocols used within the IMNH building. All movement of specimens outside the IVL will be preceded with the notification of and coordination with the curator in charge and/or the Collections Manager.
 - c. Plan ahead. Remember Murphy's Law.
 - d. Do not handle or move an object unless it is necessary.
 - e. Never hurry when handling or moving objects.
 - f. Be sure that everything the object comes in contact with is clean and dry: your hands, the counter top, etc.
 - g. The moving of an object must always be supervised.
 - h. Use a cart to transport objects whenever possible.
 - i. Never stack or overcrowd objects.
 - j. Cases shall be tightly closed after the removal of specimens. Case doors should never be left open.
 - k. Objects will not be left out overnight, but shall be secured in a locked cabinet or access controlled locked room in appropriate storage containers. The work area must be left clean at the end of each day.
 - l. When in doubt err on the side of caution. The objects we are handling are irreplaceable. In addition, many of the skeletons were once people. All objects deserve and will be treated with the utmost respect.
 - m. Set up the scanning table with the appropriate material for the specimen to be scanned. Clean the surface being used before starting a new specimen. Muslin bean bags for objects like skulls objects that can be scanned horizontally. Ethafoam for larger objects or objects that must be scanned vertically. Often such jobs require two people. Start the process with both people.
 - n. When you are done scanning an object, put it away.
9. Specimen security is of extreme importance and must be considered during all actions with specimens. This includes:
- a. When specimens are taken out of the museum or off-campus, an IVL staff member and the relevant collections person must be with the specimens at all times. All preparations must be coordinated with the relevant collections person.

- b. Specimens are to be kept in an industry-standard collections cabinet when housed in the laboratory and not being scanned.
 - c. When specimens are in the IVL, the laboratory must be locked at all times when a staff member is not present.
 - d. Access to the IVL is to be tightly controlled. Keys are to be restricted to IVL staff and IMNH administrative staff. Non staff must be accompanied when in the IVL and specimens are present.
 - e. When in transport, specimens must be secured at all times.
10. Once a specimen is imaged and scanned, the resulting files are valuable and must be treated as such. These should be moved onto the archive server used by the IVL as well as leaving a backup copy on one of the main CPU's in the IVL. A backup copy on DVD media is to be made and kept with the library of DVD's maintained by the IVL. A second copy is to be made and deposited in the external back-up area. Finally, copies will be sent back with the borrowed objects.
11. Access to data files is only available to the IVL staff and the relevant collections / administrative staff of the institution that owns the specimen. Other access is only under permission of those entities that control file access as negotiated in 1) above.
12. In the event that a specimen is damaged, destroyed, lost or stolen, the IVL will work with the agency or individual in ownership to make sure the object is repaired, retrieved or if possible, replaced.