
Treatment and Storage of a Buffalo Hide Tipi

This article describes the treatment and storage of a buffalo hide tipi from a Montana collection.

Hide tipis were once common on the Northern Plains but are relatively rare in collections today. Only a handful are preserved in museums in the United States. This tipi was acquired by the Montana Historical Society in 1939. The estimated date of origin is the 1860s, and the construction details, most especially the pinked edges and leather lacing along the inside edge of the smoke flaps, suggest it was made by the Plains Cree.

The tipi is constructed of eight full sized brain-tanned bison hides and many smaller pieces, all sewn together with heavy sinew thread. The tipi had been set up, displayed, and photographed at least once in the 1950s and again in the 1970s and is currently stored in the ethnographic collections at the state museum in Helena, Montana.



1860s Cree bison hide tipi as photographed in the 1970s

Original storage in two rolls with heavy metal rod inserts, laid on a wooden platform

The goal of conservation treatment was to document the object's condition and design treatments appropriate for both long term storage and to sustain handling for research and possible display. The large size of the object proved challenging when considering treatment options and creating the storage mount. The tipi measured approximately 14 feet across when laid flat, or over 16 feet when rolled because of the extended smoke flaps and uneven edges.

Considering its age, the tipi is in remarkably good condition. It had been well used and repaired many times during its working lifetime, yet most of the leather remains supple, and the seams intact. The upper parts of the tipi are saturated with smoke from cooking fires, leaving light colored shadows where the tipi poles had been. Leather along the lower sections of the tipi was brittle, creased, and tattered from many years of being in contact with the

ground, and no longer laid flat. Numerous fabric patches had been applied to reinforce holes in the original leather.



Detail of stiffened leather, creasing, and original fabric patches along the lower edge of the tipi

The tipi had been stored for many years on two cardboard tubes laid side by side on a wooden pallet. Two long pieces of metal square stock had been placed in the cardboard tubes, possibly to facilitate moving the object. The heavy weight of the metal rods was therefore concentrated on the lower part of the rolls.

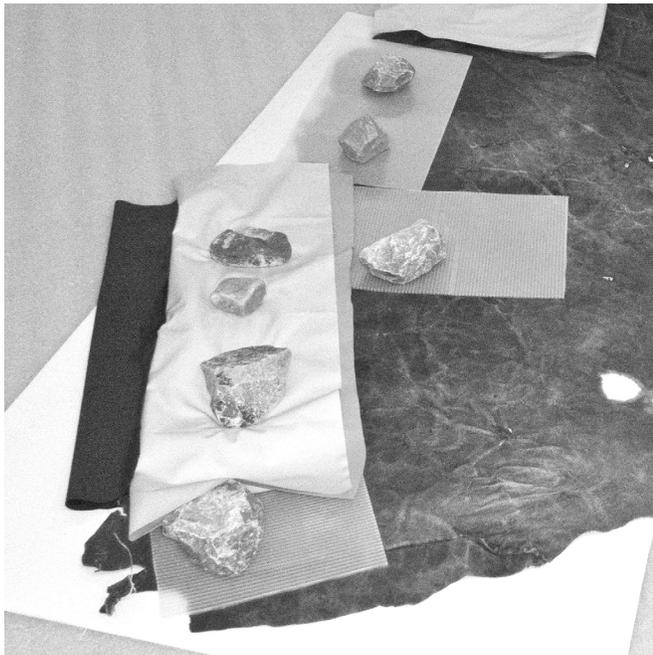
The two-tube configuration made the leather especially susceptible to tearing if the rolls had been inadvertently pulled apart. It was determined that the best way to store the tipi long term would be on a single large roll.

In order to document the object's condition, a map was made of the tipi construction, showing the placement of each of the full hides and smaller pieces of leather. White lines added to the image delineated the sinew sewn seams. Each individual hide was assigned a number in the treatment report so that location of repairs could be easily identified.



Map of the tipi construction, showing the placement of eight tanned hides. White lines indicate sinew-sewn seams.

The conservation treatment itself was multifaceted. The first step was to vacuum all loose debris from the leather surfaces using a soft bristle brush and a vacuum with a screened nozzle. Because of the size of the object, cleaning was best accomplished by carefully walking across the leather surface in stocking feet, using washed cotton sheeting to cover the leather under foot. Inexpensive knee pads were also found to be especially helpful when working on and around the tipi. Fragments of plant materials and grass seeds recovered by the vacuum were preserved as part of the record of the history of the object in use.



Reshaping leather with rehydration using breathable membrane fabrics and weights

The second, and most time consuming, part of the treatment, was to straighten and open out the stiff creases along the lowermost edges of the tipi. Flattening the leather allowed for more efficient rolled storage and gave access to areas of damaged leather that might require treatment.

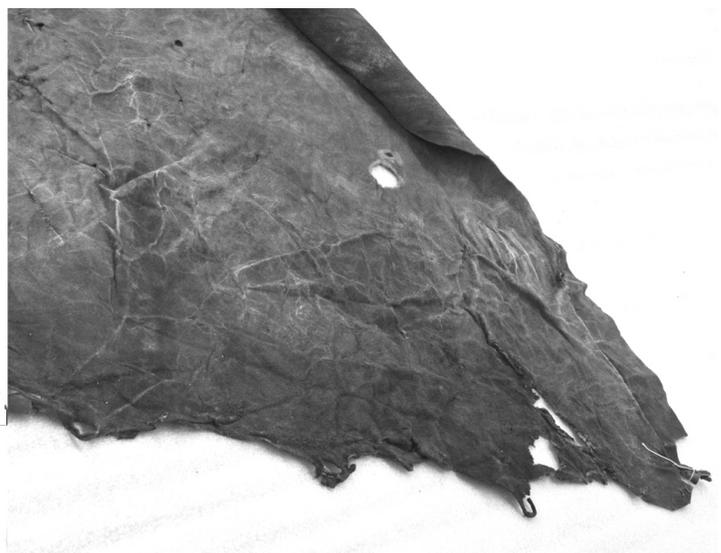
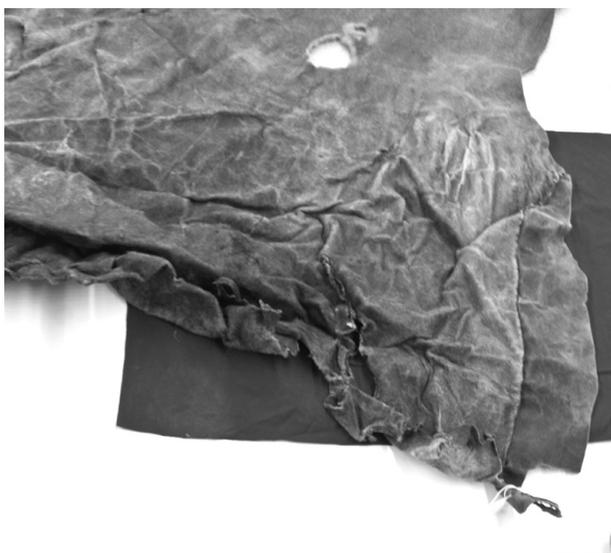
In order to flatten the materials, small sections of leather were hydrated using a waterproof breathable membrane fabric similar to Goretex. Deionized water was applied to a cotton pad sandwiched between the layers of membrane fabric and placed in contact with the leather, top and bottom.

After 2 or 3 hours the hydration packs were removed, the softened leather was weighted with washed river rocks placed on pieces of 3 mm corrugated polypropylene, and left to dry. Adding a layer or two of washed cotton muslin helped absorb extra moisture and sped the drying time. This method was very effective in recovering the original shape of the leather along the bottom of the tipi.

Three types of leather damage required attention during the treatment – open seams, simple tears, and large voids in degraded leather. Each type of repair required different methods and materials.

Torn sinew-sewn seams were repaired using sinew thread and the original sewing holes. Sinew thread was chosen for its strength and similarity to the original construction materials. The repair thread was marked for easy identification with a single strand of brightly colored polyester thread held parallel to the sinew during sewing.

Simple tears in leather that was otherwise supple and stable were repaired by backing the tear with Beva-flocked tissue, (Beva 371 flocked onto Hollytex 3221 - 2.8 mil.) The flocked tissue was tinted with dilute latex paint to match the surrounding leather. Temporary tissue bridges were



Detail of stiff and creased leather, before and after treatment

Treatment and Storage of a Buffalo Hide Tipi, continued

first placed across the tear on the front side to align the raw edges, then larger strips were applied to the back side. The adhesive was heat set with a warm iron to create a bond that was strong, yet could easily be removed without leaving adhesive residue.

Very fragile leather along the lower edges of the tipi was stabilized by backing entire areas with unbleached cotton muslin. Cotton fabric was chosen because of its flexibility and similar appearance to the flour sack cloth used for the original repairs in the same areas.

Because the cotton backings were much larger than the tissue tear repairs and the leather much more fragile, it was deemed impractical to apply adhesives using heat. Lascaux 498 was chosen for these backed repairs because it can be easily reactivated with a solvent.

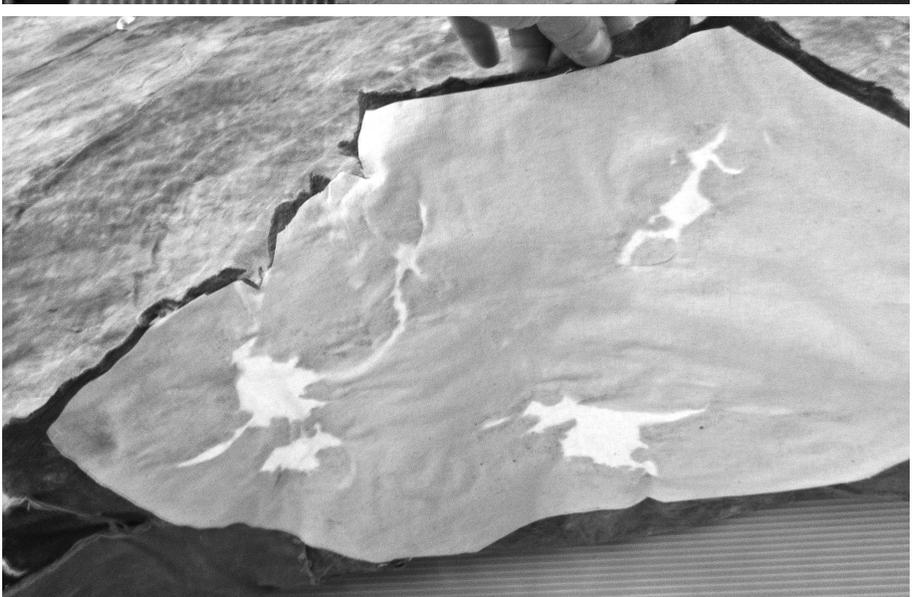
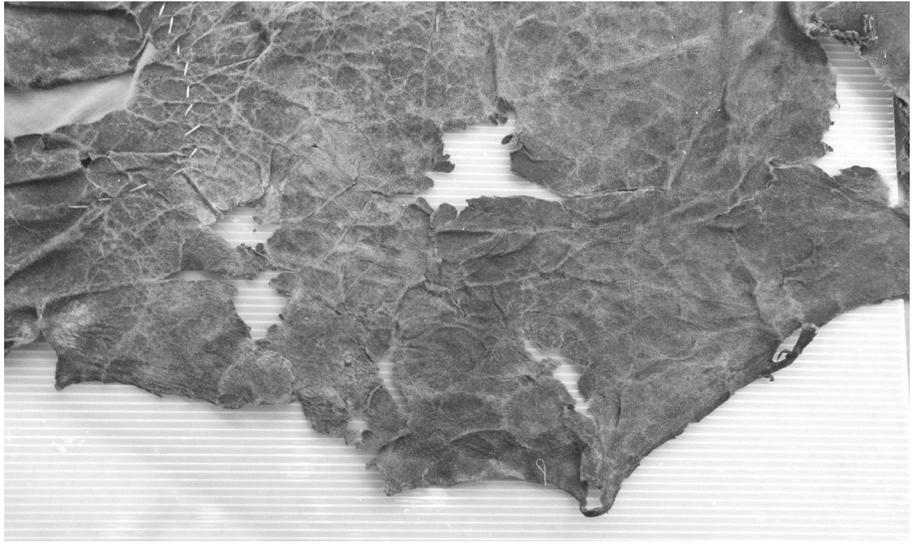
Pieces of washed cotton fabric were cut to shape and placed under the area to be reinforced. The outline of the voids was drawn directly onto the fabric with a pencil, following carefully the outline of the remaining leather.

Then the fabric piece was removed, the Lascaux was painted onto surfaces that would be in direct contact with the leather, and the adhesive allowed to dry. Adhesive applied along the raw edges of the fabric also prevented raveling and

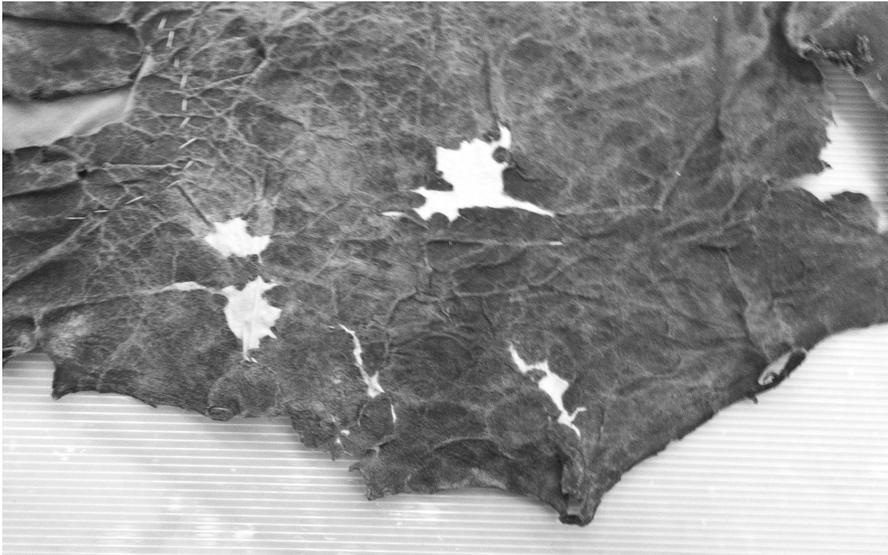
Detail of fragile leather along the lower edge of the tipi

Fabric backing marked with pencil and coated with Lascaux

Back side of repaired area



Treatment and Storage of a Buffalo Hide Tipi, continued



Fabric backing left undyed to help differentiate between original and new fabric repairs



eliminated the need to sew or bind the edges of the patch.

To apply the backing, the adhesive-coated fabric was laid behind the leather, aligning the raw edges of the leather to the pencil marks.

A piece of blotter paper the size of the backing material was taped to a piece of rigid polyethylene plastic. Acetone was applied to the blotter paper, and the blotter assembly was quickly slid beneath the cotton backing to reactivate the adhesive.

After 5-10 seconds the blotter paper was removed, and the leather and backing material was pressed from the top side to bond the backing to the leather.

This method created a strong, flexible repair that was not visually distracting, could be easily removed, and effectively supported the most fragile pieces of leather along the bottom edge of the tipi where they might be easily lost during handling. The curator requested that the fabric backings be left undyed to identify the difference in the old and new repairs.

The final part of the project was to roll the tipi onto a single tube for long term storage. A piece of 8 inch diameter corrugated polyethylene culvert pipe (available at building and construction supply retailers) was cut to size, padded with a layer of polyethylene foam sheeting, and covered with soft Tyvek.

The tipi was rolled onto the tube with soft Tyvek interleaving, tied in place with wide cotton twill tape, and covered with another layer of Tyvek. Wooden mounts were placed under the ends of the culvert tube to support the roll.

Polyethylene culvert pipe covered with ethafoam padding and Tyvek for large scale rolled storage