

# Protocol for Ice Patch Artifacts in the Field, Lab/Analysis, and Transport Actions

## Glacier Ice Patch Archaeology Project

Created for fieldwork 2011-14 by the Glacier Ice Patch Research Team, modified in 2017 by P. Yu, Boise State University.

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### **1. Background**

In 2010, Glacier National Park (GLAC) received climate change grant money to document, recover, analyze, and interpret cultural items that may be exposed due to melting of ancient snow and ice fields. The project, hereafter called the Ice Patch Archaeology Project, is funded through two task agreements with the Rocky Mountain Cooperative Ecosystem Studies Unit (RM-CESU). One agreement is with the University of Wyoming (UWY) with sub-agreements to the Blackfeet Nation (BN) and the Confederated Salish and Kootenai Tribes, (CSKT). The other agreement is with University of Colorado Boulder (CU-B, INSTAAR).

### **2. Goals and Objectives**

The goal of the Glacier Ice Patch Archaeology Project is to collect artifacts used by prehistoric groups for hunting, gathering, processing, and other settlement and subsistence activities, as a means to preserve the items and shed light on prehistoric lifeways. One of project's unique strengths is the creation of a protocol for handling of artifacts that are culturally sensitive. In May and August 2010, representatives from the park, the BN, CU-B, the CSKT, RM-CESU, and UWY formed the Glacier Cultural Resources Management Group (GCRMG) as a forum for planning and communication pertaining to this major project (no formal consultations will be conducted by this group but will be referred to appropriate personnel). The first task for the GCRMG is to create a protocol that sets culturally and scientifically appropriate guidelines for the handling and collection of artifacts in the field, analysis and documentation in the lab, and transportation associated with the Ice Patch Archaeology Project. Non-cultural or paleo-biological items are not covered by this protocol, and curation guidelines will be added later in the project or developed separately.

This protocol will serve as an example for future cultural resource projects at GLAC. Further, the protocols and the means used to arrive at them will be widely disseminated to other park units and the Glacier NP CRMG anticipates they will be useful to other park/tribal/researcher partnerships for cultural resources-related projects. Below are initial artifact documentation and treatment protocols agreed-upon by the GCRMG.

### **3. Procedures in the Field**

All crews shall be accompanied by a supervisor and carry a copy of the field protocols and the field curation handbook.

#### *3a. Locating Items*

Artifacts are most frequently encountered along the downslope margin of the ice patch and in the off-ice area immediately below the ice patch - the forefield. Artifacts collect here as they slide off the ice and/or are transported by flowing water. If an ice patch has a large, relatively low-slope surface, artifacts can occasionally be found directly on the ice. In these instances the artifact will usually be in association with other organic material, including animal feces and windblown dust and other detritus.

Ice patches with dark staining in late summer and early fall hold the most potential for discoveries. The runoff channels below ice patches are another location where cultural material can be recovered. In general, the further away from the ice an artifact is encountered, the more degraded it will be as a result of exposure to water, wind and sun.

The project is collecting data on changes in ice patch sizes and shapes over time. Points along the forefield portion (the downslope edge) shall be mapped using a GPS unit and shooting with offset may help delineate a large patch. Where feasible (if the patch is small or easy to walk around the edge), the entire patch shall be mapped. Because organic material is a lag deposit, be sure to record GPS points for every discovery.

#### *3b. Documenting and Handling Items*

##### 3bi. Artifacts

First, take some context photos of your find. When documenting an area of permanent ice, take overview photos of the location from far enough away to allow the extent of the ice to be compared year-to-year. Record the presence of windblown organic material, animal feces, etc., present at the ice patch. Take a few area photos as well. Look for stone alignments, cairns, or vision-quest related structures and/or breast works/hunting blinds, as well as chipped stone artifacts. Keep an open mind about what you might encounter and expect that preservation will be variable. If you are at or above tree line and encounter a piece of wood that may be an arrow or dart shaft (e.g., the right shape and size but with no obvious modifications such as nock or hafting elements), consider collecting it to provide a contextual basis for subsequent discoveries.

Newly discovered items shall be mapped as accurately as possible (preferably with a GPS unit to sub-meter resolution). Items shall be photographed *in situ* and a sketch map created if there are multiple items or other need to document site structure. Photograph items *in situ* with a scale and north arrow or compass, and take several overview/context photos. Between 6 and 8 megapixels is a good target resolution. Always record your shots in a photo log, if there is no log available take notes at minimum describing the photographer, date, location, subject, compass bearing for the heading/facing, and anything else that describes the object and its setting. Note the GPS coordinates of the object(s) photographed and of the location where the photographer is standing.

Excavation shall not be conducted except in cases where an appropriate decision has been made to remove an object and small amounts of sediment or snow must be displaced.

##### 3bii. Sensitive Items

Human remains, associated funerary objects, sacred objects, and objects of cultural patrimony are protected by the Native American Graves Protection and Repatriation Act (NAGPRA). This law requires procedures that are outside the authority and capability of the Ice Patch Archeology Project. The below

language covers actions that can be taken by Ice Patch field crews in time-critical situations. The team recommends that a separate Written Plan of Action (WPA; see <https://www.nps.gov/nagpra/> for this and other guidance) be developed between the Park and affected parties. In the interim, the below actions are agreed upon by the GCRMG.

### 3biii. Spiritual and/or Ceremonial Artifacts (e.g., Sacred Objects and Objects of Cultural Patrimony)

The goal of the Glacier Ice Patch Archaeology Project is to collect artifacts used by prehistoric groups for hunting, gathering, processing, and other settlement and subsistence activities, as a means to preserve the items and shed light on prehistoric lifeways. However, a different class of artifacts that might be encountered during the field survey may be associated with sensitive spiritual and/or ceremonial activity. In some instances, removal and analysis of these special-sensitive materials would be inconsistent with cultural norms and practices for those modern tribal groups who hold historical attachments to an area because these items were purposely left in the area as offerings or were brought to the area to be "put away" after ceremonial use with the intent that they would naturally decay in the that specific location away from human interference. (Need note here regarding certain tribes may not wish to touch sensitive items even to move them to safety).

Artifacts that qualify under the category of "special-sensitive artifacts" may include portions of, or intact, medicine bags; eagle bone whistles; pipe bowls and stems; buffalo stones; items fully covered with red ochre (as opposed to partial marks); isolated buffalo skulls; and ceremonial offerings directly associated with vision quest structures. These artifacts should be photographed, documented and mapped as described above, but participating Native Americans may request that such items be left in place or safely secured out of harm's way as near as possible to the original discovery location until consultation with tribal cultural and spiritual leaders can be completed. Both the discovery location and the new secure location shall be mapped with GPS. It may be necessary to request that the park temporarily block access to certain trails.

If the consultation with tribal cultural leaders and spiritual practitioners suggests that the items should be left on-site without collection, that request shall be honored by the park. If tribal cultural leaders determine that collection and removal of the special sensitive artifact(s) is culturally appropriate, the item may be collected by the Project team with the participation of tribal representatives. Under some circumstances, special conditions for removal of artifacts may be requested by participating tribes, such as leaving an offering behind, or conduct of on-site cultural activities.

### 3biv. Inadvertent Discovery of Burials (Human Remains or Associated Funerary Objects/AFO's)

Human remains and shall not be photographed, although the context of their location may be photographed from a distance. These items shall be left *in situ* unless they are immediately threatened by destruction or theft. The original discovery location shall be mapped using a GPS, with a sketch map depicting the area. If destruction or theft are a real danger, they may be placed in a more secure location as near as possible to their original resting place and the new location mapped with GPS. The remaining actions required by NAGPRA shall be carried out separately from this project.

### 3bv. Collection and Transport of Fragile Artifacts

Depending on the state of preservation, some artifacts; including fragile bone items, wood, shell or fiber material; are expected to be very fragile and will require special care for field recovery and stabilization. When collecting and transporting fragile artifacts (e.g., arrow shafts), use lightweight portable materials. "Coroplast" ([www.coroplast.com](http://www.coroplast.com)) and other fluted plastic board flexes slightly and can help to cushion artifacts during transport. It can also be scored and folded to make archival boxes (Figure 6). It is recommended that you carry at least one ca. 36" by 24" sheet folded on the long axis. Artifacts can be held in place with rolled cotton bandages. It is recommended that you carry three 2" x 60" rolls. To stabilize an artifact, cut the board several inches longer and wider than the size of the artifact being

collected. Score the edge of the board and “web” the artifact onto the board using the bandages. Other supplies include a variety of Ziploc bags, garbage bags and strips of unbleached cotton muslin to shore up splitting artifacts. If an organic artifact is dry, keep it dry. If it is wet, consider wrapping it in plastic after field stabilization for transport to a freezer (see conservation below).

### 3bvi. Collection and Transport of Lithics/stone

The focus of this project is organic/perishable items. However, the BN and CSKT are interested in sourcing of lithic raw material for understanding ancient trade, migration, and technology. If field crews discover scatters of lithic tools and debitage (by-products of tool manufacture or repair), field crews may collect small representative samples of un-modified debitage (typically small flakes that show no sign of additional working) for sourcing (which shall be funded under a different source. The location of the collected item(s) shall be GPS’ed as well as a datum point and sketch map for the site. No further documentation shall take place. It is anticipated that archaeologists and tribal culture specialists shall return to lithic sites in the future for actual recordation and/or return of analysed lithics. Note: the collection of small unmodified lithics and their return to point of origin is outside the park’s usual non-collection policy.

### 3bvii. Collection and Transport of Paleobiological/non-cultural items

It may not be necessary, practical, or even feasible to collect every piece of wood or bone that you encounter. Do your best to ascertain if the material has cultural significance (e.g., Is that bone spirally fractured? Is that piece of wood purposefully shaped?). If you do not find anything cultural but you discover paleobiological material, consider collecting a few small samples for radiocarbon dating. If the material is old, it might help make your case for future efforts. Share your observations as widely as possible (e.g., with biologists, ecologists, rangers, contacts at local universities, etc.). Animal scat or other items that are deemed non-cultural will be treated as paleobiological samples and will not require culturally sensitive handling protocols.

## **4. Procedures in the Lab**

### *4a. Storage*

Labs and other locations for temporary storage of artifacts must be secure, e.g. locked with limited access and/or protected by coded entry. The space should be temperature and humidity-controlled. If the artifacts are dry, put them into a stable, safe space. Try to support them with shims if they are warped, e.g., an arrow shaft that may be curved as a result of warping should be supported in multiple places. Wet organic artifacts can be dried, but there is a risk of warping and splitting. Some alteration is inevitable, but best practice to minimize damage should be followed: If a damp artifact begins to split, wrap it snugly with fabric strips such as Tyvek or unbleached muslin (see Figure 6). Place the wet artifact into a bag or container with a relatively small opening and put it in the freezer. This will allow the moisture to slowly evaporate from the artifact through ablation. Depending on how wet the object is, you can modify how well-wrapped it is in order to change the rate of ablation.

If the artifact is too large to fit in your available freezer, you can create a make-shift humidification chamber. Put the artifact in a moisture-proof case, such as a large cooler or under-the-bed Rubbermaid storage container. Ensure the artifact is well supported, and put a small bowl of water into the container. Put the lid on but leave it slightly ajar by 1-2 cm. Note: If you recover a leather artifact (e.g., a moccasin) a professional conservator will need to assist you with stabilization. Not all conservators are qualified to do this. The GCRMG will discuss next steps; possible experts include Objects Conservators at major museums such as the Denver Museum of Nature & Science. Craig Lee has current contact information. You can also check [http://instaar.colorado.edu/ice\\_archaeology](http://instaar.colorado.edu/ice_archaeology) for additional advice (should we just print this out?). In the meantime, keep the artifact frozen!

#### *4b. Analysis*

For cultural items, the type of analysis shall be agreed upon by the Glacier NP CRMG. It is anticipated that most analysis shall be non-destructive except where approved by the GCRMG. Of course, destructive analysis of cultural items requires tribal consultation; where destructive analysis is agreed upon, micro-sampling shall be conducted (for example, using AMS techniques for radiocarbon dating).

At this time, the following is written into the Project Scope and may be modified by the Glacier NP CRMG:

“Wood specimens will be identified as to genus at the University of Wyoming by Rick Weathermon, a Univ. of Wyoming Anthropology staff member experienced in the analysis of wooden artifacts. Organic materials will be AMS (accelerated mass spectrometry) radiocarbon-dated (as funding permits) through INSTAAR’s radiocarbon lab at a discounted rate. AMS dating of wood requires only minute samples that can be removed with a coring device at the University of Wyoming. Obsidian samples will be sent to Dr. Richard Hughes at the Geochemical Research Lab, Portola, California for ED-XRF (energy dispersive x-ray fluorescence) to determine geographic source. Following identification, other paleobiological materials, such as animal feces and non-artifactual wood will be analyzed as deemed useful in reconstructing past environments; analyses will likely include stable isotope analysis and/or DNA recovery.”

For non-cultural paleobiological items, laboratory analysis shall be non-destructive where feasible and minimize the sample size if it is destroyed. No cultural concerns are noted for these items.

Items shall remain ‘under study’ status for no longer than three years after the time of recovery unless otherwise specified by the GCRMG.

### **5. Data Management Procedures**

All parties agree that documentation containing locational or highly sensitive cultural information shall be kept in password-protected files, and hardcopies in secure, limited access facilities. Format of data will be determined by the Glacier NP CRMG and will be amended in this section.

Note: Site forms shall be filled out and sent to MT SHPO for all sites. However, SHPO records are available to the public and the GCRMG shall review these forms to ensure that sensitive information is redacted as needed prior to distribution.

### **6. Curation Protocols** will be determined by the Cultural Resources Management Group

All non-cultural samples, collections, and copies of records, data, photographs, and other documents resulting from the work will be delivered to the appropriate repository official at GLAC. Note: As of 2017, no cultural items have been located during the Ice Patch Project. A fully developed curation section was not deemed necessary. The team recommends that the Park shall provide its normal curation protocols to the GCRMG for discussion and if needed, modification, prior to additional fieldwork.

### **7. The Living Protocol: Communication, Development, Revision**

This protocol was initiated and refined in face to face meetings between representatives from all partners; while the meeting was taking place, a note-taker recorded talking points for the protocol and later turned them into a basic listing. Details and adjustments were implemented and tracked through email and phone correspondence, but the major work effort was conducted in person. The GCRMG anticipates that the protocol will be re-visited and adjusted further as new developments happen in the field and the lab.

It is anticipated that this protocol, with a current version tailored for the Ice Patch Archaeology Project, will be useful for future cultural resource projects undertaken by the GCRMG. It is intended to be a living document that can serve as a starting point for issues that commonly arise in cultural and heritage-related projects. As new projects arise, the GCRMG will revise the protocol in a consultative process that blends in-person and remote communication methods. While face to face is always most effective, 'remote' meetings may work for smaller revisions to the protocol.

The BN and CSKT shall circulate this protocol to their Cultural Committees as they deem necessary and the GCRMG shall revise as needed.

The State of Montana is not yet a member of the GCRMG. This protocol may become a Memorandum of Agreement in the future, which will require State of Montana participation.

The GCRMG shall review this protocol on an as-needed basis. In the event that the GCRMG decides to use an MOA or other Action Plan, a review schedule could be set at that time.

## **Glossary of Terms**

**Artifact:** An object that has been made or modified by a human being. This could be tools, clothing, or other functionally obvious items, as well as the byproducts of their manufacture or repair.

***In situ:*** In the place where it was first found, in its original spatial context.

**Fluvial action:** gravity-influenced water action, as with slope wash, rivulets, creeks, or larger drainages.

**Lag deposit:** In which the layers of sediment (snow, sand, soil, etc) that usually accumulate between episodes of deposition (human or natural) have been removed. This causes layers of materials to 'lag' or collapse on top of each other, so that they may appear as a single layer deposited all at the same time.

**Lithic:** Made of stone. Usually describes tools and the chips that result from manufacture.

**Paleobiological:** Non-human in origin. Animal, plant, geological remains, and so forth.

**Radiocarbon dating:** Also called C-14 dating. A process by which the actual calendar age of an item may be calculated within a certain margin of error. Organic items such as animal or plant materials, or charcoal flecks, are suitable for this kind of analysis. The ratio of two different isotopes of carbon is measured in the lab. This process is destructive, but using AMS (accelerator mass spectrometry) techniques the samples can be very small (the size of a fingernail clipping).

**Shim:** A small piece of wood or other firm material used for support, usually in association with binding.